Radio Communication

The Journal of the Radio Society of Great Britain

November 1991

Volume 67 No 11

THE VOICE OF AMATEUR RADIO FOR 78 YEARS

Raynet Sails into Action: see page 25

KENWOOD

Is this the best HF transceiver in the world?

These are a few of the very favourable comments made by reviewer **Peter Hart G3SJX** about the TS-950SD -

"The quality reports received on transmit with the DSP were **superb**."
"The PA intermodulation was **much better** than the average rig."
"The reciprocal mixing or oscillator sideband noise performance was **also excellent**, one of the **best radios** I have measured and substantially better than the TS-930S or TS-940S; even with the Lowe modification."

So you can begin to understand why we really do believe that Kenwood have set new standards for others to attempt to emulate.

Does the Digital Signal Processing (DSP) really justify itself or is it just a gimmick? Peter Hart says: "**The DSP performance was amazing**. In the widest setting, the -6dB audio bandwidth was 180Hz to 3.0kHz and yet the unwanted sideband and carrier rejection was in excess of 70dB!" - The exclamation mark is fully justified.

The TS-950SD is available for full demonstration either at Matlock or any of our Regional Centres, so if you can, call in and give it a good try and see for yourself before making up your mind to buy.

If you hear a TS-950SD being used on the air, just take a listen. You will find the answer to our question is that this is **absolutely the best HF transceiver in the world!**

TS-950SD . . . £2,995 inc VAT

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

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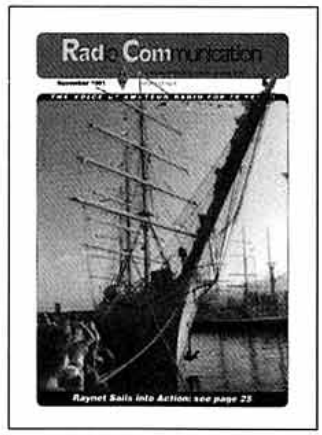
Radio Communication

Your November RadCom includes the Annual Financial Statements and The Year In Review, plus:

* **Twelve pages of technical information,**
* **Propagation predictions in the preferred colour format,**
* **Full-colour on eleven different features.**

NEWS AND REPORTS

TECHNICAL FEATURES



COVER PICTURE:
One of the Tall Ships competing in this year's Cutty Sark Race. See page 25 for details of the amateur radio invovement.
Photograph: GI3USS

REGULAR ARTICLES

RADIO SOCIETY OF GREAT BRITAIN

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

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

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

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Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE
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Telex 9312 130923 (RSGB)
Electronic Mail Via Dialcom/Telecom Gold: 87 CQQ083
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Morse practice co-ordinator: Mike Thayne, G3GMS
Audio visual library co-ordinator: David Simmonds, G3JKB

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

ANNUAL SUBSCRIPTION RATES
Corporate Members: UK and Overseas (*Radio Communication* sent by surface post): **£30.00**
UK associate member under 18: £12.75. Family member: £11.95
UK students over 18 and under 25: £19.20 (Applications should give applicant's age at last renewal date and include evidence of student status)
Affiliated club or society/registered group (UK): £30.00 (including *Radio Commmunication*): **£17.95** (excluding *Radio Communication*) (Subscriptions include VAT where applicable)

Membership application forms available from RSGB HQ

The RSGB – An Open Society

GUEST WRITERS WILL BE invited to contribute *RadCom* 'editorial' columns from time to time - their opinions not necessarily coinciding with those of Council or Society Headquarters. Apart from exercising free speech within reasonable limits, it gives columnists a chance to air their ideas - perhaps occasionally with a little humour.

It has become popular to blame Society Headquarters, Council or one or the other of the committees for virtually everything that has happened since the Flood. All sorts of stories go the rounds by one means or another. All too frequently they contain one grain of truth amongst a load of misinformation. Some are so odd that it is impossible to describe them. Have you asked yourself what the originators or the people who pass on these stories seek to achieve?

"It shouldn't be a secret."; "We want a more open Society."; "All of Council should resign."; "You know what they are like."; "Why can't I have what I want now?" (which happens to be different to what everybody else wants). There is no 'secret'. Short of telling you what brand of breakfast cereal everybody responsible for running the Society had this morning, all the information which is normally available from any national society is equally available from the RSGB - despite the anguished outpourings of the same people who appear to have little to do in life apart from criticising everything the Society attempts to accomplish. How often do they contribute to the Society in a useful way?

A lot of effort is put into trying to keep you informed as to what is going on. *GB2RS* broadcasts the information which you help to provide as quickly as possible - with local variations. *RadCom* provides a lot of information, of necessity working to longer deadlines. (Compare the amount of text in the average issue with other amateur radio magazines. There is more in each *RadCom* issue than you realise.) You want more technical articles - the Editor is always happy to hear from you.

Then there are the specialist newsletters and the Society publications. Have you noticed the new titles coming along every month or so? The Society also sells the more interesting publications from other sources such as the ARRL.

You have access to Council Members, RSGB Liaison Officers, Committee Chairmen, Society officials of all kinds and volunteers by the score. They represent you at every level and are happy to discuss anything that is near and dear to your heart in the amateur radio field. Please do not forget that they are volunteers. They hold their appointments in the Society because they really care about our hobby, whilst they have private lives to live of their own. Be reasonable in your dealings with them and they will do what they can to help or inform you.

Society Headquarters: Forget whatever experience you might have had in the past. A wind of change is blowing through Headquarters. Much has changed already and more is afoot. We will be holding an Open Day next year when you will be welcome to come and see for yourself what has been accomplished and talk to Headquarters staff and Society officials alike.

There is one Radio Society of Great Britain. It serves you at international, national and local levels. It deserves our full support if we are to continue to have the frequencies and operating privileges we currently enjoy.

The Society is what you and I make it. If you want to take an active part in its affairs, write to me - a SAE will be appreciated, please. I will refer you to a committee, group, person or appointment where competent help would be welcome. Truly, the Society is 'us' - and not 'them'.

Ingemar Lundegard - G3GJW
Council Member

NEWS & REPORTS

Volunteer Vacancy

WANTED: Repeater Manager Zone C (south-east England) to join the Repeater Management Group. The successful applicant should have an active interest in repeaters and live in RSGB Zone C. S/he will be required as a full member of the committee to attend approx 5 meetings per year, usually in London, as well as handling the vetting and processing of repeater proposals and site changes. This necessitates close liaison between the repeater groups and the RMG. Please apply in writing before the end of November. Further information is available from the Chairman Geoff Dover, G4AFJ, QTHR.

CTCSS for repeaters

AT A RECENT meeting of the Repeater Management Group a plan for sub-audible - CTCSS - tone allocation was agreed. A CTCSS tone may optionally be used in addition to the 1750Hz access tone to provide extra facilities or to help minimise co-channel interference. Full details of the plan are being sent to groups with the next edition of *Repeater Report*. Any enquiries should go to the RMG Chairman Geoff Dover, G4AFJ, whose address is correct in the RSGB *Call Book*.

VHF DF

HF DIRECTION finding (DF) is well established on a national basis in the UK. VHF DFing, however, has been confined to local clubs. The ARDF Committee has agreed to activate National VHF DF Competitions in 1992 and wishes to hear from any club or group which would like to host a one-day, weekend event. Contact P Swynford, G0PUB, 90 Silverdale Road, Earley, Reading, Berks, RG6 2NF, enclosing an SASE.

Missing Person

RAY McMILLIAN, G4JVB, went missing last May whilst on the continent. Any member who has any information as to his movements since then, or his present whereabouts, is asked to write to the *RadCom* office at RSGB HQ.

Gareth's recipe for success is DX, contests, Scouting, Raynet and home construction.

Young Amateur of the Year '91

FOR THE fourth year, the Radiocommunications Agency has generously supported the Society's Project YEAR by sponsoring the Young Amateur Of The Year Award. This year's winner is Gareth Ayre, G0MFR, of Bridgewater in Somerset. Lee Rogers, G0NQB, from Hextable in Kent is the runner up.

The RA's announcement followed informal interviews at RSGB HQ conducted by Karen Everett (RA) and Clive Trotman and Hilary Claytonsmith (RSGB). The finalists were: Gareth Ayre, G0MFR, Andrew Berridge, G7IXL, Robert Hurst, G7HIU and Lee Rogers, G0NQB.

Prizes

AT A CEREMONY at the RSGB HF Convention, the **RA**'s Barry Maxwell presented Gareth with a cheque for £250 and invited him on a guided tour of the Monitoring Station at Baldock. Mr Maxwell pledged the RA's support for the award scheme for a further year. The winner was also presented with the **RSGB**'s prize - a general coverage receiver - by President John Case, GW4HWR. **Siskin Electronics** presented the new YAOTY with a packet TNC. Gareth also received, from the **Mobile Radio Users' Association**, a week's training at Wray Castle College combining education with climbing, boating and orienteering.

Runner up, Lee Rogers, received a Digital Multimeter from **Cirkit Distribution Ltd**, a book token from the **MRUA**, and the now famous 'goodie bag' from **ICOM (UK)** which included an IC2SE handheld.

Head of RIS, Barry Maxwell presented Gareth Ayre with a £250 cheque and a certificate signed by Secretary of State for Trade and Industry Peter Lilley.

Gareth Ayre, G0MFR (16)

An active CW DXer and passionate contester, Gareth has worked 180 countries so far

continued on page 6 ▶

Runner up: Lee Rogers, G0NQB

Stolen

FROM A LOCKED and garaged car (!) in Redditch on 30 September: Yaesu FT-211RH S/N 7L110137 with Yaesu PTT box and Yaesu mobile safety boom mic. Information to Paul Charlton, G7ACU, on Redditch 21684, or any Police station.

From Knutsford on 26 September, Kenwood TS-770 S/N 940337. Information to Knutsford Police.

THIS MONTH'S *RadCom* contains four inserts: The notice calling the AGM/ EGM which includes a proxy form; Council Candidates statements; a Council Election voting form; and an envelope for your vote (NB this needs a stamp). If any inserts are missing, please contact Justine Coles at RSGB HQ urgently for replacements.

YAOTY '91

continued from page 5

and is well on his way to obtaining CW DXCC, helped by being a regular user of the GB7WDX packet cluster. He has organised JOTA stations and helped local Scouts gain the Communicator Badge.

A member of the Bridgewater Raynet group, Gareth has assisted in many exercises as well as emergency call-outs. He plans to set up a Young Amateurs' net on HF CW with the help of 4X6VU; these will probably be held on Thursdays at 1700GMT on 28.060, with 21.060 and 14.060MHz as back ups. Gareth would like to hear from any other young amateurs who may like to join in the net.

During the past year Gareth has constructed an 80m Rx, 500mW 20/80 Tx, 40m delta loop, Morse keyer, 10m cubical quad, 40m rectangular loop, 80/40m dipoles and a vertical for the WARC bands.

Lee Rogers, G0NQB (17)

Lee is a Cub/Scout instructor with the 1st Swanley (Hextable) Scouts and takes an active part in organising JOTA stations. He is very interested in home construction and has recently built a speech processor and power supply. Keen on VHF and HF operation, he holds regular skeds with 4X4DD, in addition to using RTTY.

He is very supportive of the Novice Licence Scheme and is applying to become an RSGB Instructor. As well as being involved in the Scouts, Lee is an active member of the Boys Brigade and organises special event stations for their annual camps. He is also a member of the World Association of Christian Radio Amateurs and Listeners.

● 188 CANDIDATES took the September Novice Radio Amateurs Examination, an increase on the June figure. Of these, 151 (80%) passed which should very rapidly double the number of novice licences.

● In next month's RadCom, we expect to bring you the latest news on callsign number plates.

In recognition of John Coffey's, G3PSH, dedication to the best traditions of amateur radio, his widow, Heather, has presented the RSGB with a trophy in his memory. John Coffey was licensed in his early teens and was a member of the Radio Soc of Harrow. His amateur radio interests ranged from CW DXing on 160m to amateur television; the latter forming the basis of his future career. In the 60s he was a member of the GB2GC group which activated the Channel Is on several VHF/UHF bands. HF Contests Committee Chairman Dave Lawley, G4BUO, accepted the trophy (which depicts a globe and an aerial emitting radio waves) on the Society's behalf at a ceremony at Garrards The Crown Jewellers. The G3PSH Memorial Trophy will be awarded to the winner of the Restricted Section of HF SSB Field Day.

PCB AND KIT SERVICES FOR *RADCOM* PROJECTS

PCBs

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

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

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

Complete set of boards	567WIM90	£67.56

G4PMK SIMPLE SPECTRUM ANALYSER (November 1989)

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

G3TXQ TRANSCEIVER (February/March 1989)

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

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

PCB LAYOUT	643585	£17.25

All prices include VAT, postage and packing

Please note these PCBs are not available from RSGB HQ, but direct from Badger Boards, 1180 Aldridge Road, Great Barr, Birmingham, B44 8PE. Tel: 021-366 6047

KITS

THE FOLLOWING KITS ARE AVAILABLE AS ELECTRONIC PARTS ONLY.
PCBS ARE AVAILABLE FROM BADGER BOARDS.

G3TSO	Multiband Transceiver	POA
G3TXQ	3 Band (Excl PA)	£165.55
G3TSO	Frequency Display	£27.50
G3TSO	80m SSB Transceiver	£87.00
G4WIM	Dual Band Project	£457.35
G4PMK	Spectrum Analyser	£53.00
G3RVM	Ultimate Keyer	£18.00
G3TDZ	White Rose Rx (Main Board)	£29.95
G3TDZ	White Rose Converters	POA
Technical Topics 144MHz Doppler		£4.00
First Steps. John Case PSU		£32.80

Prices shown are inclusive of P&P.

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

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

HF Convention '91

IN MANY ways the 1991 RSGB HF Convention was historic: Not only had a large number of 'G' stations made either DXCC Honor Roll or had 'completed' their DXCC, but we had the first description of the DXpedition that had made those things possible *whilst the DXpedition was actually happening!* In any event of this type one gains snapshots of the many meetings and friendships renewed; after all, the social side is the real enjoyment and the refreshment of the ham spirit.

At the DX Dinner on Saturday evening, we had a number of visitors from outside the UK, Spyros, 5B4MF; Andreas, 5B4LP; Lawrence, 5B4SA; Patrick, FP5DX; Paul, EI5DI; Jay, W6GO; Jan K6HHD; and of course Wayne, N7NG, one of the operators from ZA1A.

W6GO claimed he was the highest on the list of people who had worked ZA1A from more than one country. Over the past week he had worked it from W, GU and G! A new form of DXCC?

John Forward, G3HTA, RSGB Council Member, talked about the issue of ethics on the bands, operating practices, excessive power, bad language etc. He reminded us that these were real problems, that they had been with us for a long time and had formed the basis for the Constitution of the London Wireless Society in 1911; we all had a role to promote better practices.

Guadacanal, H44, was the topic for the first slide show, by G3SXW. What a site, no wonder they were so strong! FP5DX followed with slides of CY9CF. The weather had been quite exciting - that picture on the QSL with the boat between the rocks was taken during one of the few quiet periods on St Paul. The current is so strong that the boat had to keep moving around the little Island, whilst the equipment was unloaded, about 20 trips in the small boat!

The Sunday lectures covered a wide range of HF topics from contesting and pile-up management to the DX Packet Cluster. G4PDQ must have done a good job as I later had to push my way into the Software Demo where people could test and purchase Cluster software.

Over in the other lecture room, G3FXB teamed up with Bill, N4AR, to give a UK and US view of contesting. 'Antennas and tactics' summed it up but above all have some *fun*. Al stressed max info, shortest time and we are out to win too! Bill strongly encouraged the UK contesters, "UK is one of the best sites" as we have plenty of water at the first hop, unlike Bill who has W1, 2 and 3! He reckoned that the difference was about 9db. So we need only use modest antennas to be able to compete. Neither Bill nor Al could understand why the UK was not more 'contest active' and a lively discussion from the floor suggested TVI, lack of competitiveness, poor QTHs etc.

This was followed by G3TXF, talking about 'Pile-ups'. Roger had surveyed the audience's performance in various recent pile ups and commented that 89% had worked ZA1A. He showed how, with the right approach, it was possible to get through even the most difficult QRM and work these rare stations. Peter Dodd's, G3LDO, lecture on antenna measurements was well attended, perhaps they were taking Al's advice from earlier. There is no doubt that antenna matters are of very great interest.

Three new trophies were amongst the 34 presented; the G3PSH Memorial Trophy to Gravesend RS, the Ariel Trophy (a vintage ribbon microphone) to Lichfield and the G8KW Trophy to G3FXB for being the UK leader in CQWW CW contest.

The afternoon lecture focussed on the question of spectrum management, intruders etc, and John Allen of the RA showed us the sort of situation one might find on 80m in the evening. This topic will become of interesting importance in the future.

The keynote speaker was N7NG, who had come from Tirana direct to the convention and this was the first time he could recall a DXpedition being presented at a convention before the DXpedition had finished. Wayne was really pleased to see how many had worked ZA1A, which was, after all, the objective of mounting a DXpedition. Albania was a unique country and the team had to take a view past the current conditions in ZA, building a base so that amateur radio could flourish there in years to come. The opportunity to open up ZA arose from Martti Laine's, OH2BH, personal contacts with the ZA PTT. A series of very careful meetings led to the preparation of a document showing how the project, though based on the training of native ZA amateurs, would also include amateur radio operating to introduce the world to ZA. Of the eight sets of equipment donated, four will be used for club stations and four for spectrum monitoring. The proposal also gives something to ZA; very few of the other 65 applications to operate had this feature.

All excess contributions received by NCDXF as a result of this operation will be sent to the ZA PTT to help Albanian amateur radio operators. Tirana was, reportedly, in a terrible state of repair; the wages were so low that it is impossible to contemplate even any home construction. Most operation will therefore be from club stations.

ZA had clearly left a deep impression on Wayne: the living conditions of the people, the poverty and the poor condition of many of the buildings. However, in response to the inevitable question "Where do you go next?" he said "back home to work ZA1A!"

This was an exciting convention and what for next year? Watch out for the announcements over the next few months.

Bob Whelan, G3PJT,
Chairman HF Committee

Members of the Gravesend Radio Society receiving the G3PSH Memorial Trophy (see opposite) from John Case, GW4HWR, for winning the Restricted Section of SSB Field Day.

PHOTOGRAPH: G4RGB

A fibreglass-bodied vehicle used by the Post Office Radio Service, fore-runner of the RIS, seen recently at Chatham Historic Dockyard in Kent. Note the three-element Yagi on the roof.

QSL News

A QSL SUB-Manager for Novice Licensees has been appointed. He is Michael G Shread, GM6TAN, 2a Seatown, Gardenstown, Banff, AB45 3YQ.

DUAL-BAND

IC-W2E Dual-Band FM Handheld

ICOM have produced the hand-held with the perfect combination of size and features. This exciting new transceiver is one of the smallest in it's class yet contains so many functions you'd think it would burst!

IC-W2E features include:

- Optional pocket beep and tone squelch for quiet standby.
- High speed scan and priority watch.
- Full 5W output power with external 13.5-16V power supply unit.
- 24 hour clock with ON/OFF timer.
- 1750Hz tone call to access repeaters.
- Programmable offset frequency.
- Monitor function that allows you to check repeater input frequency.
- Built-in pager and code squelch functions for selective calling.
- Memory mask to hide seldom-used channels.
- Memory transfer function.
- PTT lock function.
- Keypad and tuning control lock.
- External DC power jack & auto power save.

ICOM

SUPERIORITY

IC-2410E Dual-Band FM Mobile

ICOM introduces simultaneous reception of two frequencies in the same band, combine this with simultaneous dual-band receive and you have a breakthrough in features not found anywhere with any other radio. Compact design fully utilises the latest technology while using a minimum of knobs and switches. One-touch controls activate both primary and secondary functions, this ease of operation makes the IC-2410E especially safe when in mobile use.

Outstanding IC-2410E features include:

- Independent volume controls and squelch setting.
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- Built-in duplexer for easy dual-band antenna connection.
- Scan and priority watch functions.
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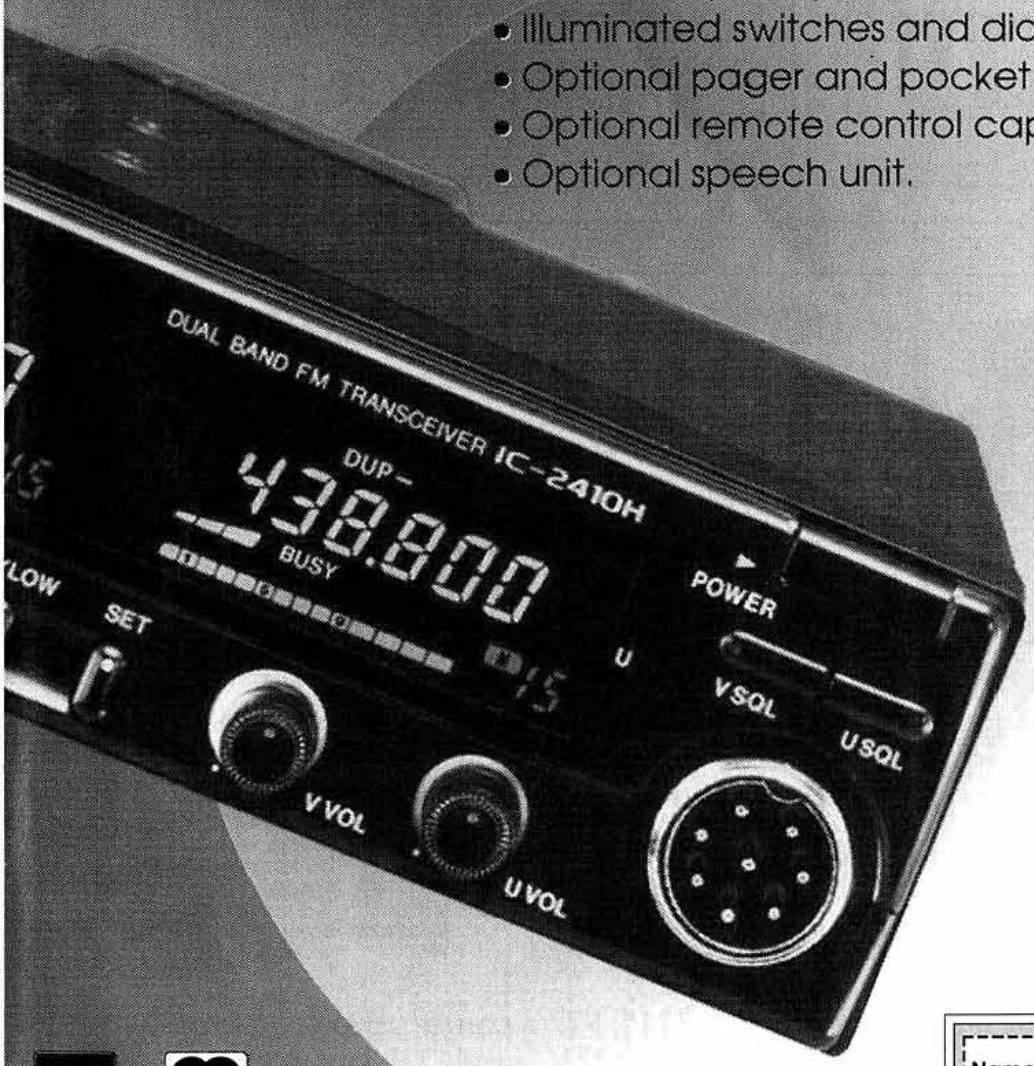
- Optional pager and pocket beep for selective calling.
- Optional remote control capability.
- Optional speech unit.



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NEW PRODUCTS COMING SOON FROM YAESU

FT-890 all band HF Transceiver

Built in ATU
13.8V DC Operation
Compact size

NEW HANDHELDS FOR 2m AND 70cms

Miniature size
Front Panel Keyboard
Based on the
popular FT-26/76

ULTRA COMPACT HANDHELDS

Based on a long line of outstanding handhelds, the FT26 and FT76 offer a vast array of features made possible by the very newest manufacturing miniaturisation techniques. The diecast alloy rear cast/heat sink and the thick high impact polycarbonate front panel provide the ruggedness demanded by constant day to day use.

Up to five different user selectable power levels are available (with 12VDC) battery) and an external DC jack is provided on the top panel to power the transcievers from a 5.5-16V DC external source.

The large LCD has selectable lighting mode, shows a full six digits and has a bar graph for signal strength and power output.

Vox circuitry is included to enable hands-free operation with the optional YH2 headset.

Battery saving functions are standard with a constantly updated battery save facility based on past operation history. Automatic power off can be selected for 10, 20 or 30 minutes.

Other features include 53 memories, 5, 10, 12.5, 15, 20 or 25kHz + 1MHz steps are available along with an optional CTCSS unit and many other matching accessories - see below.

FTS17A	CTCSS module	**NC18C**	Charger for NFB27
FBA12	6 x AA cell case(empty)	**NC28C**	Charger for NFB25
FNB25	7.2V 600mAh nicad	**NC34C**	Charger for FNB26
FNB26	7.2V 700mAh nicad	**NC42**	Desktop quick charger
FNB27	12V 600mAh nicad	**MH12A2B**	Speaker/microphone
E-DC-5	DC adaptor c/wnoisefilter	**MH18A2B**	Mini speaker/mic
MMB49	Mobile bracket	**MH19A2B**	Earpiece c/w mini mic
CSC53	Vinyl case for FNB25	**YH2**	Headset
CSC55	Vinyl case for FNB26/27		

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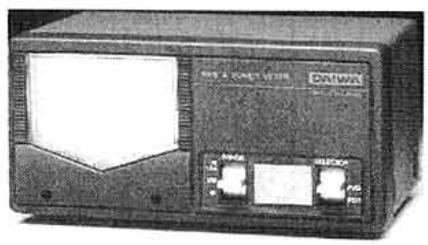

CN 101

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CFX-514	50/144/430 Triplexer UHF conn.	£36.75	B
CFX4310	144/430/1200 Triplexer UHF/N conn.	£36.75	B

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TBR	Adjustable trunk mount.	£11.50	B
RS17	Mini trunk mount.	£12.75	A
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CK-3LX	Mini Cable Assy for RS16/RS17	£16.25	B

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FILTERS

CF-30MR	HF Cut off 32MHz 1kW P.E.P.	£38.75	B
CF-50MR	6m Cut off 54MHz 1kW P.E.P.	£38.75	B
CF-30H	HF Cut off 32MHz 2kW P.E.P.	£60.75	A
CF-30S	HF Cut off 32MHz 150W cw	£19.35	A
CF-50S	6M Cut off 57MHz 150W cw	£20.35	A
CF-BPF2	2m Band Pass 150W cw	£31.65	A

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CD-120	1.8-200MHz 15/60/200W	£76.60	B
CD-160H	1.6-60MHz 20/200/2000W	£90.85	B
CD-270D	140-525MHz 15/60/200W	£79.65	B

COAX SWITCHES

CSW-20	2 way DC-1000MHz SO239	£26.50	A
CSW-20N	2 way DC-1500MHz N	£45.95	B

ACCESSORIES

CEP-M2	Earphone 3.5mm jack	£1.28	A
CES-M2	Mini Clip on Speaker 3.5mm jack	£5.62	A
CHM-M4	Mini mic + PTT 2.5mm jack	£9.15	A

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13M20BP60	60FT BASE PLATE MOUNT	£863.63
13M20M25	25FT MOBILE TOWER	£2226.63
13M20M40	40FT MOBILE TOWER	£2439.30
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16M20FB40	40FT FIXED BASE MOUNT	£658.00
16M20FB60	60FT FIXED BASE MOUNT	£780.20
16M20FB80	80FT FIXED BASE MOUNT	£1245.50
16M20BP40	40FT BASE PLATE MOUNT	£869.50
16M20BP60	60FT BASE PLATE MOUNT	£972.90
16M20BP80	80FT BASE PLATE MOUNT	£1563.93
16M20M40	40FT MOBILE TOWER	£2909.30
16M20M60	60FT MOBILE TOWER	£3031.50
16M20M80	80FT MOBILE TOWER	£3760.00

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HF NEWS

JOHN ALLAWAY G3FKM
10 Knightlow Road, Birmingham
B17 8QB

THE PROMISED activity from Albania materialised and there must be many satisfied customers. However I was appalled at what was taking place on ZA1A's transmitting frequency - particularly when the station was using SSB. Sorry to say it wasn't all coming from southern Europe because quite a few of the morons on that frequency sounded like they were in the UK. I only hope (since this was intended to be a *demonstration* station) that the Albanian authorities were not monitoring - otherwise the future for amateur radio in their country may be bleak. Why on earth do otherwise balanced people behave like maniacs and in a way that they wouldn't think of doing if they could be recognised? One zero-beat station was complaining that the IARU was discriminating against eastern Europeans because they didn't have two VFOs and couldn't operate split-frequency!

INTRUDERS

IF YOU USE 18MHz you are probably enjoying QRM-free contacts which are fairly easy to come by because so far linear amplifiers and beams have not become the order of the day. However, there is cause for concern that other users are moving in - mostly stations of the Fixed Service. Among those listed by Bob Knowles, ZL1BAD, IARU Monitoring System Coordinator, are stations on 18.090, .093, .111, .122, .125, .143, .160, .162, .1645 and .167MHz. Some of these are in Russia (they are allowed to be there by Footnote but only with low power), Sudan, and Argentina, and some are harmonics but analysis shows that there are very few frequencies in the 18MHz band that are not used by non-amateur stations at some time in the day. More use by us - the rightful users - might help. Radio Pakistan seems to be trying out 7MHz frequencies again.

Last, but not least there is concern about a number of non-amateur stations in Lebanon using amateur callsigns to pass traffic to a number of other countries using amateur bands. They operate from 0000 - 0600 and 1700 - 2000 mostly on 14.100MHz but 14.080, 14.090, and 14.110MHz are sometimes affected. A similar problem exists on 21MHz where from 0500 and from 1630 to 2000 they congregate on 21.080, .090, .100, .120, .130, and .450MHz.

DX NEWS

A COUPLE OF months ago I mentioned a possible visit by a group of DXpeditioners to Pratas Is. G0IOV read this and wrote to say that he believes that this island is now called Tungsha Tao and that it is in fact located 160 miles SE of Hong Kong. He was there in 1946 when all that was there were three palm trees and head high vegetation!

Hugh Roberts, formerly V85NR, has returned from **Brunei** and at the time of writing was in the UK awaiting another posting. QSLs are still available (see *QTH Corner*). He says that V85DA is now VK1DA, and that the only really active stations left are V85AA and V85GA. PY8ZBJ is now in the **Federated States of Micronesia** as V63YL and will be there for about a year. V63CJ and V63DJ are often to be found between 0600 and 1100 in the 14.190 - 14.220MHz area and they will be there for up to two years. 9M8ZZ should now have moved to Bintulu from where he hopes to have a four-element beam for 28MHz, a tri-bander beam, and dipoles for 3.5 and 7MHz. He also operates on 18 and 24MHz.

According to *RSGB DX News Sheet* a fax was received from VK9NS on 29 August concerning amateur radio in **Bangladesh**. It said that Jim had just received a telephone call from the T & T Board in Dhaka which had said that the Board had unanimously agreed to the introduction of amateur radio in Bangladesh. This is a personal triumph for Jim Smith who has spent a great deal of time and effort into making this come about and he deserves sincere congratulations and thanks from all of us. VE3CHZ is in **W Malaysia** and on the air as 9M2NA for a few months. He sometimes uses RTTY on 14MHz at 1330.

C9RKL, using RTTY, seems to be a new amateur in **Mozambique**. C9RZZ - operated by SM7DZZ - appears regularly near 14.025MHz from about 1800 until 2000. 5R8AL has not been able to return to **Madagascar** yet but may do so next month. D68RH, on **Comoro Is** appears on 21.220MHz at about 1900 and moves to 14.220MHz if conditions there are poor. According to *DX-NL* there is a new station in **Guinea**. This is 3X0/HNU who is often found on CW about 40kHz above the lower band edges.

If you hear CT0A this will be a special callsign issued to celebrate 500 years of Portugese discoveries. The operator is CT1DVV.

Stations in **Anguilla** are using the VP25E prefix and may continue to do so until May 1992. This is to mark the 25th anniversary of separation from St Kitts Nevis.

According to *DX-NL*, VP8SGB in **S Georgia** is on from 1100 to 1200 on Tuesdays on 14.226MHz, and VP8CEM, on **S Orkney** keeps a schedule with his QSL manager GM4KLO each day at 1930 on or near 14.160MHz.

DXPEDITIONS

JOHN HANSON, GW0FJT, should have appeared on the air from **Ascension Is** last month with the callsign ZD8OK. All operation will be on CW.

According to *RSGB DX News Sheet* a six-man American team is planning to travel to **Vietnam** either this month or next for a ten day expedition. It consists of AA2AV, NK6I, WJ2R, W6MKB, AB6BH, and KM1R. ICOM has loaned two 751A transceivers and 2KL linears but they will also purchase other equipment to add to that left by the 3W3RR expedition. Expenses are calculated at US $25,000, half of which has been pledged by team members. Hopefully two stations will be on the air, one on CW and the other on SSB for at least 12h daily on all bands from 1.8 to 28MHz. They will also be active on the satellites.

There is a rumour that UI8ZAA is planning a visit to **Afghanistan** which might take place this month. If it does he will be on all bands (including WARC) on CW and SSB.

FR5AI was expected to be on **Juan de Nova Is** as FR5AI/J from the middle of last month until the end of this. He should be on the air mostly between 1200 and 1800 probably near 14.005, 14.250, 21.010, and 21.250MHz.

Latest update on the **S Sandwich Is** expedition comes from *DX'press* which says that it is definitely going ahead in March. The boat was being prepared and was due to leave for the Falkland Is in late September. Nine or ten operators are hoping to leave London on 9 March for Port Stanley and departure for Thule Is will take place between 12 - 14 March 1992. They hope to be there for at least two weeks.

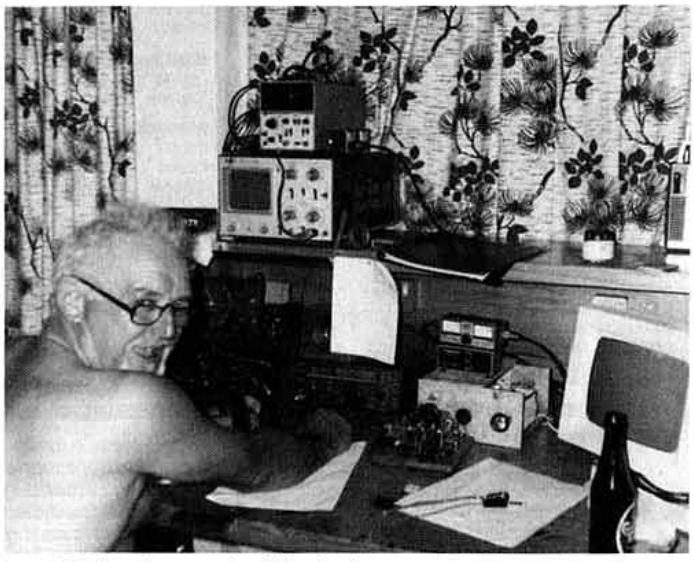
David Dutton, G6QQ, intends to be in **Antigua** again for the CQ WW DX contest later this month. He will be on from 13 November with the callsign V2/G6QQ.

Alan Davies, GW3INW/HK3, writes that he is on the air most weekday evenings (2300 to 0200) looking for G contacts. He will be in **Colombia** for another year.

The much anticipated visit to the **S Sandwich Is** has now been postponed until March 1992 due to anticipated ice pile-ups at the intended S Thule Is landing site.

NEWS FROM OVERSEAS

CHRIS NICHOLAS, G0LZV, recently visited Singapore and met some of the locals. There is only one type of licence issued - this is equivalent to the UK Class A and



Lou, 7Q7LA at the controls of his shack.

BAND REPORTS

Some very interesting happenings during the month included the appearance of two hitherto 'impossible' countries - XZ and ZA. In future I intend to place more emphasis on the WARC bands in this section and this may mean leaving some of the regular bands out. However, there is a lot on them of interest - so let's see what we can do.
To G2HKU, G3s GVV, LPS, YRM, GM4CHX, G4DJC, GW4HBK, GW4KGR, G4MUW, G4NXG/M, G4SFU, G0s DOO, JZA, LRX, and the UK DX Packet Cluster (via G4PDQ), many thanks for the input.
Stations in italics were using CW.

7MHz

0000	*V44KJ*
0400	*ZS1QD, 3DA0BK*
1900	*VS6WV, XY0RR, 4K2OIL*
2000	*JT1/KC7V*, ST0DX, *9K2ZZ*
2200	*JW0GB, KP2/VS6CT*, Z21AA, 4K1B, DK7WV/5B4
2300	*HF0POL, UA0QE*

14MHz

0600	FO5JV, KH6G, P29DX, T20WW, 5W1JU
0700	AL7LD, FK8CP, KH0AC, *ZA1A*, ZK1TW, 3D2XV, 5W1JW
0800	FK8GK, FW/FO5IW, KP2A/KP5, VR6YL
1000	H44AP
1200	XY0RR
1500	KC6DX, V63AO, 3B7/3B8CF, 9M8FN
1600	SV2ASP/A, 3DA0AY
1900	KC6DX, ST0DX, VP8CFM, 3B8CF/3B7
2100	KP2/VS6CT, KP2A/KP5
2300	*P43SF*

18MHz

0800	*FW/AA7AF*
1000	*ZK1OQ*, 3D2XV
1500	XW5AHH, ZB2AZ, 3B8FU, *9L1US*
1600	*V63WW, V85FC*, VU2RX, XY0RR, *VK2DXI/9M2*
1800	*KC6WW*, ST0DX, V51P, VP8CFV, 7X2BK, 9M2HB
1900	S79HX, 6W1QJ, *7P8RM*
2000	*C9RAA*, PJ8AD, *XY0RR*
2100	*HF0POL*, HH2Z, *HZ1AB*, ZD7KT, *4K2DDU*. 9K2ZZ

21MHz

0700	JA, VK, ZL, 9X5HG
0800	BY5QA, FK8FI, JT1BV, KA3HMS/KH3. V63YL, XY0RR, 3D2XV, 5W1JW
0900	A35KB, BY7WGL, ST0DX, TT8SA, V73AX, ZA1A, 9N1MM
1000	SU1ER, T20WW, VK9NS
1400	SV2ASP/A, ZS9A, *9X5HG*
1500	XW8KPL
1700	BY5RA, KC6DX, XW5AHH, XY0RR, 3C1EA
1800	HL0O, HS1ABU, TZ6VV, ZD9BV, 8Q7DA
1900	A25AA, A41KY, V51TM, ZF2QQ, 3B8CF/3B7, 7Q7JL, 9M2YX
2000	D68RH, ST0DX, ZD8WD, 5H3OH

28MHz

0800	VS6/N2OO, XW8KPL, 3B8DB
1000	A35KB, C9RZZ, PY0FF, S01A, S79IUJ, 3D2XV
1100	BY8AC, KH0AC, XY0RR, ZD8AM
1300	ST0DX, V2IGC
1400	FR5ZR, TI2CC, VP8CGL (S.Orkney), 9M8PV
1500	DU1ELB, FY5LY, YI1BGD, 3B8CF/3B7, 9V1WW
1600	KP2/VS6CT, VP8CFM, W6-W7-W0, 3C0CW, *4K1A*
2000	HI500A, GW3IMW/HK3, *ZA1A*

QTH CORNER

C9RKL	PO Box 2524, Maputo, Mozambique.
V63YL	Yarl Lundstrom, PO Box 687, Yap Is, Fed. States of Micronesia 96943, via Hawaii.
V85NR	H Roberts, 40 Sherlock Rd, Coventry, CV5 8EY.
ZA1A	NCDXF, PO Box 1, Los Altos, CA 94023, USA.
ZC4ZD	Frank Claytonsmith, G3JKS, 115 Marshalswick Lane, St Albans, AL1 4UU.
ZD8OK	Jon Hanson, GW0FJT, Rhoslwyd, Talley, Llandeilo, Dyfed, SA19 7EJ.
3B8CF/3B7	S Mandary, Shastri Rd, Candos, Quatre Bornes, Maurutius.
3C0CW	(SSB QSOs) via EA3CUU, Box 220, Olot, 17800, Gerona, Spain.
4U1UN	(new) J.Tullis, W8CZN, 7226 Huntingdon Dr, Hudson, OH 44236, USA.
9M8ZZ	Arie Pols, Box 1084, 97008 Bintulu, Sarawak, EMalaysia.

1991 28MHz COUNTRIES TABLE

G0DOO	205	(SSB)	GM4CHX	88	
G0OFE	203	(SSB)	G4YNG	75	
G0JZA	202	(SSB)	G2FDR	63	
G0AEV	175		G4NXG/M	63	
G4DXW	159		GM0GEI	55	
G0KDS	146		G0DUS/M	54	
G4MUW	139	(SSB)	G4XAH	43	(RTTY)
LA0GC	137	(SSB)	G2AKK	31	(CW)

newly licensed amateurs are restricted to 25W output on CW only for their first year on the air. Foreigners are granted licences after a qualifying period of residence and if they already hold a valid licence. It can only be issued after the station has been set up and can be inspected - serial numbers of equipment are recorded and Chris wonders what happens to home-brew gear!

The WARC bands were not available when he wrote but HF operation otherwise is similar to that in the UK. Transceivers with general coverage receivers are not allowed but many ordinary receivers are available on the open market of course. There is no requirement for planning permission for antennas. Finally Chris gives a mouth-watering list of equipment prices and says - "if you can get there - good luck . . ."

CONTESTS

CQ WW DX CW CONTEST

0000 23 November to 2400 24 November

Rules for the SSB section of this were given in last month's column. The last date for the postmark on logs for this section is 15 January 1992. Please remember to mark clearly on the envelope whether your entry is Phone or CW. I can supply copies of rules (SASE please) but I have *no* log or other sheets.

In the **1990 IARU HF World Championship** HQ stations listing, GB5HQ (operated by G3OZF, G4JUG, G4RTO, and G0HSD) came fifth with 1,347,260 points. On Phone, GM0ECO scored 686,488, GW0AJI 41,361, and G0KTN 21,630. On CW G3FXB scored 974,974 points, G3ESF 115,924, GM3CFS 70,148, G4BKI 55,614, G0IDE 48,336, G4ZME 24,786, and G0/ON6LO 23,050. GX3CSR scored 52,030 in the multi-operator part.

The results of the **1991 UBA SSB Contest** I listed in last month's column did not do justice to **GW4UZL** or **G5LP** who in fact were the winners of the Fourth European Community Trophies in the SSB and CW sections respectively. Also left out was GW0ANA who scored 104,874 in category C. Apologies all round.

Results of the **1990 CQ WW SSB DX Contest** have now been published. There were a number of specially noteworthy scores by UK stations and in particular the following were picked out for special mention. In the **Single-operator** category: **G3FXB** who came world second and top European on 14MHz, **G4CNY** who was world sixth and fifth European on the same band, and **GW4OFQ** who was world and European second on 3.5MHz. **GW4BLE** was European second, and **GM0ECO** European seventh in the all band section. On 7MHz **GB0DX** was third in Europe.

In the **Multi-operator Single-transmitter** category **GU6UW** succeeded in coming second in the world listing. Actual scores were as follows: **All-band, GW4BLE** 6,329,120,**GM0ECO** 4,254,678, **GW0ARK** 2,877,740, GM3BCL 1,061,280, **G4XKR** 334.884, GM4WEW 314,420, GM0DBW 228,744, G0KTN 154,959, G5LP 83,584, GM4CUX 46,200, G4MJZ 33,352, G3JKY 21,408, and G4NXG/M 11,501. On **28MHz, GM4XTA** 332,514, **GM4CHX/P** 84,387, **GJ3XZE** 74,800, **G0LMX** 54,815, GM4PVC 46,084, and GM3CFS 24,034. On **21MHz, G3TXF** 218,790, G3XSV 108,288, and **GM4HQF** 76,970. On **14MHz, G3FXB** 1,523,450, **G4CNY** 1,029,908, and GW4HBK 16,214. On **7MHz, GB0DX** 392,160, and on **3.5MHz, GW4OFQ** 135,590, and **G4PKP** 40,870.

In the **Multi-operator Single-transmitter** grouping **GU6UW** scored an excellent 13,155,792, **GW8GT** 7,200,496, **G0KPW** 7,135,320, **G3NAS** 5,304,955, GX0OBS 1,851,390, and **GM3BSQ** 689,136. In the new **Single-operator Assisted** class (All-band) **G0HSD** scored 2,810,784, and G0MFO 1,756,120. Last - but not least - in the **QRP Section (All band)** G4SNR scored 4,995 points. On **28MHz, GJ3YHU** scored 163,511 points, **GM4ELV** 69,680, and **G4MET** 50,745. Those listed in bold letters received certificates.

ALARA CONTEST

0001 to 2359 9 November

For all sexes - and listeners. *[Letters about that sentence to G3FKM, not me please! - Ed].* Photocopy of rules available.

THANKS

THIS TIME thanks go to *DX-NL* (DL3RK), the *Ex-G Radio Club Bulletin* (WA8TGA), the *Long Island DX Bulletin* (W2IYX), the *RSGB DX News Sheet* (G4DYO), the *Lynx DX Group Bulletin* (EA2KL), *DX'press* (PA3DZN), and the *Heard Is DX Bulletin* (VK9NS).

To be in time for the **January** column I need to have your news by **11 November** please - early but of course due to the holiday period.

VHF/UHF NEWS

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

THERE WAS A welcome period of enhanced tropospheric propagation for several days from the end of August. European E-layer contacts were being made on the 50MHz band at least into the middle of September. The first reported 50MHz opening this season from Europe to the Pacific was on the 18th and the first VK opening occurred on the 28th.

VHF COMMITTEE

BAND PLANNING

At its last meeting the VHF Committee rejected the proposed allocation of 144.475MHz or an S-channel to packet radio mode. In collaboration with the DCC representative, we agreed alternative proposals which that committee will have discussed by the time you read this. The aim is to solve the short term problem of an extra packet frequency without violating the existing RSGB and IARU band plans.

RECORDS

While 'firsts and longest DX' achievements on the VHF/UHF/SHF bands have been archived in *RadCom* and other magazines, they seem not to have been officially collated. The VHF Committee would like to hear from anyone willing to undertake the task. Offers to the chairman, G3UBX, via this column.

WET SQUARES

AMATEUR RADIO operation in the 144MHz band from the *RRS Challenger* is again imminent since crew member Paul Duncan, GW7KES, will be on board during the next trip. They should sail from Troon, on the west coast of Scotland, on 4 Dec to a working area in the North Sea and expect to return to their home port in Barry, South Wales, by the 20th.

Paul's working frequency will be 144.240MHz SSB using a TR-751E running 25W and an 8-element Jaybeam antenna; a 100W amplifier may be available. Operation will depend upon his work schedule, but he suggests evenings and early mornings for GW7KES/MM activity. No itinerary was mentioned.

REPEATER NOTES

CLIFF SHARPE, G2HIF (OFE), the repeater manager of the Ridgeway Repeater Group's VHF relay GB3WH on R2, sent a copy of the August issue of *QAV*, the newsletter of the Harwell ARS, which includes his status report on GB3WH.

The original Sheffield University logic of 1980 vintage has been replaced. To access the repeater now from cold requires a 1750Hz +/-5% toneburst for 250ms minimum duration, followed by six seconds of speech. A carrier drop of more than 500ms after toneburst will lose access.

Once the logic has been correctly latched, talkthrough can be maintained by a modulated carrier, but after 10s of unmodulated carrier the shutdown sequence is triggered. The end of each latched talkthrough period is indicated by a pip. After a courtesy interval of 2s, carrier break-in is possible, a 'K' (dah-di-dah in morse) indicating the start of the next carrier re-accessed period. Re-access must be within 4s.

The new logic features automatic signal strength reporting. Time out, indicated by a succession of six pips, is 60s on initial access, 90s on carrier re-access and 8.5min on carrier re-access after a 'K' indicator. GB3WH has battery backup should the mains supply fail. Identification followed by "near Swindon" is transmitted every 12min. The Ridgeway Repeater Group also manages UHF repeaters GB3OX (RB15) and GB3TD (RB13), and packet relay GB3TA on 144.650MHz.

Following the item in the September *VHF/UHF News* about the Aylesbury Vale Repeater Group, its *Newsletter* editor Mike Marsden, G8BQH, pointed out that the group runs three repeaters. The one I overlooked was GB3BV (RB1) which, like GB3AV and GB3VA, has been operating faultlessly.

LINKING

The Radiocommunications Agency (RA) has agreed to the Society's proposal for experimental linking of three pairs of repeaters for an 18-month trial period. These are: GB3BD (RB6) and GB3BL (RB7) in Bedfordshire, GB3AR (R4) and GB3AN (RB4) in Caernarfon (GDD) and GB3DG (R7) and GB3AY (R2) in southwest Scotland (SCD).

MOONBOUNCE

THE SECOND leg of the ARRL EME Contest is over the 23/24 November perigee weekend. For a London QTH, moonrise on the Friday is about 1620 at an azimuth (QTE) of 50°. At the start of the contest the az/el are 157/62° respectively with moonset around 0915 at 310°. There is a North American window from 0630.

Next moonrise is around 1720 at 50° QTE with an Asian window till 1845. Moonset is around 1010 at 309° with a North American window from 0730. The last moonrise is about 1840 at 53° with an Asian window till 2000. Under favourable conditions stations with 150W and a 13dBd Yagi ought to be heard by the likes of W5UN and KB8RQ.

In the July/August issue of *2M Direct*, editor Mark Turner, G4PCS (BFD), mentioned the very distinctive fluttery fading heard on EME signals the day before a large aurora which makes them sound less than T9. He wrote; "In my experience such characteristics have *always* heralded an aurora on the next day."

ZB0T (IM76) is QRV on EME from Gibraltar with a pair of 4CX250Bs and four 19-element Yagis. He suggests his QSO with W5UN on 16 June was the first on EME from The Rock. He has since completed with SM5FRH, SM7BAE, N5BLZ and KB8RQ. Mark's QSL route is via DL1SDN. Other regulars reporting to *2M Direct* included G0GMS, G4SWX, GM4IPK and GM4YXI.

Stuart Jones, GW3XYW (GNW), was QRV on 430MHz in the 31 Aug/1 Sept weekend. He completed random contacts with G4RGK, DK0TU, G4ALH, DL6WU and UT5DL on the Saturday, and with LA8LF, SM4IVE, DF3RU and DF9CY the next day, all on CW. On the 1st he completed on SSB with K1FO who answered his CQ call. The minimum elevation on his dish is 25° so he misses out on quite a bit.

METEOR SCATTER

PERSEIDS EPILOGUE

From numerous reports on the August Perseids, G4PCS concluded that the peak, which was in the early morning of the 13th, was exceptionally good. Impressive lists of completions were sent in by several contributors; eg GW4VEQ (IO73) to YU7EF (KN04) at 2034km on SSB and GM0EWX (IO67) to I4XCC (JN63) at 1997km.

THE LEONIDS

The only significant stream in November is the Leonids, active 14 - 21 Nov. The International Meteor Organization's *1991 Meteor Shower Calendar* suggests the visual peak around 1200UTC on the 18th when the radiant's Right Ascension (RA) will be 152° and Declination (DEC) +22°.

The parent body is comet Tempel-Tuttle which has a period of 33.3 years and the stream velocity is 71km/s, one of the highest of all. In the run up to the next perihelion in 1998-2000, activity should increase from the recent level of 10 - 15 Zenithal Hourly Rate (ZHR) to storm proportions. In 1966, a ZHR of 155,000 was recorded.

The radiant is above a mid-UK horizon from 2230, through midnight, to 1430. Reflection efficiencies exceed 50% as follows: NE/SW 0130-0700 and around 1100; E/W 0400-0900; NW/SE around 0200 and 0600-1200; N/S 0300-0500 and 0800-1300. Your reports on this shower would be useful.

50MHZ

GENERAL NEWS

Ted Collins', G4UPS (DVN), *6M Information* is the prime source of this news. 9L1US operated in his first opening for some time on 7 September. He was due to leave Sierra Leone last month for home leave in the USA. 9Q5EE was going QRT on 20 October and leaving Zaire. 9Q5TE had many European QSOs in August and September using 2W and a 3-element Yagi. Gus's home call is SM5DIC; QSL via SM0BFJ.

TR8CA is back in Gabon and leaves his keyer on 50.092MHz. From Malawi, 7Q7CM got going on 16 September and 7Q7LA (KH75) has acquired some gear. 7Q7JL operates from KH74 and from KH75 as 7Q7JWL. Listen for 6Y5/W3JO, 15 Nov - 16 Dec; QSL to 23 Dogswood Lane, Aston, PA 19014, USA.

Gerard Jacot, 5V4JG (JJ06), started on 21 September using 25W to a 5-element Yagi. He is F2JD and an excellent CW operator and on the 28th worked many stations all over Europe, including GMs and SMs. QSL via F6AJA. 7P8EN was QRV for the Southern Africa contest on 21/22 Sept, but made few contacts. QSL via ZS4TX, PO Box 28691, Danhof 9310, Rep of South Africa.

LA5GHA/OD5 is with the UN Force in the Lebanon and should be QRV by now with a 3-element Yagi 800m ASL. OD5SK was awaiting arrival of a transverter and his QSL address is PO Box

ANNUAL VHF/UHF TABLE
January to December 1991

Callsign	50MHz Cty	50MHz Ctr	70MHz Cty	70MHz Ctr	144MHz Cty	144MHz Ctr	430MHz Cty	430MHz Ctr	1.3GHz Cty	1.3GHz Ctr	Total Points
G6HKM	65	49	-	-	76	22	40	10	32	7	301
G0NFH	44	25	30	7	61	17	43	11	13	2	253
G4FCD	13	19	-	-	82	13	54	12	30	5	228
G0EHV	-	-	39	6	76	15	43	11	-	-	190
G8ESB	5	6	19	5	74	7	40	6	12	3	177
G4LDR	26	19	10	2	51	12	35	5	-	-	160
G0FYD	10	27	-	-	72	28	-	-	-	-	137
GW6VZW	76	54	-	-	-	-	-	-	-	-	130
G8XTJ	30	22	-	-	53	11	-	-	-	-	116
G8LHT	0	8	25	4	24	17	8	3	6	3	98
G6MXL	10	15	6	3	14	6	24	5	11	4	98
G8PYP	15	32	1	1	24	11	8	4	-	-	96
G3FPK	-	-	-	-	73	20	-	-	-	-	93
GI4OWA	11	28	-	-	38	14	-	-	-	-	91
G3FIJ	1	1	-	-	48	11	16	3	-	-	80
G4OUT	-	-	25	6	33	9	-	-	-	-	73
G7CLY	-	-	-	-	38	10	-	-	-	-	48
G6ODT	-	-	-	-	20	6	12	3	-	-	41
GW7EVG	-	-	-	-	24	7	-	-	-	-	31

British counties are those listed on page 64 in the January 1991 RadCom, but excluding HBN; 77 in all. Up to three different stations allowed in all 12 GM regions. Do not include EI counties. Countries are the usual DXCC ones plus IT9.

180, Tripoli, Lebanon. On 1 Oct, VK3OX aimed his 9-element Yagi beacon antenna towards Europe. Its call is VK3SIX and it runs 25W on 50.054MHz; reports to Box 622, Hamilton, Victoria 3300, Australia.

ACTIVITY

G4UPS's daily records up to 23 Sept showed African stations heard/worked from the British Isles on 1 - 4, 6/7, 12 - 16, 19, 20 and 23. From 1753 on the 1st, CX, LU and PY stations were heard till 1930 when all but CX4HS (GF06) faded out. At 2050 Ted heard LUs working East Coast stations, but nothing audible in Hemyock. There were frequent Es openings to Europe in this period.

Inband Asian TV was heard on the morning of the 18th and at 1015, NI6E/KH6 worked I2ADN/IA5 via the long path for probably the first Europe/Pacific opening of the season. The KH6 also copied beacons SV1SIX and 5B4CY. On the 28th, a VK8 worked into Europe from 0745 and for 20min from 0900, VK6JQ contacted UK stations. The first VKs reported last year were on 19 October, so this may be a good omen.

144MHZ

CONDITIONS FOR the monthly Scandinavian contest on the first Tuesday coincided with excellent tropo propagation in September. Eddie Ashburner, G0EHV (TWR), worked SM1NVW (JO96) for a new square. On 31 August he contacted G0PDE/MM in JO09 for another new wet square. The WAB contest on the 15th created lots of activity, but nothing new.

Jon Acton's, G0NFH (AVN), log showed GI4GVS (ATM) on 28 Aug, EI4CI (MTH) on the 31st, OZ9HN (JO56) and SM7AED (JO66) on 3 Sept, OK1IAS/P (JO60) on the 7th and LX/PA3FPS/P (JO30) on the 8th. Terry Chaplin, G1UGH (SFK), worked several new squares in the 29 Aug/3 Sept period in DL, LA, OZ and SM, plus G0PDE/MM on 31 Aug. Y2 and OK1 were contacted on 6 Sept and TW1C/P (JN09) was a new French prefix on the 7th.

Peter Atkins, G4DOL (DOR), worked DLs and PAs early on 29 August followed by PA and OZ QSOs in the evening. More OZs were contacted in the morning of the 30th. 7 Sept was a super day with southern French, HBs and DLs in the log before 1000. From 1400 his DX included DL, EA1, EA2, F and HE7 stations. On the 12th SP1MVG/MM was worked on FM - near the Channel Islands.

Mark Holloway, G4YRY (DOR), added four new Scandinavian squares on 3 Sept and next day worked SM7AED and Y23SB (JO53) on CW. He contacted some OK1s and Y36XN/P (JO60) on the 6th and on the 7th similar DX to that which G4DOL achieved. On the evening of the 17th Mark found HE7STY/P (JN36) and F6IRF (JN35) and next morning some Fs in JN15, 25 and 35. In an aurora on the 25th at 1600 he worked GM3JFG (IO77) at QTE 20°.

Ela Martyr, G6HKM (ESX), contacted GM4CAQ (SLD) on 31 Aug, using 10W to an HB9CV antenna only six feet AGL. LA5JEA (JO18) was a new square later on. A number of DLs, OZ and Y stations were contacted on 4 Sept plus six SPs in JO83. Ela worked more DLs and OKs in JO43, 50 and 60 from 1400 on the 6th. In the contest on the 7th she made 404 QSOs.

Tony Jarvis, G6TTL (KNT), wrote that, although the early September opening was good, ". . . compared to the events of the mid-80s on 70cm and the early-80s on 2m it was only average." The enhanced tropo started on 2 Sept and by the 4th, high level ducting was observed between GU and PA with GU3EJL (ALD) creating a big pile-up.

Arlen Pardoe, GM0HUO (FFE), made a few auroral QSOs with F, G and PA on 27 August and with SM5BSZ (JO89) on the 31st. Tropo on the 31st brought G0PDE/MM, DL and PA contacts and he worked a good spread of Scandinavians on 3 Sept including SK6IF (JO58) for a new square. In another aurora on the 9th he worked G1GEY (IO94) and SM5BSZ again.

Lyn Leach, GW8JLY (GNS), found the 29/30 Aug tropo, that was so good to Scandinavia and north Germany from central and eastern UK, very patchy in south Wales. He fared better in the evening of 3 Sept working many OZs and three SMs. The strings of SPs being worked by east coast stations on the 4th were inaudible with Lyn.

Operating/P from his excellent tropo site 4km south of Abergavenny early on the 7th, using 100W and a 5-element Yagi at 5m AGL, he made scores of QSOs with DL, F, HB, LX, ON and PA stations from the north, through southeast to the Spanish border. The good conditions had almost gone by the start of the contest but, from his home QTH, Lyn's best DX were EA2s in IN82 and 93, FF6KNB/P (IN92) and HE7MM/P (JN36).

430MHZ

THE GOOD TROPO conditions started for G0EHV on 29 Aug with coastal contacts into JO44 and 53, lasting till 2 Sept. Next evening, most people were on 144MHz for the Scandinavian contest. G0NFH added OZ7RD to his 1991 countries total on the 3rd.

Dave Townsend, G0OFC (NHM), set up his first SSB station in March comprising an FT-726R, BNOS 50W amplifier and 48-element Multibeam. He managed three OZs in JO45, 46 and 56 on 2 Sept and a DF8 (JO53) the next day. He has worked lots of UK stations as well as ONs and PAs and reckons much can be worked under flat conditions if only people would come on.

Dave Dibley, G4RGK (BKS), worked F, OZ and SM on 29 Aug, SM6 on 3 Sept, SP2DDV (JO93), SP2NJI (JO92) and SP3RBF (JO71) on the 4th, SP2NJI again next day and OK1AGE/P (JO70) on the 6th. This was ". . . . the first real tropo opening of the year," he reckoned.

G6HKM also worked SP3RBF on the 4th, her first SP, and SP2DDV who was Ela's best ever DX. DF1AS and DL0USB (JO52) were also contacted and on the 9th, GU3EJL produced more table points. John Hill, G7CLY (HBS), is now QRV with a transverter, 30W PA and 21-element Yagi at 30ft AGL.

G6TTL copied several beacons, including GB3ANG, at 1530 on 2 Sept. His CQ call at 1550 was answered by OZ9IT (JO46) who remained a strong signal for several days. Activity was low with only about 20 Scandinavians QRV. They called for long periods without success. Although GB3ANG was S9 at 2200, not a single GM was heard. By the 4th, all activity seemed to have ceased.

1.3GHZ

G4RGK's DX INCLUDED Fs in JO00 and 10 on 30 Aug and 1 Sept and DLs and PAs in JO31, 32 and 42 on the 4th. G6HKM worked ON5UI (JO11) on 30 Aug and PAs and DLs in JO21, 31, 32, 42 and 52 on 4 Sept. On the 20th Ela contacted G0FCD (OFE).

DEADLINES

PLEASE SEND all your reports for the **January** issue by Thursday, **21 November**. Thursday, **19 December** is the deadline for **February** as I would like a free Christmas.

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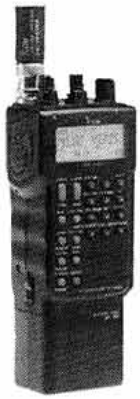

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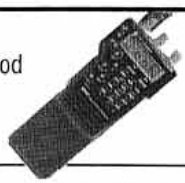

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BOB TREACHER BRS 32525
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IT IS ACTIVITY most of the way this month but before we set into a pleasing number of reports, let us pause a moment to consider a request from Ron, RS92928. He heard a station he copied as VE3ATR, 'Doug' operating from a Canadian Boeing 747 airliner on 8 April on 14MHz at 0703. He sent off for the confirmation only to receive a letter from the late VE3ATR's son. If the callsign was copied correctly, it seems that it was being pirated. Unfortunately, these things happen and there is little that can be done now as so much time has elapsed, but if anyone else logged the QSOs which 'VE3ATR' made, it would at least confirm that the callsign details were correctly logged.

VHF HAPPENINGS

PLENTY TO REPORT this time, but first, I am delighted to welcome Brian Underdown, BRS93818, to the fold. He has been keen on the VHF spectrum for 10 years and monitors the daily 10cm Solar Flux and Geomagnetic Index levels as a guide to possible good conditions on 144MHz. I would draw your attention to the interesting graphs which I have reproduced. His findings show a Geomagnetic Index peaking 56 on 19 August, 49 on the 20th, 36 on the 21st, 38 on the 22nd and 41 on the 23rd, but a major aurora was not forthcoming as he suspects that the quiet side of the sun was facing our way. The 10cm Solar levels were very high on 19 August, reaching 290. As a result of his dedicated monitoring he has caught 25 auroral events in the last six months. He has heard over 120 locators this season on 144MHz and logged a good deal of DX during the Perseids Meteor Shower.

Mick Toms, BRS31976, and I also listened during the event and between us there are a fair number of stations whose locators would be welcome. Perhaps one of our licensed colleagues might have some information - IN3DOV, IW5MEM/P, IK5JWQ, IK1JXY, IW3QPL, IK2DDR, YZ3TTI, EA1ELQ, HA5CW/0, HG1VQ and OK2PZW.

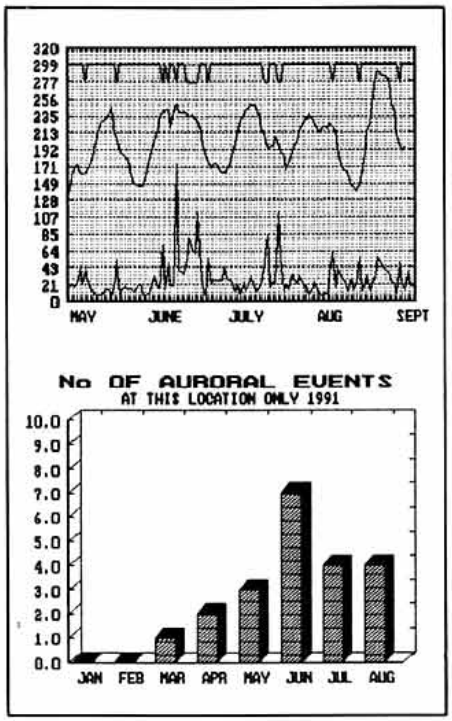
The Perseids seemed quite good this year, with the peak at around 2300 on 12 August. Nothing was heard from Scandinavia, but there were plenty of signals from I, OE and YU. Best DX for Mick Toms was RA6AAB in KN94, while your scribe heard what he thought was a station signing SV9HS at 0042 on the 13th. I am rather dubious about it as SV9 is a very long way via MS. However, there were plenty of strong bursts from Italians, including IW/DB5ML/P in JN81 at the time. If anyone can confirm or deny, I would be grateful. While on the subject of confirmations, locator squares etc, Mick Toms heard KB8RQ off the Moon on 31 August and would like to know his locator without waiting for the card!

Hot on the tail of the Perseids was this season's best (and only) Es opening on 144MHz. Of course, I, like a good many others, was still in bed following a night listening to the Shower. So, much of what was on offer was missed. However, my spies tell me that the opening was to YO, LZ and YU. Indeed, five YUs were logged here between 0844 and 0858, but the opening had been in full swing since 0650!

On tropo, conditions at the end of August and early September were quite good. David Whitaker, BRS25429, fared the best, catching some good ducting across the North Sea from his Yorkshire QTH. The 29th provided OZs in JO45, 55, 56 and 47 and SMs in JO67. The 30th provided SMs in JO65, G6EBH/MM in JO04 and some GMs. 432MHz gave David his first DX on this band for at least two years - by virtue of his 9 element 144MHz yagi! - in the shape of DLs and OZs in the Baltic area. The 31st gave another 'wet' square courtesy of LA5JEA in JO18. He also logged several stations in the Shetlands and GM4BAP/P in 1087. September 1st only provided a GM in 1097, while the 3rd gave David many SMs, including SM1LPU in JO97 for a new one.

Down South the band was not in such good shape. Some DLs around the Baltic were heard on the 30th, but the best tropo conditions were reserved for the 3rd, 4th and 5th. OZs, LAs and SMs were audible on the 3rd, including SM7BOU/6 in JO66 on 432MHz. DL3KZA provided JO64 for a new one on the 4th and SP3EPX supplied JO83 for another new one on the 5th. Unfortunately the good conditions did not last for the contest on 7/8 September, although there were some EAs on the band early into the event.

Moving to 50MHz, congratulations to David Whitaker on winning the UK 6 Metre Group's Summer contest. The best DX to report on 50MHz this time is the appearance of PY5CC at 1850 on 1 September. CX and LU followed him into the log at around 2100. As for Es, I2ADN/8 was a welcome addition from JN60, while other interesting European DX had been available in the shape of PA3DYY/MM (IM98 and JM09) and F8OP (JN25). The best catch, however, was hearing ES0SM in KO08. The cards continue to arrive for 50MHz loggings and I will try to put together a montage for reproduction in a future issue.



A index and 10cm solar flux levels. Data supplied by GEC Marconi Research.

HF NEWS

THERE IS ALSO one HF newcomer to mention. He is SWL Harvey, but he did not give his BRS number. He sent in a fine list of DX logged mainly on 14MHz.

Moving on to my 'regulars', the highlight of the month was the appearance of XY0RR from Myanmar (Burma). I for one needed it, having cards from XZ5A which is no good for DXCC. However, at the time of writing it had only been bagged on 7MHz. Robert Small, BRS8841, caught them on 7, 14 and 21MHz SSB and CW and 28MHz SSB.

By the time you read this there will have been a legitimate operation from ZA, and there is DX speculation that North Korea will be on the bands, too.

There was a great deal of DX on the bands during August and early September so I shall take our usual look at the best which on offer:

3.5MHz: CX9VU, FR5DX, HF0POL, HL11UA, VP8ML, Z21HS, 5H3RA, 5Z4BI, 8Q7CO, 9J2HN and 9Q5TE (Albert BRS48462's 297th country on the band).

7MHz: CE0ZIW, V44KW, XW8KPL and 5N0ETP (Victoria Is).

14MHz: A41JR, BV2CR, FK8CP, HK0EFU, WH6ASW/KL7, KP2/VS6CT, KP2A/KP5, DL1SCQ/TF7 (Vestman Is), T40PAN (Special callsign for the Pan American Games), VK9LA, ZK1TW, 3B8GA, 3DA0BU, 3D2XV and 9M2CW.

21MHz: A22AA, A35KB, BV7BB, D68RH, DU6JS, HF0POL, HL9HH, JTIBV, KH2EN, OD5ZZ, S79BCC, TJ1FN, VS6/N200, XT2BS, XX9AW, ZD8WD, ZS9S, 3C0CW, 5H3RA, 7Q7JL, 9L1US, 9M8FH and 9V1WW.

28MHz: A45ZN, HH2BN, SO1A, VP8CFM (South Orkney Is). V85GA, 3B8FA, 3B9FR, 5H3GM, 8R1VMB and 9M2AM.

Philip Davies, G1EMD, looks like being the Oblast expert now that we have sadly lost Brad Bradbury. He has 165 heard. Recent additions include RJ8R/UA6BGB (042), UM8NU (032), UJ1K (182) and UMSTWA/RM6P (177).

Robert Small has decided that it was about time he bothered G3AAE to claim an IOTA Award. On checking through his cards he found that he had cards from 422 Islands (not bad going, eh?).

FINALE

IT HAS TAKEN longer than usual to sift through the mail this time because a good many listeners sent in reports of what they had been hearing. Please continue to keep our postman happy!. Deadline for the **January** 1992 issue is Tuesday **5 November** .

Propagation NEWS

Compiled from reports supplied by G3FKM, G3FPK and the Propagation Studies Committee

HF

AN EXTENSIVE report from G8KG this month: "As we move into the sixth year of Cycle 22 we are now close to half-way and may already have reached it. It seems that some people have the mistaken idea that the next minimum is just around the corner. How wrong this is can be seen from the fact that SIDC Brussels and NOAA Boulder forecast a smoothed monthly sunspot number between 120 and 130 for Jan 92 and this is higher than the *peak* value in Cycle 20 (1968/69) - and for that matter in all of Cycles, 12 to 17.

According to the classical method using smoothed monthly sunspot numbers the present cycle had a broad peak in the second half of 1989. Smoothed numbers, however, are not observations but statistical artefacts. The highest observed monthly mean sunspot number (200.3) was that for Aug 90 - also the highest for more than 30 years - while the highest 3-month mean (173) was only reached in the recent mini-peak in Jun-Aug 91.

Those who rely on a close equivalence between sunspot numbers and solar flux should note that the latter tells a different story, the highest monthly mean (243 sfu) being in Feb 91 and the highest three-month mean (234 sfu) in Jan-Mar 91. The peak of 251 sfu in the 27-day mean which occurred in Feb was the highest for over 30 years. Taken together these figures show a prolonged and rather turbulent maximum extending over most of three years - which, incidentally, smooths to a double-humped curve.

At the time of writing (17 Sep) it is evident that the high peak in activity in Jun-Aug is over, the daily solar flux values in the current solar rotation being in the 170/180 sfu range, as much as 100 units lower than in Aug. Whether this change marks the beginning of the declining phase of the cycle should emerge over the next few months. What is certainly true is that the 1991/92 DX season has made a promising start with very high MUFs for the time of year. We are now in the part of the cycle where we expect higher levels of geo-magnetic activity and disturbance."

VHF

THE EQUINOXES are interesting periods for radio propagation and usually herald subtle changes. They occur when the Sun crosses the equator which causes day and night to be of equal length wherever you happen to live. The autumnal equinox was on 23 Sept this year.

On 144MHz Sporadic-E activity usually fizzles out by mid-August - but on 50MHz it persists into October. From the autumnal equinox, the propagation pattern on 50MHz changes from predominantly Es to more frequent openings to Africa, Central and South America, then North America, the Pacific and Australia. In 1989, the first autumn opening from the UK to Australia occurred on 11 Oct and in 1990 it was on 19 Oct. This year it happened as early as 28 Sept. With so many more countries now allowing 50MHz operation, we should be able to accumulate data for hitherto uninvestigated paths. On the HF bands simple computer programs, such as MINIPROP, calculate the radiation angle, number of F-layer hops and the likely signal strengths over the selected path. In non-disturbed conditions, the practical results correlate reasonably well with the predictions. By contrast, on 50MHz, some very odd propagation has been reported over the past few years, apparently involving several different modes during a single contact. In some instances great circle bearings, whether short or long path, have not worked and QSOs with Japan, for example, have only been possible with completely 'wrong' beam headings. We need comprehensive reports of all such anomalous propagation to try to establish diurnal, seasonal and solar cycle effects; eg the date of the first autumnal opening from various European countries to Australia or Hawaii. The obvious 'post box' for these reports is the *VHF/UHF News* column.

HF F-LAYER PROPAGATION PREDICTIONS FOR NOVEMBER 1991

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	....8++96...	....999981..	...2999994..	...59889971.	221877789953	886755457998	88642223578 8	++3.....25++
MALTA	....898871..	....999993..	...1999997 1..	...49889994.	441877789984	997754458999	88852113588 9	+++2....25++
GIBRALTAR	....487761..	....699884..	....9999971.	....9989994.	12.187778983	786775557999	99674222479 9	+++5.....4++
ICELAND	.....6886...	.....89982..	....399995..	....5999981.	11..88889951	674176668897	88865334678 8	+5+42...34++
** ASIA								
OSAKA	....93.....	....95.....	...2971.....	...4873....1	1..4654334 14	1..142235764	....1..13662	.........33.
HONGKONG	...2++83....	...399951...	...3888831..	...2777863 1.	2...4546785 2	2...12136886	13674	352
BANGKOK	...4++++6...	...4899981..	...2588993..	....3778961.	3....4468954	3....1136888	1.....3676	353
SINGAPORE	...589996...	...5799981..	...3588993..	...1377896 11	2....4468964	2....1136887	3675	352
NEW DELHI	...5+++8....	...5799921..	...447895...	...2267871 11	421..3468655	74....136888	61.....3677	3.....355
TEHERAN	...6++++6...	...7889981..	...7668894..	1.1534789721	6443114689 76	8741..136889	752.....3678	43.....345
COLOMBO	...5++++7...	...5689992...	...3368895..	1....1578982 1	52...2468976	72....136898	4.....3677	355
BAHRAIN	...6++9961..	...7779982...	...7458896 1.	2115236898 42	7542..468987	974....135889	761.....3678	43.....345
CYPRUS	...4++++82..	...7999995...	...8888998 2.	3218778899 63	7757556789 97	9974223468 99	8852...14788	5+2.....4++
ADEN	...6++++83..	...7678995 1.	2..6346898 42	4214125899 75	8741..258998	984....25889	761.....3677	43.....344
** OCEANIA								
SUVA/S	.....4773...	....26886....	....588983..	....777895..	....1655686..	....3422354..	....11..131..	.....
SUVA/L	1...5431.363	21..765226 74	22.2876558 53	.1158666783 1	.1686335 76..	....431.253..	....11...21..	.....
WELLINGTON/S	....48753....	....7887 6....	....888882..	...1877894..	...3655686 1.	...2422363..	....1..131..	.....
WELLINGTON/L	.....	11..21....11	221.431..222	1122542124 32	.1464335 51..	...231.253..	....1...2....	.....
SYDNEY/S	...398886....	....498998....	....5988992..	....4877895 1.	...1654688 3.	....3213673.	....1..1351.	.....2..
SYDNEY/L	....21....11	....431...22	...1.7631.253	...1.8653256 3.	....6434575 1	....4112462.	....1...23..	.....
PERTH	...6887 65....	...6888772..	....4688895..	1..2477898 21	1...1446897 4	1135884	3661	.....33.
HONOLULU	.....2..	.....4..	....1...271.	12..3.1.472.	.44.6231761.	.2644222 53..	..441...2....	...2.....
** AFRICA								
SEYCHELLES	...6668743..	...6668866 1.	21.4347888 52	4211115899 75	862...2589 99	951....25889	72.....3667	4.....345
MAURITIUS	...5788884 1.	...5668997 31	21.3336899 63	5311114799 86	861...1579 99	84.....2589 9	61.....2677	3.....355
NAIROBI	....5888986 2.	1..6677998 42	42.8345899 85	7514113799 98	9841...5799 9	984.....2588 8	761.....2677	43.....344
HARARE	...3567887 41	21.5566899 74	53.5333799 97	8614111589 99	9941...2799 9	983.....5899	761.....2677	43.....355
CAPETOWN	1..1668898 63	31.3666799 85	65.5433589 98	9715211379 99	9952....5899	984.....2689	762.....378	53.....45
LAGOS	1...+++++863	32.1877799 86	75.4743569 98	9825621379 99	9977 3....5899	8895....2799	7772.....478	444.....255
ASCENSION Is	1...8877875 3	22..8766787 5	65.1184336 98	8833721139 99	9986 4....1699	8896....389	7773.....167	444.....35
DAKAR	....8++++962	11..9876898 5	541.964379 98	7741842158 99	9985 61...2799	8897 3....489	77751....267	4442.....35
LAS PALMAS	....8++9+83.	....9999995 1	11..9988998 4	3421987789 97	8875865568 99	9998632247 99	8886 31..1488	+++3.....25+
** S. AMERICA								
Sth SHETLAND	....4677776 2	11..6887777 5	441.887556 77	7741865334 67	7875642..136	566541.....3	23331.....	.....
FALKLAND Is	....4778+862	11..6887677 4	432.886335 77	6641874112 68	8985641...36	788731.....4	57751.....1	2442.....
R DE JANEIRO	....3866676 2	1...5865577 4	332.773335 87	665.8511.389	998462....58	98874.....37	77751.....4	4442.....2
BUENOS AIRES	....4777785 1	....6876667 3	322.885327 76	655.8731.158	998364....27	888741.....4	67751.....2	3442.....
LIMA	.....+++85.	1976662	111.148433 55	334.3562..36	7882543....6	789641 1....3	57751.....	2442.....
BOGOTA	.....+++85.	1976661	1.1..384336 4	334..562.147	7782143...17	8886321....4	66751.....2	4442.....
** N. AMERICA								
BARBADOS	.....7+++85.	8866772	111..873358 5	334.1761.277	8782443...58	888641....27	77751.....4	4442.....2
JAMAICA	.....+++84.	1986761	..1..385346 4	323.1563115 6	7781453...27	888621....4	76751.....2	4442.....
BERMUDA	.....4+++84.	6987861	..1..886568 4	223.2774347 6	7781554 1.158	888621...27	76651.....4	4432.....
NEW YORK	.....8++83.	.....299885.	.....488677 3	222.1676557 5	7771454322 57	888542 11..26	66651.....3	3432.....
MEXICO	.....++73.	.....19764.	.....1.48534 2	222.3.573124	6771624 5....4	888542 12....1	36751.....	.442.....
MONTREAL	.....18++83.	.....299985.	.....588787 2	222.1677678 5	7771454534 67	888542 12.136	66551.....13	3322.....
DENVER	.....4871.	.....6983.	.....886 51	221.2..77543	6761512542 25	886542131...2	36751.....	.342.....
LOS ANGELES	.....861.	.....1972.	.....3864 1	221.1..57432	576.42.5511 2	478542132....	15751.....	.242.....
VANCOUVER	.....25...	.....571.	.....783.	221.2..28752	575.52.4754 4	4784421342 12	24651....1...	.232.....
FAIRBANKS	.....	.....12..	....11.135 1.	22..3223076 31	563.5445776 4	5664422355 44	23541...2221	..22.....

The provisional mean sunspot number for August 1991 issued by the Sunspot Data Centre, Brussels was 125.3. The maximum daily sunspot number was 170 on 1 September and the minimum was 80 on 20 September. The predicted smoothed sunspot numbers for November, December and January, are respectively: (classical method) 129, 127, 124; (SIDC adjusted values) 132, 131, 131.

Novice NEWS

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

FIRST, A big "thank you" to the Novices who have taken the time and trouble to put pen to paper (or fingers to keys!) and sent the outcome to me. I am sure that readers will be as grateful as I am to hear your views. Thanks too to others who have done the same. So far, I have managed to reply to all letters almost immediately, and hope to continue. Please keep them coming, many of your views and ideas are of interest to all and this column can give them an airing.

A VERY GOOD IDEA

TWO MONTHS ago, Scrooge gave Riley's idea of keeping components under control when project building. Riley has sent a detailed description of the way he does it and I think it is worth a second mention.

Egg *sheets* are used (your friendly grocer will be delighted to part with some), with thirty little 'nests'. These are numbered R1 to R30, D1 to D30 and C1 to C30 (resistors, diodes, capacitors?) a fourth sheet, which is rarely used, is numbered R31 to R45, D31 to D45. Before starting to build, all the components are sorted into the relevant nest giving a quick check that all are present and knowing exactly where to find them. And I thought I was well organized.

A BAKER'S DOZEN

IN ONE month, Michael, 2E0AAD, has worked 13 countries, apart from G, mainly on 10m! (Is this a record?) In January, Nigel, G4XNS, (Michael's teacher) explained what the Novice set-up was all about, and four boys embarked on the course, sat the June exam and all passed. The 12WPM Morse test followed and that too was passed. As Michael intends to tackle the RAE course with a friend starting in September he saw no reason to take two Morse tests!

He planned and drew his QSL cards on Nigel's computer and printed 250. (He is going to need them as he has already sent out about 50!) He sent one to me. My ambition is to get another with details of a QSO filled in!

Obviously impressed, his brother enrolled for the next course. Between them they bought an old but working Heathkit and Michael put it to good use. He called CQ on 10m. Then it happened! A European pile up! Having survived - and enjoyed that, Michael is ready for anything. He proved a good ambassador for the Novice concept, as this "2E0 business" was unknown and an explanation was needed.

The other boys on the course all have 2E0 callsigns - Hugh AAA, Matthew AAC, Christopher AAE. Michael wonders where 2E0AAB is, he would like to contact him/her. He also wonders if he will be in as much demand when he gets the G0 callsign!

Instructor Nigel has courses fully booked for the next two years. Let me see now. That *could* possibly mean another 32 Novices in the Preston area plus those studying under other Instructors.

Michael's final comment: "I would strongly recommend training for the licence because I am getting a lot of enjoyment out of the hobby." Isn't that what it is all about?

LESSONS WITH A DIFFERENCE

AS PART OF the Beacon Arts Festival, a special event station was set up at Beacon Community College, Crowborough, East Sussex on 16 July, with the callsign GB2BAF. This was for groups of students to visit the station, and learn a little about amateur radio in a practical situation.

Throughout the day, students were given the opportunity to listen, tune various HF receivers and speak to other amateurs over the air. The station operated on 2m and 40m, with G0HWQ, and G0GLM, at the controls. Science Coordinator Dave Tattersall arranged the students' visits to the station and was impressed by the interest and enthusiasm shown.

Around 150 twelve and thirteen-year-old pupils visited the station altogether, and it is hoped to repeat the event and that it will lead to the setting up of a short-wave listening station to join the weather satellite receiving station already installed in the school.

COMMERCIAL BREAK

CONSTRUCTION should not end with the training course, so what do you make next? A little bird told me that Kanga Products produce some kits that Novice *builders* may consider with confidence.

I wrote for information to Dick, G0BPS, who not only replied very promptly, he also sent the latest catalogue to tempt me. (Oh yes, I do know which is the business end of a soldering iron.) Incidentally the RSGB Novice amplifier kit came from the same stable.

To name but one item, there is the OXO crystal controlled CW transmitter. At £10.95, it will not make too big a hole in the piggy bank. There are many other goodies already in kit form with about ten more in the pipeline, not all radio projects, but fun to build while learning how electronics work. And why shouldn't the older Novices have fun too?

For the catalogue, write to: Kanga Products, 3 Limes Road, Folkestone, Kent CT19 4AU. A Self-Addressed Stamped Envelope (A5ish), would be appreciated, I'm sure. Happy building!

D-I-Y RADIO

I HAVE JUST been reading (properly!) the last edition of the above and come to the conclusion that there is no firm demarcation line between this column and that publication. Now that Novices have passed the exam and have dipped a toe into friendly waters, it is perhaps time that they reviewed the last few months and communicated in a different way.

There are readers of *D-i-Y Radio* who would love to know what awaits them in the near future when they have reached the same stage as the Novices reading this. There is only one way that this can happen.

Fully fledged Novices - this is to you. You must have something to say to those who are just starting out on the path you took. Your excitement at your success in construction, pleasure in making new friends on the course - and meeting them on the air later! And the elation when you received your licence. Why not share your experiences? Any Novices in the nine to ninety age group (Or even outside that range?) are invited to drop a line or two to the *D-i-Y Radio* Editor, Marcia Brimson, at RSGB HQ.

Novice students in the same age range as above, what are your thoughts? How is the course going? Is it what you expected? All your views are needed if we are to provide the articles you want. There is a working agreement between Marcia and myself, that anything that arrives in either postbag which will get a better airing in the other is duly dispatched in the right direction, but a deadline could be missed in the transfer.

One of my Novice correspondents has some suggestions, one of which is Novice reporters. Come on then, report! Your efforts will see light of day in one place or the other. *[see page 51 for more information on D-i-Y Radio - Ed]*

YOUTH TAKES THE HELM

THE SOUTH Dartmoor School, who has featured in this column before, has formed an amateur radio club and has issued the first Newsletter. Peter, G6ZKQ, the current Editor has sent me a copy. The Club holds a full Class B licence and the callsign is GX7KSX. It will be in operation as soon as the equipment is set up, and used only if there is a fully licensed amateur present. Financially, they have had help from local business organisations, for which they are very grateful. These had to be worked for, with letters sent telling of their needs.

Anyone thinking of starting a similar venture, and desperately

The intent young man in the picture is tuning in a 40m receiver made from a C.M.Howe's kit.

needing advice, could write to Peter at: 21 Elmbank, Buckfastleigh, Devon TQ11 0DN. Sorry about that, Peter. More work for you! Finally, I've saved the most interesting bit until the end. The Club has a President who is a teacher, but the Officers and Committee, seven in all, are *all* 14 to 16 years old. Well done. An example for others to copy?

BRAIN TEASERS

THIS QUIZ is a bit of fun originally intended for Novices who have all the licence conditions (callsigns and how to use them) at their fingertips. But of course, we all know them backwards, don't we? But, do we? G0KKL, challenges you to put yourself in the following situations. Your callsign is 2E0ABC, how would you send it in the following situations?

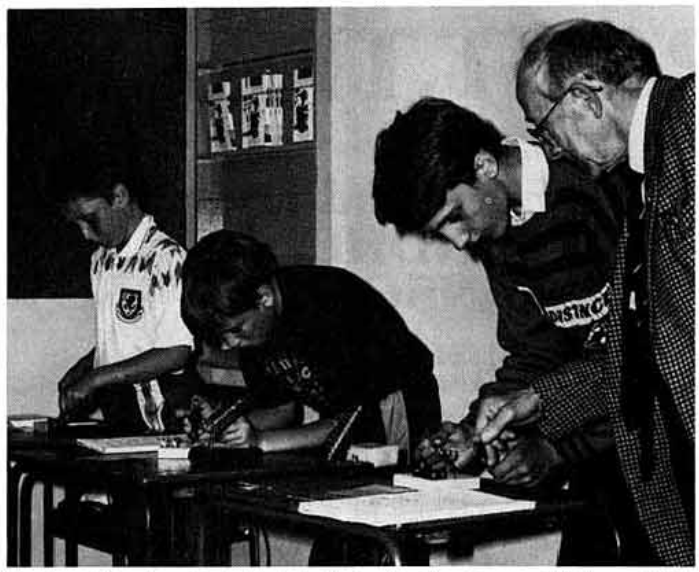
1) You are on a camping holiday in Guernsey. Two convenient trees have given you the opportunity to put up a dipole. You decide to call CQ on 80 metres.
2) With a walking party in the Cairngorms, you want to keep in touch with a friend in another group, also with a 70cm rig. You are still struggling in the foothills, but think he/she may have reached the top of Ben Avon, so you call him/her for a progress report.
3) In a motor launch, just upstream of the Severn Bridge, your friend in the launch bets you can't contact your pal in Bristol because of all the steelwork of the tower between you and him/her. You call to check.
4) In a Land Rover with an ex Army whip aerial, on a bumpy road in Jersey, you remember the QSO with an amateur from Guernsey who is always on the air at this time. You power the rig from the car battery and call him/her.
5) Riding in the TT races, you want to make a quick call to your friend in the grandstand near Douglas on your 70cm handheld.
6) Radio amateur Uncle Patrick lives just outside Belfast. His rig is tuned to 40 metres and you hear a CQ call at a nice steady 8WPM. Uncle Patrick suggests that you answer - to show that you can do it.

FROM A NOVICE

NEVILLE, 2E1ACS, has sent details of his activities since gaining his callsign, and it makes encouraging reading. He is interested in sideband working, and he worked Richard, G4YTV who lives in Hull on 70cm SSB using just one Watt. As Hull is about 70 miles from Barnsley, knowing the ups and downs of the local countryside, I reckon that is pretty good! Through the ATV repeater, GB3ET, on Emley Moor, he worked G6LIC/M, who was mobile travelling down the M1, a distance of some 40 miles. Neville was received on 24cm ATV.

Another Barnsley Novice is Russ, 2E1ACQ, and he and Neville can be found on 70cm sideband on 434.00MHz - the local Novice calling frequency (see above). Anyone interested could arrange to meet by ringing Neville on 0226 249873. Out of school hours he can usually be found on GB3ET as ATV is his main interest.

I mentioned in a previous column that there are many facets to amateur radio. Here is a young man who is exploring some of them - and thoroughly enjoying himself. In a couple of months there will be more Novices around, but in the meantime if you live in the area do listen on 70cm - especially on 434.00MHz SSB. There's no knowing who you'll meet.



Pontypool Amateur Radio Society Novice Training Course 5/16 August 1991. Left to right - Andrew, Damian and Graham complete test set no. 2 under the watchful eye of David, GW3XJA.

LOW COST ANTENNA

WORTH A mention outside Scrooge's Corner, as even the best equipment in the world needs an antenna, and that can be expensive on UHF. John, G4LRS comes to the rescue.

John lives on the ground floor, so he is rather limited as to where he can erect the aerial. As he says "Do not despair" he usually finds someone comes back to his calls *and* for an outlay of less than £1! Coat hangers are the answer - you know the kind (been to the dry cleaners lately?). At *low* power all you need is a Belling Lee connector, the usual piece of coax (John normally uses UR52 or UR43), a PL259 (you could use an N type if you are feeling extravagant), and you are in business!

Promising to be *very* careful, use some cutters to prune your handiwork - or ask someone more experienced to do it - under your supervision of course! You will make mistakes of course, but they won't be expensive mistakes. John didn't mention a SWR meter, but you know all about that don't you?

A final comment from him which I must pass on. He has spoken to his local Novices who show an avid interest in the hobby, a keenness to learn and their operating procedures is better than that of some fully fledged amateurs. Take a bow, Novices, and keep it up. Instructors too may take some credit for this.

WANT TO SPOT A BARGAIN?

JEFF, G3LWM has written again with useful information for those Novices who are visiting rallies looking for bargains (aren't we all?). He has obviously been looking in those boxes of seeming junk that abound. You know the sort of thing - you think "Now that looks useful - if only I knew what it was." Help is at hand, thanks to Jeff.

As Novices' first forays are likely to be on UHF, anything appertaining to 70cm is of interest. Armed with a list, at best you may find something quite rare. At worst, you may be able to identify some of those older items and somewhere in between perhaps, pick up something that you can convert or strip for additions to your ever-growing collection of components. What is more, you will recognize collectable items. Jeff has compiled such a list, and will send it to anyone who sends a SASE to: Jeff Harris G3LWM, 21 Waltham Way, Frinton on Sea, Essex CO13 9JE. Happy hunting!

ANSWERS

I AM NOT mean enough to make you wait until next month for these, so here we go:

1) 2U0ABC/P. You are away from your main Station address, and haven't given advance notice of the change, but don't forget to give your location. [Para 1(8) and notes (v) and (w) of your licence.]
2) 2M0ABC/M. Struggling you may be, but you are mobile and in Scotland.
3) Your friend wins the bet but not for his/her reason. The Severn is tidal at this point. [See para 2(10) and para 10(1)(d).]
4) 2J0ABC/M. The vehicle must be moving if you can feel the bumps!
5) (Here I quote) "2D0ABC/M would be fine if you were a Martian with four hands and two brains! As a mere human being you should keep both hands on the handlebars and your mind on the road! This is the way to live long enough to renew your licence."
6) Your licence does not allow you to use the 40 metre band *except under direct supervision and using Uncle Patrick's callsign.* [See note (f) of your licence and paragraphs 2(8) and 7(2) of your uncle's licence.] However, if you want more than the rubber stamp QSO and your Morse key doesn't complain, why not tell your new friend sometime during your second over that 2E0ABC is operating? He may well be more interested than if you were a 'full' amateur, - you are rather rare you know!

Five or six means you know your stuff, did you fancy Law as a future career? How about this one: You are in a Hovercraft crossing Lake Windermere. Are you "on a boat in inland waters" or "in an airborne vehicle"?

Less than three right? You know your "book at bedtime" for tonight don't you?

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Options:
- Remote Control Speaker Microphone which controls a host of functions
- Battery packs, wall chargers, filtered 12V power cord, soft case, etc

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The detailed information sheet does these little handhelds more justice, so write, phone or FAX for one and it will be sent immediately. Better still, seeing is believing, so why not drop in on one of our shops or approved dealers and get a feel for what we are talking about!

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Squelch:
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A full colour specification sheet is available upon request and both models are in the showrooms of our shops and approved dealers. When you see the transceiver as a handheld, you will find it small. When you see its profile in your car without the battery pack, we think you will be pleasantly surprised at the very small amount of space required to house a fully functional FM VHF/UHF transceiver with all the modern necessities.

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G4HKS

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For those of you who have not visited MARTIN LYNCH (a year gone by and you haven't visited me already?) we really are easy to get to. My shop is just across the road from NORTHFIELDS UNDERGROUND on the Piccadilly Line. It's the closest store to HEATHROW by tube, 5 minutes from the M4/40/25 motorway, and about 20 minutes from the M1. If customers can visit the busiest Exchange Centre from as far as Australia, Canada, Sri Lanka and Marlow Bottom, surely you can make it to sunny Northfields. (Where is Marlow Bottom?)

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Knowledgeable staff and back-up second to none, completes your peace of mind package. For those of you who prefer to mail order, give me a try! I have many letters thanking my staff for the help and service they have received. The repeat business and recommendations tells me we are doing it right. Give it a go!

Final word, yes of course I take part exchange and yes I do want to buy your unwanted equipment. (It amazes me how often I get asked that, it's like asking a barber if he cuts hair). Where do you think all the stock comes from? So if you have an FT101ZD and want a new FT990, or own a TS830S and want the latest ICOM, give me a call TODAY. Don't wait just ring.

73 Martin G4HKS

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RADCOM NEWS FEATURE

Before the Mast

How radio amateurs helped make this year's Tall Ships Race safe and successful

THE ANNUAL Cutty Sark Tall Ships Race started this year from Milford Haven in Pembrokeshire on 14 July. Some 60 ships were involved in the race, crewed by youngsters from 18 countries.

Pembrokeshire Radio Society ran a special event station, GB2TSR, for almost the whole of July from a site commanding views of the Haven. On the other side of the Irish Sea, Cork Radio Club put on their own special event station - EI2TSR.

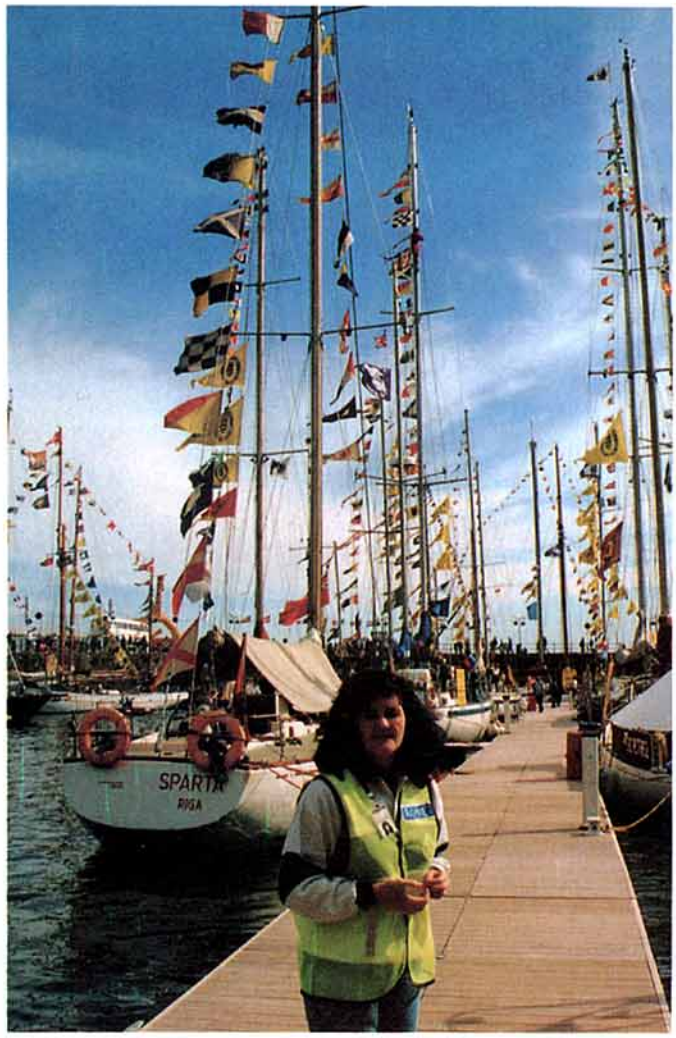
Several radio amateurs were involved in the race itself. For instance, the Newsletter of the Irish Radio Transmitters Society reports that EI4HF, EI6GJ and EI5HG were amongst those volunteers with marine radio experience helping to keep eveyone in touch.

At Milford Haven, Raynet was responsible for safety communications. John Jones, GW3IGG, Group Controller, SW Dyfed (Pembs) Raynet Group sent us this report:

Planning for the event began a year ago, when a special subcommittee of Dyfed County Council was formed. I was invited to become a member of this committee which included representatives of 20 organisations, amongst them the emergency services, local authorities, Milford Haven Port Authority and the voluntary services: Red Cross and St John.

From the deliberations of this diverse group came the plans involving hundreds of local people which would enable both residents and thousands of visitors to enjoy the spectacles of the arrival of the ships and the Parade of Sail as they proceeded to the starting point.

For Raynet, the task was to provide radio communications for the Red Cross and St John, with links into the police, ambulance, coastguards and County Civil Protection organisations. In addition, mobile patrols walked the Pembrokeshire Coast Path on both the north and south sides of the Milford Haven waterway, which for this event became a huge amphitheatre twelve miles long by six miles wide. Red Cross and St John established ten first-aid posts with ambulances at the best viewing points while the police and the County Civil Protection Planning Unit set up controls in the Milford Haven Port Authority.



Kate Jenkin, Raynet member 01642, from North Staffs Raynet.

Raynet was requested to set up its control station in the Pembrokeshire County Ambulance Headquarters in Haverfordwest, eight miles north of Milford Haven. A 70cm link connected this station to a crossband talk-through station operated at GW1WQM overlooking the east end of the Haven, with output on 2m to the stations along the fifty miles of coastline. Three subsidiary nets (two on 2m, one on 70cm) dealt with heavy local traffic in the Milford Dock, Angle and Dale areas.

Operations began on 10 July and built up to a climax on Sunday the 14th when the net opened at 0550 and closed at 1920 after the ships had left en route for Cork. Each day at 0900 and 1900 Raynet Control transmitted a Sit-Rep with details of duties for the next operating period.

At its peak, 28 stations were operating, manned by 40 operators drawn from Raynet groups in the counties of Dyfed, West and Mid Glamorgan, Gloucester, Hampshire, Shropshire and Staffordshire. The traffic handled included crowd and road traffic information, ambulance movements and emergencies which included two lost children, two people taken ill, one broken arm, one broken leg and suspected broken ribs.

Before operations got very busy, a meeting was held on the Thursday for the operators to meet each other and to hear Don Sunderland, G6FHM, and his XYL present a video tape *Raynet in Romania*. In line with the spirit of the occasion, this meeting took place on the deck of a sail training ship afloat in Milford Dock.

This was the largest operation carried out by Pembrokeshire Raynet. It would not have been possible without the help of the volunteers who travelled to the area and camped out in poor weather for the duration of the event.

Thanks are also due to Dave, GW0KWY, and the extra operators he persuaded to attend at very short notice when a sudden unforeseen demand for eight more stations came into Control.

This was just one of the things which didn't go according to the original plan, but, due to the skill and flexibility of the operators who took part, all the problems were overcome and once again an efficient emergency communication service was provided for the community by radio amateurs.


Deputy Controler North Staffs Raynet, Bernard Cashmore-Thorley, G6YBY, and Raynet member Kate.

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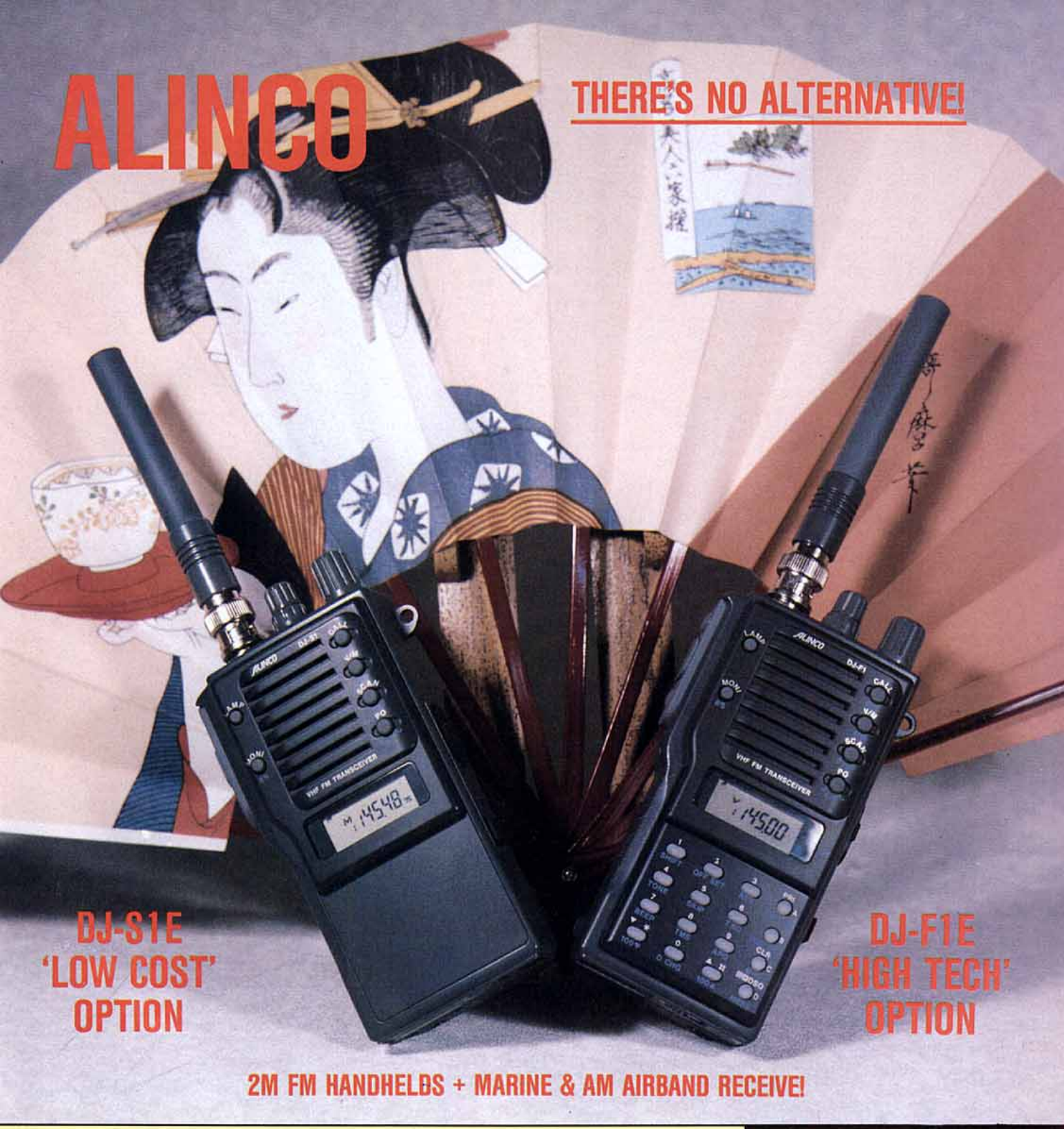

The new handhelds from ALINCO prove that the company has now moved into the "BIG LEAGUE." Once described as "the serious alternative" it is now surely true to say "there's no alternative!" In the past year ALINCO have dominated the handheld market. These new models will move them even further ahead of the competition.

Wide receiver coverage is standard on both models with AM airband reception as well. Just key in a code to transform the DJ-F1E from a normal handheld, to a high performance scanner covering 108-174MHz. Other features common to both models include • rotary frequency control • illuminated dial bar S-meter • 40 memories • direct 12v DC operation for 5 Watts output • battery save • three output levels of 0.1W/1W/2.5W etc. The DJ-F1E includes • illuminated key pad • extended receive • 700mAh nicad pack and charger • DTMF • comprehensive scanning and much more. Send or ask for colour leaflet.

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TOPICS

PAT HAWKER G3VA

ADD-ON SPEECH PROCESSOR

THE ABILITY TO USE speech processing to increase the 'talk power' of transceivers, which may well in future be enhanced by the prospect of increasing use of digital signal processing techniques, has long been recognised. Many of the add-on processors however have tended to result in 'hard limiting' using, for example, back-to-back diodes to slice off the audio peaks; a process which tends to result in a rich harmonic output and which unless corrected can lead to distortion and some loss of intelligibility. An alternative approach is to use rather milder forms of dynamic-range compression in which an amplifying stage has its gain throttled back on the speech peaks, thus providing automatic level control.

A 'Speech processor for transceivers' by Rob Evans (technical editor of *Electronics Australia*) appears in the September 1991 issue of that magazine (pp72-77). This provides full constructional and adjustment details of an add-on unit that connects in-line with an existing microphone and acts as a preamplifier, compressor and speech filter. The unit also incorporates a tone oscillator which automatically generates a short 'beep' each time the push-to-talk (PTT) button is released, although circuit details for this have been omitted from the simplified circuit shown in **Fig 1**.

Operation is as follows: The gain of a TL072 dual op-amp pre-amplifier is automatically varied by means of an opto-isolator constructed from a combination of a 5mm LED and an OP-12 miniature light dependent resistor (LDR) assembled together in a short piece of heat shrink tubing: **Fig 2 (a)**. **Fig 2 (b)** shows the audio compression curve this provides for the pre-amp (note that although the shape of the curve remains fixed, the values along each scale will depend on the setting of RV1 and RV2 - miniature PC-mount horizontal trimpots, 50k and 5k respectively). Filtering and screening is used to suppress RF input to the unit and to shape the audio response roughly to about 300Hz to 3kHz. A 'compress' LED2 flashes to indicate compression on the speech peaks.

Before connecting the unit to a transceiver it should preferably be checked on a high-gain audio-amplifier/loudspeaker to check the quality of the output signal.

Rob Evans includes a section on 'possible changes' that may be found necessary in some cases where the processor may not perform quite as expected, despite the fact the circuit is operating correctly. He notes that while RV1 can be used to alter the gain over quite a wide range, the final output level *does* depend on the strength of the microphone signal and the light sensitivity of the LDR.

He has found that with different LED/LDR combination, with 2mA flowing through the LED (as in the circuit of **Fig 1**), the LDR may present a resistance anywhere between 10k and 50k. These are within the adjustment range of RV1. However, for microphones providing an unusually low or high output, the value of R11 may have to be adjusted. It is useful to test the opto-isolator action before installing it in the unit.

It should also be remembered that when a speech processor is used on an SSB rig, the duty cycle of the power amplifier will be significantly increased, possibly calling for a chunkier power supply unit and/or improved cooling. It is better to compress an audio signal too little than too much so as to avoid the danger of flat-topping and hence radiating an excessively broad signal. Remember that peak-limiting and/or compression represents a form of signal distortion and needs to be carried out with care if it is not to impair signal intelligibility. Broadcasters use dynamic compression on both AM and FM transmissions without introducing excessive distortion, although it is interesting to compare the quality of Radio 3 FM (virtually no compression) with the other UK Band II signals (moderate compression), or the heavy compression on the BBC medium-wave World Service transmissions (and other international-broadcasting transmissions) with the less heavy processing on domestic AM services.

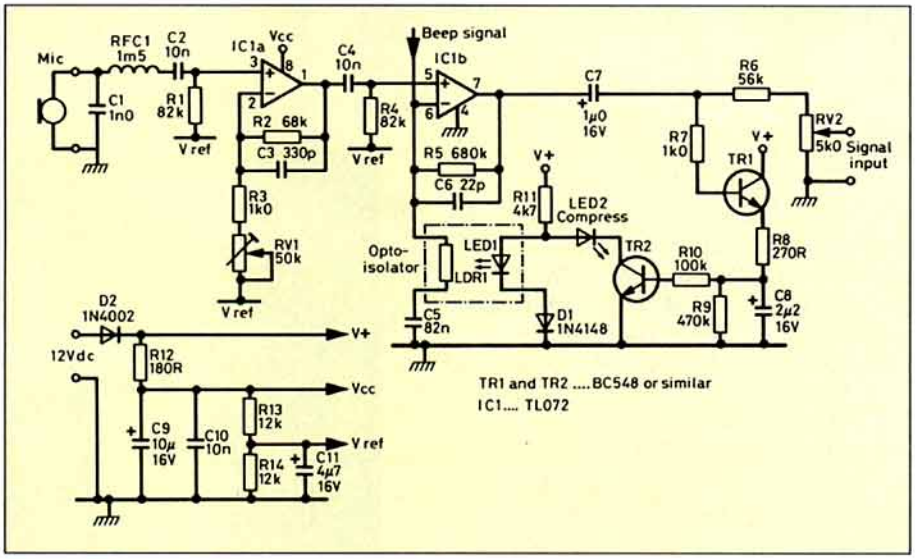

Fig 1: Simplified circuit-diagram of the *Electronics Australia* speech processor (PTT-operated beep generator circuitry omitted). The gain of the microphone pre-amplifier (IC1a and IC1b) is reduced on speech peaks by the action of the opto-isolator (LED1 and LDR1). Note that some electret microphones require a DC voltage not provided in this circuit.

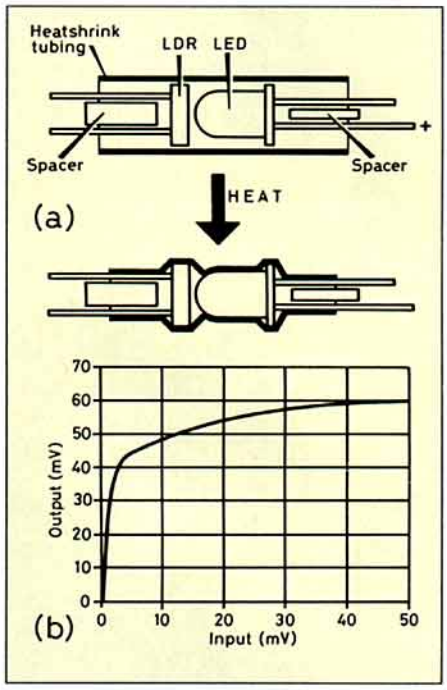

Fig 2: (a) Construction of the opto-isolator. The components are slid into a piece of heatshrink tubing and heat applied. (b) Audio compression curve. Note that the shape of the curve remains the same but the values along each scale depend on the settings of RV1 and RV2.

THE GOOD OLD DAYS?

SOMETIMES ONE TENDS TO THINK that amateur radio (like the old grey mare) "ain't what she used to be many long years ago". But in many respects one should say thank goodness it ain't! Consider for example the terms of the standard amateur/experimental licence in the UK circa 1925: "The power must not exceed 10 watts and messages may be sent only on waves of 150 to 200 metres (Tonic train, CW and Telephony) and a further fixed wave of 440 metres (CW and Telephony only) . . . . Messages may be sent at any time, but the time occupied in transmission must not exceed two hours during any consecutive period of 24 hours. The use of the 440-metre wave is not allowed between 5pm and 11pm on weekdays or during the Sunday transmissions of the BBC. Except with the sanction of the Postmaster-General, messages may be transmitted only to stations in Great Britain or Northern Ireland which are actually co-operating in the licensee's experiments . . . . No single transmission may last more than 10 minutes, and must be followed by a period of three minutes listening-in on the wavelength used for transmission . . . . " Hardly the Good Old Days!

COUNTERPOISES AND ELEVATED RADIALS

THE AUGUST ITEM 'Earths, counterpoises and radials' emphasised that there is growing evidence (I am tempted to write 'proof') that buried earths, even when there are a large

number of buried radials or several deeply-sunk earth rods, should be avoided wherever possible as part of an antenna system. The remarks on this topic from Allan Taylor, G3JMO, in his criticism of the American 'surface wire ground' (SWG, *TT* April 1991), rang a bell for Arch Doty, K8CFU, who has done so much to re-awaken us to the advantages of the nearly forgotten 'counterpoise' approach. He writes: "Several years ago some of the data we collected on earth conductivity was published by the IEEE and in *QST* but was largely ignored (I suppose only real antenna nuts can be expected to show much interest in the topic of earth conductivity!). The data based on my daily measurements showed clearly that even in areas of relatively good earth conductivity this varies significantly over a period of months: **Fig 3**. If short ground rods are used, as with the US Army SWG system, it is obvious that, if used as part of the antenna system, the return ground currents (which vary with earth conductivity and on which the efficiency of the antenna will depend), will be unpredictable, to say the least. I feel that G3JMO's conclusions are right on the mark!"

G3JMO, himself, in a follow-up letter, traces the concept of using the earth as part of an antenna system back to the era of very long wave communications (wavelengths of thousands of metres) as used by Marconi in the first decades of the Century: "From there it was natural that amateurs should carry on this practice for '200 metres and down' since it is not easily recognised that the shorter the wavelength, the less efficient and less appropriate becomes the use of the Earth as part of a radio transmission system. To some extent amateurs were lead astray in carrying on long-wave practice down into the short-wave region.

"If radio had developed directly from the dipole-like 'antenna' structures of Hertz who in the pre-Marconi era experimented with spark equipment on very short wavelengths, it is possible that the concept of using the Earth as part of a tuned antenna (eg Marconi Antenna or verticals at ground level) would never have caught on.

"That a number of amateurs in the 1920s appear to have recognised the value of antenna systems not directly connected to earth can be seen from George Jessop's all-too-short but fascinating *Bright Sparks of Wireless* (RSGB) where references to the then popular and clearly effective 'conterpoise' approach appear on pages 15, 26, 27 and 37 - not bad considering the relatively few stations described. It would seem that amateurs in general have, over the years, been using very-long-wave techniques for short-wave radio and paying the price in terms of efficiency and unpredictability."

The early stations referred to as using counterpoises in G6JP's book were those of H W Pope, PZX (later G3HT); E J Simmonds, 2OD (one of the most active and successful pioneers of the short waves in the early twenties); the receiving station of W R Wade of Clifton for the 1921 Transatlantic Tests (although in this case the counterpoise was buried); and that of Jack Partridge, 2KF who was the first British amateur to make two-way contact with the USA on 200 metres and who used "a five-wire counterpoise mounted some 7ft above the ground with an antenna of the L-type with three wires 60ft long in parallel at a height of 50ft."

The single-wire counterpoise remained popular in the 1930s and I recall using one for Top Band in 1938 and also putting one up at Helmond, Holland in 1944 for use with a Whaddon Mk III transmitter. The popularity of a large number of buried radials stems from Dr George Brown's classic study of *medium-wave* broadcast antennas in the 1930s.

BALANCED ACTIVE RECEIVING LOOPS

J A LAMBERT, G3FMZ, in a full-length article 'A directional active loop receiving antenna system' in *RadCom*, November 1982, pp944-949 described in detail the development by C&S Antennas Ltd of a novel form of resis-

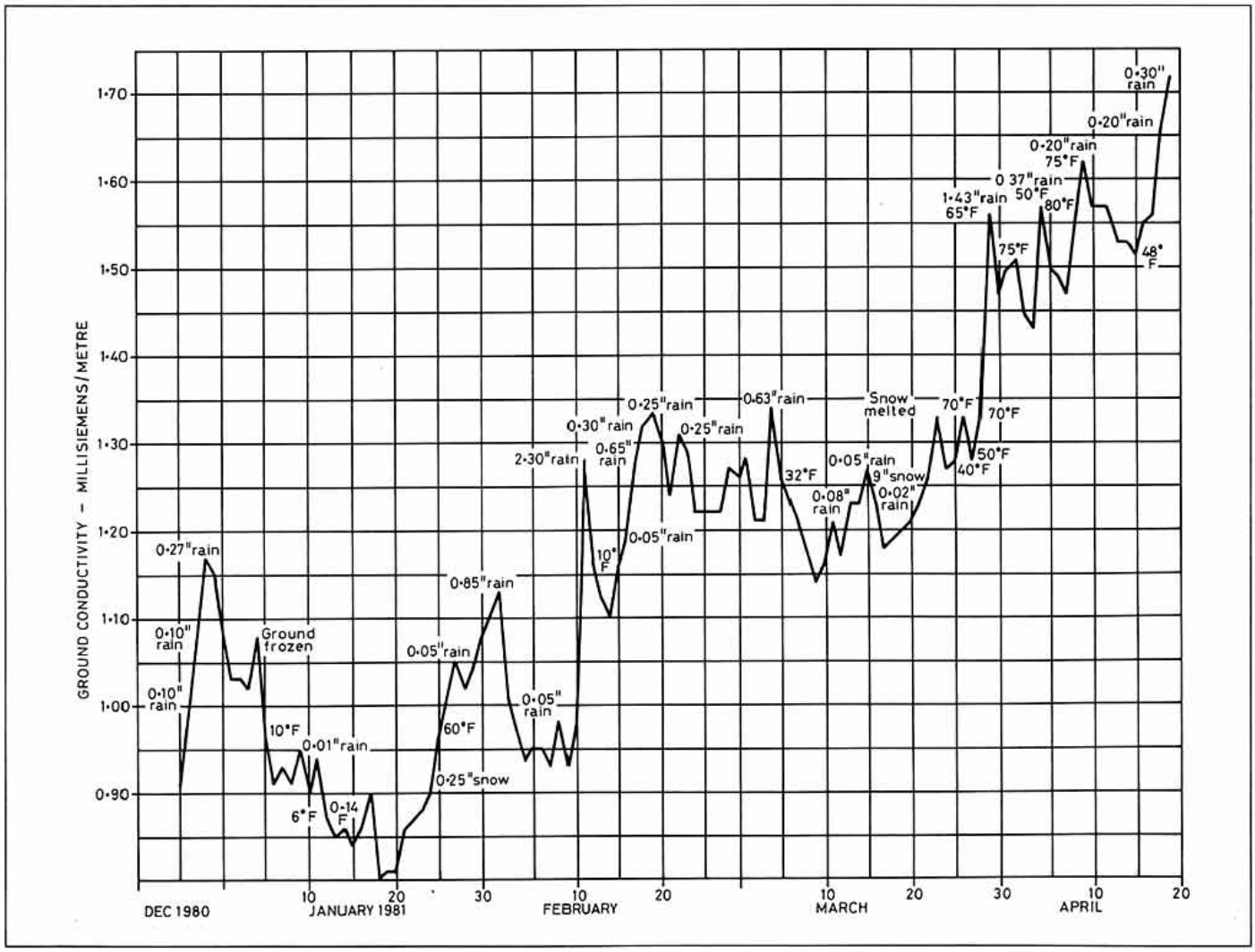

Fig 3: Ground conductivity measured over some four months during 1980-81 at K8CFU's test site at Fletcher, North Carolina shows that conductivity varies significantly under different weather conditions.

tance-loaded compact receiving loop antenna with an associated 2 - 30MHz wideband matching pre-amplifier. This provided a cardioid (heart-shaped) horizontal radiation pattern rather than the usual figure-of-eight pattern. Such loops were then (and possibly still are) being marketed for use at professional receiving stations, usually with a number of loops forming an endfire or broadside directional array suitable for permanent, temporary or portable use. G3FNZ provided constructional details of an experimental loop with an 0.5W carbon non-inductive resistor (value between 47 and 100 Ohms) connected across the top of the loop with the matching amplifier across the base junction: **Fig 4**.

Dick Rollema, PA0SE had his attention drawn by PA0EZ to a contribution to the IEE's *Electronics Letters* (18 July 1991, pp1320-21) by P V Brennan and Y Valverde of University College, London. This shows how the C&S type of unbalanced loop can be changed into balanced form by using two resistors and a balanced feed arrangement, maintaining the cardioid pattern but not suffering from the problems associated with the requirement of an unbalanced antenna for a solid ground connection, which becomes particularly important in the lower HF spectrum.

To quote their introductory remarks: "An antenna with a cardioid radiation pattern can be produced by taking an electrically smaller circular loop and introducing an imbalancing resistance in the top of the loop, as shown in **Fig 5**. This is the basis of a commercially produced antenna for HF reception purposes which includes a low noise amplifier mounted at the base of the loop.

"The antenna, being electrically small, has a very low radiation efficiency, but this is of little concern in HF reception applications, because the system is usually limited by external noise . . . . The antenna relies on a ground plane connection to one side of the loop, without which a figure-of-eight would be obtained, and this can often be difficult to achieve in the HF band. A stake may be driven into the ground for this purpose or the trailing coaxial cable may be used as a pseudo-ground plane; in both cases it is found that the antenna pattern varies quite considerably depending on the quality of the ground connection and/or the position of the coaxial cable. For this reason, it is attractive to consider a balanced version of the antenna that does not require a ground connection".

Of interest also is that they describe a scaled down prototype antenna of this type suitable for use between 40 and 600MHz, presenting measurements made between 150 and 200MHz which shows that a good performance may be obtained without the need for a ground connection or careful placing of the feed cable. It would thus appear that this technique might be useful, for example, for 144MHz D/F.

Their prototype antenna (**Fig 6(a)**) consists of a printed rectangular loop, of 3mm track width, with a 180° hybrid for the balun and an MMIC amplifier mounted within the loop. The resistor values required for a good cardioid pattern were found not to be critical and were in the same range as for the original unbalanced antenna, The antenna was measured in a relatively small anechoic chamber, using a dipole as the source antenna. **Fig 6(b)** shows the radiation pattern (linear scale) at 200MHz, with a front-to-back ratio of some 17dB and the field pattern dropping "quite convincingly" to -6dB at +/- 90° from the main beam direction.

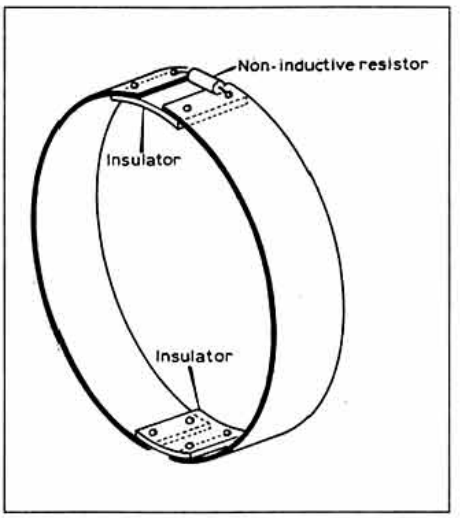

Fig 4: The experimental 3 - 30MHz HF unbalanced active-antenna described (with associated matching pre-amplifier) by G3FNZ in *RadCom* November 1982. The 1m-diameter loop is made from a 150mm-wide strip of 16SWG aluminium, cut into two parts and then rejoined using two blocks of insulating material. The amplifier is mounted and connected across the lower insulator, with a 47 to 100-Ohm non-inductive resistor across the top insulator. Cardioid horizontal radiation pattern.

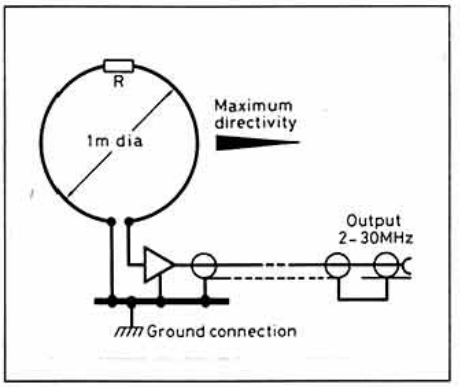

Fig 5: Unbalanced HF active loop receiving antenna system as originally described by G3FNZ of C&S Antennas Ltd.

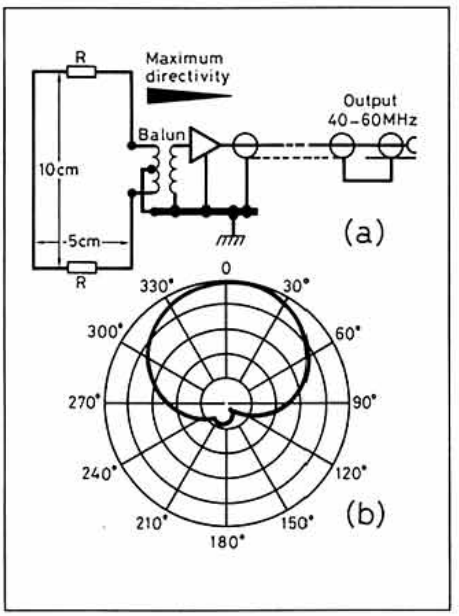

Fig 6: (a) Balanced form of the prototype active VHF/UHF loop antenna as a scaled down version intended for HF reception. (b) Radiation pattern of the prototype at 200MHz showing operation without the need for an earth or ground-plane.

Incidentally, Dick Rollema, PA0SE questions the mathematics (not given in the *TT* digest) of the Canadian VHF D/F loop with half of the coaxial-cable screening braid removed (*TT*, June 1991 p29) which is claimed to give a cardioid pattern with a single deep null. He points out that in their paper it is assumed that there is uniform current distribution on the loop; however since this is a 'half-wave' in circumference this cannot be the case, although it would apply to electrically very small loops. I am not clear whether this error in any way affects practical results and it would be interesting to learn whether anyone has any comments based on a practical test. In fact the authors seem to have tried to put together possible theoretical explanations to fit their practical results, so possibly this theoretical error is of little practical consequence.

CRYSTAL OVEN

ABOUT A DOZEN YEARS AGO, *TT* included a couple of items on the use of proportional control to stabilise the working temperature of crystals for applications requiring high frequency stability. In both cases the control systems used solid-state devices both as sensors and to provide the heating, in one case with discrete transistors soldered directly to the metal cover of an HC16/U crystal and in the other (contributed by G3SEK) based on a National Semiconductors LM3911 IC temperature controller and a heating transistor both mounted on a copper clip which was then slid over an HC6/U crystal. These ideas are in *ART7* pp178-9. [*Amateur Radio Techniques*, 7th edition is now back in print again by popular demand, see *Bookcase* pages - Ed].

Such temperature controllers can be installed for example in an existing frequency counter without the requirement for fitting them in an 'oven'. Nevertheless crystal ovens still have their place, particularly for crystals with a zero-coefficient temperature of around 70°C.

Bob Parker ('Circuit and Design Ideas', *Electronics Australia*, September 1991, p67) describes a homebrew oven with a solid-state temperature sensor and controller but with a resistive heating element (**Fig 7**). He has installed this in an elderly counter in conjunction with a custom-ground 3.579545MHz 75°C HC6/U crystal which gives a stability of better than one part in two million. He writes:

"The crystal lives in a plastic foam-lined 35mm film canister, sandwiched between a power resistor to heat it and a BC178 transistor to sense the temperature. I used the BC178 because it has a quick temperature response from its metal can, which is earthed. But a BC558 would probably work just as well (and BC178s are becoming hard to find). The sensing transistor is connected so that it amplifies its own temperature-dependent emitter-base voltage drop, and the 741 op-amp compares this voltage with the approximately 5.1V derived from the zener diode.

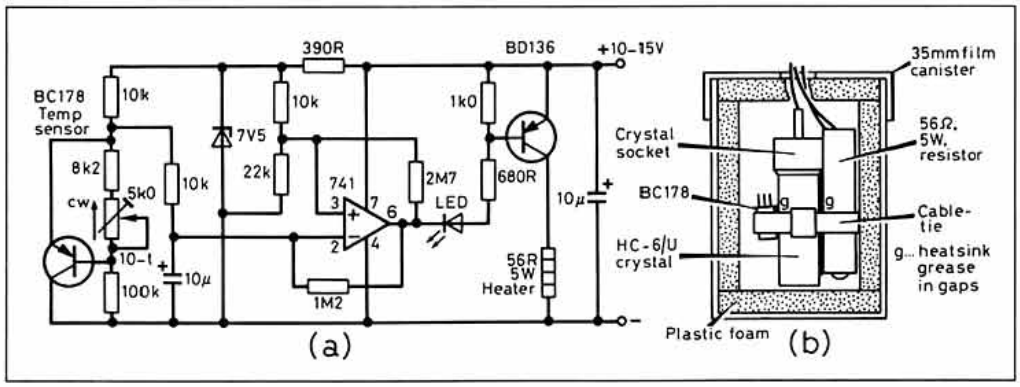

Fig 7: Details of the electronic temperature controller and the mechanical details of the Australian crystal oven.

"The 2.7M resistor provides hysteresis to ensure that the 741 switches sharply. The 1.2M resistor and 10uF capacitor combination has the effect of turning the circuit into a low frequency variable-duty-cycle oscillator, once the crystal temperature stabilises. This gives better temperature control than a simple on-off circuit. The LED indicates when the heater is on, and its voltage drop ensures that the BD136 switching transistor switches fully off.

"I calibrated the original by attaching leads to a 1N914 diode, sleeving it with heat-shrink tubing and connecting it to a digital multimeter on a 'diode' resistance range, I immersed the diode in 75° water and noted the meter reading, then temporarily attached the diode to the crystal in its oven and adjusted the 5k pot until the meter gave the same reading - the tricky part is finding a thermometer which can read up to 75°C. I used a dairy thermometer.

"If it is found that the circuit keeps going from full-on to full-off instead of stabilising in the oscillating mode, then reducing the value of the 1.2M resistor should solve the problem. The circuit could be useful for other applications requiring an electronic thermostat".

A Q-GATE VFO STABLE TO 39MHZ

GEORGE SOUTHGATE, VK5QG (ex-G3LXO), was delayed by ill-health from pointing out that unfortunately the 'corrected' diagram of his Q-GATE oscillator (Fig 5(a) of *TT*, March 1990) still differed from his original drawing in showing the output taken from the source rather than the drain (my profound apologies for the SNAFU - *G3VA*). Although the circuit as then shown resembles the oscillator described by Dr Mike King, G3MY, (*TT*, November 1990), VK5QG following tests remains convinced that his intended circuit, without G3MY's source resister but with low supply voltage, as (hopefully) in **Fig 9**, gives better results. He found that G3MY's circuit tends to stop oscillating if loaded with less than 2000Ω, even with a 12V supply, with a frequency shift measured in kHz. He writes:

"I offered my circuit to the QRP and KISS fraternity as it gives excellent frequency stability under varying load conditions due to having good isolation from the tuned circuit and a very low impedance, all with a minimum of components. I have now completed my receiver with 10.7MHz IF which was what started me investigating oscillators and led to the Q-Gate Circuit. The receiver tunes amateur bands from 1.8 to 29.7MHz with 10kHz resolution per revolution of the tuning knob (less on some bands). In a series of 8-hour runs in a room whose ambient temperature changed from 14° to 25°C the oscillator frequency at 39MHz showed a frequency stability of better than 26ppm/°C with the receiver staying tuned to 28MHz SSB transmissions throughout long contacts without having to touch the tuning.

"I have taken all the usual precautions in making the tuned circuit as stable as possible. The coil former is ribbed ceramic 0.75-in diameter and the 20SWG wire was preheated so that it shrunk on the former under tension when cooled. The coil has several taps taken off and is switched with a small ceramic switch. Temperature compensation is accomplished with a mixture of fixed ca-

TREE-BRANCH ANTENNA SUPPORTS

THOSE OF US WHO USE trees to support one or both ends of wire antennas soon come up against the problem of getting a cord or wire over a sufficiently high and strong enough branch, without the antenna becoming entangled in the lower branches etc. An accepted and effective solution involves the skilled use of a good bow and arrow - fine if you or a friend are 'into' archery and the tree(s) are sufficiently in the clear to avoid an errant arrow damaging people or property! Personally, I have always tended to limit the height of my ambitions to around 20-30ft using either a weight attached to a thin cord and then thrown over the branch (more proficient throwers could improve on my results!) or, more recently, creating a lightweight 'pole' from bamboos etc with, at the top a V-shaped aluminium guide designed to allow a weighted thin line to be 'put' over the branch so that it drops to the ground, the 'pole' recovered and then used to guide the final antenna support wire beyond the reach of the lower branches. This has proved superior to my poor throwing performances but I would not recommend it for branches much higher than 25ft or so, above which makeshift lightweight poles tend to become too whippy and unmanageable.

Ron Grant, G3XPH, has tackled the problem more elegantly (and more effectively) while still avoiding the requirement for the use of professionally made archery equipment. He writes: "Details of my system, evolved after many years of hanging wire antennas between trees and in pursuit of even greater height, are shown in **Fig 8**. Briefly, I use a catapult - a simple affair in the form of a sling, not needing a Y structure. This fires a cross-bow type of arrow or bolt, a piece of wood about 9 by 0.5 by 0.5 inches. This carries a fine nylon monofilament line aloft but to avoid festooning the trees with bits of tangled nylon I have developed a crude release mechanism. This is a portion of matchstick pushed transversely through the arrow.

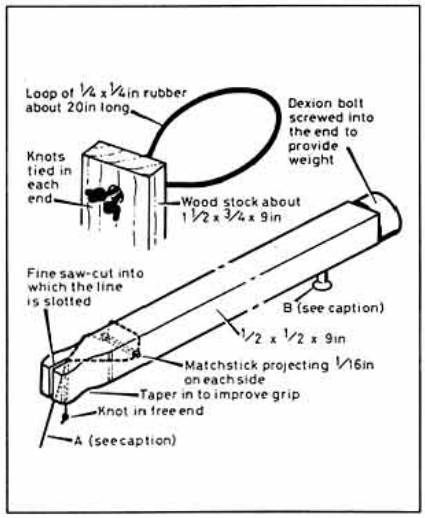

Fig 8: Details of G3XPH's homemade 'catapult' and associate wooden arrow used for shooting a line across the high branch of a tree. A - Make sure the line passes *over* the wrist of the hand holding the arrow which should be fired from the side of the tree where the antenna will hang. B - Wood-screw let in for the elastic to hook behind. Make sure the screw does not pinch the elastic or the arrow will wobble on release. Preliminary practice may be advisable.

"With the arrow fired up into the tree, if all goes well a few jiggles on the nylon line causes the arrow to carry the line smoothly to the ground, where it can be unhitched and a halyard bent on and then pulled back over the branch. Sometimes however, I haul a white plastic gardening tape back through the tree so that I can study it through binoculars to see whether it looks useful.

"If, however, the line or arrow snags then a few jiggles on the line will disengage the line from the arrow which falls to the ground and one can then retrieve the nylon line ready flaked out to shoot again."

G3XPH does not mention the heights he achieves but clearly this can be much better than my lightweight pole! But some preliminary practice in safely using and aiming this type of catapult/sling would seem highly advisable. A metal-loaded wooden bolt fired from quarter-inch rubber elastic could prove a formidable weapon!

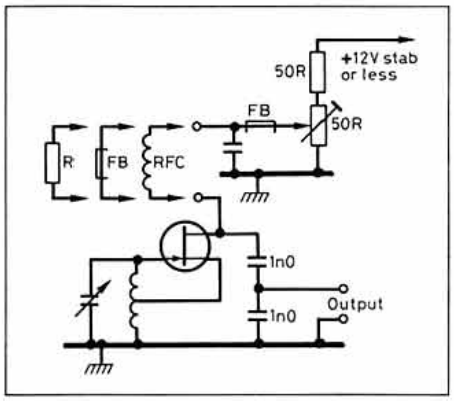

Fig 9: The Q-Gate FET ocsillator - hopefully this at last shows the correct connections for the output, taken from between drain and chassis.

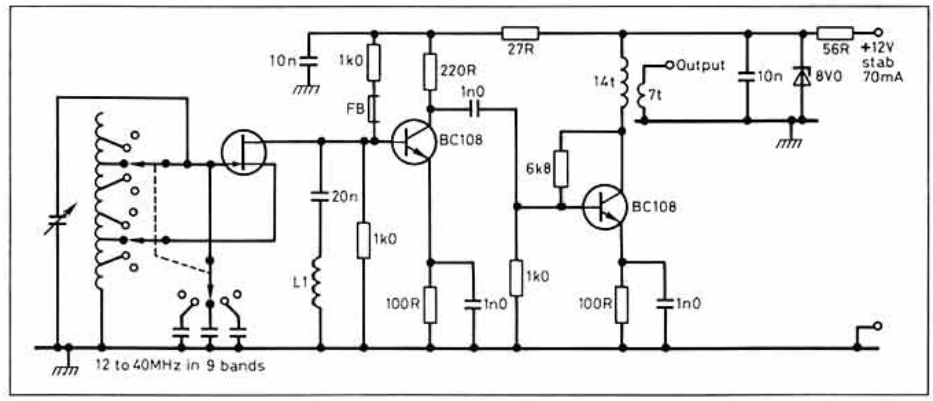

Fig 10: The final oscillator circuit used in VK5QG's HF communications receiver and capable of holding 28MHz SSB transmissions throughout long contacts without retuning.

pacitors, those of negative coefficient being of the polystyrene type.

"The oscillator circuit, as used in the receiver, is shown in **Fig 10**. L1 is a small coil of 4 turns (1/8in in dia) of 22SWG wire and forms a filter with the 20nF capacitor resonating at about 5.6MHz. This adjusts the output for maximum amplitude and minimum distortion. If not included the output is very low and varies greatly from band to band. If this inductance is made too large, the output is high but distorted. I found the optimum value by winding the coil just large enough to be able to insert a ferrite bead on the end of a toothpick and then watched what happened on a CRO (for those without an HF CRO I suggest that L1 should be adjusted for the purest T9 note on a receiver). Some FETs produce a cleaner waveform with a diode connected from gate to ground (eg 1N914 etc diode).

"I have also recently checked to see if the basic oscillator could be located remotely from the buffer amplifier and the main heat-producing equipment. I found that I could run the oscillator at the end of a 60ft length of coaxial cable (the longest single length to hand at the time) with no problem at all: **Fig 11**. I have not tested frequency drift but I feel the configuration should give advantages. The 3k resistor should be adjusted to a value that just maintains oscillation over the full tuning range, measured and then a fixed-value resistor substituted. The collector transformer for the BC108 in both Figs 10 and 11 is wound on a small toroidal core. While compiling the drift figures for my receiver VFO it was winter time with the shack temperature raised from 14°C to a maximum of 25°C or so, although the temperatures compensation components had been selected the previous summer with a shack temperature between 30-35°C. I intend to make further checks in summer conditions and expect the drift in ppm/°C be even better.

TECHNICAL TOPICS

MORE HOSTILE ENVIRONMENT?

A RECENT ANNOUNCEMENT by government scientists suggests that the ozone depletion over Britain and Europe (due largely it is believed to the CFCs used in refrigerators, air conditioning, aerosol sprays etc) is double that of previous estimates. We were warned of the increased danger of skin cancers and eye cataracts stemming from over-exposure to the more intense UV rays resulting from the thinner ozone layer. Apparently, the UV light reaching the ground has been increasing by about 1% per annum since 1980, with ozone levels now about 8% lower than a decade ago.

For radio amateurs, this means more rapid deterioration of plastic ropes, plastic coverings, plastic tapes etc used in outdoor antenna installations, or indeed all materials exposed to strong sunlight. As noted in *TT* (June 1985) in an item 'Reducing ultra-violet radiation damage': "Deterioration caused by UV has always to be taken into account with materials used in full sunlight, as shown by the deterioration of the outer covering of coaxial cable. Similarly, plastic rope often used for mast stays becomes hardened and brittle after to exposure to sun and rain."

It was suggested that good quality outdoor paint can provide useful protection; white materials and cables tend to be more resistant to UV than coloured materials; UV-resistant marine varnish can be used on metal items; white adhesive tape can be wound round cables; self-amalgamating tape tends to be particularly vulnerable and should be protected by layers of thicker conventional tape.

TT (March 1991) noted that polypropylene lines or monofilament (nylon) fishing line deteriorates progressively in sunlight due to UV radiation and suggested a number of alternatives. The vulnerability of polypropylene rope was confirmed by Ernie Sumpton, C53GS/G3DQL, writing from The Gambia who found that in the strong tropical sunlight polypropylene ropes tend to lose all strength in less than a year.

Les Parnell, G8PP, operates quite often in Australia and also in Labrador where he found that the outer plastic cover on some British coaxial cable (he took the first time) could not withstand intense cold - after a couple of months his feeder consisted of the outer braid fully exposed to the elements. Since then, when visiting Labrador, he uses the 'local coax' which treats –40°C with contempt. ❑

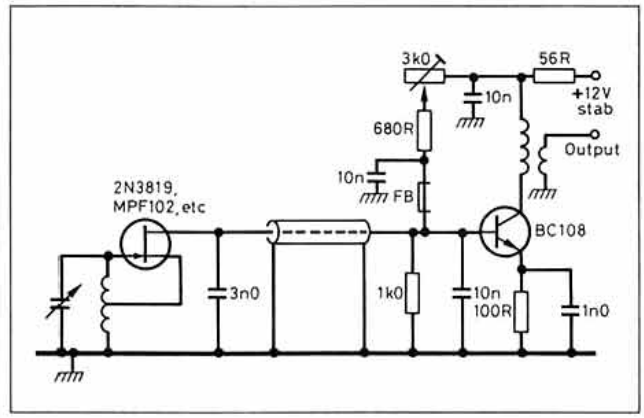

Fig 11: Test circuit used by VK5QG to investigate the possibility of locating the Q-Gate oscillator remotely from sources of heat, etc. He achieved successful results with 60ft of coaxial cable.

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RADCOM CONSTRUCTION FEATURE

First Steps in Home Construction

A series of articles by John Case, GW4HWR

PART SEVEN: PROTOTYPE BOARDS

An introduction to simple design and some fun with an integrated circuit.

WITH A SUCCESSFUL variable voltage PSU at your disposal (see parts 1 - 6), hopefully you will now wish to tackle further projects. Many relatively simple designs appear in various radio magazines, including *RadCom* and especially RSGB's new *D-i-Y Radio*.

If the circuit is not too complicated, it is very useful to be able to set it up in a temporary way which allows for experimentation and development. The prototype or plug board allows this to be done without the need for any soldering and leaves the components in good condition for use in the final circuit or elsewhere. There are a number of different types from which to choose (see table at foot of page 36), but all are basically similar with a plastic surface carrying a matrix of holes which have a series of interconnected sockets beneath. A wide variety of components can be plugged into these holes, and the interconnections allow circuits to be built up.

Most boards use a 0.1 x 0.1 inch matrix with two groups of sockets separated by 0.3 inch which is the standard spacing for the pins of 8, 14 and 16 pin DIL (dual in line) IC packages. A section of a typical board is shown in **Fig 1**. It will be seen that the main blocks are arranged in groups of five interconnected sockets, with long rows of sockets at the top and bottom edges of the board. These last make very useful supply busbars.

All decks have similar maximum ratings which allow for up to 50 Volts between adjacent strips and a current of 1 Amp per strip. The *mains* electricity supply must *never* be connected to the board in any way.

Boards may usually be joined together to provide a greater working area. The type illustrated in Fig 1 comes complete with a component support bracket which can be fitted into any one of three positions and allows normal panel components to be mounted.

A strip having two extra busbars is also available. This will slot into the main board and simplifies the power supply arrangements when a number of diffferent voltage rails are required. Most boards have a system of alpha-numeric labelling which enables any socket to be referred to in any record or note. In order to set up a circuit in an orderly fashion, considerable use of wire links is required. Again, the off-cuts from resistors and capacitors are very useful and the longer ends could be saved for this purpose. The method of use is reasonably straightforward and will be illustrated in the exercises that follow later.

THE '555 TIMER

THIS IS A VERY versatile device having many applications, three of which will be described at this stage. It is an 8 pin DIL package and the pin connections are given in **Fig 2**. Note that these are as they appear from the top (the label side) of the IC. Although the exercises all use the basic NE555, it is worth noting that a CMOS version, having almost identical characteristics and bearing the number 7555, is available. There is also a dual version of each with the numbers 556 and 7556.

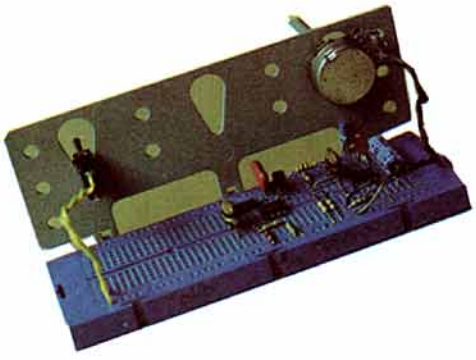
The connections may be considered in three groups:-

1 Supplies - positive and negative
2 Inputs - TRIGGER, THRESHOLD, RESET and CONTROL VOLTAGE
3 Outputs - O/P and DISCHARGE

The supply may have any value between 5 and 15 volts but the devices are very intolerant of reversed supply.

Input - TRIG: When voltage at this input falls below one-third of the supply value, the output (O/P) will go high. The input voltage must then be returned to more than one-third of the supply.

Input - THRESHOLD: When the voltage at this input rises to more than two-thirds of the supply, the output (O/P) will return to the low state.



Input - RESET: This is normally held at the supply positive voltage but if it is reduced to zero the O/P will go low irrespective of the state of the other inputs.

Input - CONTROL VOLTAGE: This is normally at two-thirds of the supply from internal circuitry but if any other voltage is applied, both the Trigger and Threshold voltages will be changed.

Output - O/P: This is either low (0V) or high (almost supply positive).

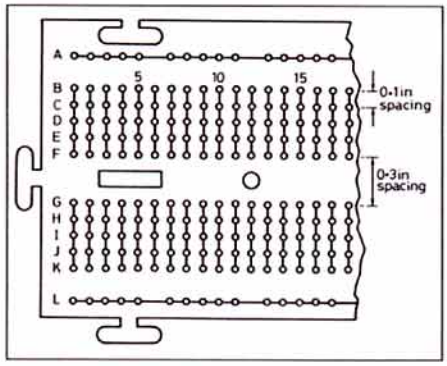


Fig 1: A typical prototype board.

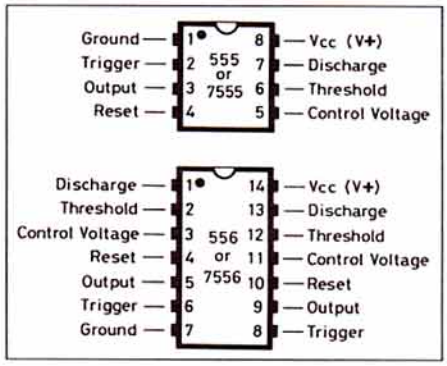


Fig 2: NE555 pin connections.

Output - DISCHARGE: This will be high resistance with respect to 0V (GND) when the output is high but becomes almost a short circuit when the output goes low.

THE 'MINUTE TIMER'

THE CIRCUIT SHOWN IN **Fig 3** works in the following manner. All voltages mentioned are with respect to the 0V or GND terminal. When the supply is connected, pin 8 (VCC) immediately rises to supply voltage but because C2 is discharged, pin 2 (TRIG) is at 0V so that the

output at pin 3 is set to supply voltage. Therefore the LED lights due to the current via IC1 and R5. Almost immediately C2 charges to the voltage across R3 which is just half of the supply voltage. C1 slowly charges via R1 and some portion of VR1 and eventually the voltage at pin 7 (THE) reaches two thirds of the supply voltage and the output at pin 3 resets to 0V. The LED goes out. At the same time, the resistance between pin 6 (DIS) and GND becomes very low and C1 is rapidly discharged. Nothing further will occur until the supply is removed and reconnected.

The time during which the circuit is set (LED alight) will be about 1 minute when VR1 is at minimum value and between 7 and 8 minutes with it at maximum value. For shorter times, the value of R1 should be reduced and for longer the value of C1 can be increased, but a low leakage type of electrolytic capacitor must be used. If at any time it is desired to reset the output to 0V, this may be done by connecting pin 4 (RES) to 0V. Again, the supply must be disconnected and reconnected to initiate another timing period.

Now try to set up the circuit on the plug board. Remember that components cannot be connected along a strip, eg a resistor plugged into B1 and F1 would be shorted out by the connector strip. Make use of wire links to connect the strips together where required. Do not attempt to make the components bridge wide gaps, as there is a danger of allowing them to short to other parts of the circuit. If you find it too complicated refer to **Fig 4**, but do try to set it up yourself.

Test this section before going any further. First ensure that all components and links are pushed well into the sockets and are making good connections. Set the PSU to 12V and connect the output to the positive and GND rails on the plug board. Check the polarity! Switch on, the LED should light and go out after a time of between one and eight minutes. Various times should be available with different settings of VR1.

If the LED does not light, check that there is 12V between pins 8 and 1 at the IC. Then check the voltage between pin 3 (O/P) and GND. If this reads 12V, the LED is probably reversed or faulty. Short pin 2 (TRIG) to GND. If this causes the LED to light, it may be necessary to increase the value of C2. Still no light? Check the voltage at pin 6 (THE), if this is more than 8V check that C1 is correctly connected. Finally, try another '555. If the LED lights but does not go out, set VR1 to minimum and measure the voltage at pin 6. This should rise slowly towards 8V. If it does not, connect pin 6 to supply positive; if the LED goes out, check the values and/or connections to R1 and VR1. Finally, pull out C1, if this causes the LED to go out, C1 is either short circuit or leaking.

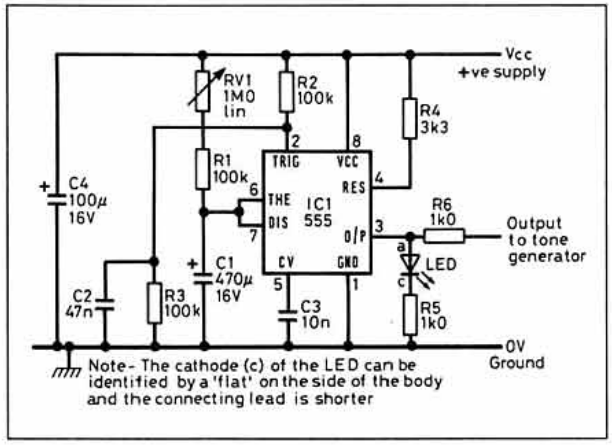


Fig 3: Simple timer using the NE555.

THE TONE GENERATOR

THE CIRCUIT IS SHOWN IN **Fig 5**. When the supply is connected, both pins 6 (THE) and 2 (TRIG) will be at 0V because C5 is discharged. The output will go high. C5 will charge rather quickly through R7 and R8. When pin 2 reaches two-thirds of the supply voltage, the output will go low and C5 will be discharged via R8 and the low resistance between pin 7 and GND. When the voltage across C5 falls to one-third of the supply the TRIG input will cause the output to go high again. The action will be continuous while the supply is maintained.

On a Cathode Ray Oscilloscope (CRO) we could display a triangular waveform at pin 2 or 6 and a rectangular one at pin 3 (Fig 5). The latter occurs because the output can be only high or low. A small loudspeaker or acoustic transducer connected as shown will reproduce the tone. A loudspeaker having an impedance of about 35Ω will produce a reasonably loud output while those of lower impedance will give lower outputs. The frequency of the tone may be changed by altering the value of C5.

To raise the tone (increase the frequency) reduce the value, and vice-versa. A small amount of change can be produced by applying a voltage to pin 5 (CV). The pin normally stands at two-thirds of supply voltage but any other voltage may be applied from another source. Increasing the voltage will lower the frequency while decreasing it will give an increase.

The oscillator may be stopped by linking pin 4 (RES) to 0V (GND). The transistor Q1 allows the above effect to be reversed so that supply voltage applied to its base via R6 will cause the transistor to become a very low resistance and effectively connect pin 4 to 0V.

Set up the circuit on the plugboard. Again make an effort to do this by referring to the circuit diagram and the board only, but if you do have trouble, a suggested layout is given in **Fig 6**. Do not fit R6 at this stage. Test as a separate unit - the presence of the minute timer will not affect the operation while R6 is missing. Connect a supply; the tone should appear immediately on switch-on. If it does not, check the voltages: pin 8 to pin 1 = 12V and pin 4 to pin 1 = 12V. If there is 0V or a low value at pin 4, Q1 is either incorrectly connected or faulty. Remove Q1, the tone should then appear. If the voltages appear to be OK, check the connections and the resistance of the loudspeaker.

When the oscillator is working satisfactorily, switch off and fit R6, it will need to stand up so as to bridge R3 and the lead of C3. Set VR1 to minimum and switch on again. The LED should light and about one minute later the tone should be heard from the loudspeaker. The oscillator will be stopped by the output voltage of the minute timer and will be allowed to work when the timer completes its cycle and the voltage at pin 3 of IC1 falls to 0V. It will continue until the supply is switched off. Set VR1 to maximum and switch on again - the tone will sound after about 7 to 8 minutes.

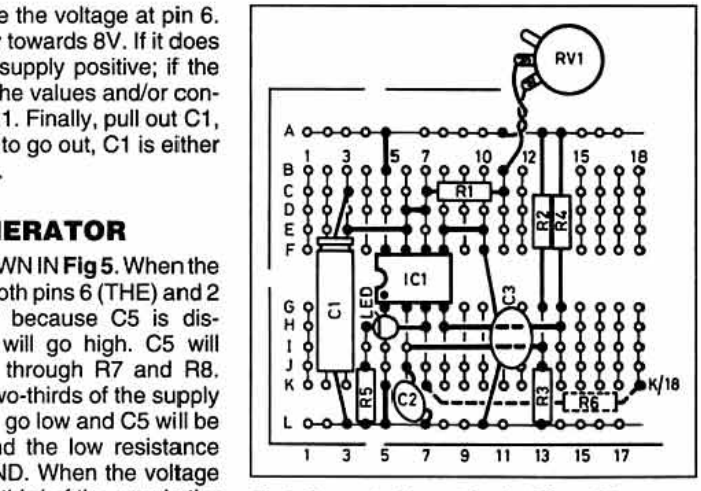


Fig 4: Suggested layout for the Minute Timer.

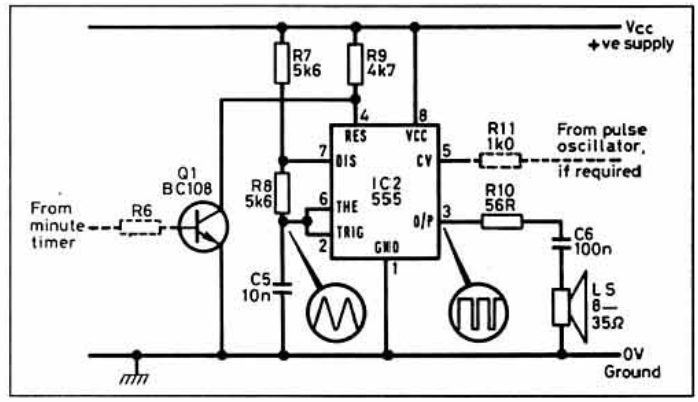


Fig 5: Another use for the NE555 – a tone generator.

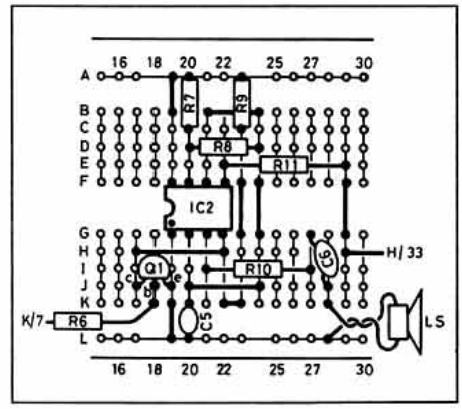


Fig 6: Tone generator – suggested layout.

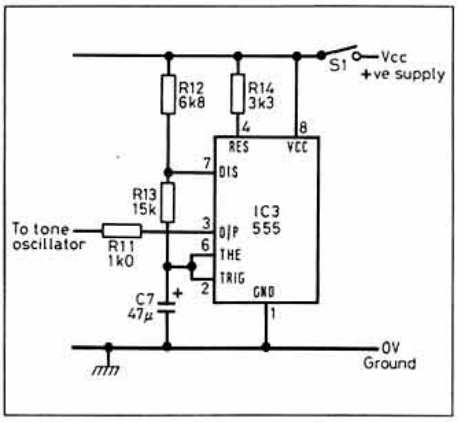


Fig 7: The '555 as a pulse generator.

THE PULSE GENERATOR

THE CIRCUIT, SHOWN IN **Fig 7**, is almost identical to that of the tone generator. It operates in exactly the same way except that the values chosen give an oscillation frequency of about 1Hz. The needle of a voltmeter connected between pin 3 and GND will flick back and forth between 0V and 12V continuously. This output is applied, via R11 to the Control (CV) pin 5 of IC2 where it modifies both threshold and trigger levels and so changes the frequency of oscillation. The audio effect is a sound rather like that of a police siren. The layout on the plugboard is very similar to the tone generator and a suggested layout is shown in **Fig 8** for those in trouble.

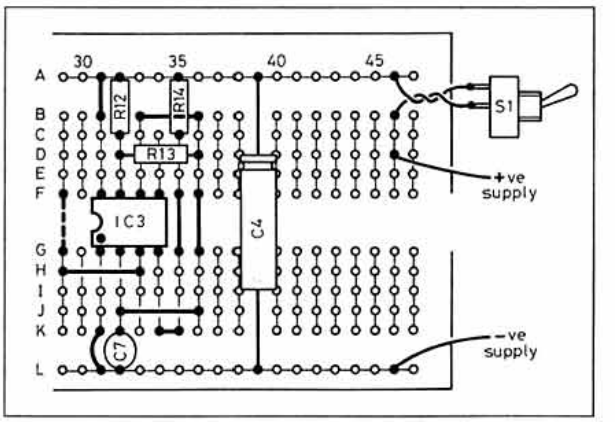
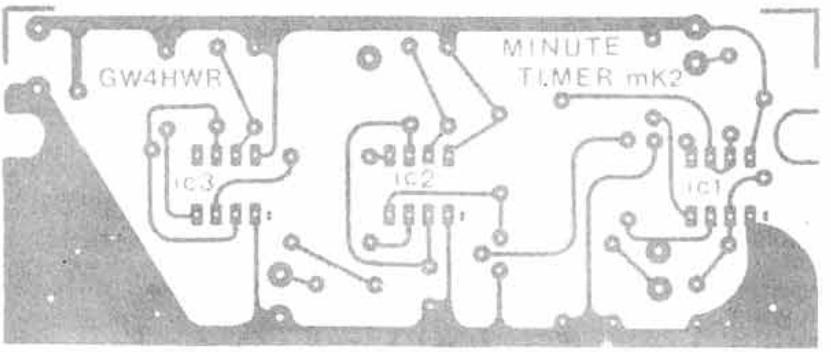


Fig 8: Layout for the pulse generator.

If you wish to produce a single, composite diagram, photocopies of Figs 3, 5 and 7 can be trimmed and stuck together. Finally, a brief summary of the function of the complete unit may be helpful:

- Supply established - IC1 sets - output high - LED lights.
- IC2 immobilised by output from IC1 via Q1.
- IC3 oscillates at 1Hz.
- After timing period, dependent on setting of VR1 - IC1 resets - output low.
- Q1 ceases to conduct - IC2 oscillates - Tone.
- Tone is modulated by output from IC3.
- Continues until supply is removed.

The above exercises are most useful in demonstrating three of the functions that can be provided by a NE555 timer and I hope that a number of possible applications will occur to constructors.



Suggested PCB layout for permanent construction of the three units.

PARTS LIST

RESISTORS - all quarter-watt carbon film or similar.

R10	56Ω
R5, R6, R11	1k0
R4, R14	3k3
R9	4k7
R7, R8	5k6
R12	6k8
R13	15k
R1, R2, R3	100k

CAPACITORS

C3, C5	10nF	Disc ceramic
C2	47nF	Disc ceramic
C6	100nF	Disc ceramic
C7	47µF	16V electrolytic (axial)
C4	100µF	16V electrolytic (axial)
C1	470µF	16V electrolytic (axial)

MISCELLANEOUS

Plugboard	See text
IC1, IC2, IC3	NE555 timer
S1	Minature switch - SPDT unless mobile control box is to be built later - if so SPDT
LS	Small loudspeaker or old type telephone earpiece - not critical
Supply	9V battery - PP3 and connecting clip. Useful later
Q1	Transistor - general purpose NPN - BC108 metal or BC548, etc
LED	5mm standard type - colour optional
VR1	Any value in the range 100k to 1M0 - linear 100k or 1M0 will be needed in part 6 for the practical timers

TYPES OF PROTOTYPE 'PLUG-BOARD' AVAILABLE

TYPE	No. of SOCKETS	EXTRAS	PRICE	SOURCES
Professional	550		£9.95	Maplin, RS Comp.
	80	Extra busbars	£3.95	Maplin, RS Comp.
		Component bracket	Free	
Euro	600	-	£8.95	Maplin.
Vero block	360	-	£9.95	Maplin
Multi-board	840	-	£7.95	Maplin.

Made up from 4 strips which will make many different spacings.

. . . to be continued

NEXT MONTH

Some practical applications of the NE555 timer.

The RSGB's all-colour magazine for beginners of all ages, ***D-i-Y Radio*** features the versatile NE555 as an electronic organ (Sept-Oct edition) and as a simple piece of test gear (Nov-Dec edition). See page 51 for how to subscribe.

SPECIAL '555 OFFER

JAB Components are offering readers of *RadCom* and *D-i-Y Radio* a pack of ten NE555 timer chips at the special price of £2.00 plus 50p postage. *D-i-Y Radio* subscribers may use *one* of their 50 pence discount vouchers towards this offer. Write to: JAB Electronic Components, 1180 Aldridge Road, Great Barr, Birmingham, B44 8PE, and mention you saw this offer in *RadCom*.

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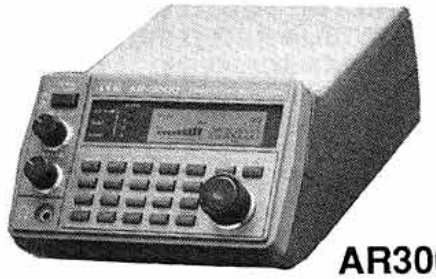

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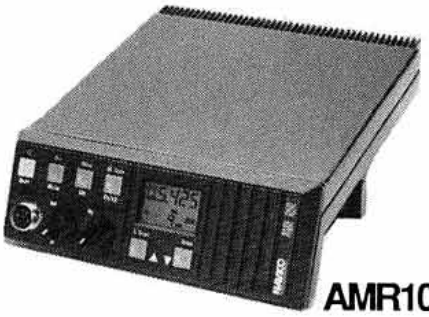

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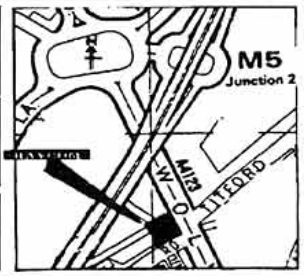

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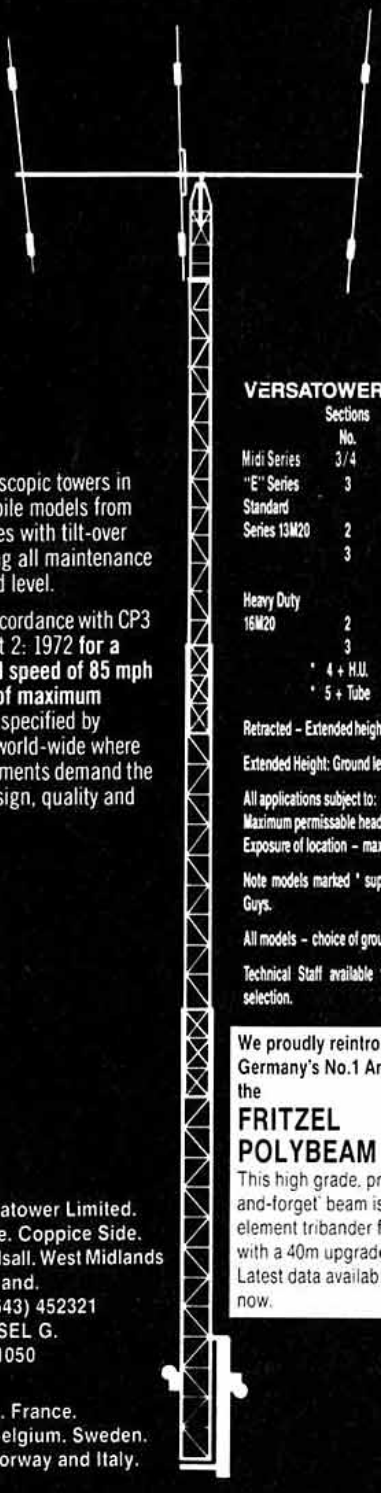

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	3	8.0	18.0
Heavy Duty 16M20	2	7.8	12.0
	3	8.0	18.0
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FINANCIAL STATEMENTS AND THE YEAR IN REVIEW

for the year 1 July 1990 to 30 June 1991

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)

LAMBDA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTS EN6 3JE

PATRON: HRH The Prince Philip, Duke of Edinburgh, KG

COUNCIL (1 July 1990 to 30 June 1991)

President
F. D. Hall, GM8BZX (President to 31.12.90)
E. J. Case, GW4HWR (President from 1.1.91)

Executive vice-President
J. T. Barnes, GI3USS
(Executive Vice President from 1.1.91)

Honorary Treasurer
W. J. McLintock, G3VPK (Retired on 12.1.91)
P. D. Tucker, FCA, ATII, GU4DWZ, (Appointed on 7.3.91)

Secretary
D. A. Evans, MSAE, CPL, G3OUF (to 6.3.91)
J. C. Hall, OBE, G3KVA (Appointed from 7.3.91)

J. Allen, G3DOT
J. Bazely, G3HCT
G. L. Benbow, MSc, CEng, MIEE, G3HB
P. E. Chadwick, G3RZP
M. H. Claytonsmith G4JKS
(Resigned on 31.3.91)
J. D. Forward, MBIM, G3HTA
(Elected on 1.1.91)
J. A. Gannaway, MA, D.Phil, G3YGF
(Retired 31.12.90)
J. Greenwell, AMIEE, G3AEZ

Members
G. R. Jessop, CEng, MIEE, G6JP
T. I. Lundegard, G3GJW
A. A. McKenzie, MBE, Ceng, FIEE, FAES, G3OSS
N. Roberts, B.Sc, C.Eng, MBCS, MIEEE, G4IJF
(Co-opted from 22.4.91)
C. N. Trotman, GW4YKL
(Elected 1.1.91)
F. S. G. Rose, G2DRT
G. R. Smith, BSc, MISTC, MBIM, G4AJJ
(Resigned on 27.4.91)
I. D. Stuart, GM4AUP

Auditors - Peter Goddard & Co

Solicitors - Douglas-Mann & Co.

Bankers - Barclays Bank PLC

Financial Report of the Radio Society of Great Britain for the year ended 30th June 1991

COUNCIL IS PLEASED to present its report together with the financial statements for the year. The Society experienced another turbulent year and this required further rationalization and changes at headquarters. Strict financial controls were implemented to take the society out of the loss-making position reached in the previous year. The situation was recognised after the end of the previous financial year and you will have seen that the interim position at December 1990 showed a deficit for the half year approaching £100,000 (*RadCom*, March 1991).

Action was taken in September 1990 to reduce staffing levels and review all ongoing expenditure. These steps had the effect of reducing the deficit on ordinary activities by the year end. The financial statements show a deficit of £45,874 on ordinary activities. Redundancy costs incurred in the year have been shown as an exceptional item as they do not form part of normal activities. There is a net recovery of Corporation Tax of £7,179 in the accounts.

The Society with the assistance of the company's auditors was able to negotiate a VAT refund with Customs and Excise which recovered tax back to 1984. This has been shown as an extraordinary item for the year and the overall result for the year is a surplus of £72,476.

Subscription income increased by 8% over the previous year but the increase in subscription levels made during the year will only take full effect in 1991/92. Council has agreed that the subscription for UK corporate members can be maintained at the present level for the time being. Advertising revenue increased by 14% to £250,660 and this was a very good result considering the effects of the recession. Book sales increased by 17% to £360,990 and gross margins improved. These increases during a difficult trading period are the result of the number of new titles introduced during the course of the year.

Most areas of expenditure have been maintained at anticipated levels although some costs exceeded budgets. Overall financial controls at Headquarters have now been implemented by our hardworking and enthusiastic staff. Council take this opportunity to acknowledge the valuable contribution made by Headquarters staff.

Since the year end, income has been up to expected levels and the outlook for the forthcoming year is brighter than it has been for some time. New budgetary and reporting systems have been implemented which produce detailed information in a more timely fashion. The AS400 computer is still only providing limited information in some areas but a strategy has been adopted to resolve the remaining difficulties. Approval has been given by Council to expenditure of up to £65,000 on renovations and rewiring to Lambda House which has only had limited maintenance carried out on it since it was acquired by the Society.

Council believe that many of the problems it has had to deal with over the last two years have been resolved and confidently look forward to the forthcoming year. As funds become available these will be utilized to enhance the services provided to our members. The recruitment of new members to the Society by existing members will enable the Society to maintain its role in amateur radio.

RADIO SOCIETY OF GREAT BRITAIN

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 30 JUNE 1991

	Notes	1991 £	1991 £	1990 £	1990 £
INCOME					
Subscriptions	(1)		674,056		*623,773*
Advertising	(1)		250,660		*219,739*
Book Sales			360,990		*308,567*
Other Income	(5)		160,949		*116,316*
TOTAL INCOME			£ 1,446,655		£ *1,268,395*
EXPENDITURE					
Cost of Sales					
Cost of printing & distribution (Books etc)		217,084		*204,262*	
Cost of publishing & despatch staff		60,964		*69,322*	
Cost of printing & distribution (Newsletters)		32,066		*32,239*	
Morse Tests		11,287		*8,395*	
Exhibition costs		52,085		—	
Publicity and advertising		16,170	389,656	—	*314,218*
Headquarters					
Rates,lighting,heating & cleaning		36,680		*33,589*	
Repairs & maintenance		9,145	45,825	*8,908*	*42,497*
Administration					
Cost of administration staff/accounting		247,427		*305,580*	
Telephone, postage, printing & stationery		117,614		*72,122*	
Insurance		11,008		*8,162*	
Hire & maintenance of equipment		47,385		*45,573*	
Depreciation of fixed assets	(1)	51,723		*35,501*	
Audit fees		11,000		*14,200*	
Legal fees		11,863		*12,666*	
General expenses		834	498,854	*3,216*	*497,020*
Finance					
Bank charges		12,157		*14,662*	
Credit card charges		4,006		*4,826*	
Bad debt provision		10,481		*1,398*	
Finance lease interest charges		7,338	33,982	*3,146*	*24,032*
Membership services					
Radio Communication	(7)	400,321		*416,054*	
Certificates, awards, trophies, etc		5,980		*8,191*	
QSL Bureau		23,893		*21,873*	
Beacons, repeaters, satellites & Intruder Watch		15,859		*7,443*	
IARU Region 1 contribution & levy		16,656		*14,585*	
Cost of committee, regional & Council meetings		43,599		*33,383*	
Cost of international meetings & conferences		1,372		*7,078*	
Cost of Annual General Meeting		4,496		*8,303*	
Novice Licence		12,036	524,212	—	*516,910*
TOTAL EXPENDITURE			£ 1,492,529		£ *1,394,677*
DEFICIT ON ORDINARY ACTIVITIES BEFORE EXCEPTIONAL COSTS			(45,874)		*(126,282)*
Redundancy costs	(8)		12,089		—
DEFICIT ON ORDINARY ACTIVITIES BEFORE TAXATION			(57,963)		*(126,282)*
TAXATION	(9)		7,179		*1,226*
DEFICIT FOR YEAR			£ (50,784)		£ *(125,056)*
EXTRAORDINARY ITEM	(10)		123,260		*(200)*
SURPLUS/(DEFICIT) TRANSFERRED TO RESERVES			£ 72,476		£ *(125,256)*

RADIO SOCIETY OF GREAT BRITAIN

BALANCE SHEET AS AT 30 JUNE 1991

	Notes	1991 £	1991 £	1990 £	1990 £
FIXED ASSETS					
Tangible assets	(1)(2)		820,850		*860,185*
CURRENT ASSETS					
Stocks, at lower of cost and net realisable value		103,960		*100,441*	
Trade debtors		122,539		*113,912*	
Corporation tax		3,600		—	
Other debtors		12,119		*1,495*	
Prepayments and accrued income		24,407		*16,877*	
Cash at bank and in hand		156,614		*10,605*	
		423,239		*243,330*	
CREDITORS: AMOUNTS FALLING DUE WITHIN ONE YEAR					
Obligations under finance leases	(3)	19,874		*19,874*	
Bank overdraft		—		*18,041*	
Trade creditors		39,428		*19,809*	
Corporation tax	(9)	1,000		*10,000*	
Other taxation and social security		8,372		*18,996*	
Other creditors		8,497		—	
Accruals and deferred income		52,462		*59,863*	
		129,633		*146,583*	
Subscriptions in advance		155,410		*50,000*	
		285,043		*196,583*	
NET CURRENT ASSETS			138,196		*46,747*
Total assets less current liabilities			959,046		*906,932*
CREDITORS: AMOUNTS FALLING DUE AFTER MORE THAN ONE YEAR					
Obligations under finance leases	(3)		(47,544)		*(67,906)*
			£ 911,502		£ *839,026*
ACCUMULATED FUNDS	(4)		£ 911,502		£ *839,026*

(The notes on pages 42 and 43 form part of these accounts)

Approved by Council on 21 September 1991
and signed on its behalf by:

E J Case, President
P D Tucker, Hon. Treasurer

STATEMENT OF SOURCE AND APPLICATION OF FUNDS FOR THE YEAR ENDED 30 JUNE 1991

	1991 £	1990 £
SOURCE OF FUNDS		
(Deficit) for the year before taxation	(57,963)	*(126,282)*
Recovery of VAT	123,260	—
Corporation tax refund	—	*6,226*
	65,297	*(120,056)*
Adjustment for items not involving the movement of funds:		
Depreciation	51,723	*35,501*
Total funds generated from operations	117,020	*(84,555)*
APPLICATION OF FUNDS		
Purchase of fixed assets	(12,388)	*(110,973)*
Corporation tax paid	(5,421)	*(4,000)*
	£ 99,211	£ *(199,528)*
MOVEMENT IN WORKING CAPITAL		
Stocks	3,519	*(3,168)*
Debtors, prepayments and accrued income	26,781	*(56,982)*
Waived debt due to subsidiary company	—	*(217,340)*
Creditors, accruals, deferred income and subscriptions in advance	(95,139)	*118,734*
	(64,839)	*(158,756)*
MOVEMENT IN NET LIQUID FUNDS		
Cash balances less bank overdraft	164,050	*(40,772)*
	£ 99,211	£ *(199,528)*

NOTES ON THE ACCOUNTS

1. Accounting policies:

   (a) Subscriptions - cash received in respect of subscriptions net of VAT are accounted for on a cash basis for all renewals or subscriptions commencing in the financial year.

   (b) Advertising income is the net amount receivable, after deduction of VAT, for advertisements in *Radio Communication.*

   (c) Depreciation - tangible fixed assets, except freehold land, are written off using the straight-line method over the estimated useful lives at the following rates, based on cost:

Freehold building	—	2 per cent per annum
Furniture	—	10 per cent per annum
Equipment	—	20-25 per cent per annum
Computer	—	20 per cent per annum
Leased Assets	—	over the lease period

2. Tangible fixed assets

	Leased Assets Computer Equipment and Programmes	Freehold Land and Buildings	Furniture, Equipment and Computer Programmes	Total
Cost	£	£	£	£
At 1 July 1990 - Cost	96,644	417,572	120,422	634,638
Revaluation	—	350,000	—	350,000
Additions	—	—	12,388	12,388
At 30 June 1991	£ 96,644	£ 767,572	£ 132,810	£ 997,026
Depreciation				
At 1 July 1990	7,596	50,537	66,320	124,453
Charge for the year	19,329	6,624	25,770	51,723
At 30 June 1991	£ 26,925	£ 57,161	£ 92,090	£ 176,176
Net book value				
At 30 June 1991	£ 69,719	£ 710,411	£ 40,720	£ 820,850
At 1 July 1990	£ 89,048	£ 717,035	£ 54,102	£ 860,185

Freehold land included above amounts to £450,000 (1990: £450,000)

The freehold land was professionally valued on 19 June 1990 and the increase reflected in the accounts. A transfer of £350,000 has been made to re-valuation reserve in respect of this increase. The freehold buildings have not increased in value and the Balance Sheet figure is considered an accurate reflection of their value.

3. Obligations under finance leases

	1991	*1990*
	£	*£*
Gross obligations under finance leases	91,718	*119,419*
Less: finance charges allocated to future periods	24,300	*31,639*
	£ 67,418	*£ 87,780*
Due within one year	19,874	*19,874*
Due within the second and fifth year inclusive	47,544	*67,906*
	£ 67,418	*£ 87,780*

4. Accumulated Fund

	1991	*1990*
Income and Expenditure Account	£	*£*
(Deficit)/Surplus as at 1st July 1990	(46,260)	*78,996*
Surplus/(Deficit) from Income and Expenditure Account	72,476	*(125,256)*
	26,216	*(46,260)*
Special Reserve	317,946	*317,946*
General Reserve	217,340	*217,340*
Revaluation Reserve	350,000	*350,000*
	£ 911,502	*£ 839,026*

a) Special Reserve: This reserve was set up in 1990 on the change in the accounting policy for subscriptions where the cash basis was adopted from the accruals basis.

b) General Reserve: This reserve was set up in 1990 on the cancellation of the debt to the former subsidiary company Lambda Investment Company Limited by the Society.

5. Other Income

	1991	*1990*
	£	*£*
Morse tests	16,085	*16,646*
Rent	17,433	*5,200*
Rallies and Exhibition Fees	65,593	*47,108*
Repeaters	10,290	—
Bank Interest	4,962	*2,297*
Newsletters	22,739	*35,202*
Sundry Income	23,847	*9,863*
	£ 160,949	*£ 116,316*

6. Total staff costs

	1991 £	*1990 £*
Wages and salaries	268,385	*327,448*
Social security costs	26,383	*29,996*
Pension costs	13,623	*7,288*
	£ 308,391	£ *364,732*

The average number of persons employed by the Society was divided into the following categories:

	1991	*1990*
Headquarters	15	*21*
Radio Communication	5	*5*
QSL Bureau	1	*2*
	21	*28*

The Society operates a defined contribution pension scheme. The costs of the scheme are held separately from those of the Society in an independently administered fund. The pension cost charge represents contributions payable by the Society. All contributions due for the year had been paid to the fund at the year end.

7. Radio Communication Expenses
The Radio Communication expenses comprise the whole of the costs of printing, distribution and the cost of editorial staff.

8. Redundancy Costs
Due to the rationalisation of the Society's affairs the company has made a number of redundancies and the cost in the year amounted to £12,089.

9. Taxation
The Society is liable to corporation tax on its investment and trading income.

	1991 £	*1990 £*
Corporation Tax on investment and trading income at 25%	1,000	*5,000*
Recovery of Corporation Tax from previous years	(8,179)	*(6,226)*
	£ (7,179)	£ *(1,226)*

No provision for deferred tax owing to the effects of capital allowances is necessary at the balance sheet date.

10. Extraordinary Item
During the year, the Society was able to recover £123, 260 net of expenses from Customs and Excise in respect of the VAT overpayment arising on the proportion of zero rated supplies included in members subscriptions.
During 1990 the investment in subsidiaries was written off.

	1991 £	*1990 £*
VAT recovered during the year	123,260	—
Written off investment in subsidiaries	—	*(200)*
	£ 123,260	£ *(200)*

REPORT OF THE AUDITORS TO THE MEMBERS OF THE RADIO SOCIETY OF GREAT BRITAIN

We have audited the accounts set out on pages 40 to 43 in accordance with auditing standards.

In our opinion the financial statements give a true and fair view of the state of affairs of the Society at 30 June 1991 and of the surplus of income and its source and application of funds for the year ended on that date and have been properly prepared in accordance with the Companies Act 1985.

"Goddards",
London Road,
Sunningdale, Berks. SL5 0JN.
30 September 1991

PETER GODDARD & CO.
Chartered Accountants and Registered Auditors.

The Year in Review

General Manager's Report

Highlights of the Activities of the Society 1 July 1990 to 30 June 1991

THIS YEAR'S REPORT inevitably has more of a financial flavour than usual given the state of the Society's resources at the end of the last financial year.

In the late summer of 1990, the management began to reduce the overhead cost of Headquarters with a small reduction in staff numbers. It became clear towards the end of the year that more fundamental changes would be required to address the mounting deficit problem. A strategy was developed involving a restructuring of Headquarters management around a team of four managers reporting to myself as the new General Manager from 1 January 1991.

One of my objectives stated at the 1990 AGM was the improvement of communications within the Society. This was started by publishing the half-year accounts in RadCom, albeit in unaudited form.

The immediate objective early in January was to cut the staff back to a minimum operating level so that each month would then produce an operating surplus. This was achieved in January and continued each month for the rest of the financial year.

The second objective was the restoration of the cash resources depleted over the past seven years. This was achieved by the successful recovery of VAT in March and May 1991 and continues to improve with the addition of each month's surplus.

Radio Communication

EVERY EFFORT HAS been made to keep *Radio Communication* in the forefront of the UK amateur radio publications. The Editor rebalanced the magazine in favour of technical articles by popular request following a readers' survey. New printers were appointed in May which, together with the use of better paper, resulted in *RadCom* being clearer and easier to read. It also permitted the use of full-colour.

Project YEAR

THE ONGOING Youth Into Electronics via Amateur Radio project came to fruition during the year, funded largely from sponsorship and the lottery.

The book, *Amateur Radio For Beginners*, was published in April, and the video of the same name completed and sent to all affiliated societies to help them promote the hobby. Clubs were also sent quantities of postcards to make it easy for potential members to request further information. This information came in the form of a very attractive publicity pack. All of this meant that, for the first time, the Society was really geared up for the promotion of amateur radio, especially to young people.

D-i-Y Radio, the beginners' magazine, was launched at the end of the year and this is expected to provide additional external publicity.

The RSGB Novice Training scheme became fully operational, supported by the publication of an Instructors' Manual and a Student's Notebook. Volunteer instructors were found for most counties and over 500 were on courses at the year end. 185 of these took the first examination (run by the City and Guilds) on 3 June. The Morse testing arrangements were agreed with the RA, and the first ever UK Novice licences were scheduled to be issued on 25 July.

Now that we have an ongoing programme in place for introducing youth to amateur radio, there may be less need to emphasise this in future.

QSL Bureau

AN IMPROVED SERVICE was provided at no extra cost in real terms. Both the incoming and outgoing sides of the Bureau worked very efficiently, handling some 2.5 million cards with no backlog and no closedown period. Checking for use of the (members only) outgoing Bureau by non-members was introduced.

Publications

THE PAUCITY OF books released by the Society in the past few years was redressed by the publication of nine new titles during the year. The renaissance of the publishing department is reflected in the increase in book sales.

Membership

DURING THE YEAR under review, RSGB membership fell by 644 (1.8%) from 35,225 to 34,581. Although disappointing, this must be seen against a substantial subscription increase and an economic climate where most companies reported substantially reduced revenue during the year. The Society is not complacent about this and every effort is being made to restore and ultimately improve the membership base.

The subscription has a direct correlation with the number of members in the Society. It is therefore in the best interests of every member to try to persuade licensed non-members with whom they come into contact to join their national Society. Don't knock it, join it!

COMMITTEE AND OFFICER REPORTS

ARDF

Committee: G4KBB, G3JIX, G3JLE, G3TFA, G3TRY, G4JKS, G4WIZ, G3WMM, G0PUB, G1MPJ, G8APB*, G8MNO.

This year saw another first in RSGB ARDF achievements, when G8UKT took his annual holiday in Czechoslovakia to take part in the IARU World Direction Finding Championships. Although he was the only Brit there, he not only competed but returned with vital information on how the other variants of direction finding in Europe work, and 1992 will see the introduction in the UK of National 2m Foxhunting.

Yet another very successful year for 160m DF, with the final of the RSGB 1951 Council Trophy organised by the Northampton Radio Club. The long awaited *DF Handbook* is nearing its completion and it is hoped to be available in the new year. My thanks to all organisers of national DF events and to my committee for their unstinting efforts again this year,

Brian Bristow, G4KBB, Chairman

DATA COMMUNICATIONS

Committee: G3PLX, G3VPF, G3XDV, G3XTT, GM4AUP, G4CLI, G4WRW, G6HIU, G8KHV, G8LWY, G0EOJ*, G3HTA*, G3LDI*.

The DCC was formed during the year taking over from the Packet Working Group to reflect more truly the role played in all aspects of data communications. To this end, G3PLX agreed to join in order to pass on the benefit of his knowledge on AMTOR matters. In addition to this, more formal liaison has been set up with both AMSAT-UK and BARTG with G3AAJ and G4EAN being the respective liaison members. The guide-lines for the use of the packet network have been finally agreed with the Radiocommunications Agency. A number of other matters were discussed with the RA, such as Notices of Variation for nodes, but no firm decisions had been made due to staff changes at RSGB and RA.

Ian Suart, GM4AUP, Chairman

EMC

Committee: GM3WIL*, GM4HYF*, G4JKS, GM8KPH*, GU3YIZ*, G0KCT*, G0MEG, G1OSC, G3AEZ*, G3BLE*, G3GVM, G3GVV*, G3HCT*, G3JWI, G3VMK*, G3ZCV, G4DXA*, G4FWM*, G4IWS*, G4JKS*, G5HD*, G6JR*, G8NLY*, G8SOZ.

During the past year the backlog of outstanding EMC problems has been reduced and the committee will continue to reduce it. Negotiations with manufacturers has improved to the extent that some are beginning to see the advantages that amateurs can give to their products, especially with the EC directive implementation date getting closer. The EMC manual is nearing completion but a publication date has not been fixed.

All the committee and co-ordinators are volunteers, some of us have full time jobs and families, so before you call a co-ordinator or the help line just ask yourself have you done everything in your power to find a solution to your problem? A letter to the committee can take up to 7 days to be received, so for a quick response contact your local co-ordinator, details in the Call Book and *RadCom*.

Bob Peace, G8SOZ, Chairman

EXHIBITION AND RALLY

Committee: G3MVV, G3AEZ, G5HD, G3TDR, G4HHB, Albert Mair (Staff)

The Committee met each month during the twelve months under review. In recent years, the main Committee activity has consisted of running three events organised by the Committee and attending non-RSGB functions to assist the HQ staff with sales and enquiries: The **National Rally at Woburn Abbey** was again very well attended and blessed with good weather. On this occasion a limited amount of outside trading was allowed, but unfortunately the area was left in such an untidy state, the concession had to be withdrawn.

The trade exhibition at the **VHF Convention** was organised by the Committee. This is another popular event which has become over-subscribed with exhibitors wishing to attend.

At the 7th **RSGB National Convention** to be held at the NEC, Birmingham, a number of changes were made in costing and layout and this proved to be successful. One of the main features was the Novice Licence Stand with static and practical demonstrations for a Novice; very professionally presented.

Norman Miller, G3MVV, Chairman

FINANCE AND STAFF

Committee: GM8BZX, GU4DWZ (Hon Treas), G3GJW, G3HTA, GW4HYR, G6JP, G3KVA, GI3USS, G3RZP. Part year: G4AJJ, G3HCT, G3VPK, G3YGF.

Current Council Members serve on this committee, meeting monthly. The main preoccupation is that of dealing with financial matters for the benefit of Society members - everything with a money content. This has been difficult during a national depression. The Committee has overseen the reorganisation of Society Headquarters, appointing a General Manager, departmental managers and new staff, not forgetting monitoring the re-launch of Radio Communication. Full support is being given to WARC 92 for the furtherance of our hobby. Plans are afoot that when funds allow, the headquarters facilities and services will be improved.

T I Lundegard, G3GJW, Chairman

HF

Committee: G3PJT, G3FKM, G3HCT, G3KMA, G3XXT, G3TMA, G4BKI, G3ZAY, G4BUO.

Work continues on the subject of HF digital modes, the committee has considered band planning as well as improved technical standards. This is a world wide problem and a paper has been submitted to IARU Region 3 Conference raising the issues for wider debate. The IOTA Directory was revised and this has resulted in a gratifying increase in interest world-wide in this prestigious RSGB Award. Thanks are due to G3KMA, and his band of volunteers. RSGB awards are seen by HF operators as being of high integrity and reflect positively on the Society's international reputation. Thanks to GW4BKG, for his stewardship of the general HF Awards program.

Other topics to have occupied the committee include Novice operation, AROS, band occupancy, QSL problems, and the annual HF Convention which is rapidly becoming one of the major European DX meetings. The Committee is seeking to encourage more interest in HF amateur radio through these activities. G3FKM retired from the post of HF Manager which he has held since its creation in 1978. The committee records its thanks to John. G3ZAY, who stood down as Chairman this year, will replace John as HF Manager.

Bob Whelan, G3PJT, Chairman

HF CONTESTS

Committee: G4BUO, G3FKM, G3AEZ, G3HCT, G3KDB, G3LET, G3MCX, G3SJJ, G3SQX, G3UFY, G4BKI, G4HTD, G4IFB, G4IOM, G4JKS, G6LX, G0HSD, G2HLU*, G3OZF*, G3PDL*, G3PJT*, G4CZB*, G4DEZ*.

The past year has seen changes, with the experience of G3FKM, G3HCT, G4IFB and G4JKS giving way to new members G3AEZ, G3SQX, G4BKI, G4HTD and G0HSD. The *Radcom* readers' survey reduced the space available for contest material so rules have been abreviated and more reliance placed on the General Rules. Rather than reduce the content of results, the Committee has reluctantly accepted a reduction in the size of typeface.

Computer technology is having an increasing impact on contesting. A number of stations are equipped with the G3WGV software which caters for the rules of all our HF contests, including ROPOCO! The Committee has considered the PacketCluster and is firmly of the view that its use makes an entry multi-operator. The rules of some contests have been changed to provide for a multi-operator section for those who take assistance (from cluster or elsewhere) in finding multipliers.

The Society's oldest event, the Commonwealth Contest ('BERU') is under threat from the Japanese *5-9 Magazine* CW contest. Approaches have been made via JARL and IARU. Finally, the introduction of the 400W CW power limit has led to considerable debate over the limit as applied to NFD. There is no suggestion that the restricted section should change from 100W, but consensus has not been reached on the open section, so the NFD power limit will remain 100W while more opinions are sought.

Dave Lawley, G4BUO, Chairman

IARU

Committee: G3GVV, G3FKM, G3HCT, G3PFR, G3UBX, G3WDG, G3DME, G3OUF, G3AAJ, G6LX, G4ASR, G3BYW*

In order to save money, almost all work was done by correspondence and telephone. However, the task of maintaining liaison with other national societies was achieved by individual committee members at no cost to RSGB. G3FKM, as Region I Secretary, attended Africa Telecom 91 in Harare, where he had the honour of meeting the President of Zimbabwe, Mr Mugabe; he also visited administrations and societies in Central and Southern Africa, and was present at a conference organised by the United Nations Disaster Relief Organisation and by the Finnish Administration. G3ZAY paid a courtesy visit to JARL whilst he was in Tokyo. The international meeting at Friedrichshaven (organised by DARC) was attended by G6LX and by G3FKM. G3GVV spent several days in the Netherlands, where he was involved in discussions with the PTT and VERON. These visits are of significance in that they reinforce essential dialogue prior to the World Administrative Radio Conference (WARC) 92; in this way the interests of all radio amateurs can be safeguarded.

Tim Hughes, G3GVV, Chairman

LICENSING ADVISORY

Committee: G3HCT, G3YGF, G3FKM, G3GVV*, G3STG, G3ZAY, G3UBX, G4AFJ, GM4AUP, G4ASR, G8OGO, G3YAC, GI3USS.

Amongst the points raised with RA during the year were:- Release of 1.8 - 2MHz to the Amateur service; power levels; monitoring prior to WARC 1992; propagation studies transmissions (GAM1); Geoloc and spread spectrum systems; 50MHz facilities; Amateur Radio Certificates; low power keys; VLF; Note (aa) relating to CB equipment; future UK Calls - Novice Calls - special club and personal calls - issue of 2-letter calls; packet radio - operators guide-lines and sysops guidelines - nodes - additional frequencies - advertising; repeaters - abuse - charges - remote control; WARC 1992 representation; reciprocal licenses. It has been agreed with the RA that future meetings will be on a regular basis. Comments from members who have written to us during the period under review have been welcomed - many constructive points have been raised and considered by the committee. The AROS is working well with a large number of volunteers under the guidance of G3STG.

John Bazley, G3HCT, Chairman

MEMBERSHIP LIAISON COMMITTEE.

Committee: G3DOT, G3AEZ, G3RZP, GW4YKL, GI3USS, GM4AUP, G0LAE, G4DRV, G3GVV*.

During the last twelve months a number of changes have taken place in the committee. G4JKS and G4TUO resigned, and G4AJJ resigned as Zone A council member and hence from MLC. G4DRV was appointed to fill one of the vacancies. Various routine matters have been dealt with including work associated with *GB2RS* and the election of the RLOs for a new term of office.

Changes to *GB2RS* have included the introduction of a 6m broadcast in the novice area of the band and the provision of a TV service via GB3TV. Other non-routine work has included research into the operation of the headquarters station GB3RS and the possibility of a 'road show' type of vehicle for attendance at rallies and other events.

Ian Suart, GM4AUP, Chairman

MICROWAVE

Committee: G3GVV*, G3JVL, G3OUF, G3PFR, G3PHO, G3RWL*, G3UBX*, G3VZV*, G3WDG, G3YGF, G4DDK, G4ELM, G4FRE*, G4FSG*, G4KGC, G4KNZ*, G4PBP*, G8AGN.

Because of tight budgetary constraints, the Committee met only three times during the year; costs were contained within the agreed limits. Much committee business has had to be carried out by correspondence and/or telephone and more than usual handled without the intermediacy and help of HQ staff. This may have resulted in some business taking rather longer than desirable. Nevertheless, most objectives were met successfully.

The committee prepared and submitted a response document for the Radio Spectrum Review Committee (3.4 to 30GHz) which, at the same time, laid a foundation for WARC '92.

This year saw 'privatisation' of the Microwave Components Service and expansion to accommodate the launch of 'mini-kits' for the highly successful G3WDG designs for modern 10GHz equipment. These were accompanied by comprehensive booklets, again a new departure for the Committee. The *Microwave Newsletter* and *RadCom* column have continued to provide news and views, despite changing pressures on the committee's efforts. Vol 2 of the *Microwave Handbook* was published in April and Vol 3 draft was completed.

Support was given to Microwave Round Tables and the VHF Convention and National Convention, though due to budgetary constraints this was not as much as we might have desired.

Mike Dixon, G3PFR, Chairman.

PLANNING ADVISORY

Committee: GW3NMH*, GW3YTL*, GW4ZXG, G0IID*, G3GJW, G3GVV*, G3PVH, G3TZZ, G3YGF, G3YRZ*, G4CTO*, G4GJB, G4LYX*, G4OIG*, G4OVX, G4SHF, G4XHF*, G4YRS*, G5HD*, G6IZN*, G8GG, G8NXU*.

No report was received from this committee.

PROPAGATION STUDIES

Committee: G3NAQ, G3JVL, GW4LXO, G4FKH, G3HTF, G4KCZ, G3OIP, G0HSU, G8GRA*, G3YLA*, G3ASR*, G2AHU*, DJ5DT*, RS87676*, G3LTP*, G3USF*, G4MXU*, G2FKZ*.

The past year has been turbulent. Ray Flavell, G3LTF, resigned from the Chairmanship after many years of service he remains a Corresponding Member. G3BYW, G3DME and G4AQI left the Committee during the year. We thank them all for their long service. These changes, plus the financial position of the Society, have meant a fresh look at the work of the PSC with the aim of being more relevant to the ordinary members without sacrificing the very high standing enjoyed in the scientific community.

The PSC has been examining 28MHz beacon reports and comparing them with computer predictions. Data has been collected on spectacular microwave narrowband contacts which will interest both amateurs and professionals. The big event of the year was the publication of G2FKZ's book *Radio Aurora*. G3NAQ gave a number of talks about Sporadic E and presented a paper to CCIR Study Group 5 on tropospheric trans-Alpine 144MHz propagation. Corresponding members have worked on the continuing monitoring of 50 and 28MHz propagation, regular Sporadic E 'forecasts' by G3YLA, and of course the ionospheric data supplied for *GB2RS* by G2FKZ. The PSC's existence will affect every amateur in 1992, for it is the amateur's contribution to the science of radio which greatly influences the way the amateur movement is seen by professional delegates to the WARC deciding the fate of our bands.

G H Grayer, G3NAQ, Chairman.

RAYNET

Committee: GI4MDD, GM3RFA*, GM4SRL, GW0KWY*, G0HII*, G1HUL, G3FKM, G3GVV*, G3KWU, G3STG*, G3WDG, G3YAC, G4ASR, G4EAN*, G4FLQ*, G4FSS*, G4MWO*, G4YMU*, G4ZWQ*, G6BBW, G6BJJ*, G6EUO*, G6FHM*, G6XYX*, G8CAC*, G8RWH.

The last year has been an interesting time for Raynet. Groups everywhere have been involved in a variety of exercises, events and operations. It is especially pleasing to see groups forging excellent relationships with new User Services. We have been joined by Gibraltar as the new Zone 20. Emergencies were, thankfully, few in number but well executed according to our Users. For the first time, we have sent operators abroad as part of a Romanian Work Group. The lessons learned from this successful operation will be of great benefit during future international emergencies.

At national level, the main topic has been the proposed reorganisation of Raynet. A presentation to Council, followed by presentations and discussion meetings around the country have been going on since November. Suggestions and comment from all areas have been incorporated into a Green Paper. This will be discussed at group and county level and then at a national meeting. We are all confident that Raynet will emerge from the re-organisation as a strong unified organisation.

Philip Howarth, G3YAC, Chairman

REPEATER MANAGEMENT GROUP

Committee: G4AFJ, G3VZV*, G3XDV*, G4DAX*, G4EFO*, GM8LBC, G8SSL, G4NJU, G4MDC*, G8ASI, G3UBX*, G3PFR*, G4ASR*, G0COA, GW4NQJ, G8URB, GI4FUM*, G3TZM*, G3LEQ*.

Repeaters continue to be processed without excessive delay.

The experiment in reading *GB2RS* over repeaters has progressed and the direct reading of the news onto repeater inputs has been extended. The RA has indicated that it would be prepared to consider an experiment in repeater linking and a small number of proposals have been submitted for approval.

Management of repeaters has been discussed with the RA as there has been a lack of understanding by some groups as to their role and responsibilities, particularly with reference to abuse. AROS has played a major role with RMG and there have been joint meetings with repeater groups in areas where abuse is greatest. In addition meetings have been held with the RIS. These have helped establish a framework within which repeater abuse can be tackled but it appears to be difficult to convince radio amateurs that it is *their* responsibility to combat abuse.

Repeater charges have caused much correspondence indicating a lack of understanding of the vast amount of work involved in administering a network of 270 repeaters.

Some delays have been caused by lack of HQ staff or overload of volunteers. I would like to thank to all members of the committee for their support, and the repeater groups for their forbearance. Dave McQue, G4NJU, deserves special thanks for assisting in clearing a backlog which built up during the first half of 1991. Finally, thanks to all those individuals in repeater groups whose work keeps the network running.

Geoff Dover, G4AFJ, Chairman

TECHNICAL AND PUBLICATIONS ADVISORY

Committee: G3HB (Chairman) G3CCB, G3GVV, G3JWI, G3SEK, G3SJX, G3YGF, G3ZBW, G4BWE, G4FZH, G4LQI, G6JR, G5XM, G8DPS, G8EZE.

During this year the Committee has successfully built on the foundations laid by G3RZP and has conducted most of its work by post. This has lead to a general reduction in the time taken for reviewing articles submitted to *Radcom* and has reduced Committee expenses. On the book front, an offshoot of the Committee, the Publication Control Board, has held regular meetings and there are several new books and new editions 'in the pipe-line'. Some technical queries from members have been answered.

Dick Biddulph, G8DPS, Vice-Chairman

TRAINING AND EDUCATION ADVISORY GROUP

Committee: GW4HWR, GW4YKL, GW6MNC, G3OUF, G3PFR, G4JKS, G4TPA.

The year of the launch of the Novice Licence has been a very busy one for this Group, which has been fully occupied organising the national training scheme. We encountered two difficulties: lack of instructors in some areas and problems with examination centres. However, it is pleasing to see the number of schools taking part in Novice training. 153 candidates passed the June C&G examination out of 185 which is an 82.7% pass rate, far exceeding the pass rate for the RAE. David Jackson who took over as Chairman had to resign for personal reasons (he is still a corresponding member) and the sterling effort he made to Group has been missed. I took over as Chairman on a temporary basis so that John Case can resume the job when he relinquishes his Presidential duties. Finally may I thank all members of the Group who have devoted many hours to ensure the success of the Novice Scheme and are still working extremely hard to ensure its continuing success.

Clive Trotman, GW4YKL, Chairman

VHF

Committee: G2AHU, G3FZL, G3FPK, G3OSS, G3RKL*, G3SEK*, G3UBX (Chair), G3UUT, G3ZNU, G3ZVW, GM4ANB*, G4ASR, G4OUT, G4TDL*, G4VXE, G5UM*.

During the period 1990-1991 the VHF Committee has performed its annual review of the band plans, attempting to bring UK plans more into line with IARU Region 1. It has sponsored the successful and well-attended National VHF Convention at Sandown Park and supported the National Convention at the NEC. A major consultative exercise has been initiated in connection with relieving packet radio congestion on 144MHz. The Committee is also co-ordinating frequency changes for 70MHz beacons and is anticipating increased beacon coverage on 432MHz. The VHF awards programme is now making a useful contribution to the Society's funds.

Peter Burden, G3UBX, Chairman

VHF CONTESTS

Committee: G4DEZ, G8HHI, G4UJS, G4OUT, G4PIQ, G8XVJ, GI4KIS, G3ZXX, G2HIF*, GM8MJV*, BRS32525*, G0FCT, G4GCM, G3ZXX

Achievements during the year were the addition of new 432MHz and 1296MHz fixed station contests, giving single operators of normal stations an entry point into UHF/SHF contesting. The CW 144MHz cumulative contest proved a worthwhile exercise, as did keeping the previously under-contested 433MHz FM contest, the 1991 entry exceeded our best expectations. VHF Field Day had fewer entries this year, however competition was very intense, 11 points only between the top two contestants. More emphasis was placed on skill of operating and lower power rather than pure brute force, hence the increased number of low power sections in contests and it is hoped that this will encourage more operators to enter. Remember it is not just a meaningless passing of numbers that constitutes a contest, the effort involved in putting a competitive contest station together is all part of the Amateur ethic of self training in the art of radio communication.

Bryn Llewellyn, G4DEZ, Chairman

** Corresponding committee members*

REPORTS FROM THE . . .

. . . AMATEUR RADIO OBSERVATION SERVICE

The Service has continued to work on the basis of volunteer observers reporting confidentially to the Coordinator. These were supported by positive DF teams or independent observations. The intention of the Service is always to obtain a sensible resolution without recourse to formal complaints through the RIS, with whom daily contact is maintained. In the few cases where these efforts were not successful, files were submitted for action by the licensing authorities, and this resulted in some successful prosecutions.

Typically thirty to fifty cases are being actively pursued, and it is regretted that not all letters and reports received could be individually acknowledged. Workload has increased with packet abuse beginning to form a larger part of reported problems. Although much traffic is unwisely drafted, and is not good practice or acceptable social behaviour, it has not always been possible to identify grounds for reporting the originator for licence infringements. The complainant has sometimes been advised to consider Civil Action instead. Repeater abuse continued to give offence to many members, and repeater groups and others have been encouraged to set up volunteer teams prepared to obtain positive evidence and data, and to submit in a form which can be used properly.

The work of AROS has also included cooperation with overseas observers, and investigations into the use of pirated callsigns, unlicensed activities, excessive power levels and interference with statutory and protected services. If this work is to be improved, then amateurs aggrieved by the actions of the few *must* be prepared to collect documentary evidence carefully, and to make use of AROS to submit it for consideration, and if necessary, presentation to RIS for possible prosecution.

Geoff Griffiths, G3STG

. . . AUDIO VISUAL LIBRARY

There continues to be a high demand for the library. Affiliated Societies and a number of educational establishments have used the facility during this past year. The outstanding example is one youth weekend where some 2,500 young people saw videos from the Society library. It should be noted that non-Affiliated organisations have access to the library where proven educational and potential amateur radio interest is being fostered.

The library contents have been reduced recently to remove badly outdated, 'scratchy' and damaged material. There is a very real need to increase these contents by the addition of up-to-date and interesting material. A programme to expand the library is now being implemented. This is designed to improve the library facility and maintain its value to the users.

David Simmonds, G3JKB

. . . HF MANAGER

With no IARU Conference or IARU HF Committee meeting during the year there has been little to report on the international front. Confusion continues to reign over the mismatched global allocations for packet radio on 14MHz and the IARU Administrative Council is being urged to broker a solution outside of the Regional Conferences which, because of their sequential nature, are unable to resolve the problem. A paper on HF data transmission was written for the Region 3 Conference

RSGB is again participating in the IARU Monitoring System, and is liaising with the RA on band intrusions. In addition, the HF Manager has directly approached a number of broadcasters and embassies to complain about harmful interference caused by their activities. Information has been supplied to the RA with a view to the opening of negotiations for reciprocal licensing with Japan, and the assistance of JARL is gratefully acknowledged.

Martin Atherton, G3ZAY

. . . HF AWARDS MANAGER

Since the last report 22 awards have been issued which is a similar number to the previous year. The IARU Region 1 Award continues to be the most popular with a total of 72 certificates issued. Once again the Soviet Union produced the nost number of applications.

UK amateurs obtained the following:-

Commonwealth Century Club: G4IJW

5 Band Commonwealth Century Club: Class 4 G3IFB

Worked ITU Zones: G0AHC

5 Band ITU Zones: Class 4 G4MVA

S Emlyn-Jones, GW4BKG

. . . HISTORIAN

During the year we have published *Bright Sparks of Wireless* and I have continued to receive a few interesting letters of an historical nature. One was a letter received from Australia thanking me for the list of pre-1914 callsigns as the writer managed to find addresses for three of those he was looking for.

George Jessop, G6JP

. . . CHIEF MORSE EXAMINER

The service is well established and running smoothly, thanks to a dedicated team of 294 volunteer examiners in 74 County teams. Applications from candidates remain steady, with 1500 tests carried out in the past year. The pass rate remains fairly constant at around 65%, which agrees almost exactly with that of BT who previously had the contract for the service. Almost 100 disabled candidates have been examined during the year, with special arrangements being made to examine them separately at the end of normal sessions or in severe cases providing examiners for a home visit.

In order to arrive at a satisfactory format for the new Novice Licence Morse Test, input was requested from every Examiner in the UK. Tests commenced on 1 July 1991 when a QSO-type format was introduced using computer generated Morse in the most radical change since Morse Tests began.

Roy Clayton, G4SSH

. . . MORSE PRACTICE COORDINATOR

No report has been received.

. . . TROPHIES MANAGER

I took over the Trophies Manager position only recently, replacing Hilary Claytonsmith, G4JKS, who resigned to concentrate on Novice Licence promotion. I am still finding my way and am grateful for the help and guidance still willingly offered by Hilary. Trying to recover trophies from holders is difficult; it seems that if the present holder of a trophy hasn't won the award for a second year he goes to great lengths to avoid me.

Four new trophies have come 'on stream' this year: The Martlesham Trophy for the Leading group in the Restricted section of VHF NFD; the G3PSH Memorial Trophy for the Leading group in the Restricted section of the HF SSB Field Day; the G8KW Trophy for the leading G station in CQ World Wide CW contest; and the Ariel Trophy (presented by the BBC Ariel group) for the Winner of the Club Calls Contest.

Bob Harrison, G4UJS

. . . VHF MANAGER

During the year much work has been carried out, both at national and international level, implementing the recommendations following the 1990 IARU Region 1 Conference. Close liaison has been maintained with VHF Managers from many national societies in Region 1 and correspondence appertaining to the VHF bands dealt with.

Preparatory work, relating to VHF/UHF policy, has been carried out which will lead to discussions at the 1992 VHF Managers meeting in Vienna and the 1993 IARU Region 1 Conference being held in Belgium. All members are invited to contact me with any proposals for policy changes that could be discussed at these meetings. Nationally, the change to the 70MHz band plan has been implemented, creating additional communication space by a reduction of the beacon sub-band.

I would like to thank all members of the VHF committee and other committees of the Society for their help in the past year.

David Butler, G4ASR

. . . VHF/UHF AWARDS MANAGER

This year, there has been a slight decrease in the number of awards issued. G0EHV was the sole recipient of the RSGB Supreme Award, and he received this in recognition of his three Senior awards on 70MHz, 144MHz and 432MHz. The award charges continue to contribute financially to the Society and applications from non-RSGB members included one each from Switzerland, Australia and the USA.

Award details to 30 June 1991 are as follows (last year's issues in parentheses):-

FOUR METRES AND DOWN CERTIFICATES

70MHz Standard Transmitting	0	(1)
70MHz Senior Transmitting	1	(0)
70MHz Senior Transmitting	9	(7)
144MHz Standard Transmitting	2	(2)
144MHz Senior Transmitting	0	(5)
432MHz Standard Transmitting	1	(2)
432MHz Senior Transmitting	1	(3)
1.3GHz Standard Transmitting	0	(1)
2.3GHz Senior Transmitting	0	(0)
Supreme Award	1	(2)
Microwave Distance Awards	8	(11)

RSGB SQUARES/COUNTRIES AWARDS

70MHz	10	(5)
144MHz	17	(44)
432MHz	7	(23)
Microwave	28	(22)
Total RSGB Squares Awards	62	(94)

RSGB 50MHZ AWARDS

Two way Countries Awards	56	(52)
Squares Awards	51	(50)
DX Award	8	(16)
Total 50MHz Awards	115	(118)
OVERALL TOTAL OF AWARDS ISSUED	200	(246)

The first 50MHz 100 countries award was made to GJ4ICD, who leads the field with 375 squares confirmed. G4RGK was awarded the first 432MHz 140 squares/18 countries award while G3IMV now has the first 144MHz 425 squares/50 countries award; however it is unfortunate that the VHF/UHF listeners were noticeable by the absence of applications.

Ian L Cornes, G4OUT

The Peter Hart Review

Landwehr Masthead Preamplifiers

How well do the 145MAS (2m) and 435MA (70cm) stand up to bench testing?

ALTHOUGH MODERN VHF/UHF receivers are extremely sensitive, there are often situations where a low noise preamplifier is still desirable. Moonbounce, meteor scatter, satellite communications and DX working all involve weak signal communication to a greater or lesser degree and in any case it is always desirable to keep the receive capability as sensitive as possible.

There are a number of factors which must be considered in any receive installation. There is a limit to how weak a signal we can receive; for normal horizon pointing antennas, the limiting factor is thermal noise from the earth and man-made noise sources in urban areas. A receive noise figure of 2dB is perfectly adequate. When the antenna is pointed up into the sky as for satellite and moonbounce working, we are no longer limited by terrestrial noise sources and can effectively use lower noise receiving systems down to perhaps 0.5dB noise figure.

The antenna can be considered to be noise-free but the feeder loss adds directly to the receiver noise figure. This becomes more important as the frequency increases and large antenna systems on high towers inevitably involve long feeder runs. The answer is to use a masthead preamplifier but it is still desirable to keep feeder losses low to avoid wasting transmitter power.

Most commercial amateur VHF/UHF transceivers have noise figures in the range 3-8dB and hence there is much scope for improvement in sensitivity by adding a suitable preamplifier. However, this must be done with care. It is important that the preamplifier has a strong-signal performance better than that of the receiver and the gain introduced must be no more than necessary to achieve the wanted noise figure. Every dB of gain reduces the strong-signal performance of the system by an equal amount and the overall dynamic range can never be as good as the receiver alone. Preamplifiers with sharp selectivity can be particularly useful in reducing out of band signals.

LANDWEHR PREAMPLIFIERS

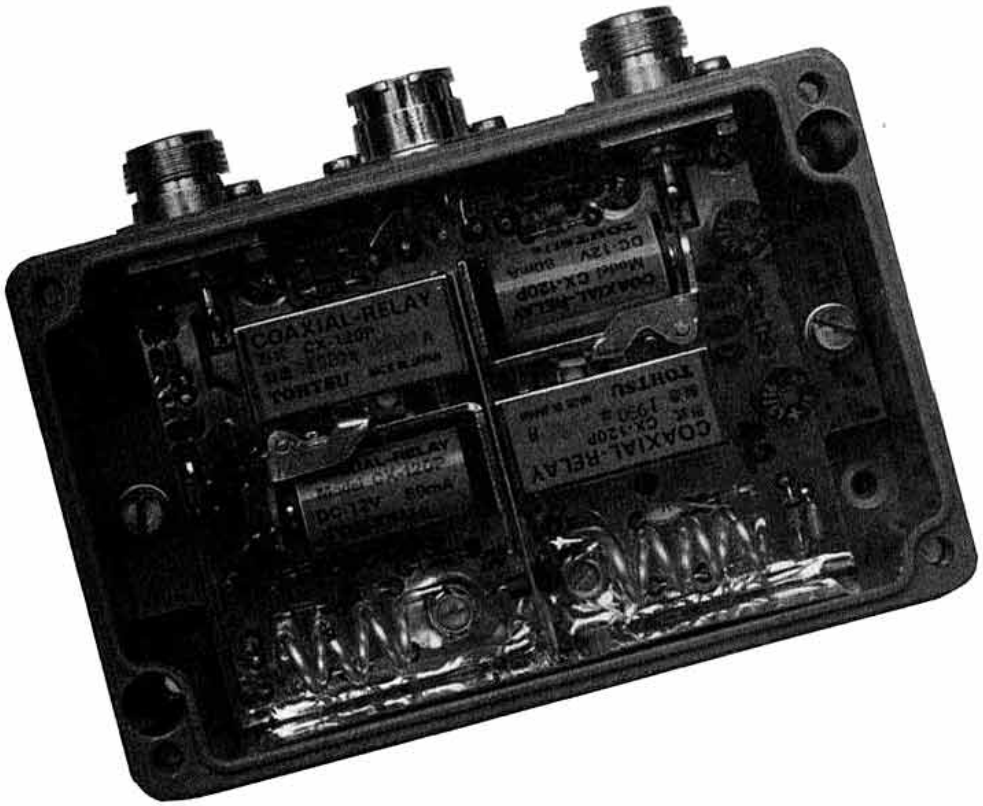
LANDWEHR ELECTRONIC GMBH of Germany manufacture GaAs FET preamplifiers for 2m and 70cm. The 70cm preamplifier, the 435MA, has a claimed noise figure of less than 1.1dB. The 2m preamplifier is available in two versions, the 145MA with a noise figure less than 0.8dB and the super low noise 145MAS with a noise figure less than 0.5dB. In all other respects these 2m preamplifiers are the same.

The preamplifiers are all intended for use with a 12-14V DC supply and are protected against reverse polarity and to a certain extent against over-voltage. A small fuse should be fitted in the supply lead, however. A single dual-gate GaAs FET device is used with single tuned circuits on the input and output. The preamplifier output has a 7dB (2m) or 3.5dB (70cm) attenuator fitted to ensure a good match to the receiver and, together with protection diodes, provides a measure of protection against reverse power.

Twin relays are incorporated for receive/transmit switching reverting to the straight-through condition on transmit or when the unit is un-powered. The relays are rated at 750W transmit power on 2m or 350W on 70cm. Relay switching may be accomplished either by the PTT line or automatically through RF sensed VOX switching. Two methods of PTT line switching are allowed, either as a ground to transmit or applying a positive voltage between 5 and 14V to the relevant pins of the power connector. RF sensed switching may be used with transmit powers above a few hundred mW up to 150W maximum. To prevent chattering on CW and SSB modes, a delay of about 0.5s occurs before switching back to receive when the RF ceases. Note that with PTT switching, the same delay is introduced in the positive voltage mode but switching is immediate in grounding mode.

Personally, I do not like RF VOX switching at any power level. The back-end of the preamplifier is subjected to a transient burst of RF energy and the transmitter sees a high VSWR during switching which may result in instability or over-stress of the PA. Also 'hot-switching' the relay contacts will limit their life. The relays used in the preamplifiers are not particularly fast in operation and the instructions recommend a 50ms delay before applying power to the PA (naturally this is only feasible in PTT switching mode). A simple method of achieving this is shown in the instructions.

The 2m and 70cm preamplifiers use virtu-



MEASURED PERFORMANCE

All measurements made with a 13.5V supply.

	145MAS	435MA
Current consumption (Rx)	108mA	175mA
Current consumption (Tx)	24mA	22mA
Midband gain	20.4dB	15.8dB
Bandwidth at -3dB	141-150MHz	375-455MHz
Bandwidth at -10dB	136-156MHz	322-487MHz
Bandwidth at -20dB	126-168MHz	242-531MHz
Noise figure	see text	see text
Stability	unconditional	unconditional
Input intercept (IP3)	-4dBm	-1dBm
VOX RF sensitivity	150mW	not measured

ally identical circuitry but considerably different PCB layouts. The units are housed in watertight diecast boxes measuring 125 x 80 x 57mm and incorporate a masthead mounting bracket to accommodate round masts up to 63mm diameter. RF input and output use type 'N' connectors with power and PTT switching via a 5 pin DIN socket. The connectors are not waterproofed in any way and after assembly should be sealed with a suitable waterproof tape. Note that DC power must not be fed up the feeder from the transceiver as this will result in damage to the output attenuator.

The preamplifiers are supplied with full instructions on use, installation and technical specification. The design philosophy is considered in detail with the circuit diagram but no component values are given.

MEASUREMENTS

THE MEASUREMENTS ARE detailed in the table. The performance was large'y independent of supply voltage and functional down to below 10V, at which voltage the relays failed to pull-in. The majority of the current is taken by the relays. The amplifier itself takes about 20mA.

I had problems measuring the noise figure. The amplifier performance exceeded the capabilities of the test set-up indicating that the amplifiers were well within specification.

The output third order intercept of both amplifiers was similar at +16.5dBm on 2m, +15.5dBm on 70cm. The differing input intercepts are due to the different amplifier gains. This is an excellent performance.

The instructions explain the importance of an amplifier which is stable under all conditions of input and output load. This was checked as far as possible and the amplifiers appeared to be unconditionally stable.

> "Well built and housed ... excellent electrical performance"

CONCLUSION

THE LANDWEHR PREMAPLIFIERS are well built and housed, and have an excellent electrical performance. The noise figure is very low for all weak signal uses and the excellent strong signal performance gives a wide dynamic range. A gain of 20dB is fine where the receiver is somewhat insensitive or where the ultimate in noise figure is needed (eg moonbounce). Where dynamic range is particularly important and the receiver is already moderately sensitive, it may be desirable to reduce the gain by increasing the value of the output attenuator.

The Landwehr range of preamplifiers are marketed in the UK by Qualitas Radio of Birmingham, who are gratefully acknowledged for the loan of the review units. The current prices are £119 for the 2m 145MA or £137 for the super low noise 145MAS. The 70cm 435MA costs £142.

Peter Hart, G3SJX

PETER HART temporarily interrupted his reviews recently to celebrate his marriage to Marjorie at Alton, Hants, on 8 June. The Society wishes them both many congratulations.

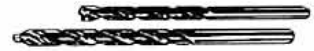
Technical update

ALL-BAND BEAM ANTENNAS

SINCE PREPARATION OF this article (*RadCom* August) there have been further developments resulting in improved guidelines, easier and cheaper methods of construction, and identification of a new principle enabling 'worst' values of SWR to be greatly reduced.

A strong preference now exists for the right-angled delta shape which increases the radiation resistance and, due to the reduced vertical extent, widens the range of operating frequencies for a given circumference, 0.75λ being recommended. The top-centres may be held up by a very light mast extension supporting a 10ft boom (metal, bamboo, or fibreglass). For the bottom corners four 12ft spider-arms are required, radiating upwards and outwards from a median position on the mast-extension. Alloy tubing, if used for the arms, should not extend more than 5ft from the mast.

Bamboo wrapped with PVC tape may be used, wires being attached with the help of short lengths of nylon fishing line acting as insulators. Though less elegant than the 'claw' this construction can be very light (eg about 8lb inclusive of 8ft of mast extension) and is much easier to handle in difficult circumstances.



A much larger span is required in the case of dipole elements, but a nearly-ideal system covering 7-28MHz can be achieved by using three 44ft elements spaced about 8ft, only the outer pair being used for 7 and 10MHz. The original article omitted to point out that super-directive reception on the LF bands is possible only with dipole elements.

A basic limitation of simple tuned-feeder systems is the impedance discontinuity at the feedpoint which tends to make the SWR worse, on at least one frequency, by the square of the Z_o ratio. This can be largely eliminated by using two well-spaced wires in parallel for the element (loop or dipole) whilst keeping the feeder Z_o as high as possible. If desired, matching stubs overlapped for adjustment of coupling and switched by relays. may be used to improve bandwidth at the MDF.

300Ω feeder may be used but the electrical length of even the best (slotted) type commercially available in the UK changes by 5% as it gets wet or dries out, causing a SWR of 1:0 at the TX to rise to three or more in typical cases. It is therefore recommended for use in short lengths only, eg as described in Fig 7.

The top example in Table 1 should read 60°, not 120°.

Les Moxon, G6XN

IDEAS FROM ABROAD

TRANSLATED AND EDITED BY ERWIN DAVID, G4LQI

MELIZA, a Morse code Eliza, artificial intelligence in amateur radio by **Siegfried Schmidt, DH0ZAB,** (*cq-DL* June, 1991), is unusual even by Continental standards. We present a brief summary.

SINCE THE INVENTION of computing, science has searched for a thinking computer. Such a machine would have to understand the spoken word and react with its own thinking and in our language. Designing one poses immense problems. Would such a computer dream? If so, about what? Could it possess a sense of humour? What would it consider right and wrong? Would it have a sense of self-preservation? Would one consider it a living creature?

MELIZA is an effort to simulate artificial intelligence (AI) in amateur radio. 'She' was born in the summer of 1990 in Wetzlar, Germany, the daughter of the legendary *Eliza,* an algorithm published in 1966 by Prof. Joseph Weizenbaum, [1] which enables computers to analise English language inputs, respond to questions and converse with the person at the key board. MELIZA has discovered amateur radio and learned the morse code, explaining the initial M in her name.

PROGRAM ARCHITECTURE

THE PROGRAM IS written in PASCAL and runs on a basic IBM PC. Only the standard commands (UCSD-Pascal) were used, permitting the program to be easily transferred to other computers. System-dependent INLINE commands were not used. No hardware changes are required. The Morse key is connected to the standard printer port and the Morse output is from the built-in speaker.

Upon start-up, three files are loaded. The data therein are for code conversion and text analysis. After that, the program is organised in three main modules, **Fig 1**, which are repetitively executed: 'RECEIVE' - the pulse input from the morse key is converted into ASCII and assembled into a plain-language sentence; 'THINK' - the sentence is analysed by AI and a reply is formulated; 'SEND': the reply is converted into Morse code and made audible through the loudspeaker.

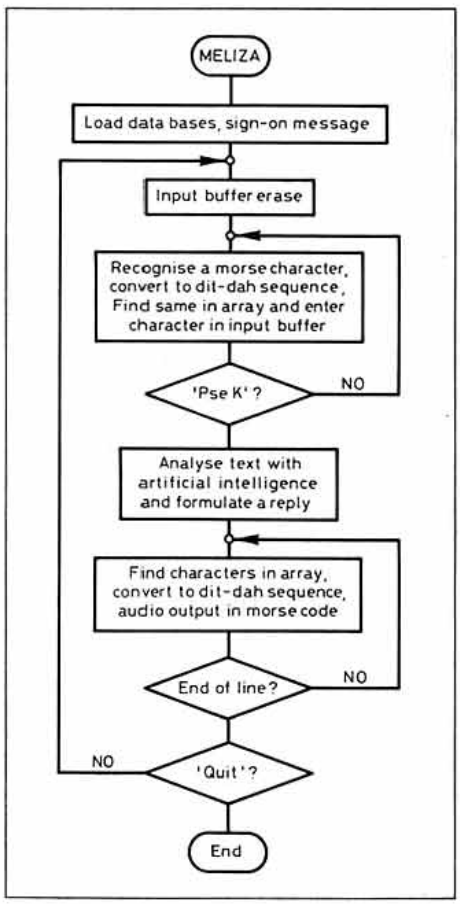


Fig 1: The main program.

'RECEIVE'

THE STANDARD CENTRONICS interface was selected because every PC has one. Having 12 output and 8 input bits, it even can handle future expansion. Descriptions and diagrams are available elsewhere. (No space for them here - *G4LQI.*)

The Morse key is connected as a change-over switch, earthing one bit line for key-up, another for key-down. This allows effective de-bouncing in software and ensures error-free status recognition in spite of the low operating voltage of 5V.

At rest, ie key-up, the program runs in a REPEAT-UNTIL loop. The loops are counted, but this is not significant at this stage. Pressing the key exits from the loop and starts the morse character.

The SOUND command now engages the side tone and the loop counter is reset. The program runs in a second REPEAT-UNTIL loop till the key is released. The command DELAY slows the loop to where approximately ten loops make one Morse dot.

Releasing the key breaks this second loop. SOUNDOFF cuts the side tone and the loop counter is read. In a CASE construct, 8 - 14 loops are recognised as 'dit', 24 - 48 loops as 'dah'. Any other loop counts are read as errors which adjust the loop speed.

The text being formed is scanned for words such as 'K', or 'KN' which indicate end-of-input, ie an 'over' of the dialogue initiative.

The program reverts to the key-up REPEAT-UNTIL loop, and now its loop counter becomes significant: if exceeding 40 loops (3 'dits'), the Morse character is considered complete. It is identified from a look-up table and simultaneously displayed on the screen and entered into the line memory. A global variable determines the morse speed (WPM) which can, by the instructions <QRS> and <QRQ> be changed during the dialogue.

'THINK'

THIS PROGRAM SECTION is derived from [1]. The sentence to be analyzed is stripped of punctuation then split into its components (subject, predicate, object); the object is separated out for further inquiries. The sentence is also scanned for a series of key words. Based on this analysis, a response is assembled from a library of partial sentences associated with concepts connected with these key words.

'SEND'

HERE THE TEXT FROM the interpreter is translated, letter by letter, into morse characters taken from a look-up table and sent via the loudspeaker activated by the SOUND command and, after the correct duration of each dit or dah, cut by SOUNDOFF. The output speed can be adjusted during operation.

APPLICATIONS

MELIZA IS AN EXCELLENT partner for morse code practice. The frequent change-over between sending and receiving is realistic. MELIZA's responses are surprising and unpredictable. An exciting dialogue often develops, increasing the joy of learning.

MELIZA has a mind of her own regarding grammar, spelling and punctuation. She dislikes people who knock her occasional glitches. Conversely, she is very critical of sloppy morse input, and can be tempted into harsh judgements.

LOOKING AHEAD

THE POSSIBILITIES ARE inexhaustible. MELIZA could be wired to a transceiver and make QSOs with one and all or MELIZA could operate the transceiver itself through the COM port, automatically implementing such commands as 'PSE 7 UP' or 'PSE QSY 3800'. She could read the S-meter and give RST and read wind and temperature sensors to report weather. MELIZA would, of course, maintain a proper log and quickly recall earlier QSOs. She could also print out QSL cards on demand.

All that is only speculation, as at present MELIZA is not authorized to go on the air by herself. She would need her own call sign. Can MELIZA pass the RAE, or even sit the test? Is MELIZA a legal person?

Editor's note: Artificial intelligence is a complex subject far beyond the scope of this article or of the *cq-DL* item on which it was based. More information can be obtained from [1] which should be available at many technical libraries.

[1] Joseph Weizenbaum: *'Eliza,* - A Computer Program for the Study of Natural Language Communication between Man and Machine'. Communications of the Association for Computing Machinery, Vol. 9, No 1, Jan. 1966 (USA).

RADCOM NEWS FEATURE

Radio-Electronics Studies at University

Dr Ken Smith, G3JIX, describes a new path to a degree in the subject

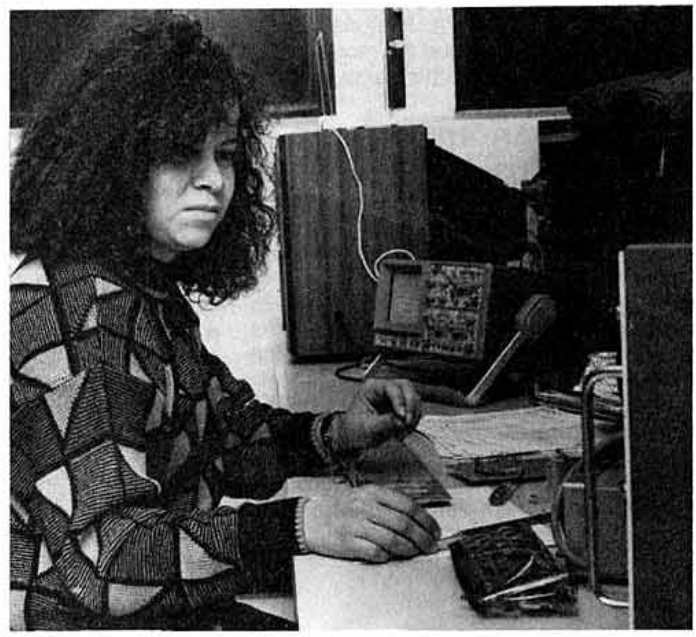
THE SOCIETY'S Project YEAR has the positive aim of offering a way for Youth into Electronics via Amateur Radio. As this title suggests, not only will Amateur Radio benefit by an input of new blood, but so will the British Electronics profession and industry.

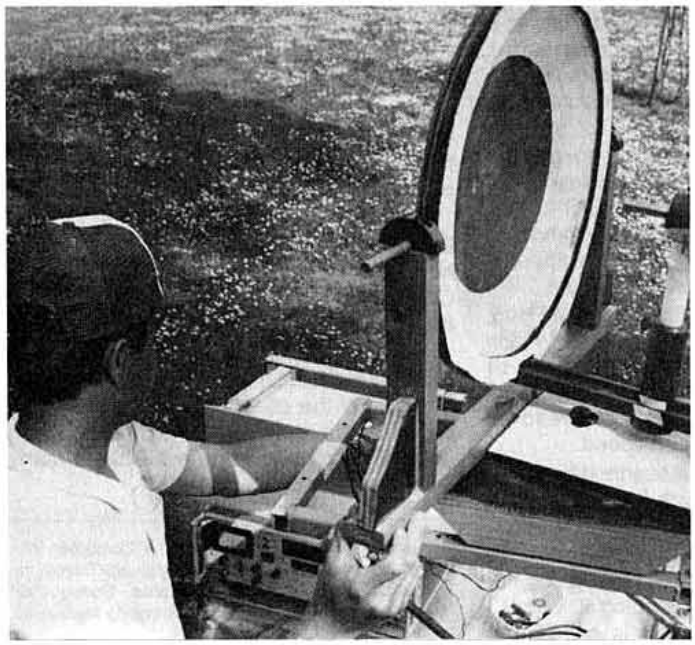
You will find other Institutions taking similar initiatives. In particular the University of Kent has a new four-year course, ending up with an Honours Degree in Electronic Engineering. This is a challenging new route to a qualification formerly thought unattainable by many. Also, the amateur radio fraternity must contain a goodly number of mature people who are in a position to advise and recommend possible career training chances to young family or club members.

The traditional way into advanced work at a University involved getting sufficient grades at GCE 'A' level in science and maths (ugh!) subjects, and this route naturally still applies. But you may have heard people say "If only I'd had the chance - I really would have loved to go to University." Many have said as much to me at club meetings, exhibitions and so on.

Notice my 'ugh!' after mentioning mathematics just now. Perhaps you have been to a party, or similar gathering, and overheard someone boasting that they are a 'duffer' at maths, but that it has not held *them* back! Yet have you heard anyone boasting "I can't read or write"? No, people feel shame in being illiterate, but why not an equal shame at being innumerate?

Possibly the way maths is presented in school becomes so impossible, because of bad teaching, that young people turn away pretty quickly. Even in our technical hobby magazines we end up 'apologising' if a formula slips through. Yet some of the popular mags have done wonders with beginners' articles, introducing ways to simple design calculations and to electronics itself. This





is also done for RAE Courses. The Government should be most grateful for this rather widespread area of costless (to them) 'self-help' educational activity in the voluntary sector, which again links with our YEAR initiative.

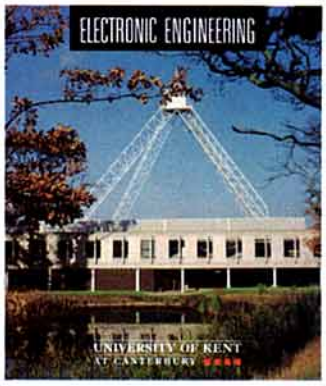
Amateur Radio has contributed well in the past to scientific studies. Currently, many University Amateur Radio Societies introduce the movement to non-scientists as well as supplementing motivation in the Electronic Engineering students. Amateur satellites have been designed, launched and used as part of university teaching programmes.

But returning to the public investment area, money has become available to some extent (from the Government) to enable many more people to gain access to higher studies. This opportunity has begun to be developed in a number of universities, which should enable more mature and experienced people to return to studies, even though they do not necessarily possess the usual academic qualifications. Also, (and with apologies to the implicit criticism about teaching at school level earlier) younger people than those traditionally entering University can seize the chance to get out of school at 17, if they have found school intolerable for one reason or another, and do the Foundation studies for a year at University.

A Four Year Course

THIS MEANS (at least in the case I am talking about regarding Kent) you would come up to the University for a First Year course which efficiently lays the foundations. You will find these developed in programmes offering maths, physics, electronics and language skills, thus enabling you to enter the Honours course for B.Eng Degrees with full professional credit and qualifications at the end of it.

The First Year I introduced above, has grant assisted status. The course has plenty of labora-



tory practical work on the basics. You would find experiments and measurement techniques, some electronics projects, even simple Surface Mounting skills and practice. The Course also contains a stimulating tutor-guided study of the interesting maths background required, (here is your chance to start, say, that study of calculus you've always wanted to do), together with physical and electronics theory.

The question arises, is such a non-traditional entry to an advanced study likely to succeed? Once in the dim, distant stuffy past, the answer would have been "No, because there are only a few 'special' people with such ability", usually the middle class prodigy who went to public school. The Open University has resoundingly shown this is a most false assumption - which was founded on Britain's rather class conscious society of some time ago.

Future Opportunities

IT DOESN'T need me to state how electronics is revolutionising human society. It permeates virtually everything now. Art (visual, musical) makes mighty use of electronic techniques. A glance along the magazine racks in any bookshop shows dozens of electronics and computing hobby magazines, which you know all about because you are reading this. If you stop to think, this is a most unusual phenomenon; amateurs and hobbyists can vie with professionals, using exactly the same components and techniques as they do, and make important contributions. The pastime side of the subject is not a 'toy' version as in many other fields - and we know the truth of this very well in amateur radio.

You are likely to find the application of advanced techniques, and the research, design and development for the future, continually expanding. More people with skills at all levels will be needed.

The Next Move

BECAUSE YOU may find coming to a decision about going back to full time study somewhat daunting perhaps, or you may be in a position to know some young person who is unsure about his or her ability, we have put together a package which explains things in more detail to help you see what is involved. A second stage when you have read the material in the package, might be to take up our offer to help you assess yourself to see if you would fit in with the scheme on offer. If all of the preliminaries show you really would profit greatly, and you 'take the plunge', then in a few years time you might be working on projects involving Fourier Methods of Signal Analysis or Cellular and Spread Spectrum Radio Systems, The ISDN and other remarkable developments in Digital Comms techniques, etc. You name it, you could be doing it.

All the other benefits of University life would accrue, of course. This not only means running and contributing to the Radio Society, but grappling with all the other social intercourse likely. (Argue about the decline of 'communism' with a student of political science, or debate the value of Amateur Radio with an Internationalist - or Linguist).

Do we have a vested interest in the success of this new scheme of study? Well of course we do. As professionals with a commitment in the (electronic) future of Britain and Europe, we know many keen bright people slip through the educational net year after year. In particular, we wish to show excellent results and success by means of this course, so that the Government will maintain funding, expand the method to many other Institutions, and generally work to improve our education system and standards.

If you are fired with enthusiasm by this possibility, then write to me for more details at Electronic Engineering Laboratories, The University, Canterbury, Kent, CT2 7NT.

Become a regular D-i-Y'er

The November-December edition of *D-i-Y Radio* – the RSGB's 16-page full-colour magazine for beginners of all ages – has just been published. It is packed with goodies, including: a simple tester using an NE555, TV weatherman Jim Bacon, a report on a visit to the Marconi Monument at Poldhu, *Amateur Radio and the Weather* A3-size poster, the new Young Amateur Of The Year, how the NE555 works, all about batteries, a review of Howes 21/24/28MHz receiver and S-meter kit, readers letters, puzzles, competitions (win a Maplin digital indoor/outdoor thermometer), special offers (over 450 assorted components for £2.50; 10 NE555s for £1.50!) and more.

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RADCOM CONSTRUCTION FEATURE

Using an Oscilloscope as a General Purpose Tester

Mike Dawson, G3TCL, **explains how an oscilloscope can be used to display more than just AC wave-forms by adding a very simple circuit.**

THE PIECE OF TEST equipment to be described is extremely simple, and yet its usefulness is such that it is difficult to imagine how servicing and repairs could ever have been carried out without it.

It will test resistors, capacitors, inductors, and most PN/NP junctions including MOSFETs, UJTs, LEDs, varactors, tunnel diodes and avalanche diodes. In fact a qualitative test can be carried out on virtually every component in a piece of electronic apparatus.

A further advantage is that tests can be carried out on the suspect component when it is wired in place, and yet the tester uses only seven components plus a Cathode Ray Oscilloscope (CRO). It can differentiate between NPN and PNP devices and will identify transistor leads.

DISPLAY

THE CRO SHOWS both forward and reverse responses of the voltage applied to the component under test. Open circuit test voltage is only 8V peak to peak whilst short circuit test current is a mere 1.6mA. Thus, even surface mounted transistors can be checked. The circuit is shown in **Fig 1** and is assembled onto a piece of Vero stripboard measuring 1in by 2in, including the mains transformer. See **Fig 2** for assembly details. The two electrolytic capacitors may be replaced by a single reversible polarity type if available.

USING THE TESTER

TO USE, CONNECT up the mains supply to the transformer, taking *great* care to shield lethal voltages. Set up the CRO with the time-base switched off, and the two connections going to the dc inputs of the X and Y amplifiers. Screening of the test leads is unnecessary but may be used with advantage to the CRO amplifier inputs.

With the test leads open circuited, the trace will be a horizontal line. If the test leads are shorted together, the trace becomes vertical. If the common test lead is connected to a transistor base and the other lead to either emitter or collector, the CRO will show the turnover characteristics for that particular junction. The trace for different components is shown in **Fig 3**. These will be modified if the component under test is wired into circuit, since adjacent components may affect the test result. In this case, a comparison test can often be made between two similar circuits such as in a stereo amplifier. Note that with the circuit as shown, and the X-amp set at 0.2V/cm, a 9cm trace will result. With the Y-amp set at 1.0V/cm the trace is 7cm high.

Note also that some transistors have built-in protection diodes which can result in a trace which looks like a short circuit. These devices are mainly used in inductive switching circuits such as television line output stages.

Badger Boards can produce a PCB for this. Enquiries to Badger Boards, telephone: 021-366 6047.

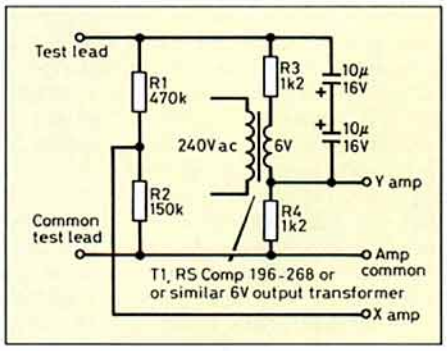

Fig 1: Schematic.

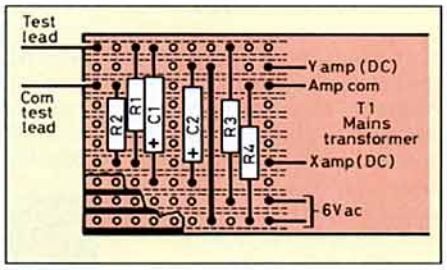

Fig 2: Assembly.

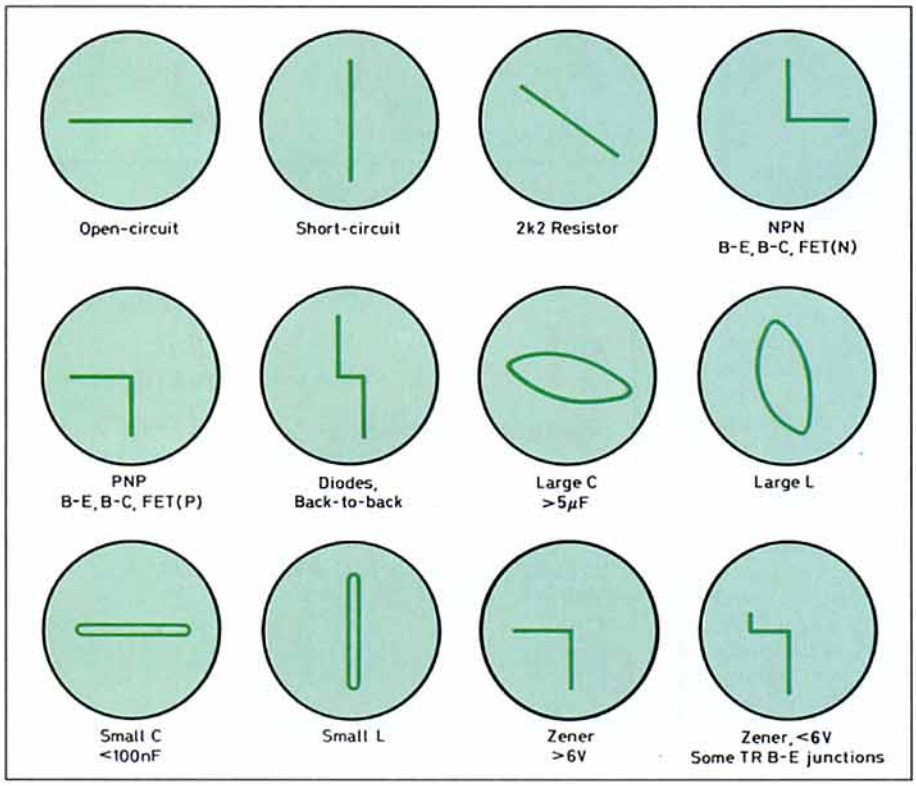

Fig 3: The trace for different components.

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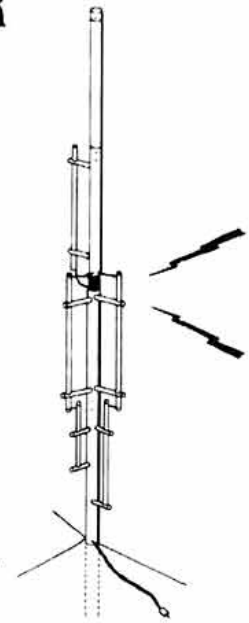

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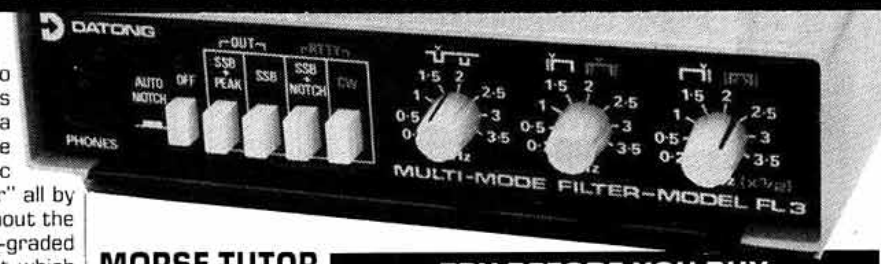
FL2 £99.95 FL3 £149.95 FL2A £54.95



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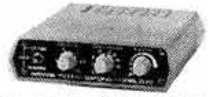

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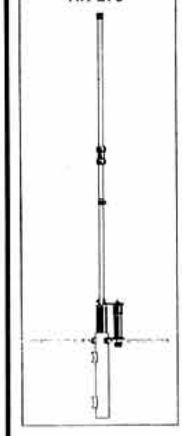

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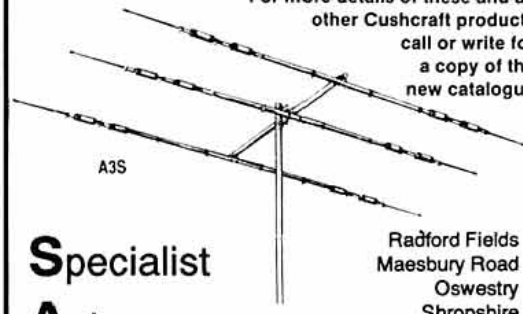

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FOLLOWING THE SUCCESSFUL mission to Romania in March/April, which was fully reported in *Raynet* (August), Raynet Groups from Strathclyde combined to provide communications for a party of 40 employees from Strathclyde Regional Council's Building and Works Department based at Bellshill in Lanark Sub Region. The Raynet work was on behalf of the Regional Emergencies Planning Officer, John MacVicar, who asked Raynet to set up the Scottish end of the link in his office in Glasgow.

Unlike the previous mission, this one was to last for six weeks, and did not require many operators at the Romanian end. It was decided to send one operator out for the whole period, and to send out three others for two-week tours of duty. In the end, owing to work commitments and a change of dates, the three tours of duty were for three, two and one week. Ted, GM4GHB, from Tobermory was the operator who went out with the overland convoy and stayed for six weeks, while Allan, GM0EFH, from Glasgow; John, GM0JMO, from Girvan; and Ray, GM4CXM, from Bearsden, were the three operators who flew out for the shorter periods.

Ian, GM3UTQ operating GB2SRC, Raynet's link to Romania.

The Glasgow end was organised and manned by Tom, GM0RKX, Ronnie, GM4SRL; John, GM6LEZ, and Ian, GM3UTQ, who did a lot of sterling work with the AMTOR link which proved a great success. Allan and Ray also operated at the Scottish end when they were not in Romania. Help was also received from the West of Scotland Amateur Radio Society, in the form of Jack, GM4COX, who was running a special event station for the World Scout Jamboree in Korea and who had a station established at Auchengillan, to the north of Glasgow. Help was also received from local amateurs who assisted the Glasgow station when the going got tough! AMTOR proved to be very successful, and Ian's policy of training the operators before their departure with the equipment which was to be used in Romania, more than paid off.

NATIONAL RAYNET

OWING TO THE LEAD TIME to publication, it is not possible to give an up-to-date report on the Raynet re-organisation situation, and by the time this edition of *Radio Communication* is published, the Manchester meeting will have taken place. The Green paper was issued to Groups, Counties, Regions, Zones, etc. during September, and comments were invited. Hopefully the meeting will go well, and we can once again do what we are pledged, provide communications in times of emergency and disaster.

EXERCISE CANBERRA

THE STRATHCLYDE RAYNET GROUP was called out for a 'real' exercise on Tuesday 24 September when a light aircraft was found to have crashed on the northern approach path to Glasgow Airport at Rothesay Dock, Clydebank, demolishing an inhabited building, and hitting railway wagons containing dangerous chemicals, and a car which was pushed into the docks.

A request for Raynet assistance was received from the Senior Emergencies Planning Officer for Glasgow Sub Region, and within ten minutes the required number of operators were on their way to the scene. Communications were established on 2m voice linking the Incident Site and Regional Headquarters, and two buses which were used to ferry volunteer casualties etc from their bases to the site and other rendezvous points. 70cm packet was used for Situation Reports which were sent from the site to Regional Headquarters and from there to the Scottish Office.

Adjoining Raynet groups in Strathclyde Region were put on *green alert* meaning that an adjacent group was active but that it was unlikely that their groups' members would be required to be called out.

Although Raynet groups in Strathclyde have been called out in 'real' situations in the past, and Raynet have been asked to act as observers and to take part in table-top exercises, this is the first time that a group has been written in to a 'live' exercise. Raynet communications were good, and it was excellent to see that the required number of operators were provided; no more, no less!

OPERATION BLUE IRIS

ON THE SAME DAY THAT the Strathclyde Group was participating in Exercise Canberra, Tayside Raynet was operating on behalf of Tayside's regional Emergencies Planning Officer for an exercise called Blue Iris. This was a pre-planned event, and a briefing meeting was held on the previous Thursday. On the day, tactical callsigns were used, and over twenty Raynet members provided nets for both the Directing Staff and for the Umpires who were on a different band, as well as a Video Net with four or five operators from Central Fife.

Talkthrough was used, the unit being sited on Dundee's famous Law Hill which sits high above the city. Talkthrough, along with Control, was under the guidance of the Tayside Regional Controller, Iain Strachan, GM4FLP, the East Fife Group Controller, Roger Stapleton, GM0GKR and his wife, Fiona, GM0GKF.

EMERGENCY PLANNING COLLEGE

TWO PAPERS ON RAYNET were given by the National Raynet Committee at a Communications Workshop; a four day course held at the Emergency Planning College at Easingwold. Eleven Raynet members attended the course, which is run annually. They were GW0CUM, G0DZG, GW0KWY, G1DZQ, G1GZG, G6DSA, G6FHM, GW6JUS, G7FKS, GW8TVX, and GW8UZL.

Raynet at Easingwold: L-R (Back Row) G7FKS, G6FHM, GW6JUS, GW0KWY; L-R (Front Row) GW8TVX, G1DZQ, G1GZG, GW0CUM, G6DSA, G0DZG; Absent from Photograph, GW8UZL

A presentation on Raynet was also made to an Emergencies Seminar which was held at Bradford University on 11/12 September.

TALK-THROUGH PERMITS

REQUESTS FOR TALK-THROUGH Permits should be made in writing to Ian Jackson, G8RWH, who is QTHR. Please allow two to three weeks for the processing of your request, and enclose a stamped addressed envelope for the return of your permit. A list of currently active permits can be seen on the 'National' files which are held on the National Raynet Mailbox, GB7NRC, in Leicester, and on the GB7SRL Raynet Mailbox in Glasgow. The file can be downloaded by typing *D NATIONAL\TALKTHRU.1* or *D NATIONAL\TALKTHRU.2*.

PHOTOGRAPHS REQUIRED

GOOD QUALITY BLACK AND WHITE and colour photographs are always required showing Raynet in operation. If you have any, and are willing for them to be used on display stands, or in *RadCom*, please in the first instance contact GM4SRL who is QTHR.

FEBRUARY COLUMN

ITEMS OF NEWS FOR THE **February** edition should be sent, **as soon as possible**, to GM4SRL at the above address.

Satellites

ARTHUR GEE G2UK
21 Romary Road, Oulton Broad, Suffolk
NR32 3PJ

AMATEUR RADIO SATELLITES have the potential for enabling a wide range of experimental work to be carried out, not only in the realm of satellite technology but also in communication techniques. One of these is the possibility of using two or even three satellites to pass signals from a ground station to one satellite, then directly from the satellite to another and thence down to a far distant ground station.

Dave Rowan, G4CUO, will be remembered for the enthusiasm he has shown in investigating this possibility and over a long period has demonstrated that this mode of satellite communication is possible. He writes:- "From the days of OSCAR 6 (1972) through to OSCAR 7 (1974) using Modes A and B, it was apparent that inter-satellite communication was possible. Also O-7 and O-8 (1978) using Modes B and J on to the days of Radio Sputniks RS 5 to 8 (1981) and O-11 (1983) and later on O-12 (1986) and O-13 (1987) Mode B and J."

He continues:- "Previous attempts at 'double hopping' were extremely restricted because of the quality and types of satellites that were available. Also little information had been written in the form of guidance. Now that we have an abundance of satellites in space with very similar parameters, double or triple hopping may be possible."

In a paper which Dave is preparing he outlines the essential parameters necessary to enable this mode of communication to be carried out. Such characteristics as the mode of operation of the satellites, their respective heights above ground, period, orbital times, orbits per day, Mean Motion and so on. Using a great deal of patience, Dave has successfully demonstrated that this mode can be carried out and contacts have already been made between his station, G4CUO, and that of Pat Gowen, G3IOR. Others such as H Hildebrand, DL1CF, and J Nevin, G4ZHG, of Newark deserve mention for their involvement in these experiments. As Dave says, there is a lot to be done yet in developing this mode of satellite communication and it is good to see yet another sphere in which amateur radio is contributing to advances in radio communication techniques.

Dave would be interested to hear from other satellite users who would like to become involved in these experiments.

THE FRENCH AMATEUR RADIO TELESCOPE - SARA

ENTHUSIASTIC LISTENERS to the satellite bands may have heard signals from a satellite on 145.955 MHz. This could have been the French/Belgium Amateur Radio Telescope SARA. Cooperation between the Belgian AMSAT group BELAMSAT and Meudon Observatory Astronomers in a unique project - Satellite Amateur de Radio-Astronomie - has proved eminently successful.

There is a good description of this satellite in the *BELAMSAT Newsletter* 8/91 to which we are indebted for the following. SARA was designed to listen to radio signals coming from the outer Universe. Low frequency signals (to a few MHz) do not pass through the ionosphere so they are not receivable in the usual way. An experiment was proposed by astronomers at the Meudon Observatory for a satellite that could listen to Jupiter's radio emissions and transmit them to earth on frequencies which could pass through the ionosphere. Some professional satellites have measured the Jovian emissions for short periods but these have been of too short a time to give valuable results. The satellite Voyager carried out experiments near the planet, but because of electromagnetic interference from its own instruments in the decametric band could only detect the strongest peaks of the Jovian emissions. These are very irregular, occurring mostly during storm periods lasting from one minute to one hour. They occur mostly between 2 to 15MHz.

BELAMSAT had been considering building an amateur satellite for some time and they realised that this suggestion from the Meudon Observatory astronomers would be ideal for their capacity in satellite building. Two criteria dominated their plans; it had to be in low orbit to miss the ionosphere, going around the earth without any trajectory control with only passive thermal control and simple electronic equipment. The project was to be favourably comparative with other amateur satellites but less complex and the whole project had to be of scientific interest.

Preliminary ideas for such a satellite were first made public in this country in a paper given at the 1990 AMSAT Colloquium at the University of Surrey by P Hamptaux, ON1KHP. Since then just about one year later, SARA has been constructed and was launched along with other satellites which included UoSAT 5, from Kourou on 17 July last at 0343, Paris time. It was the first heard by the ground station at Noisy-le-Grande on 18 July at 2337, when it was found to be functioning perfectly. It is an FM modulated, 300Baud digital transmission, ASCII, callsign FX0SAT.

The on-board equipment receives radio waves between 2 and 15MHz and can calculate their average amplitude over 150 seconds which constitutes the useful information. No other measurements are carried out, not even data of the condition of the satellite itself. The radio waves are received by means of three pairs of aerials placed perpendicular to each other. This configuration allows computation of the intensity of the fields regardless of its direction and polarisation. As the electromagnetic field is quite strong only short aerials are used; five metres on each side for all frequencies which should make the sensitivity lower than the galactic noise. One of the pair is also used to transmit the data towards the earth.

ANOTHER SUCCESSFUL COLLOQUIUM

EVEN THOUGH THE AMSAT-UK Colloquium has been over for many weeks, we feel we must congratulate all who worked so hard to make this one so successful. We still hear comments that it was the best to date. It has become an international occasion giving a unique opportunity for national groups and societies to get together formally and informally to discuss their common interests. There is no specialist international umbrella organisation to cover the national satellite bodies which exist. International cooperation is normally achieved by regular exchange of news and information between the centres or by joint work on individual projects. It was rewarding to see so many countries represented at Surrey.

Seen in the front row of the audience at the AMSAT-UK Colloquium three years ago in July 1988: (l to r) Jan King, W3EGY; Karl Meinzer, DJ4ZC; Bob McGwier, N4HY and Raphael Soifer, W2RS.

DataComms

RICK STERRY G4BLT
1 Wavell Garth, Sandal Magna, Wakefield,
West Yorkshire WF2 6JP

MANY THANKS to those readers who sent messages or letters to me in response to the September *Datacomms*. I have to prepare copy many weeks in advance, so please understand if there is a long delay before I use any of your material.

First, a slight correction. I was given the wrong postcode for Ann, G6ZTF, the BARTG Membership Secretary; it should be CV6 7GW. Second, whilst I set out the ground rules for contributing to the column back in September, I think it worth adding that if you are sending me a message from an AMTOR mailbox, it may be necessary to specify part or all of the full hierarchical address of my Packet mailbox:

G4BLT AT GB7WRG.#19.GBR.EU.

OLD DOG, NEW TRICK

ONE OF THE SNAGS with AMTOR, particularly if it is used to forward messages originating on Packet, is that all lower-case letters are converted into UPPER-CASE ones. All is not lost, as apart from the LETS and FIGS shift characters, there is a third shift character available, which is not normally used. An exception to this is the Soviet merchant navy, which uses the third shift character when sending Cyrillic alphabet characters over AMTOR. These characters are used on Russian keyboards in place of our lower-case letters, and the method has also been used on their teleprinters for some years. This third shift character is 1101010, (bits transmitted from right to left).

Some imported multimode terminal units do have this facility already, so two suitably-equipped stations could use this method with Western keyboards, and thereby send mixed-case text. Unfortunately, this is not compatible with normal amateur AMTOR, unless only upper-case letters are sent. However, Peter Martinez, G3PLX, who was originally responsible for the introduction of AMTOR, has hit on a rather neat way round the problem. By using the third shift character simply to 'toggle' between upper and lower case, complete compatibility with existing amateur AMTOR stations is assured. If the receiving station does not have the lower-case facility, then all letters are received as upper-case. If the receiving station does have this capability, and the third shift character is missed occasionally, or one is received spuriously due to a corruption, then all that happens is that a few letters or words are received in the wrong case, which does not seriously affect legibility.

On some existing TUs, such as the ICS AMT-1, AMT-2 and AMT-3, this third shift character is encoded as an ASCII NUL (00h) on the RS232 port, and so from now on I will refer to this character as a NUL. I modified my AMT-2 driver program slightly back in July, and found that the method works very well. Here's how you handle the characters within a TU driver program. All ASCII codes are in Hexadecimal, indicated by an 'h' suffix.

On Rx, the text is always assumed to start in upper-case, and a software 'flag' is set accordingly. If a NUL is received at any time, then the flag is toggled to the opposite state, eg upper to lower, or vice-versa. If a FIGS character is received, ie in the ASCII range from 21h to 40h, or 07h (BEL/Asterisk), then the flag is reset to upper-case. In other words, text following a FIGS character is assumed to be in upper case unless preceded by another NUL. Note that 'caseless' characters such as LF, CR and SPACE have no effect on the state of the flag. When an alphabetic character (letter) is received, ie in the ASCII range from 41h to 5Ah, the software flag is checked. If it is set to lower-case, then the character is converted to lower-case simply by adding 20h to its ASCII code, (or binary ANDing it with 20h). After that, the character is displayed on the screen or printer as normal.

On Tx, another software flag is used in a similar way. Initially, the flag is set to upper case. Whenever a valid FIGS character is sent, (remember to filter out characters that are not used on AMTOR), the flag is reset to upper-case. When an alphabetic character is to be sent, the flag is checked. If it is in the same state as the letter to be sent, ie both lower or both upper-case, then the character is sent as normal. If the flag is in the opposite state to the letter, ie one is upper and one is lower, then the character is preceded by a NUL, and the flag is set to the correct state.

Here's a simple example of a sequence of mixed characters, showing where the NULs should be inserted when the sequence is sent to the TU. For clarity, I've used numbers rather than punctuation or symbols. I have represented the NUL (third shift character) by the graphic symbol '▲'.

ABC ▲abc a▲B▲c 123 ABC 123 ▲abc

The ICS AMT-3 TU now has modified firmware to cater for this 'extended' AMTOR, thus removing the need to modify the driver program. The facility can be inhibited if required, and existing users can obtain an upgrade for £14·95 fully inclusive.

Extended AMTOR is in use by GB7PLX, GB7SCA, G0BSX, GM4EMX, G3SIG, HB9AK, DK0MTV, PA0RYS and JA5TX, with others pending in Finland and Ireland. Many of the prompts on mailboxes such as GB7PLX are in mixed-case text, so it is easy enough to check that your own extended AMTOR capability is working correctly once you've made the necessary changes. There may be a few cases where an AMTOR terminal displays any NULs received as some sort of special graphic character, in which case a minor software change would need to be made to inhibit this. Also, some TUs may transmit a NUL if an invalid character is sent to it from the terminal, but this too could be prevented by proper filtering in the software. In addition, there is a small speed penalty to be paid for this extension, of the order of 4 or 5% on typical text.

There are further possibilities by which the system could be extended to provide more punctuation characters, but this is not so straightforward from a compatibility point of view. If you're interested in a fuller description of the extended AMTOR, and the background to it, then watch out for an article by G3PLX in the Winter 1991 issue of the BARTG magazine *DATACOM*. Many thanks to Peter Martinez, G3PLX, and to Peter Meiring, G0BSX, for their advice.

The highly successful BARTG, convention was held at its usual venue of Sandown Park on 15 September.

PACKET LITE

THE AEA PK-88 AND PK-232 now have a new trick too! An 'abbreviated' packet mode known as Packet Lite is now included. This employs reduced-length packet header-frames, I-frames, and (especially) ACKnowledgement frames, the idea being that reducing the total packet size cuts down the risk of it being 'hit' by QRM or QRN. It is claimed that this "should lead to a significant improvement in Packet operation on the HF bands". There is a snag, as Packet Lite can only be used for direct connection between two participating stations, with no digipeating allowed. You cannot use it to connect to a standard AX25 station. Existing users can obtain upgrades to their PK-88 or PK-232 firmware, and to the IBM driver software.

NOVEL TECHNOLOGY

I CAME ACROSS AN interesting and unexpected use of digital radio comms, when my wife and I were returning a hire car near Los Angeles airport. The returning cars were being 'processed' by a number of young men, each carrying a chunky handheld terminal, with built-in thermal printer. The terminals were connected, via a thick cable, to a fairly ordinary-looking handheld transceiver (complete with rubber ducky antenna), worn on the belt. The cars ID number was entered on the terminal, and by the time I had removed the suitcase from the car, my completed statement and credit card details were neatly printed out and handed to me; all we had to do was jump on the shuttle bus. I was impressed! Does anyone know how this system works, and whether it is in any way related to Packet?

NEW PACTOR MODE

A NEW MODE HAS been developed in Germany, combining some of the features of both Packet and AMTOR. It is primarily designed for HF use, as an improvement over AMTOR. I haven't enough space to describe it this month, but you can obtain a full description plus details and prices of a PACTOR/AMTOR/RTTY TU, by sending an IRC to Dr Tom Rink, DL2FAK, Roentgenstrasse 36, 6450 HANAU 1, Germany.

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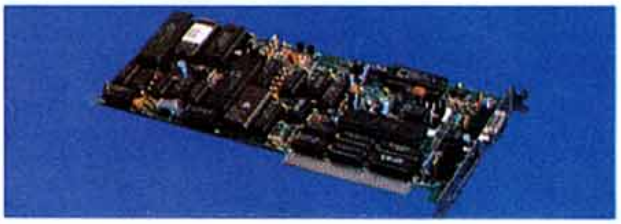

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NOVEMBER MIGHT SEEM too early to wish readers greetings for the coming festive season. However, due to the publishing schedule, *Microwaves* will not be in the December issue, but will be back in January 1992. My sincerest thanks to all of you who have contributed ideas and news for the column throughout the year, and particularly to the 'production crew' in the Editorial office who are constantly up against deadlines, writers' idiosyncrasies and space problems! I haven't forgotten the *Microwave Newsletter* editors, either. Their task may be easier in some ways, but it is still difficult without the support of you, the readers and contributors. May you all have a Happy Christmas and a Prosperous New Year!

10 AND 24GHZ COME ALIVE FROM GD!

THERE HAS BEEN A very marked increase in 10GHz narrowband activity, largely as a result of the very successful G3WDG 10GHz modules. So much so that regular participants in the 10GHz Cumulatives have remarked that 10GHz wideband activity is 'dead'. To which I can only misquote "Wideband is dead. Long live wideband". Although the results from narrowband operation are so much more convincing, please let us not forget the beginners (and particularly the Novices) who may still want to explore microwaves by means of the simpler wideband techniques which, until recently, dominated most portable activity, such as the Cumulatives.

The results of the recent Telford Club 'expedition' to the Isle of Man as GD3ZME/P for the August Cumulative, manned by G3UKV, G8VZT, G0LIA, G4AUY and G8UGL, dramatically illustrate the potency of 10GHz narrowband. The abridged results sent in by Martyn, G3UKV, are shown in **Table 1** which tells all!

Note that many of the stations worked were *not* portable, but home-based stations, and running only 200mW. Martyn recalled the group's earlier foray to GD in 1988, when the best DX was Shining Tor (196km) on wideband, with a total of "about 17 stations then". Wideband gear was used on 24GHz, consisting of a Plessey GDHM32 oscillator/mixer into a Microwave Society 10.7MHz IF receiver strip, with a Penny feed to an 18in dish. A sked with Sam, GI8GJX, failed due to low cloud/mist and 85% humidity. Dave, GM3WIL, called in on the talkback frequency en route to his site at Burrow Head (NX 451341) and the 'ZME group moved back to their original site.

Once the cloud lifted, signals from GM3WIL started to be heard. By 1130Z (still with 75% humidity, but no cloud or mist) a two-way 57/57 contact resulted, despite QSB and drifting Gunns, over the 64km path. This is claimed as the first 24GHz QSO from the Isle of Man to anywhere, and Scotland in particular! Subsequent attempts with G6CMS/P on mainland G were fruitless, but "nevertheless we had the long-awaited contact under our belts". Well done all! Let's hear of some of the contacts which are regularly going on between the growing number of fixed stations, outside the Cumulatives. Perhaps that will reveal some even more remarkable results.

BEGINNERS CORNER

IN THE SEPTEMBER column I mentioned commercially available wavemeters, suitable for VHF/UHF alignment of microwave sources and also for some of the microwave bands as well. Two wavemeters covering the range 50 to 450MHz produced by AK Developments are available directly from them, or via Cirkit Distribution. The WA2 wavemeter covers 50-90MHz and 90-210MHz in two switched ranges. Input is via a short 'whip antenna' ie capacitive coupling to the circuit to be measured is possible. The meter is 'amplified' to provide high sensitivity. The WA1 wavemeter is similar in concept, but covers 120-200MHz and 200-450MHz in two switched ranges. The accuracy of calibration of the higher range of the WA1 in my shack is not too good, but maybe that is just a one-off - I know what the offset is, so I can allow for it!

You might like to keep your eyes open at rallies for occasional bargains including ex-professional wavemeters or 'resonators'. For instance, the Marconi Instruments' TF1026/2 Frequency Meter, covers the range 500MHz to 1,000MHz with a built-in meter and input from an inductive loop on the end of a short length of coaxial cable or a capacitive probe. There are other Marconi-manufactured instruments of similar type covering other tuning ranges. Although I'm not familiar with what these are, the coverage should be obvious from the calibration scale. Another useful range of wavemeters, sometimes available as surplus, made by Wayne-Kerr Laboratories, are housed in grey steel cases, complete with calibration charts, with a large micrometer head sticking out of the front panel. They have an N-type coaxial input socket, an in-built detector and a rather odd coaxial screened output socket to connect to an external indicating meter. The Resonator CT307 covers 1,900 to 5,000MHz whilst the CT308 covers 3,000 to 8,000MHz. Although I haven't got one, the CT309 covers, I believe, 6,000 to 11,000MHz. They are all worth haggling for - I got mine for less than £10 each, which must have been a tiny fraction of their original cost.

Finally, G4ONF (QTHR) manufactures a wide-range wavemeter (144 to 2,500MHz) of a type similar to the one described later. He also produces a 'kit' of precision machined parts for a 9 to 11GHz self-calibrating wavemeter of the type described in the *Microwave Handbook*, Volume 2.

A wide range wavemeter was described in Volume 2 of the *Microwave Handbook*. Mike Scott's (G3LYP) design was similar and also required several machined parts. This version is simpler and needs no machined parts using, instead, copper 'plumbing' parts which are available from any DIY store. You will need the following bits and pieces:

- 1x 12in (305mm) length of standard 22mm OD copper pipe
- 1x 14in (355mm) length of 1/4in (6mm) brass rod
- 1x 22mm 'Yorkshire' (self-soldering) stop end
- 1x Bushing for 1/4in (6mm) shaft, at least 1/2in (13mm) long, preferably made from brass and maybe salvaged from an old radio set or wire-wound 'volume control'. Alternatively, the RS Components type 509-816 split collet 'Spindle Lock' may be used.
- 1x Control knob with 1/4in (6mm) bush
- 1x 25mm x 25mm piece of 3mm thick (not critical) PTFE or polythene sheet
- 2x Flange-mounting coaxial sockets (eg BNC, SMA or Belling-Lee, the impedance does not matter. Belling-Lee are easiest to use)
- 2x Coaxial plugs, to match sockets
- 4x 6BA (or 3mm) countersunk bolts, 1/4in (6mm) long
- 1x 6BA (or 3mm) cheesehead bolt, 1/4in (6mm) long
- 1x 6BA (or 3mm) cheesehead bolt, 1in (25mm) long
- 4x nuts and plain washers to fit above bolts

Call	QTH	Report	QRB
G3FNQ/P	Dalton, Cumbria (SD512063)	59/59	105km
G4CBW	Newcastle-u-Lyme, Staffs	59/53	194km
G3PYB	Nr Leeds (1-way)	58/—	202km
G3PHO/P	Merryton Low, Staffs	57/42	204km
G6CMS/P	Millom, Cumbria (1-way)	59/—	73km
G3NKL/P	Fairsnape Fell, Lancs	56/55	125km
G3FWA	Leicester (1-way)	219/—	293km
G3VKV/P	Cleeve Hill, Glos	119/229	301km
G8KQW/P	Walbury Hill	44/52	376km
G6CMS/P	Nr Barrow,Cumbria (1-way)	—/59	82km
G4PBP	Wolverhampton, W Mids	54/53	238km
G3LQR	Woodbridge, Suffolk (1-way)	429/—	449km

Unsuccessful attempts were made to hear G3JVL's personal beacon (450km), and to work G3NEO/P (Merryton Low, WB), G6YPK/P and G4GSB/P (Shining Tor), G0BPU (Ipswich), G3BNL (Northants), G8LSD/P and G3JMB/P (Chanctonbury Ring).

Table 1: Some of the narrowband contacts made by GD3ZME/P in the August 10GHz Cumulative.

- 4x brass half-nuts, approx 1.6mm thick - see text
- A few inches of 20SWG (0.7mm) tinned copper wire, resin-cored solder and small-flamed gas blowtorch

Note that none of the dimensions given is critical.

Cut the copper pipe to length, using either a hacksaw or a pipe cutter. Square off the ends and remove lips or burrs. Next, mark and cut the socket mounting and clearance holes (**Fig 1a**). To be sure that the holes are correctly placed, drill through *both* walls in one operation. Remove burrs. Prepare the copper stop-end fitting by drilling (**Fig 1b**). Remove burrs. Fit the shaft bushing into the centre hole (**Fig 1c**), and tighten the nuts firmly. Make sure that the copper pipe is clean and bright, both inside and outside. Clean it, if necessary, with a wet, soapy panscrub or wire wool. Wash and dry it. Fit countersunk bolts in the four smaller holes in the copper pipe, fixing them in place with clean brass half-nuts. Carefully using a fine blowtorch flame and a little resin cored solder, solder the nuts and bolts in place on the pipe. The nuts will form a firm mounting for the socket flanges.

Next, fit the prepared stop end, aligning the small holes with the socket mounting screws (**Fig 1d**). Solder the stop end in place using the blowtorch flame around the rim on the stop end. You should see the solder run around the joint when the stop end and pipe are hot enough. Remove the flame and allow the pipe and stop end to cool completely without being disturbed. This completes mechanical construction of the wavemeter body. Cut two 3in (76mm) lengths of the tinned copper wire and bend one end of each to fit tightly round the solder spills of the two sockets. Align each wire with two opposite socket mounting holes, as shown in **Fig 1e**, then solder each wire to its socket spill. Allow to cool.

The next step needs a little juggling! Feed one of the wires through one of the socket clearance holes on the wavemeter body and down through the adjacent small hole on the stop end, placing the mounting holes of the socket over the mounting screws on the body. Fix in place with a washer and nut fitted to both screws. Once in place, straighten the wire by pulling it through the hole and then bend it over at right angles where it protrudes from the hole and cut off excess. Repeat this for the other socket.

When both are in place, solder the wires to the stop end, using as little heat as possible. Square-off the ends of the brass rod. Drill a 2.3mm (for 6BA) or 2.5mm (for 3mm) hole, about 5mm deep, centrally in one end, and tap it to take a screw. Take the piece of PTFE or polythene and mark the centre, using diagonals. Mark a circle of 20mm diameter and cut a disc a little larger than this, using a fret-saw or sharp knife (take care!). Drill the marked centre hole to just clear the bolt you are going to use to fix the disc to the rod. Fix the disc to a long, say 1in (25mm) bolt, using one or two nuts and washers, clamp the bolt in the chuck of a hand-drill and the hand-drill in a vice. Using a file or abrasive paper, you can now 'turn' the disc to exactly the right size to be a smooth, sliding fit into the wavemeter body. The disc helps keep the rod central in the cavity.

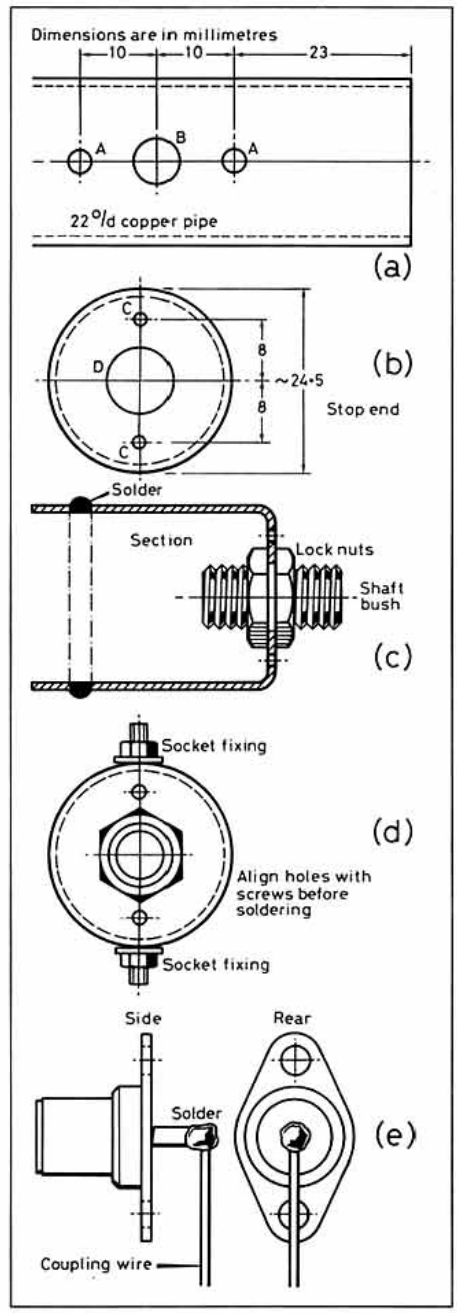

Fig 1: (a) Drilling coaxial socket mounting and clearance holes in copper pipe: Holes A = 1/8in (3mm), Hole B = 1/4in (6mm). NOTE: Hole spacings are given for Belling-Lee sockets. Different spacings/ sizes will be needed for other sockets. (b) Drilling the stop-end. Holes C = 1mm, Hole D = 3/8in (9.5 mm) or to suit shaft bushing. (c) Fitting the shaft bushing to the stop-end. (d) Alignment of the stop-end and socket mounting screws before soldering. (e) Position of the coupling wires on the sockets. The socket spills should be cut to about 5/16in (8mm) long before positioning the wires.

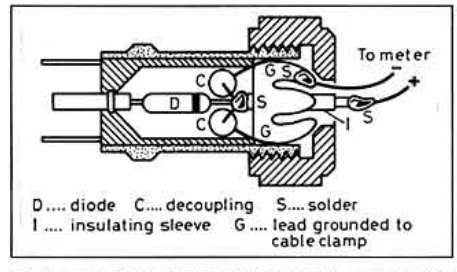

Fig 2: Making the diode detector mount. Any suitable Silicon or Schottky diode may be used. The 1nF decoupling capacitors are 16V wkg. sub-miniature disc caps. Belling-Lee ('TV') plugs are very easy to use in this application.

When satisfied, fix it in place on the tapped end of the brass rod and fit the other end of the brass rod down through the body and through the shaft bushing. Align the disc with the open end of the body. This leaves enough rod at the opposite end to attach the control knob against the outer end of the shaft bushing: if there is too much, cut off the excess to match the depth of the knob which then acts as an 'end-stop'. Make off one of the coaxial plugs with a short length (say 6in) of coaxial cable and solder a single turn probe loop, say 6 to 8mm in diameter, between the inner and outer of the cable at the free end of the cable. Alternatively, fix another plug suitable for connection to the equipment to be aligned. Make a detector by taking the other plug and soldering a diode and decoupling capacitors, as shown in **Fig 2**, inside the plug. Attach a sensitive meter (eg. 10 to 100μA) between the plug body (earth) and the detector output. Plug the detector into one socket and the probe loop into the other - it doesn't matter which!

The wavemeter works as follows: power is fed into the cavity from the probe loop. When the centre rod is 1/4 or 3/4 wavelength (λ) long (inside the cavity), it resonates and absorbs power from the coupling line. Maximum current occurs at the earthed end of the rod and maximum voltage at the 'open' end. At resonance, some power is transferred to the detector coupling line, where it is rectified to produce a DC current which is indicated by the meter.

Frequencies can be marked on the brass rod with an indelible marker or *light* scribe mark. More elaborately, as suggested by G3LYP and the *Microwave Handbook*, the wavemeter can be mounted on a wooden base carrying a calibrated (mm) scale, but this is not really necessary! Where the 3/4λ resonant length is less than the physical length of the wavemeter body, you will find *two* resonances: at 3/4λ and 1/4λ. The difference in length is 1/2λ, from which frequency can be calculated and the wavemeter becomes self-calibrating.

Place the loop close to the circuit to be measured and slowly withdraw the knob of the wavemeter. At some point the meter will indicate power. Note the position and mark the shaft with the frequency, if known. Continue withdrawing the rod, looking for a second response. If there is only one response, this will be the 1/4λ mode. In very low power circuits, it might be impossible to get a meter reading: in this case, try monitoring the emitter voltage or collector current of the stage, looking for a small change in current or voltage as the wavemeter resonates and absorbs power. Alternatively, the wavemeter may be connected to the output socket of the equipment to be aligned, if necessary via a matched (50Ω) attenuator, to couple sufficient power into the wavemeter to give adequate indication.

Made in this way, the wavemeter should cover from about 250MHz to 2.5GHz. The range could be extended to lower frequencies by increasing the length of the body and resonator rod, leaving all other dimensions unchanged. ❑

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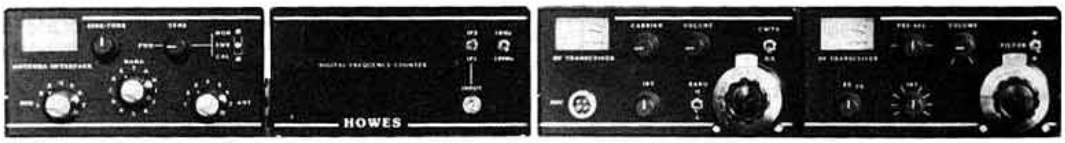

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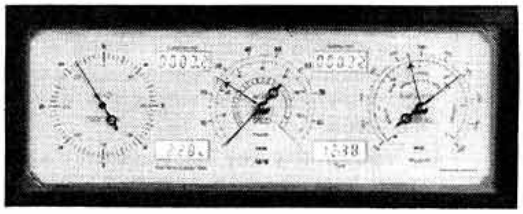

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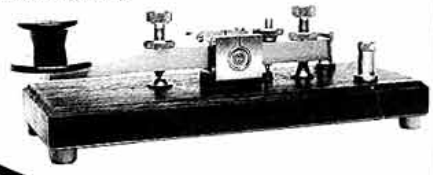

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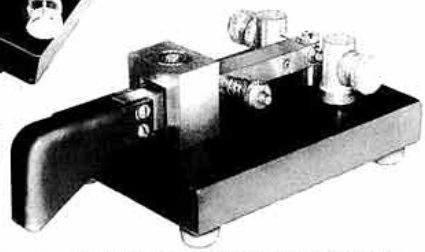

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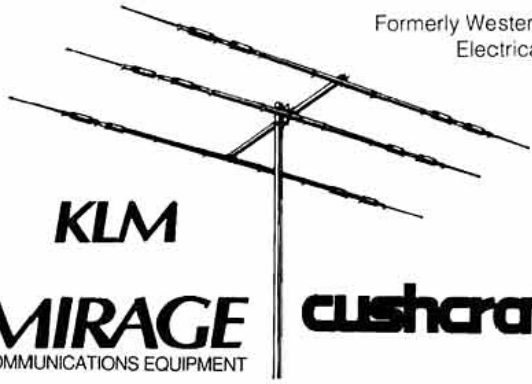

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RADCOM CONTESTS FEATURE

HF Field Day 1991

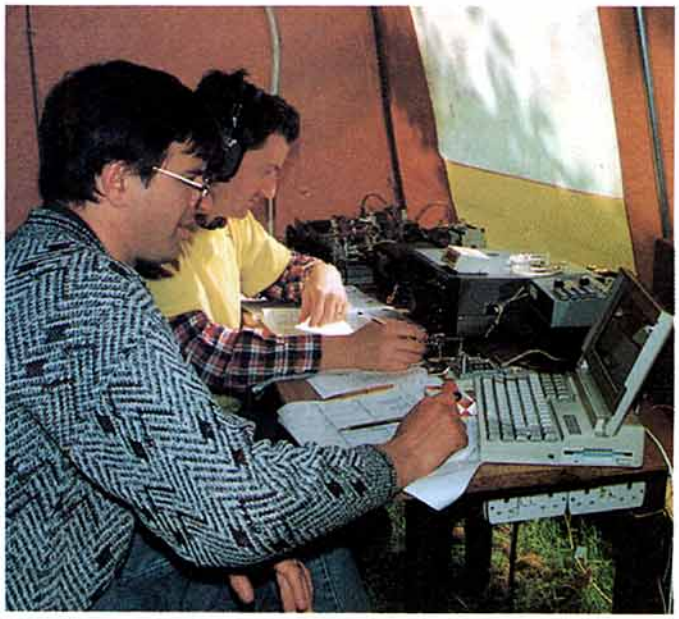
A report by Chris Burbanks, G3SJJ, with band checking and reports by G4IQM, G3SQX/G2HLU, G3MCX/G4HTD, G3LET, G4BUO and G3UFY.

OVER A HUNDRED portable stations braved the coldest Field Day weekend and the poorest conditions for many years. An increase of 6% in logs received over last year is one interesting statistic but of greater importance is the breakdown of the callsign groups, - compared to 1990, calls up to the G3 series were down by 20, G4s remained about the same but there were 24 more G0 operators listed, an increase of some 28%. I can only add a comment from G3MRP, who has helped many CW operators on their way, "If an amateur hasn't taken part in Field Day, then he hasn't lived".

A powerful solar flare just 20 minutes into the event caused considerable havoc, many groups reported checking equipment and antennas only to realise that propagation was the problem. The consequent blackout seemed more intense the further north a station was located or perhaps the effect was not so noticeable in the south due to higher level of Amateur activity.

The Leaders

A MAJOR change-round is probably the only way to describe this year's leader board. The absence of some of previous Field Days' winning groups coupled with conditions appearing to favour the southern half of the country has contributed to a new look at the top. **Overall winner** is the *Reading and District Radio Club, G3ULT/P*, operated by G3WGV and G3XTT combining high-tech with group participation. To quote "There are numerous tasks other than simply operating the station and it was a real pleasure to see so many people on site throughout the competition. It is interesting to note that the majority of those were Class Bs. Maybe the class As were frightened they wouldn't be able to read CW any more!" The group's big score on the three higher bands was undoubtedly a major factor in their success. The station consisted of an FT1000 feeding a TH5 at 66ft, with a triband dipole at right angles, a two element switchable quad for 7MHz apparently was not so useful, dipoles at 60ft for 1.8 and 3.5MHz complete the picture.



Gravesend RS, G3GRS/P with G4FAM at the computer and G4IFB at the rig.

Runner-up in the **Open** section was *Torbay ARS, G3NJA/P*, and they will collect a trophy after being so close for many years. Well done! *Kilmarnock and Loudon ARC, GM0ADX/P*, hold on tightly to the **Scottish Trophy**, with the *Stirling & District ARS* close on their heels.

G3GRS/P with watery earth mat - the river Wey in Surrey.

The **Restricted** section was hard fought as usual with *Gravesend RS, G3GRS/P*, coming out as clear winners followed by the *Downs CG, G4FNL/P* changing section and moving up a few notches to take second place.

Band Reports

1.8Hz

Top Band entries for this year's event totalled 82, with 34 in the Open section and 48 Restricted. Logs did not seem as good as in the 1990 event, five had unmarked duplicates and one of these had two despite the use of a check sheet! Points were lost with the usual transcription errors, omission and insertion of /P and claiming for phantom contacts which did not appear in the alleged station's log. On the credit side, 9 entries did not have any detectable errors and none was totally illegible.

In the **Open** section, *G3TBK/P* took the honours with 150 contacts achieved in three visits, followed by G5LO/P and G3ZRS/P with 137 and 127 respectively. *G3VMW/P* was first in the **Restricted** section with a perfect log of 156 contacts, most of which were gained in one long session. G3FXB/P and G3GRS/P were second and third with 141 and 135 contacts. The latter also submitted a perfect log. Most of the leaders started on the band between 2100 and 2200, conditions being variously reported as "good" to "fair". Static was minimal although G3XRT/P thought the band was noisy. Despite the apparently kind conditions only G3FXB/P and G3ZRS/P worked outside Europe in the shape of VE1ZZ.

Antennas were mainly centre-fed halfwaves although GM3YOR/P used an HF6VX vertical and G0MWT/P a 213m end fed wire. G5RVs were also in evidence though obviously very inefficient at this frequency. GM4MFL/P used a home made transmitter and a convertor to a modified R1155 receiver.

3.5MHz

There were some glowing reports about band conditions this year. What groups expected to find, and what they got, was an abundance of strong European portable stations worth 4 points each. The lack of static together with poor conditions on the higher bands contributed to some high scoring rates. **Open** section band winners are *G4ALE/P* scoring 666 points from 175 contacts. They made two short trips to the band at around 2115 and 2215 with a longer sojourn from 0030 to 0500. Quick checks on the other bands reassured them that they were scoring as well on 3.5MHz as they would anywhere else.

Restricted section band winners, *G4FNL/P*, netted 650 points from 173 contacts and achieved their score mainly from

a sustained period on the band from about 0000 till 0415, with two half-hour looks elsewhere. In contrast to previous years, the best strategy seemed to be to stay on the band as long as there were stations to work. Very little DX was found, just a few North American and Asian stations were active. Most entrants were content to work page after page of 4-pointers, with G4ALE/P summarising "Brisk as usual." GM0ADX/P commented that they were glad that "we were all on the band at the same time!" G4BRA/P noted some stations below 3510kHz, which is specifically prohibited by Field Day rules.

7MHz

Restricted section bandleader was again *G3GXI/P* with a single band entry containing 383 contacts, an excellently produced log with an increase in points compared with last year. In the **Open** section, single band entry scores were down, *G3IYT/P* led with 308 contacts and only lost nine of the points claimed. Most multiband groups made fewer points this year, probably due to the poor conditions in the first two hours. One group thought the receiver had died!

Comments received generally expressed satisfaction with the band. Good scoring rates could be achieved with Eu/P around 1800 on Saturday after the band had recovered, although most of the activity took place on Sunday from around 0300 onwards. Leading multiband groups spent up to six hours on the band making visits ranging from less than ten minutes to test the temperature to up to 1.5 hours depending on activity at the time, nearly all spent at least an hour on Sunday afternoon.

Some DX was available in the form of VP8, ZD8, ZL plus a few Asian and North Americans. Commiserations to the group who logged GM5NN, it had to happen sometime!

14MHz

Many groups agreed that conditions were exceptionally poor for DX. Even the specialist single-band entrants found the night hours slow going and many stations were not able to work any DX at all. Apart from a couple of contacts with ZD8, there was no activity from Africa and very little from South America and the Far East. Signals from Western Europe and even the UK were stronger than usual however and this made things easier for the less experienced operators.

Overall band leader and winner of the **Frank Hoosen, G2YF, Memorial Trophy** was *G3VHB/P*, with 1479 points from 471 contacts. A histogram provided with the entry shows major activity occurring between 1930 and 2230 with smaller peaks at 1600 - 1800, 0430 - 0630 and 0730 - 0930.

Multiband leaders were *G3ULT/P* in the **Open** section with 757 points from 244 contacts and *G3VMW/P* in the **Restricted** section with 780 points from 227 contacts.

21MHz

This band did not escape from the poor conditions that afflicted other frequencies. Most groups pronounced themselves disappointed, although short skip around G and Eu meant 4-pointer contacts were usually available. Activity declined on Saturday after 2030, with the last recorded contact at 2216. G4ALE/P made a contact at 0515 on Sunday, otherwise the band didn't liven up until around 0800.

G4APN/P and G3TVS/P were happy with conditions, but more typical were the following comments: "Silent for long periods," G3XRT/P, and "hard going, only 1W (USA, not power!)," G3TBK/P. Only G0FBB/P had a different excuse, "Didn't do as well as we had hoped as the beer ran out, the person responsible has been suitably chastised." Frequent visits to the band to keep the rate up were important, the four overall leaders in the restricted section made an average of ten visits each, while the top four in the open section averaged eight and a half visits. This underlines the importance of a quick band change capability along with a willingness to use the facility.

Those who hooked no DX at all will be surprised at what was available: A22GH, A45ZN, HM5IZ, JA3BJZ, PY2NY/2, SU1HV, VK2BJ, VQ9RS, KA1DWX, W1HT, NM2Y, N3JT, WF3M, K3WW, (these Stateside at around 1330), W2MEL and KV8H at 2040, YB2FEA, ZD8SE/P, ZL3GQ and Z21HS. However, no single group worked more than four or five of these.

28MHz

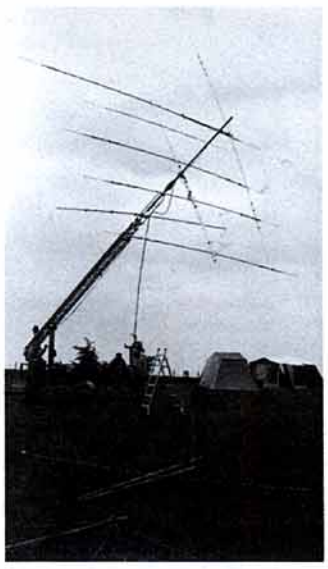
Over the past few years, sporadic-E propagation has been taken for granted and the dipole at ground level has become a standard back-up antenna. This time only two groups reported any Es contacts and it is likely that, with the possible exception of late Sunday, there were none to be had. Propagation was almost exclusively tropospheric, as evinced by the consistent weakness of signals outside groundwave range and the absence of any skip zone. Stations in the South benefited from the higher population density and the shorter path into Europe, whilst those in the north had to contend with higher absorption due to a solar event at the beginning of the contest. Several stations reported a roughness of tone on the most distant signals, another indication of troposcatter at extreme range.

Open Section band leaders, *G3ULT/P*, netted some 200 contacts from 10 visits, no doubt their TH5 at 60ft was helpful. G3NJA/P were also high scorers with 169 contacts from 13 visits. Those who correctly identified the propagation mode were ready for the evening 'lift' and made a killing when it came, GM0ADX/P ran up over 100 contacts in the period 1900 - 2100GMT and GM3YOR/P managed 80+ in the same time with only a vertical antenna.

There were more logging errors than normal, particularly amongst the leaders, with some losing 10% of claimed score; this is not really surprising in view of conditions.

AWARD WINNERS

NFD Shield	Reading and DARC	G3ULT/P
Bristol Trophy	Gravesend RS	G3GRS/P
G6ZR Memorial Trophy	Torbay ARS	G3NJA/P
Gravesend Trophy	Downs CG	G4FNL/P
Scottish Trophy	Kilmarnock & Loudon ARC	GM0ADX/P
G2YF Memorial Trophy	Midland Tower Snatchers	G3VHB/P



The G3ULT/P TH5 and 7MHz quad going up.

Possible Rule Changes

Comments were received on several rule issues and are gratefully acknowledged. The HFCC have discussed potential areas of change and have agreed the following actions:

- A Low Power section will be added to next year's event.
- The new power limit of 26dBW will NOT be applied to the Restricted section.
- Since entrants and the HFCC have no strong views on whether or not to apply the higher power limit to the Open section, the power limit rule will stay at 20dBW for Field Day 1992. Further comment will be sought from registering groups in the form of a questionnaire.
- There was no consensus on the issue of re-introducing the use of a monitor receiver and this will also be included in the questionnaire.

Field Day remains as popular as ever with a strong following, the HFCC welcomes your comments and participation in future events.

In Conclusion

CHECK LOGS were received with many thanks from G2HLU, G3BPM/P, G3HJF/P, G3SXW, G4JKS/M, GB0QRP (operated by G4BUE who inspired the introduction of the Low Power section with his 307 contacts from 5 watts), K3ZO, HP1AC, YB2FEA, ZS1AFN/P YU7KM, YU7SF and OK1DMS.

Many hours were expended voluntarily by the team of adjudicators in checking and producing the results. My own efforts start in December submitting the rules for publication in *Radio Communication* and ending in September with this report. Life just wouldn't be the same without Field Day, here's to next year's contest.

see following page ▶

CONTEST NEWS

All rules should be read in conjunction with the General Rules published in December 1990 (VHF/UHF/Microwave) and January 1991 (HF)

HF RESULTS

HF NATIONAL FIELD DAY
(see previous pages for details)

RESTRICTED SECTION

Posn	Call	Group	QSOs	1.8	3.5	7	14	21	28	Total
1	G3GRS/P	Gravesend RS	925	1032	630	675	608	549	884	4378
2	G4FNL/P	Downs CG	901	972	650	687	691	377	670	4047
3	G3VMW/P	Marple CC	884	1156	496	717	780	357	506	4012
4	G3FXB/P	Lordings CG	864	1048	593	625	539	424	750	3979
5	G3MXJ/P	Uckfield CG	866	1020	599	833	619	331	546	3948
6	G4MBC/P	Mid Beds Contest Assn	882	780	523	848	619	381	770	3921
7	GW3WAS/P	Lichfield ARS	902	896	562	672	673	420	668	3891
8	GW8GT/P	Red Dragon CG	802	1004	583	702	699	331	250	3569
9	G5BK/P	Cheltenham ARA	832	668	582	751	573	329	662	3565
10	G3GLL/P	Tollesbury CG	728	936	542	609	382	412	528	3409
11	G3SFG/P	Southgate ARC	783	646	515	689	591	357	488	3286
12	G3OZF/P	Chiltern DX Club	711	618	386	701	537	422	562	3226
13	G0FBB/P	Windmill CG	709	784	451	609	688	256	330	3118
14	G4BRA/p	Bracknell ARC	696	598	546	735	454	227	432	2992
15	G3XRT/P	Ilford RSGB Group	690	686	427	625	510	351	366	2965
16	G3WSC/P	Crawley ARC	623	952	346	677	502	173	280	2930
17	G3DIT/P	South Hants Telegraphy Soc	646	634	410	490	516	294	456	2800
18	GM3BSQ/P	Aberdeen ARS 'A'	622	634	494	584	519	227	392	2850
19	G4ARN/P	Norfolk ARC	705	558	580	765	446	163	280	2792
20	G4COU/P	Stumble CG	605	764	548	650	367	157	270	2756
21	G4GZQ/P	G4GZQ CG	648	442	480	805	444	195	290	2656
22	G3TRF/P	Maidstone YMCA ARS	688	538	385	646	334	296	388	2587
23	G4FOX/P	Melton Mowbray ARS	558	950	214	569	420	151	264	2568
24	G4AYM/P	Gloucester ARS	575	744	394	372	489	250	288	2537
25	GM3YOR/P	Inverclyde ARG	501	602	140	147	517	151	924	2481
26	G3TMA/P	Lincolnshire Poachers CG	635	780	428	485	518	110	72	2393
27	G3TVS/P	TV ARTS	618	494	558	357	445	221	308	2383
28	G3YDD/P	Hereford ARS	513	742	292	551	358	194	196	2333
29	G3KHZ/P	Park Air Club	501	734	412	347	437	2	344	2276
30	G3HRC/P	Havering & DARC	557	384	364	458	454	251	302	2213
31	G6UQ/P	Stockport RS	483	724	326	420	229	164	316	2179
32	G4ADM/P	Sutton & Cheam RS	456	630	425	238	203	166	404	2165
33	GW4CC/P	Swansea ARS	509	518	465	377	535	44	196	2135
34	G0FDX/P	Central Lancs ARC	530	250	404	486	521	261	176	2098
35	G3WSM/P	Weston-Super-Mare RS	462	302	338	714	348	64	116	1882
36	G4PGW/P	North Devon Binder Twine CG	348	614	42	213	257	138	576	1840
37	GM3ULG/P	Glenrothes & DARC	457	590	328	389	426	64	0	1797
38	G3KNU/P	Scunthorpe ARC	453	434	316	409	380	173	60	1772
39	G4ECT/P	Cheshunt & DARC	443	176	219	538	394	97	300	1724
40	G3WQK/P	Southdown ARS	398	466	196	235	508	123	164	1692
41	G4GCT/P	North Bristol ARC	397	346	280	397	441	74	88	1626
42	G3WKS/P	West Kent ARS	401	0	400	292	374	219	320	1605
43	G8GG/P	Blackpool & Fylde	404	248	394	378	287	138	104	1549
44	G0EMU/P	Haytor Hillbillies CG	496	16	381	572	334	157	68	1528
45	GW4LZP/P	Meirion ARS	366	88	308	438	310	193	108	1445
46	G4UFK/P	Exmoor RC	247	480	124	100	188	101	360	1353
47	G4APN/P	Easington ARS	332	84	203	207	259	367	116	1236
48	G3GXI/P	Eccles & DARS	383	-	-	1215	-	-	-	1215
49	G4FRS/P	Farnborough & DARS	348	-	-	1129	-	-	-	1129
50	G4RKO/P	Thatcham Novice CG	341	0	193	590	203	72	32	1090
51	GM0LNQ/P	Aberdeen ARS 'B'	199	174	94	271	160	36	0	735
52	G4BLI/P	Plymouth RC 'B'	212	0	78	218	256	156	16	724
53	G3LRS/P	Leicester RS 'B'	98	0	184	0	0	44	192	420
54	G4CDD/P	Denby Dale ARS	127	50	75	96	145	22	6	394

OPEN SECTION

Posn	Call	Group	QSOs	1.8	3.5	7	14	21	28	Total
1	G3ULT/P	Reading & DARC	1048	898	599	574	757	582	1288	4698
2	G3NJA/P	Torbay ARS	999	764	627	582	669	570	1080	4292
3	G4ALE/P	Addiscombe ARC	917	922	666	677	678	324	838	4105
4	G5LO/P	Oxford & DARS	927	1006	588	527	731	445	688	3985
5	G3TBK/P	East Notts CG	867	1120	569	776	526	296	692	3979
6	G3PRC/P	Plymouth RC 'A'	857	746	508	607	682	495	744	3782
7	GM0ADX/P	Kilmarnock & Loudon ARC	812	620	400	611	600	641	900	3592
8	G3ZRS/P	East Riding CG	806	926	522	735	558	410	308	3459
9	GM6NX/P	Stirling & DARS	730	616	436	524	632	434	664	3306
10	G3RIR/P	Leicester Poly ARS 'B'	709	866	450	618	0	389	710	3033
11	G5RS/P	Guildford & DRS	658	672	342	588	550	213	640	3005
12	GM4AZZ/P	Magnum CG	695	650	305	468	697	498	380	2998
13	G3ASR/P	Edgware & DARS	659	664	440	634	457	207	582	2984
14	G0ODS/P	Verulam ARC	638	640	447	641	501	283	364	2876
15	G3CAR/P	Chiltern ARC	616	882	353	570	430	148	468	2851
16	G3VGG/P	Bromsgrove & DARC	695	368	384	266	749	324	718	2809
17	G3CNX/P	Grimsby	671	772	621	569	458	210	164	2794
18	G3PDL/P	Scunthorpe ARC	616	828	524	452	408	111	396	2719
19	G4ODR/P	Southgate ARC	641	720	440	430	584	211	320	2705
20	G0MWT/P	Chelmsford ARS	561	808	240	729	260	240	360	2637
21	G3FVA/P	South Manchester RC	480	834	344	422	262	160	228	2250
22	G4BP/P	Scarborough ARS	464	700	316	253	375	212	374	2230
23	G3KUE/P	Preston ARS	495	726	184	476	444	216	182	2228
24	G4EKT/P	Hornsea ARC	461	640	380	301	350	143	340	2154
25	G4RSE/P	Sears CG	520	344	306	365	509	240	364	2128
26	G4VRS/P	Aylesbury Vale	460	586	492	336	278	174	238	2104
27	G0IAM/P	East Birmingham CG	429	572	238	463	215	302	254	2044
28	G3UES/P	Echelford ARS	378	260	313	164	245	118	814	1914
29	G3VCP/P	Crystal Palace & DRC	421	372	298	368	198	204	414	1854
30	G3WKX/P	Maidenhead & DARC	401	88	246	258	476	225	364	1657
31	G3YRC/P	Great Yarmouth RC	324	518	332	301	112	77	216	1556
32	G3VHB/P	Midland Tower Snatchers	471	-	-	-	1479	-	-	1479
33	G3SDC/P	Leicester Poly 'A'	423	-	-	-	1359	-	-	1359
34	G4ATH/P	Thornton Cleveleys ARS	291	464	146	333	192	46	144	1327
35	G6LX/P	Surrey RCC (Croydon)	386	-	-	-	1269	-	-	1269
36	GM4GRC/P	Glenrothes RC 'A'	300	312	166	191	289	133	84	1175
37	G3IYT/P	Humberston RC	308	-	-	1021	-	-	-	1021
38	G5UM/P	Leicester RS	303	-	-	988	-	-	-	988
39	G4AHG/P	Shirehampton ARC	326	-	-	962	-	-	-	962
40	G3BSN/P	Clifton ARS 'B'	295	-	-	959	-	-	-	959
41	G0BRC/P	Bredhurst RATS	292	-	-	-	947	-	-	947
42	GM3USL/P	Cunninghame & DARC	325	0	38	81	346	68	368	901
43	GM3ZRC/P	Greenock & DARC	241	0	156	140	241	290	24	851
44	G3GHN/P	Clifton ARS 'A'	236	-	-	-	787	-	-	787
45	GM4MFL/P	Easter Ross RC	220	22	46	138	215	116	140	677
46	G3NFC/P	Burton on Trent & DARS	122	0	0	202	48	20	272	542
47	G2XV/P	Cambridge & DARC	134	0	68	24	225	107	60	484

HF RULES

LF CUMULATIVE CONTESTS 1992

The original aim of these events was to offer newcomers to contesting an opportunity to 'get their feet wet'. Even though support has grown over recent years, 'Old Sweats' taking part (who are more than welcome, of course!) are asked to bear this aim in mind should they run across an operator who lacks their own confidence, experience and expertise. There are five sessions on each band, the best three of which will count. Each band is regarded as a separate contest, and entrants must operate from the same location for every session on a particular band. In response to a number of requests, the sequence of the sessions has been varied slightly this year, thus avoiding a clash with the RSARS annual event, and also leaving the day of CW AFS clear. This does mean, however, that the first event of the 1992 series is in fact in 1991!

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

2 Dates and Times:

1.8MHz - Mon 6 Jan, Tue 14 Jan, Wed 22 Jan, Thu 30 Jan, Fri 7 Feb.
All sessions 2000 - 2200GMT.

3.5MHz - Sun 5 Jan, Sat 11 Jan, Sun 19 Jan, Sat 25 Jan, Sun 2 Feb.
All sessions 1600 - 1800GMT.

7MHz - Sun 29 Dec 1991, Sat 4 Jan, Sat 18 Jan, Sun 26 Jan, Sat 1 Feb.
All sessions 1000 - 1200GMT.

3 Frequencies and Mode: All contacts to be made between the limits 1835 - 1865, 3520 - 3550 and 7015 - 7040kHz, CW only.

5 Contest Exchange: Send RST + Serial Number, commencing with 001 *for each session*. Stations may be contacted world-wide, and may be worked **once in each session** for points.

6 Scoring: Each completed contact scores 3 points. The total score for each contest is the sum of the best three sessions on that band.

7 Logs: Only one cover sheet is required for each band. Entrants are asked to submit logs for every session that they are active, in order to assist with adjudication. Address for entries as in General Rules.

8 Closing Date for Logs: All entries must be postmarked no later than 25 February 1991.

9 Awards: *Remember that each band is a separate contest!* A Certificate of Merit will be awarded to the station with the highest score from the best three sessions on each band. Additionally a Certificate of Merit will be awarded to the entrant having the highest aggregate score from all three contests combined.

The adjudicator would welcome checklogs from SWLs and non-participants.

RSGB VHF CONTESTS CALENDAR - 1991

27 Oct	2nd 1296MHz Fixed/SWL (Mar 91)
1 Nov	432MHz Cumulatives (Mar 91)
3 Nov	144MHz RSGB CW (Mar 91)
2/3 Nov	144MHz CW Marconi/RSGB 24 Hour (Mar 91)
8 Nov	144MHz CW Cumulatives (Mar 91)
9 Nov	1.3 & 2.3GHz Cumulatives (Mar 91)
17 Nov	432MHz Cumulatives
25 Nov	1.3 & 2.3GHz Cumulatives
1 Dec	144MHz AFS & Fixed & SWL (Mar 91)
3 Dec	432MHz Cumulatives
10 Dec	1.3 & 2.3GHz Cumulatives

A full list of 1991 RSGB VHF Contests appears on page 65, December 1990 *RadCom*. Dates of publication of rules in *RadCom* are shown in brackets.

AFFILIATED SOCIETIES TEAM CONTEST 1992

1 The General Rules for RSGB HF Contests as published in the January issue of *Radio Communication* will apply. As in 1991, the top 20kHz of the allocated band are dedicated as the 'QRS Corral' - it is intended that operators less experienced in CW and contest techniques should be able to make contacts here in a more relaxed environment - experienced contesters using the segment are required to play fair and *keep their speed right down.* Contestants are reminded that those who operate in a manner not within the spirit of the event render themselves liable to disqualification, as do those who breach the rules.

2 When: 1300 to 1700GMT, Sunday 12 January, 1992.

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

4 Eligible Entrants:

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

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

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

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

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

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

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

8 Entries:

(a) Each team entry must be accompanied by a Team Summary Sheet, which must contain the following information, and be signed by an officer of the affiliated society:
Name of team (eg RNARS Copenhagen 'B');
Callsign of each station in the team
Individual claimed score for each station in the team;
Claimed score for the whole team;
The normal meeting-place of the club/branch;

continued on page 75

HF CONTESTS CALENDAR - 1991/92

Nov 9	Club Calls Contest (Sep 91)
Nov 9	*YL/OM CW/SSB*
Nov 9/10	*OK DX CW/SSB*
Nov 9/10	*WAE RTTY (p16, Aug 91)*
Nov 16-17	2nd 1.8MHz CW (Sep 91)
Nov 16/17	*Austrian 1.8MHz CW*
Nov 17/17	*Oceania QRP (WIA)*
Nov 23/24	*CQWW CW (p13, Nov 91)*
Dec 6/7/8	*ARRL 160m DX (CW)*
Dec 13/14	*ARRL 28MHz (CW/SSB)*
Dec 29	LF Cums 7MHz (Nov 91)
Jan 4	LF Cums 7MHz
Jan 4/5	*ARRL RTTY Roundup*
Jan 5	LF Cums 3.5MHz (Nov 91)
Jan 6	LF Cums 1.8MHz (Nov 91)
Jan 11	LF Cums 3.5MHz
Jan 12	AFS (CW) (Nov 91)
Jan 14	LF Cums 1.8MHz
Jan 18	LF Cums 7MHz
Jan 18	AFS (SSB) - NEW EVENT (Nov 91)
Jan 18/19	*HA DX CW*
Jan 19	LF Cums 3.5MHz
Jan 22	LF Cums 1.8MHz
Jan 25	LF Cums 3.5MHz
Jan 25/26	*CQ 160m DX*
Jan 25/26	*UBA CW*
Jan 25/26	*REF CW*
Jan 26	LF Cums 7MHz
Jan 30	LF Cums 1.8MHz
Feb 1	LF Cums 7MHz
Feb 1/2	LF SSB
Feb 2	LF Cums 3.5MHz
Feb 7	LF Cums 1.8MHz

VHF RESULTS

1990 70MHZ CUMULATIVES

Despite usual propagation conditions, deep QSB, noise and generally poor, short openings in all directions produced good contacts, and entry activity was up on the previous year. Congratulations to winners and runners up in each section.

G8HHI.

SINGLE OPERATOR FIXED

Pos	Call	Pts	QSO's	Loc	Sessions	Best DX	Km
1	G6ZTU	652	98	93HN	3,4,5	G3YJX	413
2	G4APA	471	91	83TD	1,2,-	GM0FRT	435
3	G3WHK	446	90	91VJ	1,2,3	GI4SJB/P	516
4	G3UKV	389	89	82RR	1,2,3	GI4SJB/P	298
5	G0EHV	275	29	94FW	1,3,4	G4LNV	391
6	G4FOH	242	59	83QC	2,3,4	G4ZTR	279
7	G8FMC	168	53	91PT	1,3,4	G0EHV	352
8	G0HFJ	154	38	91JJ	2,3,4	G4HGT	274
9	G4OUT	139	51	92AY	1,2,3	GI4SJB/P	321
10	G8BFL	132	39	92BQ	1,2,3	GI4SJB/P	335
11	G4SJH	92	32	91PI	1,2,4	G6ZTU	249

OPEN OTHER STATIONS

1	G7APD/P	483	111	92LJ	1,3,4	GI4SJB/P	398
2	GI4SJB/P	466	40	74CO	2,3,4	G8MFV	582
3	G4LNV	306	80	91MK	1,3,5	G0EHV	391

SWL SECTION

1	BRS52543	178	34	83LT	1,2,3	G3WHK	330

Checklog acknowledged with thanks, from G3BPM. G8HHI. (How about putting your checklog in as an entry? *G4DEZ*).

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- ASCII
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- ACARS (aircraft TLM)

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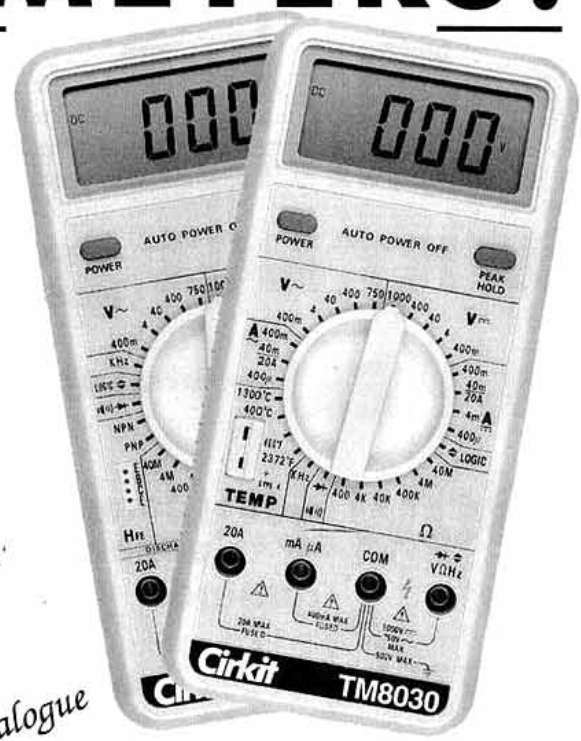

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ALTRON m/band mini beam Cushcraft A4 Tribander G600RC Yaesu rotator Altron AT32 telescopic tiltover tower: £50, £150, £100, £150 respectively. (Congleton) 0477 34601.

BBC-B computer (ISS7), Acorn DFS, ATPL ROM bd, extra 16K Ram: £175. Acorn teletext adaptor: £65. AMT2 AMTOR modem and BBC ROM: £125. Commstar 2: £15. CC Caretaker: £15. Sleuth: £15. BEEBCALC: £10. Toolbox: £10, Chess: £5. Wordease: £5. Linkword German Spanish Italian: £5 each. Acorn users 82-86 free with computer. (Cardiff) 0222 598062.

CLEARANCE sale - Realistic DX440 HF Rx as new: £50ono. Yaesu FT4700 dual band 2m/70cm mobile 50W HI - 5W low, as new: £500ono. Buyer collects. Steve G6ELD (South Manchester) 061 969 5103. (after 6pm or wkends). First to see will buy!

CLEARANCE sale. TH77E 2m/70cm dual-band h/held, as new, 6 months old.: £290ono. FT707 100W SSB/50W AM HF rig & mic, ex conx: £300ono. PK232 multi packet/fax/fec etc decoder, as new: £220ono. Tandy h/h PRO-34 scanner, as new: £240ono. Buyer collects. Steve G6ELD (South Manchester) 061 969 5103 (after 6pm or wkends).

COLLINS KWM-2A tcvr with nb, 312B-5 VFO, 516F-2 PSU, spare new PAs, Shure 444: £599. Collins R-390A Rx with (rare) desktop cabinet, spare IF strip, valves, knobs etc: £499. Collins KWM-380 tcvr with all filters, nb, processor and Collins hand mic: £1199. Eddystone 1650/9 rx with motorised preselector, FM and desktop cabinet: £1299. Liniplex F2/OSC1 sync am hf rx with Liniplex loop antenna: £499. KW Vespa tx: £60. Yaesu FRT7700 atu: £30. ICOM SP20 spkr: £50. Adonis AM805G desk mic: £25. WPO parametric equaliser: £10. SEM audio multifilter: £20. Zenith twin drive PC laptop: £150. Rollercoaster and caps for ATU: £40 or £2999 the lot, buyer collects. Going homebrew QRP so would consider PX for gdd test gear. Stuart Senior, G4MIB QTHR (South London) 081 674 6452.

HANSEN VHF/UHF SWR/PWR meter 20/200W remote head illuminated display, mint, bxd: £43. SG Brown Type F hdphones: £15. Eddystone 3653P black crackle, circular loudspkr: £50. Drake HS75 headphones: £11. All carr paid. G3XGK (Lowestoft) 0502 564 160.

DRAKE TR4 with remote VFO-PSU: £285, Linear 2 144 SSB: £50, 10m 28.260-29.700 FM SSB: £50, Atlas RX TX: £200. G4BNH QTHR. (Shipley) 0274 593153.

FT227R 10W 2m mobile tcvr complete with mans: £100: 50W amplifier for use with any 2m FM 10W rig: £40. G3SHD. (Milton Keynes) 0908 314919.

FT480R manual mic, needs attention: £150. CBM 64C, 2 datassettes: £300. Games, mouse, joystick, paddles, full-size 61-key keybd and s/ware, all boxed £175. Harngear PMX preselector: £30. Yashica electro camera outfit, extra lenses: £150. Rare Rolling Stones albums, 10 in all including rare 3D album, all vgc: £250. Ian G7HXI (Stalham) 0692 580 201 (day).

FT707 Yaesu, ideal HF/Mobile/Contest radio, 100W SSB, 50W AM with mic, as new: £300/offers. Steve RS9241 (Manchester) 061-969 5103 (eves).

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HRO MX, HRO 5t, Marconi CR100. BC221, W1191A, Eddystone EC10, CT216 VSWR meter Marconi valve voltmeter, TG23G XTAL calibrator, TF1101 RC. OSC, RF bridge GR-1606A, GR-916AL, Tayluy sig-gen. Racal ATU, Racal VSWR indicator, 13.2v, 15amp PSU, Ferrograph 632u tape-deck, 400v PSU, Colonel FR360, Tandberg S15-tape recorders. Rees-mace TX's Morse keys, Pioneer graphic equaliser portable aerial mast plus lots more. All very cheap to callers only. (Nottingham) 0602 582 132.

HY-GAIN, HY-QUAD 2-ele 10/15/20 beam. Top quality high performance all metal antenna. In good condx: £150. G0JIU (Woodhall Spa) 0526 52965.

ICOM IC-2GE and IC-4GE (2m and 70cm high power single band current model h/helds) used but in perfect wkng order, bxd and complete with all accessories as orig supplied when new, IC-2GE: £125. IC-4GE: £250. Tonna 20089 2m 9-ele prtble Yagi, unused and bxd as new: £25. Could deliver. 0273 722 955.

KENWOOD TS830S c/w CW filters and mic. vgc, any inspection/test: £650ono. GW3VOL Jeremy (Cardiff) 0222 892 020.

KENWOOD TS830S fitted CW filter, SP230, AT230, MC50, mans, all bxd as new: £750. G0NBI QTHR (Birmingham) 021 445 1958.

SUPERB mint condx HF station. Little use. Drake TR7A (late model), Drake L-7 2kW linear. Both with Drake power supplies. MN2700 ATU, Shure 526 amplified desk mic, DL-1000 dummy load. All manuals. No splits - no time wasters (re-advertised). Price: £1850. Also extra L-7 linear with PSU for sale, also mint: £950 (no offers). Ray G3PCN (Pinner, Middx) 081 866 3300 or fax: 081 429 0950.

TOKYO hy-power linear HL-IK, recent prof. overhaul: £350 buyer collect. (Reading) 0734 693284.

TENTEC Paragon, as new condx, CW filter, very little use: £1100. Homebrew HF linear 2x3/500Z at 3.5kV separate PSU, contest winner in the right hands: £375. G4OBK not QTHR (Stoke-on-Trent) 0782 201001.

TRIO TS515 tcvr 80-10m, PS515 PSU, remote VFO5S, CWF, mans: £230. Palomar tcvr preselector: £50. Collins 75S-3B Rx, man: £250. Pair field tele 'F': £50. Mains txfmr 1800-0-1800 500m/A: £50. Heater txfmr 2x813: £20. 5KW linear amp tank components: £50. (Ash Green) 0474 872743.

YAESU FT69OR II, dip on linear, mobile mount, tele/ant: £325. FT79OR II, nicads, DTMF mic, s/case, antenna: £350. Mutek 2m preamp: £15. Ezitune: £25. 8-ele Yagi, 2ft Jaybeam, HD stand-off brackets, 1.5Mbyte PC mem: offers? (Reading) 0734 819303.

YAESU FT707 100W 10/80m SSB AM CW filter; FP707 power supply and speaker; FC707 tuner; fitted cabinet key on drop leaf. Orig bxs, man and other books incl. Gd condx - moving home: £590ono. Also Sommerkamp TS788DX - offers. Fred G3JTI (Cumbria) 0539 533 860.

"GOING for a song" Icom IC22A + 44 crystals: £65. 2m 10-40W linear: £40. FRV7700D VHF to HF cnvtr: £30. R537S VHF Air Rx + 2 crystals: £40. G8XPZ (Nottingham) 0602 389911.

132FT long wire possible! QTH 3 bed semi, cnsrvtry, long garden, fertile soil, rotovator, garage, near sea: £65,000. G3GT not QTHR. (Portchester) 083 483 369.

290 incl NiCads, carrying case, rubber duck and chrgr. Gd condx: £220. (Burnley) 0282 38306.

2METER 5/8 whip gutter mount cable: £15. Spectrum amp 25W, suit FT290: £25. 5-ele Yagi, unused: £10. Carr extra. G2WIW (Hinckley) 0455 845 019.

2MTR Yagi Tonna 9-ele with 10m URM67 low loss co-ax. Buyer collects: £20. Brian G4FIG QTHR (Lancing) 0903 762 134.

40FT self supporting mast complete with 8x11ft shack/4th bedroom. 20x12ft brick gge, parking for 2 cars, quiet end-terrace house Camberley/Sandhurst area, Junior/Comprehensive schools 4 minutes, shops/doctor/dentist/buses 3 minutes: £74,500 Not QTHR. SAE details G4ISK(0256 469 682/0344 771 141).

60FT LDF5-50, four connectors: £60. Codar CR70 receiver: £30. FF2's xtalled, with charger: £70, will split. 2m 40W amp: £35. (Walsall) 0922 473 492.

A.O.R. 1000 m/m with D130N discone antenna: £200. Eddystone EC10 Mk2: £50. All equip in mint cond, bxd as new. Prefer buyer collect or carr extra. G1EYL QTHR (Dronfield) 0246 415 667 (after 5pm).

ACORN User, PE, PW, Studio Sound mags. Box: £10. Collect RS Comps omega 5+ alarm panel c/w bell: £50. Stolte memomatic rotator: £16. (Chester) 0244 335 152.

ALTRON wall mounted tower, 45ft: £250. CAPCO magnetic loop AM3: £175. All perfect condx. (Epsom) 081 330 0142.

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APPLE II Europlus, twin disks, colour mon, word processing, spreadsheet, games: £250 with printers. G7IET (nr Sevenoaks) 0959 34459.

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BBCB 32K, 14in B/W ptble TV, 44 games cass, datacorder & books. Buyers collect or carr extra: £175 the lot - no split. G1EYL QTHR (Dronfield) 0246 415 667 (after 5 pm).

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BNOS linear amp LP 144-3-50, 3W in, 50W out. Bxd as new. Absolutely mint: £85, 9-ele XY tonna: £30. G0KPH QTHR. (Nr Warwick) 0926 429719.

BNOS LPM 2m 180W linear: £175. Standard C500 2m/70cm + accs: £275. CA-2x4 max 2m/70cm colinear: £50. Valve HT PSU 1500v: £75. G6OWI (Accrington) 0254 382423.

BRAND new bxd valves. Two 8438/4-400A capable 700W each valve. G2DTQ (Wolverhampton) 0922 415 048.

CABLE Westflex 103 40m reel: £36. URM67 two reels 40m: £26 and 60m: £39. Post at cost. G4ZHI (Wallingford, Oxon) 0491 651 236 (after 6pm).

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CAPCO loop AMA3. Trio 9RS9DS comms Rx. Star masterkey keyer. Offers. (Stockport) 061 477 3912.

COLLINS 30L-1 linear new valves leads h/book, immac: £430. 572B valves tested, bxd: £30. KW antenna 3-way switch unused: £15. Power SWR meter by TTC, pristine: £20. Silent key sale G4HTA by G3MJK QTHR (Basingstoke) 0256 389 439.

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DATONG FL3 inc power unit, ex condx: £95. Approx 40 yards FHJ4-50 coax. Dusty but unused: £50 Buyer collects. (Bedale) 0677 422316.

EDDYSTONE 1830 Comms Rx 120KHz-31MHz s/state: £250. Eddystone 1837 Rx chassis, digital display, unfinished project: £80. Yaesu FC901 ATU: £90. G4MQW (Solihull) 021 745 4068.

EDDYSTONE EA12 RX amateur bands only (not WARC). Ex condx. Many spare valves plus h/book: £100. G3KAA QTHR. (Luton) 0582 508370 (eves).

FACTORY built Heathkit tcvr model HW-5400 plus power supply HWA-5400-1 complete with all mans and data sheets. Extras incl built-in digital clock and direct entry keypad. WARC equipment is as new and has been checked over by Heathkit and not used since. Offers around £499. G4BZP QTHR (Loughborough) 0509 880 279.

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FT101E with digital readout. Ex condx: £310. (Brighton) 0273 736915.

FT101E, ex wkg condx, bal mixer mod, all WARC bands, 12v/mains: first £200 wins. G3JKX QTHR (Shropshire) 0952 299 677.

FT101ZD Mk3 bxd, mans: £425ono. AVO 9SX as new: £42ono. Scope 15MHz 2 beam: £110ono. G0GUL QTHR (Coventry) 0203 450 476.

FT102 Yaesu tcvr, mint condx: £495. Prefer buyer collects (Somerset) 0934 743 636 (home) 0934 742 326 (office).

FT221 2m m/mode £280. FT708R 70cm h/held inc mic/spkr wallcharger: £140. Both ono and incl carr. G4GBF QTHR (Chester-Le-Street) 091 388 2790.

FT221R 2m m/mode VFO 144-148 AC240 or DC+12 20W + cal etc, vgc, precision built, man: £350ono. (Poole) 0202 666 299.

FT290RII bxd, soft case, nicads, chrgr, less than 12 months old, mint: £295. G7FZB QTHR (Alsager) 0270 875507.

FT4700 c/w boot mounting kit, duplexer and dual band antenna: £500. AOR2002 VHF/UHF scanning Rx bxd: £300. KAM TNC unused, bxd: £220. Microwave Modules Morse talker: £100. Buyer to collect. (Chesterfield) 0246 852 469.

FT480R 2m m/mode, mic, brkt & desk stand vgc: £220 + carr. G4LWA QTHR (High Wycombe) 0494 531 755.

FT480R 2mtr m/mode tcvr, mint condx with matching FP80A mains power supply, YM38 desk mic and mobile brkt. 10W output. Instruction man. All bxd and in perfect condx and wking order: £285. (Bexley, Kent) 0322 523 668.

FT707 Yaesu. Ideal HF/mobile/contest radio. 100W SSB 50W AM with mic, as new: £300 offers. Steve G6ELD (Manchester) 061 969 5103 (evenings only).

FT707, FC707, FP707, YM35 mic, Adonis compressor mic: £400. G4UPB. (Wirral) 051 339 5183.

FT726R: £800. 50MHz BNOS linear 10-100W: £150. TL922 new valves serviced: £900. TS430S with FM: £650. Shure 4440: £40. New 757 mobile mount: £10. Cushcraft 6m 6-ele beam ant: £120. FT726R has 2m 70cm 6m and satt. (Maidstone) 0622 850 510.

FT757GX mic: £450. FC757AT automatic antenna tuner: £150. RTTY terminal unit ST5C: £50. HY-GAIN CD45 ant rotator controller and lead: £80. G4IVP QTHR (Cornwall) 0736 710 819.

FT75B 100W 80-10m mobile and base PSUs, external VFO, perfect wkng order: £150ono. G10MPT (Derry) 0504 265 675 OR WHY.

G2DAF Rx/Tx + PU, all bands, inc WARC Kokusaiu filter 100WRF, recently new 6146B output valves fully operational with h/book, will demonstrate: £130. Buyer collects or pays carr. (Crewkerne) 0935 881 763.

HAMMOND tone wheel organ model T500, built-in tape recorder, little home use only: £350ono. John G3HQX (Winchester) 0962 880312.

HEATHKIT SB1000 1kW linear amp: £395. (Horsham) 081 566 1120 or 0403 52023.

HEATHKITS SA-2500-1: £450 (£12), IC781 SP20: £3000, (£15) AH2a: £400 (£5), CAPCO SPC300: £125 (£3), AT1000: £20 (£1). Carriage in brackets. G3FPD QTHR.

HEWLETT Packard 141 scope, dual 20MHz amplifier: £80. Command Rx 52-1.5MHz CCT46165 with dynamotor and local control front panel: £25. Denco coils valve and transistor ranges 3 and 4 red, blue, yellow qty 13: £1 each. QQV06-40A: £8 each. Crystals 82kHz, 84.055kHz, 84.52kHz: £2 each. Collectors items CR100/2: £25. Connoisseur craftsman 111 turntable: £10. G3OWY (Chester) 0244 381 051.

ICOM 271H and 471H both mint condx, hardly used, both bxd: £500 ea. G4SLN (Northumberland) 0670 824 788.

ICOM 290D 144/5MHz m/mode 25W: £325. G4WKD QTHR. (Wilmslow) 0265 526 686 (eves).

ICOM 505 6m m/mode tmscvr: £380. ERA microreader Mkl: £80.

ICOM 735 + Daiwa 30A PSU, VGC: £750 + extras. Antenna avail also ideal HF starter. All details G0JXR. (Hoddesdon) 0992 440898.

ICOM 751A HF Rx/Tx bought new August 1991. Orig pckng box: £1350. Gen reason for sale. G3JJU (Fleet) 0252 615 831.

ICOM IC32E, LC41 case, HS10 headset and switchbox, cig lighter chrgr, mains chrgr, mounting brkt: £295 + carr. G3YBK QTHR (Exeter) 0392 78710.

ICOM IC730 tcvr plus extras: £450. Datong FL3 filter: £95. Datong PC1 gen cov cnvrtr: £85. BARTG Versaterm RTTY terminal unit built. Tested and cased: £45. Dragon 32 computer with man: £40. Tony (Charlbury, Oxon) 0608 811 102 (eves/wkends).

ICOM IC740 HF tcvr 8 bands 100W 2VFO in vgc with FM unit fitted, mic, mans, bxs: £400 incl delivery. GW4RLP QTHR (Caernarfon) 0286 5264.

ICOM ICO-4E with NiCad pack, belt clip, chrgr and man. Ex condx: £120. G8BKE QTHR (New Milton) 0425 615 143.

ICOM ICR100 HF-UHF scanner, mint condx, bxd, current cost £500+: offers around £325. QTHR GW8RNK (Swansea) 0639 730 237.

ICOM ICR7000 VHF UHF RX 25-2000MHz. Mint condx. Price new £1000, accept £650. Heathkit tower 32ft, dismantled: £150. G4ERO QTHR (Ely, Cambs) 0353 665 869.

ICOM SM5 vgc: £20. Low ZMC desk mic: £15. All ceramic two rollers roller coaster: £20. G0FRM (Welwyn Garden City) 322 862.

ISOLOOP mag loop, covers 20m to 10m. Perfect condition, only used indoors. All accessories etc: £215 inc. carr. G4XLX QTHR (nr Crewe) 0477 32523.

JAYBEAM 2m 10-el long Yagi, new: £25. 14-ele parabeam, VGC: £25. G0HET QTHR. (Charmouth) 0297 60556.

KENPRO KR400RC with bottom brckt, bearing 20m cable: £100, 3 section tower: £50, Kent Morse key: £25. G4DIC. (Wells Next the Sea) 0328 711784.

KENT keyer and twin paddle key in gwo as new, bxd: £100, p/p extra. (Bournemouth) 0202 579 115.

KENWOOD TR751E, as new: £395. FT77 HF all band: £350. KLM KT34A 4-ele HF beam: £390. G3PJK QTHR. (Manchester) 061 655 3483.

KENWOOD TR851E 70cm m/mode, mint condx with accessories. TS930 plus auto ATU good unmarked condx. Offers. 0473 311 665 (after 7pm).

KENWOOD TS-850S. Bought end June 1991. Immac condx, never used on HF: £900. MM 50MHz XVTR model MMT50/28S £100. Goldstar GT212 AT computer 2Mb RAM, 1.44Mb floppy, 44Mb hard disk, VGA monitor and Logitech Mouseman mouse. DOS and Windows3 plus First Publisher DTP, Cricket graph presentation s/ware. Four months on-site remaining: £600. Alan G1EBH (Basildon) 0268 545 573 (after 6pm).

KENWOOD TS430S plus 20amp supply plus MC60 mic, all vgc: £625. Possible PX or swap British motor-cycle. (Rooksbridge, Som.) 0934 750 768.

KENWOOD TS44S auto ATU sideband CW filters, PS50 PSU, SP430 spkr, man, ex condx: £850. No offers. Buyer inspects and collects. Arthur G0EDV QTHR. (London) 081 701 9734.

KENWOOD TS450S HF Tcvr gen cov RX, mint condx, minimal use "unwanted gift" std unit, mic, manuals, boxes, warranty: £910. GW4RLP QTHR (Caernarfon) 0286 5264.

KENWOOD TS520SE CW filter fitted, AT200 ATU ex condx: £400 the pair. Buyer to inspect and collect. No cheques. QTHR G2BUJ (Swindon) 0793 613 610.

KENWOOD TW4100E dualband 2m, 70cms FM TX, high power 45W VHF, 35W UHF with duplexer. Good condx: £325 incl carr (UK). (Choppington) 0670 855953.

MARINE tcvr 25W SEA voice digital tuning, unused: £200. Sony 7600 DS, as new: £100. Azden 2m tcvr with aircraft coverage, also SEM transmatch: £60. Tentech antenna tuner: £100. Sattelite 600 Profficial: £150. (Brentwood) 0277 823 434.

MICROWAVE Modules 144-432 MHz tnsvrter repeater shift 15dB attn: £85ono. Mobile mount brkt for IC22A: £5ono. Fortop 435MHz AM ATV test demodulator: £15ono. Service man for JVC HR3300E video recorder (covers Ferguson 3V00, 3V22, cost £33 new) sell for £10. Heathkit 3 1/2 digit multimeter IM2202 with man, NiCads, chrgr: £30ono. Buyer collects or pays carr. G8GTP QTHR (Manchester) 061 766 6269.

MICROWAVE Modules 2m linear with preamp 200W output; 3, 10 or 25W input: £220ono. G4NTY QTHR (Manchester) 061 790 7673 (evenings).

MINICOIL 1ft 455 475kHz: £2 each. 1ft 10.7MHz: £2 each. All valve types. Cylinder fan 60mm: £5. G3OEG (Staines) 0784 454 757.

ONLY £300 for FT101ZD in superb condx. Ideal club or starter rig. With mic, fan, man and spare PA valves. Prefer buyer inspects and collects but could deliver south UK. Dave G3LSL. (Grateley) 0264 88579 after 7pm.

PROGRAMS for PC compatibles: Wordstar 1512 new still sealed £15; PGA golf tour, new: £7.50; Mini office personal, new: £12. Also Domesday Book for Berkshire, new: £5. Swan PSU 16/18amp integral spkr, comfortably runs FT707: £60. Boots PT1000 ptble typewriter under guarantee c/w carrycase: £45. Mutek MFA144E control unit ATCS500: £7.50. FT480 2 metre m/mode, fine condx, c/w workshop man but unmodded: £255 or exchange dual band h/held - not Yaesu. OBO G0ARW John (London SE9) 081 857 8096 (evenings).

PSION organiser LZ, CW 32K datapaks, printer drive software, printer cable, WP software, cases and manuals: £75. Trevor G7KRE. (Rushden) 0933 56728.

QRT SALE FT102, FC102, SP102, MH188 mic. Prefer buyer inspects and collects. No split: £650. Bob G4ZVC QTHR (Margate) 0843 225445.

QTY 3 new bxd unused 2C39A valve:s £10 each or £25 the lot (STC branded CV2516). (Cowes IOW) 0983 296 958.

QUATTRO PRO2, used but in new condx, available due to change of product: £40. G6JNS QTHR (Worcester) 0905 620041.

R2000 Rx, ex condx but unbxd hence: £300 for quick sale. (Glasgow) 041 334 2811.

RACAL RA1218 with external spkr and man. Clean and in gwo: £390. Buyer collects. Tony G0KUL QTHR (Bognor Regis) 865 468.

RACAL RA17, Good condx: £145 man incl. (Blackpool) 0253 722446.

RN 6m Tvtr 28MHz IF: £100. Nevada ATU: £70. PM-2000 peak read SWR meter 3.5/30 MHz: £25. (Surbiton) 081 390 1566.

RTTY the easy way. SWL OR TCVR with Microwave Modules MM4001KB keybd: £75. HFRX Realistic DX200: £30. Yaesu 70cm mobile 35W FT711RH FM only, bargain: £200. Heathkit HM102 SWR power meter £15. All plus postage or collect. 0952 550 235.

RX8 All mode s/ware, RAM, interface, instructions, - installed BBC series 7 computer, disk drive. Ring for details and haggle: £290ono. (Swindon) 0793 771 153.

SHACK clearance: CR100: £25. LINER2 needs attention: £15, Storno Viscount R5: £20. Pye RTF27AM: £5. 3xQQV06/40 + holder 2xQQV03/20 RadCom 1981-90, All ono. G3JIZ QTHR (Winchester) 0962 734 396.

SILENT key sale. FT757GX: £575. FP757HD: £160. FC757AT: £200. YD148 stand mic: £40. MD1B8 stand mic: £40. YS500 VHF SWR/PWR meter: £50. FT690R YM47 mic: £295. Tokyo HL160V 144MHz 160W linear: £160. all above mint & bxd, mans. FT290R, YM47 mic case: £180. MMB brkt, suit FT290R: £15. PA3 DC/DC 13.8/10.8v POA. Heatherlite boom mic suit FT290: £14. MM 140/30ls 144MHz linear: £40. Kenpro KR400R rotator: £80. KR400: £75. Datong Morse tutor key: £35. 7/8 144MHz whip: £15. 5/8 whip: £13. 4el J-Beam 6m Yagi: £30. 4-el J-Beam 144MHz QUAD: £24. 4-el J-Beam 144MHz Yagi, unused: £14. 27ft telescopic mast (RXP3231): £27. (Newcastle, Staffs) 618 632

SPECTRUM 48K all leads PSU interface one keybd overlay two microdrives and eight carts, will split: £65 the lot. Serial 8056 80 col thermal printer c/w leads and paper, suit spectrum: £35. 4m Westminster AM .280 .260 50W: £30. 1/4 wave end fed vertical base for 4m varnished but unused £18. Why not phone and haggle? G1HSG (Bolton) 0204 594 235.

SPECTRUM+3 system including MGT 3.5" lifetime drive, serial interface, 8-bit I/O, VTX5000 modem, CPM+ HiSoft Devpac, Tasword+3 and more: £150. 2m 5-ele Jaybeam: £10. 2m 10+W power amp: £15. Valve collection incl QQVs, 6146s, 807s, 6BW6s, 5763s, octals, B9As, B7Gs, transmitting and receiving types: offers. Misc crystals, txfrmrs, RadComs, SWMs, other magazines etc going back years. Paul G4DNI (Milton Keynes) 0908 310 578.

STANDARD h/held 2m C111E, bxd, mint: £95ono. Datong model D70 Morse tutor: £35. 5-ele 2m beam Yagi: £8. (Nuneaton) 0203 349 156.

TANDBERG reel-to-reel for professional master recordings. Overhauled by Tandberg engineer. Spare valves: £400. G0POS Colin (Medway) 0634 379 140.

TEKTRONIX D755 dual beam 50MHz delay timebase o/scope with service man, gwo: £220. DARTRON dual beam 10MHz o/scope with service man. Wking but slight ripple from PSU: £50ono. G4JQT QTHR (Reading) 0734 596 806.

TENTEC Paragon tcvr with PSU, mic, filters 6kHz, 2.4kHz, 1.8kHz, 500Hz, 250Hz, FM. VGC: £1150. G5BM QTHR. (Glos) 0531 820960.

TH205E h/held, SMC-31 spkr/mic, chrgr, spare PB-2 NiCad. As new, bxd, man: £115+carr. G4LWA QTHR (High Wycombe) 0494 531 755.

TH205E mint: £160, Heathkit SB610 Monitorscope: £50, Class D wavemeter: £20, pair Toshiba 6JS6C (condx unknown): £20, Datong processor module (cased): £20, Yaesu YD844 mic: £10. G3RKH QTHR. (Halifax) 0422 202551.

TOKYO HX-240 2m to HF tnsvtr complete with cables and man, perfect condx: £190 + carr. G3YBK QTHR (Exeter) 0392 78710.

TRIBAND 3-ele HB, 33, SP, c/w assembly instructions. Gdd condx, super performance: £120. Brian G0EIA QTHR (Cornwall) 0579 63192.

TRIO 201A 2m FM tcvr: £160. Cushcraft triband aerial: £45. QTHR G0KIE (Greenford, Middx) 081 575 2671.

TRIO 430S with FM board, ex condx: £500, Composit video monitor: £10. Chas (London) 081 764 6767 (eves).

TRIO 930 with auto ATU and CW filters, immac: £1050. Mini beam 20m 15m 10m 6m 4ele: £225, or swop for 2m linear. Malcolm (Shrewsbury) 0743 367 087.

TRIO TS120S: £325. AMT2 terminal unit: £130. Cartridge to drive AMT2 C64 or Vic 20: £25. All mode 2m rig TS700SP: £350. FRG7700, FRV7700, FRT7700: £300. G4LXK. (W Midlands) 021 353 3620.

TRIO TS940S fitted auto ATU, ex condx, going QRP hence sale: £1300ono. TET triband vertical: £25. Alan (Aylesbury) 0296 29342 (eve, w/end).

TRIO TS940S mint cond: £1190. 60ft versatower, AR2002 scanner, 6mtr QRP TCR offers or PX compact HF TCR IC735 or similar. G4VIO QTHR (Co. Durham) 0388 763 501.

TRIO/Kenwood TS930S 500Hz CW filter: £950. Diawa CNW518 twin needle SWR meter/ATU: £130, or £1050 the pair. Canon E800 camcorder: £650. Sony RM-E300 video editing controller/titler: £200, or £800 the pair. All ovno. GM3RAO QTHR (Ayr) 0292 43501.

TS830S ex condx, bxd, man: £600ono. FT290 Mutek, NiCads, chrgr, case, bxd, man, ex condx: £210ono. Both units must be sold due to home constructed 2nd harmonic. Any offers please to Andy GM1TNU QTHR (Glasgow) 041 777 8037.

TS830S, DFC230, SP230, MIC/HB: £760ono. TS780, 2m/70cm m/mode, MIC/HB: £575ono. IC-R7000, h/book: £650ono. All rigs bxd, gd clean wrkng condx. (Warwickshire) 0203 363 123.

TS930S with auto ATU and 500Hz CW filters fitted, matching SP930 spkr, vgc: £1000. Phillips PM3240 dual beam scope, vgc: £250. (Leeds) 0532 659 227.

VHF/UHF equip: 2m 25w FM mobile (FDK700EX) superb cond, not tampered with: £115. MMT 432-114 trnsvrtr, gwo: £69. MM 1 or 3W input, 30W out, 70cms linear, vgc: £55. (Huddersfield) 0484 603 963.

WESTERN DX33 3-el tribander, VGC: £200ono. Iwasaki FU-400 rotator: £65ono. G4NUM QTHR (Leeds) 0532 686016.

YAESU 227R 2m FM tcvr with h/book and man. Any trial, buyer collects or pays postage: £160. (Redditch) 0527 543 598.

YAESU FP700 PSU: £150. FC700 ATU: £100. Kent Morse key: £35. All items new 8/90, unused, carr extra. QTHR G3FK (Ferndown) 0202 873 175.

YAESU FRG8800, vg condx: £350 inc carr. G4BPY QTHR (Walsall) 0922 413 193.

YAESU FRG9600, good condx incl box, man, PSU and video board. Prefer buyer collects: £325. Paul (Abergele) 0745 833847.

YAESU FT101ZD gwo, 9 band, fan, mic, CW filter with spare PA valves and manual: £425. G0IUD (Bristol) 0454 318 539.

YAESU FT102 AM/FM CW narrow filter. Spare set valves. FP102 matching spkr with audio filter. Immac condx, bxd. G3AWI QTHR (Mansfield) 0623 842 227.

YAESU FT221R, Mutek front end, c/w service man: £300. Yaesu FT73R 2 bttries, chrgr: £185. FTT4 DTMF keypad for FT73/23: £20. Mullard Band IV TV linear PA c/w YD1300 valve, will mod/tune 70cm, 300W out £75. Mike G8TIC (Worcester) 0905 763 476 or 0831 842 642.

YAESU FT404R 70cm FM h/h, spkr/mic, PA2 power adaptor: £65ono. LCL 2740FM 10M, FM rig: £45ono. G4EDR. (Filey) 0723 515675.

MEMBERS' ADVERTISEMENTS

YAESU FT736R 2m 70cm and 23cm with CW filter, vgc: £1150ono. G4BIO QTHR (High Wycombe) 0494 813218.

YAESU FT757EX with CAT and scanning mic: £500. FC757AT auto ATU: £200. FP757HD PU: £150. Or complete station: £800. ICOM ICR7000 scanning RX with remote control and voice synth: £695. All orig bxd with mans. EOPJI (E1NAX) (Plymouth) 0752 775 375.

YAESU FT767GX 2m module fitted bxd incl h/mike and full mans: £1150. Racal RA17L superb Rx, vgc: £140ono. Not QTHR (Warrington) 0925 728 253.

YAESU FT767GX tcvr fitted with 2 and 6m modules. Ex condx, bxd with man and mic: £1350. Also Kenwood TH77E 2m/70cm h/held complete kit with 7.2 and 12v bttry packs, chrgrs and cases, headset/mic, telescopic antenna and bttey case. Only 6 months old, hardly used, all bxd as new: £370. Nick G7IYG (Uxbridge) 0895 236 397.

YAESU FT790 bxd, c/case, NiCads, chrgr: £250. Storno h/held crystalled RB11, requires bttry pack: £25. G4LOY QTHR (Cleethorpes) 0472 697 334.

SEM QRM eliminator Mkl: £75. Revco Discone 30-500MHz "N": £15. Spectrum 128+2, PSU, joysticks, games etc: £65. 40m used RG58U: £6, 60m unused: £14. S8056 thermal printer: £30. G7HNY QTHR (Weymouth) 0305 773 860 (eves).

WANTED

19 INCH equip rack between 4ft and 5ft high. Must be in gd condx with side panels. G3TMA QTHR. (Lincs) 0775 87464.

AP1086 issue one 1938/1952 (RAF Radio Stores ref nos). Also air publications relating to radio, radar equip, exc prices offered. Would purchase post-war to current magnetrons, klystrons, T/R cells, TWT's, photomultipliers, microwave and special CV types. Required unmodified Gee R/X type R1355. M Gee, 6 Verbena Road, Canning Town, London E16 4NU. 071 511 4786 or 071 790 2846.

BASIC valved oscilloscope like Serviscope S51, frequency counter (to 100MHz), information about Marconi sensitive valve voltmeter TF2600. G3JWW QTHR (Harlow) 0279 436 660.

DRAKE L4B or L7 linear. Hygain monoband Yagis for 10/15/20. Drake MN2700 ATU. Chris G3VBL (Bournemouth) 0202 841258.

FTDX560, service man and circuit diag. Can you please help to obtain. Will purchase or loan to copy. Will pay postage etc. Norman GM6YRZ QTHR (Kelso) 0573 24217 (day) 0573 23182 (eve).

GRUNDIG compact video recorder VP100 circuits or service man. Also same for camera FAC1700 and PSU NA100. Barry G4SJH (Lightwater) 0276 74981.

REMOTE Control unit 310, working condx. Mounting tray 656 (IOA/17535) for RI475. G0DIC. (Boston) 0205 360044.

UHF pager. Motorola pref but anything considered. Must be working. Graham G8LUV QTHR. (Leicester) 0533 772442 (eves).

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18 SET wanted, complete but not necessarily working, ditto 38 Mk III. GW4RYK (Montgomery) 0686 630 255.

ARMY type prismatic compass. G3UWH QTHR (Taunton) 0823 432 527.

ASHTRAY wanted. Cottage picture with wording "RSGB Convention Bristol Sept. 1954" prod. by Watcombe Pottery Torquay. Contact Frank G4YXS QTHR (Westbury) 0373 832 678.

B2 TX, any condx for rebuild. Headset or correct jack plug for MK123 Tx/Rx. Derrick G3LYU QTHR (Leicester) 0533 876459.

BIRD MODEL 43 thruline wattmeter. Elements for ham bands to 1500MHz, power levels 1-2kW. G4LU QTHR. (Shropshire)

CAN ANYONE supply serviceable valve type GL446B. Lighthouse triode for use in WW2 Rx. Costs and expenses paid. G8RW. (Bromley) 081 462 1592.

CIRCUIT Diag for telequipment D65 o/scope, buy or borrow. All costs paid. Also diag for Grundig Party Boy 100 model. (Longfield) 0474 707678.

CLARK mast type QT12M/HP suitable for rear of Landrover, must be vgc. Can collect. G4AJE (March, Cambs) 0354 741168.

CLEAM HF tcvr (solid state) with no mods or improvements. Ancillary eqpt also of interest. Cash awaiting most attractive offering. (Maidenhead) 0628 25010.

COLLINS tuning knob/gear for 75A-4 Drake B2-B RX Quad stereo. Brian GI4GNZ QTHR. (N Ireland) 0266 880740 (eves).

DATONG FL3 m/mode filter incl mains adaptor. If poss in first class condx. G0OPG. (Wilmslow) 0625 531154.

HELP! Two good 813's wanted for homebrew linear and 2.5kV trnsfmr for next project. Will collect sensible distance. QTHR G0NQG (Bristol) 0272 712 672.

IC-2SE 2 m h/held, wking. Also Bird thruline elements HF and VHF, low power, dead or alive. Image (light) intensifier with integral supply i.e. Mullard XX-1060/1306 or ITT F-4704 Tec. Ask for 'OLI' - G8NCL QTHR (Minehead) 0643 706 823.

KENWOOD TS440S. Must be in gd condx, also coil and spokes for G4MH minibeam. G0DGB QTHR. (Durham) 091 3847306.

M-O VALVE CO. Literature on valve type TT11 to buy or borrow. Mr Knapp (Bexhill-on-Sea) 0424 215556.

MOBILE mount MB430 for the Kenwood TS430S. Also m/mount for IC251E. Sensible prices please, disabled operator Mike GW0MNP QTHR. (Bridgend) 0656 724 041.

MURPHY B40D RX in gwo. Type 618 TX, Geloso G209 RX, Pye CAT RX complete and wrkng. G4FUY (Wokingham) 0734 733 633.

ROTATOR/Control unit for 4-el YAGI, cash waiting. Buyer collects. G3JLB QTHR 0474 534 694.

SET of 3 Electroniques 85KHz valve I.F. txfrmrs plus BFO coil. Must all be in gd condx. (Cowes, IOW) 0983 296 958.

SOFT case, m/mount, h/book for FT290R1. Kenwood R600, SP230, VFO230/240. CW filters for TS830. Chrgr for Motorola HT-220 portable using rapidcharge 15v 225mAh NiCad. 52 set TX/RX h/book, PSU and case. (NOT remote RX PSU and case). G3TZL QTHR (Peterstield) 0730 821 667.

T1154, also A1134 and R1155 front panel parts or scrappers. Any appropriate Jones' connectors. Rob (Bristol) 0275 462886.

TO BORROW for photocopying - man for FT101ZD, post and expenses will be paid. John G4KDN QTHR (Iver) 0753 655 570.

TRIO RX model 9R-59 circuit diag or man to copy or purchase. Postage repaid. G4KRE QTHR. (Lincoln) 0522 685247.

WANTED to complete project one Electroniques 85Kc FF. Can anyone help please? Tony (Worcester) 0905 641 759.

WS22 WS18 WS31 radios, also info on Rx unit type 71 and circuit for Freeway cordless telephone. Pat (Ewell) 081-393 7478.

YAESU YO901 or YO901P, also copy of man, buy or loan and return all costs paid. (Maidstone) 0622 681 294.

EXCHANGE

AMSTRAD PC1640 5.25in DD, mono display, DMP3000 printer, Wordstar, Supercalc, Accountmaster, all in ex condx. Will exchange for Capco AMA5 80M loop antenna or mobile tower on trailer. Must be in gd condx. Mick QTHR (Canterbury) 0227 738 248.

FRG9600 as new no mods for GCR FRG7700 8800 etc. Cash adjustment if required. G4LSL QTHR (Richmond, N Yorks) 0748 833 559.

BENCHER paddle chromeby-2 not used. Wattmeter Weston PM2000. RAF Morse key Type Ref No 10A/7373. Datong audio filter model FL1. Mic Yaesu YD148. Require lens for 5x4 format camera. Xenar f5.6 180mm or 210mm. Must be in clean cond. G4HHN QTHR (York) 0430 872 547.

KENWOOD TG-455C-1 CW filter new bxd, exchange for ATG30, Welz SP-300 meter, MC60A or £80. Cash adjustment possible. G0KGD QTHR (Cheshire) 0948 81302.

RF thru-line wattmeter model T435 144 - 435MHz. Will exchange for similar covering HF bands or sell £50. (Leeds) 0532 654 644.

HELP LINES

CIRCUIT DIAGRAMS/ MANUALS

Mr C Fairchild, G3YY, has acquired what is supposed to be a Western Electronics (UK) Ltd Type DX5V Pentrator vertical antenna as a collection of bits. He is looking for diagrams or a list of parts that will enable him to assemble the unit. Any information to G3YY at 4 Chalkland Rise, Brighton, BN2 6RH.

Mr JM Clarke, GI4GUH, requires operating instructions for his RACAL-DANA 9912 VHF frequency counter, and his Levell Type TM12 transistor tester. He is prepared to borrow or buy, and will answer all letters received. His address is 2 Areema Heights, Banbridge, Co Down, N Ireland.

Mr Mansell, G2CPM, is looking for information of the Narda Microline Attenuation Calibrator and VSWR amplifier, Model 441F. Expenses will be reimbursed. Please write to Mr Mansell at 12 Dunstan Road, Thatcham, Nr Newbury, Berks, RG13 3QS.

17-year old William Stoner, RS92693, wants to build a directional FM broadcast antenna (87.5-108MHz) with a large enough gain to receive London broadcasts from his home QTH in Tetbury, Gloucestershire, as well as an accompanying preamp. The only projects he has so far seen have been too complicated and he really needs something simpler and more basic for him to complete this task. Please write to William at 52A Long Street, Tetbury, Glos, GL8 8AQ.

Mr A Langton, GM4HTU, is anxious to obtain a circuit or any other information relating to the Storno CQF-634 base station. His telephone number is 0224 592104 (Aberdeen).

Mr GT Allen, G3FTR needs a handbook and circuit diagrams for his Galaxy Transceiver V Mk3, manufacturered by Galaxy Electronics in Iowa, USA. Any expenses incurred will be reimbursed. Mr Allen's telephone number is 0787 281159 (Suffolk).

SPECTRUM LOGBOOK PROGRAM

Mr Hossack, GM3DKW, recently sent free copies of this program to some interested readers. In response to requests, he has now modified the program to be compatible with the Microdrive system and will be happy to replace the original listing. His telephone number is 0294 823199.

MARCONI RECEIVER B7630

Roger Daniel, G4RUW, would appreciate any information on this 1920 circa receiver, including circuit diagrams, manuals, etc. Please contact him QTHR.

NEC TRANSCEIVER CQ110E

A plea for parts for the above transceiver has been received from Malcolm Livingston, A92EV. During transit the microphone was lost, and more importantly, the circular 17-pin female power supply plug lead. The plug is approx 32mm diameter and is secured by a threaded female ring to the male socket 17-pin arrangement at the rear of the rig. Any help to Malcolm at Electricity Directorate, Career Development Centre, PO Box 833 (or PO Box 2), Bahrain.

Helplines is designed to help put people in touch with each other. If you have a problem, it's more likely there's someone out there who has the solution; if you are looking for an old colleague or amateur friend, there could be a reader who has some news of their whereabouts; if you have solved a particular problem, write and tell the rest of us. 'Helplines' is there to help you and to give you the opportunity of helping others. Write to us marking your envelope 'Helplines' and we'll do what we can to get the message out.

NASCOM 2

Mr R Scadden, G3TFM, has mislaid his stock of Nascom Magazines during two house moves and wonder whether any readers may have copies of these - or for that matter any other Nascom items - which they may part with. Please let him know what you have and prices, etc. His telephone number is 0458 73967 (Somerset).

ANY BUDDING CONSTRUCTORS?

Phil Jenkins, G4ZOW, would like correspondence with anyone interested in QRO HF solid-state linear amplifer design, or possibly someone with CAD facilities to further personal project. Contact Phil at 37 Barleycroft, Leverstock Green, Hemel Hempstead, Herts, HP2 4UU.

WWII COIL METERS

Mr DC Money, G3HKD, is repairing and refurbishing to original condition WWII moving coil meters as a hobby. His aim is to eventually offer a range of these to a museum - they are not for resale. If anyone has any of these dead meters, why not send them on to him. His address is 125 Wroxham Road, Norwich, NR7 8AD.

OUR NEW STYLE 2 ADVERT

THIS IS our new style 2 advertisement. It comprises a line of white space with a rule, top and bottom of the advertisement. The cost of choosing this advert is an extra £2. If you would like your advertisement to look like this, tick the appropriate box on the form when filling it in.

The above example represents a style 2 advertisement. The cost is £2 above the price of the ordinary (style 1) advert. If you would like your advertisement to look like this, tick the appropriate box when filling in the advert form.

CLUB NEWS

DEADLINE - Items for inclusion in the January 1992 issue must be sent to HQ marked "Club News - DIARY", to be received by 18 November latest. If news is received by the published deadline, it should appear in the listing. It is your responsibility to ensure that items are sent DIRECT to HQ in good time. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

NOTE: This is primarily a service for clubs affiliated to the RSGB, to whom priority will be given.

AVON

NORTH BRISTOL - 1, QSL cards and awards 'boast' night; 15, talk 'Chips, Bytes and Solder on the Carpet' by Chris, G0LOJ - a brief talk on some homebrew ideas and projects.

SOUTH BRISTOL ARC - 6, bring & buy/junk sale; 13, talk 'Simple Computer Programming' by Len, G4RZY; 20, free ice-cream evening; 27, talk 'Simple Circuit Designs for Novices' by G4VBU; Dec 4, exhibition of Calligraphy. Details Whitchurch 832222 on a Wednesday evening.

BEDFORDSHIRE

SHEFFORD & DARS - *CHANGE OF TEL NO* Nigel, G1JKF, Secretary, on 0908 274473. - 21, junk sale; 28, talk 'A Guide to All Things IBM Compatible' by Nigel; Dec 5, talk 'VHF Contests Through the Ages!' by Don, G4LOO. Details from the Secretary.

BERKSHIRE

BRACKNELL ARC - 13, members' talk; Dec 11, Christmas Dinner. Details 0628 25952

READING & DARC - 14, talk 'Winning HF NFD' by Don Field, G3XTT and John Linford, G3WGV; 28, construction contest/alignment evening; Dec 12, AGM followed by Cheese and Wine. Details 0734 476873.

BUCKINGHAMSHIRE

AYLESBURY VALE RS - 20, talk 'Raynet' by Ray Willis, G6NPP.

CHESHAM & DARS - 6, general meeting; 13, technical topic; 20, annual general meeting; 27, talk 'A Lifetime of Radio' by Arnold. Details 0923 283911.

MILTON KEYNES & DARS - 11, junk sale night - everybody is welcome with their junk & wallets; Dec 9, talk 'Liquid Petroleum Gas' by W. Backhouse, G4HZI. Details 0908 501310 or 0908 315435.

CAMBRIDGESHIRE

CAMBRIDGE & DARC - 1, Morse training; 8, talk 'Maps and Surveying' by George, G0OEL; 15, junk sale at the Coleridge Community College. Lots accepted from 6.45, start time 7.30; 22, talk 'Oscilloscopes and Their Use' by John, G6UGI; 29, talk 'Earthing Systems and Lightning Protection' by Ian, G4AKD. Details 0763 243570.

CHESHIRE

CHESTER & DARS - 12, talk 'Jandek' by Derek Pearson, G3ZON; 19, RSGB video; 26, 'Meterosat' by Peter Higgs, GW4IGF. Details 051-608 3229.

CLWYD

RHYL & DARC ***CHANGE OF SECRETARY*** Mr Kenneth Padley, GW7IAR, 67 Rosehill Road, Rhyl, Clwyd LL18 4TS; tel: 0745 338276. - 18, talk by Nigel, GW7HUY. Details from the Secretary.

CORNWALL

CORNISH RAC - 8, bring & buy; 12, activities night; 18, computer section; Dec 5, Christmas party. Details 0209 820836.

DERBYSHIRE

DERBY & DARS - ***CONTACT*** Mr Richard Buckby, G3VGW, 20 Eden Bank, Ambergate, Derby DE5 2GG, tel: 0773 852475 (not as in RSGB Call Book) - 6, junk sale; 13, visit by SMC (Midlands) Ltd, demonstrating their latest goodies; 27, talk and demonstration 'Scanners - Their Uses and Abuses' by Richard, G4NAD of AOR Ltd; Dec 4, junk sale; 11, constructors' contest. Details from the Secretary.

DEVON.

TORBAY ARS - 22, talk 'Communications in British Gas'; Dec 13, Christmas party. Details 0803 526762.

DORSET

PLESSEY CHRISTCHURCH ARS - meets every Thursday at the club house, rear of the Plessey Sports & Social Club in Grange Road. Details 0202 519708 (eves) 404658 days) - 14, 'Club Station Operations' - practical guide to operation of the club's equipment; 28, 'RF Dissipation', what is it? Come along and find out; Dec 12, Christmas party.

SOUTH DORSET RS - 5, talk 'Space Communications' by Andy, G3VMZ; Dec 3, talk 'WX Sat Reception' by Chris, G4RAK. Details 0305 781164.

EAST SUSSEX

EASTBOURNE ELECTRONICS ARC - meet last Monday of month at 'The Meeting House' (next to RAFA Club), Wish Road, Eastbourne, at 8pm. Slow Morse transmissions every Monday 8pm on 145.250. Details 0323 412171.

ESSEX

BRAINTREE & DARS - 4, QTH Reports and social evening - members; 18, talk 'Keeping Your Station Legal'; Dec 2, talk 'Simply Wire Aerials' by Dave, G3PEN; 16, cheese & wine for club members and families. Details 0376 27431.

CHELMSFORD ARS - 5, junk sale; Dec 3, talk 'The Marconi History of Radar' by Stan Woods. Details 0245 260831.

LOUGHTON & DARS - 1, Home Brew (beer *NOT* radios), with samples by Mike Pilsbury, G4KCK; 15, 'The Sinking of the Titanic' (provisional); 29, inter-club trivia quiz; Dec 13, Christmas Meal to be held at The Spotted Dog, Ivy Chimneys, Epping (provisional). Details 081 504 4581.

FIFE

DUNFERMLINE RS - 7, talk 'Scottish Tourist Board Radio Amateur Group' by GM3MTH; 21; talk '3 Years in America' by VP8AQA. Details 031 331 4340.

GRAMPIAN

ABERDEEN ARS - 1, junk sale. Details 0224 780519.

GREATER LONDON

ACTON, BRENTFORD & CHISWICK ARC - 19, talk 'Feeding Dipole Antennas' by G3IGM. Details 071-938 2561.

BROMLEY & DARS - 19, talk 'Stereoscopic Slides' by G0ILW. Details 081-462 2689.

CLIFTON ARS - ***NEW VENUE*** Earl of Derby Public House, Dennett's Road, New Cross, London SE14 - 15, talk 'Malaysia DXpedition' by G0HUZ. Details 081-691 2341.

CRAY VALLEY - 7, visit by RSGB LO - G3NFV; 21, talk 'Lord Howe Island DXpedition' by G3ZAY; Dec 5, talk 'Greenland and the Caribbean' by G3DCC. Details 081-699 6940.

CRYSTAL PALACE & DARC - 16, junk sale. Details G3FZL

EDGWARE & DARS - 28, discussion 'The Novice Licence'; Dec 12, junk sale. Details 081 205 1023.

GRAFTON RS - 8, talk and demo 'Detection Devices' by Pat Brolan, G1MPU; 29, talk and 'The Post Office Tower' by George Morley, G0OXH; Dec 13, talk 'Post Office Telephones'. Details 081-368 8154.

HAVERING & DARC - 13, talk 'Water' by Andy, G4VIW and Kevin; 27, Constructors Cup, 1991; Dec 11, talk 'Construction' by John Lemay, G4ZIR. Details 04022 23310.

HORNDEAN & DARC - 7, talk 'The Southern Electricity Microwave Scheme' by Steve Frost. Details from G0FYX.

KINGSTON & DARS - 20, annual general meeting and constructional projects. Details 081 398 1128.

SILVERTHORN RC - meets every Friday at The Chingford Community & Adult Education Centre, Friday Hill House, Simmons Lane, Chingford. Details 081-529 4489 (5.30pm - 6.30pm weekdays).

SOUTHGATE ARC - 14, construction judging for G6QM Trophy and brains trust evening; 28, construction demonstration; Dec 12, AGM. Details 081-360 2453.

WIMBLEDON & DARS - 8, annual general meeting. Details 081 397 0427.

GREATER MANCHESTER

ECCLES & DARS - 5, talk 'Getting your PPL' by G0KFP; Dec 3, demonstration 'Digital Speech Generation' by G8DTF.

SOUTH MANCHESTER RC - 1, Halloween PF; 8, talk Reciprocal Licence' by G4PDX; 22, talk 'Modernised TeleCom Network' by G3SVW. Details 061-969 1964.

GWYNEDD

DRAGON ARC - 18, talk 'Pre-Radio Communications in Anglesey' by Mr Tomos Roberts; Dec 2, films - Mr Ron Watson-Jones; Dec 16, Christmas party. Details 0248 600963.

HAMPSHIRE

FAREHAM & DARC - 6, talk 'Coding'; 20, talk by Chris, G8JFJ; Dec 4, talk 'Reliability' Details 0705 321411/2 (daytime).

ITCHEN VALLEY RC -8, Eddy Ogden, G4EOW, Raynet. Details 0703 736784.

THREE COUNTIES ARC - 6, talk 'Best Buys in Amateur Radio Equipment' by SMC Ltd; Dec 4, quiz night. Details 0420 83091.

HEREFORD & WORCESTER

BROMSGROVE ARS - 12, talk 'Crime Prevention' by West Mercia Police. Details 0527 503024.

TELFORD & DARS -13, JANDEK demonstration; 20, RSGB RLO speaker; 27, new club construction project. Details Bridgnorth 761203.

HERTFORDSHIRE

CHESHUNT & DARC - 27, annual general meeting. Details 0992 464795.

STEVENAGE & DARS - 5, practical rig testing; 12 talk 'HF Data Tones, Part 2' by Peter, G0GTE; 19, practical antenna testing; 26, computer evening Shareware and Public Domain; Dec 3, practical feedline testing; 10, construction projects evening. Details Stevenage 724991.

VERULAM ARC - 26, talk 'Jandek Kits' by Mr D Pearson; Dec 8, Rally at Hatfield Polytechnic. Details 0727 59318.

HIGHLAND

INVERNESS ARC - 6, construction night; 20, annual general meeting and awards. Details 0349 61783.

HUMBERSIDE

GOOLE R&ES - 1, construction evening; 8, repeater report; 15, video 'Microwave Links'; 22, talk 'Home Construction' by Ray, KCE; 29, Christmas Dinner; Dec 6, 20th Anniversary Evening; 13, video. Details 0405 769968.

NORTH FERRIBY UNITED ARS - 1, talk 'Satellites - Part 2' by Frank, G3EFR; 15, RFI forum - David, G0MXI; 22, talk 'Amateur TV' by Richard, G4YTV; 29, RSGB video - Frank, G3YCC; Dec 6, The Way Ahead meeting - Ken, G4VKK; 13, talk 'LF Band DX' by Vic, G4BYG. Details 0482 650410.

ISLE OF WIGHT

BINSTEAD ARS - meets every Monday at Brickfields, Newnham Road, Binstead, IOW -4, surplus equipment sale. Details from G0ISB QTHR.

KENT

DARENTH VALLEY RS - 13, construction night; 27, Neil McGrath, G7AQK - 70cm Repeater G3KB; Dec 11, proposed Christmas Dinner. Details 0689 876733.

MAIDSTONE YMCA ARS - 8, junk sale; 22, talk 'GAP Vertical' by Peter, G3ORP; Dec 6, Christmas social. Details from Colin L Roberts, 16 Derby Road, Maidstone, Kent.

SEVENOAKS & DARS - 18, talk 'Amateur Radio and Travels in Czechoslovakia' by Colin Turner, G3VTT; Dec 2, AGM. Details from Council Offices, Argyle Road, Sevenoaks, Kent.

WEST KENT ARS - 15, open evening - come along and see what it's all about. Details from G3OHV, Eagles Rest, 9 Jefferies Way, Crowborough, E Sussex TN6 2UH.

LANCASHIRE

PRESTON ARS - 14, illustrated talk 'An Australian Miscellany' by Mr Langton; 28, illustrated talk 'A Kenya Adventure' by Mr Ruthven; Dec 12, Christmas Buffet - all members and wives welcome.

THORNTON CLEVELEYS ARS - 4, update on new Scout-hut - Ken Wilcox; 11, talk 'Radio Controlled Helicopters'; 18, talk 'Contest Logkeeping' by Jen, G8YOK; 25, auction. Details from G4BFH.

LEICESTERSHIRE

LEICESTER RS - 18, talk 'Bits and Bobs and Things' by John, G3LMR. Details Leicester 762241.

LOUGHBOROUGH & DARC - 5, quiz; 12, construction evening; 19, talk 'The Other Man's Shack' by G8AYG; 26, talk 'PMR Equipment' by G0LCU. Details 0509 218259.

LINCOLNSHIRE

RAF WADDINGTON ARC - 21, VHF Fox Hunt. Details Derrick, G0NPB, 69 Ferry Road, Fiskerton, Lincoln.

SPALDING & DARS - 8, construction contest; 15, talk 'Amateur Fast Scan Television' by Frank Dimmock, G0CFD; Dec 12, Christmas social. Details from G4DHF.

LOTHIAN

LOTHIANS RS - 13, junk sale. Details from P.J. Dick QTHR.

MERSEYSIDE

LIVERPOOL & DARS - ***NEW VENUE*** The Dudley Function Rooms, Blenheim Road, off Smithdown Road, Liverpool L18 1EH, 8pm Tuesdays. Details from Gordon, G4VYR.

NORFOLK

AMATEUR RC OF FAKENHAM - 5, video of amateur radio and lifestyle on the Pitcairn Isle; 9, RSGB club calls contest 20.00 to 00.00GMT on 1.9MHz to 1.99MHz, venue QTH of G6MDM and G0MQU; 23-24 November, GX4LSF 10th anniversary station on 160,80,40m, venue QTH of G8FTP & G4DCJ. Details from Philip Jarrett, G8FTP.

NORFOLK ARC - 6, 'real radio' evening; 13, talk 'Satellite TV' by Steve Sewell, G4VCE; 17, surplus equipment auction/bring & buy (doors open 10am); 20, talk 'Raynet' by Pat Bates, G0IYD; Dec 4, licence conditions, Q&A; 11, Christmas Party. Details 0603 747992.

YARMOUTH RC - 7, talk 'Atomic Power' by G3OEP; 21, annual general meeting - Club & Raynet homebrew competition for OEP prize; Dec 5, debate 'Amateur Radio is going to the dogs'. Details Yh 721173.

NORTHAMPTONSHIRE

KETTERING ARS - *NEW SECRETARY* Geoff Philpotts, G7AIR, 62 Erneley Close, Stourport on Severn, Worcestershire DY13 0AH, tel: 02993 79229 - 19, talk 'A Dealer's View of Radio'. Details from the Secretary.

NORTH YORKSHIRE

HAMBLETON ARS - ***NEW SECRETARY*** Nigel Robertshaw, G0NHM, QTHR, tel: 0609 776608 - 11, talk 'My First Project' by Rodney Richardson; 25, talk 'Radio Astronomy (cont'd)' by Ken Shearman, G1XLZ; Dec 9, talk 'Fault Finding Techniques' by Tony Nicholson, G8FLV. Details from Secretary.

HULL & DARS - 8, junk sale. Details Hull 74731.

NOTTINGHAMSHIRE

MANSFIELD ARS - 7, talk 'The Shortwave Broadcast Bands' by John, G4GYU. Details from Mary, G0NZA on 0623 755288.

SOUTH NOTTS ARC - 22, talk on Raynet by D Molyneaux, G3YUT. Details 0509 672734.

OXFORDSHIRE

OXFORD & DARS - 28, talk 'Radio Control of Model Gliders' by Mike Leask; Dec 13, Christmas mince pie party. Details 0865 58785.

POWYS

SOUTH POWYS ARC - 5, annual general meeting followed by GB3BB annual general meeting. Details 0874 84266.

SHROPSHIRE

SALOP ARS - 7, annual dinner at the Lion & Pheasant; 21, equipment sale (good working order); Dec 5, talk by G3IDY Bob Robson and the BBC. Details 0743 790457.

SOMERSET

TAUNTON & DARC - 1, talk 'Radio Control Models'; 15, talk 'Greyline Propagation' by Rob Michlewright, G3MYM. Details 0823 680778.

SOUTH GLAMORGAN

BT (WALES) ARS (formerly BT Wales and the Marches ARS) - ***CHANGE OF SECRETARY*** Syd Richards, GW0PPG, tel: 0222 593341. Club meets 2nd Wednesday each month at HT HQ, Coryton, Cardiff at 7.30pm.

CARDIFF RSGBG - 11, talk 'Home-Brewing in General' by Jeff Diplock, GW3UZS - Whitchurch Community Centre; Dec 9, Christmas Dinner at The Pantmawr Hotel. Details 0446 773212.

SWANSEA ARS - 28, talk 'RSGB - Past, Present and Future' by John Case, GW4HWR, RSGB President. A buffet will be held after the talk. Visitors welcome. Venue - College House, Swansea University. Details from GW0BBO on 0792 818100.

SOUTH YORKSHIRE

BARNSLEY & DARC - 4, discussion on bring & buy at the Barnsley Rally; 18, talk 'Amateur Radio on a Shoestring' by Rev George Dobbs, G3RJV; 25, junk sale; Dec 9, talk by G3ZOM on Jandek Kits and other technical topics. Details 0226 716339;

STAFFORDSHIRE

STAFFORD & DARS - 19, vintage videos - G4DYA; 26, construction evening; Dec 10, talk 'Introduction to Astronomy' by G3EHM. Details from Bernard, tel: 0785 662350.

STRATHCLYDE

CUNNINGHAME & DARC - ***CHANGE OF VENUE*** The Woodlands Centre, Kilwinning Road, Irvine - every Thursday 7.30-9.30pm. The Ardeer Community Flat, Garven Road, Stevenston - Wednesdays 7-9.30pm. (Club Training Centre - RAE class, Novice class, Practical Radio class & Morse). Details from GM3DJS, Secretary, QTHR.

SUFFOLK

IPSWICH RC - 13, junk sale; 27, talk 'Magnetic Loop Aerials' - speaker TBA (Volunteers?); Dec 5, Morse test at Ipswich - details from RSGB; 11, quiz vs Stowmarket Radio Club. Details Mrs. S.M. Elden, G8HYE QTHR, tel: 0473 742072.

SURREY

DORKING & DARS - 26, talk 'Marine Communications - Safety at Sea' - Rescue coordination - initiation from ship via satellite utilising various radio links at HF-VHF, (by Haydn Jones, Consultant Marine Systems) - Friends' Meeting House; Dec 6, Christmas Dinner - venue TBA - organiser Ian, G1GUB.

TAYSIDE

DUNDEE ARC - 5, construction night; 12, lecturettes - members' night; 19, construction night; 26, talk 'Ohm Sweet Ohm' by John Hughes, GM3LCP. Details GM4FSB.

WARWICKSHIRE

MID WARWICKSHIRE ARS - 12, programme discussion for 1992; 26, talk 'HF Antennas for You' by Neil, G3OAY; Dec 10, Christmas pies and wine. Details 0926 513073.

STRATFORD-UPON-AVON RS - 11, talk 'Amateur Radio Observation Service' by Geoff Griffiths, G3STG; 25, Amtor demonstration by Peter Harris, G3WHO; Dec 9, discussion evening. Details 060 882 495.

WEST MIDLANDS

COVENTRY - 1, bangers & mash (meal & social evening); 15, mini lectures; 29, talk by Mr Allen,

RSGB Regional Rep. Details from Jon on 0203 610408.
SOLIHULL ARS - 21, surplus sale. Details 021-783 2996.
STOURBRIDGE & DARS - 18, annual surplus sale. Details from Dennis Body, G0HTJ.
WALSALL ARC - ***CHANGE OF VENUE*** - Manor Farm Community School, King George Crescent, Rushall, Walsall. Details from G6HZI, QTHR.
WEST BROMWICH CRC - ***NEW SECRETARY*** Ian T Leitch, G0PAI, tel: 021 561 2884. Club meets at The Sandwell Public House, High Street, West Bromwich, Sunday evenings from 7.30pm.
WILLENHALL & DARS - ***CHANGE OF SECRETARY*** Mr David G Sanders, G0KRY, QTHR. Home tel: 0922 404127.

WEST SUSSEX

MID SUSSEX ARS - 7, junk sale; 14, talk 'Test Gear for the Amateur' by Tony, G3NPF; 28, talk 'Radio Telemetry Systems' by Chris, G4ZCS; Dec 13, Christmas Social - Sergison Arms. Details from G0OIO.
HORSHAM ARC - 7, inter-club quiz. Details 073784 2150.

WEST YORKSHIRE.

BRADFORD ARS - 14, review of GB0CBS; 20 annual general meeting. Details 0274 494694.
DENBY DALE ARS - 6, annual general meeting. Details 0484 532371.
KEIGHLEY ARS - 14, films; 28, talk 'The Ionosphere' by L.M. Dougherty. Details from Kathy, tel: 0274 496222.
NORTHERN HEIGHTS AR&ES - 6, club project update; 20, talk 'More Easy-to-Build Circuits' by John Grantham. Details 0274 673116.
SPEN VALLEY ARS -7, video show; 21, talk 'Home Construction' by Rev George Dobbs, G3RJV; Dec 5, talk 'Band 3 Radio Systems' by John Abbott. Details 0484 716453.
TODMORDEN & DARS - 4, talk 'Drink Driving' by G1DWA; 18, Antennas - informal discussion led by G3IGW; Dec 2, annual Christmas lecture by Rev George Dobbs. Details Halifax 882038.
WAKEFIELD & DRS - 5, quiz night and pie and pea supper with Sheffield & DRS; 19, talk 'Simple Test Equipment' by G0DJA; 26, members' HF contest night; Dec 3, talk 'Earth's Magnetic Field' by G2FKZ; 10, members' VHF contest night. Details Wakefield 260048.
WHITE ROSE ARS - 6, rig test night; 13, talk 'Windows 3 for IBM PC'; 20, talk 'DX Packet Cluster'. Details from J E Hart, G3ZGA.

WILTSHIRE

DEVIZES & DARC - 15, talk 'Flash Testing'; 29, talk 'Weather Satellites'. Details 0380 724533.

RALLIES AND EVENTS

This is a list of all rallies, hamfests, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Rally News - DIARY'.

1 NOVEMBER

BANGOR & DARS Winter Bring & Buy Sale - Bangor Technical College Gymnasium, Castle Park Road, Bangor. Doors open at 7pm. 'Sell your own Gear', table space only £2. Tea and coffee available. Entrance fee £1. Details from GI3USS, tel: 0247 473948.

2/3 NOVEMBER

NORTH WALES 5th Radio & Electronics Show - Aberconwy Conference Centre, Llandudno. Opens 10am both days. Entrance fee £1 adults, 50pOAPs, children under 14 free. Details from N B Mee, GW7EXH, tel: 0745 591704.

3 NOVEMBER

ELEVENTH NORTH DEVON RALLY - Holsworthy Memorial Hall. Opens 10.30. Bring & Buy stand etc. Talk-in on 2m (S22). Details from K J Nicholls, G8MXI QTHR.
TYNE & WEAR REPEATER GROUP Auction - Fencehouses Community Centre, Fencehouses, nr Chester-le-St, Co Durham. Doors open at 11am for booking in goods. Auction starts at 12.30pm. Details from Ian, G4OCQ QTHR, tel: 091-3840827.

10 NOVEMBER

BARNSLEY & DARC Rally - Willowgarth Senior High School, Brierley Road, Grimethorpe, Barnsley - midway between Barnsley & Pontefract, just off the A628. Travel on A628 & follow the Brierley signs, turn at Three Horseshoes in Brierley (right from Barnsley, left from Pontefract). Follow road to T-junct, turn right. Parking will be on the school field. Opens 11am, (10.30 for disabled visitors); all usual trade stands including anchor and many local radio club stands and groups, Raynet, St John's, bring & buy, refreshments, licensed bar, free prize draw, talk-in on S22. Details from Ernie, G4LUE, QTHR, tel: 0226 716339 (between 6pm and 8pm please).
MARS/STOCKLAND Mobile Radio Rally - Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Trade stands; bring & buy; free parking; admission 50p. Details from Norman, G8BHE, tel: 021-422 9787, Peter, G6DRN, tel: 021-443 1189 or Michael, G4OMP, tel: 021-382 3606.

16 NOVEMBER

BARTG Annual General Meeting - The Churchill Room, London House, Mecklenburgh Square, London. This is near to Kings Cross and Russell Square tube stations. Details from Peter Adams, G6LZB, 464 Whippendell Road, Watford, Herts WD1 7PT, tel: 0923 220774.

17 NOVEMBER

BRIDGEND & DARC Annual Rally - Leisure Centre, Bridgend. Doors open 11am (10.30 for disabled visitors). Usual traders, bring & buy, raffles etc. Talk-in on S22. Details from Alan Hulmes, 0656 721574.
HULL Amateur Radio & Computer Rally - Staff House, Hull University, Cottingham Road, Hull. Entrance fee 50p, refreshments, club stalls, talk-in. Details Mrs A Knight, 100 Church Street, Gainsborough, Lincs; 0427 611299.
This is not connected with Ferriby RC as published in October RadCom.

23 NOVEMBER

CARRICKFERGUS ARG Radio Rally - Downshire School, Downshire Road, Carrickfergus, Co Antrim, N Ireland. 12 - 5pm. Talk-in on S22. Details from GI0NMV, tel: 0232 835812.

24 NOVEMBER

WEST MANCHESTER RC Winter Rally - Bolton Sports & Exhibition Centre, Silverwell St, Bolton. All the usual trade stands, societies, bring & buy etc. All at pavement level, with facilities for the disabled. Refreshments available all day, plus bar. Details from Dave, G1IOO, tel: 0204 24104 (evenings only).

1 DECEMBER

BISHOP AUCKLAND Radio & Computer Fair - Sunnydale Leisure Centre, Shildon, Co Durham. Easy access from A1(M). Doors open 11am (10.30 for disabled visitors). Usual traders stands, bring & buy, ample car parking, bar & refreshments. Details from Ernie, G4TYF, 64 Gurney Valley, Bishop Auckland DL14 8RW, tel: 0388 607500.

8 DECEMBER

LEEDS & DARS Christmas Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey (at junct of the Leeds Ring Road with Bradford Road DO NOT follow signs for Pudsey). Doors open at 10.45am, all usual facilities. Details from Geff Stubbs, 0532 585801
VERULAM Christmas Rally - Hatfield Polytechnic. 11.30 to 17.30. Free parking, catering, raffle. Ring 0923 249456 (Trade) 0727 59318 (Club).

15 DECEMBER

CENTRE OF ENGLAND Christmas Radio & Electronics Rally - National Motorcycle Museum, Bickenhill, nr the NEC jct 6 M42. Doors open 11am (disabled visitors 10.30), admission £1 (concession for RAIBC members and senior citizens). Over 60 traders in 3 large halls; Free parking, bring & buy, talk-in on S22, bar & restaurant facilities. Christmas Special: "Spot the Cracker" on many of the trade stands to win a free prize. Details from Frank Martin, G4UMF, 0952 598173.

19 JANUARY 1992

OLDHAM ARC Rally - Queen Elizabeth Hall, Civic Centre, Oldham. Doors open 11am. Free parking. Catering & bar facilities. Morse test available. Details from Mrs K Catlow, 137 Haven Lane, Moorside, Oldham OL4 2QQ, tel: 061-624-7354 (daytime) 061-652 8617 (evening), fax: 061-633 0550.

26 JANUARY 1992

2ND LANCASTRIAN Rally - University of Lancaster. Doors open 11am (10.30 for disabled visitors). Details from Sue, G1OHH on 0524 64239 or QTHR.

2 FEBRUARY 1992

SOUTH ESSEX ARS Radio Rally. Details from Dave Speechley, G4UVJ, tel: 0268 697978.

9 FEBRUARY 1992

CAMBRIDGE & DARC Mobile Rally and Boot Sale. Details from John, G6UGI, 0763/243570.

22 FEBRUARY 1992

KIDDERMINSTER & DARS Rally 1992. Details from G4HFP, 16 Marlborough Drive, Stourport-on-Severn, Worcs. DY13 0JH.

23 FEBRUARY 1992

5TH TAW & TORRIDGE RALLY - BAAC Halls, Bideford. Details from John, G0GFK, 0237 476402.
EAST COAST AR & Computer Rally. Details from Terry, G7DNS, tel: 0255 222207 or Tony, G0MBA, tel: 0255 422843.
WAKEFIELD & DARS Northern Cross Rally. Details from Bob Firth, G3WWF tel: 0532 378207 (daytime).

29 FEBRUARY 1992

BREDHURST R&TS - Rainham Radio Rally. Details from G0LKE, tel: 0634 362154.
TYNESIDE ARS - Temple Park Leisure Centre, South Shields. Details from Jack, G0DZG, 091 265 1718. (This Rally was previously scheduled for 7 March 92).

1 MARCH 1992

TRAFFORD Rally. Details from Graham Oldfield, G1IJK, tel: 061-748 9804.

14 MARCH 1992

VHF CONVENTION - Sandown Park Exhibition Centre. Stand booking to Les Hawkyard, G5HD, tel: 040-928 342. Details from Geoff Stone, G3FZL, tel: 081-699 6940. Please note this is on a Saturday this year.

15 MARCH 1992

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

22 MARCH 1992

MAGNUM Radio Computer Rally (Cunningham & DARC). Details from Peter, GM0FCI, 0294 72253.
PONTEFRACT & DARS 12th Annual Components Fair. Details from Colin Mills, G0AAD, 0977 643101.

5 APRIL 1992

25TH WHITE ROSE Rally. Details from Tony, G4DXA, PO Box 73, Leeds LS1 5AR.

19 APRIL 1992

CENTRE OF ENGLAND Easter Radio & Electronics Rally. Details from F Martin, G4UMF, 0952 598173.

10 MAY 1992

MARS/DRAYTON MANOR Radio Rally. Details from Peter, G6DRN, tel: 021-443 1189. Trade stand bookings - Norman, tel: 021-422 9787.

30/31 MAY 1992

RSGB National Convention - NEC Birmingham. Details from Norman Miller, G3MVV, QTHR.

14 JUNE 1992

ELVASTON CASTLE Mobile Rally. Details from John, G4PZY, tel: 0332 767994; trade enquiries Peter, G3WFU, tel: 0332 700265 (evenings).
RNARS Annual Mobile Rally. Details from Cliff Harper, G4UJR, 0703 557469.

21 JUNE 1992

DENBY DALE & DARS Annual Mobile Rally. Details from Philip, G4FSQ, 0484 644827.
NEWBURY & DARS Annual Car Boot Sale. Details from N Jaques, G0HFU, 0635 63310.

28 JUNE 1992

LONGLEAT AR Rally. Details from Shaun, G8VPG, QTHR, tel: 0225 873 098.

12 JULY 1992

SUSSEX AR & Computer Fair. Details from Ron Bray, G8VE, QTHR, 0903 763978.

SILENT KEYS

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

G0CTB	Mr FD Wade	23.08.91
G0IKK	Mr CM Brooks	05.06.91
G0KAA	Mr JE Bussey	01.05.91
G2DF	Mr FA Vost	05.08.91
G2DF	Mr FA Vost	05.08.91
G2RF	Mr HD Bramwell	August 91
G3ANS	Mr N Mason	18.10.90
G3AO	Mr S Luvings	21.06.91
G3CLG	Mr F Bills	14.09.91
G3HSK	Mr L Seaton	04.01.91
G3IG	Mr AB Willshire	18.01.91
G3KCA	Mr AC Clements	06.08.91
G3PSH	Mr J A Coffey	04.02.91
G3WYF	Mr CW Heigh	03.08.91
G4FDW	Mr DG Morgan	
G4PUL	Mr WGJ Duddell	26.08.91
G4RBJ	Mr J King	15.06.91
G4RNH	Mr H Robey	March 91
G5OX	Mr C Hubbard	
G6LQF	Mr AGE Burgess	16.08.91
G8BJ	Mr R Nicholass	03.07.91
G8GSI	Mr RR Browne	16.08.91
G8GWG	Mr S Rabone	24.05.90
G8LG	Mr LH Gray	
G8ROI	Mr HLR Coleman	02.08.91
G8ZHF	Mr R Taylor	16.08.91
GI0JLG	Mr JL Gallagher	10.10.91
GI3CSV	Mr JHW Millar	08.09.91
GM0LUX	Mr A Syme	04.08.90
GM1EOL	Mr W Kerr	13.07.91
GM2CQI	Mr J McNab	07.08.91
GW4KHH	Mr JRS Craigie	March 91
NY8T	Mr W Murawsky	23.03.91
RS30467	Mr H Hina	
RS32121	Mr W Hall	
RS51871	Mr FK Webb	

CORRECTION:
G0IPR WT Aldridge 07.06.91 (not as Sept 1991 *RadCom*)

HF RULES

continued from page 67

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

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

(f) All the entries from each competing society are to be sent in one package to: RSGB HF Contests Committee (AFS), c/o S V Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey, CR7 7AF. Packages must be postmarked no later than 1 February 1992. **(Please ensure that logs are well packed to avoid loss or damage in transit.)**

9. Awards.

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

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

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

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

SSB AFFILIATED SOCIETIES TEAM CONTEST 1992

This is a new and experimental event, introduced as the result of requests for an extension of AFS. The HFCC appreciate the lack of advance warning, and will take this into account in their evaluation of the response. The event has been scheduled for a Saturday in deference to the large number of 80m SSB operators who regularly use the band on Sundays at this time. The rules for this event are the same as those of CW AFS, except as detailed below:

1 The General Rules for RSGB HF Contests as published in the January issue of *Radio Communication* will apply. There is no QRS Corral in this event!

2 When: 1300GMT to 1700GMT on Saturday 18 January, 1992.

3 Teams: Teams comprise up to *three* stations.

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

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

9 Awards:

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

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

(c) A commemmorative certificate will be awarded on request to any operator making more than 50 QSOs in this event. Society Secretaries with members wishing to claim these certificates should include an A4-sized SAE with their entry.

CABLES & CONNECTORS

Westflex 103, low loss air spaced 50 ohm	95p/m
RG213U, (UR67), Mil spec, 50 ohm low loss	70p/m
UR43, 5mm dia, 50 ohm, single centre	25p/m
UR76, 5mm dia, 50 ohm, stranded centre	25p/m
RG58CU, 5mm dia, 50 ohm, stranded centre	25p/m
RG174U, 2.3mm, 50 ohm, miniature coax	30p/m
UR95, 2.3mm, 50 ohm, mini nylon coax	30p/m
UR111, 2.3mm, 75 ohm PTFE mini coax	40p/m
UR57, 10.3mm, 75 ohm low loss coax	70p/m
UR70, 6mm dia, 75 ohm transmitting coax	30p/m
Double screened, 75 ohm coax, 8mm dia	40p/m
UHF low loss TV downlead, 75 ohm	20p/m
75 ohm twin balanced feeder, 400 w PEP	20p/m
300 ohm standard ribbon	18p/m
RG62AU, 6mm dia, 95 ohm coax	50p/m
Single core screened cable, 2.3mm dia	12p/m
Two core screened cable, 5mm	25p/m
3 core mains, 5 amp, cable	20p/m
5 core rotator cable, medium duty	30p/m
6 core rotator cable, heavy duty	45p/m
8 core rotator cable, heavy duty	65p/m
14 SWG HD copper **25p/m** 16 SWG HD copper	20p/m
PVC coated AE wire, light duty	8p/m
Red/black DC power cable, 8 amp	30p/m
PVC coated AE wire, heavy duty	12p/m
NEW UR67 50 ohm HD with robust outer sheath	90p/m
NEW 75 ohm HEAVY DUTY TWIN Balanced feeder	60p/m
NEW 300 ohm HEAVY DUTY SLOTTED Feeder	60p/m
NEW 16swg stranded copper aerial wire	30p/m

Postage on cables up to 20m £2.50, over 20m £4.00

CONNECTORS

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N line socket, GREENPAR	£2.50	only in 10.3mm size	
N4 hole sq chassis socket	£2.00		
BNC plug, GREENPAR 5mm	£1.20	ditto 10.3mm	£4.00
N SKT to N SKT line adaptor	£3.00	ditto N plug to N plug	£3.50
N socket to BNC plug adtr	£3.00	BNC plug to N socket	£3.00
PL259 plug, GREENPAR, PTFE/silver	£1.20	(P/P on connectors	75p)
Special N plugs for W103	£5.00	Polyprop egg insulators	70p
Self amalgamating tape	£3.80	4" dog bone insulators	70p
Dipole centre boxes	£2.50	Half kilo multicore solder	£5.00

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The Last Word

LM-ENTARY SOLUTION

On behalf of the Lincoln Short Wave Club and Lincoln Repeater Group, here is a report on the recent happenings regarding interference to GB3LM, the Lincoln 2m repeater.

Several months ago British Telecom installed a paging transmitter in the tower of Lincoln Cathedral, its colinear antenna on the same mast as that of our repeater. With 85W output this, not surprisingly, caused us vast interference with a pulse of data every thirty seconds on four alternating frequencies.

We felt (quite strongly) that this was a pretty unacceptable thing to do, but in fairness BT have tried to help and indeed supplied us with cavity filters to help combat the problem. These were carefully tuned and tested but all without improvement.

We approached the RA and this resulted in a site meeting last September between a representative of BT paging, an official from the RIS and ourselves. The RA official thoroughly checked the output from the British Telecom equipment which was found to be perfectly satisfactory and in accordance with the specifications. Next, similar tests were carried out to the output of GB3LM. To our relief, this also was perfectly acceptable and in accordance with its spec.

The three gentlemen climbed to the top of the tower to assess the antennas. When his eyes adjusted to the light, the BT man exclaimed under his breath all sorts of curses as he saw for the first time how close the two antennas were situated! He then suggested that rather than have the two (vertical) antennas side by side we should instead both switch to folded dipoles mounted on the same mast one above the other. This sounded the most reasonable solution and BT have offered to do the work as long as we supply the dipole. The only problem we now face is the fight for whose dipole should go at the top of the mast and whose should go below!

Unfortunately the users of GB3LM have suffered extensively with a very poor service in recent months and I hope a report in RadCom will liven their spirits knowing that what was an excellent repeater will soon be back in full working order.

Patrick J Markham G0OSO, Secretary, Lincoln Short Wave Club

ITS ALL RUSSIAN TO ME

While I think most members would agree that RSGB publications are generally very good, and looking at the crowds around the book stalls at the rallies this must be so, but I do wonder how many members bought the cassette tape *The Amateur's Conversation Guide* in Russian! This was bought for me as a present some twelve months ago; very interesting tape, I didn't understand a single thing or word that was said as there were no explanations, booklet etc.

Well not to be defeated I enrolled in the local college evening classes to take Russian and am re-enrolling as a second year student this month. So in a roundabout way, thank you RSGB but I feel this may be rather drastic action to take to understand that cassette.

I see now that the tape is not advertised any more - is it that it was found to be unsuitable? Maybe now with the changes in the USSR and a new interest in the language a new, more understandable, tape could be of use, as I hear other amateurs having a bash at Russian on the air and the Ua stations seem so pleased to think that a few of us have bothered to learn even just a few words, even if it is only for a rubber stamp QSO.

Roger Daniel G4RUW

[Sorry, you were disappointed. The language cassettes, which were not produced by the RSGB, were discontinued some time ago by our supplier and we know of no other source -Ed]

PARTY LINE

Congratulations on your achievements with old 6m privileges restored and strong precedent set for the future.

Might the RSGB now like to turn its attention to the restoration of another old (but lost) privilege, that of third party traffic? With the fall of telephone monopolies/duopolies, surely there can be no objection in principal now to phone patch, for example, as allowed elsewhere.

Allowing a spouse or friend on the microphone to join in a QSO with a DX station, rather than passing on best wishes or relaying messages signed from across the room, is long overdue for liberalisation. I do hope we can make some progress in this area soon.

Jeremy Boot G4NJH

KILLING PACKET?

I am writing over the receipt here in Cyprus of some disturbing packet radio bulletins coming from the UK. I provide a backup BBS in Cyprus to the community BBS, 5B4TX, and many stations log onto my BBS to obtain information. For example, as well as personal messages, DX news, satellite information, ARRL and RSGB news bulletins.

Included with the above recently we have seen bulletins attacking private individuals, attacking the RSGB, giving out personal fax numbers, and carping about censorship and threatening legal action. I will not name the stations concerned but I have received seven such messages in the past few weeks with assurances that there will be more to follow.

There are problems with other countries, for example a station in Belgium is publishing a 'black list' of QSL cards not received, but the UK is of more concern to us in ZC4/5B4.

We look forward to receiving up to date information and news here in Cyprus via the packet network and there are several G license holders here. If messages of this type continue to be sent there is always the danger that the authorities will withdraw the BBS privileges and we will be deprived of a very useful network. Let us not see bulletins ending, in all seriousness, with the phrase "Hate mail welcomed", or as in another example linking a SysOp to Hitler with a thinly veiled suggestion the SysOp might follow Hitler's example and shoot himself.

Finally on the question of censorship, yes I will remove any messages I feel may contravene the license regulations in the UK or Cyprus. So come on, please keep strictly to the terms of our licenses and to the spirit of amateur Radio.

Ian Osborne G0KKT/5B4YX/ZC4OS, SysOp 5B4YX

[See page 71, July RadCom, *for UK packet guidelines - Ed]*

THE WAY TO DXCC

It pays to brush up your Morse. Five years ago I was talked into starting on DXCC. Now looking at my invaluable RSGB *DX News Sheet* I find that some of my missing countries only appear on CW. So, two weeks of listening and then two trembling QSOs, next I got the KP5 expedition on 28004 on CW. He probably worked two other stations while I was sending my call for the first time but he came back with 599 sent quite slowly! I have not used CW since 1948 and find that my speed is lacking, also the wrist may be stiffer. However, now I have a new country on CW and have ordered a bug, my McElroy one having got lost in the war. I live in hopes of the Honor Roll before I become a silent key.

John Clarke TK5FF, also G8KA

Please note that the views expressed in 'Last Word' are not necessarily those of the RSGB.

We reserve the right to edit letters and regret that we can no longer acknowledge them individually but will pass them on to the relevant department.

SIMPLEX ON RB8

In the north-west of England there is considerable simplex activity on repeater output frequencies, in particular RB8.

I spoke to one of those using this channel and enquired if he were aware he was using a repeater channel. The gist of his reply was: "Yes I know it's a repeater channel but we have used it as a local natter channel for over 20 years, long before repeaters were allocated to these frequencies and anyway there are no local repeaters on this channel." From my location I can hear at least two repeaters.

Later, the same person, still on RB8, using a 2 x 21 element antenna and by inference well over 10W output, was in simplex contact for more than an hour with a station in Dublin. Hardly typical equipment for local nattering. During this period all the normal simplex channels were unoccupied. We must be thankful that most amateurs do not have this attitude.

Mr D P T Evans GW3IVK

CONTEST BEGINNER

As a fairly recent convert to amateur radio, as can be seen by my callsign G7HJX, I feel it would be helpful to run a short series about contesting, something that many people have an interest in but, like myself, find the rules and regulations a little daunting. Perhaps the VHF and HF Contests Committees could prepare an article including:- An interpretation of the various rules and regulations; a simple explanation of the scoring methods used eg radial rings; minimum equipment needed to compete; basic tips and hints; and Safety standards on portable operations.

So far the only contests I have had the courage to enter have been those run by the Worked All Britain group with very simple rules and scoring methods, but great fun nevertheless. Perhaps this may encourage more entries to contests to the benefit of all.

Dave Raybould G7HJX

[I have raised this with both committees several times over the past year and I think we will be able to grant your wish in 1992 - Ed]

HELPING HAND

Early in June, I was struck by a heavy goods vehicle, which failed to stop, leaving me lying in the road with a serious hand injury! I was rushed to that fine Queen Victoria Hospital at East Grinstead, where micro-surgery was employed to save the hand.

As I had been picked up off the road, I was admitted with none of the items required for a stay in hospital, but help was at hand! As soon as news of my accident became known, I was visited by G3WR and G8TOZ, who were able to take me back home, in order to collect a few items, (including my 2m h/held), being returned to hospital by a CB-er!

During the two monthsI remained there, I was able to make several contacts, including one with G6UUO, who was able to pass my best wishes to those at the Brighton Rally, (where I should have been on the organising committee!). Later, he took me on a very pleasant afternoon drive, followed by a cream tea before delivering me back to the hospital. Also during my stay, many amateurs visited me and I received innumerable cards and messages from the members of the Brighton, Worthing & Mid-Sussex clubs, with G8TOZ taking care of my home and mail etc.

These actions must show that whatever is said, the amateur spirit still survives, irrespective of what one hears. I pass on my grateful thanks to all those who helped me in my hour of need. I will have to return to hospital soon for further operations, and will make sure that a rig goes with me!

Reg Moores G3GZT/VS6QD

THE IMPOSSIBLE DREAM

G3OUF remarks (apropos of 50MHz, *RadCom* May) "what was once considered impossible was achieved". I now hope, before I die, to see:-

(i) The recent power increases allowed to CW users followed by improvements for other modes.

(ii) HF telephony licences issued without Morse testing.

(iii) A letter of mine on some such subject published in RadCom.

Alex L Dick GM0IRZ

[Happy to grant one out of the three straight away Mr Dick- Ed]

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AWARDS BOOKS

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Filter 6 - Notch Tuned to 50MHz	£9.42	£8.01
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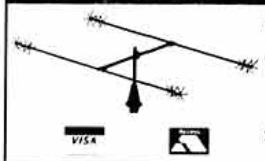

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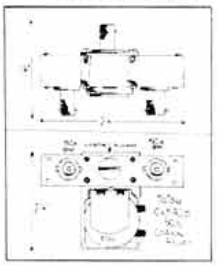

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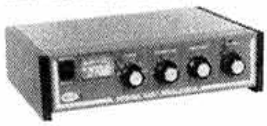

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