

FOR THE RADIO LISTENER

shortwave magazine

REVIEWED THIS MONTH

Icom IC-R72 Communications Receiver
Uniden Bearcat UBC 142XLT Scanner



Projects to Build
Chart Recorder, Bandspread
Dipper & Signal Monitoring Meter

Also
Survivor's Guide to Listening

Plus Regular Features Covering

Airband, Scanning, Junior Listeners, SSB Utility
Listening, Propagation, Amateur Bands, Long,
Medium & Short Waves, Satellite TV Reports,
Weather Satellites and more.

May 1993 £1.90 ISSN 0037 - 4261



short wave magazine

VOL. 51 ISSUE 5 MAY 1993

ON SALE APRIL 22
(Next issue on sale May 27)

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pw publishing ltd.

Cover:

Projects are this month's theme and inside you will find constructional details for a bandspread dipper, signal monitoring meter and chart recorder.

The inset picture shows the Icom IC-R72 communications receiver, the main review subject.



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good listening

CROSSWORD
MAY 1993

editorial



SWM SERVICES

Subscriptions

Subscriptions are available at £21 per annum to UK addresses, £23 in Europe and £25 overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £36(UK) £39 (Europe) and £41 (rest of world).

Components for SWM Projects

In general all components used in constructing SWM projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

The printed circuit boards for SWM projects are available from the SWM PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 021-353 9326.

Back Numbers and Binders

Limited stocks of most issues of SWM for the past five years are available at £1.80 each including P&P to addresses at home and overseas (by surface mail).

Binders, each taking one volume are available for £5.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for back numbers, binders and items from our Book Service should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Broadstone (0202) 659930. An answering-machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Broadstone (0202) 659950.

In this issue you will find several projects to provide you with many enjoyable hours building and then using them. One of these projects is for a chart recorder - an indispensable piece of equipment for those interested in weather, propagation or astronomy. Unfortunately, the drawings would take up far too much of the magazine, so I have decided not to reproduce them in the magazine. This decision was helped by the fact that, good as the drawings are, they have been produced on a PC. Experience shows that these do not convert to the Macintosh used to produce the magazine, at least, not to a standard acceptable to me - and the cost of having them redrawn on a Mac would have been prohibitive.

A No Code Licence

There is current speculation that a 'no code' amateur licence is being sought from the Radiocommunications Agency. It is certainly true that the RA is asking for written observations by any interested party on a 'no code' licence - so if you have any views, you should write to Mrs Karen Scott, Room 712, Radiocommunications Agency, Waterloo Bridge House, Waterloo Road, London SE1 8AU. My own views, as a Class B licensee, are that a golden opportunity was lost with the introduction of the Novice Licences to move towards a licence structure as used by the Americans. Some form of incentive is needed to gain access to the h.f. bands and Morse is probably the most obvious. I, personally, couldn't care less if the extra qualifications entailed juggling three balls and a rubber chicken at 12 moves a minute! The important thing is that there must be some extra effort needed to show commitment before any extra privileges are granted.

Prize Winners

The five winners of the December 92 SWM Crossword Competition were Graeme Chesser of Aberdeen, D Ferris of Workington, Harry Guy of Stirling, David Tasker of Leicester and Kenneth Hutley of Maldon. They have all now received their £10 SWM vouchers.

Dick Ganderton G8VHF

letters

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER IS PUBLISHED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to any other magazines. The views expressed in letters published in this magazine are not necessarily those of *Short Wave Magazine*.

Long Range Maritime CW Services Update

Dear Sir

I would like to say how much I enjoy the article by Graham Briggs on long range maritime c.w. services. I have some information on the stations that he lists as unknown.

8453kHz HWN *French Naval, Paris*
8466kHz UJY *Kalingrad Radio, Russia*
8475kHz FUX *French Naval, le Port, Reunion & Dependencies*
8551kHz CTP *NATO, Lisbon, Portugal*
8568kHz FUV *French Naval, Jibuti, Djibouti*
8697kHz CFH *Canadian Forces, Nova Scotia, Canada*
22537kHz FUF *French Naval, Fort de France, Martinique*

I hope these are of some use to Graham.

Simon Lucas
West Yorkshire

Dear Sir

Readers might like to hear a comment on the excellent article on maritime matters in the February issue, which shows that even the 'experts' get it wrong sometimes.

You may remember that a while ago a Sea King from Brawdy crashed into the Bristol Channel while on a search and rescue operation. This resulted in a rescue operation to recover the crew, which involved the warships *Cumberland* and *Roebuck*, the Angle lifeboat and, of course, the second Sea King (191) from Brawdy.

Obviously this meant there were a lot of signals to and from Plymouth Rescue Centre, a lot being on 2.182MHz. While Sea King 191 was talking on 156.8MHz, the v.h.f. distress frequency, they were asked by Plymouth Rescue Control to change to '2182 MF' (meaning 2.182MHz on medium frequency).

Sea King 191 assumed it was u.h.f. they were being asked to use and replied that they did not have this channel. There then followed a long exchange, with Plymouth repeating the letters 'MF', when it would have been better to say '2 decimal 182' when all would have been clear. Eventually 191 realised that they meant h.f. and all was well!

Just to complete matters, 191 did eventually use a u.h.f. channel when contacting one of the warships, using 282.8MHz.

The ditched crew were rescued by a helicopter from one of the ships, and the wreckage was brought to the Naval jetty at Pembroke Dock.

It shows just what can be heard at busy times like this and in addition to emergencies there are rescue exercises that are very realistic and well worth listening out for. They are usually set-up well beforehand.

P.A. Finn, Dyfed

letters

Old v New

Dear Sir

Regarding Mr Marker's comments in the February issue about old and new receivers.

My main communications receivers are good and over 30 years old, I certainly don't intend parting with them in this life. However, they won't work in the bathroom, garden or on a quiet hill-top and they don't receive f.m. Surely, the Sangean portable should not be compared with an old Trio; they were intended for different applications and both represent(ed) excellent value for money.

I also have an ATS-803A and am entirely satisfied with performance; big batteries for long life; bass/treble for comfortable listening; fast, accurate and stable frequency selection; and yet I find that both types of receiver are necessary - the 'tranny' for

general use and frequency hopping - the 'valve' for trustworthy long term listening and monitoring.

The 803A has many advanced internal features, one being automatic switching to 50Ω input termination above 1620kHz when the external antenna socket is used, and as Mr Marker noted, compared with older receivers it will not directly match ordinary wire antennas at top and tropical band frequencies.

Fortunately, one very simple additional and easily removable wire link will disable the pod and boost sensitivity by some 20dB around 2MHz. I'll gladly send details f.o.c. to anyone who forwards an s.a.s.e.

There is one point that niggles me about the Sangean. This medium size portable does not have a handle, so I had to make one.

**Graham Maynard
N. Ireland**

Health Warning

Dear Sir

Regarding *SWM* January page 33.

It is not totally nutty to say that large amounts of Radio Energy are hazardous to health. It was discovered during World War II that personnel had been sterilised by radar after the development of the Magnetron, now found in microwave ovens. The Magnetron developed at Birmingham University revolutionised radar working even in the 1940s at 10cm considered by both sides at the time as the best wavelength to use. This device was considered at the time as Most Secret. There is some intelligence that suggests that the Russians used beamed r.f. against embassies and that at least one official retired prematurely, during the Cold War.

During World War Two engineers could not understand how German planes managed at night (in the dark) to bomb British cities. After much thought and an experiment in a plane, recommended for write-off by the engineers, a beamed signal was found. Some time later a captured German bomber was examined. The receiver was studied and was found to have a larger amount of i.f. gain than was normally necessary for a blind landing system.

To cut a long story short, diathermy units were requisitioned from hospitals and modified in a small workshop. Although the h.f. beam was only bent instead of being completely indecipherable. This was due to the fact that for operational reasons one of their telephone lines was pinched. As for Kilocycle Ken, he retired and I am reliably informed that young Golly has a very good job with GEC. The recommended safe limit for r.f. is 10mW per square centimetre but this is based on the heating effect - nobody really knows what the safe limit is.

Science is an onion and we keep peeling it.

Peter C Gregory, Ashton-under-Lyme

Thanks

Dear Sir

I recently wrote to your First Aid column and received a very good response. The pre-selector in question is now working. Thanks must go to Peter Barber, R.H. Avery and David Davies for their invaluable help.

Tim Bucknall, Cheshire

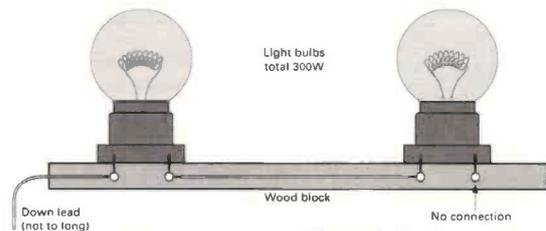
Short Wave Magazine, May 1993

Unwanted Gifts?

Dear Sir

I am an old timer DXer who saw service with the eighth army in Italy, 1944-45, - I still have a QSL card from HP5J in Panama that I heard on an 18 Set - and whose FRG-7700 receiver has recently clocked up eleven years service with just two overhauls. I never cease to be amazed to read about receivers, etc., for sale in *SWM* with the declaration, 'as new, still boxed', or 'few weeks old'. What is the reason for this? Surely they can't all be unwanted Christmas gifts.

**Harold Frank Buggins
Witney**



Novel Antennas

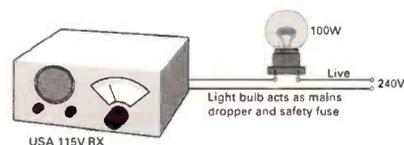
Dear Sir

As a ship's carpenter in the early 1950s, aeriels on a 10 000 tonner was a no-no! They kept getting broken. So we made them as short as possible from very large light bulbs, borrowed(?) from cargo clusters. They really did

work. I suppose one could silver paint half of one bulb for semi-direction on v.h.f. The drawings are from memory - a bit old by now.

Hopefully, they may be of use to someone.

Terence Purkis, Hull



More DXing

Dear Sir

How nice it is to see the long, medium and short wave DXing column in your magazine, but I thought it would be quite nice if you could possibly extend that by including an f.m. chart on local radio?

**David Brooks
Redruth**

Dear Sir

I was interested in Robert Connolly's letter in the February issue of *SWM* and support his idea for a one-off special on Band II v.h.f. f.m. broadcast stations. It might also be useful to do a feature on the audio equipment used in the stations of f.m. stereo broadcast

stations and to cover the licensed ethnic/community and minority-interest music stations available on v.h.f. There is more to broadcasting than just transmitters and receivers!

**Ivor Nathan
London**

grassroots

rallies

May 3: The Dartmoor Radio Club Rally will be held at a new and larger venue, the Yelverton War Memorial Village Hall, Meavy Lane, Yelverton, Devon. Doors open 10.30am with Talk-in on S22. **Ron G7LLG. Tel: (0822) 852586.**

May 9: The MARS/Drayton mobile rally will be held at Drayton Manor Park, Tamworth, Staffs. Doors open at 10.30am. All the usual traders, flea market, Bring & Buy, club stands. The family rally. **Peter G6DRN. Tel: 021-443 1189.** Trade stands ring **Norman G8BHE. Tel: 021-422 9787** evenings.

May 30: Plymouth Radio Club Rally will be held at Plymstock School, Plymstock. Doors open from 10.30am to 4pm. There will be car parking, traders, Bring & Buy, Talk-in, Raffle and refreshments. **Derek Foster G7ESZ. Tel: (0752) 787181.**

June 6: The Spalding & DARS are holding their Jubilee Mobile Rally at Springfield Gardens, Spalding. **T Kettlewell. Tel: (0775) 722940.**

June 27: The 36th Longleat Amateur Radio Rally, Longleat House, near Warminster, Wiltshire. **Shaun. Tel: (0225) 873098.**

July 4: The York Radio Rally will be held in the Tattersall Building, York Racecourse, Knavesmire, York. Doors open at 11am, entrance fee £1. Ample free parking, amateur radio, electronics and computers, arts and crafts, Morse tests, licensed bar and cafe. Talk-in on S22. **Andy Suter. Tel: (0904) 708164.**

July 11: The Horncastle Amateur Radio, Electronics & Computing Fair will take place at the Queen Elizabeth's Grammar School Sports Hall. **Tony Nightingale G6CZV. Tel: (0507) 522482.**

***August 8:** Flight Refuelling ARS Hamfest will take place at the Flight Refuelling Sports ground, Merley, Wimborne. The event will run from 10am to 5pm and will include the usual mix of traders, Bring & Buy, craft exhibitors, car boot sale and field events. Overnight camping facilities available for the 7th. Talk-in on S22. **Richard Hogan G4VCQ. Tel: (0202) 691021.**

August 29: The Galashiels Club are holding their open day at the Focus Centre, Livingstone Place, Galashiels. All the usual activities will be there - Bring & Buy, traders, club stands, raffle and refreshments. **GMOAMB. Tel: (0835) 22686.**

If you're travelling long distances to rallies, it could be worth phoning the contact number before setting off to check all is well.

AVON

RSGB City of Bristol Group: last Mondays, 7pm. The Small Lecture Theatre, Queens Building, University of Bristol, University Walk, Bristol. May 24 - Half Yearly General Meeting. **Dave Bailey G4NKT. (0272) 672124.**

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. May 5 - 20m Activity Evening & Committee Meeting, 12th - Talk on 'Bristol' Aero Engine by Doug Dyson, 19th - DIY Crystal Set by G0JQW, 26th - 10GHz Narrow Band DX by G6PJS. (0275) 832222.

BEDFORDSHIRE

Shefford & DARS: Thursday, 7.45pm. Church Hall, Amphill Road, Shefford, Beds May 6 - Modern 10GHz operation by G8DKK, 20th - Balloons and hot air by Mike Ladell. P. Bradfield. (0462) 700618.

BERKSHIRE

Maidenhead & DARC: 1st Thursday & 3rd Tuesday, 7.45pm. The Red Cross Hall, The Crescent, Maidenhead. May 6th - Bracknell 70cm Repeater GB3BN by G4EMO, 18th - Preparations for HF and VHF Field Days. Neil G0SVN. (0628) 25952.

CHESHIRE

Stockport RS: 34 Ladythorn Road, Bramhall, Stockport, Cheshire. May 13 - Introduction to Packet Radio by G4UJD, 27th - Clinic Evening. 061-439 4952

EAST SUSSEX

Hastings E&RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey Close, Hastings. May 19 - Police Forensics by Gary Fellows G7GHP. Reg Kemp. 7 Forewood Rise, Crowhurst.

Southdown ARS: 8.00pm Chasely Home for Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne. May 10 - Mercury Communications by John Vamperlow from Mercury. Jan G4XNL. (0323) 412699.

ESSEX

Vange ARS: Thursdays 8pm, Barnstable Community Centre, Long Riding, Basildon, Essex. May 6 - No Meeting (Local Election in Hall), 13th - X-Rays (Pt 2), 20th - Bert's Bugs, 27th - Port Connections. GONJY (0268) 552606.

FIFE

Dundee ARC: Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. May 4 - Lecture by Harry Matthews, Museum of Communications, Boness, 11th - Construction Night,

Club Secretaries:

Send all details of your club's up-and-coming events to: Lorna Mower, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Please tell us your County and keep the details as brief as possible.

18th - DARC Awards Evening, 25th - Construction Night. GM4FSB, 30 Albert Crescent, Newport on Tay, Fife DD6 8DT

GREATER LONDON

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, Chiswick, W4. May 18 - QRP Problems, an open discussion. G0JRY. 081-749 9972.

Edgware & DRS: 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. May 13 - Using the Straight Key by G3SJE, 21st - Straight Key Evening. Rod Bishop. 081-204 1868.

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. May 13 - Lecture on 'Early Radar, Part 3' by Stan Wood, the Marconi Historian, 27th - DF Workshop, equipment and technique explained. Brian Shelton G0MEE. 081-360 2453.

HAMPSHIRE

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. May 6 - Visit by Peter Chadwick G3RZP 1993 RSGB President. S.W. Swain. (0705) 472846.

HERTFORDSHIRE

Dacorum AR & TS: 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. May 18 - Talk by Mr Armstrong from AKD. Dennis Boast. (0442) 259620.

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. May 14 - Hints and Tips by G3JNJ, May 28 - Learn Morse in One House with G3ZVW. Roy G4UNL. 081-804 5643.

Verulam ARC: 2nd & 4th Tuesdays, 7.30pm. RAF Association Headquarters, New Kent Road, St Albans. May 25 - Antiques Road Show by Keith Goodchild Walter Craine. (0923) 262180.

HUMBERSIDE

Goole R & ES: Most Fridays, 7.30pm. West Park Pavilion, off Airmyn Road, Goole. May 7 - GOOLE on the air, 14th - DF Practice, 16th - G3XAY Memorial Trophy DF, 21st - Contest Planning, 28th - Social Evening. Steve Price. (0405) 769130.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. May 18 - TV Principles by Ian Daniels. Graham Chamberlin. 081-462 2689.

Maidstone YMCA ARS: YMCA Sports Centre, Melrose Close, Maidstone, Kent. May 4 - Dummy

Morse Tests, 7th - Construction Competition (open), 8th - RSGB Morse Tests New Format Only, 14th - RAE and CV, 21st - Practical Evening, Bring Soldering Irons, etc., 28th - RALLY '93 Final Meeting. GOSFC (0622) 670936.

LANCASHIRE

Rochdale & DARS: Mondays, 8pm. Cemetery Hotel, 470 Bury Road, Rochdale. May 10 - Five Million Volts - Aftermath. G0PUD. (0706) 32502.

NORFOLK

Dereham ARC: 8pm. St John's Ambulance Hall, Yaxham Road, Dereham. May 13 - The Use of Test Equipment. Mark Taylor G0LJG. (0362) 691099.

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. May 5 - Radio Bygones Update by Tim Christianson, 12th - GB3NB Repeater AGM, 16th - Club Trip to RSGB Exhibition NEC, 19th - Real Radio Practical Tuning up, 26th - Final HF NFD Briefing. Sheila Snelling G0KPV. (0603) 618810.

NOTTINGHAMSHIRE

Mansfield ARS: 1st Thursdays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. May 6 - AGM. Mary GONZA. (0623) 755288.

STRATHCLYDE

West of Scotland ARS: Fridays, 8pm. Garnethill Multi-Cultural Centre, Rose Street (Off Suchiehall St), Glasgow. May 7 - Strathclyde Police Communication Networks GM0EFH, 14th - Club Night GM0NOZ, 18th - Visit to BBC m.w./l.w. TX Wester Glen, 21st - AGM. Jack Hood GM4COX. (0698) 350926.

SUFFOLK

Sudbury & DARC: 1st Tuesdays, 8pm. The Five Bells Inn, Great Cornard, Sudbury. May 4 - SANDBRA Club night at the Five Bells, Great Cornard. Natter'n'Noggin night, with a raffle. Colin GOPAO. (0787) 77004.

WARWICKSHIRE

Stratford upon Avon & DARS: 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford-upon-Avon. May 10 - Preparing for the 2m DF Foxhunt, 24th - Mobile Operation by G4ABS. A. Beasley G0CXJ. 060-882 495.

WILTSHIRE

Trowbridge & DARC: 3rd Wednesday. The Southwick Village Hall, Southwick, Trowbridge. May 5 - Data Mode Symposium, 19th - Natter Nite. Ian G0GRI. (0225) 864698.

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

junior listener

Many short wave stations change their schedules in March of this year. I've had quite a few details sent through this month. First Radio Sweden. Their English broadcasts to Europe are: 1500UTC on 1.179 (weekdays only) & 15.190MHz. 1730UTC on 1.179, 6.065 (also via satellite), 9.645 & 15.270MHz. 2100UTC on 1.179, 6.065 (also via satellite) & 9.655MHz. 2230UTC on 1.179 & 6.065MHz (also on satellite).



Next WCSN and their *Christian Science Sentinel* programme:

Saturdays from May 4
1205-1255UTC on 15.665MHz
1405-1455UTC on 15.665MHz (1st & 3rd Saturdays and 1st Sundays)
Sundays from May 4
0705-0755UTC on 9.840MHz (1st & 3rd Saturdays and 1st Sundays)
0905-0955UTC on 11.705MHz
1205-1255UTC on 15.665MHz
1405-1455UTC on 15.665MHz
Onto WSHB and again the *Christian Science Sentinel* programme.



Prize Time

I've had a generous donation from a reader of this column. John O'Neill is awaiting delivery of a smart Easyreader DM1000 decoder and so has offered to donate his RMS-3 program for the Spectrum to a junior listener. This program decodes RTTY, Morse and SSTV.

John suggested this gets offered as a prize in a competition, which is a nice idea. Tell me what you already do with your spectrum and what you would like to try and do with this program and the best letter wins. I'll talk to the Editor and see if he can't drum up a few extra prizes too. So get writing, who knows what you could win!

Short Wave Magazine, May 1993

Saturday
0705-0755UTC on 9.870MHz
1905-1955UTC on 17.510MHz

Sunday
0705-0755UTC on 9.870MHz
(1st & 3rd Saturdays and 1st Sundays)

Finally in this group, two frequencies for KHBI for the same programme.

Saturday
1905-1955UTC on 15.665MHz

Sunday
1920-1955UTC on 15.665MHz
Radio Austria International broadcasts to Europe *Report from Austria* every day at the same time. This programme includes a review of listeners' letters and DX news in the Saturday edition starting at 1430 and continuing in all broadcasts including Sunday 0830UTC.

0730UTC
on 6.155 & 13.730MHz
1430UTC

on 6.155, 13.730 & 21.490MHz
1830UTC on 6.155 & 5.945MHz
Swiss Radio International broadcasts to various areas in English.

0400, 0500, 0600 & 1000UTC on 3.985, 6.165 & 9.535MHz.
The KOL-Israel schedule goes through until September 1993.

0400-0415UTC on 9.435MHz
1000-1030UTC on 17.545MHz
1300-1325UTC on 11.587, 11.603 & 15.640, 15.650, 17.575 & 17.590MHz

1700-1715UTC on 11.587, 11.675, 15.640 & 17.575MHz
1900-1930UTC on 11.587, 11.603, 11.675, 15.640, 15.650 & 17.575MHz

2130-2200UTC on on 11.587, 11.603, 11.675, 15.640, 15.650 & 17.575MHz



Radio Award

The City of Belfast Radio Award can be obtained by short wave listeners on a heard basis.

Applicants from the UK and Republic of Ireland need to hear 6 contacts from the city of Belfast. These can be

logged on any band and any mode. The cost of the award is £2, with any cheques being made payable to RAIBC (NI) Area. The award is free to blind and disabled s.w.l.s.

To apply, send to **Awards Manager, RAIBC (NI Area), PO Box 87, Belfast BT12 5PU.**

On Target

On Target is the name of a very 'up-market' leaflet from Radio Netherlands. *Media Network* by Jonathan Marks is a weekly survey of communications developments compiled with the assistance of over 190 monitors across the globe. Regular contributors include Arthur Cushen, Victor Goonetilleke, Dave Rosenthal, Lou Josephs, Jim Cutler, Mike Bird, Vasily Streinikov and Andy Sennitt. The programme offers coverage of the media developments linked to current events as well as full-length documentaries.

Transmissions times are Thursdays at 0150, 0750, 0950, 1150, 1350, 1550, 1750 & 1950UTC. The best times and frequencies to listen for Europe are 1130UTC on 5.955 & 9.855MHz.

Thinking Day & The Guides

Did anyone get involved with the International Guides Thinking Day on the Air? I've heard of one group, the Test Valley Special Event Radio Group, who did get involved - very successfully too!

Prior to the big day, the Guides were given tuition so they learned the phonetic alphabet and had prepared their greetings messages. What's really interesting is that some of those involved in the event were only 7 years old!

Radio conditions were excellent and as a result both the North Atlantic Countries and Europe were very active. Notable contacts were W1BFA in Maine, USA, VP2VA in Tortola in the Virgin Islands and 4N5ET in Macedonia amongst a really excellent list.

Apparently, the final contact of the day was VE1CHP in Nova Scotia chatted for twenty minutes with the Guides.

It sounds as though a good time was had by both the radio group and the Guides. I hope that we'll hear about their exploits again next year!

QRP Novices

I've had an interesting letter from Dave Gosling, who is the Novice representative with the G-QRP club. This club provides great back-up for their Novices, with help on such matters as antennas, headphones, Morse keys, learning Morse, transmitting, etc. In *SPRAT*, the news magazine for club members, there is a Novice News column too.

The G-QRP club novices range from 13 to 77 years old with the only rule that

their interest is QRP (that's low power). If you are interested in joining a group such as this to help with your Novice training, then send an s.a.e. to Rev George Dobbs G3RJV, St Aiden's Vicarage, 498 Manchester Road, Rochdale, Lancs OL11 3HE. You'll get a sample copy of *SPRAT* for your trouble and plenty of help when you join the group.

My thanks to Dave for taking time off from his decorating to drop me a line.

news

RAYNET & GPS Trials

Telecom Design Communications in conjunction with South Midlands communications recently loaned a Global Positioning System Transponder to West Cheshire RAYNET for field trials.

The GPS Transponder not only has a display showing position, date, time and velocity, but also has the facility to be interrogated from a remote station using AX.25 packet radio. Accuracy of the given position is quoted as $\pm 100m$. National Grid References (NGR) are also available from the system

making correlation to an Ordnance Survey map very simple.

The transponder is available in custom specifications to order.

Telecom Design Communications.
Tel: (0256) 332800.



Digital Audio Broadcasting

European agreement has been reached to commence terrestrial digital audio broadcasting (DAB) across much of Europe over the next few years. The EC Eureka project was finalised and agreed mid December and passed to the European Telecommunications Standards Institute for international ratification and to define DAB standards.

The BBC will commence DAB test transmissions across London later in 1993 from a transmitter located at Crystal Palace within the 220MHz band. If transmissions prove successful then use of 220MHz will remain as the DAB UK band. It is anticipated that most of the UK's DAB bandwidth needs will be met with use of Band 3, however a section of Band 1 at 60MHz will remain as a back-up frequency. The BBC will transmit the existing f.m. services over the Crystal Palace transmitter during the test period.

Use of the 60, 220 and 1500MHz bands for DAB will occur across Europe once the service becomes established. France will also be testing later this year across Paris possibly opting for a small band (1.75MHz wide) at 60MHz and the rest at 1.5GHz. Bands I/III are still in use for TV in France. The CSA in France calculate that 17.5MHz of bandwidth will be sufficient for French DAB transmission use. Germany will also be going DAB and has projected a start of DAB transmissions for real from September 1995 at 220MHz.

For the London tests only a few hundred receivers will be available intended for broadcasters and manufacturers. Eventually UK DAB receivers will be designed to cover the 50-250MHz band accepting a down-converted 1.5GHz signal input into the v.h.f. receiver - should the 1.5GHz ever be used.

JB Radio Group

The JB Radio group was founded in 1989 to promote friendship through radio, breaking down social, political and racial differences between people of different cultures throughout the world.

Members come from all backgrounds, but all have one important thing in common - they are all interested in radio DXing and the exchange of QSL cards. Many members are living in Eastern Europe and CIS. but membership is open to all DXers who operate in professional and courteous manner everywhere throughout the world. This includes s.w.l.s, amateurs and 11m bands DXers.

On joining, members receive:

A unit number that can be used as a callsign when DXing on 11m or for exchanging QSL cards as an s.w.l.

Free membership for your spouse
A membership certificate
QSL cards to fill in and send away
A directory or list of members world-wide
A postcard and information about Ireland will also be enclosed.

Extra QSL cards are available to members.
The cost of joining and receiving your membership package is £5.00 or \$8.00. If you would like more information, please enclose 1IRC:

JB Radio Group, PO Box 2496, Dublin 13, Ireland.



Special Event Station

GB8WA. The Wirral & District Amateur Radio Club will be operating a special event station marking the 50th Anniversary of the Battle of the Atlantic.

During the Battle of the Atlantic in WWII, the Combined Headquarters, Western Approaches were situated in Liverpool from 1941 to 1945. Control of all Allied shipping movements in the Western Approaches of the North Atlantic was performed from beneath a City Centre building. Most of the shipping was convoys of troops and supplies between the UK and the USA.

Throughout the war, Liverpool handled a total of 75 million tons of cargo, of which 56 million tons were imports, including 19 million tons of foodstuffs. More than 73 000 aeroplanes and gliders were loaded at the port and 4 700 000 troops passed through.

To mark the anniversary, one of the largest ever peacetime gatherings of naval ships and submarines of various nations will converge on the port at the end of May. A supporting calendar of events on land, sea and in the air will make up a full week of celebrations.

The station, GB8WA, will be operated from Perch Rock Lighthouse at New Brighton, Wallasey. The lighthouse was built in 1830 at the time of the Napoleonic Wars. It stands over 35m high at the mouth of the River Mersey, the western approach to the Port of Liverpool.

Operational Dates: May 7 to 31

Operational bands: 80, 40, 20, 10 and 2m

Modes: h.f. - c.w. & s.s.b.; v.h.f. - s.s.b. & f.m.

A commemorative QSL cards is available for all who confirm contact. Please QSL via the Bureau.

Ron Cairns G3HFA. 71 Springfield Avenue, Newton, Wirral, Merseyside L48 9XB. Tel: 051-625 7124.

Short Wave Magazine, May 1993

news

Construction Course

A Construction Course is due to start at Arnold and Carlton College, Digby Avenue, Mapperley, Nottingham. The course lasts for six weeks, taking place on Tuesday evenings at 7pm, all starting on May 11.

Students will have a choice of any of several amateur radio related projects ranging from simple test equipment to a relatively complex receiver or transceiver. No previous constructional experience is necessary, but students are expected to bring their own small tools - soldering iron, pliers, etc.

The components used can either be supplied by the student or purchased at cost from the college. **Alan Lake G4DVW. Tel: (0602) 382509.**

QTI

QTI Tape Magazine have been undergoing a move of house, which didn't go well by all accounts. The latest address for them is now:

QTI Tape Magazine Association, Towers Cottage, Towers Lane, Cockermouth, Cumbria CA13 9ED. There may be another move in the offing and we wish them well.

Petrol Tokens for Radios

In the past, the RAIBC in Northern Ireland have been able to provide close to £30 000 worth of equipment to members by converting petrol tokens and air miles into cash. This project still continues and they would ask all readers to consider their appeal when you next purchase petrol or home heating oil.

if you have any tokens, vouchers or air miles you can send them, free of charge, to the following address:

RAIBC (NI Area), FREEPOST, BE 1769, Belfast BT12 5BR.

By the way, your used postage stamps can also be useful to provide guide dogs for the blind. These should be sent to:

Archie, PO Box 87, Belfast BT12 5PU.

MVT-7100 New Instructions

Javiation have informed us that they have re-written the MVT-7100 handbook to make it more understandable. These handbooks are included in with any MVT-7100 purchased from them, but can be purchased separately.

Contact: **Javiation, Carlton Works, Carlton Street, Bradford, West Yorkshire BD7 1DA. Tel: (0274) 732146.**

Open Day

Waters & Stanton are holding their 3rd Open Day from their Hockley premises from 10am to 5pm on May 9. There will be free food and drink. As usual they will have a Bring & Buy Sale, Service Department clear-out items, special offers, etc., and lots of equipment to look at. Talk-in will be on 144MHz using the callsign G0PEP.

Oops

Recently, we got the telephone number of SSE wrong, it should read: **(0703) 769598.**

Nostalgia is Back in Fashion

Roberts Radio have taken a nostalgic return to the days of jive and Elvis and combine genuine 1950s styling with 1990 performance for some of their newest radios.

Between 1959 and 1965 enough radios were sold to stretch between London and Glasgow. They were often customised with anything from real mink to jewels.

The two radios here are the *Revival*, a 3-band receiver costing £99.99 and the R737, also a 3-band radio costing £119.99.

The *Revival* is an authentic replica of the R200 which was so very popular back in the early 1960s. It has the same mahogany and leathercloth finish as the original, but this radio has 1990 technology and performance. It now has f.m. included in the spec.

The R737 is a top-of-the-range model and has ten pre-sets on both m.w. and f.m. and five pre-sets on l.w.. The l.c.d. shows frequency, clock and alarm and provides stereo via headphones. Also in this range is the R701 at £89.99.

For your nearest Roberts dealer, contact **PR Unlimited, 78 Ebury Street, London SW1W 9QD. Tel: 071-730 7174.**



World Telecommunications Day

Celebrated annually on May 17, World Telecommunications Day commemorates the founding of the International Telecommunications Union in 1865. The theme of this year's World Day, the 25th, is Telecommunications and Human Development. It covers such things as the promotion of human rights, the universal availability of medical care, access to education, employment, environmental protection and economic development.

Morse Book

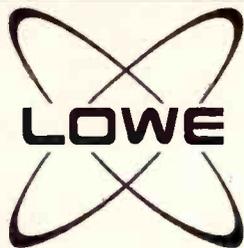
As the happy owner of a Vibroplex Lightning Bug Morse key, I was very interested in a book stocked by Eastern Communications called *The Vibroplex Co Inc.* It's the story of the company that developed the 'revolutionary' design of all-mechanical bug key from 1890 to 1990. It charts the history of the key, with plenty of illustrations that will help any collector date their key. I found the book very interesting, including the pages of patents at the end of the book. One feature that is helpful to the collector is the glossary of the 'plates' mounted on the Vibroplex and how they have changed

over the years.

The book costs £19.95 including postage for the ordinary copy, or £23.95 for a signed copy.

Eastern Communications, Cavendish House, Happisburgh, Norfolk. Tel: (0692) 650077.





LOWE ELECTRONICS

Bringing the world
to your home

WORLD BEATING SHORTWAVE RECEIVERS

LOWE HF225

Everybody loves a winner! It probably came as no surprise to owners of the HF225 when our receiver won yet another award. After all, they are already appreciating the excellent sensitivity, superb IF filtering and the remarkable ease of operation. Add a keypad for direct frequency entry, an active whip antenna, synchronous detection and FM unit and you have one of the most versatile receivers on the market today – significantly less expensive than some of its far eastern competitors!



HF225.....£479.00
HF225 EUROPA£699.00

(A very special limited edition – telephone for details)

LOWE HF150

Small, but perfectly formed, the HF150 is really establishing itself as a premier receiver for serious listening. It's complete with selectable sideband synchronous detection, three AM bandwidths and SSB filtering optimised for DXing utility stations. But we don't just stop there. We've just made it a lot more useful by launching a quick release mobile mounting bracket, and now we've added computer control for complete versatility. Call at any of our branches for full details.



HF150.....£359

THE BEST OF THE REST...

KENWOOD R5000

Despite its age, still proving a tough, reliable HF receiver. IF Shift and Notch controls allow you to process the incoming signal and narrower CW and SSB filters are available for those who need them. Now the only shortwave set with provision for installing a VHF converter. (And our unique two year warranty!)



From.....£949

ICOM R72E

An ideal choice for those who need lots of memory channels and scanning facilities. FM can be added as an option as can narrower CW filters. DDS technology ensures smooth tuning. Direct frequency entry from the keypad, clocks and timers enhance the operation.



R72E.....£759.00

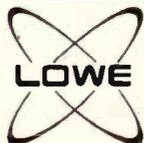
JRC NRD535

Probably the finest receiver available today. Designed to give you total control of the incoming signal, its many features include pass band tuning, notch filters, noise blankers, dedicated data modes including FAX and built in RS232 interface for computer control via our Multiscan software.

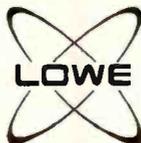


From.....£1395

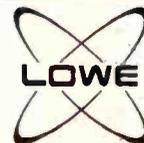
Colin G3XAS at
BOURNEMOUTH
27 Gillam Road,
Northbourne,
Bournemouth
BH10 6BW
Tel: 0202 577760



Dave G4KFN at
NEWCASTLE
Newcastle Airport,
Woolsington,
Newcastle Upon Tyne
NE20 9DF
Tel: 0661 860418

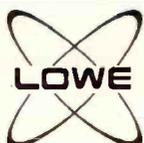


Tony G4CYE at
BRISTOL
79/81 Gloucester Rd,
Patchway,
Bristol
BS12 5JQ
Tel: 0272 771770

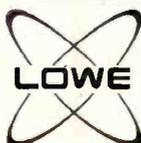


NEW

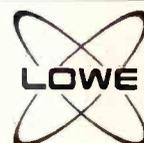
Fred G4RJS at
LONDON
223/225 Field End Road,
Eastcote,
Middlesex
HA5 1QZ
Tel: 081 429 3256



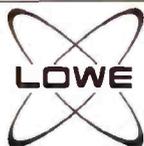
Tony G4NBS at
CAMBRIDGE
162 High Street,
Chesterton,
Cambridge
CB4 1NL
Tel: 0223 311230



Sim GM3SAN at
CUMBERNAULD
Cumbernauld Airport,
Cumbernauld,
Scotland
G68 0HH
Tel: 0236 721004



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Tom G6PZZ, Richard G3OQT
John G3PCY

Chesterfield Road, Matlock,
Derbyshire DE4 5LE
Tel: 0629 580800
Fax: 0629 580020

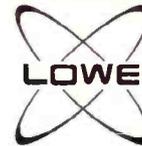
Steve G6URJ
KENT
Chatham Road,
Sandling,
Maidstone
Kent ME14 3AY
Tel: 0622 692773



Steve G1WSY at
HEATHROW
6 Cherwell Close,
Langley,
Slough, Berks
SL3 8XB
Tel: 0753 545255



Tom G4LAR at
LEEDS
34 New Briggate,
Leeds,
LS1 6NU
Tel: 0532 452657



NEXT?

**NEW!
YAESU
FRG100**



A new receiver from Yaesu has been a long time coming and the FRG100 sets a new standard from this manufacturer. Broadcast listeners may like the 6 and 4kHz bandwidths and the fifty memory channels will store both frequency and mode.

Seems good value at.....£559

LOWE NEWS!

Plymouth is the site of our latest branch, bringing Lowe sales and service to the south west for the first time. Over the years we have served a large number of satisfied customers in the Devon and Cornwall area by virtue of our excellent mail order system, so we are particularly pleased to offer customers old and new, somewhere they can visit and actually see our products and to try them out before buying.

Derek Foster, G7ESZ, and Peter Thornhill, G6ZKQ are your contacts here. Both contribute widely to amateur radio activities in the area, and keep themselves up to date on the short-wave scene also. In addition, both have many years professional experience to draw on and you still have the back up of the biggest and best service department dedicated to hobby radio. You'll find us at:

**The Basement
Royal Fleet Club
Devonport
Plymouth
Devon
PL1 4PQ**

Tel 0752 607284
Fax 0752 607285

MULTISCAN

Computer control of receivers is a growing interest with many SWL's and as a result, Lowe Electronics have commissioned the Multiscan program for IBM PCs and compatibles. This is quite a sophisticated and versatile program offering a high level of control of functions depending on the receiver in use. It supports the current range of receivers from Kenwood, Yaesu, AOR, JRC and Icom's R7000 and R7100.

Multiscan features 2000 memory channels with dual VFOs and space for a fifty character "comment". Manual tuning can be accomplished with keyboard entry, up/down controls or by mouse control, together with mode change, filter selection, BFO control, passband tuning, noise blankers etc., depending on your receiver.

A spectrum analyser display is also incorporated, together with a comprehensive logbook and precompiled database of over 1000 entries. The database is fully editable, allowing you to create a number of files. A datasheet is available but a demonstration at one of our branches allow you to see the full potential of this excellent software.

MULTISCAN.....£75.00

RF SYSTEMS

This small company from the Netherlands has really turned on the world of shortwave listeners. Their products are highly innovative, extremely well made and offer great value for money – and what's more they work!

Comprehensive datasheets are available on all their products and we'll be happy to supply these on request.

- Magnetic Longwire Balun.....£39.95**
- MLB Antenna Kit 1 (12.5m long).....£66.95**
- MLB Antenna Kit 2 (20m long) £76.95**
- MLB Marine (special MLB for maritime use).....£54.95**
- DXONE the ultimate active antenna.....£289.00**
- DX7 Active antenna.....£179.00**
- T2FD Low noise antenna.....£169.95**
- DXListener.....£249.00**

**NEW! FROM
RF SYSTEMS
THE MAGNETIC
TRANSFER ANTENNA**

Developed primarily for marine applications, the MTA is a passive antenna. Comprising of a 2m long, UV resistant, plastic pipe with stainless steel fittings, the MTA can be mounted in a variety of locations. It has a specially wound helical element designed for omnidirectional reception and is elliptically polarised to make the most out of transmissions vertically or horizontally polarised. Two versions are available: one covering 100kHz – 25MHz and the other 500kHz – 30MHz. We expect the price to be around £159.00. Full details on request.

UNIDEN BEARCAT UBC142XLT Scanning Receiver



Uniden are well-known for manufacturing receivers for the scanning enthusiast. Lawrence Harris welcomed the opportunity to have a closer look at the new Bearcat 142XLT.

The UBC142XLT is a 16-channel programmable scanner, operating in the v.h.f. and u.h.f. bands. Operating the set is particularly straightforward and the *Operating Guide* is a folded set of instructions that will not give anyone any problems. A telescopic antenna is supplied with the receiver but, as usual, best results will undoubtedly be obtained by connecting an external antenna. For this review both methods were used as described.

The *Operating Guide* describes the memory back-up system as being of the 'capacitor type'. This means that frequencies programmed into the receiver will be retained for a considerable time, powered by the capacitor's stored energy. Many scanners use battery back-up, but the capacitor-type can be more convenient, unless long periods of power disconnection are anticipated. The manual suggests that four hours of memory storage will be obtained before these frequencies are lost, but I found that stored frequencies were still held after more than 12 hours disconnection.

The unit includes a two-pronged mains adapter (220V a.c. to 12V d.c.). Although the review sample did not have a

shaver adapter - essential to enable it to be plugged into a 13A mains socket - President assured me that one is supplied with all Bearcat UBC142XLT scanners sold in the UK. Alternatively, the scanner can be operated from any 12V supply, and consumes about 500mA. This means that it is highly portable and could run for hours on a small NiCad. I use a 5Ah NiCad for powering my telescope, which uses more power, yet runs almost all night before recharging is necessary.

Appearance

The unit is very light to handle and is finished in black abs plastics with white lettering. The top face has a small two-digit i.e.d. indicator which normally shows the channel currently being scanned. There are two rotary knobs, SQUELCH and POWER/VOLUME, and several rubber digital buttons. There are two groups of these buttons, the smaller being used for numerical entry - setting digital frequencies and channel selection. The six larger buttons, PRIORITY, WEATHER, LOCKOUT, REVIEW, SCAN and MANUAL, select the required operation.

There are no surprises amongst these options, excepting possibly WEATHER - more on this later. The rear of the unit has three connectors; a d.c. power input jack, an external speaker connection and the antenna socket, which is an automotive connector.

Frequency Programming

On receipt, the scanner appeared to have no frequencies already programmed in the main bank, so I started by setting up several of the weather satellites and Russian (or should I say CIS) navigation and military satellite frequencies. Entering a frequency is easy; assume that we are setting channel 1 with NOAA 9's frequency - 137.62MHz. Press 1 (for channel 1) and then MANUAL. Press the digits 137.62 in sequence (the frequency in megahertz) and finally the E (Enter) button, which is the last small button on the keypad. After programming any channel it is worth checking that you have set it up correctly. The REVIEW button does this. When the button is pressed (with the channel number showing), the

frequency is displayed on a digit-by-digit basis. This unusual method of showing a frequency is probably due to the receiver being intended mainly for marine use. Frequencies here are channelised and usually referred to in this manner. I was still surprised, considering the almost universal use of wide character displays. Setting up all 16 channels and checking each one afterwards only took a couple of minutes.

Keeping a written record of programmed frequencies is a sensible precaution, so I have a list on my wall for this purpose.

Antennas

Although it is possible to use an indoor antenna, particularly if you are situated fairly high up, I wouldn't expect to be able to test a scanner properly without giving it a fair chance to tune into the æther! I started with my backup WXSAT antenna - an external crossed-dipole (cut for 137MHz) - using less than professional connectors and set the scanner running.

Scanning

When SCAN is pressed, the

unit monitors at the rate of 15 channels per second. It tests every channel, including those not programmed. There is a LOCKOUT button which stops selected channels from being scanned. This feature is useful, particularly when 'birdies' arrive! Birdies are those odd signals (or noise) that every receiver picks up sooner or later. They may be generated internally by the receiver itself, but one can also acquire the occasional un-modulated carrier which can hold a scanner for ages before it is noticed. Use LOCKOUT for any un-programmed channels, but remember to regularly check which channels are locked out - there is an indicator for this. The MANUAL button allows selection of a specific channel - press MANUAL, then the required channel. One of the two rotary controls is labelled SQ, the 'squelch' control. It is used in the conventional manner - turn it from the minimum setting until receiver noise stops and after a short delay scanning then starts. This control operates in an anti-clockwise direction - the opposite from any other scanner that I have used, but after my initial surprise, I found it perfectly acceptable. Perhaps it's an American convention? The other rotary control is the combined ON/OFF and VOLUME control, which operates clockwise.

Priority

Channel one has a special feature. If the PRIORITY button is pressed, this channel will be sampled every two seconds during normal scanning, until a signal is detected. It then remains locked in the usual way. If you are keen on closely monitoring a particular channel, such as the marine distress channel, this can be a useful facility. PRIORITY only operates on channel one so remember this when setting up the frequencies.

Results

I operated this scanner next to both my WXSAT and general scanners and used the same external antenna for each. The satellites in the 150MHz band came in on both the Uniden Bearcat and my normal

Specifications

Frequency coverage:	66 - 88MHz 136 - 174MHz 406 - 512MHz
RF sensitivity:	band 1 0.3µV band 2 0.3µV band 3 0.5µV
Selectivity:	-55dB at ±25kHz
Channels:	16
Scan rate:	15 channels per second
Audio output:	800mW into 8Ω, 10% t.h.d.
Size:	250 x 200 x 70mm
Weight:	750g

scanner clearly. There are several satellites in this band and the scanner detected them as they came into range. Similarly the WXSATs were easily heard. The sensitivity quoted for the receiver is fairly typical for this type of scanner (see listings below), and this was confirmed by my results. Listening very carefully to the sound I could detect little difference between that from either scanner. A note of caution should be mentioned regarding the use of the scanner near a computer. I did my initial tests with the computer off, and found the receiver sensitivity as expected; all of the satellites were there - loud and clear. Later in the evening I was using the computer for word processing and wondering why little was coming in on the scanner. Investigation showed that the noise from the computer was apparently de-sensitising it. Switching off the computer immediately brought the scanner back to normal sensitivity.

Abbreviations

A	amperes	mW	milliwatts
Ah	ampere hours	NiCad	nickel cadmium
d.c.	direct current	t.h.d.	total harmonic distortion
dB	decibels	u.h.f.	ultra high frequency
g	grams	V	volts
kHz	kilohertz	v.h.f.	very high frequency
l.e.d.	light emitting diodes	WXSAT	weather satellites
mA	milliamperes	µV	microvolts
MHz	megahertz	Ω	ohms
mm	millimetres		

the coastline of America. This is channelised in the 162MHz band. I let it run for several minutes without any signals being received.

Frequency Search

Although the receiver is designed to cover three bands (see list below), it does not have a facility to search for active channels. This means that exploring the various sections of the spectrum is not possible in that manner. The use of published frequency listings could get around that problem.

Conclusions

This Uniden Bearcat scanner is very easy to set up and use, though caution may be needed in computer environments. It is almost certainly aimed at the marine monitoring enthusiast, and its light weight and low power consumption seem to make it ideally suited for a life on the waves. Otherwise, more programmable frequencies would enhance its performance. The review sample was supplied by **President Electronics Benelux** and is available from many SWM advertisers priced at around £117. ■

Marine frequencies

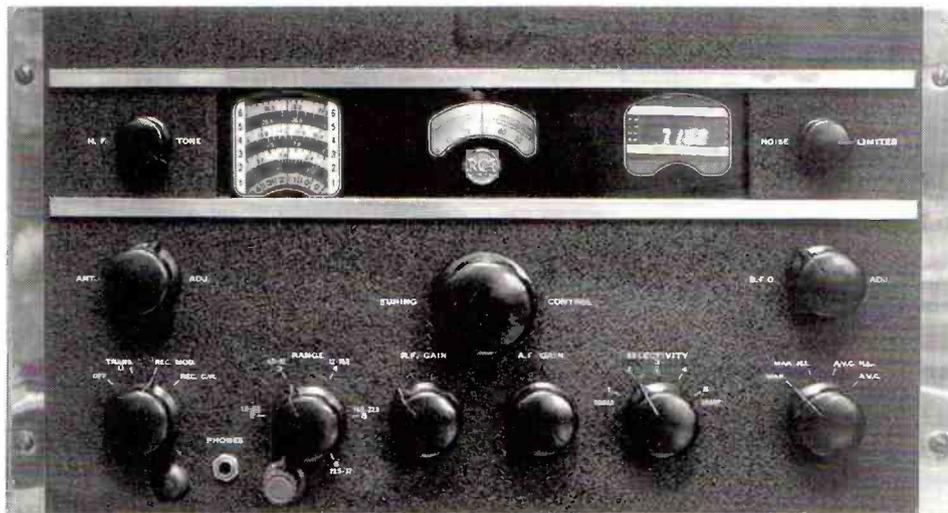
The style of this Uniden Bearcat scanner indicates its marine monitoring applications, so after tuning into all of the WXSATs, I programmed it to monitor the numerous local marine frequencies (thanks to a neighbour who is a navigation pilot). The scanner hardly stopped going all afternoon. Looe fishermen were chatting all the time, and several other channels were heavily used! With receivers like these, no ex-mariner could ever feel lonely. My father was ex-Navy and would have loved to listen in to the marine conversations.

Weather Search

The mystery button! The notes say press to search all seven pre-programmed NOAA frequencies - "only used in the USA". In fact it is designed to receive the local USA weather stations which neighbour John tells me operate around

In Praise of the AR88

B.A. Berry claims that he doesn't really understand modern receivers. The truth is that he fell head over heels in love with the AR88 over 40 years ago.



It was just after the war and I had joined the RAF some three years previously as a Boy Entrant at the age of 16. After training as a Telegraphist I somehow got tangled up in a mysterious project known as the 'Y' service, which was responsible, amongst other things, for radio monitoring. My first day on duty saw me being ushered into a very old and damp Nissan hut, whose walls were lined with a solid mass of AR88s. The sight of these gleaming black beauties, which covered nearly all of the radio spectrum we knew about at that time - with, I might add, a sensitivity and selectivity that was not far short of one of the modern Japanese wonders - was the beginning of an affair that has lasted a lifetime. True, the AR88 has its disadvantages in this modern world, but when I read desperate cries from young amateurs of today for a cheap communications receiver and I see what they get for their £300 or so, it really does make me wonder why no-one has told them that they can get a receiver for around £50 that will knock spots off the lesser

breeds of modern communications receivers. In fact, as far as dynamic range goes, the AR88 can show most of the more expensive jobs a clean paid of heels.

History

The AR88 first appeared in the 1940s. It was a high quality general coverage receiver that was developed for commercial use. It had two r.f. stages, three i.f. stages with a variable selectivity crystal filter, a b.f.o. and a noise limiter. It covered from 535kHz to 32MHz in six bands and was built to the highest mechanical standards. In fact, those standards are very rarely reached in today's equipment. During the war a modified version, the AR88D came into service with much the same specification as the AR88 except that it lacked an S-meter. The AR88D was built by several firms under licence for RCA during those years. Another model, the AR88LF was an l.f. version covering 75-550kHz and 1480kHz-30.5MHz in six bands.

Today an AR88 can be purchased for around £40 -

£70 and with few modifications will perform extremely creditably, both as a general coverage receiver and on the amateur bands. True, it will probably need some servicing and alignment, but given this it will give long and faithful service for years to come.

Specifications

The model that is most commonly available today is the AR88D. This is a 14-valve receiver consisting of two r.f. stages, mixer and local oscillator, three i.f. stages, a switched crystal filter, detector, a.v.c. and audio amplifier. There is also a b.f.o. and noise limiter. Its frequency range is from 0.6 to 32MHz, although the exact coverage may vary depending on the model. Sensitivity figures for 0.5W audio output may vary between 0.5 to 1.2µV, with the exception of the range covering the 28MHz amateur band, where the figure is somewhat lower at 2.5µV. I have deliberately given sensitivity figures here rather than signal to noise ratios which are perhaps

more important, since most people find them easier to understand. But for those interested, the antenna input for a 6dB signal to noise ratio varies from approximately 0.9 to 1.5µV. The i.f. stages operate at 455kHz and have twelve tuned circuits, which together with a switchable crystal filter give a very high degree of selectivity - when aligned properly! The filter bandwidth is switchable between 3kHz, 1.5kHz and 400Hz. The b.f.o. is continuously variable, and s.s.b. can be resolved fairly easily. However, this is one area where a modification can be very successful, but more of this later. Both r.f. and a.f. gain controls are fitted, as is a tone control, and the noise limiter can be switched in and out of the circuit as required. The a.v.c. can also be switched off if necessary - one area in which some modern receivers are lacking.

The main tuning control that gives mechanical bandspread is extremely smooth in action when properly adjusted and lubricated, although for use under contemporary conditions the scale

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calibration is not really good enough, and this is another region in which a modification can be beneficial.

Initial Checks

Having purchased your AR88, the first thing to do is to give it a good checking over and clean it up. Also take a look under the cover of the r.f. stages - this is a large screened box at the left front of the chassis. If you're lucky you'll find that the original trimming tools are still there in clips on the side - if not you'll have to adapt some from their modern equivalents. Do not even **think** about modifications at this time!

The next stage involves bringing the receiver back to its original specifications as nearly as you can. By doing this you will be certain that at faults are cleared prior to modification, and it will give you a good basis for evaluating the effects of any circuit changes you may make later. I'm afraid you're going to have to beg or borrow some proper test equipment to do this, as it is almost certain that someone will have 'twiddled' the i.f. and possibly the r.f. stages in order to 'get more out of it'. If it hasn't been done properly, the result will be a lack of sensitivity, and what is worse, a loss of selectivity. I have purchased several AR88s over the years, and I have never yet met one that has been properly aligned. The easiest and correct way to align the i.f. stages is with a sweep generator and oscilloscope. The i.f. stages are 'stagger tuned' (ie. each i.f. is tuned to a slightly different frequency) in order to give a flat response of position 1 of the selectivity switch. It is this stagger tuning, in conjunction with the positioning on the i.f. passband of the crystal filter, together with its phasing, that determines the selectivity in the other four positions of this switch. There is an alternative method of stagger tuning using a signal generator set to the individual frequencies, but this is not nearly so good as

Advantages and Disadvantages

There is no doubt that the major disadvantages of the AR88 is its size and weight. I've never actually weighed one, but it definitely takes a couple of people to lift it! As for size, its standard 19in rack mounting front panel is 280mm high, whilst the depth is also 483mm - so you get a lot of receiver for your money! The following table will give you an idea of the points you should consider before buying:

Advantages

1. Cheap to buy and usually freely available.
2. Circuitry is easily understood.
3. Valves and other components are easy to obtain.
4. Plenty of room for modifications that are usually uncomplicated.
5. Specifications fall very little below modern equipment and in some instances exceed them.
6. Solidly built and will last a lifetime.

Disadvantages

1. Weight and size are excessive.
2. Some component deterioration over the years.
3. Performance lacking on 28MHz and above.
4. Analogue frequency dial not good enough by today's standards.
5. The b.f.o. is not good enough for quick resolution of s.s.b. signals and can effect a.v.c. action.
6. Can be difficult to align without proper equipment.

Even with the disadvantages listed above, the AR88, properly serviced and aligned, performs creditably in competition with its modern counterparts. In the case of some of the cheaper models around today it will outperform them easily. If you can put up with its weight and size, which really are the only major disadvantages, then you have a very good receiver that won't dent your bank account!

employing a sweep generator - and in any case I can't assist with the frequencies!

Get a Manual

At this stage if you haven't got a manual you'll have to get one. Reprints are freely available from advertisers in the pages of *Practical Wireless*. In the manual you will find a set of i.f. curves, which graphically illustrate the shape that you should be aiming for. For those who haven't used a sweep generator don't let the name put you off. Basically it is a ordinary signal generator in which the output frequency is swept over a range of frequencies, in this case the i.f. - say from 400 to 500kHz. If the vertical input of an oscilloscope is then connected to the final i.f. stage, a curve will be drawn on the tube facing the i.f. response. Your aim is to match the curve to the curves shown in the manual by trimming the i.f. stages. If the sweep generator and the oscilloscope are both set for a 50Hz sweep repetition rate it

should not be necessary to synchronise the two instruments. It is not a difficult task, but you should take your time doing it as it must be correct. The same applies to the alignment of the crystal filter. Both its phasing and loading should be adjusted as described in the manual until every curve for each position of the selectivity switch matches those given in the drawings. The r.f. alignment is much simpler, although it can take a considerable time to do properly, full instructions are given in the manual. As you go through the r.f. alignment you can make a quick check on the sensitivity of each range, which will give you a good idea of the condition of your receiver. Finally adjust the b.f.o. trimmer until zero beat with a signal occurs at the middle of the range of the b.f.o. control.

Problems

It is likely at this stage that the sensitivity of the receiver will be somewhat lower than the figures given in the manual.

There are several possible causes for this, assuming that your alignment is correct, the most common being loss of emission of one or more valves. Substitution is the best bet here, and it is usually the two r.f. stage valves (6SG7s) or the mixer/local oscillator combination (6SA7/6J5) which will be culprits. other causes can usually be determined by taking a quick look at the valve electrode voltages and comparing them with the figures given in the manual.

A not so well known reason for loss of sensitivity is due to the fact that in receivers of this age capacitors can dry out and/or go leaky, especially coupling and decoupling capacitors. This will in turn affect valve electrode voltages and cause a change in operating points, with a subsequent loss of sensitivity or increase in distortion. One particular rascal in this respect is the decoupling capacitor on the anode of the 6K6 output pentode. Frequently this goes short circuit - if it does, you can say goodbye to the audio

output transformer, because a failure here instantly shorts the main h.t. rail to earth via the transformer primary. The transformer is a big one, and not easily obtainable. Your first modification should be to remove this capacitor and place a new one in parallel with the output transformer primary, together with a fuse in series with the h.t. rail. Any future shorts will merely blow the fuse.

Pay particular attention to the contacts on the range switch. They are almost certainly dirty - particularly those inside the r.f. compartment. A good switch cleaner will work wonders for your sensitivity and noise figures. Another problem I have noticed is noisy r.f. and a.f. gain controls. The audio gain control is easy enough to replace, but you may have trouble with the r.f. control. This is marked on the circuit as 66MΩ! To be honest I have never checked, but I imagine that it would be difficult to find a control of this value nowadays. The old service trick of a drop of light machine oil inside seems to work quite well.

Modifications

There are quite a few modifications that can be profitably carried out on the AR88, and although I can mention only a few, I would be pleased to hear from those of you who know of others, since I am contemplating a much larger article in the future.

Digital Frequency Counter

It is extremely easy on the AR88 to fit a digital frequency counter with the necessary 455kHz offset from the local oscillator output. In my own case I removed the AR88 logo (I have the AR88D) and replaced it with a frequency counter from a very old multi-band portable receiver. It works extremely well, and this type of add on frequency counter with built in offset is freely available. The supply

can usually be obtained quite easily by a small bridge rectifier and smoothing capacitor from the filament supply, and if this is not the correct voltage then there is plenty of room inside for a small transformer. This is one modification that could be useful before commencing any alignment - it makes the job that much easier.

Product Detector

The addition of a product detector is perhaps one of the more useful modifications that can be done to the AR88, and there are plenty of quite simple circuits around for doing this. The b.f.o. leaves a lot to be desired when receiving s.s.b. signals. For reasonably distortion free reception, the b.f.o. injection voltage should be equal to or greater than the signal level, which is certainly not the case in one of these old style a.m. receivers, where the b.f.o. was added almost as an afterthought to permit c.w. reception. At one time the cure for this was to simply increase the b.f.o. signal to the last i.f. by removing the twisted pair of wires employed to mutually couple the stages, and replace them with a 1nF capacitor. Unfortunately, although this was extremely effective in correcting the levels, it resulted in the b.f.o. signal saturating the a.v.c. stage when it was switched on. However, if you don't want to go the effort of fitting a product detector and can manage without a.v.c. then this modification does help considerably when trying to resolve s.s.b. signals. If you do decide to go ahead and fit a product detector, be aware that you may still get problems with the a.v.c. stage but that this can be overcome fairly easily.

28MHz Reception

One of the long standing problems with the AR88 has been a lack of sensitivity and poor signal to noise ratio on the 28MHz band. Fortunately

Abbreviations

a.f.	audio frequency
a.v.c.	automatic volume control
b.f.o.	beat frequency oscillator
c.w.	continuous wave (Morse)
dB	decibells
h.f.	high frequency
Hz	hertz
i.f.	intermediate frequency
in	inches
kHz	kilohertz
l.f.	low frequency
MHz	megahertz
mm	millimetres
MΩ	megohms
nF	nanofarads
r.f.	radio frequency
s.s.b.	single sideband
V	volts
W	watts

it is very easy to substitute more modern low noise valves in place of the 6SG7s that are fitted, and this results in a very considerable improvement in signal to noise ratio. One other modification that I have seen successfully carried out is the fitting of the f.m. detector, although this can involve locating a 455kHz i.f. transformer with a centre tap on the secondary.

A Warning

Finally a word of warning to any younger listeners who may be contemplating work on the AR88. It uses man sized voltages! The h.t. rail starts off around 350V - it's dangerous, so do take care when working on it - those big paper capacitors can hold their charge for a long time!

If there is sufficient interest, then I hope to go more deeply into these, and other modifications at a later date. In the meanwhile, if you need a good, cheap communications receiver that will perform extremely well, why not try the AR88? ■

Further Reading

Valved Communications Receivers - the AR88D.
Practical Wireless, August 1987



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AR1500EX	Compact <u>all mode</u> hand-held receiver. Receive coverage 500 kHz ~ 1300 MHz... AM/NFM/WFM & SSB using BFO. Latest model.	349.00	299.00	50.00
AR2800	Competitively priced full featured base - mobile scanning receiver. <u>All mode</u> operation AM/NFM/WFM & SSB using a BFO. Coverage is 500 kHz ~ 600 MHz & 800 ~ 1300 MHz. Includes internal NiCad.	449.00	375.00	74.00
AR2500	Base - mobile receiver 5 - 550 MHz & 800 - 1300 MHz fitted with BFO. Has an RS232 computer port.	Was 419.00	325.00	94.00
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ICOM IC-R72

Communications Receiver

Having been an Icom user for many years, I was keen to unpack the R-72 and see just what it offered. With the packing removed, I was certainly not disappointed with the general appearance. The front panel was very smart and positively bristling with an assortment of knobs and buttons. Dominating the front panel was the very well-lit liquid crystal display that conveyed details of the frequency, mode, memory channel, etc. One of the characteristics of virtually all Icom receivers is the excellent tuning knob. The R-72 is no exception and has a weighty knob which is very smooth in operation. There was even an adjustable mechanical brake so that the operator could set the feel of the tuning to suit personal preferences.

In my usual impetuous way, I was keen to power-up the receiver and see how it performed. As you would expect, the external connections were few and easy to complete. The power requirements were met with a built-in a.c. power supply that could be set to operate at 100, 117 and 220 - 240V. This should meet the needs of all listeners. For those that enjoy portable or mobile operation, the R-72 featured a coaxial external power socket on the rear panel. When a plug was inserted the internal power unit was automatically disconnected. The power requirement was a fairly modest 13.8V d.c. at 1.2A max.

Incidentally, should you have requirement for back-up in the event of a mains failure, Icom produce a battery version with a built-in lead acid battery and changeover circuitry. The only other external connection required was to plug the antenna into the standard SO-239 socket on the rear panel. For the review, I used my G5RV multi-band antenna, though a simple long wire and magnetic balun is the best option.

Tuning Around

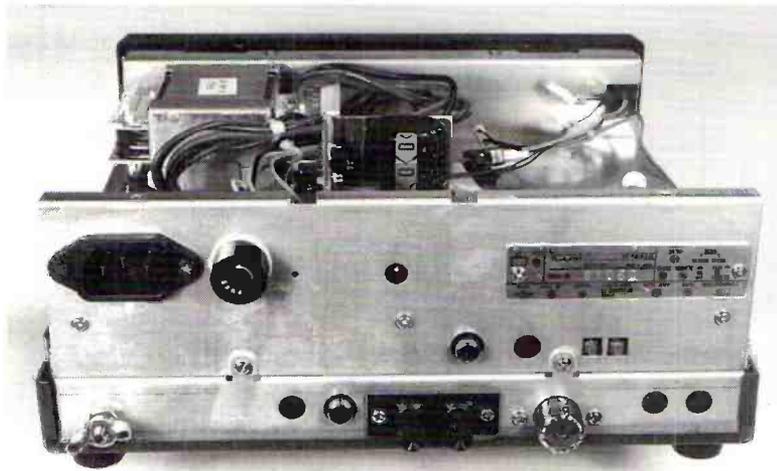
With the R-72 powered up and ready to go I tuned around the bands to see how it fared. As with all modern receivers, the R-72 tuned in steps rather than continuous coverage. The steps were very well chosen with a default setting of 10Hz. When a.m. is selected the tuning steps change to the programmable kilohertz setting. The default for this mode is 1kHz, but you can set this to any value between 1kHz and 10kHz in 1kHz increments. This had many uses both for broadcast and utility listening. Broadcast listeners can set this to 9kHz to align with standard broadcast channel spacing. On the other hand, a 3kHz step is useful when monitoring the h.f. marine and air bands. The kilohertz setting was also useful for quickly moving around the band. However, for rapid frequency changes, pressing the megahertz button increased the frequency steps to 1MHz. Once you had found

Icom have a formidable reputation for high-quality radio products. The IC-R72 communications receiver, reviewed here by Mike Richards, has proved to be a very popular receiver.

that elusive DX you could use the dial lock button to prevent accidental detuning. For really fast frequency selection the keypad is the best option. This enables direct entry of any frequency within the R-72's range. As with most modern units you don't have to enter trailing zeros, so 12.100MHz becomes 12.1. An extra time saving feature came into play when changing frequency within the same megahertz band. In this case you only had to enter the new kilohertz setting - the receiver's software sorted out the rest.

When I first started using the R-72 I found the keypad a little too eager and I often ended-up with repeated digits. However, this improved with practice.

Another useful little extra was the inclusion of switchable pre-amp and attenuators. The pre-amp gave



a measured SINAD improvement of 8dB which was very useful on the higher frequency bands. The r.f. attenuation range of the R-72 was very good indeed covering 0-30dB in 10dB steps. This should be enough to cope with the strongest of signals.

Comprehensive Memories

The provision of a comprehensive memory system is extremely useful and is becoming a feature of all modern receivers. The R-72 boasts ninety-nine memories, each of which can store both frequency and mode. I must admit I was surprised to find that there were no memory grouping facilities provided. I find these particularly handy for keeping the various utilities and broadcast stations separate. On the bright side, the memories were extremely easy to use. The memory mode was selected with a single key press and the active memory number shown in the main display.

One excellent feature was the way in which empty channels were displayed. These appeared with a line immediately above the memory number. This was a very quick and effective way of shown whether or not a channel was free. Once a channel had been selected, you could use the manual tuning controls to move on from the preset frequency.

One handy tip is to store the lower band edge of the h.f. broadcast bands into a set of memories. This makes moving around the bands very quick indeed. So as to make optimum use of the

information stored in the memories, the R-72 includes a number of scanning modes. There were four modes provided: Programmed Scan, Memory Scan, Selected Memory Scan and Auto Memory Write Scan. The Programmed Scan is designed to help the operator find stations within a preset band. Before this can be used, the operator has to store the upper and lower frequency limits of the scan in memories one hundred and one hundred and one. With the limits set, the scan repeatedly sweeps between the two limits until a station is detected that exceeds the manually set squelch threshold. In addition to setting the frequency limits there were a couple of other setting that effected all the scanning modes. The first of these was to set the scan speed using the push button on the rear panel. The two setting gave speeds of approximately 10 or 4 channels per second.

The only other user setting was to decide the action to be taken once a signal had been detected. Again there were two options the simplest of which was to cancel the scan when a signal is detected. The second and I suspect more popular option is to pause for ten seconds on a continuous signal or a further two seconds if the signal disappears before the ten seconds is up. An interesting development of the Programmed Scan was the Auto Memory Write Scan. A bit of a mouthful, but very effective! This used the same upper and lower frequency limits but, instead of just stopping on active

frequencies, the details were transferred into the top twenty memories - a very fast way of capturing active stations with minimum effort. Once all twenty memories had been programmed the scan automatically stopped so that the operator could review the contents. My only criticism of this mode was that it only operated in a.m. and (optional) f.m. modes. This meant that it couldn't be used for searching air, marine or amateur bands.

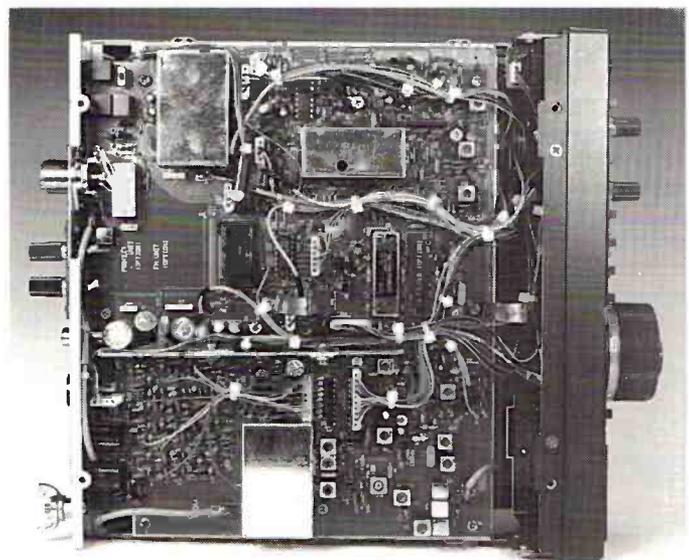
The remaining two scanning modes operated on the contents of the main memories. The simple memory scan stepped through each memory in turn stopping on any where the signal exceeded the squelch threshold. The final mode provided the facility to select which of the memories would be scanned. The selection of memories was a manual operation requiring each of the required memory channels to be marked for inclusion in the scan.

Computer Control

For the ultimate in flexibility the R-72 featured Icom's CI-V computer control system. The system is very versatile and, in its most basic form, can be set-up to control the receiver's basic frequency, mode and memory channel from a personal computer. If you have a range of Icom equipment, you can use this system to connect them all together and control all the functions from one computer. Of course, once you have control by the computer it's comparatively simple to link the receiver direct to your logging system and so build a very sophisticated listening system.

Clock/Timer

The R-72 included in its armoury of features a clock and timer facility that could be used to control remote operations. The timer was a simple, single programme type that could be set to turn the receiver on, off or on and off at pre-set times. The inclusion of such a simple timer was actually a strong point as it was difficult to make mistakes. In practice, it's unusual to need more than one programme anyway. To facilitate the remote recording of programmes, the timer activated the 'remote' socket on the rear panel. This could be used to control the record function of most tape recorders. The clock had a straightforward twenty-four hour readout that could be transferred to the main display with a single keypress.



Optional Extras

The R-72 featured a very comprehensive range of optional extras that are worthy of mention. For operators with impaired eyesight there was a very good voice synthesiser module. This was quick and easy to fit and gave an announcement of the operating frequency when the SPCH button was pressed. In addition to being able to select English or Japanese, both the volume and speed could be set to the operators preference. If you live in close proximity to high power transmitters the UR-1 protection unit could be useful. This provides internal protection against such signals. Perhaps the most popular of the options is the UI-8 f.m. receive unit. This provides the final i.f.

conversion to 455kHz and f.m. demodulation. As with all the other options, full installation details were contained in the excellent manual. For the c.w. enthusiast there were two optional narrow filters available. These featured -6dB bandwidths of 500 or 250Hz. The 500Hz filter can be particularly useful for those interested in RTTY/ data modes providing the centre frequency of your decoder can be adjusted to match the receiver.

Finally, for those needing the ultimate in frequency stability, there was an ovened crystal reference oscillator. Installation of this required rather more expertise than the other options and is probably best left to your dealer. Once installed the already good frequency stability increased to an excellent $\pm 0.5\text{p.p.m.}$ over the working temperature range -10 to +60°C.

Performance

During the review the R-72 was put through a series of tests in the lab to check that performance was within the published specification. Not surprisingly, the R-72 fared very well, exceeding the specification on virtually all counts. The selectivity was particularly good with a filter shape factor of better than 2:1 for the 2.3kHz s.s.b. filter. Distortion of the recovered

Specification

Frequency coverage:	30kHz to 30MHz
Modes:	s.s.b., a.m., c.w. and f.m. (optional)
Sensitivity:	1.8-30MHz (pre-amp on) s.s.b. and c.w. < 0.16µV for 10dB S/N a.m. < 2µV for 10dB S/N
Squelch sensitivity:	s.s.b. < 10µV f.m. < 0.4µV
Selectivity:	s.s.b./c.w./a.m. narrow > 2.3kHz -6dB, < 4kHz -60dB a.m. > 6kHz -6dB, < 20kHz -50dB f.m. > 15kHz -6dB, < 30kHz -50dB
Spurious image rejection:	> 70dB
Intermediate frequencies:	s.s.b. 70.4515 and 9.0115MHz c.w. 70.4506 and 9.0106MHz a.m. 70.45 and 9.01MHz f.m. 70.45, 9.01MHz and 455kHz
Usable temperature range:	-10 to +60°C
Frequency stability:	< ±200Hz (25°C 1min -1 hour after power-on) < ±30Hz (25°C after 1 hour) < ±350Hz (0 to 50°C)
Antenna:	50 or 500Ω unbalanced
Audio power:	More than 2W at 10% distortion into 8Ω load
Power supply:	117, 220, 240 V a.c. or 13.8V d.c. ±15%
Current drain:	1.2A max.
Dimensions:	241(W) x 94(H) x 229mm(D)
Weight:	4.8kg

audio is an area where many receivers fall down. The R-72 did quite well here too, with a best figure of 0.53% from the Line-out jack. This worsened to 0.7% when the measurement was taken at the external speaker socket. Both of these figures were actually very good and were backed up by the perceived audio quality during listening tests.

Whilst checking out the audio, I took the opportunity to measure the signal level available from the line out jack. This gave a figure of

150mV, which should prove fine for most tape recorders. This socket can also be used to feed auxiliary units such as data decoders. Frequency stability is another important area especially for the utility listener. The specification quotes a drift of less than ±200Hz during the first hour of operation. For my measurements I checked the drift during the first 30 minutes of operation in the shack. The review model showed an excellent result, with a drift of just 6Hz in 30 minutes. ■

Abbreviations

A	amperes
a.c.	alternating current
a.m.	amplitude modulation
c.w.	continuous wave (Morse)
d.c.	direct current
dB	decibels
DX	long distance
f.m.	frequency modulation
h.f.	high frequency
Hz	hertz
kg	kilograms
kHz	kilohertz
mA	milliamperes
MHz	megahertz
mm	millimetres
mV	millivolts
mW	milliwatts
p.p.m.	parts per million
r.f.	radio frequency
RTTY	Radio TeleType
s.s.b.	single sideband
S/N	signal to noise
SINAD	Signal to Noise And Distortion
V	volts
W	watts
°C	degrees Celsius
µV	microvolts
Ω	ohms

Summary

Despite the complex front panel, the IC-R72 is really a very simple and easy to operate communications receiver. It does all that's claimed very well indeed. Some may regret the lack of pass band tuning and grouped memories, but the overall result is a competent receiver that is, I'm sure, why it is so very popular. The IC-R72 currently costs £759 and is available from all Icom outlets. My thanks to Icom UK for the loan of the review model.

ICOM IC-R72

NEVADA EVERYT

YUPITERU

NOW IN STOCK THE NEW MVT 7100

Set to be THE handheld scanner of 1993 this radio has to be heard to be believed!

- Now with SSB reception here are some of the many features:-
- ★ Covers 530KHz-1650MHz
 - ★ Modes NFM/WFM/AM/LSB/USB
 - ★ Memories 1,000 channels
 - ★ Freq steps 0.05/0.1/1/5/6.25/9 12.5/20/25/50/100 KHz selectable
 - ★ Scan Speed 30 Ch. per second

The set is supplied with a full compliment of accessories including Telescopic Antenna, Car Connector, NiCad Batteries, Carrying Strap, Belt Clip, Earphone, Original Manufacturers English Manual, UK Spec. Charger.

First Supplies will be limited - reserve your set now! **PRICE £449**



MVT 7000 HANDHELD

- ★ Receives 8 to 1300 MHz 100kHz-1300MHz (at reduced sensitivity)
- ★ 200 Memory channels
- ★ AM/FM/NFM
- ★ Rotary or keypad freq control
- ★ Large display with signal strengthmeter

SUPPLIED COMPLETE WITH:- Full set of high power NiCads, AC charger, DC power lead and carry strap..... **£369**



MVT 8000 MOBILE/BASE

This new model is the mobile version of the popular MVT 7000 Handheld above.

- ★ Receives 8 to 1300MHz, 100kHz to 1300MHz (at reduced sensitivity)
- THIS RADIO IS ESPECIALLY SENSITIVE AT UHF FREQS. Set is supplied with mains power unit. **£389**

AIRBAND RADIOS THE WORLDS FIRST DEDICATED CIVIL/MILITARY AIRBAND RECEIVER, THE VT225.

A powerful pocket scanner that leaves the competition standing. - A super sensitive set designed for optimum performance on the Civil/Military Airbands.

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- ★ 100 Memory channels
- ★ AM/FM on VHF
- ★ Priority channel function

EACH SET IS SUPPLIED COMPLETE WITH:- NiCads, earphone, carrying strap and mains charger



£269

VT-125 UK CIVIL AIRBAND RECEIVER

Using the same technology as the VT225, this set covers the full Civil Airband - hearing distant signals that are inaudible on some other scanners.

- ★ Covers 108-142MHz
- ★ 30 Direct entry memories
- ★ Search steps 25, 50, 100kHz SUPPLIED COMPLETE WITH NICADS AND UK CHARGER..... **£189**

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- ★ 1000 channels of memory
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- ★ AM, FM and WIDE FM modes
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NEVADA

MS1000 BASE/MOBILE SCANNER

MOBILE VERSION OF THE HP2000 HANDHELD BUT WITH SEVERAL ADDITIONS:-

- ★ Switchable audio squelch
- ★ Tape recorder output socket
- ★ Automatic - signal operated tape recorder switching
- ★ Metal case for improved EMC compatibility
- ★ Receives:- 500kHz - 600MHz, 805 - 1300MHz. Supplied with mains power supply..... **£279**



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NOW IN STOCK THE NEW AR1500 EX

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- ★ Soft case
- ★ Ear piece
- ★ Dry cell battery case
- ★ 5 mtr LW antenna

NOW IN STOCK **£349**



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- ★ Receives 100kHz - 2036MHz. Modes:- USB, LSB, CW, AM, FM, WFM.



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- ★ 16 memories

IDEAL FOR: Civil/Military Airbands..... **£239**



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Due to a special purchase we can now offer this 50ch Base Scanner at an amazingly low price.

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- ★ Includes Mains Adaptor..... **£195**



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200XLT HANDHELD SCANNER Still one of the easiest to use, and the most reliable scanners on the market, easy to program, sensitive receiver.

- ★ 200 memories
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- ★ UK charger/nicod pack..... **£249.95**



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YUPITERU

Original Leatherette soft carrying cases for MVT 7100 or MVT 7000

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SONY

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A full coverage shortwave, VHF, and airband radio (150kHz to 136MHz). Receives AM, FM, and SSB Special Price **£249**

SW77

One of the new additions to the Sony range, the SW77 covers 150kHz to 30MHz plus 76-108MHz. With a rotary tuning dial, 125 scan memories, reception of AM, FM, USB, LSB, CW, tape record facility, this is a superb all rounder **£349**

SW1E

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- ★ Variable gain/attenuation control.....**£79.95**



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- AOR 2001 Desktop scanner.....**£175.00**
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- Regency MX7000 Desktop scanner.....**£145.00**
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ICF-SW7600£154.95



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LW/MW/FM/SW/SSB reception • PLL synthesized circuitry • FM stereo • Continuous AM frequency coverage • 4 way tuning: 10 memory presets, auto scan, manual tuning, 10 key direct tuning • Sleep function • Digital clock • Programmable timer • 2 step tone control • Antenna input socket • Headphone socket • Key protection • LCD display • Dual conversion system • Supplied with compact antenna, stereo earphones and AC power adaptor • Power: 4xAA size battery.

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- ICF-PRO 80£309
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SONY

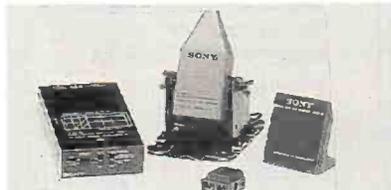
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ICOM

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A Practical Survivor's Guide

Whilst some may be fortunate enough to count their loss of work in financial terms through a lump sum in redundancy cash, many more - like me - find they can't get anything other than what is due because the outfits we worked for went before we 'got some in'.

Obviously, having a hobby, such as radio, isn't the cheapest way to pass the time now that we have a surplus of it on our hands. After all, even a 'budget price' receiver costs in the region of £100 or so brand new and many more established makes cost the same second-hand, if not more.

Priorities here have to be domestic. Maybe you're wondering about the sense of having a hobby that, on the face of it, could be an investment that in the

what was an essential item, so we think that we can survive this employment hiccup until something else comes along. When I say fortunate, I mean that my wife realises that my hobby is important to me. As I don't go out on the razzle, in effect, it's costing us both no more than the electricity - and that is so small as not to count.

But, she also realises that whilst I enjoy my radio enough for it to be everything I've ever wanted in a hobby, she realises that - at times - I may want to get more from it. Obviously, with no money coming in to finance such luxuries, this could prove to be a problem. An example is my a.t.u., which cost almost £90, but which I felt I needed in order to get much more from my radio. The a.t.u. was

work. Having been in the Merchant Navy and used to being away, time at home would be an extreme shock to my system, therefore I needed something to occupy me for the length of time that I'd now have at home. However, in order to 'earn' the a.t.u. I had to agree to allow her to start up her own business, again part-time, and that I would 'role reverse' and start to do what she used to - clean the house, look after the two children, cook, shop and otherwise assume her place in the great order of domesticity. Fair enough, I said. After all, what else was there for me to do?

In return for my 'labour' I would be, in effect, be paying for the a.t.u. 'in kind'. That seemed reasonable and it also began what we now call our 'points system'. I do the odd jobs around the house that, had I have been away at sea, would have had to be done by outside labour. That, as we are all well aware, costs! By deferring these jobs to me - thus cutting costs greatly - I earn 'points' that can be saved towards new gear. Now, while many will argue that I am only doing what is expected of me as a father and

husband by undertaking jobs around the house, I must point out that my doing the wife's work allows her to become the breadwinner. So, in effect, I am only being paid the way I used to 'pay' my wife! All that has changed is that she works while I keep house! The budget is such that any extra money made is banked and, if the budget balances, put aside in a savings account. As long as we get no horrific bills in the meantime I can then 'buy' what I want within reason. That reasoning is that it must

be second-hand and cost no more than £65 - a figure that is quite reasonable.

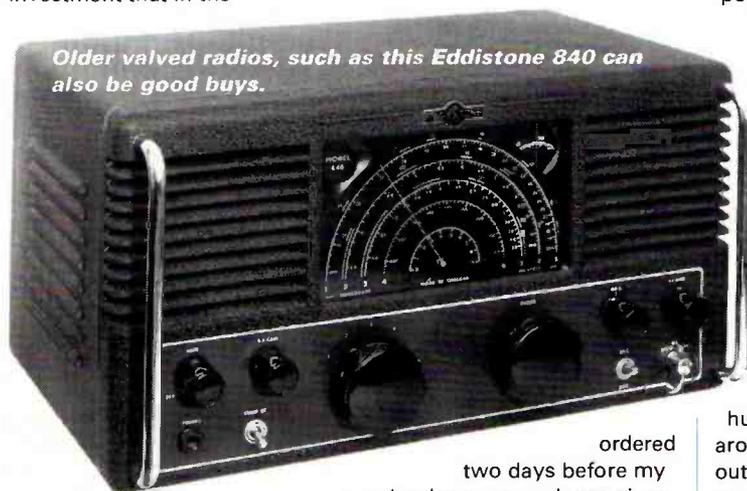
Second-hand Bargains

There are numerous bargains on the second-hand market as well as at rallies and the like that can add to an existing set-up without incurring heavy financial outlays. I recently missed a Sangean AT-803A going for £55 and advertised as being 'Brand new, used once, unwanted birthday present'. While that may be stretching the truth some, the idea of another short wave receiver in the shack adds to the whole monitoring aspect of the hobby, as well as increasing coverage. At £55 the Sangean was almost half-price and any inspection would have soon allowed me to make my own mind up as to whether it really was 'used once'.

Whilst I am a dedicated s.w.l. the majority are not. The number of sets, particularly scanners, bought and then sold when the new owner realises that listening is not all 'royal telephone call, is tremendous! Another example - although well out of my price range - was an AOR 2000 going for £125! The person, known to me, was 'fed up with trying to listen to things' and admitted the programming sequences were beyond him. Needless to say it was soon snapped up by another enthusiastic buyer! Had I have been working then I'd have snapped his hand off for that price!

Affordable Prices

Rallies have a great deal of reasonable equipment for sale and are often the best source of good quality gear at affordable prices. What's



Older valved radios, such as this Eddystone 840 can also be good buys.

circumstances you need to realise. After all, the set-up I've got could realise about £350 cash-in-hand if I sold it now. That cash could go a long way to easing the bills that roll in, no matter what.

However, my wife works part-time and brings in some cash. We are also very fortunate in having only minimal hire purchase on

ordered two days before my redundancy came. I was given no warning that I was being consigned to the scrap heap, by the way and in any case the order for the a.t.u. was already in.

Role Reversal

Panic! I offered to cancel the order, but my wife, bless her, decided that it was an item that would keep me busy in the days to come with no

Guide to Short Wave Listening

more, many of the retailers selling at rallies will be enthusiasts or amateurs, so you are assured of a certain amount of goodwill on your purchase - new or second-hand. What's more, the 'flea market' stalls may well turn up an item that you find you need at a considerable saving. Look, browse and be choosy. Unemployment means you have the luxury of being careful. Avoid, if you possibly can, car boot sales, unless you feel confident in examining the gear and are allowed to. A local sale here had a Heathkit *Mohican* at £50, advertised as being a 'bargain' - but with an S-meter jammed at S9 and a tuning dial that felt mushy, I certainly wasn't going to be tempted - even if I could have knocked the seller down!

Another very good source of reasonable gear for sale is the 'For Sale' column in the local paper. Recently the gear here has been scanner orientated, although the odd h.f. receiver slips in now and again. There are some good, affordable buys to be had by scouring here carefully but, once again, check the gear to satisfy yourself that it is in good working order and legitimate. Far too much stolen gear is being sold through these columns. Again, beware and be careful!

Armed with my 'points earned' £65, I'm currently on the look-out for a good second-hand short wave RX. Brand names like Tatung or Sangean - yes, the same thing in reality! - are top of the list, though Eddystone, RCA or the like, valued jobs will also be looked at. Being unemployed means I can wait for as long as necessary until the right set at the right sum comes along. Previously, when working, I'd have bought outright! I'm also going through my 'junk box' and finding lengths of wire

which can be made into antennas and tuned via the a.t.u. Bothering my uncle - GW0KPV - is also worth while, he always seems to find odd bits he would otherwise have got shot of, such as an old 'Silver Rod' CB vertical. With the loading coil removed this may prove to be a reasonable h.f. vertical. The time is mine, as is the inclination to get on the bands at a pinch and on the shoe-string that I'm finding myself on now.

Home Brew

Being redundant or unemployed need not mean the end of the hobby that was so attractive during working days. In fact, reduced circumstances may be the 'shove' needed to get us into home-brew. After all, why buy when you can build? Many of us will have the requisite items needed to home-brew anyway - soldering iron, various electrical tools - and the know how can come through experimentation.

Personally, while I would not balk at splicing eight-stranded, multi-plait rope, handling a soldering iron is an art I do not possess! Joking aside, however, I may well find that I can 'if I try'. Why not? After all, I've got whole days in which to learn! The solution to enforced redundancy or unemployment is to remain active. We have a damned good hobby in s.w.l.ing and with a basis of quite good equipment already owned, those otherwise idle days can be spent trying to recapture the true spirit of the hobby; making do, on the cheap and with economy in mind.

As I said before, my system is working and my wife sees short wave radio as a means of keeping me interested in something. If I didn't have my

sets then there's no doubt I'd end up sitting in a chair moping - and that's the start of a host of ills. Those otherwise hopeless days can still be made worthwhile if we fight back. In doing that - in learning to cope - we can only do ourselves a power of good and it is that, in the end, which makes us different from those who have nothing.

Invaluable Lesson

I've been unemployed for nearly a month but, through the interest in radio and in experimenting on a low budget with bits of wire and the like, to keep me going, it's passed quickly. Sure, there are problems - but we had those while I was at work as well! The truth is, this new phase of my life has taught me an invaluable lesson. That a reduction in the essential element in my life need not

If, like John Griffiths, you've got a family, a mortgage and all the trappings of life that go hand in glove with them and you've just been made redundant then life looks grim and money is going to be something there isn't a lot of. But it doesn't mean that it's the end of the hobby.



mean the end. In fact, to be quite truthful, it's opening up a whole new vista of avenues that I would not ordinarily have explored. That, on the face of it, can't ever be a bad thing.

Keep an eye on the second-hand ads, you may see a bargain like this Sangean ATS 803A for £55!

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This new title will be published in early April and replaces the eighth edition of the "Short Wave Listeners Confidential Frequency List". We challenge you to find better value! It's crammed with stations that have actually be monitored in Europe, not just listed by somebody else. Our team of monitors have done it the hard way, which means you get the very latest information. When you read this you'll realise what you have been missing! Money back if returned in 10 days.

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Projects

A Multi-purpose Signal Monitoring Meter

Those who spend their spare time experimenting in communications frequently need pieces of test equipment. The average amateur enthusiast's budget doesn't go far when it comes to test equipment, so Richard Q Marris designed a simple, low-cost, multi-purpose, signal monitoring meter for home-construction.

The author's amateur station G2BZQ, only includes equipment that can be quickly repaired on the spot, or has been home constructed or extensively modified. A continuous programme of receiver, transmitter and especially antenna design is in progress. The antenna activities cover v.l.f. to u.h.f. including antenna designs such as loops, ferrite loops and restricted space designs for transmitting and receiving. The transmitting antennas are, of course, restricted to the amateur h.f. bands.

To carry out various tests it has been necessary, from time to time, to lash up test gear to do a particular job. Inevitably this is eventually demolished and the parts used in other projects. Recently it was decided to build a more permanent audio/visual signal monitoring meter that can be used in many ways, some of which are outlined here.

1. A simple receiver tuning meter.
2. A simple receiver output meter for use when aligning/realigning the i.f. and r.f. stages of a receiver.
3. An audio/visual indicator when designing transmitter antennas.
4. An audio/visual meter for use in the design of resonant receiving antennas, such as frame loops and ferrite loops.
5. A general purpose audio/visual 'in-circuit' communications receiver signal monitor.

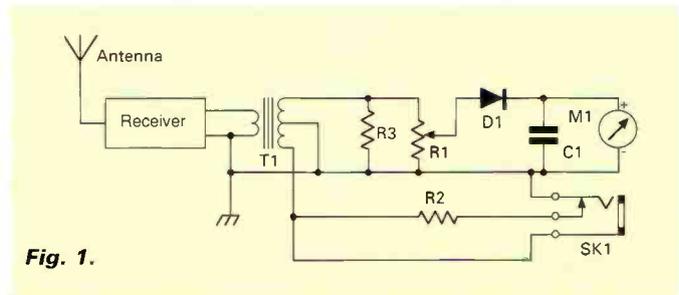


Fig. 1.

Signal Injection

The A/V meter monitors signals from the audio output of the receiver. A signal injected into the antenna, after processing and amplifying, appears as an audio signal at the loudspeaker and/or headphones. The input signal source is either an external transmitter, or a signal generating oscillator, injecting into the r.f. or i.f. stages.

Some of the functions of the A/V signal monitor are often performed by the receiver's built-in S-meter, where fitted. This is usually operated by the a.v.c. circuit

and when used for anything but its intended function, as a signal strength comparator, can produce confusing results for the unwary. Therefore the most satisfactory, though seldom seen, method is to fit a visual signal monitoring meter at the receiver's audio output. A refinement is to fit headphones and listen to what the meter is recording. With this method it is most advisable to switch off, or otherwise temporarily deactivate, the receiver's a.v.c., which can often be done with an AVC ON/OFF switch.

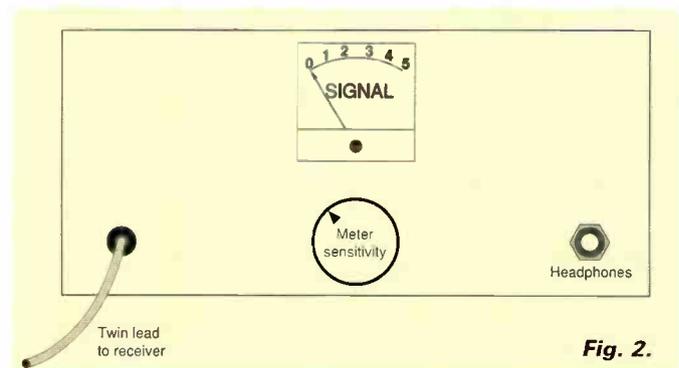


Fig. 2.

Projects

You Will Need

Resistors

1W 5% Carbon Film
470 Ω 1 R3

0.25W 5% Carbon Film
10k Ω 1 R2 (see text)

Potentiometers

10k Ω 1 R1

Capacitors

Min Ceramic
330pF 1 C1

Semiconductors

Diodes

1N34A 1 D1

Miscellaneous

Transistor output transformer type LT700 (Maplin LB14); Meter, 250 μ A f.s.d. (Maplin LB80B); Single-sided, copper-clad, SRBP board 203 x 89mm (cut from Maplin HX00A.); Jack socket to suit your headphones.

The Circuit

The resulting simple circuit, using readily available, low-cost components is shown in **Fig. 1**. A transistor output transformer, type LT700, is used to match the audio output of the receiver, which is usually between 3 and 8 Ω impedance, to a meter monitoring circuit and headphone socket.

The meter circuit consists of a 250 μ A f.s.d. signal meter M1 and a signal diode D1. The diode used is a 1N34A, but any of the many alternatives would suffice. Meter sensitivity is controlled by a 10k Ω potentiometer R1. An optional resistor R2, nominally 10k Ω , is connected in parallel. When a signal leaves the receiver audio output it causes an upward deflection of the meter. At the same time the signal is audible in the headphones. Tuning the receiver exactly to the resonance of the signal peaks the meter reading.

Output

Because the output power and impedance of receivers varies from model to model, it may be necessary to make R2 either larger or smaller, or eliminate it altogether. The arrangement shown suits the various receivers available at the author's station, all of which are 8 Ω output. If headphones are not used, resistor R3 is switched in to provide a load.

Construction

The unit is built on to a 203 x 89mm single-sided, copper-clad SRBP board, with the copper surface to the rear, as shown in **Fig. 3**. This acts as a combined front panel/chassis. The first prototype was built on a much smaller board, but was abandoned in favour of the larger board shown for various reasons. The author's hand hid the meter when adjusting R1 and invariably the headphone lead got tangled with the R1 knob or drifted across the meter face. The unit, being so small, was also light in weight, so that a

movement of the headphone lead moved the unit around on the desk. So a larger panel was selected and fitted into a simple wooden case. An alternative would be to build the unit onto the lid of a plastics box.

The layout is not critical, so no actual dimensions are given in **Fig. 3**. Everything is directly mounted on the front panel, and all earth connections are soldered directly to the copper-clad board. The one exception is transformer T1. This is mounted on a small piece of

plain SRBP board, a small brass bracket being bolted to this board. The bracket is soldered directly to the copper-clad board to avoid having to drill the front. Sufficient tags exist on the major mounted components to hardwire the small components C1, R2, R3 and D1. A short length of twin lead is taken, through a rubber grommet, to the audio output of the receiver. The size of the headphone jack socket SK1 depends on the headphones in use. If you are using a non-insulated jack socket the copper **must** be removed from around the hole so that the socket is not earthed. In the author's case, 1k Ω impedance headphones were used, but they could be anywhere between 500 and 4k Ω .

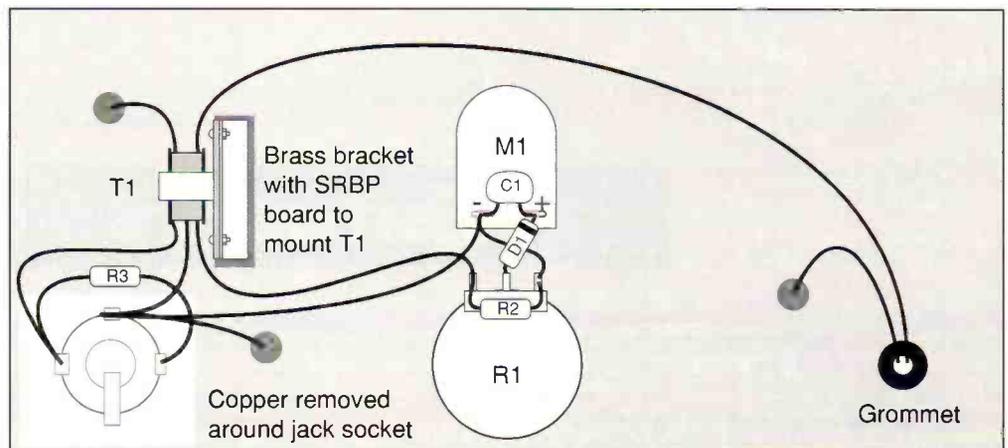


Fig. 3: The back of the copper-clad front panel.

Projects

Operation

Some ideas of how to use the A/V signal monitor are given here.

1. If a receiver is not fitted with an S-meter, or tuning indicator, the A/V meter can be used for seeing and hearing. If the RX has a loudspeaker, and the headphones are not required, then just plug in an open jack plug into SK1, to switch out the load R3.

2. The A/V meter can be used as a receiver output meter when lining up or realigning the r.f. and/or i.f. stages. Temporarily deactivate the

receiver's a.v.c. and inject a signal at the required frequency. Realign the receiver's circuits for peak output meter reading on the A/V meter. If a signal generator is not available it is possible to use strong carrier signals of known frequency for r.f. alignment. Another idea is to use a 100kHz crystal calibrator with a short length of wire as an antenna. The headphones ensure that interference is not confusing things on the meter.

3. When a new transmitting antenna is being designed or adjusted, use the A/V meter with a separate receiver (a.v.c. off), a short wire whip antenna

and the r.f. control set near minimum. The receiver should be placed at some distance from the transmitter and the transmitted signal monitored with the A/V meter and headphones. Relative signal strength readings are possible with the A/V meter, which cross-checks when the new transmitter antenna is at resonance, at the same time listening to the quality of the signal. This has been found particularly useful with indoor transmitting loop and other restricted space antennas.

4. When designing resonant receiving antennas, such as frame loops and ferrite loops, the procedure is a

combination of 1. and 2. above. Using a suitable carrier or external oscillator, the A/V meter provides relative signal strength readings at resonance and as adjustments are made to the new antenna. The headphones ensure that the signal being used is 'pure' and is not partly interference.

From time to time, the A/V monitor meter is used for other activities where a relative signal strength meter with audible checking is required. ■

FIRST AID

Has anyone got a spare tuning film for an R210 h.f receiver or any information on obtaining one? Also has anyone got any information on fitting the film?

Gavin Jones. 74 Joseph Luckman Road, Bedworth, Warks CV12 8BQ. Tel: (0203) 315080.

I hope some reader can help me. My FRG-8800 has gone on the blink. Ten to fifteen minutes after switching on, the sound goes off and the l.c.d. blinks on and off approximately 60 blinks per minute, also intermittent - the blinking stops and the sound comes back for a few seconds.

I bought this radio about three years ago, second-hand so I don't know if this fault has occurred before. I don't have any circuits for this radio. I do have an operating manual.

All expenses will be reimbursed.

Peter B Jones. 22 Windsor Road, Six Bells, Abertillery, Gwent NP3 2QE. Tel: (0495) 212166.

Can any reader kindly supply information on an Advance AC Voltmeter type VM78. I don't even know which batteries it takes. Instruction book, maintenance manual, circuit diagram, whatever you have, I'll gladly pay any expenses.

G Whitlock. 13 Ingestre Road, Stafford, Staffs ST17 4DJ. Tel: (0785) 225106.

Obituary

Amateurs and listeners alike will be shocked to hear of the sudden passing of William Albert Mills GW3LJP of Rhayader on the morning of Sunday February 28. Within four hours, the news was all over the county. Bert, a retired BBC engineer, life-long radio

enthusiast and dedicated home constructor, built, along with many other pieces of radio gear, his own SSTV equipment.

At the funeral on March 4, the Baptist chapel in Rhayader was full; every radio club in Powys was represented plus

Hereford and South Wales. Bert was very sound technically and at the time of his death was training a group of newcomers for the Novice licence. There are literally dozens of groups and individuals who received a helping hand from GW3LJP,

and he will be sorely missed. All of us at *PW* and *SWM* extend our deepest sympathy to Bert's family and his many friends.

Paul Essery & Ron Ham

RADIO HAMSTORES

YOU'VE READ THE FEATURE
NOW TRY FOR YOURSELF



ICOM IC-R72 Well, if you have read this magazine's review of the ICOM IC-R72, you will no doubt want to experience this tried and tested receiver for yourself, so, for the full story why not pop along to, or telephone a Radio Hamstore today. Here are just a few of the IC-R72's excellent features:

- Frequency range 30kHz-30MHz.
- USB, LSB, CW, AM and optional FM.
- Direct keypad entry for improved programming versatility.
- 99 memory channels and 2 independent scan-edge channels.
- Built-in 24-hour clock and timer.
- Advanced DDS system.
- 100dB dynamic range.
- Level-selectable noise-blanker and much more.

IC-R7100

This receiver is the R72's new shackmate featuring:

- Advanced window scan.
- 25MHz-1999.999MHz coverage (25-1000MHz & 1240-1300MHz guaranteed).
- 900 memory channels.
- 4 memory modes.
- SSB, (USB/LSB), AM, FM & wide-FM.



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Part-exchanges & payment by Access, Visa and Switch. Finance arranged (subject to status).

Interest free credit is available on selected new ICOM products.

If you cannot visit a HAMSTORE in person, use our efficient MAIL ORDER SERVICE. Stock items normally dispatched within 24Hrs.

We give full warranty on all ICOM products bought from authorized ICOM UK dealers. In some cases the equipment will be

replaced if the fault is beyond speedy and satisfactory repair. ICOM equipment purchased from an unauthorized dealer is not covered by ICOM warranty.

Gordon G3LEQ & John G8VIQ at Birmingham, Chris G8GKC at Herne Bay and Doug G0LUH & Paul G7MNI in London all look forward to your visit.

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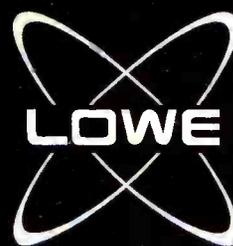
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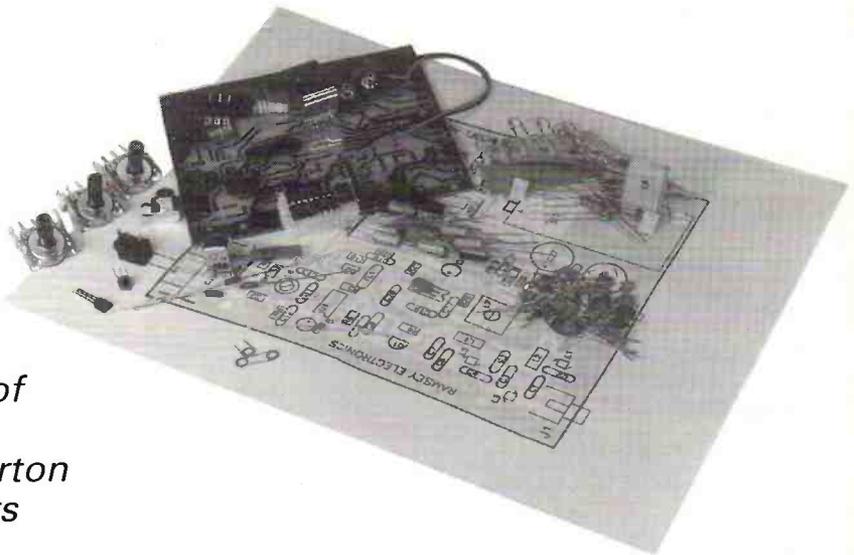
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Projects

Ramsey Kits

For the beginner to home construction, a kit should offer a reassuring start by providing all of the parts needed together with detailed instructions. Dick Ganderton has been looking at a range of kits imported from the USA.



I have enjoyed constructing my own items of radio and electronic equipment for well over forty years and during that time I have assembled a wide variety of kits, some of which have been superb, while others are best forgotten!

What should one look for in a kit? This depends on what level of competence you have reached and what equipment you have at your disposal. I suppose that most readers would be unable to carry out complex metalwork in order to make a professional looking case. I remember well the kits supplied by the renowned, but sadly now defunct, Heathkit company. Complete in every detail the finished project was indistinguishable from a professional piece of gear. But what always impressed me were the instructions. Each component and every step had its own box to be ticked off when that step had been completed. The instruction booklets supplied with the Ramsey kits that I have been looking at followed the same pattern. I noticed several errors and there were a few problems with component markings not conforming with those stated in the manual. Otherwise full marks for the instructions, which were also informative. I liked the explanatory notes. A loose p.c.b. component overlay drawing is provided, as is a circuit diagram - American style, of course, but one of the better ones. Why the

Americans cannot draw decent circuit diagrams has always mystified me.

I followed the constructional order laid down in the instructions to see how easy it was. I found no problems, although I did find it strange to be putting in the sockets and other large components first with links and smaller bits last. Ramsey have a reason for this - at least I think they have. By not following the usual convention of the smallest parts first, the instruction sequence works its way across the printed circuit board in logical circuit blocks.

Components

The components seemed to be good quality, although the resistors, for example, were a bit of a mixed bunch. Some of them had pre-formed leads for vertical mounting, and the leads needed to be

straightened out before they could be used. This created no problems, but might confuse the beginner. The whole project is built on one glass fibre, single-sided p.c.b. and the tracks and pads are a reasonable size - essential if the beginner is not to lift them with the application of a hot soldering iron for longish periods.

The kits that I tried out were the AR-1 Aircraft Band Receiver Kit and the FR-1 FM Broadcast Radio Receiver Kit. Both of these kits are supplied without a case and also require a PP3 battery and earpieces. However, cases are available as separate 'kits' and I was supplied with one for the FM Radio. The case kit comprises a plastics box with pre-punched and lettered front and back panels. Knobs are also supplied. The p.c.b. just screws into the bottom half of the case, the front and back

panels slot into the case and the top half slots over the panels and is held in place with two self-tapping screws through the bottom half. Four self-adhesive rubber feet are also provided.

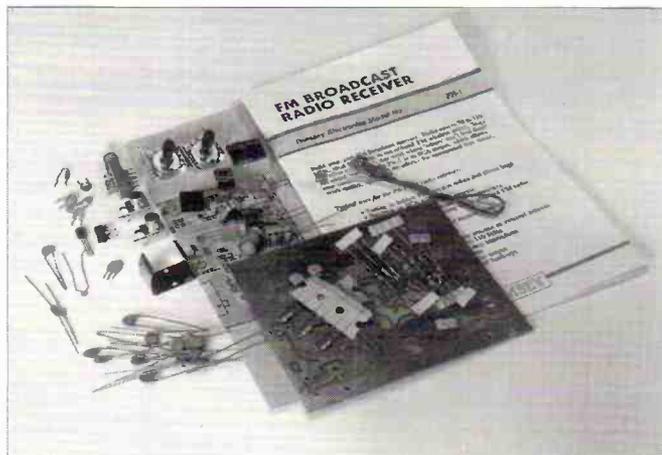
Alignment

Full instructions are given for aligning the completed radio. A hex-headed alignment tool is required to adjust the coil slugs and, unfortunately, Ramsey have seen fit not to supply one with the kit. I feel that this is a serious omission, especially for a kit that will appeal to the newcomer, who will certainly not have a suitable tool to hand. The instructions do, however, tell you how to improvise one.

Experience

I found the kits to be simple to assemble and will provide the newcomer to the hobby with a useful piece of equipment at a reasonable price. More to the point, though, it will give pleasure during construction as well as in use and you will have gained experience in the process.

The kits reviewed were kindly supplied by **Waters & Stanton, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835.** The AR-1 costs £29.95, the FR-1 costs £22.95 while the case and knob set for the FR-1 costs £14.95.



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HKS

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No. 2 ★★★★★★★★★★★★★★★★★★

The AOR 1500 is now up to "EX" spec and makes a close runner to the MVT7100. Still featuring all mode capability, the Handie continues to offer excellent value Including NICADS, CHARGER, FLEXI Antenna, CIGAR LEAD, CASE & much more as standard.

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No. 3 ★★★★★★★★★★★★★★★★★★

The AOR 3000A is still the ultimate in BASE/Mobile scanners. It's actually more than a scanner, but a true ShortWave receiver as well. All mode and offered complete with Power Supply & Antenna. I've also EXTENDED the payment terms.

Deposit £241 & 12 payments of £59.00

No. 4 ★★★★★★★★★★★★★★★★★★

For the keen AIRBAND enthusiast, the VT-225 from Yupiteru is a must. Covering Civil & Military Airband only, this HANDIE scanner has its performance optimised for those two bands leaving the wide band scanners unable to compete.

Deposit £49.00 & 3 payments of £66.66

No. 5 ★★★★★★★★★★★★★★★★★★

The Icom ICR7100HF mk111 has found its way into many commercial applications & even more listeners homes! No shortcuts in design & thanks to our HF Modification, the receiver now covers 50KHz - 2000MHz with no gaps. It's not cheap but I'll probably never sell you another receiver!

Deposit £405.00 & 9 payments of £110.00

No. 6 ★★★★★★★★★★★★★★★★★★

The MVT7000, despite the introduction of the 7100, is still high up the charts & selling well. Basically, if you don't want 1000 memories and have a SW receiver with SSB already, then this is the beastie for you. Brilliant performance & purchased recently by several PUBLIC SERVICE operators..

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No. 7 ★★★★★★★★★★★★★★★★★★

AOR have had their AR2000 around for a while now and I'm bound to say it's one of the most reliable of all the models. 1000 memories & offered with all accessories, in true AOR VALUE FOR MONEY tradition, buy one & you won't be disappointed

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No. 8 ★★★★★★★★★★★★★★★★★★

The ever so tiny Icom IC-R1E has still to be caught up with in terms of its size and performance. A real "POCKET" scanner, sold in their thousands to amateur and commercial users alike.

Deposit £39.50 & 9 payments of £39.50

No. 9 ★★★★★★★★★★★★★★★★★★

The amazing VT-125 mk111 from YUPITERU still represents the best civil airband handie scanner available. Nothing comes close to its performance or size. Offered with the very latest "AIR BAND FREQUENCY GUIDE"

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No. 10 ★★★★★★★★★★★★★★★★★★

Just sliding into the top ten, the incredible value MS1000 base/mobile scanner from NEVADA. Built in a strong metal case, the unit covers all the important frequencies from 500KHz-600MHz & 805-1300MHz. Offered with free Mains Power Supply and mobile or base antenna for instant operation!

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THE SCANNER TOP TEN...THE SCANNER TOP TEN...THE SCANNER TOP TEN

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Do-it-yourself Chart Recorder **Part 1**

For those enthusiasts engaged in radio astronomy or interested in magnetometry often the most difficult or expensive component to come by is a suitable chart recorder. Richard Noble set to and built his own!

This article describes how to build a simple single or multiple trace instrument, using nothing but hand tools found in most amateur workshops and techniques requiring no special skills beyond those which can be taught here. Most of the parts used are readily available and inexpensive, certainly in the context of chart recorder cost, new or second-hand.

The main simplifying technique employed is what could be called, for want of a better name, clock construction. This is a method pioneered by the old watch and clock makers. "Hold on" I hear you say, "you promised that we required no special skills, and now you talk about watch makers!"

Do Not Be Put Off

Most people probably associate watch-making with the Swiss and immediately think of incredible precision engineering. While not in any way wishing to diminish the skill of these gentlemen, for whom I have a great respect, nothing could be further from the truth. What is actually involved in their case is better described as incredibly small engineering.

If you imagine a small watch, enlarged by some magic or science-fiction process by 25 to 50 times and then imagine that this now large object was something

that you had just made in the engineering workshop you worked for, the first thing you would get from the foreman, after he inspected your creation, would be your cards. The bearings in watches work so well, not because they are precision fits, but because they are in fact, nice sloppy fits that would disgrace any macro-engineer. Sloppy fits, of course, wear much more rapidly than precision fits, so now you know the real reason why expensive watches have all those jewels. They make the watch last longer!

Exploit

It is this loose fit approach that we are going to exploit,

together with the very ingenious way they fit everything between two flat plates separated by spacers. The great advantage of the system is that the two plates can be clamped together when they are being made, eliminating the possibility of them not being subsequently in perfect alignment, as far as hole drilling is concerned. This ensures that spindles and spacers end up reasonably parallel without special effort. In addition, the two flat plates give good surfaces to attach things to without complication.

The next simple trick to be exploited comes from the way in which brass rod and tube manufacturers make a popular

variety of their product. The sizes are imperial and go up in $1/32$ in increments. The more fascinating thing, though, is that the tube wall thicknesses are just a little less than the increment, which means that they are all a beautiful sliding fit into the next size up, throughout the range of sizes. This makes the manufacture of sliding parts and bearings very easy, without special tools. The other very attractive feature they have is that solder takes to them very well, making all kinds of interesting construction possible. If soldering is not one of your skills, you need not worry as Araldite will do everything you need for this design.

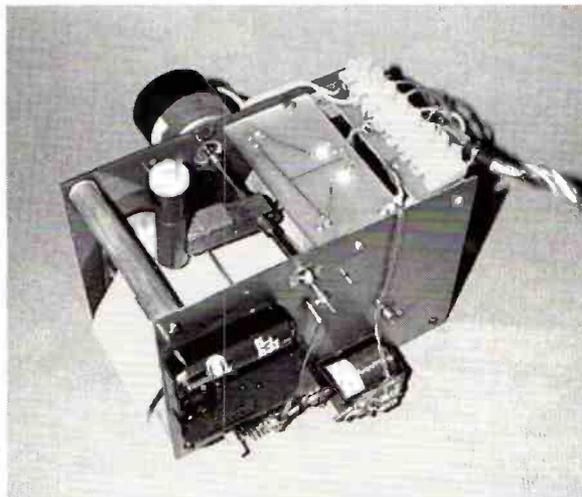
One other necessary special item, which would be impossible for us to make, is a miniature lead-screw and travelling nut, to be used as a drive system for the pen that makes the traces. Two otherwise unrelated components can be found which will make this possible. One is a length of 4BA threaded brass studding and the other is a cylindrical plated spacer with a 4BA hole tapped through it.

After this, all we need is a small, low-voltage d.c. electric motor to drive the lead screw, a linear pot to provide the positional feedback, a small solenoid to lift the pen and another electric motor with an output shaft which goes round once every twelve hours, better known under its alternative name of 'clock'.

The general construction and layout can be seen from the drawings showing the assembly and in particular from the exploded diagrams of the various parts. The finished article can be broken down into a number of more or less independent sub-assemblies, each with their own function to carry out, each described separately in what follows.

Clock Plate System

The first is the basic clock-plate assembly, consisting of two pieces of glass fibre printed circuit board 160 x 110mm and four pieces of $1/2$ in wooden dowel, each 80 mm long, as shown in **Fig. 1**. The dowels are held in place



The prototype chart recorder.

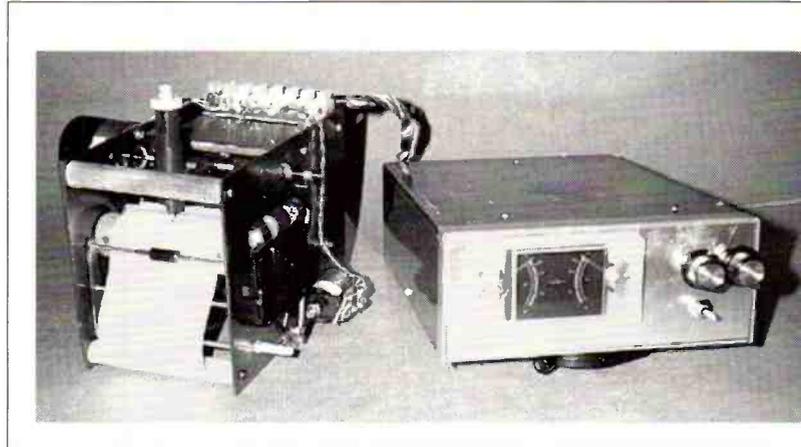
Projects

by round-head wood screws fitted into holes which should be pre-drilled in each end of the dowels. The p.c.b. is screwed to two 6 x 12mm wood blocks, bolted to the side plates, thus providing some of the spacing and rigidity for that corner of the plates. The p.c.b. fixing screws should also have pilot holes pre-drilled for them to prevent the wood from splitting. It is best to do this before assembling the components onto the printed circuit board. If the whole assembly is slightly warped, try rotating the dowels a bit. Since the ends are never perfectly square, a suitable combination of rotations can usually be found which will allow the plates to sit square on a flat surface.

The method of drilling the side plate is to mark the top, front, corner hole on one plate and centre-punch it carefully. If you are not used to this and do not have a centre-punch, find an OBO nail, place the point on the mark and tap the head gently with a hammer. This makes a small dent which guides the drill when it starts cutting. Clamp the two plates together and drill slowly through both with a 3mm drill. Bolt the plates together with a 6BA bolt through these holes, align them carefully and clamp them. Mark, centre-punch and drill the rear bottom corner hole and bolt with a second 6BA bolt. The plates should now be firmly held together and the rest of the holes can be marked and drilled. All of them should be pilot-drilled with a 1.5mm drill. They can then be opened up to final size using the pilot holes as guides. Be careful however, as some holes are different sizes in the two plates and can only be opened up after the plates are separated.

Paper Drive

The next sub-assembly is the paper drive system shown in Fig. 2, consisting of a quartz clock movement and a wooden roller. The clock movement is attached to the side plate by the usual central threaded stud and nut, making use of the rubber washer, if one is supplied. The roller is a piece of 1in diameter wood



The chart recorder with the associated electronic module.

dowel. As supplied this is often not exactly 1in in diameter, but it is relatively unimportant and only affects the length of paper used to cover any recording period. The method of fitting the roller is to drill a hole in one end, the same size as the outer diameter of the hub of the hour hand, supplied with the clock movement. Cut the hour hand off the hub and glue the hub into the hole in the roller. This allows the roller to be pushed on to the clock spindle where it is driven by the usual friction grip. The other end of the roller is supported by a brass rod, which is a push fit into a hole drilled in the roller end. This brass rod is a free fit into a hole in the side plate opposite to the clock.

If you are uncertain of your ability to get a hole in the centre of a round rod, try the following. Measure the rod diameter carefully, draw a circle with a pair of compasses on paper and cut it out carefully. Align the paper circle as carefully as possible over the end of the rod and then push the point of the compass through the paper centre hole into the wood. This provides a centre mark for the drill. Use a 1.5mm drill first to give a guide hole for the final drill.

Pinch Roller

To complete the paper drive system we add another sub-assembly - the pinch roller mechanism. The frame is made from $\frac{3}{32}$ in diameter brass rod and glass fibre p.c.b. end-cheeks. The reason for this is that, after assembly, the rods can be soldered to the copper surface to make the mechanism rigid, but this should not be done immediately. The pinch roller itself is made from a piece of rubber tubing pushed on to a short length of $\frac{1}{8}$ in diameter brass tubing. This should be slipped on the brass rod before the ends are soldered. Note that the centre rod is not soldered and that the bottom rod is longer than the others, long enough to protrude through pivot holes in the side plates. This is shown in Fig. 3.

If you choose to solder the parts, the brass and copper should be cleaned with fine emery and Baker's Fluid should be used as flux, in order to make the solder flow freely. (Editor's Note: Baker's Fluid and electronic components do not mix - do not even allow Baker's Fluid in the same room as your electronics as even the fumes given off during soldering will

destroy the innards of your radio gear.) If you prefer to avoid soldering, use Araldite instead to fix the rods.

Notice that the pinch roller tube is much shorter than the rod it fits on. This is a deliberate part of the design since, with a sliding roller, there can be no side forces on the paper tending to crush the edge against the spacer guides. Instead, the roller will probably creep slowly to one side or the other, but this does not matter as you can easily move it back to the centre at intervals. The chart paper will move over the drive roller and stay straight between the guides. The pinch roller is tensioned on to the drive roller with rubber bands threaded over the centre rod and another rod going between the side plates. Both rods are left free so as to make replacement of the bands easy.

Part 2

Part 2 will continue with the pen sub-assemblies to complete the mechanical side of the Chart Recorder. A convenience kit of all the mechanical parts, finished and drilled, including p.c.b.s, motor, solenoid, clock, paper roll, pen, etc., but no electronic components other than the slider potentiometer, is available from R & W Noble, Penbidwal House, Pandy, Abergavenny, Gwent NP7 8EA. An s.a.e. will bring you further details.

The author has produced a comprehensive set of detailed drawings for making the Chart Recorder. Apart from the circuit diagrams and p.c.b. layouts, which will appear in a later part of this series, the mechanical drawings will not be reproduced in the magazine as they would take up far too much space. They will, however, be referred to in the articles. Copies of these drawings are available from the Broadstone Editorial Offices - just send an A4 stamped, self-addressed envelope marked Chart Recorder.

S.R.P. TRADING

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(Direct key-in world receiver with quartz alarm clock timer)

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A powerful pocket scanner that leaves the competition standing. - A super sensitive set designed for optimum performance on the Civil/Military Airbands.

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- ★ Priority channel function

EACH SET IS SUPPLIED COMPLETE WITH:-

NiCads, earphone, carrying strap and mains charger

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FAIRMATE

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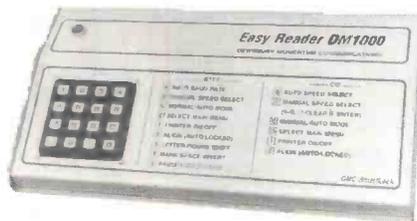
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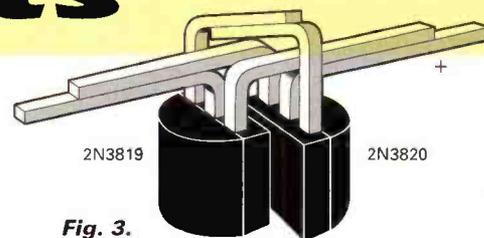


Fig. 3.

amplifier, Tr3. Potentiometer R8 acts as a sensitivity control and in the basic circuit is combined with the on/off switch. Power is provided by a PP3 battery, D3 or IC1 stabilising the voltage to the oscillator.

Options

The circuit around Tr4 is a simple a.f. sine wave oscillator working at about 1kHz modulating the r.f. oscillator via Tr1, this is brought in as required by S1a. Transistor Tr5 and associated components make up a charger for the optional NiCad battery, the l.e.d. (D4) acting as a 'charge' indicator. The battery in this case being either a PP3 NiCad or two 3.6V 100mA p.c.b. batteries in series, soldered directly onto the board. Application of 12-30V d.c. to SK2 charges the NiCad at the correct current.

For testing 'unknown' coils, one plug-in unit can be made up with two short leads terminated in a miniature crocodile clips. This time the scale is calibrated in picofarads. The coil under test is connected to these clips and the output found by listening on a suitable receiver or by coupling the dipper output to a frequency counter, then the capacity to resonate that

particular inductance at the specific frequency read from the picofarad calibration.

Construction

Before starting work, get hold of an old, portable, transistorised radio. This will provide the tuning capacitor, the sensitivity control with on/off switch and the a.f. transformer (the one to look for is the red coded one). Now you know why this is a 'green' dipper - almost all of the components can be salvaged! The full scale p.c.b. print is shown in Fig.4. and should be etched on standard 1.6mm glass fibre board, this making the top panel of the dipper. The board will then fit nicely into a cut down (25mm high) suture box of the kind commonly found at rallies and junk sales. The alternative is to treat yourself to a minor operation and collect a few boxes in the process!

The holes for the slide switch, l.e.d. and 2.5mm socket will depend on the particular types used but, of course, need not be cut out all if only the basic option is to be built. Before assembly, the unetched side of the board should be sanded with 'wet and dry' paper, sprayed with a suitable cellulose colour and any lettering applied. If using

'rub-down' lettering, it is wise to afterwards spray on a coat of protective laquer, 'DampStart' is ideal for this as it will not 'lift' the lettering or the paint surface underneath as well as giving a smart eggshell finish. The 40mm meter can be a snug fit in the opening provided or it can be held in place with double-sided tape. All components are soldered directly onto the copper pads and will require their leads cropped to a few mm except for some diodes and resistors which are mounted upright on the board.

Assembly is a trifle difficult as there are no holes in the board to hold the components in place while soldering takes place, so a small bit on the soldering iron and thick skin on your fingers are essential.

Figs 1 & 5 show the simplest configuration of the dipper, note that the two f.e.t.s are pre-assembled in a 'package' (Fig.3) - you now have a two terminal negative resistance device, provided that you remember to label the + end with a fragment of sleeving while the type markings are still visible. This package is then wired between the 5V line and the tag on C1 that goes to SK1. There is a land on the p.c.b. - the square with the broader edge - which can be used for C1/SK1

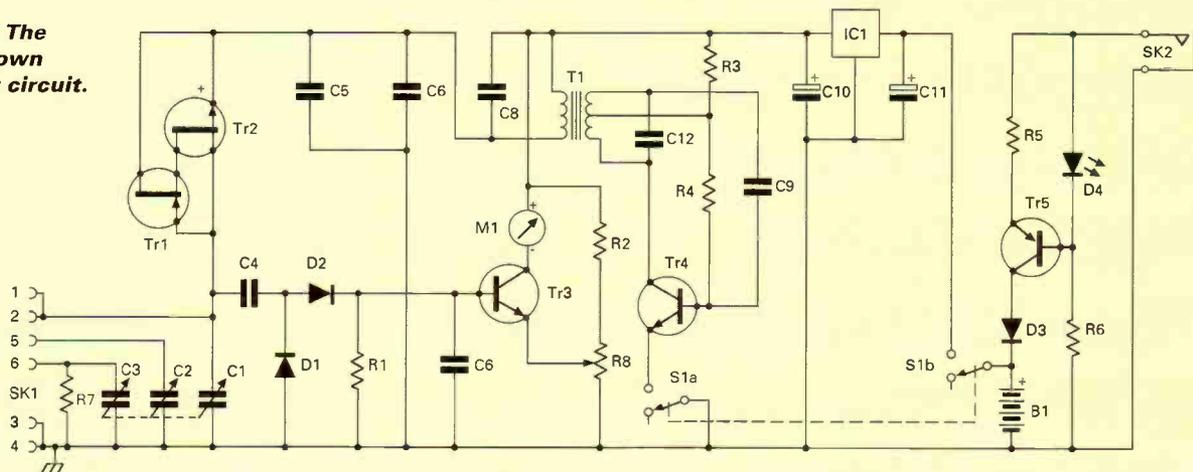
junction, if required. Take good care in this part of the circuit to avoid stray capacitance and inductance if you want the dipper to go up to 200MHz. The component layout for the 'all-options' version is shown in Fig.6.

Coil Socket

The coil socket is prepared by soldering short lengths of stiff copper wire, or better still, 2-3mm wide copper foil to the contacts, which are supplied separately. Once these are inserted into the housing the complete socket is 'Superglued' to the underside of the board with a scrap of 1mm thick Paxolin sandwiched between them. This extra thickness will lower the level of the calibration dials so that they slide neatly under the tuning capacitor pointer. To attain the highest possible frequency at v.h.f. the tuning capacitor trimmers should be removed or at least set for minimum capacity.

The calibration scales are cut from further suture boxes, you'll get five from one box, and are 'Superglued' to the top of the coil plugs. Calibration points can be drawn on with a fine-tipped, permanent marker and 'Decadry' numerals applied at a later stage when the dipper

Fig. 2: The full-blown dipper circuit.



Projects

Fig. 4: Full size p.c.b. copper foil pattern.

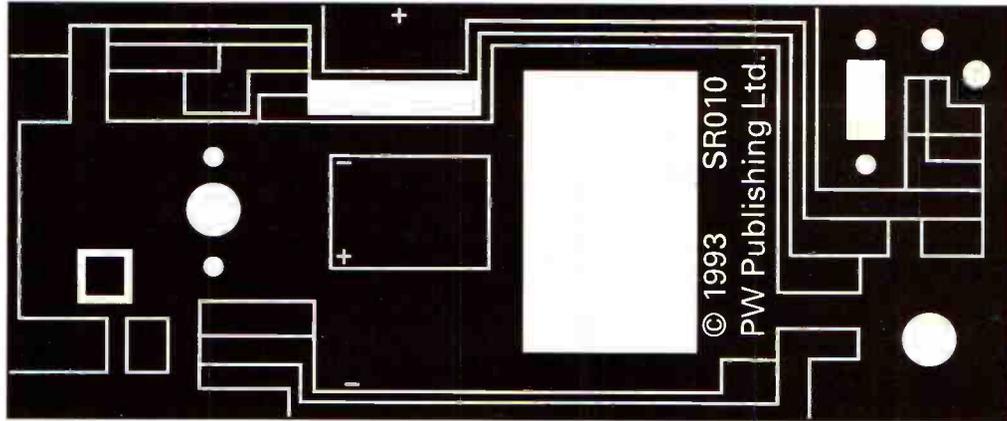


Fig. 5: Component placement for the basic dipper.

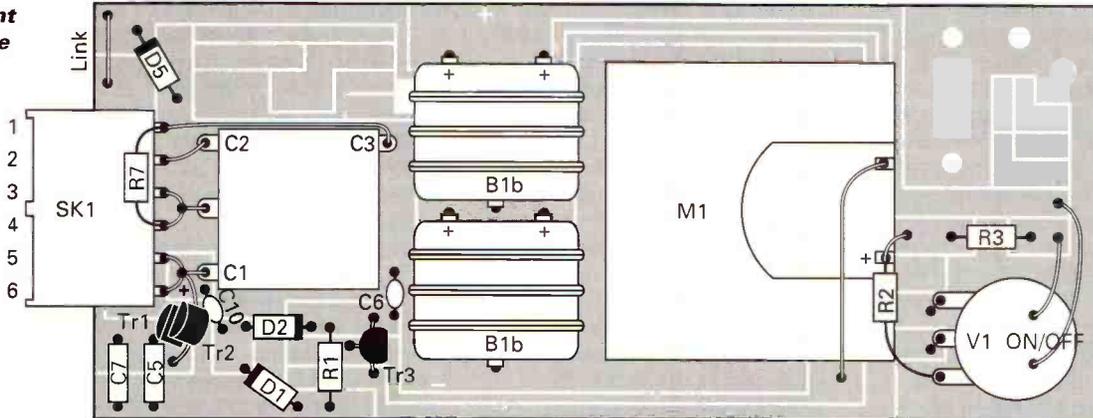
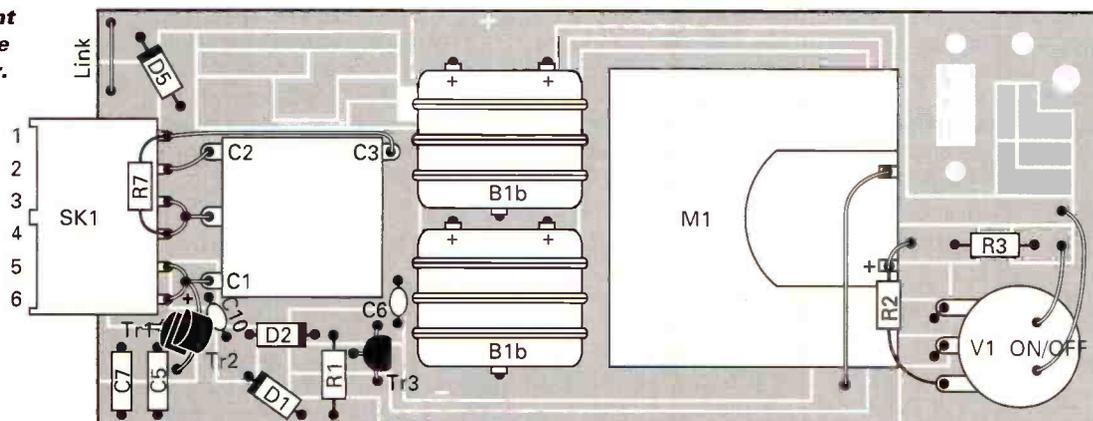


Fig. 6: Component placement for the full blown dipper.



is operational. Once the coils are wound and trimmed to frequency, they too, are bonded to the plugs using an epoxy resin for strength. Of course, there is no necessity to use this particular plug and socket system - a bracket could be made for the end of the p.c.b. and any other type of socket arrangement used (even a 3.5mm stereo socket

would allow one extra capacitor section to be used.) However, it is then, perhaps, more difficult to contrive individual scales.

The suture box is prepared by cutting it down to a height of 27mm, cutting an opening for the coil socket and stiffening the interior of the box along the long sides with strips from offcuts, using

polystyrene cement to weld the strips 2mm down from the top edge. These strips provide a ledge for the p.c.b. to rest on. No other fixing of the board to the case if reasonable accuracy is employed in the construction. For a snug fit, leave the final filing of the p.c.b. until after the box is complete

Coil Winding

The windings for the 265 + 20pF tuning capacitor used by the author are shown in **Table 1**. Of course, ranges can be omitted, expanded or compressed by using one, two or three tuning capacitor sections depending on one's interests. There is no lower limit to the dipper although

Projects

Table 1.

Range MHz (MHz)	Capacitor (pF)	Coil (turns)	Wire (s.w.g.)	Notes
1.5 - 5	20 + 250	100	36	close wound
3 - 11	20 + 250	46	28	close wound
11 - 18	20 + 20	22	28	close wound
19 - 32	20 + 20	10	28	close wound
26 - 39	20	9	28	close wound
36 - 60	20 + 20	8	16	25mm long
57 - 91	20 + 20	3	16	10 mm long
90 - 143	20		16	Hairpin 52 x 12mm
130 - 200	20		16	Hairpin 22 x 9mm

This table is a guide only, the ranges will depend on the particular tuning capacitor employed and the diameter and spacing of the windings. Prototype coils were wound on empty Berol pen barrels 11m diameter - colour-coded, of course!

the dip is less at lower frequencies. A resistor across the coil plugs makes the oscillator less lively and the dip more apparent. Resistor R7 is built-in for this purpose, but external resistors can be added to individual coil units. You will have to experiment with the value of R7, but try around 10kΩ for starters.

Calibration is best done with a counter loosely coupled to the coils, or the output of the dipper read off from a receiver - but watch out for images!

Further Reading

For a very full description of dippers and their uses, you are referred to an excellent series of articles by GW3JGA in *Practical Wireless* October to December 1985. Photocopies of the articles are available from the Broadstone Editorial Offices, price £2.50 for the set, including postage.

You Will Need

Resistors

Carbon Film 0.25W 5%

82Ω	1	R5
1kΩ	2	R3,6
1.5kΩ	1	R2
10kΩ	1	R7 (see text)
470kΩ	1	R4
1MΩ	1	R1

Potentiometers

5kΩ	1	R78 see text)
-----	---	---------------

Capacitors

5pF	1	C4(see text)
-----	---	---------------

Min. Ceramic Disc

20pF	2	C1, 2
265pF	1	C3 (see text)
1nF	3	C5, 6, 9

Disc ceramic

100nF	3	C7, 8, 12
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Tantalum

1μF	2	C10, 11
-----	---	---------

Semiconductors

Diodes

OA81	2	D1, 2
1N914	1	D3
BZY88C5.1V	1	D5
I.e.d.	1	D4

Transistors

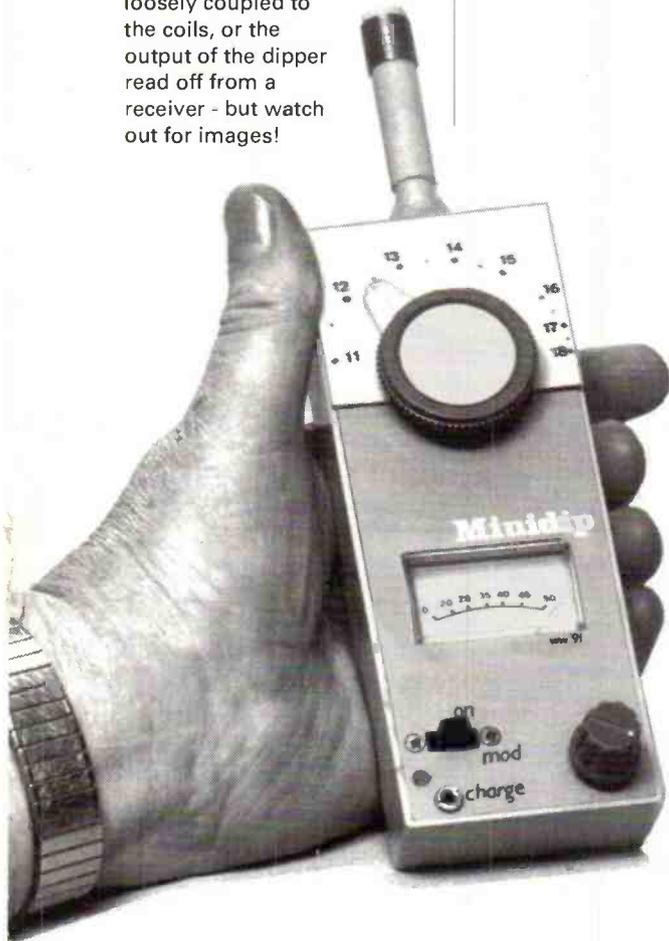
2N3819	1	Tr1
2N3820	1	Tr2
2N3710	1	Tr3
BC214L	1	Tr4

Integrated Circuits

78L05	1	IC1
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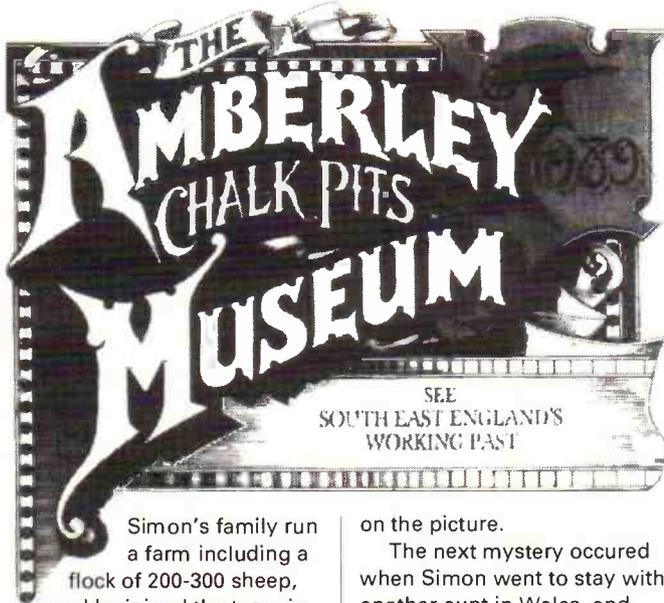
Miscellaneous

Slide switch 2p2w (S1); Power connectors, 6-pin 0.156in, male (SK1), female (one needed for each for plug-in coil); 2.5mm jack socket (SK2); Output transformer, (see text) (T1); Battery, 9V PP3 or NiCads (See text); Meter 200μA f.s.d.; suture boxes; 1mm felt tipped pen barrels; 16 & 24 s.w.g. copper wire.



Sheepdip and DX

Many readers of Ron Ham's column will be familiar with the name Simon Hamer. He's been a contributor to Ron's columns for over 10 years now. Joan Ham met him when he visited Chalk Pits Museum for a chat.



Simon's family run a farm including a flock of 200-300 sheep, and he joined the team in the natural course of events. It is not the first thing that springs to mind that a busy farming calendar would leave time or energy for an absorbing interest in TVDXing, or for meticulous observations.

Simon claims to have discovered his interest by accident. He remembers co-channel interference bringing foreign voices from the loudspeaker in 1960. When he was 10 years old and staying with an aunt in Denmark, he saw Danish TV and asked for *Blue Peter* to be put on. His aunt obligingly changed channel, but instead of his favourite programme, he saw a children's programme in Swedish!

The autumn of 1966 was memorable for a tropospheric opening. When changing channel on the family's turrent-tuned receiver, channel 6 produced Anglia TV with an ITA tuning card bearing the identification 'East of England'. A few days later, this signal was no longer there, and Simon had no idea why this was so. He then found London Rediffusion on Channel 9 and noticed the apology for interference that the station was superimposing

on the picture.

The next mystery occurred when Simon went to stay with another aunt in Wales, and turning on the TV expecting to hear the signature tune for *Midlands Today*, was once more confronted with an unfamiliar signature tune and caption *Wales Today*. This was Simon's introduction to regional broadcasting. They first received BBC2 when the Sutton Coldfield transmitter was commissioned because they were happily located where a gap in the hills allowed the signal through. It was the only part of Wales able to receive the transmissions in the mid-'60s.

Like many youngsters, Simon liked listening to pop music, especially from Radio Luxembourg. All the sets in the house had the lovely old dials with many station names on them, and Simon wanted to know where they all were. The domestic sets began his s.w.l. interest, and his father, who used to pick up Australia on a short wave set in the early days, got out an old Mullard wireless and connected a long wire antenna to it. Simon found that a lot of fun.

Then came his 11th birthday and a present of a Russian s.w. set. That was his pride and joy and brought Radio Australia booming in at

7am. The first time he became aware of amateur radio was when a Scout troop from Hereford were camping in his uncle's field. They possessed a Heathkit *Mohican* communications receiver – a real eye-opener, which introduced Simon to the magic of bandspread.

Local radio in the v.h.f. bands came in the 1970s, and while tropospheric openings were in progress he could hear Radio Birmingham, Bristol, Manchester, Oxford, Stoke-on-Trent and BBC Radio London; the first foreign DX was a French station.

At 17, Simon was given a Grundig *Melody Boy* 500E that had a very good v.h.f. band and intensified his interest in Band II DX with such stations as BBC Radio Leeds, Sheffield, Solent and for the first time a station from the Republic of Ireland. Other memorable moments of reception were of tuning in for Radio Derby using just the set's own antenna and hearing the announcer from BFBS in Germany saying, "10 o'clock in Germany and 9 o'clock in Britain". Another tropospheric opening was in progress; West German and Dutch stations were coming in, and on TV, good colour pictures. At the time, Simon wondered why they had little sound, not knowing that sound was

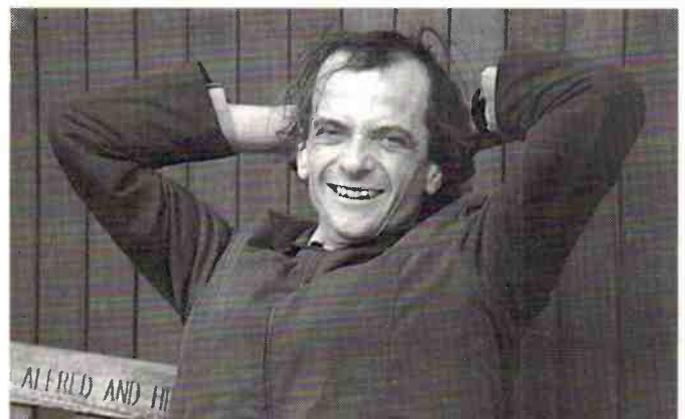
transmitted on another channel.

So to the 1970s, when Ron started writing about v.h.f. matters in *Practical Wireless*, this naturally captured Simon's attention. He wrote to Ron for some advice about a converter to receive u.h.f. on his v.h.f. set. By 1980 Simon had become a regular contributor to Ron's column.

Simon's first real communications receiver was a Grundig *Satellit* with digital readout. With this came reception of Radio New Zealand, a station using a mere 7.5kW on 15.485MHz.

In 1983, on a visit to the amateur radio rally in Droitwich, Simon added a Daiwa 144MHz receiver to the collection, enable him to hear the amateur repeaters. The following year a 4.5in screen multi-standard Hitachi K2300 for mobile TVDXing appeared, closely followed by a Lafayette HE30 communications receiver.

Simon Hamer has gained an enviable expertise at trapping and identifying DX. This led him to writing an invaluable little book illustrated with photos of European test cards and captions received in the UK. Published by HS Publications, 7 Epping Close, Derby DE3 4HR and available from *SWM Book Service*. ■



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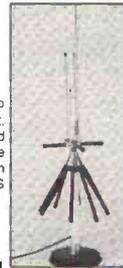


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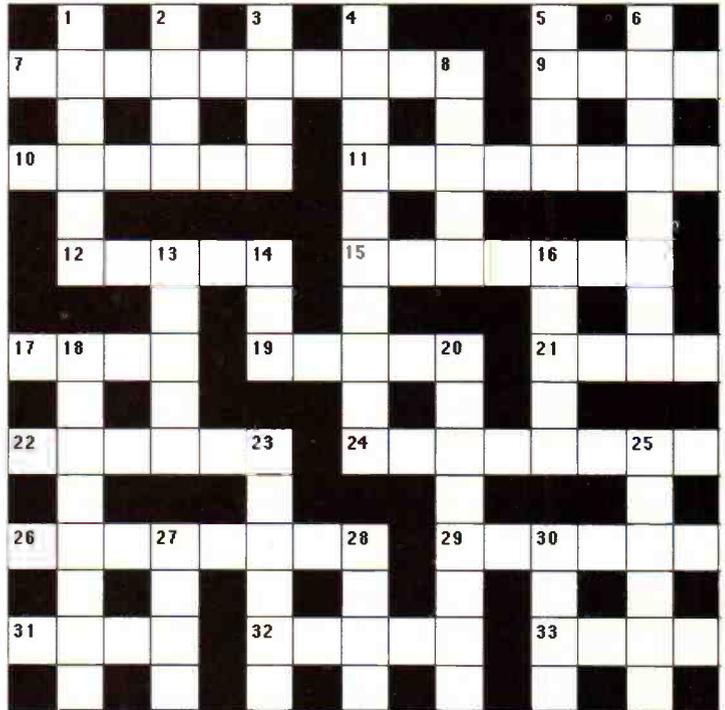
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Clues Across

- 7 Artificial heavenly bodies, like Oscar (10)
- 9 Highest point in trap extension on antenna (4)
- 10 Alter, usually equipment, hopefully for the better (6)
- 11 Schooled, not ignorant. Dated cue (8)
- 12 Environment friendly colour - resistor number 5 (5)
- 15 All the same these military clothes - phonetic letter (7)
- 17 Extension to electric socket supply - found on cowboy's boot (4)
- 19 An element, but nothing to do with antennas (5)
- 21 Q, SINPO, RST for example (4)
- 22 What an XYL is to her children (6)
- 24 Sent in a different direction (8)
- 26 Become less strong, as an attenuated signal might (4)
- 29 Where the World Service is based (6)
- 31 Small quantity, comes before farad (4)
- 32 Avoid, get around, shirk or dodge (5)
- 33 Natural support for long wire antenna ? (4)

Clues Down

- 1 Electronics company who make well known Morse tutor (6)
- 2 Partly, as in detached or conductor (4)
- 3 Drama seen in radio equipment display (4)
- 4 Made less by absorption or scattering. AAEEEDTTU (10)
- 5 P, phonetically speaking (4)
- 6 Paid off, recovered, saved. EEEEDDRM (8)
- 8 Usually found just before Arabia (5)
- 13 Planet and antenna connection (5)
- 13 Not secondhand, used or pre-owned (3)
- 16 Orbital Satellite Carrying Amateur Radio (5)
- 18 Radio amateur's alphabet (8)
- 20 What an antenna does on a rotator (8)
- 25 Wears away, like outdoor antenna components in bad weather (6)
- 27 Top of house - where you might have to climb to put up antenna (4)
- 28 This Dutch cheese is made about (4)
- 30 Fishing devices or groups of broadcasting amateurs (4)



Complete the crossword and send it (photocopies accepted including the coupon at the bottom of this issue's contents page) to the Editorial Office, marked *SWM* May Crossword competition.

A worthwhile prize will be forwarded as a surprise present to the first five correct entries drawn from the sack!

Don't forget to include your name and address with your entry!

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Board	Title of Article	Issue	Price £
SR008	Experimental VHF Receiver	Jun 91	5.81
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SR006	Medium Wave AM Radio	Nov 90	3.34
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SR004	PRO-2004 Modifications	Oct 89	6.63
SR003	HF to VHF Converter	Aug 89	5.22
SR002	Weather Satellite Reception	Jun 88	3.88

Propagation

by Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

It's a wonder, with the bad winter weather, that friends in the British Astronomical Association, who supply me with auroral and solar data, are able to achieve the results they do. This was made abundantly clear by **Ron Livesey** in his January report to the BAA, where he wrote, "Dave Wheeler on Fair Isle made the understatement of the year when he said that it was not a good month for observing aurora. Although he reported auroral glows on four nights, tying in well with other observations, magnetic and visual, he also reported, 22 days of gales of which 8 were severe gales, 6 storms, 2 violent storms, 1 hurricane and 24 days on which gusts of storm force were recorded". All I can add is my thanks to Dave and to all the visual astronomers. Your efforts are much appreciated.

The atmospheric pressure for the period January 26 to February 25, recorded at my home in Sussex, plus more weather reports from readers, can be seen in my television column elsewhere in this issue.

One of my regular beacon contributors, **Gordon Foote** (Didcot), says that if he had to choose only two hours of the day to be the best time for listening, then he would select the period between 1700 and 1900. "The Scandinavians are often still there and the Americans are heard at their best", he added.

Solar

While in Edinburgh or Glasgow, Ron Livesey, using a small refractor telescope and projection screen, identified two active areas on the sun's disc on January 4, 6, 9, 15, 18, 22, 24, 25 & 31 and three on the 7th, 8th & 12th. Activity associated with the number of sunspots, observed by **Patrick Moore** (Selsey) and drawn from his projection screen, **Fig. 1**, at 1030 on February 28, may well have been responsible for the more frequent signals, received in the

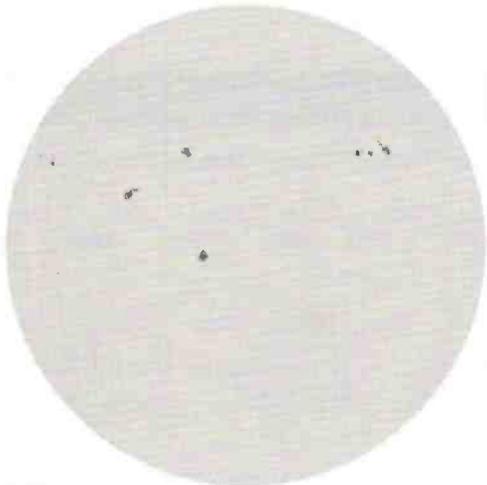


Fig. 1.

Fig. 2.

Beacon	December					November																									
	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
DK0TEN								X																		X	X		X		
EA3JA								X			X														X						
HG5GEW																															
IY4M																												X			
KA1NSV																X								X							
KB9DJA																								X	X						
KD4EC																								X							
KJ4X										X																					
LU1FHH		X				X		X																							
NX2O								X								X									X	X			X	X	X
OH9TEN																X									X	X	X	X		X	
PY2AMI									X	X				X	X								X		X	X					
SK2TEN	X					X		X																		X		X	X		
SV3AQR	X	X	X			X	X						X	X		X						X	X	X	X	X	X	X	X	X	X
VE3TEN																															
VK2RSY										X	X	X																			
VK6RWA										X													X				X				
VK8VF			X	X				X	X		X	X	X									X				X		X			
W3VD								X	X							X	X	X					X	X	X	X		X	X	X	X
ZD8HF																											X				
ZS1LA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5B4CY	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

UK, from the North American beacons, see **Fig. 2**, toward the end of the month.

Auroral

Ron Livesey, the auroral co-ordinator for the BAA, received reports of visual aurora, in various forms, for the overnight periods on January 1, 25, 30 & 31 from observers in Fair Isle, on the 17th from County Tipperary, on the 26th from Glasgow and the 18th, 23rd, 25th, 30th & 31st from North Dakota.

Magnetic

The magnetometers used by **Tony Hopwood** (Upton-on-Severn), **Karl Lewis** (Saltash), **Ron Livesey**, **David Pettitt** (Carlisle) and **Tom Rackham** (Goostrey), between them recorded active conditions on January 3, 4, 8-10, 13, 14, 16, 18, 26, 29 & 30 and magnetic storms on the 2nd, 7th, 11th, 19th, 25th & 31st.

Propagation Beacons

First, my thanks are due to Gordon

Foote, **Simon Griggs** (Chelmsford), **Henry Hatfield**, **Ted Owen** (Maldon) and **Ford White** (Portland) for their 28MHz beacon logs, which have enabled me to prepare this month's chart, **Fig. 2**, of the beacons heard by them, between January 26 and February 25, inclusive. Gordon Foote logged EA2ZRA on February 17, Ted Owen and Ford White added signals from LU1FHH (Argentina) to the chart this time and Henry Hatfield remarked that EA3JA (Spain) was 'quite loud' on February 5. Possibly some early Sporadic-E?

Tropospheric

At 1055 on January 1, **P.R. Guruprasad** (Vellore, India) listened to the commentary of a match between Saudi Arabia and Qatar on 102MHz. He uses a Sony ICF-7600DA and tells me that this programme was a simulcast of the satellite channel Star TV. Others available are BBC Asia, Music TV and ZEE TV. "Concurrent frequencies were 107.1, 90.8 and 90.6MHz with the best signals on 90.6".

Radio Astronomy

Periodically, readers ask me for more information about radio waves coming from celestial sources and in particular those coming from the active sun. I suggest that you keep an eye open for any of the books shown in **Fig. 3**. From the top, these are *Radio Astronomy* by Roger Jennison (published by Newnes), *The Radio Universe* by J.S. Hey (Pergamon), *Sun, Earth and Radio* by J.A. Ratcliffe (World University Library), *Radio Astronomy* by J.D. Kraus (McGraw-Hill), *Radio Astronomy* by J.L. Steinberg and J. Lequeux (McGraw-Hill) and *Solar Radio Astronomy* by Mukul R. Kundu (Interscience Publishers).

Most of these have been on my book-shelf for over 20 years and although they may now be out of print copies do appear in second-hand book shops. Don't forget to check all engineering and science sections in the shop - I once found a book about 'valves' [wireless type] on the motor-car shelf!



Fig. 3: Radio astronomy books.

Satellite TV News

Roger Bunney, 33 Cherville Street,
Romsey, Hants SO51 8FB

A number of unidentified satellite signals seen over previous months have now been resolved, thanks to ever vigilant readers who have written with the answers! 'CTS-PBD' has been seen on a number of occasions within Ku and Telecom bands, the identification - 'Centre de Transmission Satellite Pleumeur Beadou' and is the French equivalent of our Goonhilly and is sited in West France near Lorient in Bretagne. Thanks to **Didier Poncet** in Lesigny for this info.

On another day colour bars with the inlaid 'HPTV PRETEST' over Eutelsat II F3 (12.71GHz) at 16°E caused doubt - this was identified as a corporate video conference for Hewlett Packard. Mid February saw at 10.97GHz vertical - also 16°E - a test pattern with 'Belgacom Satellite Services' - using PAL coding - not an SNG operator this time! Over the February 18/19 RTM - Radio Television Morocco - opened up in SECAM with 'entertainment' programming making a 3rd Arabic programme downlink on this satellite (joining both Egypt and Tunisia). The quality of the programmes shown by RTM are rather heavy going with a high content of religious material, Koran, etc.



Sometimes a VTR clock is not available and a local technician produces crude count down captions such as this news feed from Algiers to Paris. The VTR machine is standing by to roll from a freeze frame hence the horizontal bar. From Andrew Sykes, Halifax.

Sixteen East is certainly the hot Ku band bird in the heavens, the weekend of the February 20/21 TV Polonia fired up with programming using PAL on 11.08GHz horizontal and with the announced intention of the full service opening end March. The on-screen logo lower right hand must be the largest logo currently in use, it was enormous and rather distracting to the programme viewing!

The usual Brightstar 11.53 and 11.56GHz trdrs are always carrying news items or the Brightstar Logo in 525-line NTSC or 625-line PAL. The 'Transponder' bulletin solved the mystery of the missing 'EBU Sarajevo' news circuits that have traditionally



It is possible to roughly lock up MAC signals using a sync inserter as this photo shows of Marco Polo 1 at 31°W.

been carried on Intelsat 601 27°W, they have decamped and are now resident on Intelsat 603 34°W, check out 11.46GHz vertical. Though the circuit on 27°W was weak, the new home is producing somewhat weaker signals still, presumably on a general European beam rather than one spotted into Central Western Europe.

Problems have been experienced for some time with locking up the sound in syncs (SIS) news circuits via Eutelsat II F4 at 7°E to provide stable images. Andrew Sykes in Yorkshire has solved the problem with his PACE receiver that with appropriate switching without any external decoder can hold and produce stable (non-shaking) pictures. More on this shortly.

News Items

Good news from the CIS-Russia. The familiar Gorizont craft are to be slowly replaced with an upgraded and more stable 'Express' satellite,

this having 10 C Band and 2 Ku Band transponders. The bird will have greatly improved station keeping characteristics compared with the Gorizont craft and a life of at least 7 years - the Gorizonts average just 3 years! The first 'Express' will come on line during this year and replace Gorizont currently operating at 40, 103 and 140°E. If you're in the market to lease a Gorizont transponder in one of these 3 nominated slots then its very cheap at \$1.5 million.

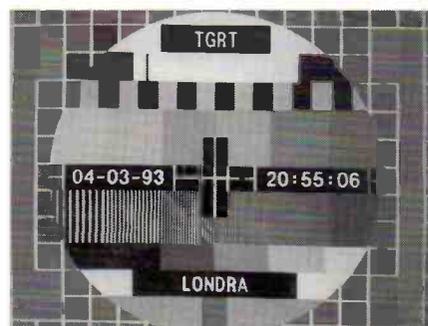
Following on from Andrew Sykes sound in syncs item above, Andrew may not be switching his Pace receiver soon, over the next 12 months the EBU news circuits over Eutelsat II F4 at 7°E

will be changing to digital video, this will offer greatly improved quality and security from piracy. Scientific-Atlanta are providing the technology for the new standard and already 16 countries have equipped for digital transmission.

In the United States Tele-Communications Inc. in Denver are now developing a cable system using satellite compression techniques (4:1) and eventually reaching a 10:1 compression standard that will offer up to 500 TV channels into a current technology 50-channel maximum system. Digital compressed services over the Denver cable will commence January 1994 with many of the incoming programmes satellite down-linked into Colorado. DirecTv Inc. that plan a digitally compressed satellite delivered DBS service from next year across the USA have signed Paramount Pictures and The Disney Channel as the first two main programmers for the new service.

Intelsat have confirmed that their first of the series 8 satellites will be launched by Arianspace. Intelsat 801 and 802 will launch on Kourou during 1996 and enjoy a long and happy 16 year life. Each will carry 6 Ku and 38 C Band transponders. The Intelsat 504 bird at 41°W is moving to 31°W to provide increased leasing capability across the Atlantic. The Eastspot beam of Intelsat 515 at 18°W has been re-orientated to improve Ku band coverage in Central Europe and Western CIS.

Over the Pacific re-positioned Gorizont craft will allow the opening of the Rimsat Ltd satellite service,



Turkiye 'Gazetesi' Radyo Televizyonu test-card.



The London uplinked 'Turkiye Gazetesi Radyo Televizyonu' test transmissions over Eutelsat II F3 at 16°E from Andrew Sykes, Halifax.

operating from designated Tongan 'space slot reservations'. Two existing Russian satellites will be used initially at 130/134°E with another five new birds to be launched by the Russians in the next few years, the first new bird will be flown this autumn. The new Rimsat service may well present a commercial threat to the Hong Kong based Asiasat service.

There have been antenna problems (misalignment) with Hispasat 1 at 30°W which has caused the delay to the full intended Spanish service. RTVE the national broadcaster will be offered 2 licences for transponder facilities on the new satellite. Hispasat 2 is tabled to launch October 1993.

It seems that plans for BSkyB to scramble their remaining programmes on Astra may be delayed until 1994. The TV and satellite trade are unhappy about all English language offerings being scrambled since it acts as a disincentive to buy satellite receivers if immediately a further payment is necessary to secure programmes. Many of the German channels are in the clear on a full time basis. RTL-2 is now transmitting on both Astra 1A (trdr 1 - previously Screensport) and Eutelsat II F1 trdr 21 - 11.095GHz horizontal. Screensport and Eurosport have joined forces and are establishing a new base in Paris. The controversial 'Red Hot Television' is now dual scrambling with SAVE on Mons, Weds and Fri., with the new Videocrypt Enigma 1 system and smart card (addressable over air) on Tues, Thurs and Saturday. The dual encryption transmissions will continue for some weeks and then opt entirely to Enigma on a 6 days a week basis.

DXTV Round-up

Ron Ham, Faraday, Greyfriars, Storrington,
West Sussex RH20 4HE

Living at sea level and more than 80km away from the Alexandra Palace transmitter, as I did, over 40 years ago, a large antenna was required to receive some sort of signal from the BBC on 45MHz. At that time a pole in the garden was preferable to an array mounted on a low-profile chimney stack.

The view in Fig. 1 was taken from our bedroom window and shows the large Belling & Lee 'H', that we used, on top of a wooden pole standing about 11m above the ground. The feeder, seen leaving the mast, just above eaves level, was an ex-RAF coaxial cable about 0.5in thick. This was terminated in a junction box mounted on the window frame near the set followed by a short length of a more flexible cable to the socket on the receiver. The foot of the mast was a good 2m into the ground and was hauled into position by ropes through the bedroom window. While the 'pull' was in progress its foot slid gently down a slope into the hole deliberately dug with an angled entry which looked like the sloping side of a 'tick'. When upright four guy wires were attached to stakes in the ground.

However, some years later, with the advent of a nearby BBC booster on Ch. 3 and the opening of Band III for the ITA, we took this hefty great pole down in the reverse order, but, while it was being lowered, it broke in two just like a matchstick at about the 45-50 degree angle. The days of large wooden masts and big antennas had gone for domestic use, although, some of them remain to this day for the DXers!

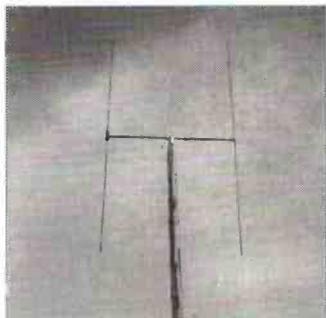


Fig. 1: It took two photographs to make-up the whole picture of this antenna.



Fig. 4: Unidentified SE Asian TV.



Fig. 5: Bangkok.

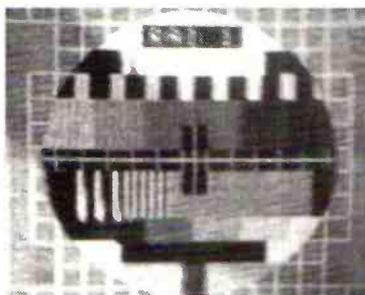


Fig. 2: Colour test-card from RAI.

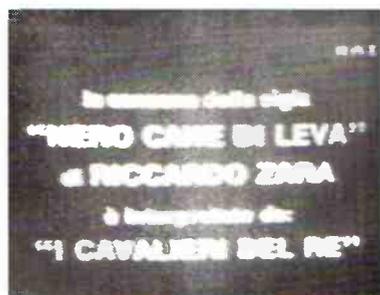


Fig. 3: RAI Italy.

Band I

Carl Bowen (Strelley) had his sight of Sporadic-E this year on February 15th when he received pictures from Italy (RAI-UNO) on their Ch. 1b (62.25MHz) and an unidentified signal on Ch. R2 (59.25MHz). "Let's hope this is the start of a brilliant 1993," said Carl.

Picture Archives

Among the DX signals logged during a Sporadic-E opening, some ten years ago, by Bob Brooks (Great Sutton), was a test-card in colour, Fig. 2 and a programme caption, Fig. 3, from Italy's

'RAI' (Radiotelevisione Italiana).

For Lt. Col. Rana Roy (Meerut, India) openings on Ch. E2 (48.25MHz) in Band I produced strong pictures from an unidentified source in SE Asia, Fig. 4, at 1915 on December 2, 1990 and Bangkok, Fig. 5, on Ch. E3 (55.25MHz) at 2053 on February 23, 1991. He also saw an Arabic station (probably Abu Dhabi), Fig. 6, on Ch. E3, at 1340 on May 8, 1992.

All of the pictures by Bob and Rana are good examples and typical of the quality to be expected while such a disturbance is in progress.

Weather

"Even though this time of the year, here in Vellore, is not supposed to be too hot, it is on the contrary (except in the Nilgiris where the night temperature reaches below zero); the temperature in my room is 23°C now at 1150IST (0620UTC) despite the fact that our house is surrounded by a dozen palm trees," wrote P.R. Guruprasad (Vellore, India) on February 8. He uses an Indian Weston receiver for DXing but he told me about a recurring problem, "monkeys sometimes distort the orientation of our TV antenna".

Among my Christmas cards was one from Peter de Jong (Leiden, Holland), Fig. 7, showing, at that time, most of the UK free from the clouds swirling around the Northern hemisphere. Peter received this picture via Meteosat.

The variations in atmospheric pressure for the period January 26 to February 25, Fig. 8, were taken at noon and midnight from the recording chart

of the barograph installed at my home in Sussex. I cannot remember when we last had a trace indicating the pressure remaining above 30.0in (1015mb) throughout the period. In addition it peaked between 30.6 and 30.7in (1036-1039mb) on 6 of the days and remained consistent around 30.5in (1032mb) for 11 days in a row.

The month ended with cold north winds, snow flurries and a frost with overnight temperatures on the 27th/28th down to 22°F as measured in our garden.

"February has been a month of high pressure, sadly little DX to show for it", wrote David Glenday (Arbroath) on March 1. David's barometer was above 30.0in for 26 out of the 28 days in the month. The exceptions were the 18th and 25th. "There was a remarkably mild spell of weather around the 16th and 17th", said David, with recorded temperatures up to 15°C. I recorded a mere 0.28in of rain in February compared with 1.94in throughout the same period in 1992. The month was predominantly overcast with either grey skies or persistent fog.

Fig. 6: Probably Abu Dhabi.

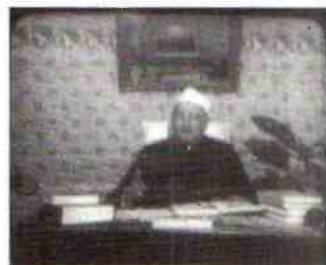
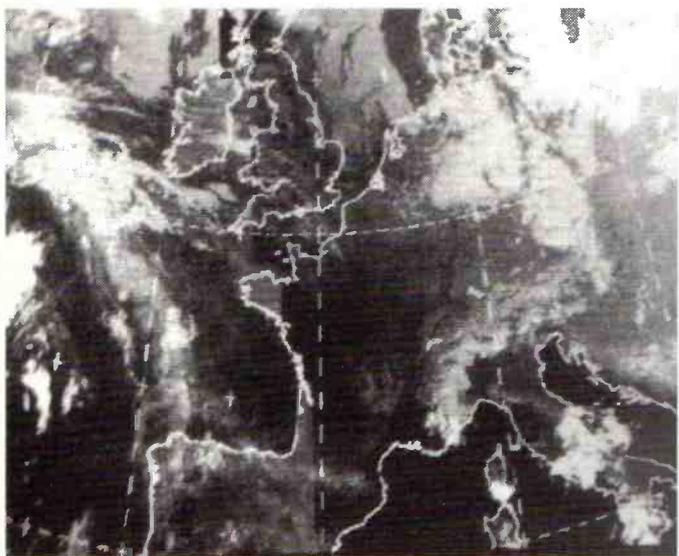


Fig. 7: Meteosat picture.



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Bandscan

AMERICA

Gerry Dexter

Progress is being made towards the arrival of another new country on the short wave broadcasting bands. Dr Gene Scott, who can already be heard on his *University Network* 24 hours a day on short wave, says the first short wave antenna has been erected at the medium wave station Caribbean Beacon, which he owns, on the island of Anguilla. Construction of the transmitter has been finished and it is likely that it will be on location by the time you read this. No target date for the start of broadcasts has been announced yet, nor have any times or frequencies. As they say - stay tuned!

Hawaii Calls

Another religious organisation, LeSea Broadcasting, which owns and operates WHRI short wave from Indiana, is also moving towards getting its new station on the air from Hawaii. This would be the first real short wave broadcaster (as opposed to time station WWVH) from Hawaii since the Voice of America closed its relay station there decades ago. Most radio country lists consider the 50th state as a separate country. The organisation says the new station, which will use the call letters KWHR, should be on the air by the first quarter of the year, i.e., by April. LeSea put WHRI on the air on the target date it had set, so if they've done that again KWHR should now be active. The transmitter is located on the southernmost tip of the Island of Hawaii and will be used to provide better coverage of Asia, including India, Japan, Korea and China. Frequencies had not been announced as this was written.

One for the Road

As most everyone is aware, time is running out for Trans World Radio, Bonaire, which is due to end its short wave broadcasts on July 1 at 0400UTC. The station has always been a friendly and professional outlet - right down to their QSL styles and policies. And that will continue right to the end. Until they leave short wave for good TWR is offering a special reprint of their first QSL card. A correct reception report to Trans World Radio, Bonaire, Netherlands Antilles will bring you one. Don't forget to wish them well when you write.

USA Notes

The Voice of America's new relay at Udorn, Thailand should be in operation by now. Check these frequencies at various times: 6.045, 6.090, 6.560, 9.615, 9.680, 9.760, 11.705, 11.785, 11.885 &



Radio SRS QSL card.

11.905MHz. The power is 500kW and beams are to South-east Asia, South Asia and China.

Incidentally, the Voice of America is working hard at cleaning up its backlog of thousands of reception reports and QSL requests. You may be able to speed a reply by writing to Janice Davis, VoA/B/BE, Room 1547, 330 Independence Ave SW, Washington, DC20547, USA. Or, to John Voclenik, PO Box 227, Mason, Ohio - he's an engineer at the VoA station in Bethany, Ohio.

WEWN, near Birmingham, Alabama, has been having problems, even before it went on the air last December. Technical difficulties have forced transmitter shut downs and local groups and individuals have filed lawsuits, claiming the station is causing environmental damage and interference to local communications.

From South America

Argentina Radio Malargue has been reported in North America on 6.610MHz variable in Spanish around 0400.

Bolivia There have been a number of new or reactivated stations come on the air from this country: Radio 9 de Abril at Pulacayo on 3.200MHz; Radio Florida, 3.371MHz at Samaipata; Radio Metropolitana, La Paz, on 6.195MHz; Radio Norte, Montero, 4.939MHz and Radio El Mundo, 6.015MHz from Santa Cruz have all been noted in recent months. All frequencies are slightly variable.

Colombia Radio Nueva Vida has resumed operations on variable 5.570MHz and heard around 1000. The government station Radiodifusora Nacional has dropped from the 9.685MHz frequency used last fall, down to 9.655MHz. The 31m band channel has apparently replaced

11.8225MHz. Another reactivated station is Radio Macarena on 5.975MHz. One of the rarest stations from this country, Radio Buenaventura on 4.833MHz, is also being heard again, though it is often tough to pick out, squeezed as it is between Radio Reloj on 4.832MHz and Radio Tezulutlan on 4.835MHz. Still another reactivation is Armonias del Caqueta on 4.915MHz, a frequency also occupied by Radio Cora in Peru and that causes some QRM. La Voz de la Selva is another that has returned recently, using 6.170MHz.

Ecuador Radio Bahai has resumed operations, this time on variable 4.950MHz, and is heard around 1000. It may also be audible in the 0000 to 0400 time period. Another reactivation is Radio Catolica on variable 3.395MHz.

French Guiana The other French Guiana station, the government's RFO Cayenne (as opposed to the RFI relay) has returned to the air on 5.055MHz variable, which is supposedly in use 24 hours a day, all in French.

Surinam Rumour had it that SRS in Surinam is planning a return to short wave on its (very) old frequency of 4.850MHz.

Uruguay Another reactivated Latin American is Radiodifusion Nacional SODRE in Montevideo. It's quite a difficult catch though, since it is listed for only 300W and is in the middle of the QRM-filled 49m band, on 6.125MHz. Test broadcasts are also supposed to be carried out on 9.515, 11.885, 15.275 & 15.350MHz. The schedule is 0900 to 0400 daily. Radio Monte Carlo, also in Montevideo, has been noted recently on 11.735MHz around 2300. This station is active only on an occasional basis.

Notes from Central America

Dominican Republic Radio Estrella is

a new station using 6.205MHz and sometimes running to as late as 0400, though often closing much earlier (on some days it's not noted at all). It's located in Santo Domingo. Radio Santiago, on 9.8775MHz, continues to be heard quite regularly and La N-103, silent for about a year, is also back on 4.800MHz variable (at least occasionally), relaying it 103MHz f.m. outlet.

El Salvador Former clandestine station Radio Venceremos is currently off of short wave due to transmitter problems, but keep an ear on the 6.3MHz area for a possible return. The address is Apartado 05-209, Metro Centro, San Salvador. The other former clandestine station, Radio Farabundo Marti, plans to return to short wave sometime in the future. That station's address is Apartado 3080, San Salvador. The other former clandestine station, Radio Farabundo Marti, plans to return to short wave sometime in the future. That station's address is Apartado 3080, San Salvador. Both stations are active with f.m. outlets.

Mexico Most of the short wave stations in Mexico are inactive much of the time, making only occasional and brief appearances at, it would seem, the whim of the owners. One that surfaced recently is Radio Yucatan, XEQM on 6.105MHz, from Merida, which is scheduled until 0600. The station is listed as Tus Panteras (The Panther) but has switched between many different names over the years. Meantime the government's Radio Mexico International continues to be active on a reasonably regular basis on at least one of its several short wave frequencies. So does Radio UNAM, the station of the Autonomous University of Mexico, which operates on 9.600MHz. Most consistently active of all is Radio Educacion on 6.185MHz.

SSB Utility Listening

Peter Rouse GU1DKD, Barcroft, Rohais de Bas, St Andrews, Guernsey, C.I.

Sorry about last month's confusion over who was compiling the column. It was me but somehow Graham Tanner's name and address appeared on the make-up page that went to the printers. Graham has kindly sent your letters on. Another correction concerns the USS *Tripoli*. My brain must have been disengaged (nothing unusual about that) when I called it an aircraft carrier. It is of course an amphibious assault ship.

You Write

The recent references to Rainbow Radio in Canada have sparked off a number of letters about message handlers, company frequencies and the like. **David Murphy** has built up quite a list of such stations and I have decided to include some here. I have skipped the usual Portishead, Stockholm, Berne, Speedbird and Arinc frequencies as these have all appeared before and are listed in the companion book to this column.

Maiquettia Radio: 8.924, 11.435, 17.937 & 21.976MHz

First Air (Ottawa): 13.285MHz
Tarom (Bucharest): 10.021MHz
Prague Radio: 5.532, 10.027 & 13.351MHz

Falcon - Gulf Air (Bahrain): 5.538, 11.354, 13.339, 17.931 & 21.943MHz
Nationair (Montreal): 13.339MHz
Cedar Base - M.E.A. (Beirut): 10.093, 13.330, 17.931 & 21.943MHz

Air India (Bombay): 6.637, 8.930, 10.072, 13.333, 17.916 & 21.943MHz
Saudi Ops: 3.095, 5.544, 8.927, 11.288, 13.339, 17.925 & 21.943MHz
Springbok - S.A.A. (Johannesburg): 5.532, 8.933, 11.354, 13.330, 17.925 & 21.943MHz

Qantas Control (Australia): 6.637, 10.078, 13.342, 17.922 & 21.970MHz

USAF traffic still seems to be the favourite listening and **Ron Galliers** reports that a lot of aircraft are still heading down towards the Gulf and Africa with air-to-air refuelling over the Atlantic at around 2°W. The tankers use callsign prefixes 'Mobil' or 'Exxon' and are controlled by Lajes with most radio traffic on 6.738 and 11.176MHz. Some co-ordination with Santa Maria takes place on 5.598, 6.628 & 3.016MHz (NAT-E tracks). Ron adds that the five figure digits that follow the 'Reach' prefix appear to be issued sequentially and are often used on both the outward and return journey. Ron noted that Ascension GHFS directed aircraft to change to 14.615MHz after poor contact on the usual 11.176MHz. Interesting because 14.615 is not listed as a GHFS frequency and is normally occupied by Cape Radio in Florida.

Paul Hilton's log included contact between an unidentified ground station and a Moroccan registered aircraft CN-AJF on 5.661MHz, which



Graham Tanner

is a EUR-A region frequency. The Aerad Comms supplement shows only Berlin and Malta on this net and you are one up on me Paul because I have never logged anything on the little used EUR-A circuit. Paul also logged Halifax (Canada) Military with Rescue 314 on 6.693MHz which is a Canforce search and rescue channel. **Phillip Murphy's** log covered a large amount of USAF traffic and an interesting entry of traffic between 'Head Dancer' and Lajes. The latter requested a move from 15.015MHz to 15.044MHz which shows there are still some changes going on as far as the GHFS network is concerned. 15.044 fits in with the typical 3kHz channelising used by the USAF but I have never before seen it listed as used by Lajes.

USAF Aircraft

Graham Tanner has responded to several queries raised in recent issues. He says that the 'Reach-4G5KN' mentioned in the March issue was probably a C-141B Starlifter although it is just possible it was C-5 Galaxy.

Graham and Ron Galliers offer the following advice on trying to identify USAF aircraft. Stay on the frequency and it is likely the crew will ask for a 'phone patch to get the weather at their destination. In return the pilot will usually offer a 'Pirep' (position and information report) in return. This will include their position and the weather conditions being experienced and with a bit of luck will also include the aircraft tail number. From the books that are available from aviation enthusiast shops it should then be possible to identify the aircraft and where it is based.

Graham also suggests that the number station 'SYN2' heard on 5.628MHz is the Israeli Mossad and has reminded me that the NAT-track reporting points are shown on the North Atlantic Route Chart available

from the *SWM* Book Service. Graham has also heard the military transmissions on 11.178MHz and believes they may be coming from 'Cove Radio' which is at Farnborough Airfield in Hampshire. I have mentioned this station before as it can occasionally be heard working aircraft doing meteorological research. Listen for the callsigns prefixed with 'Metman'.

Swissair

Alan Page has been frustrated in his attempts to find a company frequency for Swissair and says he has not even been able to hear them on Berne Radio allocations. I may be wrong but I seem to recall hearing them work through Speedbird London (British Airways) so try the following: 5.535, 8.921, 10.072, 13.333, 17.922 & 21.946MHz. Failing that check-out the usual Stockholm Radio frequencies.

Back to Ron Galliers and he says the Aerad chart NAT 1/2 also shows reporting points over the Atlantic. I am not familiar with that particular chart but warn readers not to confuse it with EUR 1/2, which only covers low level reporting points over Ireland, England, Wales and Northern France. Aerad charts are produced by British Airways and you can order them by telephone using a credit card. The number is 081-562 0795.

You might also want to order what is known as the Europe and Middle East Supplement (still referred to by many pilots as 'Aerad Comms'). This book is updated four times a year and gives details of airfields and their frequencies within the area mentioned in the title together with a host of other flight information. Ron has been trying to figure out the two letter callsigns used by the navy. He recently heard Gravesend Radio with HMS Marlborough using GAGJ and another ship using KD with the operator having a strong German accent.

A C-141A Starlifter of USAF, landing at RAF Mildenhall during February 1980. All C-141As are now converted to C-141Bs, with the inclusion of 'fuselage plugs' and an air-refuelling receptacle above the cockpit. Also, almost all C-141Bs were repainted in a dreadful low visibility slate-grey/dark green colour scheme, but they don't make very good photographs!

I have access to a comprehensive list of the ITU callsigns allocated to the Royal Navy (please do not ask for copies. I cannot get them) and cannot find KD listed anywhere even as part of a callsign. The KD series is allocated by the ITU to the U.S.A. and so I can only think that it may have been solely a tactical callsign perhaps being used by a German ship on NATO manoeuvres. Finally, from Ron he mentions that the Russian Broadcast station in Ashkabad on 4.740MHz is occasionally interrupting its programmes late in the evening to broadcast number sequences.

Still with numbers and John **MacNoughton** also believes the numbers transmissions on 6.628MHz are Mossad. John adds that a good UK source for numbers chasers is the book *Monitoring the Iraq/Kuwait Conflict* by Langley Pierce. It is available from Interproducts, 8 Abbot Street, Perth PH2 0EB. Telephone: (0738) 441199.

Books

Copies of Peter's book *Short Wave Communications* are still available from the *SWM* Book Service, along with *Scanners 3rd edition* and *Scanners 2*.

Short Wave Communications covers a wide area and provides an introduction to the hobby of radio communications. International frequency listings for aviation, marine, military, space launches, search and rescue, etc. the books costs £8.95

Scanners is a guide for users of scanning receivers, covering hardware, antennas, accessories, frequency allocations and procedures. The books costs £8.95.

Scanners 2 is the companion to *Scanners* and provides even more information on the use of the v.h.f. and u.h.f. communications band and gives constructional details for accessories.

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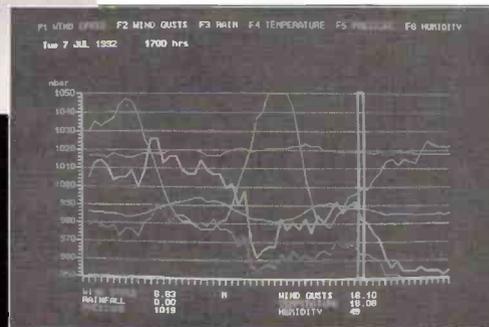


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Amateur Bands Round-up

Paul Essery GW3KFE, PO Box 4, Newtown, Powys SY16 1ZZ

Recently I was asked about e.m.e. and the s.w.l. Well, the received signal = Power out of transmitter plus twice the antenna gain, minus the losses to hear one's own return signal, all in dB. The antenna gain is times two because it acts in both directions.

Another simple sum says the path losses on 145MHz are about 194dB. Assume the transmitter runs a kilowatt output at the antenna terminals and you have 22dBd antenna gain. The return signal can be expected to look like 0.25µV across 50Ω. That is an ideal; in fact the moon is far from a perfect reflector, and the received frequency is affected by doppler shift. The reason e.m.e. stations go higher in frequency is that antenna gain becomes easier to get, faster than path losses increase. So for a listener who has the room and skills to build and operate an antenna of more than 22dBd genuine gain after taking in the feeder losses in, e.m.e. is theoretically possible. All you need now, is to know when and where stations will appear. As ever, we're back to the grapevine!

Reports

Will Williams lives in Neath, and has 21m of wire up, coupled to a Realistic DX-390, on which he listens to 3.8MHz either last thing at night or early in the morning. In the mornings ZL4BO and others attract callers from Europe. Late at night and into the small hours, Will listens to the various Europeans working the W/VE/VO stations. Don't forget that the American band goes right up to 4MHz.

Ted Trowell in Sheppeysticks with c.w.; he noted Europeans on Top band, A71CW on 3.5MHz, and on 7MHz a gaggle of Ws, plus KP4UD, JW5NM, VK6LW, EA8AB, 4K2NPC. 10MHz yielded Europeans plus TA2BD, while 14MHz gave the usual Ws and 5B4ADR, VU2NI, FY5YE, J28BS, ZS6FOC with G3MXJ driving, UA0AHM, JA4HM and FO5IW. Turning to 18MHz VP/W2GUP was booked in and on 21MHz the usual Ws along with 7P8SR, ZS10U, 8P6NX, VP5P, ZS6FOC, YN/SM00IG, PP7IK and FY5YW. Finally 28MHz where despite the shortage of sunspots, Ws, CX4NF, VR9AC and 9J2BO came in.

D. L. McLean, in Yeovil, mentions that listeners after DX may well find it worth while to look into the various nets; The European DX Net, on 14.242, 1500UTC Mon-Fri, 0600UTC Sat/Sun, and the DL2BCH/CU2YA effort at 1600UTC Monday Wednesday and Fridays are a couple that Don notes regularly.

Vince Cutajar in Malta stuck to 24MHz sideband for WA4DAN/KP5, J28BG, C9RTC while a shift down to 18MHz for OM3TZW, 3XOHLU, 5ZABI and AH1A on Howland.

Adrian Rees of Ellesmere Port in Wirral has a couple of two-element

wire beams (non-rotatable) for 3.5MHz aimed at 080 and 280°; a switched reflector is in the pipeline to enable 'steering' to some extent. For Top Band there is a half-wave with one end at 13.8m, and the other end up to 24m. As for results, I notice all continents save Africa on 3.5MHz, including Western USA, with N. America and Europe on Top Band where it was nice to observe 2M0ACI of Aberdeen among those present.

Next, **Gerald Bramwell** in Swinton. Gerald has Top Band giving various sideband Ws and VEs, UL8AWL, RW9CQ, UA9JLL, UA9FJU, plus the smaller fry including GW3JSV up the road. 3.5MHz gave a string of Ws, VEs, X01FG, UB9AAA, UL7TX, UL7ACI, UW9LM, OY1HJ, 9V1XQ, FM5BH, OD5ZZ, FG5FC, CN8HR, 7X2BK, KP2A, 9K2MU, FM5WD, 9K2ZZ, JA2JNA, PY2BW, YV5LIX, 8P6JB, VK6LK, 9M2DM, 5B4YX, NP4A/M, YA1AR, VU3COI and 7X2DG. On to 7MHz where we find VEs, 9H1AL, YV, LU, PT7NZ, JA7JPZ, 9K2HA, EA8, EA9, VQ9YA, 9K2WA, 4X4JP, HK1HHX, VP5JM, and OD5/SP7LSE on c.w. For 14MHz, lots of Ws and VEs, plus both c.w. and RTTY from USSR, USA, 9K2 and Europe, plus 4X4HQ, J5UAI, TG9GI, J37ZA, KF6BLT/5, EL8PP, VP8CMG, ZS1AU, LU/PY/PP/YV, ZS1AU, 7X2DG. 4X/KH2EWF, ZPTED, VK5AGC, 8P6CC and 8P6CK. 24MHz yielded a brace of Ws, and 28MHz K2KAA, SU1AL/2, 9H1PA, ZS6IY, CP3FT(f.m.), TA2FT(RTTY) and CX6XB. On all bands of course, the smaller fry. Notice that Gerald uses sideband, f.m., RTTY and c.w. modes to add variety to his listening.

In Hereford, **Luciano Marquardt** found S79FIB for a new country, and S0RASD likewise on 14MHz. On 28MHz

I also see various ZSs, CU2GY, YV3EXP, 9K2JC, UM7MD, EA8BYQ and Europeans; for 21MHz Luciano has 4N7DW, NR1H, WF5A, EA8RR, OM3CPC (not far but a new one!), EP2MHB, 9A1AKL, 9A3NY, JAs, CN2GF, TU2JL, 5N0BRC, 9K2JC/NLD, 4M7I, KE9PW, PY4OY, and N90QS/P/T5. Down again to 14MHz, for 5B4BD, D44BC, LU4DUZ, HL5AP, VK3WIO, VK5WP, HP9PJ, 7S4SKI, S0RASD; leaving 3.5MHz where various Europeans and VE1EGG were noted. Again, the usual crop of smaller fry.

Programs?

Help! says **Nigel Alford** of Larkfield. He has an Amiga 500+ for which he is desperately searching for a program showing the Grey Line on a map of the world such as is available for example in the public domain for the IBM compatibles. Anyone who can help, write please, direct to: Nigel Alford, 56 Marlow Road, Larkfield, Kent ME20 6TW. On a different tack, Nigel has modified his G5RV so it now has all-coaxial feed, and this seems to have knocked his noise problems down by 75%.

Clive Penna up in Deerness, Orkney, sticks to his key and 7MHz or Top Band. Top band obliged with FG5BG, 9M2AX, OX3CS, 9F2CW and UJ8JI, while on 7MHz the dits and dahs from 4K2MAL, JW0F, JA5AUC/JD1, C56/SM0JHF, VP2MLD, TR8GR, VY1JA(Yukon), XE1/JA1QXY, PZ1DY, FY5FW, 9F2CW, CP6UH, CE3HDI, 4S7CF, 9K2ZZ, B44CT, JT1BR at 1043UTC, 4K2NP, 9V1ZE, W1-0 by short path and W1, W4, W6, W7 W8 and W0 by the long path.

On now to Iceland, and **Geoff Crowley** in Hafnarfjordur. February was

an interesting month with the best and the worst radio conditions he has yet experienced there. One evening he listened at 2315UTC to a group of Scots YLs on 1959kHz who hadn't identified after fifteen minutes. On the other hand, 3.5MHz perked up for Geoff as 28MHz showed its worst side. Looking at the whole list, we see all continents represented, but a marked shortage of Africans as compared with the rest of the world.

Grapevine!

Top Band addicts will be pleased to hear that G3XTT and G3RBP are now once again operating their *Top Band News* which is the direct descendant of those bulletins that W1BB put out for years. The contact is Don Field G3XTT, 105 Shiplake Bottom, Peppard Common, Henley-on-Thames RG95HU. Incidentally, Don is trying to lay hands on copies of those old W1BB offerings, so if you have any such please let him know.

Another source of information is of course the *RSGB DX News Sheet*, which is available to non-members. This comes out weekly with all the latest news; details on this from RSGB, Lambda House, Cranborne Road, Potters Bar EN6 3JE. DXNS was first put out by Geoff Watts, who still offers his various lists from 62 Belmore Road, Norwich. There is a list relating prefixes to countries, continents, ITU zones and CQ Zones; plus one for the old-timers coming back to the hobby; and the one relating all the ex-USSR callsign to their current location.

Deadlines. As usual, the beginning of the month, to arrive at the address above. BCNU!

G4NXG/M

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Professional communications operator **Donald Robson** (Hawick) served as a telegraphist in the RAF, mainly in the Far East, during 1957-8. For 6 years in the following decade, Donald worked with the Ministry of Aviation at Croydon Airport. Not quite as historic, but still in the realms of bygone technology, is Donald's 20 year old Trio 9R-59DS receiver. About the time Donald purchased this, I was still at school. Those members of the school radio society who owned this type of receiver were regarded with much jealousy by the less fortunate ones - such as myself. What is there that is lacking in today's conditions, that makes nostalgia so attractive?

On the Isle of Man, **Mrs. B.** has befriended the visiting crew of Eurocypria. The pilots are often British, while the cabin staff are mostly Greek. Mrs. B. met one of the Larnaca flights, operated by an A.320. She was invited to sit in the jump seat while the crew prepared for the onward sector and observed the differences between the displays on this type and the B.767. Mrs. B. is becoming quite an expert on glass cockpits!



Christine Mynek

An Australian Tiger Moth at Woburn. First flown in 1931, over 7000 Tiger Moths were manufactured before and during WWII as basic trainers.

The Airbus' map display is very detailed, but easy to read as there is no control yoke in the way. Pilots seem to adjust to the left-handed side-stick controller when they are promoted to the left-hand seat. Even with a conventional control yoke, the captain would probably hold this in the left hand, thus keeping the right free to operate the throttles. Only in turbulent conditions would both hands be placed on the yoke.

Information Sources

In the UK the easiest radio-navigation charts to obtain are those from Aerad because they are produced by British Airways and are sold to the public by post. Please note the slightly amended address: Aerad Customer Services (S464), British Airways, Aerad House, London (Heathrow) Airport, Hounslow, Middlesex TW6 2JA. Tel: 081-562 0795 or 0586. Be sure to make cheques payable to British Airways plc.

C. Phillips (Ilkeston) wanted information on weather reports and my short article on page 39 of the March issue was prompted by his request. Please note that although cloud is measured in octas (eighths), this word is often omitted from reports for brevity. I believe that, in the USA, where altimeter settings are in inches of mercury (29.92 being the standard pressure setting), cloud cover is measured in tenths.

In order to monitor arrivals of aircraft at his local airport, Manchester, as well as at Gatwick and Heathrow, **Ian Doyle** consults page 747 of Skytext. Unfortunately Ian, you don't say how to go about viewing this service. Is it a dial-up bulletin board requiring a telephone modem and computer? Who do you contact to subscribe to it?

Ian has tried out a KC13 pre-amplifier. For about £25, this unit amplifies the signal picked up by the antenna, and passes the thus strengthened signal on to the receiver. It appears to amplify Band II broadcasts as well as u.h.f. television - and everything in between! An inevitable problem will be susceptibility to interference from stations that are outside the band of interest. This is a natural consequence of the broadband nature of the amplifier. It is designed not to discriminate between different signals.

Frequency and Operational News

From the CAA, GASIL 2/93 introduces the hoped-for a.t.i.s. at Bristol (Lulsgate) on 121.75MHz.

The d.m.e. at Great Yarmouth has now been withdrawn. At Prestwick the Control Zone has been removed. The Carnane n.d.b. and advisory route

Abbreviations

A.	Airbus
AIC	Aeronautical Information Circular
a.t.i.s.	automatic terminal information service
B.	Boeing
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
ft	feet
GASIL	General Aviation Safety Information Leaflet
kHz	kilohertz
MHz	megahertz
n.d.b.	non-directional beacon
u.h.f.	ultra high frequency
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range



Christine Mynek

This DH90 Dragonfly was shipped from South Africa in a crate for restoration in the UK. Formerly CR-AAB and ZS-CTR, the Dragonfly is powered by two 130hp Gipsy Majors, has a maximum speed of 144 m.p.h., a cruise of 125 m.p.h. and a range of 625 miles.

W927D have both been withdrawn on the Isle of Man, so route W2D has now been re-aligned to terminate at the island's v.o.r.

Also from the CAA comes AIC 24/1993 which changes the Danger Area Activity Information Service frequency for D007 Fowey. Previously Wembury Range Control 122.1MHz, it is now St. Mawgan Approach 126.5MHz. Outside the hours of St. Mawgan's watch, call London Information 124.75MHz.

To mark the 75th anniversary of the founding of the RAF, a flypast is planned at RAF Marham, Norfolk. By the time you read this, the practice days (March 26 & 30) and the display itself (April 1) will be over. What advanced warning is there that something this big is about to take place? The CAA organise a free of charge recorded telephone message on (0500) 354802. The information gives pilots warning to avoid hazards such as royal flights (purple airspace), the practice and manoeuvring areas for fly-pasts, and Red Arrows' display areas. The information usually gives notice of events expected tomorrow.

Readers sometimes wonder what the extra 1MHz (136.0-136.975MHz) will be used for on the v.h.f. airband. This extension was established at the beginning of 1990 and now AIC 17/1993 explains how the 40 new channels will be allocated. From 136.025-136.775MHz there are 31 channels, but the AIC refers to 32 channels (so, what about 136.0MHz?). Anyway, these are for air traffic control. The next 4 (136.8-136.875MHz) are for international operational control, the



Christine Mynek

A DH Gypsy Moth at Woburn. Many were built under licence by the Moth Aircraft Corporation in the United States.

final 4 (136.9-136.975MHz) being reserved for data links.

Channel spacing is 25kHz at present, but in my Museum I have examples of old receivers that only work at 50kHz intervals. Further subdivision to 12.5kHz is being considered, so anyone involved in the procurement of new equipment should take this into account. France already requires flights in controlled airspace to be able to communicate on the new frequencies. In the UK, the most likely needs for new frequencies in the immediate future are for the Central Control Function and the new en-route centre.

The next three deadlines (for topical information) are May 7, June 4 and July 9. Replies always appear in this column and it is regretted that no direct correspondence is possible. All letters to 'Airband', c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS. Genuinely urgent information/enquiries: 081-958 5113.

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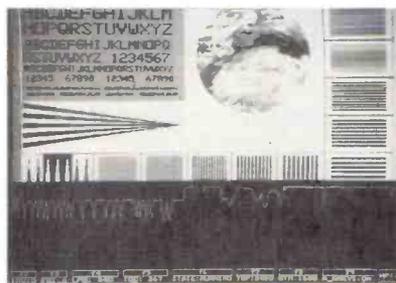
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Scanning

Alan Gardener
PO Box 1000, Eastleigh, Hants SO5 5HB.

Following the release of the AOR AR-1500EX, Richard Hillier of AOR (UK) Ltd has been good enough to send me some additional information on the changes made to this latest version of the popular hand-held. The major differences include new printed circuit boards, changes to the intermediate frequencies and switching, better selectivity, greater sensitivity above 900MHz and improved a.m. a.g.c. characteristic.

As well as these changes, the microprocessor reset keystrokes are also different. Some AR-1500EX units that were shipped out before 17.2.93 do not have the correct information in the handbook. If you reset using the AR-1500/E keystrokes you will find that the sensitivity on u.h.f. is very poor.

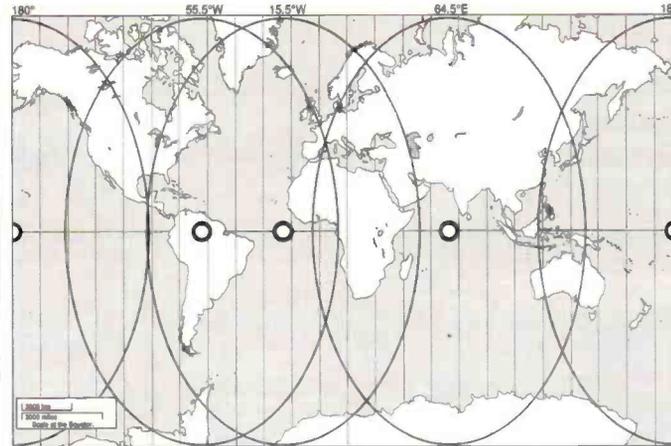


Fig. 1: Overlapping Inmarsat global beam coverage areas.

The correct keystrokes are:

BANK 1	PROG 0.5	LIMIT 95.995	SEARCH 556.325	ENTER
BANK 2	PROG 96	LIMIT 299.995	SEARCH 556.325	ENTER
BANK 3	PROG 300	LIMIT 512.995	SEARCH 249.125	ENTER
BANK 4	PROG 513	LIMIT 797.995	SEARCH 58.075	ENTER
BANK 5	PROG 798	LIMIT 1105995	SEARCH 249.125	ENTER
BANK 6	PROG 1106	LIMIT 1300	SEARCH 556.325	ENTER

One other interesting quirk is with the auto memory function. If you program the set to only search bank 9 i.e. SEARCH BANK PROG 9 LIMIT 9 ENTER strange things happen. The first search cycle works normally but on the next cycle the bank number changes to 0 (1 on the next cycle and soon) and the set searches ten 'layers' of the same search range. It no longer auto stores, but stops on busy channels as if it was in the normal search mode, except that you can lock out different spot frequencies in each of the ten 'layers'. This is likely to be due to a 'bug' in the programming but perhaps someone out there can think of a practical use for it - if you can let me know.

Satellites

Some time ago I read a short article in an American scanning club newsletter about monitoring Inmarsat, the maritime communications satellite operating in the 1.5GHz band. Inmarsat is a global non-military satellite communications organisation providing voice, data, facsimile and telex services as well as distress and safety communications for ships, aircraft and land mobile operations.

As an example, many of the recent conflicts throughout the world have been reported almost instantaneously by news crews equipped with portable satellite telephone equipment, much of this traffic has been carried via Inmarsat. There are currently ten satellites in the system, although only five of them are actually in use. The orbital positions have been chosen to provide a compromise between global coverage and channel capacity in particularly busy areas such as the

Atlantic region.

The satellites receive signals transmitted from the earth at frequencies around 1.6GHz and retransmit them at 4GHz back to a network of Land Earth Stations (LES) situated at strategic locations around the world. The LES are used to connect the satellite system into terrestrial telecommunication networks. The return leg of the signal is transmitted back from the LES to the satellite in the 6GHz band, which is then converted to 1.5GHz for transmission back to the earth.

Commercial satellite terminals for Inmarsat are split into different categories. The standard Inmarsat 'C' ship earth station is primarily intended for use as a low traffic volume terminal unit permitting transmission and reception of telex and data traffic at a rate of around 600b/s. The advantage of this type of equipment is that the digital transmissions can be sent at low data rates which means that much more compact antennas can be used, often as small as 80mm by 50mm.

An Inmarsat 'A' terminal permits voice communication and it is this type of terminal that tends to be used by reporters to send their stories back from remote corners of the world. Because of the need for a much wider bandwidth to carry the speech signal the antenna size has to be much larger, usually requiring at 0.85 to 1.2m dish. The speech signals are transmitted using a special type of n.b.f.m. that uses syllabic companding and has peak deviation of about 12kHz. This type of modulation can be received on a scanning receiver, the most noticeable difference from normal n.b.f.m. transmissions being the disappearance of carrier during

pauses in speech. This is in order to maximise the use of the limited amount of power available on-board the satellite.

As well as the type 'A' and 'C' terminals, a new generation of digital 'B' and 'M' terminals are planned. The 'B' terminal is intended to be a digital version of the existing analogue 'A' terminal but the 'M' terminal is intended to provide digital voice grade communications from a unit the size of a briefcase. This could easily be the forerunner for a future global mobile phone system.

Receiving INMARSAT

As an experiment, I wondered if I could detect any signals from the Inmarsat stationed at 15.5°W. This is intended to give coverage of the Eastern Atlantic region and is the easiest to receive in the UK, although there are others stationed at 55.5°W and 64.5°E that may just be within range of the southern half of Britain.

In order to save time, I decided to modify an existing antenna. I have a small Amstrad offset dish mounted on a tripod that is calibrated so that I know what azimuth and elevation I need to set for a given satellite orbital position. I wondered if the dish would work effectively at the much lower frequencies used by Inmarsat. I quickly made up a small dipole from some tinned copper wire, which I soldered to a short length of thin 50Ω coaxial cable. I rotated the dish to approximately the correct position, set

Maritime Mobile Satellite Services
1530 - 1544MHz (Sat TX)
1626.5 - 1645.5MHz (Mobile TX)
Mobile Satellite Distress & Safety
1544 - 1545MHz (Sat TX)
1645.5 - 1646.5MHz (Mobile TX)
Aeronautical Mobile Satellite Service
1545 - 1548MHz (Sat TX)
1646.5 - 1647.5MHz (Mobile TX)

Table 1. Inmarsat II frequency bands.

my AR3000 to search from 1530 to 1545MHz and connected it to the dipole. I then held the dipole just in front of the existing LNB feed and waited. To my surprise the search stopped on a weak data signal at 1530.975MHz. Once I had located this signal I was able to position the dipole feed more accurately at the focus of the dish. I also found that adding a small reflector helped to improve the antenna gain.

Having peaked the antenna on the data signal I was able to find several other weak transmissions in the 1530 to 1545MHz band. Some of these appeared to carry speech but they were just a little bit too weak to be able to determine what was actually being said. No doubt adding a pre-amplifier or second dipole phased to give right-hand circular polarisation would have brought these signals up to a usable level.

LEO Sats

Several companies are now proposing a new generation of low power communications satellites known collectively as Low Earth Orbiting spacecraft or LEO. It is intended that these will operate on frequencies around 1.6GHz. The difficulty with orbiting satellites is that they only provide communications when they are within range of the user. This often means that only a few minutes of communication is possible during each orbit, depending upon the height and orbital position of the satellite relative to the user. The way the LEO will overcome this problem is by having several satellites orbiting the earth at carefully selected positions, so that at any one time there will always be at least one within range. As well as providing communications the system will also be able to give positional information in a similar manner to existing navigation satellites. In fact, two of the proposed systems may provide positional information as a spoken location such as 'M4 motorway Junction 12'.

One of the main contenders in the race to provide LEO communications is Motorola with its Iridium system. This will use a constellation of 77 satellites in seven evenly spaced circular polar planes, each plane containing eleven satellites spaced 37.5° apart. This arrangement gives global coverage with more capacity towards the earth's poles where the coverage areas overlap. In order to maximise the use of the limited radio spectrum available and minimise the amount of transmitter power required, each satellite will use digital modulation and use up to 37 separate spot beams to form cells on the surface of the earth. Each one of these spot beams is likely to be able to provide 174 full duplex voice channels.

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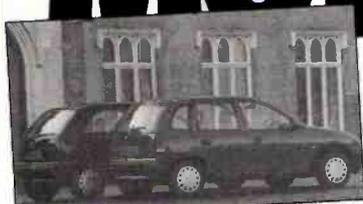
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Info in Orbit

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METEOR 3-4 has remained operating on 137.30MHz since mid-January. It has only transmitted visible images (at least when I've been looking). During its night-time orbits it transmits only the bars and a blank line. METEOR 3-3 was switched off around February 16 (previously using 137.85MHz). METEOR 3-3 had been operating very close to the morning terminator - a location that provides very poor solar illumination for the solar panels. It came back on in early March. As the weeks pass by we can expect more changes in operations. Perhaps METEOR 3-5 will come on during its next favourable solar illumination period.

FENGYUN 1-2

Paul Wilson of Macclesfield regularly sends me data collected from various BBS, and one has given some recent information about the Chinese WXSAT FENGYUN 1-2. We stopped receiving a.p.t. from it a long time ago, but it was known that the Chinese were trying to stabilise it. Apparently a rocket thruster jammed in the open position causing all the propellant to escape. Thrusters are sometimes used for minor attitude (pointing position) adjustments.

The magnetic torquing system was used for a period, to bring the WXSAT to a stable position while over the PRC (Peoples' Republic of China), and some h.r.p.t. was also received in America. Unfortunately it seems that this cannot now be done.

METEOSAT 3

During January and February this geostationary WXSAT was slowly drifted westwards to its new location at 75°. I managed to receive signals from it until February 18, by which time it was very weak due to horizon obstructions.

Pictures from M3 will continue to be re-transmitted from METEOSAT 4 at the usual times, and I believe that there is a likelihood of extra transmission slots being allocated. There is a significant change in the view from M3; we can clearly see right across to the western coast of the USA. Californian weather can now be monitored! My Primary Data images from MET 3 are quite spectacular.

Letters

Brian Dudman of Harrow has spent some months setting up what must be an exceptionally well featured WXSAT receiving station. He has sent me several pictures during the last year or so, (thanks for those) including Fig. 1, which shows his various computers fed from assorted antennas and receivers. The left monitor shows hurricane Andrew, the central one shows a METEOSAT Primary Data



Fig. 1: Brian Dudman's receiving station.

whole disc image of the earth, and the monitor on the right displays a FAX image but the nearby light has caused a reflection.

Brian operates three computers in that room - I can't but wonder whether he suffers much interference from them? To receive the polar WXSATS Brian has installed three different antennas in his loft. The original crossed dipole points vertically, this would be the usual way to install a single antenna. In such a position the main lobe (direction of greatest sensitivity) is upwards, but signals are received down to virtually horizon level.

The other two are pointing at 30° elevation north and south. Each antenna is cabled with coaxial lead down to his operations room where they are connected directly to a motorised switch. The south antenna has allowed him to obtain good signals 'way down the Red Sea', and the north-pointing antenna has let him see to the top of Greenland. His main problem, he tells me, is deciding on each pass, just when to switch over between the different antenna. Brian's photographs have shown an unusually clear image of Greenland - see Fig. 2, which was taken before his antenna installation was modified.

Peter de Jong of Leiden in Holland sent me Fig. 3, which shows an image from METEOR 3-5 collected last April during a morning pass. The picture illustrates the cloud detail that METEORS seem to register so well. Peter comments that when the METEORS do transmit infra-red images during a north-bound pass, they switch from visible to i.r. usually after first transmitting four minutes of blank frame, followed by one minute of white, so we don't see much during these

northbound passes. I wonder how many monitors have noticed that when the white section does start, it normally includes one line of (infra-red?) data first?

Doug Harris GW3NDR of W Glamorgan, has recently completed building a Maplin 137MHz receiver as part of his plan to start receiving WXSATS. Doug already has an IBM clone of the 286 variety and is proposing to use the Technical Software WXSAT module to decode the images.

He has been receiving FAX for some time, using PC-HF-FAX 6 and wondered whether the FAX program could decode WXSAT images. In fact I think that it is just possible to decode an image of sorts, but there would be no synchronisation because the two

systems (FAX and WXSAT) use different modulation techniques and different start and end tones (and there are many other differences as well).

Tom Woolner of Harpenden has designed a simple analogue demodulator-remodulator interface to fit between a Cirkit satellite receiver and a PC. Perhaps Tom will let us have more details about the operation and application of his device, which can apparently be used with HF-FAX type software.

A Malloy is one of the column's younger readers who has been setting up some WXSAT equipment at home. He has been able to use school satellite software and a NOAA predictor to calculate when the different NOAA satellites will be visible from home. He has made his own quarter-wave

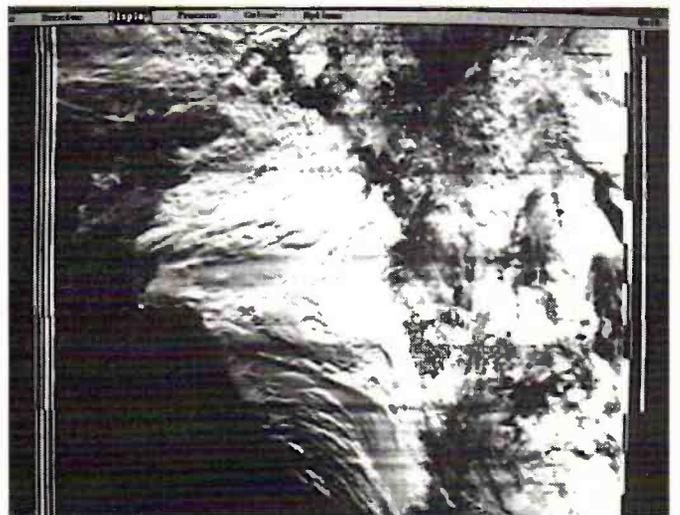


Fig. 2: METEOR 3-3 image of Greenland from Brian Dudman.

crossed dipole cut for 137MHz and can use a scanning receiver to hear the WXSATS. The problem has been locating a suitable interface for a BBC computer. Although he was able to use the school's unit for test purposes he was wondering where he could obtain one, including the necessary software.

The BBC computer was one of the first to be used for decoding WXSAT images, and I believe that there are still one or two companies which can supply interfaces and software. I know Maplin did at one time. Nowadays the extremely limited capabilities of the earlier machines have long been surpassed by many machines.

More Letters

Lester Curno of Holsworthy and Steve Nas of Oswestry have both written to mention the shareware tracking program PC Track, version 2.14 which has an American author and which can be bought from radio rallies and other outlets, and costs about \$25 to register. They comment that the graphics are good and that up to eight satellites can be tracked simultaneously.

Geoff Chance of Redruth has bought a 286 PC to use with the Radiofax system, which he says provides FAX and SSTV as well as WXSAT decoding. Geoff's computer runs at 12MHz and has a mono-VGA monitor. Although he feels that this may be slow, in fact I suspect that he will find everything works very well. Satellite pictures are black-and-white anyway!

He also advises me that he

understands Maplin has a waiting time for METEOSAT down-convertors of four months from receipt of order. This does accord with letters that I have received from other readers who have commented to me on long delivery times. **Bill G13MMF** is an engineer servicing X-ray and ultra-sound scanners, and suggests that an article on 50kHz i.f. for 10.7MHz would be welcomed. This is the normal i.f. for many receivers, of which the WXSATS require a bandwidth of about 50kHz for extracting the full range of frequencies from the signals. This would be of interest to those people who are building their own, so perhaps a short piece would be helpful.

Mike Robinson of Accrington has designed and built his own h.f. WEFAX, RTTY and c.w. decoders. That only leaves the WXSATS! Mike recently bought an ICS METEOSAT MET 1 system and got 'hooked'. After building a crossed dipole antenna and connecting it to a Realistic PRO-2006 scanner Mike did have some success, but was still unaware of satellite rise and set times. His latest purchase is the Timestep TrackII program which Mike is finding extremely helpful. Mike runs it on a 386 computer fitted with a co-processor. He supplied **Fig. 4**, a NOAA picture from early February showing Spain and a cloudy France.

Jim and Hilda Richardson of Fife recently updated the computer to a 386 PC with SVGA monitor, bought a Timestep PROsat WXSAT receiver, loft-mounted turnstile antenna, and runs the PC-GOES/WEFAX 3.3 program, which also provides HF FAX decoding. Jim contacted Comar about the screen scroll-freeze, which I noted in a review of the software some months ago. Apparently he has been advised that setting the IOC to 864 enables a full

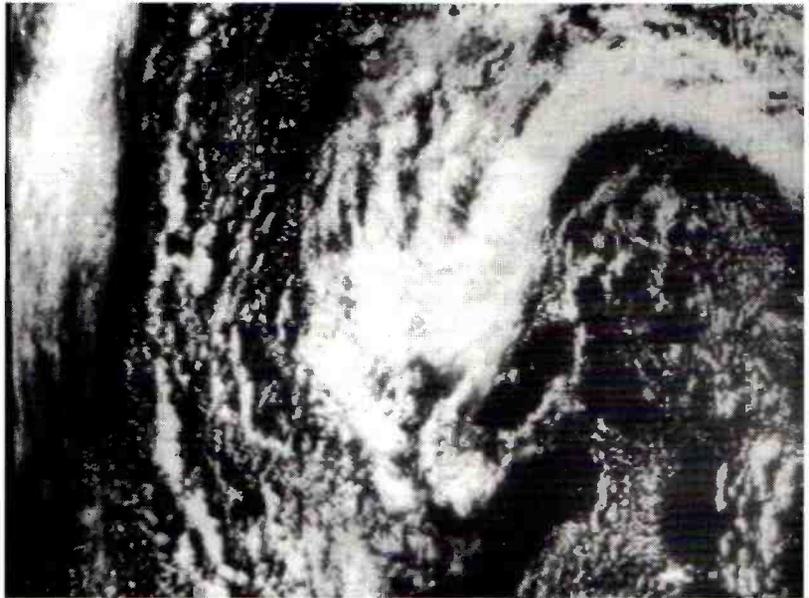


Fig. 3: METEOR 3-5 image from Peter de Jong.

METEOR scroll without any disadvantages. This may help other users. Jim says that Comar are issuing updates to the software to correct problems with running PC-GOES on faster machines than the 286.

Peter Finn of Dyfed asked me a few questions about the use of colour on Timestep's PROsatll software. I did a review of this suite of programs which covers METEOSAT, NOAA (and the other polar satellites) and an animation facility - and can be enhanced with the tracking software TrackII mentioned previously. Unfortunately, as Peter points out, I didn't mention the use of colour. In fact all but the animated images can use colour, and several sample palettes are provided. There are no special computer requirements for adding colour - other than needing a colour monitor. The facility is quite advanced and special palettes can be set up and stored for selected formats. One very effective method is to set up a palette for METEOSAT D2 images - infra-red for Europe, using shades of red. The same palette can be loaded throughout the year, and the warmer summer months result in deepening reds. This method can be used with other software, not just PROsatll. It provides an interesting insight into the changing streams of warm water that flow around the Mediterranean sea.

Lester Jones G7NIR of West Kirby has also upgraded from a BBC Master to a 386DX PC. He asked me what hardware and software I would recommend for this computer, which is identical to mine. This is quite difficult, not because of any wish to avoid advertising in the column - but simply because the choice is large and depends on personal means and

preferences. All I can do is to try to bring new products to the attention of readers whenever suppliers advise me of new hardware and software.

GOES Constellation

The current position of all WXSATS in the GOES group is as follows: Prime - GOES 7 112°; GOES 6 94°; GOES 3 175°; GOES 2 (west) 135°; MET 3 75°.

Kepler Elements

I will send a print-out of the latest elements upon receiving an s.a.e. and extra stamp. All known weather satellites plus MIR can be included, together with their transmission frequencies if operating. This data originates from NASA.

Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.50MHz; NOAA beacons on 136.77 and 137.77MHz; METEOR 3-4 or 3-5 on 137.30MHz; METEOR 3-3 on 137.85MHz; FENGYUN 1-3 monitor 137.06 and 137.80MHz.

Tape Recordings

Some time ago, I offered to provide a.p.t. recordings to anyone having trouble starting off. For several weeks I was kept unexpectedly busy making such recordings. I will offer the service again for a short period. Please send a pre-paid envelope with a cassette tape and a couple of extra stamps, and I will provide NOAA and METEOR a.p.t. signals. METEOSAT is a bit of a problem because I don't have a suitable output for recording signals from that system.



Fig. 4: NOAA 11 7 Feb from Mike Robinson

Timestep

PROsat II is used by most leading Weather Satellite enthusiasts. Lawrence Harris, Mark Pepper, Roger Ray and Brian Dudman are just a few who have come to rely on the vastly superior features of **PROsat II**. Features such as 1,000 frame full screen full colour animate, 3D, direct temperature readout and Windows export make Timestep products preferred by most users. All satellites are catered for including the awkward Japanese GMS and the very infrequent Soviet Okean series. All current SVGA cards are supported. NOAA images contain full resolution visible and infrared data in a stunning 2.4Mb file!

If you really are serious about Weather Satellites, phone or write us now for a colour catalogue and find out why the world's experts including Arthur C. Clarke use and recommend our equipment.



Advanced Weather Satellite users will by now have read about our new **TRACK II** prediction software. Full screen colour graphics and 6 simultaneous satellites are just some of the amazing features. For the ultimate in detail we offer **HRPT** digital systems with five 1.1km ground sensors, towns and rivers are clearly visible. For everyday use we also have the **PDUS** digital Meteosat system that takes 2.5km data every 30 minutes. Timestep **PDUS** colour animate is used several times a day by Anglia Television because of its very high resolution combined with spectacular colour. Forecasters will appreciate temperature calibrated 30 minute interval images.

A full range of separate Antennas, Preamplifiers, Cables, Receivers and accessories are held in stock.

Timestep PO Box 2001 Newmarket CB8 8QA England
Tel: 0440 820040 Fax: 0440 820281

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Mail Order to: **Eydon, Daventry, Northants NN11 6PT**
Tel: 0327 60178



NEW!



New style receiver case

3 Band SSB/CW Receiver: £58.30

You can enjoy the pleasures of building this excellent communications receiver with **HOWES** Kits! The **DXR10** receiver covers the 10, 12 & 15M amateur bands, and will "pull in" DX stations from all over the World. We have just improved the case to make construction even easier, and the appearance has been transformed, so that the styling now follows the lines of our much admired "M Series" cases (used for our transceivers and their accessories). The front panel is pre-punched, and both the chassis and cover are sturdy 2mm aluminium. The compact size makes this an ideal rig for holiday and portable use. You can even upgrade it to a full transceiver with our matching transmitter kits! Just the job for those taking the Novice Licence!

When you build a **HOWES** kit, you know that you are dealing with well designed equipment that has full technical support, and a wide range of matching accessory kits to enable you to build up your station in easy stages!

DXR10 Electronics kit for SSB/CW receiver with 1W AF output **£27.50**
DCS2 "S Meter" accessory kit - driver module and custom meter **£10.90**
HA10R Hardware (case, tuning cap., dial, knobs, nuts and bolts etc.) **£19.90**

Total cost of receiver (as pictured above) in kit form: **£58.30** plus £4.00 P&P.

Other Receiver Kits: **DcRx** single band SSB/CW for 20, 40, 80M or 5.45MHz air: **£16.90**.
TRF3 Shortwave Broadcast: **£15.50**. Hardware and accessories available.

ASL5 DUAL BANDWIDTH FILTER

Hot up your radio's selectivity with this excellent accessory! The CW filter has a narrow 300Hz bandwidth, and the speech filter is at least 50dB down at 3.3kHz - sharper roll-off than most crystal filters! The ASL5 connects between the radio and the external speaker or headphones, so no mods to the set are needed. Suits all general coverage receivers.

ASL5 Kit: £15.90 **Assembled PCB Module: £24.90**

ACTIVE VHF AIR-BAND ANTENNA

The **HOWES AB118** covers 118 to 137MHz. It has a band-pass filter, a tuned halfwave antenna element for good low angle (long distance) reception, a low noise pre-amplifier and switched 10dB attenuator. The antenna fits standard 1.5" plastic pipe for easy weather-proof installation. Interesting to build, and should transform your reception if you are still using that whip on the back of the scanner!
AB118 Kit: £18.80 **Assembled PCB Modules: £25.90**

AA2 150kHz to 30MHz ACTIVE ANTENNA

Use 6 to 8 feet of wire with the **AA2** module and you get broad-band performance right across the long, medium and shortwave bands. There are two gain settings, and the strong signal performance is designed to be compatible with the popular SWL sets (IP3 +38dBm typical). Don't settle for less!
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AA4 25 to 1300MHz ACTIVE ANTENNA

Designed as the neat, compact, unobtrusive alternative to the discone, the **AA4** is deservedly popular with those who want broad-band performance without having to have an antenna that shouts "scanner"! Fits in standard 1.5 inch water pipe for outdoor use, or use uncased indoors.
AA4 Kit: £19.90 **Assembled PCB Modules: £27.90**



Build your own Amateur Radio Station with HOWES KITS and "M Series" hardware

PLEASE ADD £1.50 P&P for kits, or £4.00 if ordering hardware.

HOWES KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our **free catalogue** and specific product data sheets. We have lots more kits in the range! Delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.

Decode

Mike Richards G4WNC
200 Christchurch Road, Ringwood, Hants BH24 3AS.

A success story to start with this month. Alan Lowe of Chelmsford, like many, had been suffering computer interference problems. Having read my comments in the March 'Decode', he lined his monitor with foil and has now completely cured the interference. The nice touch is that he took the trouble to write and let me know. For those that are thinking of trying the same, I'll repeat the safety warning. Don't even consider delving inside the case of a computer monitor unless you know what you're doing. All monitors contain lethal voltages which can be present even with the mains supply disconnected. It's also important to make sure that you don't restrict or block the ventilation slots or you could considerably shorten the life of the unit.

For those interested in receiving press photos, Geoff Crowley reports good results on 9.242MHz. This frequency is used by DyN in Buenos Aires and appears to send a regular stream of pictures. Geoff prints out the images on a 24-pin NEC printer which seems to produce very good results. To give you an idea of the quality, I've shown an example in the column. The only problem with receiving pics from South America is the news personalities are often unknown.

Now for some detective work! Keith Mayhew of Mansfield has sent me a print of a RTTY station running on 16.793MHz. Unfortunately, he omits to give any details of the mode. Looking through the printout, the transmission starts with a conventional CQ call and includes a request for confirmation of reception followed by the character string +?. As this is the standard string to change direction on a ARQ or SITOR link, I assume that's what this station is using. The odd point about the station is that it's using the callsign RAF and is sending press reports with a South American slant. Can anyone out there help with any further details on this station. If you can, please drop a line to the address at the head of the column.

If you have the ability to receive the Coquelet eight tone systems you might like to try a few frequencies suggested by Day Watson. The frequencies to try are: 13.9364, 16.2738, 16.3165, 18.1836, 18.7565 and 23.1275MHz. According to Day, the best time to monitor is during the weekend.

Audio Filters

Having spent some time recently experimenting with a Datong FL3 audio filter, I thought it might be useful to give you a run through the benefits. Whilst I'm giving the background, I'll throw in a review of the FL-3 for good measure.

To understand the benefits of using an audio filter we first need a reminder of how utility signals are transmitted. The system used for virtually all h.f.

data transmissions is frequency shift keying (f.s.k.). In this system the two states of the data signal (mark and space) are transmitted as two separate frequencies. If we take a typical press RTTY signal as an example, the two frequencies for the mark and space are separated by 400Hz. From this you can see that a station with a mark frequency of 4.501MHz would send a space by moving the transmitter to 4.5014. This is 400Hz higher than the space frequency.

applying modern switched capacitor filter technology, it's comparatively simple to build very sophisticated variable filter systems.

Let's now look at what the filter is required to do. Remember, our signal comprises two audio tones spaced 400Hz apart. If we use a practical example of a decoder with a centre frequency of 1300Hz, the two audio tones will be 1100 and 1500Hz respectively. So our ideal filter would only pass frequencies between 1100 and 1500Hz and reject all others. This

200Hz to 4kHz looking for a steady tone to lock onto. Once a suitable tone has been found, the notch filter takes over and reduces the level of the tone by at least 40dB. In my tests, this rendered the interfering tone completely inaudible.

At the heart of the FL-2 is a pair of computer optimised five-pole elliptic filters. These are configured as high and low pass filters which, when combined, create a band pass effect. As these two filters are separately adjustable, you can tailor the filters

performance to match the requirements of each received signal. This gives tremendous power, well above that from even the best crystal filters. In addition to the high and low pass filters, the FL2 includes a two-pole notch filter that can be switched to operate as a peak filter.

Now those of you who've never used a filter before may be starting to think this is all too complicated for me. However, Datong have made great efforts to ensure that the FL2 is very simple to use. This is achieved by clever use of panel markings and switched functions. For example, when

s.s.b. is selected you simply adjust the right-hand knob to cut out high frequency noise and the left-hand for low frequency noise.

For the utility listener there was a particularly effective RTTY mode. This gave an ideal response with two peaks for the f.s.k. signal and a deep notch in the centre. In fact the mode appeared so good I took a few measurements to prove the point. The results were extremely good with 40dB skirts and a deep 40dB notch in the centre. Setting the controls for this mode was also very simple. You just pressed the two buttons marked RTTY, adjusted the left knob for the centre frequency and the right knob for shift. To make this simple the knobs had calibrated scales that were remarkably accurate in the review model. If you're receiving some of the more complex data modes you could also set a very tight band pass filter without the notch filter. The FAX enthusiast will find the FL-2 extremely effective when dealing with the adjacent channel interference that effects Offenbach.

I hope you can see from this short review, that the FL2 is an extremely effective accessory for the utility



Press photo from Geoff Crowley.

There is a wide range of shift frequencies in use, but 170Hz and 400Hz are by far the most common. When receiving these signals, the common practice is to select u.s.b. on the receiver. By doing this the received f.s.k. signal is converted to two audio tones. The frequency of these tones is dependant on the setting of the tuning dial. When tuning a RTTY signal for decoding you would normally alter the receivers tuning until the signal is in the optimum state according to the decoders tuning indicator. The most common display being the bargraph type.

So far so good, but what if our signal is suffering interference from adjacent stations? If your receiver has pass-band tuning you may be able to adjust this to eliminate the interference. Some of the more comprehensive communications receivers feature switchable i.f. filters. If these are available you could select a narrow 500Hz filter to reduce the interference. In practice however, every case is different and what's really needed is a filter system that can be adjusted to suit each signal. This is where the audio filter comes into its own. By

type of filter is called a bandpass filter as it passes a band of frequencies. Although this would probably get rid of most of the interference we also need to consider the band between 1100 and 1500Hz. These frequencies are not used in the decoding process, so they could also be excluded by the filter. Therefore, the ideal filter for example I've quoted would pass only 1100 and 1500Hz and reject all other frequencies. As you will see later, the Datong FL3 goes a long way to matching this requirement. One of the problems with the theoretical model is that tuning would become very tricky and the filter parameters would have to be reset whenever another station was selected. Because of this, practical filters tend to have a slightly wider response.

Having placed filters in perspective, let's now take a look at the popular Datong units. The two main models for the utility enthusiast are the FL2 and FL3. The difference between these two models is in the provision of an automatic notch filter in the FL3 unit. The automatic notch is primarily for speech reception and works extremely well. The unit searches over the range

MESSAGE No 451 HIGH LEVEL WIND DATA EUROPE 01
 COMPILED BY STATION IN UNITED KINGDOM
 DAY 15 TIME 1800 UTC
 UPPER AIR REPORT (A)
 DAY 15 TIME 17:00 UTC
 WEATHER STATION AT PAYERNE

PRESS LEVEL	HPA	WIND	KNOTS
	850	350	02
	700	270	06
	500	010	14
	400	035	14
	300	040	15
	250	035	18
	200	020	11
	150	350	09
	100	350	14

MAX WIND NOT OBSERVED OR TRANSMITTED

UPPER AIR REPORT (A)
 DAY 15 TIME 17:00 UTC
 WEATHER STATION AT GIBRALTA

PRESS LEVEL	HPA	WIND	KNOTS
	850	075	30
	700	260	06
	500	235	20
	400	235	27
	300	230	29
	250	245	51
	200	245	80
	150	225	56
	100	200	08

MAX WIND OCCURED AT 12,360 METRES
 DIRECTION AND SPEED 250 80
 VERTICAL WIND SHEAR MAX+ 1KM= 17
 VERTICAL WIND SHEAR MAX- 1KM= 42

Sample print from the ERA Synoptic decoder.

listener. Although I've concentrated on the advantages for the utility listener, the filter can be useful in all types of listening. In fact I was so impressed with the review model I bought one for my shack! The current price of the FL2 and FL3 is £99.95 and £145.99 respectively. My thanks to Datong Electronics Ltd., Clayton Wood Close, West Park, Leeds LS166QE. Tel: (0532) 744822 for the supply of the loan model that was used at the London Amateur Radio Show.

ERA SYNOPTIC Weather System

Bill Green of ERA Electronics came to see me at the London show and presented me with a sample of his latest brainchild - a SYNOPTIC weather decoder. This ingenious device has been designed to automatically decode the five-digit weather reports from stations such as Bracknell on 4.489MHz. Although these transmissions can be decoded by hand, it's a labourious process that few have the patience to follow-up. The prototype unit from ERA takes the output from a standard RTTY decoder such as the Microreader and converts the five digit number groups into plain English weather reports. This is a great boon for many people and I'm sure it

will prove very popular. I tried the prototype version with an Icom R-72 and ERA Microreader and the results were very impressive. Not only was the data decoded, but it was well tabulated to provide a readable display for the user. I've shown a couple of examples in the column. As I said at the beginning, this is still only a prototype but, if you're interested, I'm sure Bill would be only too pleased to hear from you. The contact details are: ERA Electronics Ltd., 26 Clarendon Court, Winwick Quay, Warrington WA2 8QP. Tel (0925) 573118.

My thanks to Bill for giving me the opportunity to try this interesting prototype.

London Decode Clinic

Those of you who caught last month's magazine would no doubt have seen that I was running a Decode clinic at the London Pickets Lock show. This proved to be a resounding success and I was kept very busy throughout Saturday and most of Sunday. To help attract attention to the stand I set-up a display station using loaned kit. The receiver was a Lowe HF-150 that was fed by a Datong AD-270 active antenna. The output of the receiver was fed to a Pocomtor AF-2000 decoder and associated monitor. All this equipment

was very kindly supplied by Lowe Electronics, Datong and Dewsbury Electronics. As is normal for show venues, the reception conditions at London were appalling. Not only was the building steel framed, but there was an abundance of r.f. hash. However, this compact set-up managed to squeeze in a reasonable signal from TANJUG Belgrade on 12.2125MHz. This attracted plenty of attention and many were surprised at what could be achieved with such a neat and compact station. One of the reasons for the surprise is the appearance of the HF-150 receiver. Many are deceived into thinking that it's not a serious receiver because of its simplicity. Nothing could be further from the truth as the HF-150 is an extremely capable receiver and well up to the standards required for utility listening.

Moving back to the clinic itself, the range of questions posed was extremely wide. One particularly interesting topic concerned the requirements of the national curriculum. All schools are now required to teach weather as a topic. From what I can gather, most schools seem to be rushing out and buying weather satellite systems. Although these provide very impressive images, I wonder if there's perhaps a more practical alternative using the information available on the h.f. bands. My feelings are that FAX charts and SYNOP decodings may provide a source of more relevant local information. If you have had any thoughts along these lines I'd be very pleased to hear from you. I'm looking to put together a few suggested packages that could provide schools with an easy to use weather data collection system.

Overall then I found the clinic very successful and I'm sure the magazine will be running more of them at the larger rallies.

Frequency List

The listing for this month follows the normal format, e.g. frequency, mode, speed, shift, call sign, time and notes.

I can also supply copies of my full list or the Day Watson beginner's list. To receive your copy, just send three first or second class stamps to the address at the head of the column. It would be very helpful if you could include a self addressed label and mark you envelope Beginners or Decode list.

- 0.1113MHz, RTTY, 50, 150, SOA211, 1211, Warsaw Met
- 0.1174MHz, FAX, 120, 576, DCF37, 1220, Offenbach met
- 0.1237MHz, FEC, 96, 200, DCF42, 0940, PIAB Bonn
- 4.307MHz, FAX, 120, 576, GYA, 2052, Northwood
- 4.4425MHz, RTTY, 50, 1000, RGC72, 1853, Kiyev Met
- 4.583MHz, RTTY, 50, 400, DDK2, 0128, Met traffic
- 5.285MHz, FAX, 120, 576, RBX71, 1821, Tashkent
- 5.7525MHz, SITOR, 100, 170, -, -, ICRC Bosnia
- 7.855MHz, RTTY, 50, 1000, ROK24, 0229, Moscow met
- 7.88MHz, FAX, 120, 576, DDK3, 0922, Hamburg
- 7.9125MHz, RTTY, 50, 425, 9J28, 0245, Lusaka air
- 8.1231MHz, ARQ-M2, 96, 406, TNL48, 0310, Ascena Brazzaville
- 9.045MHz, FAX, 120, 576, 5YE, 2235, Nairobi met
- 9.43MHz, RTTY, 50, 500, ZAT, 0926, ATA Tirana press
- 9.97MHz, FAX, 120, 576, JMH, 2242, Tokyo met
- 10.107MHz, FAX, 120, 576, ATE60, 2144, Delhi met
- 11.08MHz, RTTY, 50, 600, -, 1919, SANA Damascus
- 14.367MHz, RTTY, 75, 400, BZP54, 1227, Xinhua press
- 14.56MHz, RTTY, 50, 365, JYF2, 0944, Petrs Amman arabic
- 15.959MHz, FAX, 120, 576, NAM, 1715, USN Norfolk sat pics
- 19.171MHz, RTTY, 50, 400, CNM85, 1328, MAP Rabbat
- 19.7563MHz, RTTY, 50, 625, 6VU79, 0801, Dakar met
- 19.8215MHz, SITOR, 100, 170, -, 1714, UN Monrovia
- 22.6455MHz, CW, -, -, DGW64, 0932, German ship press
- 25.2715MHz, RTTY, 50, 400, ISX25, 0916, ANSA Rome



Datong FL3 Auto Notch Filter.

Long Medium & Short

Brian Oddy G3FEX, Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

Freq kHz	Station	Country	Power kW	Listener
520	Hof/Hurzberg	Germany	0.2	M*,N*
531	Ain Beida	Algeria	600	C*,H*,O*
531	Torshavn	Faroe Is.	5	E,N*
531	Leipzig	Germany	100	H*,M*,O*,P*,R*
531	Oviedo	Spain	10	H*,M*,O*
540	Wavre	Belgium	150/50	H*,K,M*,O*,P*,R*
540	Sidi Bannour	Morocco	600	C*,H*,O*
549	Les Trembles	Algeria	600	C*,E*,H*,O*
549	Bayreuth (DLF)	Germany	200	H*,M*,O*,P*,R*,T
549	St.Petersburg	Russia	1000	M*
558	Espoo	Finland	100	M*
558	Tirgu Jiu	Romania	200	O*
558	Valencia	Spain	10	E*,H*,M*,O*,R*,T
567	Berlin	Germany	100	M*,O*
567	Tullamore (RTE1)	Ireland (S)	500	E*,F*,H*,L*,O*,P*,R*,S,T
567	Marbella (RNE5)	Spain	10	N*
576	Muhlacker	Germany	500	H*
576	Stuttgart	Germany	500	E*,M*,O*,T*
576	Riga	Latvia	500	N*
576	Barcelona (RNE5)	Spain	20	H*,O*,R*
585	Paris (FIP)	France	8	M*,O
585	Madrid (RNE1)	Spain	200	H*,M*,O*,R*,T*
585	Gafsa	Tunisia	350	N*,O*
594	Frankfurt	Germany	1000/400	H*,M*,O*,P*,R*
594	Quida-1	Morocco	100	H*,N*,O*
594	Muge	Portugal	100	H*,O*
603	Lyon	France	300	H*,M*,O*
603	Sevilla	Spain	20	M*,O*
603	Newcastle (BBC4)	UK	2	R*
612	Kiel	Germany	10	M*
612	Athlone (RTE2)	Ireland (S)	100	E*,H*,J,L*,O*,P*,R*,S,T
612	Sebaa Aioun	Morocco	300	N*
612	Lerida	Spain	10	O*
612	Tallinn	Estonia	100	O*
621	Wavre	Belgium	80	H*,M*,O*,R*
621	Barcelona	Spain	10	E*,H*,M*,O*
630	Vigra	Norway	100	E*,M*,O*
630	Tunis-Ojedaida	Tunisia	600	C*,H*,M*,O*
639	Praha (Liblice)	Czech	1500	R*
639	La Coruna	Spain	100	E*,H*,M*,O*,R*,T*
648	P. de Mallorca	Spain	10	M*,O*
648	Orfordness	UK	500	O.E*,H*,M*,O*,P*,R*
657	Burg	Germany	250	M*,O*
657	Madrid (RCE2)	Spain	20	H*,M*,O*,R*
657	Wrexham	UK	2	J,M*,N,P
666	Bodenseesender	Germany	300/180	H*,J,M*,O*
666	Lisboa	Portugal	135	M*,O*
675	Marseille	France	600	H*,M*,O*
684	Hof-Saal	Germany	100	N
684	Sevilla (RNE1)	Spain	250	H*,M*,O*,R*
684	Beograd	Yugoslavia	2000	H*,M*,O*,R*
693	Berlin	Germany	250	M*
693	Burghhead (BBC5)	UK	50	E*
693	Oroitwich (BBC5)	UK	150	F*,H*,L*,P*,R*,S
702	Presov (Haniska)	Czech	400	O*,R*
702	Aachen/Flensburg	Germany	5	M*
702	Monte Carlo	Monaco	300	M*
702	Zamora	Spain	5	E*,H*,N*,O*
711	Rennes 1	France	300	H*,J,M*,O*,R*
711	Heidelberg	Germany	5	N*
711	Laayoune	Morocco	600	C*,H*,J*
711	Murcia (COPE)	Spain	5	J*
711	Donetsk	Ukraine	150	N*
720	Holzkirchen (RFE)	Germany	250	N*
720	Langenberg	Germany	200	O*
720	Lisnagarvey	Ireland (N)	10	L*,O*
720	Norta	Portugal	100	H*,M*,O*
720	Lots Rd London	UK	0.5	H*,O*,P*,R*
729	Cork (RTE1)	Ireland (S)	10	E*,J,M*,O*,P*,S
729	Oviedo	Spain	50	H*,M*,O*,R*
738	Paris	France	4	M*,N*,O
738	Poznan	Poland	300	H*,O*
738	Barcelona (RNE1)	Spain	250	E*,H*,M*,O*
747	Flevo (HilvZ)	Holland	400	E*,F*,H*,J,M*,O*,P*,R*,T
756	Brunswick	Germany	800/200	E*,H*,J,M*,O*,R*
756	Redruth (BBC4)	UK	2	M*,O
765	Sottens	Switzerland	500	M*,O*,P*,R*,S*
774	Abis	Egypt	500	N*
774	Enniskillen (BBC4)	Ireland (N)	1	B*,M*
774	San Sebastian	Spain	80	E*,H*,M*,O*
783	Burg	Germany	1000	H*,M*,O*,P*,R*
783	Miramar (R.Porto)	Portugal	100	O*
783	Tartus	Syria	600	C*,N*
792	Limoges	France	300	M*,O*
792	Lingen	Germany	5	O*
792	Sevilla	Spain	20	H*,M*,O*
801	Munchen	Germany	300	H*,M*,O*,R*
801	Ajlun	Jordan	2000	N*
801	Burgos	Spain	10	M*,O*
810	Voru	Estonia	5	O*
810	Madrid (SER)	Spain	20	M*
810	Burghhead	UK	100	E*,S
810	Westerglen	UK	100	F*,H*,J,L*,O*,P*,R*,T
819	Batra	Egypt	450	C*,O*
819	Toulouse	France	50	H*,M*
819	Warsaw	Poland	300	O*,R*
819	San Sebastian	Spain	5	O*
828	Hanover	Germany	100/5	M*
837	Nancy	France	200	O*,R*,S*
837	Sevilla(R.Popular)	Spain	10	E*,H*,M*,O*,R*
846	Home	Italy	540	E*,H*,M*,O*,P*,R*
855	Berlin	Germany	100	H*,M*,O*,R*
855	Murcia	Spain	125	E*,H*,M*,O*,R*,S*
864	Santah	Egypt	500	C*,N*
864	Paris	France	300	H*,M*,O*,T
873	Frankfurt (AFN)	Germany	150	D*,M*,O*,P*,R*
873	Zaragoza	Spain	20	E*,H*,M*,O*
873	Enniskillen	UK	1	M*
882	Wachenbrunn	Germany	250	N*
882	Malaga (COPE)	Spain	5	N*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Freq kHz	Station	Country	Power kW	Listener
882	Washford	UK	100	E*,H*,J,K*,L*,M*,O*,P*,R*
891	Algiers	Algeria	600/300	C*,H*,J,M*,O*,R*
891	Huisberg	Netherlands	20	H*,J,M*,O*,R*,T
891	Uzghorod	Ukraine	150	N*
900	Milan	Italy	600	E*,H*,O*,R*
900	Bilbao (COPE)	Spain	10	M*,N*
900	Quraym	Saudi Arabia	1000	O*
909	P. de Mallorca	Spain	10	N*
909	Brookmans Pk	UK	140	A*,H*,L*,P*,S
903	Moorside Edge	UK	200	E*,R*
918	Moscow	Russia	75	N*
918	Madrid	Spain	20	B*,H*,M*,O*,R*
918	R.Ljubljana	Slovenia	600/100	N*,O*
927	Wolvertem	Belgium	300	E*,H*,L*,M*,O*,P*,R*
927	Velke Kostolany	Czech	40	M*
927	Izmir	Turkey	200	A*
936	Bremen	Germany	100	E*,H*,M*,O*,R*
936	Venezia	Italy	20	O*
945	Toulouse	France	300	M*,O*,R*
954	Brno (Dobrochov)	Czech	200	H*
954	Madrid (RCE)	Spain	20	H*,M*,O*,R*
963	Sofia	Bulgaria	150	M*
963	Pori	Finland	600	E*,H*,M*,O*,P*,R*
963	Paris	France	8	H*
963	Tir Chonail	Ireland (S)	10	L*,N*,O,S
963	Seixal (RRE)	Portugal	10	N*
972	Hamburg	Germany	300	E*,H*,M*,O*,R*
972	Cordoba (RNE1)	Spain	5	N*
981	Alger	Algeria	600/300	A*,H*,J*,O*,P*,R*
981	Megara	Greece	200	C*,B*
990	Berlin	Germany	300	H*,M*
990	R.Bilbao (SER)	Spain	10	M*
990	Redmoss	UK	1	S
990	Tywyn (BBC2)	UK	1	F*
999	Hoyerswerda	Germany	20	M*
999	Madrid(R.Popular)	Spain	20	H*,J,M*,R*
1008	Flevo (Hilv-5)	Holland	400	H*,J,M*,O*,R*
1008	Malaga	Spain	?	H*
1008	Aleks'ac/Beograd	Yugoslavia	400/200	O*
1017	Rheinsender	Germany	600	D*,E*,H*,J,M*,O*,P*,R*
1017	Biurgos (RNE5)	Spain	5	J*,M*
1026	Graz-Obil	Austria	100	J*,M*,O*
1026	Alicante (SER)	Spain	3	H*
1026	Reus (SER)	Spain	10	H*
1035	Lisbon (Prog3)	Portugal	120	M*,O*
1035	Tallinn	Estonia	500	E*,H*,R*
1044	Dresden	Germany	250	D.E*,H*,J,M*,O*,R*
1044	Sebaa-Aioun	Morocco	300	C*,J*,O*
1044	San Sebastian	Spain	10	J*
1053	Zaragoza (COPE)	Spain	10	M*,N*
1053	Burghhead (BBC1)	UK	20	E*
1053	Droitwich (BBC1)	UK	150	L*,P*,R*,S
1062	Kalundborg	Denmark	250	B*,O,E*,H*,J,M*,O*,R*
1071	Brest	France	20	I,M*,O*,R*,S*
1071	Lille	France	40	H*,K*
1071	Bilbao	Spain	5	M*
1080	Katowice	Poland	1500	M*,O*,R*
1089	Brookmans Pk	UK	150	F,H*,P
1089	Moorside Edge	UK	150	E*,R*
1089	Krasnodar	CIS	300	N*
1098	Nitra (Jarok)	Czech	1500	H*,O*,R*
1098	Lugo (RNE5)	Spain	10	M*
1107	Munich (AFN)	Germany	40	I*,M*,O*,R*
1107	Logrono (RNE5)	Spain	25	M*
1116	Bari	Italy	150	H*
1116	Bologna	Italy	80	T*
1116	Pontevedra (SER)	Spain	2	H*,M*
1125	La Louviere	Belgium	20	H*,M*,O
1125	Castellon	Spain	10	O*
1134	Valencia	Spain	10	H*,M*,O
1134	Zadar	Yugoslavia	1200	H*,M*,O*,P*,R*
1143	Stuttgart (AFN)	Germany	10	H*,L,M*,O*,P*,R*
1143	Reus (COPE)	Spain	2	H*
1152	Lerida (RNE5)	Spain	10	M*
1161	Strasbourg (Fr.Int)	France	200	H*,M*,O*
1170	Vila Real	Portugal	10	H*
1179	Santiago	Spain	10	H*,M*
1179	Solvesborg	Sweden	600	E*,H*,L*,M*,O*,P*,R*,S*
1188	Kuurne	Belgium	5	H*,M*,O
1188	Reichenbach	Germany	5	N*
1188	Szolnok	Hungary	135	M*,N*,R*
1197	Munich (VOA)	Germany	300	H,M*,O*,P*,R*
1197	Vitoria	Spain	5	O*
1197	Minsk	CIS	50	H*
1206	Bordeaux	France	100	H*,M*,O*
1206	Wroclaw	Poland	200	O*,R*,S*
1215	Lushnje	Albania	500	H*
1215	Kaliningrad	Russia	500	E*
1215	Castellon	Spain	2	H*
1215	COPE	Spain	2	J*,M*,N
1224	Vidin	Bulgaria	500	H*,J,M*,O*,R*
1224	San Sebastian	Spain	5	H*,J*
1233	Liege	Belgium	5	H*,M*,O*
1233	Cape Greco	Cyprus	600	H*,R*
1233	Nitra	Czech	40	M*,R*
1233	Praha (Zbraslav)	Czech	40/20	E*
1242	Marseille	France	150	E*
1251	Marcali	Hungary	500	M*,O*,R*
1251	Huisberg	Netherlands	10	M*,O*
1260	Valencia	Spain	20	H*,M*,O*,P*,R*
1269	Neumunster	Germany	600	D*,E*,H*,J,M*,O*,R*,S*,T
1269	Leon (COPE)	Spain	5	J*
1278	Strasbourg	France	300	H*
1278	Dublin/Cork	Ireland (S)	10	M*,O*,P*,R*
1287	Melnik (RFE)	Czech	400	H*,O*,R*
1296	Valencia (COPE)	Spain	5	H*,N*
1296	San Sebastian	Spain	5	M*,N*,O*
1296	Orfordness	UK	500	H*,M*,O*,R*
1305	Marche	Belgium	10/5	H*
1305	Orsenne (RNE5)	Spain	5	M*,O
1314	Krivosoy	Norway	1200	E*,H*,M*,O*,P*,R*,S*
1314	Valladolid	Spain	10	N*

Freq kHz	Station	Country	Power kW	Listener
1314	Dabiya	UAE	1000	N*
1323	Leipzig	Germany	150	B,H*,M*,P*,R*
1332	Rome	Italy	300	H*,M*,R*
1341	Lisnagarvey	Ireland (N)	100	E,H*,O*,R*,S
1341	Almeria (OCR)	Spain	2	N*
1341	Tarrasa (SER)	Spain	2	H*,M*,O*
1350	Nancy/Nice	France	100	H*,M*,O*,P*,R*
1350	Cesvaine/Kuldiga	Latvia	50	B*,N*
1359	Berlin	Germany	250/100	H*,M*
1359	Bhadravathi	India	20	6
1359	Melilla	Morocco	5	O*
1368	Foxdale (Manx R)	IOM	20	E*,J,M*,O*,S
1377	Lille	France	300	E*,H*,M*,O
1377	Kaliningrad	Ukraine	50	N*
1386	Kaliningrad	Russia	500	E*,H*,M*,O*,R*
1395	Lushnje(R.Tirana)	Albania	1000	H*,M*,O*
1395	Alicante	Spain	2	L
1404	Brest	France	20	H*,M*,O*,R*
1413	Zaragoza (RCE)	Spain	20	M*,O*,R*
1422	Heusweiler	Germany	1200/600	E*,H*,M*,O*,R*
1422	Palmyra	Latvia	50	N*
1431	Oresden	Germany	250	M*
1431	Nikolayev	Ukraine	400	N*
1440	Marnach (RTL)	Luxembourg	1200	E*,H*,M*,O*,P*,R*,S*
1440	Damman	Saudi Arabia	1600	N*
1449	Berlin	Germany	5	M*,O*
1458	Lushnje(R.Tirana)	Albania	500	E*
1467	Esfahan	Iran	200	E*
1467	Monte Carlo	Monaco	1000/400	H*,J,M*,O*,P*
1476	Wien-Bisamberg	Austria	600	E*,H*,M*,N*,P*
1485	Bournemouth	UK	2	O*
1494	Bayonne	France	4	H*,M*,O
1494	Clermont-Ferrand	France	20	E*,H*,M*,O
1494	St.Petersburg	Russia	1000	M*
1503	Stargard	Poland	300	E*,H*,J,M*,O*,R*
1512	Wolvertem	Belgium	600	D*,E*,H*,J,M*,O*,P*,R*,U
1521	Jeddah	Saudi Arabia	1000	A*,N*
1521	R.Beijing	China	500	N*,O*
1521	Kosice (Cizaitze)	Czech	600	H*,M*,O*
1521	Duba	Saudi Arabia	2000	C*,N*
1521	Oviedo	Spain	5	H*,O*
1530	Vatican R	Italy	150/450	H*,M*,O*,R*
1539	Mainflingen	Germany	700	D,E*,H*,M*,O*,P*,R*
1539	Valladolid	Spain	5	O*
1548	Trincomalee	Sri Lanka	600	G
1557	Nice	France	300	M
1557	Kaunas	Russia	75	H*
1566	Sarnen	Switzerland	300	E*,H*,M*,O*,R*
15				

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Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener	Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
568	Spectrum R.	I	7.50	E,K,L,Q	1161	R.Tay	I	1.40	A,E,I,J*
585	R.Solway	B	2.00	E,J,N	1161	Viking R.(Gt.Yks)	I	0.35	E,N,P
603	Invicta Snd(Coast)	I	0.10	E,J*,K,L,N,O,P,Q	1170	GNR Teeside	I	0.32	I*
603	R.Gloucester	B	1.0	K	1170	Ocean Sd.(SCR)	I	0.12	E,H,J*,K,Q
630	R.Bedfordshire	B	0.20	A,B,F,K,L,N,Q	1170	R.Orwell (SGR)	I	0.28	E,H,J*,Q
630	R.Cornwall	B	2.00	E,J*,K,Q	1170	Signal R.	I	0.20	EL
657	R.Clvdy	B	2.00	E,G,K,L,N,O,Q	1170	Swansea Sound	I	0.58	E,J*
657	R.Cornwall	B	0.50	E,K	1242	Invicta Snd(Coast)	I	0.32	E,I*,J*,Q
666	DevonAir R.	I	0.34	E,F,K,Q	1242	Isle of Wight R.	I	0.50	E,F,I*,J*,K,Q
666	R.York	B	0.80	B,E,G,N,P,Q	1251	Saxons R. (SGR-FM)	I	0.75	E,H,I*,J*,Q
729	BBC Essex	B	0.20	B,E,K,N,Q	1260	GWR (Brunel R.)	I	1.60	E,H,J*,K,Q
738	Hereford/Worcester	B	0.037	E,G,K,L,O,Q	1260	R.York	B	0.50	N
756	R.Cumbria	B	1.00	E,J,Q	1260	Sunrise R.	I	0.29	E,L,Q
765	BBC Essex	B	0.50	E,J*,K,L*,N,O,Q	1260	Marcher Sound	I	0.64	E,I*,J*,Q
774	R.Kent	B	0.70	E,G,K,Q	1278	Pennine R(Gt.Yks)	I	0.43	E,J*
774	R.Leeds	B	0.50	E,J*,N	1305	R.Hallam (Gt.Yks)	I	0.15	B,E,N
774	Severn Sound (3CR)	I	0.14	E,L	1305	Red Dragon (Touch)	I	0.20	E,J*,K,Q
792	Chiltern R.	I	0.27	A,E,K,N,O,P,Q	1323	R.Bristol (Som.Snd)	B	0.63	E,J*,Q
792	R.Foyle	B	1.00	J*	1323	S'them Sound(SCR)	I	0.50	E,K,Q
801	R.Devon	B	2.00	E,F,I*,K,Q	1332	Hereford R.(WGMS)	I	0.60	E,H,J*,N,Q
828	Chiltern R. (S.Gold)	I	0.20	E,H,Q	1332	Wiltshire Sound	B	0.30	A*,E,H,I*,J*,K,Q
828	R.Aire (Magic 828)	I	0.12	B,E,N	1359	Essex R.(Breeze)	I	0.28	A,E,Q
828	2CR	I	0.27	E,K,Q	1359	Mercia Snd(Xtra-AM)	I	0.27	E,L,Q
837	R.Cumbria	B	1.50	E,J*	1359	Red Dragon (Touch)	I	0.20	E,J*
837	R.Leicester	B	0.45	B,E,H,J*,K,L,N,Q	1359	R.Solent	B	0.85	E,K
855	R.Devon	B	1.00	E,H,K	1369	R.Lincolnshire	B	2.00	A*,J*,N,Q
855	R.Lancashire	B	1.50	E,J*	1369	R.Sussex	B	0.50	E,G,K,Q
855	R.Norfolk	B	1.50	E,K,N,Q	1369	Wiltshire Sound	B	0.10	E,J*,K
855	Sunshine R.	I	0.15	E,G,L,Q	1413	Sunrise R.	I	0.125	E,Q
873	R.Norfolk	B	0.30	E,G,K,Q	1431	Essex R. (Breeze)	I	0.35	A*,E,I*,J*,K,Q
936	GWR (Brunel R.)	I	0.18	E,K,L,Q	1431	R.210 (Cl. Gold)	I	0.14	E,J*,K,Q
945	R.Trent (GEM-AM)	I	0.20	E,J*,K,L,N,Q	1449	R.Peterboro/Cambus	B	0.15	E,G,J*,N,Q
954	DevonAir R.	I	0.32	E,K,Q	1458	GLR	B	50.00	C*,E,I,K,N,Q
954	R.Wyvern	I	0.16	E,F,L,Q	1458	R.Cumbria	B	0.50	E,J*
990	WABC (Nice & Easy)	I	0.09	E,L,Q	1458	R.Devon	B	2.00	E,K,Q
990	R.Aberdeen	B	1.00	P	1458	R.Newcastle	B	2.00	E
990	R.Devon	B	1.00	E,F,K,Q	1476	County Sound	I	0.50	D,E,G*,I,J*,K,Q
990	Hallam R. (Gt.Yks)	I	0.25	E,N,Q	1485	R.Humberside	B	1.00	B,E*,I,J*,N
999	R.Solent	B	1.00	E,F,G,H,K,Q	1485	R.Merseyside	B	1.20	A,E*,J*,L,O,P
999	R.Trent (GEM-AM)	I	0.25	E,N,Q	1485	R.Sussex	B	1.00	C*,E,G,K,Q
999	Red Rose R.	I	0.80	E,I*,J*	1503	R.Stoke-on-Trent	B	1.00	A,E,J*,L,Q
1017	WABC Shrewsbury	I	0.70	E,I*,J*,K,L,N,Q	1521	County Sound	I	0.64	ADEG*I*,J*,KM*OQ
1026	Downton R.	I	0.70	E,I	1530	Pennine R(Gt.Yks)	I	0.74	E*,I*,J*,N
1026	R.Cambridgeshire	B	0.50	B,E,G,H,N,P,Q	1530	R.Essex	B	0.15	E,O,Q
1026	R.Jersey	B	1.00	E,K,Q	1530	R.Wyvern	I	0.52	E,I,K,L,Q
1035	Northsound R.	I	0.78	E	1548	Capital R. (Gold)	I	97.50	C*,D,E,K,P,Q
1035	R.Kent	B	0.50	E,K,Q	1548	R.Bristol	B	5.00	E,J*,K
1035	R.Sheffield	B	1.00	N	1548	R.Forth (Max AM)	I	2.20	A,C*,E,I*,J*
1035	West Sound	I	0.32	E,I,J*	1548	R.Hallam (Gt.Yks)	I	0.74	B,E,N
1107	Moray Firth R.	I	1.50	A,E,G*,J*,P,Q	1557	Chiltern R.(Gold)	I	0.76	A,E,I*,J*,P,Q
1116	R.Derby	B	1.20	A,E,G*,J*,L,N	1557	Ocean Sound (SCR)	I	0.50	E,J*,K
1116	R.Guernsey	B	0.50	E,G,J*,K,Q,Q	1557	R.Lancashire	B	0.25	I
1152	BRMB (Xtra-AM)	I	3.00	E,L	1557	Tendring R.(Mellow)	I	?	E,I*,P*,Q
1152	GNR Newcastle	I	1.80	N	1584	R.Nottingham	B	1.00	B,E*,J*,N,Q
1152	LBC (L.Talkback R)	I	23.50	D*,E,G*,K,Q	1584	R.Shropshire	B	0.50	E,L
1152	R.Broadland	I	0.83	E,I*,Q	1584	R.Tay	I	0.21	E,I,J*
1152	R.Clyde (2)	I	3.06	I*	1602	R.Kent	B	0.25	E,G,I*,J*,K,Q
1161	GWR (Brunel R.)	I	0.16	E,F,K,Q					
1161	R.Bedfordshire	B	0.10	E,Q					
1161	R.Sussex	B	1.00	E,G,K,Q					

Listeners:
A: Leo Barr, Sunderland.
B: Vera Brindley, Woodhall Spa.
C: Geoff Crowley, Hafnarfjörður, Iceland.
D: John Eaton, Woking.
E: Gerry Haynes, Bushey Heath.
F: Simon Hockenhill, E.Bristol.
G: Sheila Hughes, Morden.
H: Rhoderick Illman, Oxted.
I: Ross Lockley, Stirling.
J: Eddie McKeown, Newry.
K: George Millmore, Wootton, IOW.
L: Sid Morris, Rowley Regis.
M: Graham Powell, Pontypridd.
N: Harry Richards, Barton-on-Humber.
O: Tom Smyth, Co.Fermanagh.
P: Ted Walden-Vincent, Gt.Yarmouth.
Q: John Wells, East Grinstead.

their ground wave signal is weak here, Sheila Hughes (Morden) logged it as SINPO 22212 at 1445. Reception may improve after dark when their sky wave signal reaches here. A 33333 rating was noted at 2228 by Vera Brindley in Woodhall Spa.

An unexpected change in propagation was noted one evening by Michael Williams in Redhill. At 2130 he heard Atlantic 252 in Clarkestown S.Ireland clearly with no trace of co-channel Tipaza, Algeria, but half an hour later Tipaza was loud and clear and Atlantic 252 was almost inaudible!

Medium Wave Reports

On January 31, Roy Merrall (Dunstable) heard several transatlantic signals. CJYQ in St.John's on 930kHz was readable by 0023UTC, on 1610 he heard the Caribbean Beacon, Anguilla at 0035, weak, but very clear Portuguese from R.Globo in Rio, Brazil was heard on 1220 at 0044. At 0100 he listened to a religious broadcast from VOAR in Mount Pearl, NF on 1210, a USA station was co-channel, but no ident could be obtained. Weak but readable signals from CBG in Gander were heard on 1400 at 0107. On February 1 Roy logged R.Globo as 13322 at 2328, VOAR was clearly audible at 2335 and by 0151 R.Globo was peaking S10243.

In Worthing, Ron Damp logged CJYQ as 22222 at 0150, VOAR as 33333 at 0215 and R.Globo as 32333 at 0240. Just before midnight on February 6, Steve Ferminger heard CJYQ for the first time in Oxford, by 0030 they were S10323. A co-channel station, possibly CFBC, was audible at 0130. A religious broadcast was heard on 1210 at 0145, probably from VOAR, but no ident was given.

Another station in St.John's, VPCM on 590, was heard at 0015 by Jim Willett in Grimsby, at S10233. He logged CJYQ as S10333 at 0025, CBG as S10222 at 0035 and WNEW in New York 1130 as S10222 at 0120. The ident from WNEW was heard on two nights by Ted Bardy in N.London, the signal was 24332 at 0321. He logged WOGI in Philadelphia on 1210 as 24332 at 0103; Caribbean Beacon as 13231 at 0150; CJYQ as 24332 at 0210; VOAR as 13431 at 0328; VPCM as 23231 at 0430.

Some of the signals from N.Africa and the M.East also reached here after dark. Good reception from several stations in Algeria, Egypt, Morocco and Tunisia was noted by George Millmore in Wootton. He also heard Qurayyat, Saudi Arabia on 900, at S10222.

Duncan Cadd (Northampton) has informed me that Hilversum Radio 3 via Lopic on 675 ceased at 2300 on February 15. It is now on v.h.f. as 'Radio 3 FM'.

John Wells (E.Grinstead) has noticed that BBC R.Bedfordshire (630

& 1161kHz) are calling themselves 'Three Counties Radio'. Although they still announce R.Bedfordshire fairly often he suspects their 'three counties travel news' could lead to confusion with 3CR/Severn Sound on 774kHz.

Short Wave Reports

Solar activity resulted in some ionospheric disturbances, fortunately they were short. Good reception from many areas has been reported.

Daily variations in propagation were evident in the 25MHz (11m) band. Sometimes signals from R.Australia via Darwin on 25.750 (Eng to NE.Af 0800-0855) were buried in the noise but more often they could be clearly heard here. In Rugby they rated 23222 at 0827 by Peter Pollard.

Broadcasts to other areas in this band came from UAE R, Abu Dhabi 25.690 (Ar to Far East 0900-1300) heard at 0900 by Richard Gosnell in Swindon; R.Norway Int, Oslo 25.730 (Norw to Asia, Aust 0800-0830 & 0900-0930, Norw* to W.Af 1300-1330. *Eng Sat/Sun) 45544 at 1300 by Ross Lockley in Stirling; R.Denmark via RNI 25.730 (Da

to Aust 0830-0900 & 0930-1000. Da to W.Af 1330-1400); DW via Julich 25.740 (Ger to E.Asia 1100-1355) 24222 at 1219 by Eddie McKeown in Newry; RFI via Issoudun 25.820 (Fr to Af 0700-1550) 25322 at 1200 by Simon Hockenhill in E.Bristol; R.Netherlands via Flevo 25.970 (Duto W.Af 1030-1125, Sun only) S10242 at 1100 by Kenneth Buck in Edinburgh.

Some of R.Australia's 21MHz (13m) signals have also reached here in the morning. The transmission to SE.Asia via Darwin 21.525 (Eng 0200-0800) was 42443 at 0748 in Newry; to Pacific areas via Carnarvon 21.590 (Eng 0100-0900) as S10344 at 0845 in Edinburgh; to S.Asia via Darwin 21.725 (Eng 0800-1300) as 44333 at 1115 in Woodhall Spa.

Other broadcasters noted in the morning were RTV Tunisia via Sfax 21.535 (Ar 0700-1800) 32232 at 0917 by Ron Galliers in Islington; R.Denmark via RNI 21.705 (Da to M.East, E.Af 0930-1000) 55555 at 0930 by Zacharias Liangas in Thessaloniki, Greece; R.Austria Int via Moosbrunn 21.490 (Ger, Eng to Australasia 0800-1100) 35223 at 1030 by Darren Beasley in Bridgwater; UAE R.Dubai 21.605 (Ar, Eng to Eu 0615-1545) S10444 at 1034 by

Gerry Haynes in Bushey Heath; R.Moscow 21.515 (Eng to M.East, Af 1000?-1300) 55444 at 1038 by Tim Allison in Middlesbrough; BSKSA, Saudi Arabia 21.505 (Ar [Home Service]) 1030-1700) S10444 at 1050 by Bill Clark in Rotherham; R.Pakistan, Islamabad 21.520 (Eng to Eu 1100-1120) 33443 at 1104 by Peter Polson in St.Andrews; Vatican R, Italy 21.850 (Port, Spto S.Am 1045-1215) 54343 at 1128 by Rhoderick Illman in Oxted; BBC via Ascension Is 21.660 (Eng to Af 0730-1745) 44444 at 1200 in E.Bristol.

Later, R.Yugoslavia, Belgrade 21.605 (Eng to Aust 1230-1300) was 43343 at 1232 by Chris Shorten in Norwich; RFI via Issoudun 21.645 (Fr, Eng to E.U.S.A, C.Am 1030-1300) 33333 at 1256 in Rugby; SRI via Sottens? 21.820 (Eng, Fr to SE.Asia 1300-1400) 34333 at 1300 in Morden; BBC via Limassol 21.470 (Eng to M.East, E.Af 0430-1615) S10222 at 1339 by Julian Wood in Elgin; RAI, Italy 21.560 (It to USA 1400-1430) 43443 at 1400 by Robert Connolly in Kilkeel; HCJB, Ecuador 21.480 (Eng to M.East 1630-1745) 33333 at 1630 by Harry Richards in Barton-on-Humber; also 21.455 (world-wide u.s.b. + p.c.)

Long Medium & Short

35543 at 1635 by **David Edwardson** in Wallsend; WCSN, Maine 21.640 (Eng to N/E.Af 1600-1955) 23333 at 1708 by **Ken Milne** in Basingstoke; WYFR via Okeechobee 21.615 (Eng to Eu, Af 1600-1700) SIO323 at 1640 by **Cliff Stapleton** in Torquay; also 21.500 (Eng to Eu, Af 1700-1900) 44444 at 1720 by **John Eaton** in Woking and 21.525 (Eng to Eu 2000-2300) 21422 at 2235 by **Geoff Crowley** in Hafnarfjordur, Iceland; R.Nederlands via Bonaire 21.590 (Eng to Af 1730-2025) SIO434 at 1830 by **Tom Smyth** in Co.Fermanagh; VOA via Greenville 21.485 (Eng to Af 2000-2200) 55534 at 2049 by **Ronald Kilgore** in Co.Londonderry.

The **18MHz (15m)** broadcast to Europe from WEWN in Birmingham, USA on 18.930 (Eng, Du, Fr 1300-1800) was 45554 at 1459 in Wallsend.

In the **17MHz (16m)** band two R.Australia broadcasts may be heard in the morning: 17.695 via Darwin (Eng to SE.Asia 0700-0900) SIO333 at 0800 by **Cyril Kellam** in Sheffield; 17.750 via Carnarvon (Eng to Asia 0000-0400, 0700-0900) 34232 at 0803 in Hafnarfjordur. Also noted were R.Pakistan, Islamabad 17.900 (Eng to Eu 0800-0845) 45244 at 0805 in Newry; KHBI, N.Mariana Is 17.555 (Eng to NE.Asia 0800-1155) 33223 at 0902 in Islington; R.Finland via Pori 17.800 (Eng to Aust, S.Asia 0900-0955) 54444 at 0902 in Norwich; Voice of Israel, Jerusalem 17.545 (Eng to USA, W.Eu 1100-1130) 43333 at 1129 in Woodhall Spa; AIR via Aligarh 17.387 (Ta, Tel to SE.Asia 1115-1245) 33333 at 1145 in Kilkeel; R.Sofia, Bulgaria 17.780 (Eng 1130-1300) SIO222 at 1200 in Co.Fermanagh.

After mid-day REE via Noblejas? 17.890 (Sp to M.East 0900-1700) 43443 at 1201 in Oxted; HCJB 17.490 (Eng, u.s.b. + p.c.) was SIO322 at 1215 in Rotherham; R.Cairo, Egypt 17.595 (Eng to S.Asia 1215-1330) 22222 at 1230 in Morden; R.Yugoslavia, Belgrade 17.740 (Eng to USA 1200-1300) SIO555 at 1235 by **Philip Rambaut** in Macclesfield; Africa No.1, Gabon 17.630 (Fr, Eng to W.Af 0700-1600) 45534 at 1300 in Stirling; RTM via Tanger 17.595 (Fr, Eng to N.Af, M.East 1400-1700) 54444 at 1445 in Woking; HCJB Quito 17.790 (Eng, Ar to M.East 1630-1800) 34333 at 1643 in St.Andrews; RFI via Issoudun 17.795 (Eng to E.Af, India 1600-1700) 44444 at 1650 by **Ernest Randall** in Dalton; RCI via Sackville 17.820 (Eng to Eu 1700-1730) SIO434 at 1715 in Torquay; also 17.820 (Eng to Af 1800-1830) 34443 at 1800 in Middlesbrough; KVOH, Rancho Simi 17.775 (Eng, Sp to USA 1200-0400) 35333 at 1858 by **Chris Haigh** in Huddersfield; R.Nederlands via Bonaire 17.605 (Eng to W.Af 1930-2030) SIO454 at 2000 in Edinburgh.

The **15MHz (19m)** band is still the hub of activity for many listeners. R.Australia's Shepparton broadcast to Pacific areas 15.240 (Eng 0030-0830) was 24532 at 0820 in Wallsend; KHBI, N.Mariana Is 15.665 (Eng to Oceania

Tropical Bands

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2036	B.F.G.H.D.O.S.W.X
2.325	ABC Tennant Creek	Australia	1930	B.G.H.O.O.S.W
2.340	Fujian 1, Fuzhou	China	0435	C
2.485	ABC Katherine	Australia	1931	B.O.S
2.495	R Madagascar	Madagascar	2210	X
2.850	KCBS Pyongyang	N.Korea	2018	B
3.200	TWR	Swaziland	1926	F.H
3.205	AIR Lucknow	India	0115	F.H
3.210	R.Mozambique	Mozambique	1801	F.Q
3.220	R.Togo, Lome	Togo	1851	H
3.240	TWR	Swaziland	1801	F.H
3.255	BBC via Maseru	Lesotho	2115	W
3.270	SWABC 1, Namibia	S.W.Africa	1835	W
3.279	La Voz del Napo	Ecuador	0357	F
3.285	R.Belize	Belize	0440	C
3.300	R.Cultural	Guatemala	0016	F.F.G
3.315	AIR Bhopal	India	1656	F.H.Q.V.W
3.316	SBS Goderich	Sierra Leone	2040	G.H.S.W
3.320	R.Orion	S.Africa	2201	F
3.325	FRCN Lagos	Nigeria	2002	H.W
3.330	R.Kigali	Rwanda	2040	S
3.338	R.Maputo	Mozambique	1846	H
3.345	AIR Jammu	India	0005	F
3.355	R.Botswana	Gabaron	1820	F.H.S.W
3.355	AIR Kurseong	India	1627	H
3.365	R.Rebelde, La Julia	Cuba	0019	C.G
3.365	GBC Radio 2	Ghana	1955	F.G.H.M.P.S.V.W
3.370	R.Tezulutlan	Guatemala	0424	F
3.375	AIR Gauhati	India	1605	H
3.380	RRI Malang	Indonesia	0120	F
3.380	R.Malawi	Malawi	0542	P
3.385	R.Educacao Rural, Tefe	Brazil	0210	V
3.385	RFO Cayenne	Guiana	0115	C
3.390	R.Candip Bunia	Zaire	1706	F
3.390	AIR Delhi	India	1611	H.P.X
3.395	BBC Kranji	Singapore	1635	F.H.P.W
3.395	KBS Seoul	Korea	0010	C
3.395	PBS Hubei Wuhan	China	2127	Q
3.395	AIR Gorakhpur	India	1550	Q
3.395	Qinghai PBS, Xining	China	0005	C
3.395	BBC Skelton	England	2000	C.D.F.K.N.P.R.V
3.395	Xinjiang PBS, Urumqi	China	0005	C
3.395	RFE/RL Munich	Germany	1834	C.F.P.V
3.395	RFI Paris	France	2010	C.D.F.K.L.P.R.V
3.395	RFE Munich	Germany	1916	C.F.L.P
3.395	BBC Skelton	England	1917	C.F.P.V
3.395	VOA Munich	Germany	2000	C.D.F.P.R.U.V
3.395	China R via SRI Berne	Switzerland	2200	J.R
3.395	SRI Beromunster	Switzerland	1837	C.D.F.J.P.V
3.395	Xinjiang BS, Urumqi	China	2201	J
3.395	RFE Munich	Germany	1913	F
3.395	DW via Julich	Germany	2000	C.F.J.K.P.R.U.V
3.395	Channel Africa, Jo'burg	S.Africa	1851	Q
4.000	Bofoussam	Cameroon	1945	H.Q.S
4.005	RRI Padang	Indonesia	1605	H
4.020	China R, Beijing	China	2203	J
4.025	Xizang PBS, Lhasa	Tibet	0010	C
4.081	Ulan Bator 1	Mongolia	2315	F
4.130	V of the Strait 1	China	1545	J.Q
4.190	CPBS Minority Sce	China	2204	F.J
4.220	Xinjiang PBS, Urumqi	China	1637	F.J
4.330	Xinjiang BS, Urumqi	China	0016	F
4.470	R.Movima	Bolivia	2340	O
4.500	Xinjiang BS, Urumqi	China	2302	F.J,X
4.600	R.Baghdad	Iraq	1848	J
4.735	Xinjiang	China	2308	C.E.F.H.J.P.R.V
4.740	R.Afghanistan, Kabul	Afghanistan	0140	V
4.750	Nei Menggu PBS	China	0017	F
4.750	Xizang BS, Lhasa	Tibet	0510	C
4.755	R.Educ CP Grande	Brazil	0147	F
4.755	R.Maranhao	Brazil	0020	C
4.760	Yunnan PBS, Kunming	China	2207	F.G.H.J
4.760	AIR Port Blair	India	1619	J
4.765	Brazzaville	PR Congo	2018	F.R
4.770	FRCN Kaduna	Nigeria	2147	A.C.F.G.H.J.L.O.P.R.S.V
4.775	R.Amarea	Brazil	0047	F
4.775	R.Gabon, Libreville	Gabon	2138	H.J.W
4.775	AIR Gauhati	India	1626	H.J
4.780	RTD	Djibouti	1900	F.J.P.O.S
4.785	R.Baku	Azerbaijan	1653	A.H.W
4.785	R.Tanzania	Tanzania	1938	F.J
4.790	AIR Shillong	India	0120	C.F
4.790	Azad Kashmir R.	Pakistan	1549	H.J.L
4.790	TWR Manzini	Swaziland	1810	H.S
4.795	R.Nueva America	Bolivia	0300	F
4.800	PBS Xinjiang	China	0020	C.V
4.800	R.Popular Cuenca	Ecuador	0257	F
4.800	UNBS Lesotho	Maseru	1810	J.S
4.800	R.Onda Azul	Peru	0125	C
4.805	R.Nac Amazonas	Brazil	2344	C.F.J.V.W
4.810	Voz de Galapagos	Ecuador	0125	C
4.810	R.Suid-Afrika	So Africa	1805	H.J.Q.V.W
4.815	China R, Beijing	China	1535	Q
4.815	R.diff TV Burkina	Ouagadougou	2208	F.J.S.V
4.820	La Voz Evangelica	Honduras	0425	F
4.830	Gaborone	Botswana	2150	H.J.P.S
4.830	R.Tachira	Venezuela	2234	C.E.F.G.I.J.O.W
4.832	R.Reloj	Costa Rica	0411	E.P
4.835	R.Tezulutlan, Coban	Guatemala	0240	P
4.835	RTM/Bamako	Mali	2130	A.F.H.J.L.P.R.S.V
4.840	R.Valera, Trujillo	Venezuela	0035	C.F
4.845	ORFM Nouakchott	Mauritania	2136	C.F.G.H.I.J.L.O.P.R.S.V
4.850	R.Yaounde	Cameroon	1830	F.J.P.R.V
4.850	AIR Kohima	India	0000	H.J.S
4.850	Ulan Bator 1	Mongolia	0000	J
4.860	AIR New Delhi	India	0000	F.H.J
4.865	L.V. del Cinaruco	Colombia	0007	C.E.F.G.P.W.X
4.870	R.Bangladesh	Bangladesh	1922	J
4.870	R.Cotonou	Benin	2145	C.F.H.I.J.P.R.S.W

Freq MHz	Station	Country	UTC	DXer
4.880	R.Bangladesh	Dacca	1551	Q
4.885	Em Reg Zaire	Angola	2148	Q
4.885	R.Clube do Para	Brazil	0210	F
4.885	China R, Beijing	China	1508	H.Q
4.885	Voice of Kenya	Kenya	1852	J.S.V
4.890	RFI Paris	via Gabon	0414	C.F.J.P
4.895	Voz del Rio Arauca	Colombia	0032	C.F.J
4.895	AIR Kurseong	India	1629	J
4.900	V. of the Strait 2	China	2036	H.J.Q.S
4.900	RTG Conakry	Guinea	1636	F
4.905	R.Nat.N'djamena	Chad	2050	A.C.F.H.J.P.R.S.V
4.910	Tennant Creek	Australia	2135	H.J.S
4.910	V of P Kampuchea	Cambodia	2316	Q
4.910	R.Zambia, Lusaka	Zambia	1837	J.Q.S
4.915	R.Anhanguera	Brazil	2319	F.H.X
4.915	R.Nac Macapa	Brazil	2023	Q
4.915	PBS Guangxi, Nanning	China	2149	Q
4.915	GBC-1, Accra	Ghana	2135	F.G.H.J.L.P.R.S.V.S
4.915	Voice of Kenya	Kenya	1840	S
4.920	ABC Brisbane	Australia	1914	J.S
4.920	R.Quito	Ecuador	0130	C
4.920	AIR Madras	India	0040	W
4.925	R.Nacional, Bata	Eq.Guinea	1908	J
4.935	R.Capixaba	Brazil	0222	F.J.P
4.935	Voice of Kenya	Kenya	2150	A.F.H.J.P.S.W
4.950	R.Nac Luanda	Angola	2055	J.S
4.955	R.Marajoara, Belem	Brazil	2157	C.E.F.J.P
4.958	Baku	Azerbaijan	2005	H
4.960	R.Federacion, Sucua	Ecuador	0631	F
4.960	AIR New Delhi	India	0040	C.J.L.P.W
4.970	PBS Xinjiang	China	1514	J
4.970	R.Rumbos, Caracas	Venezuela	2349	C.E.F.G
4.975	R.Uganda, Kampala	Uganda	1840	F.H.J.P.S.W
4.980	PBS Xinjiang	China	1612	J
4.980	Ecos del Torbes	Venezuela	2305	C.E.F.G.J.P.R.X
4.985	R.Brazil Central	Brazil	0132	F
4.990	AIR via Madras	India	0044	P
4.990	FRCN Lagos	Nigeria	2158	J.L.P.S
4.990	R.Ancash, Huaraz	Peru	2307	P
5.005	R.Nacional, Bata	Eq.Guinea	1925	F.P.R
5.005	R.Nepal, Kathmandu	Nepal	1626	C.H
5.010	R.Garoua	Cameroon	2132	C.F.G.H.J.L.O.P.R.S
5.010	R.Malagasy	Madagascar	1730	Q
5.015	R.Brazil Tropical	Brazil	0450	F
5.020	PBS-Jiangxi Nanchang	China	0055	C
5.020	ORTN Niamey	Niger	2019	F.H
5.025	R.Parakou	Benin	2153	G.H.J.L.P.S
5.025	R.Rebelde, Habana	Cuba	0002	C.F.J.W
5.025	R.Uganda, Kampala	Uganda	1851	J
5.030	R.Catolica, Quito	Ecuador	0005	G.R.W
5.030	R.Continente Caracas	Venezuela	0437	F
5.035	R.Aparecida	Brazil	0439	F
5.035	R.Bangui	C.Africa	2206	F.H.J.S.W
5.040	Voz del Upano, Macas	Ecuador	0423	J
5.045	R.Cultura do Para	Brazil	0035	F.P.R.W
5.047	R.Togo, Lome	Togo	2114	F.G.H.J.O.P.S.V.W
5.050	Voice of the Strait	China	2132	S
5.050	Voz de Yopal, Yopal	Colombia	0140	C
5.050	Em Jesus Gran Poder	Ecuador	0048	E.F.J.W.X
5.050	R.Tanzania	Tanzania	1817	H.J.W
5.052	SBC H-I	Singapore	1444	F.J.O.W
5.055	Faro del Caribe	Costa Rica	0205	F.P
5.055	RFO Cayenne(Matoune)	Fr Guiana	2219	C.J.P
5.060	PBS Xinjiang	China	1512	J
5.060	R.Nac.Progr.	Ecuador	0100	C
5.075	Caracol Bogota	Colombia	2208	C.G.H.J.O.P.R.T.V.X
5.090	Taiwan 2 Sce, Beijing	China	1609	J
5.097	R.Eco, Iquitos	Peru	0004	F.J
5.191	R.Nuevo Continente	Peru	0135	X
5.290	R.Moundou	Chad	0200	X
5.420	PBS Minority Sce	China	1606	F.J
5.440	Xinjiang PBS, Urumqi	China	1606	J
5.800	Xinjiang BS, Urumqi	China	1551	J

DXers:

- A. Leo Barr, Sunderland.
- B. Tim Bucknall, Congleton.
- C. Robert Connolly, Kilkeel.
- D. John Eaton, Woking.
- E. David Edwardson, Wallsend.
- F. Steve Farminger, Oxford.
- G. Ron Galliers, N.London.
- H. P. Gordon Smith, Kingston, Moray.
- I. Chris Haigh, Huddersfield.
- J. Gerry Haynes, Bushy Heath.
- K. Simon Hockenbuhl, E.Bristol.
- L. Sheila Hughes, Morden.
- M. Rhoderick Illman, Oxted.
- N. Ronald Kilgore, Co. Londonderry.
- O. Ross Lockley, Stirling.
- P. Eddie McKeown, Newry.
- Q. Roy Merrall, Dunstable.
- R. Sid Morris, Rowley Regis.
- S. Fred Pallant, Storrington.
- T. Roy Patrick, Derby.
- U. Peter Pollard, Rugby.
- V. Harry Richards, Barton-on-Humber.
- W. Vladimir Vassilev, Bratislava, Slovakia.
- X. Jim Willott, Grimsby.

Long Medium & Short

Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Donebach	Germany	500	A,B*,C,D,E,G,I,J*,K,L,O
153	Brasov	Romania	1200	G*,I
162	Allouis	France	2000	A,B*,C,D,E,G,I,J*,K,L,M,O
171	Kaliningrad	Russia	1000	G,I,J*,K*,L
177	Oranienburg	Germany	750	E,G,I,J*,K,L
183	Saarouis	Germany	2000	A,D,E,G,I,J*,K,L,M,O
189	Caltanissetta	Italy	10	H*
198	BBC Droitwich	UK	500	A,C,E,F*,G,I,J,M,O
207	Munich	Germany	500	C,D,E,G,I,K,L,O
207	Reykjavik	Iceland	100	B*
207	Azilal	Morocco	800	O
207	Kiev	Ukraine	500	H*
216	RMC Roumoules	S.France	1400	A,D,E,G,I,J*,K,L,M
216	Oslo	Norway	200	G*,I,K*
225	Raszyn Rasv TX	Poland	?	A*,E,G*,J*,K*,L,M
225	Surgut	Siberia	150	H*
234	Beldweiller	Luxembourg	2000	C,D,G,I,J,K,L*,O
234	St.Petersburg	Russia	1000	G*,I*
243	Kalundborg	Denmark	300	A,D,E,G,I,J*,K,L,O*
252	Tipaza	Algeria	1500	I,O*
252	Atlantic 252	S.Ireland	500	A,B*,C,D,F,G,I,J,K,L,M,N
261	Burg	Germany	200	D,I,K,L*,O
261	Moscow	Russia	2000	F*,G*,J*,K*,L*
270	Topolna	Czech	1500	D*,G,I,K,L,M,O*
270	Orenburg	CIS	15	G*,K
279	Minsk	CIS	500	G*,H*,J*,K,L

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Listeners:

- A: Vera Brindley, Woodhall Spa.
- B: Geoff Crowley, Hafnarfjordur, Iceland.
- C: John Eaton, Woking.
- D: Simon Hockenhill, E.Bristol.
- E: Sheila Hughes, Morden.
- F: Ronald Kilgore, C.Londonderry.
- G: Eddie McKeown, Newry.
- H: Roy Merrill, Dunstable.
- I: George Millmore, Wootton, IoW.
- J: Sid Morris, Rowley Regis.
- K: Fred Pallant, Strorrington.
- L: Harry Richards, Barton-on-Humber.
- M: Tom Smyth, Co. Fermanagh.
- N: Ted Walden-Vincent, Gt. Yarmouth.
- O: Michael Williams, Redhill.

0800-0955) 33333 at 0900 in Islington; AIR via Aligarh 15.050 (Eng to NE.Asia, Aust 1000-1100) 33333 at 1015 in Morden; R.Austria Int via Moosbrunn 15.450 (Ger, Eng, Fr to Aust, Far East 0800-1400) 45534 at 1040 in Worthing; SRI via Sottens? 15.505 (Eng to Aust, Far East 1100-1130) SIO444 at 1100 in Co.Fermanagh; R.Australia via Carnarvon 15.170 (Chin, Eng to Asia 0900-1430) 43122 at 1154 in Bushey Heath.

During the afternoon R.Prague, Czech 15.355 (Eng, Fr, Sp to Eu 1130-1257) 43343 at 1225 in Oxted; VOA via Tinang 15.115 (Eng to E/SE.Asia, Pacific 1100-1400) SIO212 at 1230 in Macclesfield and via Selebi-Phikwe 15.445 (Eng to Af 1600-1800) SIO222 at 1607 in Elgin; Romania Int, Bucharest 15.365 (Eng to Eu 1300-1355) was 32333 at 1310 in Rugby; R.Tashkent, CIS 15.470 (Eng to Asia 1330-1400) 32342 at 1330 in Middlesbrough; R.Iraq Int, Baghdad 15.250 (Eng to Eu, M.East 1400-1700) 35333 at 1430 by **Roy Patrick** in Derby; Vatican R, Italy 15.090 (In to India 1500-1600) SIO434 at 1520 in Torquay; R.Veritas Asia, Philippines 15.140 (Eng ident 1500, Pil 1505-1600) 42333 at 1525 in Dalton; R.Sweden via Karlsborg? 15.270 (Fr, Eng, Sw to M.East, E.Af 1500-1715) 34333 at 1620 in Woking; DW via Cyclops 15.105 (Eng to S.Asia 1600-1650) 34433 at 1639 in Basingstoke.

In the evening RCI via Sackville 15.325 (Eng to Eu 1700-1730) 33333 at 1712 in St.Andrews; Channel Africa, Johannesburg 15.430 (Eng to Af 1600-1800) 54444 at 1712 in Norwich; Vatican R, Italy 15.090 (Fr, Eng, Port 1700-1830) 54554 at 1730 in Bridgwater; WWCR, Nashville 15.685 (Eng to Eu, E.USA 1000-0000) 54444 at 1800 in Barton-on-Humber; KTBN, Salt Lake City 15.590

in Hafnarfjordur.

There is plenty to interest the listener in the **13MHz (22m)** band too! In the daytime WYFR via Okeechobee 13.695 (Fr to Canada 1100-1300) was 13443 at 1141 by **Richard Radford-Reynolds** in Guildford; R.Sofia, Bulgaria 13.670 (Eng to M.East 1130-1300) 54344 at 1157 in Norwich; R.Australia via Carnarvon 13.605 (Eng, Chin to N/SE.Asia 0900-1430) 32332 1215 in Kilkeel; WSHB, Cypress Creek 13.760 (Eng to N/C.S.Am 1200-1555) 32222 at 1218 in Islington; R.Austria Int via Moosbrunn 13.730 (Eng to Eu, USA 1230-1300) 55444 at 1241 in Middlesbrough; UAE R.Dubai 13.675 (Eng to Eu 1330-1355) 33222 at 1338 in Woodhall Spa; SRI via Sottens 13.635 (Eng to C/SE.Asia 1500-1530) 43444 at 1500 by **Leo Barr** in Sunderland; R.Pakistan, Islamabad 13.590 (Eng to M.East 1600-1630) 43232 at 1620 in Dalton; KHBI, N.Mariana Is 13.625 (Eng to SE.Asia, India 1000-1755) SIO333 at 1645 in Rotherham.

Later, R.Australia via Carnarvon 13.755 (Eng to Asia 1430-1800) was 44434 at 1718 in Basingstoke; AWR (KSDA) Agat, Guam 13.720 (Eng to Asia 1700-1900, Sat/Sun only) 32322 at 1732 in Newry; WEWN Birmingham, Alabama 13.740 (Eng to ? 1800-2000) 44333 at 1800 in Barton-on-Humber; R.Kuwait 13.620 (Eng to Eu, USA 1800-2100) 34222 at 1831 in Co.Londonderry; VOA via Selebi-Phikwe 13.710 (Eng to Af 1600-2200) was SIO444 at 1900 in Co.Fermanagh; WHRI, South Bend 13.760 (Eng to Eu, Canada 1700-0000) 45544 at 2000 in Stirling and 44444 at 2000 in Hafnarfjordur; WCSN, Scotts Corner 13.770 (Eng to Eu, M.East, USA 2000-2155) SIO444 at 2005 in Edinburgh; DW via Julich? 13.610 (Ger to Eu, Af

(Eng to E.USA 1600-0200) 34333 at 1817 in Co.Londonderry; WINB, Red Lion 15.295 (Eng to Eu, N.Af 1900-2100) 24312 at 1908 in Newry; RNB Brasilia, Brazil 15.265 (Eng, Ger, Eu 1800-2100) SIO343 at 2000 in Edinburgh; R.New Zealand Int via Rangitiki 15.120 (Eng to Pacific areas 1850-2138) 22422 at 2013 in Huddersfield; RAE, Argentina 15.345 (Ar, Eng, It, Fr, Ger, Sp to Eu 1700-0100) SIO332 at 2136 in Rotherham; BBC via Ascension Is 15.400 (Eng to W/C.Af 1500-2315) 25323 at 2200 in E.Bristol; R.Australia via Darwin 15.575 (Chin, Eng to Asia 2200-2300) 45544 at 2229

2000-2200) 24222 at 2049 in Oxted; WWCR, Nashville 13.845 (Eng 1200-0100) 45444 at 2100 in Huddersfield; RCI via Sackville 13.650 (Eng to Eu 2200-2230) 45544 at 2205 in Worthing; R.Austria Int, via Moosbrunn 13.730 (Ger, Sp, Eng to S.Am 2200-0000) 33333 at 2348 in Rugby. Some of the **11MHz (25m)** broadcasts to Europe come from Vatican R, Italy 11.740 (It, Fr, Eng 1045-1145) 44444 at 1110 in Rugby; R.Prague, Czech 11.990 (Eng 1130-1157) 44434 at 1130 in Worthing; R.Sofia, Bulgaria 11.630 (Eng 1130-1300) 34433 at 1132 in St.Andrews; R.Moscow, Russia 12.070 (Eng 0830-1300) SIO323 at 1200 in Co.Fermanagh; R.Romania Int, Bucharest 11.940 (Eng 1300-1355) 44444 at 1305 in Dalton; R.Pakistan, Islamabad 11.570 (Ur, Eng 1700-1900) SIO333 at 1704 in Elgin; R.Portugal via S.Gabriel 11.740 (Eng 1900-1930) 45544 at 1915 in Middlesbrough; Voice of Israel, Jerusalem 11.587 (Eng 2000-2030, also to N/C.Am) 55544 at 2010 in Basingstoke; R.Damascus, Syria 12.085 (Eng 2005-2105) 53543 at 2015 in Bridgwater; AIR via Bangalore? 11.620 (Eng, Hi 1745-2230) 34243 at 2108 in Newry; R.Japan via Moyabi 11.925 (Eng 2100-2200) 43333 at 2127 in Islington; Wings of Hope, Lebanon 11.530 (Eng 2100-2300) 45444 at 2207 in Huddersfield; VOFC via WYFR 11.915 (Eng 2200-2300) 54444 at 2232 in Co.Londonderry.

Among those noted to other areas in the day were FEBCV via Bocaue 11.690 (Eng to New Guinea, China 0900-1100?) 24443 at 0912 in Guildford; KTWR, Guam 11.700 (Chin to Asia 1145?-1600) 33433 at 1128 in Thessaloniki; AIR via Delhi 11.760 (Eng to SE.Asia 1330-1500) 53433 at 1419 in Bushey Heath; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Af 1400-1600) 43333 at 1450 in Woodhall Spa; R.Damascus via Adra 12.085 (Ar [Home Service] to M.East 0500-1730) SIO444 at 1453 by **Ted Walden-Vincent** in Gt.Yarmouth; R.Australia via Shepparton 11.855 (Eng to SE.Asia 1300-1630) SIO111 at 1540 in Macclesfield; R.Pakistan, Islamabad 11.570 (Eng to M.East, N/W.Af 1600-1630) 44544 at 1605 in Stirling; AWR (KSDA) Agat, Guam 11.980 (Eng to Asia 1600-1700) 33333 at 1645 in Morden.

Later, R.Netherlands via Talata Volon 11.655 (Fr to W/S.Af 1930-2125) SIO444 at 2009 by **John Coulter** in Winchester; AIR via Aligarh 11.715 (Eng to Aust, NZ 2045-2230) 23332 at 2105 in Oxted; R.Nac da Amazonia, Brazil 11.780 (Port 0800-2200) SIO322 at 2130 in Rotherham; R.Australia via Brandon 11.880 (Eng, Fr to New Guinea? 2100-0100) 45454 at 2115 in Hafnarfjordur and SIO333 at 2300 in Edinburgh; VOFC via WYFR 11.915 (Eng to Eu 2200-2300) SIO433 at 2200 in Sheffield; Voice of Israel, Jerusalem 11.603 (Eng to Eu, USA 2230-2300) 54344 at 2255 in Norwich; UAE R, Abu Dhabi 11.710 (Ar, Eng to USA 2300-0000) 44333 at 2301 by

Robin Harvey in Bourne; BBC via Ascension Is 11.750 (Eng to S.Am 2200-0330) noted as 'fair' at 2331 by **Tim Bucknall** in Congleton; China R, Beijing 11.715 (Eng to E.USA 0000-0100) 43443 at 0030 in Kilkeel.

R.New Zealand has been reaching the UK in the **9MHz (31m)** band! They beam to Pacific areas on 9.700 (Eng 0700-1200) 34543 at 0813 in Wallsend and SIO433 at 1202 in Rotherham; also 9.675 (Eng 1650-1850), 44423 at 1726 in Basingstoke. R.Australia was logged here on 9.710 from Shepparton (Eng to Asia 1100-1230) as SIO111 at 1146 in Macclesfield; 9.560 from Carnarvon (Eng to Pacific areas 1430-1800) as SIO333 at 1629 in Gt.Yarmouth, also 9.645 to Asia (Eng 2100-0000) as SIO323 at 2254 in Redhill.

Also noted were R.Netherlands via Irkutsk?, CIS 9.860 (Eng to E/SE.Asia 0930?-1125?) 24423 at 1002 in Guildford; WSHB, Cypress Creek 9.495 (Eng to USA, Caribbean 1000-1355) 33443 at 1103 by **Martin Dale** in Stockport; Voice of Turkey, Ankara 9.445 (Eng to USA 2300-2350), heard at 2300 by **Michael Griffin** in Ross-on-Wye; UAE R, Abu Dhabi 9.605 (Eng to USA 2200-0000) SIO222 at 2300 by **Francis Hearne** in N.Bristol; R.Nac del Paraguay 9.735 (Sp 0800-0400) 33333 at 0050 in Kilkeel.

Whilst beaming to Europe, TWR Monaco 9.485 (Eng 0735-0945) 33222 at 0840 in Bourne; Voice of Israel, Jerusalem 9.390 (Heb [Home Service relay] 0400-2300) 34323 at 0956 in Thessaloniki; Voice of Vietnam, Hanoi 9.840 (Eng 1600-1630) 44334 at 1615 in Dalton; VOIRI, Iran 9.022 (Ger, Eng, Fr, Sp 1730-2130) SIO444 at 1833 in Winchester; KHBI, N.Mariana Is 9.355 (Eng 1800-2000, also to M.East) SIO333 at 1930 in Elgin; R.Pyongyang, N.Korea 9.640 (Eng, Fr 2000-2150, also to M.East, Af) 33323 at 2119 in Sunderland; AIR via ? 9.950 (Hi, Eng 1945-2230) 44333 at 2119 in Bridgwater; R.Tirana, Albania 9.760 (Eng 2200-2230) SIO333 at 2200 in Sheffield; R.Yugoslavia, Belgrade 9.505 (Eng 2200-2245) 43332 at 2215 by **Jon Snooks** in Andover.

In the **7MHz (41m)** band WEWN Birmingham, USA 7.465 (Eng to Eu 0500-1000) 55555 at 0956 in Guildford; R.Australia via Carnarvon 7.260 (Eng to Asia 1800-2100) 32222 at 1851 in Sunderland; WYFR via Okeechobee 7.355 (Eng to Eu, Af 2000-2300) 33233 at 2128 in Woodhall Spa; CSN (Eng to Eu 2000-2355) 45544 at 2245 in Andover; BBC via Limassol 7.180 (Eng to E.Eu 2300-0030) 32323 at 2300 in Bourne; R.Sofia, Bulgaria 7.225 (Eng to Eu, USA 2245-0015) SIO444 at 2345 in N.Bristol.

The **6MHz (49m)** logs included HCJB, Ecuador 6.205 (Eng to Eu 0700-0830) 44434 at 0810 by **Patrick McKeever** in Birmingham; R.Australia via Shepparton 5.995 (Eng to Pacific 0800-2130) SIO333 at 0825 in Sheffield; also via Carnarvon 5.880 (Eng to S.Asia 1800-2100) 53544 at 1955 in Bridgwater.

Watching Brief

Andy Emmerson G8PTH
71 Falcutt Way, Northampton NN2 8PH

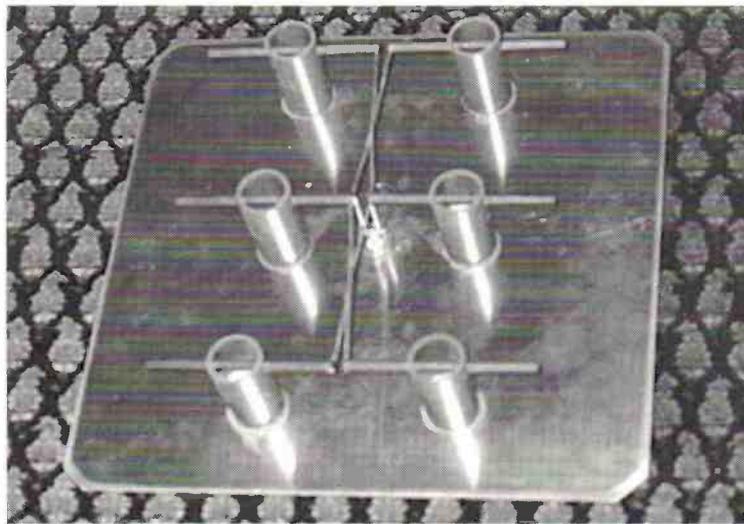
Probably because of the shorter ranges (under normal conditions) we ATVer tend to have little contact with our colleagues on the continent of Europe. This is a shame as we can no doubt learn from each other. For this reason, a letter and photos from Hardy HB9RRH in Niederzuwill came as a welcome surprise, especially as it is clear he is a keen home-brewer.

He writes, "I am active on ATV with 70cm a.m. and 23cm f.m. I made an entry in last September's IARU Region 1 ATV contest with a small 70cm transmitter working with 1.2W only. The portable transmitter weighs just 300g, without batteries, and was developed and built by my friend HB9CSU, Dr Hans Karl Sturm. Hans Karl has just completed a fine repeater, the HB9FW, situated 790m above sea level. It is about 3km from my QTH, which is at JN47NK.

"Repeater input is 23cm f.m. on 1274MHz, output on 70cm a.m. with 60W sync power on 432.350MHz picture, 437.850MHz sound. The antennas for 23cm and 70cm are slotted tubes, arranged as a four-antenna system on each band, all home-made. The pre-amp is 20dB. The relay covers the region of eastern Switzerland as far as Ulm in Germany. It is intended to make a link-up with the repeater DB0GY situated near Friedrichshafen on Lake Constance. We are awaiting permission from the post offices of Germany and Switzerland.

"Apart from the repeater, I am quite often QRV from the top of some mountains. German amateurs have relayed my transmissions on several occasions as far as to Munich as I have been active from a mountain some 1500m above sea level, sending pictures of hang-gliders starting from snow-covered slopes. It was a real thrill to us all. Two years ago I went together with my son to the Zugspitze, which at nearly 3000m is the highest mountain in Germany (near Garmisch-Partenkirchen). Hans Karl was able to receive my 70cm transmission in colour: the signals of my little 1.2W transmitter covered the distance of about 180km with flying colours.

"In the photos you will recognise the tiny 70cm transmitter developed by Hans Karl HB9CSU; it is still causing amazement among ATV-freaks. Hans Karl, by the way, is the president of the Swiss ATV association. You can judge the size of the transmitter by the meter and the connectors. It is mounted on the inside of a plastics utility crate, which also contains two accumulators and a 144MHz handy-talky. The whole kit weighs just 7kg and of this the largest component is the twin 6-volt, 10 amp-hour batteries connected in series. They provide power for the transmitter, the camera, the handy-talky (and lighting if necessary). As antenna I use a 70cm hybrid double-



A compact 24cm antenna with high gain - ideal for portable operation in the mountains of Switzerland (and elsewhere).

quad, sometimes also two 13-element Flexayagis stacked.

"The other photo shows a 23cm antenna built by me from a book design. I have also made copies of it for HB9CSU and HB9STW, and all three work exceedingly well. They are light, easy to transport and an ideal solution for portable work in the mountains."

More Repeater News - In Birmingham

G8EMX is putting out a lively bulletin giving details of progress with the new Birmingham repeater. "I am pleased to announce a MAJOR DEVELOPMENT", he writes. So it must be good if it warrants 36-point capitals. No, I must not jest, because it seems things are bubbling in Birmingham. The Midland Amateur Radio Society (MARS) have given their willing agreement for the TV repeater group to mount an Alford Slot repeater on top of their club HQ for TV coverage trials. Thursday evenings and Saturdays are the most likely times for access. The site is about half a mile north-west of Colmore Circus and it is

likely to replace a previous location planned. At this stage it is not clear what propagation is likely to be from the new site, so trials are to go ahead: in fact they should have started by now. G8EMX ends his newsletter with a very shrewd note: "We need ATV activity on both bands (70cm and 24cm)." That's right - don't write off 70cm yet!

...And In Bristol

The latest edition of P5, the Severnside Group's newsletter, has arrived and gives details of their 10GHz TV repeater trials. Shaun O'Sullivan G8VPG writes, "Work on our proposed 10GHz amateur television repeater continues to progress. A major milestone was passed on November 29 last, when the first site trials were carried out. Ted G3JMY, Ivor G1IXF and Viv G1IXE assembled on the proposed site and set up a transmitter operating on 10.15GHz, which is the expected output frequency. The antenna used was the slotted waveguide that the repeater will utilise. It was a typical cold November afternoon, but thankfully the

rain that we had been having rather a lot of at that time had stopped.

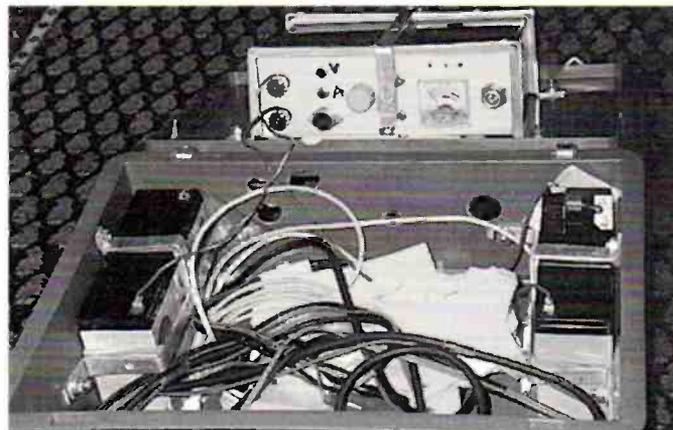
"A number of people with 10GHz receiving equipment were eagerly awaiting the switch-on to see if the signals were watchable. For receive everyone was using converted satellite TV LNBs in conjunction with dish antennas of varying sizes. The reports received were very encouraging and suggest we should obtain good coverage of the Bristol area. Roy G3FYX at home in Winterbourne sent in a P5, commenting that more deviation was required. This was a comment everybody made and a suitable adjustment will be made to the transmitter in due course.

"Phil G1HIA at home in Horfield reported a P4. John G3RFL at home in Portishead saw between a P0 to P3 with fading, which I think surprised even him. Ken G4BVK at home in Hanham utilised his main steerable 1.2m satellite dish but still could not see anything (later investigations showed one of the stages in his LNB was not working). Finally, Steve G8KUW dashed around /portable to various sites in the Filton area but also drew a blank.

"The results form the day's work will enable us to produce the necessary area coverage map and complete the licence application forms. However, we must first get formal permission to use the site. It is a super site which is the reason why we are keeping it a little under our hats. All will be revealed in due course!"

Last Word

It appears there may be another ATV repeater in London, this time in Central London. There's a whisper that Imperial College is considering a 24cm repeater at its South Kensington location (perhaps on the roof of the Imperial Institute tower?). I'll let you know when there's any more news.



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HOKA ELECTRONICS HAVE THE ANSWER! There are some well-known CW/RTTY decoders with limited facilities and high prices, complete with expensive PROMS for upgrading etc., but then there is CODE3 from Hoka Electronics! It's up to you to make the choice – but it will be easy once you know more about Code3. Code3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 640K of RAM. The Code3 hardware includes a digital FSK Converter unit with built-in 230V AC power supply and RS232 cable, ready to use. You'll also get the best software ever made to decode all kinds of data transmissions. Code3 is the most sophisticated decoder available and the best news of all is that it only costs £329!

- Morse – Manual/Auto speed follow. On screen WPM Indicator
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- AX25 packet with selective call sign monitoring, 300 Baud
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- Autospec – Mks I and II with all known interleaves
- DUP-ARQ Artrac – 125 Baud Simplex ARQ
- Twinplex – 100 Baud F78C Simplex ARQ
- ASCII – CCITT 5, variable character lengths/parity
- ARQ6-90/98 – 200 Baud Simplex ARQ
- SI-ARQ/ARQ-S – ARQ1000 simplex
- SWED-ARQ/ARQ-SWE – CCIR 518 variant
- ARQ-E/ARQ1000 Duplex
- ARQ-N – ARQ1000 Duplex variant
- ARQ-E3 – CCIR 519 variant
- POL-ARQ – 100 baud Duplex ARQ
- TDM242/ARQ-M2/4-242 CCIR 242 with 1/2/4 channels
- TDM342/ARQ-M2/4 CCIR 342-2 with 1/2/4 channels
- FEC-A – FEC100A/FEC101
- FEC-S – FEC1000 Simplex
- Sports Info. 300 Baud ASCII F78C
- Hellsreiber – Synchron./Asynch.
- Sitor RAW – (Normal Sitor but without synchronisation)
- ARQ6-70
- Baudot F78BN
- Factor – coming soon!
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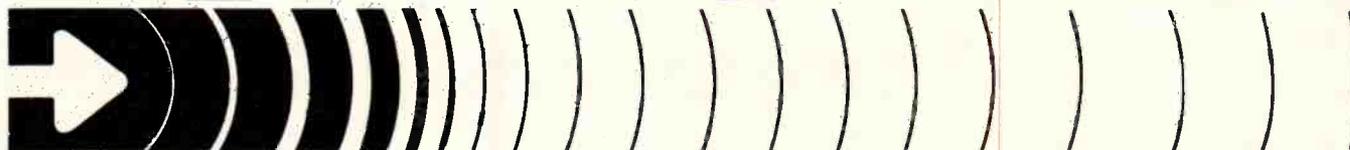
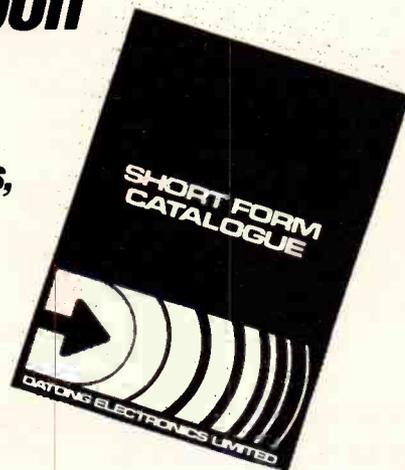
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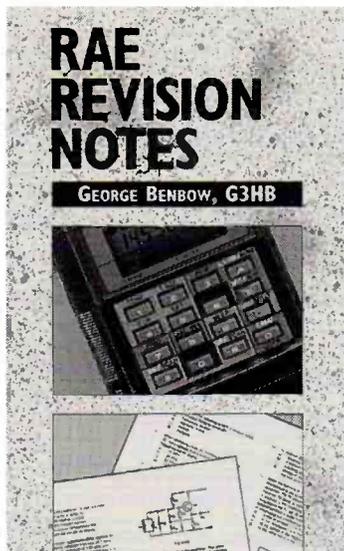
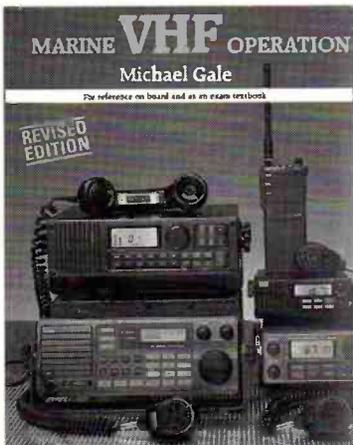


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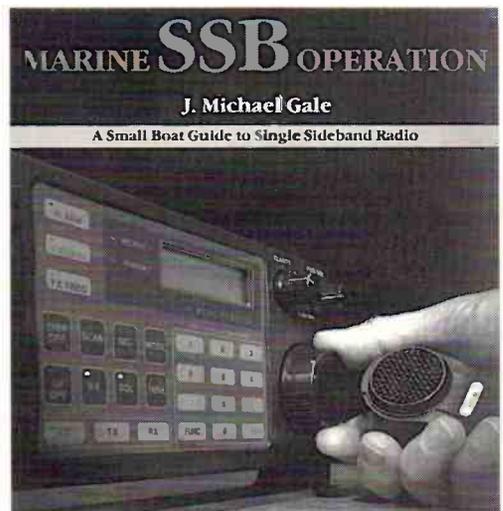
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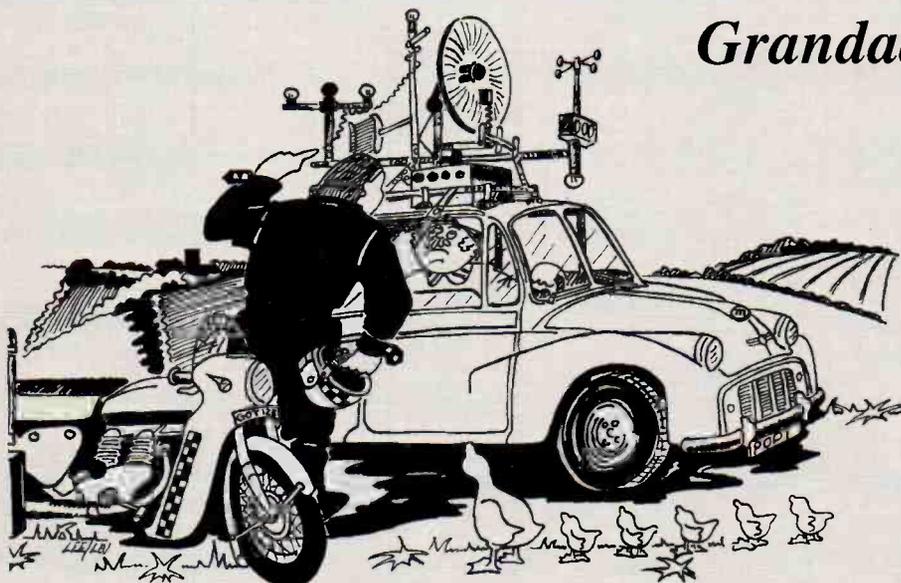
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This book gives details of frequencies from 26MHz to 12GHz with no gaps and who uses what. Completely revised and enlarged (February 1993), there are chapters on equipment requirements as well as antennas, the aeronautical bands, as well as the legal aspect of listening using a scanner. 156 pages. £9.95

DIAL SEARCH 1992/94

George Witcox
The listener's check list and guide to European radio broadcasting. Covers m.w., l.w., v.h.f. & s.w., including two special fold-out maps. Also includes a full list of British stations, a select list of European stations, broadcasts in English and 'Making the Most of Your Portable'. 46 pages. £4.25

FERRELL'S CONFIDENTIAL FREQUENCY LIST 8th edition

Compiled by Geoff Halligey
Completely revised, much larger & spirally bound for easy use. Now covers 1.6-28MHz in great depth, all modes and all 'utility' services, with new reverse frequency listing showing every known frequency against each call sign. Who's using what frequency and mode, what's that call sign? These are some of the answers this book will help you find. 544 pages. £17.95

FLIGHT ROUTINGS 1992

Compiled by T.T. & S.J. Williams
This guide was produced with the sole aim of assisting airband listeners to quickly find details of a flight, once they have identified an aircraft's call sign. Identifies the flights of airlines, schedule, charter, cargo and mail, to and from the UK and Eire and overflights between Europe and America. 122 pages. 0/P

GUIDE TO FACSIMILE STATIONS 12th Edition

Joerg Klingenfuss
This manual is the basic reference book for everyone interested in FAX. Frequency, call sign, station name, ITU country/geographical symbol, technical parameters of the emission are all listed. All frequencies have been measured to the nearest 100Hz. Included are 300 sample charts and their interpretation. 416 pages £18.00

GUIDE TO UTILITY STATIONS 11th Edition

Joerg Klingenfuss
This book covers the complete short wave range from 3 to 30MHz together with the adjacent frequency bands from 0 to 150kHz and from 1.6 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 19549 entries in the frequency list and 3590 in the alphabetical call sign list plus press services and meteorological stations. Included are RTTY & FAX press and meteo schedules. There are 11800 changes since the 10th edition. 534 pages. £24.00

HF OCEANIC AIRBAND COMMUNICATIONS 4th Edition

Bill Laver
HF aircraft channels by frequency and band, main ground radio stations, European R/T networks and North Atlantic control frequencies. 31 pages. £3.95

INTERNATIONAL RADIO STATIONS GUIDE BP255

Peter Shore
As in 'Broadcast Roundup', his column in *PW*, Peter Shore has laid this book out in world areas, providing the listener with a reference work designed to guide around the ever-more complex radio bands. There are sections covering English language transmissions, programmes for DXers and s.w.l.s. Along with sections on European medium wave and UK f.m. stations. 266 pages. £5.95

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7th Edition.
Julian Baldwin G3UHK & Kris Partridge G8AUU
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Bill Laver
A complete guide (reprinted January 1993) to the UK s.w. and v.h.f. marine radio networks. Useful information, frequency listings and the World Marine Coastal Phone Stations. 62 pages. £4.95

NEWNES SHORT WAVE LISTENING HAND BOOK

Joe Pritchard G1UQW
A technical guide for all short wave listeners. Covers construction and use of sets for the s.w.l. who wants to explore the bands up to 30MHz. Also covers the technical side of the hobby from simple electrical principles all the way to simple receivers 276 pages. £15.95

POCKET GUIDE TO RTTY AND FAX STATIONS (THE)

Bill Laver
A handy reference book listing RTTY and FAX stations, together with modes and other essential information. The listing is in ascending frequency order, from 1.6 to 26.8MHz. 57 pages. £3.95

RADIO LISTENERS GUIDE 1993

Clive Woodyear
This is the third edition of this radio listener's guide. Simple-to-use maps and charts show the frequencies for radio stations in the UK. Organised so that the various station types are listed separately, the maps are useful for the travelling listener. Articles

included in the guide discuss v.h.f. aeriels, RDS, the Radio Authority and developments from Blaupunkt. 56 pages. £2.95

SHORT WAVE INTERNATIONAL FREQUENCY HANDBOOK

Formerly the Confidential Frequency List and re-published in April 93, this book covers 500kHz-30MHz. It contains duplex and channel lists, call signs, times and modes, broadcast listing and times. 192 pages. £9.95

SOUNDS EASY The complete guide to Britain's radio stations

Compiled by Ken Davies
A guide to the numerous local radio stations throughout the UK. If you do a lot of travelling this book is invaluable. Itemised by areas, it makes finding your kind of sounds easy. 52 pages. £2.95

VHF/UHF AIRBAND FREQUENCY GUIDE 4th Edition

A complete guide to civil & military airband frequencies including how to receive the signals, the frequencies and services. VOLMET, receiver requirements, aeriels and much more about the interesting subject of airband radio are included. 123 pages. £6.95

WORLD RADIO TV HANDBOOK 1993

Country-by-country listing of l.w., m.w. & s.w. broadcast and TV stations. Receiver test reports, English language broadcasts. The s.w.l.s 'bible'. £15.95.

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AERIAL PROJECTS BP105

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Proper impedance matching of an antenna to a transmission line is of concern to antenna engineers and to every radio amateur. A properly matched antenna as the termination for a line minimises feed-line losses. Power can be fed to such a line without the need for a matching network at the line input. There is no mystique involved in designing even the most complex multi-element networks for broadband coverage. 195 pages. £11.95

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Volume Two
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BEAM ANTENNA HANDBOOK

W. I. Orr W6SAI & S. D. Cowan W2LX
Design, construction, adjustment and installation of h.f. beam antennas. The information this book contains has been compiled from the data obtained in experiments conducted by the authors, and from information provided by scientists and engineers working on commercial and military antenna ranges. 268 pages. £7.50

G-QRP CLUB ANTENNA HANDBOOK (THE)

Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRI/GWOLNO.
This book is a collection of antenna and related circuits taken from *Sprat*, the G-QRP Club's journal. Although most of the circuits are aimed at the low-power fraternity, many of the interesting projects are also useful for general use. Not intended as a text book, but offers practical and proven circuits. 155 pages. £5.00

HF ANTENNA COLLECTION (RSGB)

Edited by Erwin David G4LQI
This book contains a collection of useful, and interesting h.f. antenna articles, first published in the RSGB's *Radio Communication* magazine, between 1968 and 1989, along with other useful information on ancillary topics such as feeders, tuners, baluns, testing and mechanics for the antenna builder. 233 pages. £9.50.

INTRODUCTION TO ANTENNA THEORY (AN) BP198

H. C. Wright
This book deals with the basic concepts relevant to receiving and transmitting antennas, with emphasis on the mechanics and minimal use of mathematics. Lots of diagrams help with the understanding of the subjects dealt with. Chapters include information on efficiency, impedance, parasitic elements and a variety of different antennas. 86 pages. £2.95

NOVICE ANTENNA NOTEBOOK

Doug DeMaw W1FB
Another book from the pen of W1FB, this time offering "new ideas for beginning hams". All the drawings are large and clear and each chapter ends with a glossary of terms. It is written in plain language and you don't need to be a mathematician to build and erect the support structures that are presented in this book. 124 pages. £6.95

PRACTICAL ANTENNA HANDBOOK

Joseph J. Carr
As the name suggests, this book offers a practical guide to everything to do with antennas, from h.f. to microwaves. It also has sections on propagation, transmission lines,

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Doug DeMaw W1FB
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YAGI ANTENNA DESIGN

Dr James. L. Lawson W2PVP
This book is a polished and expanded version of a series of articles first published in *Ham Radio* following on from a series of lectures by the author, who was well-known as the expert on Yagi design. Chapters include simple Yagi antennas, loop antennas, effect of ground, stacking and practical antenna design. 210 pages. £10.95

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SATELLITE BOOK (THE) - A complete guide to satellite TV theory and practice

John Breeds
This book deals almost exclusively with television broadcast satellites and is a comprehensive collection of chapters on topics, each written by an expert in that field. It appears to be aimed at the professional satellite system installer, for whom it is invaluable, but it will be appreciated by a much wider audience - anyone interested in satellite technology. *280 pages. £30.00*

SATELLITE EXPERIMENTER'S HANDBOOK (THE) 2nd Edition

Martin Davidoff K2UBC
The book is divided into four main sections - History, Getting Started, Technical Topics and Appendices. It provides information on spacecraft built by, and for, radio amateurs. In addition, it discusses weather, TV, broadcast and other satellites of interest to amateurs. *313 pages. £14.50*

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Peter Pearson
Pictures from space, that's what satellite television is all about. Orbiting satellites, 35000km high, receive TV signals from stations on the earth and re-transmit them back again. This book explains all you need to know to set up your own satellite TV terminal at home, dish and accessories, cable and tuner. *73 pages. £1.00*

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ALL ABOUT VHF AMATEUR RADIO W. I. Orr W6SAI

Written in non-technical language, this book provides information covering important aspects of v.h.f. radio and tells you where you can find additional data. If you have a scanner, you'll find a lot of interesting signals in the huge span of frequencies covered, 100-300MHz & 50, 420, 902 & 1250MHz bands. *163 pages. £9.50.*

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Another very useful ARRL book. Although written for the American amateur, this book will also be of use and interest to the UK amateur. Topics covered range from short wave listening through operating awards to repeaters, operating and satellites. *684 pages. £12.95*

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If you're studying for the Radio Amateur's Examination, this book could be useful. It's a summary of the salient points of the *Radio Amateurs' Examination Manual*, the standard textbook for the exam. It's A5 size and therefore can be carried with you wherever you go. Easy-to-read, it's divided into 13 chapters with topics like receivers, power supplies, measurements, operating procedures, licence conditions and a summary of the formulae all dealt with. *92 pages. £4.00*

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B O O K S

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PASSPORT TO WORLD BAND RADIO

1993

This book gives you the information to explore and enjoy the world of broadcast band listening. It includes features on different international radio stations, receiver reviews and advice as well as the hours and language of broadcast stations by frequency. The 'blue pages' provide a channel-to-channel guide to world band schedules. 416 pages. £14.50.

RADIO TELETYPE CODE MANUAL 12th Edition

Joerg Klingenfuss

This book gives detailed descriptions of the characteristics of telegraph transmission on short waves, with all commercial modulation types including voice frequency telegraphy and comprehensive information on all RTTY systems and c.w. alphabets. 96 pages. £11.00

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A guide for users of scanning receivers, covering hardware, antennas, accessories, frequency allocations and operating procedures. 245 pages. 0/P

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The companion to *Scanners*, this provides even more information on the use of the v.h.f. and u.h.f. communications band and gives

constructional details for accessories to improve the performance of scanning equipment. 261 pages. £10.95

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Covers a very wide area and so provides an ideal introduction to the hobby of radio communications. International frequency listings for aviation, marine, military, space launches, search and rescue, etc. Chapters on basic radio propagation, how to work your radio and what the controls do, antennas and band plans. 187 pages. £8.95

SHORT WAVE RADIO LISTENERS' HANDBOOK

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In easy-to-read, non-technical language, the author guides the reader through the mysteries of amateur, broadcast and CB transmissions. Topics cover equipment needed, identification of stations heard & the peculiarities of the various bands. 207 pages. £7.99

WORLDWIDE HF RADIO HANDBOOK

Martyn R. Cooke

This book lists high frequencies used by aircraft and aeronautical ground stations. Divided into sections, Military, Civil, etc. The book should be easy to use. 124 pages. £6.95

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PUBLISHED on the fourth Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Printed in England by Southernprint (Web Offset), Factory Road, Upton Industrial Estate, Poole, Dorset BH16 5SN. Tel: (0202) 622226. Distributed by Seymour, Windsor House, 1270 London Road, Norbury, London SW16 4DH. Tel: 081-679 1899, Fax: 081-679 8907, Telex: 881245. Sole Agents for Australia and New Zealand – Gordon and Gotch (Asia) Ltd.; South Africa – Central News Agency Ltd. Subscriptions INLAND £21, EUROPE £23, OVERSEAS (by ASP) £25, payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not without the written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

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