FOR THE RADIO LISTENER

shortwave magazine

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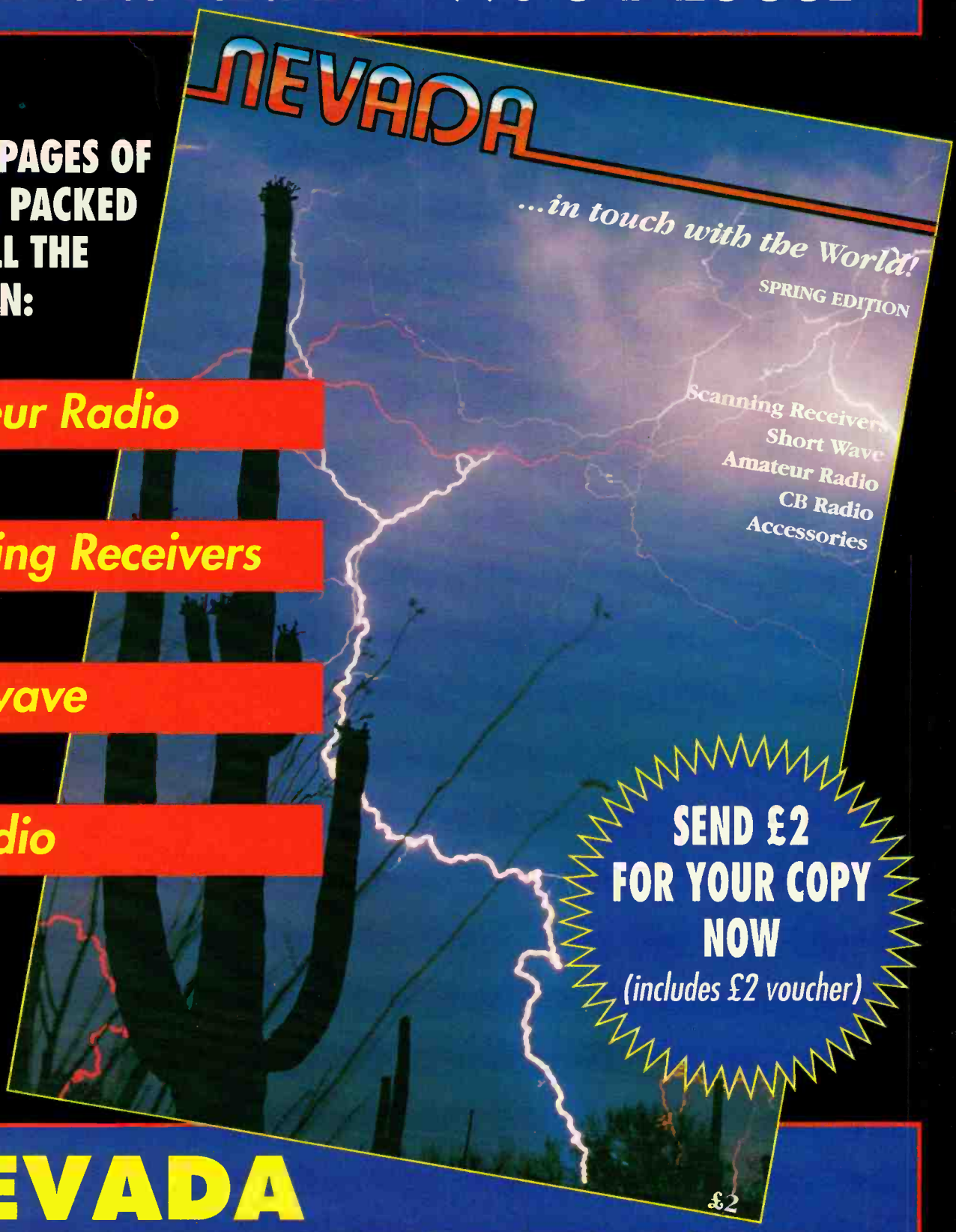

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Global business and communications networks are symbolised in this composite image of earth and the link between the two computer terminals.
Tony Craddock/Science Photo Library.

features

regulars

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letters

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 £2.00 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 Poole (0202) 659950.

Battery Save

Dear Sir

Re: April '93 *Short Wave Magazine* and the feature on the MVT-7100. With reference to the author and his comments about the battery save feature. A similar, if not as comprehensive, facility is available, I suspect, on most of the Realistic scanners - it certainly is on the PRO-34 hand-held.

I quote their manual," Your PRO-34 has a special battery-saving feature. When you have placed the scanner in manual mode, if no signal is received and no key is pressed within five seconds the scanner enters the standby mode. In this mode the PRO-34 resets for one second, then checks for 0.5 second. The scanner continues doing this until you press a button, or it receives a signal. During standby, the PRO-34 uses only 40% of the normal power consumtption."

This 'sleep' facility can be a nuisance if one is trying to 'catch' or 'unravel' a tricky callsign or some short comments (especially on the airband where the callsign is usually given first). This is because of the way the 'rest' facility works on the PRO-34 one quite often misses the start of a message due to the fact that (in my opinion) the receiver will not, in fact, 'activate' itself if it receiver a signal during the 'rest', due to the 'timer/delay' circuit having some sort of priority over every other function. However, if the signal is still there at the end of the 'rest', it then relays it through the loudspeaker as usual, and carries on so doing until the signal stops, plus five seconds, then enters the 'rest' mode again.

It is, in fact, possible to miss things altogether because of this! The best battery saving feature, actually, is not to turn the receiver on, at all!!

Think Before You Buy

Dear Sir

A short time ago, as a complete beginner, I purchased a hand-held scanner to have, as I hoped some indoor amusement. This scanner, although costing £229.95, did not have a rechargeable battery unit and I was horrified to find how soon the batteries were exhausted. I very quickly purchased a voltage converter, which saved that problem, but was still disatisfied with the audio output. As I live in a high-rise block and the reception was not all that wonderful, I was informed an outside antenna would help matters as well as an external speaker.

With all this extra equipment needed, I realised I had made a bad mistake and it was fortunate that the scanner developed a speaker fault and I was able to obtain a full refund.

I now realise I could have purchased a base, desk-top, unit for the same price, which I am now looking around for. I think this will be much more sutiable for my needs than a hand-held, which although suiting many users has its drawbacks as described.

I hope this information can perhaps be of some use to any prospective purchaser who, like myself, is only looking for a little indoor fun with a scanner.

S. Lee, London

No Code Licence

Dear Sir

As a newcomer to s.w.l., I find this Morse Test argument all rather petty. The question must surely be is Morse actually used enough to continue to be a requirement for an Amateur Transmitting A licence? What is the point of having to prove proficiency in an obsolecent mode of communication?

I cannot understand why a hurdle must be erected to merely make the licence more difficult to obatin. I would have though the studying involved and sitting the examination is enough to confirm the sincerity of the applicant. The argument for retaining the test seems based on the American Indian practice that some torture must be endured to become a warrior.

Since Morse is still used, why not have an additional qualification for those who want to use it, like the instrument rating for a Private Pilot's Licence?

Allan Young
Tonbridge

Shoestring Radio

Dear Sir

Reading John Griffiths feature in the May SWM prompts me to tell my experiences in the realm of showstring s.w.l.ing I used to make and use valves short wave receivers in the 30s until the war - after the war I got interested in competition cycling.

It wasn't until I was made redundant at the age of 63 that I got interested again and tried to make a receiver with the aid of a book from the library. This wasn't a great success as all I could get was Moscow, which seemed to cover nearly the whole of the dial. I did manage to get another job, but was made redundant again at 64 and spent a year on the dole until I retired at 65. However, I was still interested, so I asked for a Howes 20m kit for my birthday and was very pleased with it, it brought back all the old excitement. I had further presents of a built-in filter and a.t.u. - all from Howes - and my set-up is all I could wish for and has cost me practically nothing. I have had a lot of fun experimenting with different antennas, all home-made and indoors. I have also made mods to the receiver so that I can receive the 19m band.

I know I shouldn't expect too much from my set-up, which by the way is housed in a bedside cabinet fixed on to a television stand, but if there is some expert out there who can help me to separate some of the signals I receive it would make an old man very happy.

For instance, I have tried a directional loop, but when the ones you want to null out are in the same direction as the one you want it isn't much good.

Ted Plumb
Bracknell

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*.

In Praise

Dear Sir

It is not very often I sit down and write a letter, but I was so pleased with one of your advertisers, I had to let everyone know.

A few days ago I telephoned Waters & Stanton Electronics to enquire if they had an ERA Microreader. The lady I spoke to said they had and said I would receive it within one week of receipt of my cheque. I thought it took that long to clear a cheque!

I posted the order on May 8, at about 6.30am and personally I thought it would take at least two weeks before I received the package.

Can you imagine how astonished I was when I came home for lunch on the 11th to find a small, well-wrapped, little box containing my Microreader. I could not believe how quickly Waters & Stanton had reacted to my order, three days and that included the weekend.

So I would like to thank Waters & Stanton for their curteous telephone people and thanks to their response to my order. I shall send them further orders when finances and wife permit!.

M Tyreman
Maidstone

HF Airband

Dear Sir

By the end of the century, aircraft around the world will be using satellite capabilities using the Future Air Navigation System (FANS) effectively doing away with h.f. radio communication.

Thus the h.f. listener to high flying aircraft will, to a large extent, no longer exist.

My question to readers is will it still be possible inthe future to take as much pleasure from tracking aircraft over the Atlantic using a digital reading of position reports by some other method

I would be very interested to hear of any likely developments in this field with the view to equipment becoming available that would be able to receive such communication inthe years ahead.

Mike Wynn
Oxford

Dear Sir

With reference to the feature DXing Civil Aircraft on short wave, at 0901Z on January 7, the following tables came into effect.

M. Bennett
Slough

SEA 1/3	3.470	6.556	10.066	11.396	13.318	17.907					
SEA 1 EA2	3.485	5.649	5.655	8.942	11.396	13.309	17.907				
EA1	3.016	6.571	8.897	10.042	17.958						
NCA1	3.019	5.646	13.315	17.958							
NCA2	2.851	4.678	6.582	10.096	17.958						
NCA3	3.004	5.664	10.039	13.303	17.958						
CWP 1/2	2.998	4.666	6.532	6.562	8.903	11.384	13.300	17.904	21.985		
CEP 1/2	2.869	3.413	5.547	5.574	8.843	11.282	13.261	13.354	17.904		
SP	3.467	5.643	8.867	13.273	17.904						
NP	2.932	5.628	5.667	6.665	8.915	10.048	13.294	13.339	17.904	17.946	21.925
SAT2	2.854	5.565	11.291	13.315	17.995						
CAR A	2.287	5.550	6.577	8.918	11.396	13.297	19.707				
CAr B	3.455	5.520	6.586	8.846	11.387	17.907					
NW/SW SAM	2.944	4.669	6.549	10.024	11.360	17.907					
NE/SE/C SAM	3.479	5.526	8.855	10.096	13.297	17.907					
EUR A	3.479	5.661	6.598	10.084	13.288	17.961					
AFI/1 SAT/1	3.452	6.536	8.861	13.357	17.955						
AFI/2	3.419	5.652	8.894	13.273	17.961						
AFI/3 MID/2	3.467	5.658	10.018	11.300	13.288	17.961					
AFI/4	2.878	5.493	8.903	13.294	17.961						
NAT A	3.016	5.598	8.906	13.306	17.946						
NAT B	2.899	5.616	8.864	13.291	17.946						
NAT C	2.862	5.649	8.879	13.306	17.946						
NAt D	2.971	4.675	8.891	11.279	13.291	17.946					
NAT E	2.922	6.628	8.825	11.309	13.354						
NAt F	3.476	6.622	8.831								
MID/1	2.992	4.669	6.631	8.951	11.375	17.961					
MID/3	2.944	4.669	6.631	8.951	11.375	17.961					
INO/1	3.476	5.634	8.878	13.306	17.961						

ICAO HH En-route Radiotelephony Networks

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Radiation

Dear Sir

The letter from Peter Gregory, *SWM* May, raises a subject that could affect us all, r.f. radiation.

For starters, LM&S May lists 51 long wave, 276 medium wave and 117 local radio stations. Together they radiate about 94MW of r.f. energy. The majority of these stations can be picked up with a loop antenna placed on the kitchen table.

Although the receiver normally only selects one frequency at a time, the fact remains that the energy, however small, from all the transmitters receivable, is converging on the loop at the same time. Add to this the radiation from other sources, s.w., v.h.f, u.h.f, etc., and it's the total of all radiation arriving at the same point at the same time that should concern us.

We know of the dangers of over exposure to ultra-violet, gamma, nuclear and X radiation. So why should r.f. radiation be ignored? Am I right in thinking that little, or no, research has been carried out on this subject?

Is it the fact that there is so much money invested in the radio industry that no-one wants to know, or really cares what effect r.f. radiation has on the environment? With more high powered transmitters getting on the air, the situation can only get worse.

A question that could be asked is, why do some countries need such high powered transmitters to cover small areas? As an example, the Principality of Monaco. As well as several v.h.f. outlets, it has Roumoules 1400kW and Monte Carlo 300kW, a total of 1700kW, to serve an area of just 16 sq km and a population of about 22 000. In contrast, the Isle of Wight, 23.8 times larger, 381 sq km, population 112 000 can be covered by one 0.5kW local radio station.

George Millmore
Ryde

Dear Sir

In Matthew Probert's, otherwise excellent, article 'DXing Civil Aircraft on Short Wave' in March, he is mistaken in how he describes the way the North Atlantic Tracks are organised. Specifically, the NAt B and NAT C frequency families. Both frequency families cover the central/northern routes but the 30° west division refers not to the position of the routes but to where the aircraft concerned is registered. Aircraft registerd west of 30° west use the NATB family of frequencies, aircraft registered east of 30° west use the NAT C family of frequencies.

Tony Duggan
Stafford

grassroots

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.

rallies

June 27: The 36th Longleat Amateur Radio Rally, Longleat House, near Warminster, Wiltshire. There will be trade stands, RSGB bookstall, large craft fair, camping & caravanning facilities and a licensed bar and catering on site. **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: Galway Radio Experimenters will be holding their annual radio and computer rally at Newtownsmith, Galway. Doors open at 12 noon. Large trade show and lots to interestthe entire family. Large Bring & Buy, free parking and refreshments available. Talk-in on S21. **EI7DIB. Tel: 091-53592.**

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

July 11: The Sussex Amateur Radio & Computer Fair will be held at Brighton Racecourse from 10.30am to 4pm. There will be trade stands, Bring & Buy, picnic area, refreshments, car parking and a free shuttle to Brighton sea front. **(0273) 501100.**

***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. **GM0AMB. Tel: (0835) 22686.**

August 30: The Huntingdonshire ARS Annual Bank Holiday Monday Rally will be at St Germain Street, Huntingdon. All pitches and car parking on hard standing. Admission £1 per person, car parking free. Hot & cold refreshments available. Starts 10am. **David Leech. Tel: (0480) 431333.**

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

* Short Wave Magazine & Practical Wireless in attendance

AVON

RSGB City of Bristol Group: last Mondays, 7pm. The Small Lecture Theatre, Queens Building, University of Bristol. July 26 - Your Ideas Are Needed! Dave Bailey G4NKT. (0272) 672124.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. July.- 7 Destabilising of Vertical Wooden Artifacts.G7NQJ. 14th - 10m Activity Evening Club Station, 21st - Bring & Buy Perfect or Junk, 28th - Discussion of Recent Questionnaire. For more information ring (0275) 832222 on a Wednesday evening.

BERKSHIRE

Maidenhead & DARC: 1st Thursday & 3rd Tuesday, 7.45pm. The Red Cross Hall, The Crescent, Maidenhead. July 1 - Fox Hunt, 3/4th - VHF National Field Day. Neil G0SVN. (0628) 25952.

CUMBRIA

Eden Valley RS: Alternate months. BBC Club, Penrith. July 29 - Foxhunt at 7.30pm, start Southend Road car park. John Pape. Tel: (07683) 52106.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. July 7 - Junk Sale, 14th - Barbecue, 21st - 2m DF Practice, 28th - Technical Talk. Hayley Winfield, 2 Hilts Cottages, Crich, Matlock.

DEVON

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. July 16 - HF DXing by Bob Whelan G3 PJT. Peter G4UTO. (0803) 864528.

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. July 21 - Fox Hunting, 24th - Junk Sale. Gary Fellows G7GHP.

Southdown ARS: 8.00pm Chasely Home for Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne. July 7 - Barbeque. 15th July - Mobile DF hunt. Jan G4XNL. (0323) 412699.

ESSEX

Chelmsford ARS: 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford. July 6 - Club Meeting Louis Varney G5RV. Ela Martyr (0245) 360545.

Vange ARS: Thursdays 8pm, Barnstable Community Centre, Long Riding, Basildon, Essex. July 1 - Junk Sale. Doris (0268) 552606.

GREATER LONDON

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, Chiswick, W4. July 20 - Post, Low Power Field Day. G0JRY. 081-749 9972.

Edgware & DRS: Thursdays, 8pm.Watling Community Centre, 145 Orange Hill Road, Burnt Oak. July 8 - Antenna Systems a Discussion led by John Plested, 22nd - Morse Training Evening. Rod Bishop GOSQL. 081-204 1868.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm St Andrews Church Hall, Herbert Road, SW19. July 9 - Book Fair, 30th - Annual Camp Briefing. Chris Frost G0KEB. 081-397 0427.

HEREFORD & WORCESTER

Bromsgrove & DARC: Fridays. Avoncroft Arts Centre, South Bromsgrove, Worcester. July 9 - Visit to Police Museum at Sparkhill 6.30-9.00, 9th - Short Wave Listening by Arthur Miller at Waseley Hills Country Park, 8pm. Joe Poole. (0562) 710010.

HERTFORDSHIRE

Dacorum AR & TS: 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. July 20 - VHF DF Hunting by S White G3ZVW. Dennis Boast. (0442) 259620.

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. July - 8 Social Evening, 22nd - Detection by Pat Brolan G1NPU. Roy G4UNL. 081-804 5643.

HUMBERSIDE

Goole R & ES: Most Fridays, 7.30pm. West Park Pavilion, off Airmyn Road, Goole. July 2 - VHF NFD contest, 9th - VHF NFD Logfill, 16th - Video Night. Steve Price. (0405) 769130.

Wirral & DARC: July 7 - D&W.The Ridger, Newton, 14th - Bells & Whistles for PMR by Andy G7HUD at Irby Cricket Club. Mill Hill Rd Irby, 21st - D&W. The Lighthouse, Wallasey, 28th - Revenge DF Hunt. Start 8 pm Heswall Lay-by. Paul. 051-648 5892.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes.July 20th - 2m DF hunt. A.G. Messenger. 081-777 0420.

West Kent ARS: 3rd Fridays, 8pm. The School Annex, Albion Road, Tunbridge Wells, Kent. July 2 - Informal Meeting, 16th - Home-brew Equipment & Construction Techniques. John Taylor G3OHV. (0892) 664960.

NOTTINGHAMSHIRE

South Notts ARC: Fridays, 7pm. Highbank Community Centre or Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. July 2 - Open Forum, 9th -SWR Facts and Fallacies by Ron Disney GOHNZ, 11th - Third Fox Hunt, 16th - On Air, 23rd - Construction at Fairham College, 25th - Fourth Fox Hunt, 30th - Planning for Club Field Day and BBQ, 31st - Club Field Day and BBQ-Day 1. Ray. G7ENK. (0602) 841940.

SUFFOLK

Sudbury & DARC: 1st Tuesdays, 8pm. The Five Bells Inn, Great Cornard, Sudbury. July 1 - The Project for the Construction Competition is Set, 6 - SAnDRA club night at the Five Bells, Great Cornard. Natter'n'Noggin night, with a raffle. Colin GOPAO. (0787) 77004.

SUSSEX

Crawley ARC: Wednesdays, 8pm & Sundays, 10.30am. Hut 18, Tilgate Forest Recreational Centre, Tilgate, Crawley. July 9 - UFO lecture by Arthur Tomlinson. P.Cheyney G0PVK. 11 Southgate Drive, Southgate, Crawley, Sussex RH10 6EE.

WARWICKSHIRE

Mid Warwickshire ARS : July 13 - PMR,Presentation by Castle Electronics, 27 - Fox Hunt, 7 pm start. Horizontal FM on 143.350. Don Darkes. (0926) 424465.

Stratford upon Avon & DARS: 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford-upon-Avon. July 12 - Visit, 26th - Construction Contest. A. Beasley G0CXJ. 060-882 495.

WEST MIDLANDS

South Birmingham RS: West Heath Community Assoc., Hamstead House, Fairfax Road, West Heath, Birmingham 31. July 7 - Radio Demo by Ward Electronics, 8th - Visit to West Midlands Police Museum.

WILTSHIRE

Andover RAC: 1st & 3rd Tuesdays. Tangley Hall, Wildhern, near Andover. Joe McMahon, 99 Springfield Close, Andover.

Trowbridge & DARC: 3rd Wednesday. The Southwick Village Hall, Southwick, Trowbridge. July 7th - Transceiver Surgery with G3UUR and G8NEY, July 21 - Natter Nite. Ian G0GRI. (0225) 864698.

WORCESTERSHIRE

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. July 13 - 2m DF Hunt, 27 - Technical Topics. Barry Taylor. (0527) 542266.

SOUTH YORKSHIRE

Chapel Green ARS: Thursdays, 6.30pm. Chapel Green Project, 230 Lane End, Chapeltown, Sheffield. Roy Saunders 2E1BJD. (0742) 846720.

junior listener

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

Young Electronics Designer Awards

The awards for this prestigious event were presented in May by HRH The Duke of York at the Science Museum in London. I've been mentioning this event from the beginning of this column so it's good to see it doing so well.

This year the senior winner was Philip Pegden (18) of Tonbridge School who designed a computerised quadraphonic sound effects system for theatres. Nicola Hay of Woldingham School designed a device to monitor water contamination in vehicle brake fluid which won the intermediate award. The junior winner, Emma Lye of Bancroft's School designed a novel electronic elbow to test the temperature of a baby's bath water. If you would like more in formation on the Young Designer Awards the contact address is **YEDA Trust, 24 London Road, Horsham, West Sussex RH12 1AY**.

G-QRP Success

Over the last couple of months I've been mentioning the G-QRP Club Novice Group. Well, they've hit the headlines again this month. This time two of their members came first and second in the RSGB QRS/QRP Contest. Phil 2E0ABI wrote a letter to G0NEZ, the G-QRP Novice Manager with a few details on his station.

Phil uses an Yaesu FT-77 with just 3W, with this and a twin band dipole he has worked an American station. Another of their group, Jenny 2E0ABC is just 14 and comes from a truly amateur family. Her dad is G0MJG, brother Rob is 2E1AEL and finally Grandad is GW4LWO. During the summer of 1992 she built a DTR 80m rig and she followed that with a narrow-band audio filter. Not surprisingly, with this kind of dedication, Jenny came second in the contest. Dave tells me that she now is proficient at 12 w.p.m. and is going for the RAE.

If there are any other novices out there who think they deserve a mention, drop me a line.

SWL Guide

Chris Carrington (G0IYZ) is the Publicity Officer for the International Short Wave League and writes with news of the *Guide to English Language Short Wave Broadcasts to Europe*.

The title's a bit of a mouthful, but the book is really very useful. It's been designed as an easy-to-use guide to English language stations and has been extended this year to include all stations that are receivable in Europe. Those of you with previous editions will know that it used to only contain details of stations that were beaming towards Europe.This subtle difference can only add to the book's usefulness.

The information in the book is based on extensive monitoring by ISWL members and has been fully updated to take account of the 1993 summer schedules. The guide was very well laid-out and easy to use. The information was arranged in time order and listed the station name, logged frequencies and a summary of the programme, e.g. 'News, Features' This simple layout meant that you simply looked-up the required time of day and all the stations you were likely to be able to hear are listed before you. This is an excellent guide for all broadcast enthusiasts and every shack should have one! If you'd like copy, it can be obtained from the ISWL headquarters at the amazing price of £1.00. They will also accept two IRCs post paid or postage stamps to the value of £1.00. The address to write to is: **International Short Wave League, 10 Clyde Crescent, Wharton, Winsford, Cheshire, CW7 3LA**.

Radio Sofia

Here below are the conditions for qualifying for the Bronze Diploma of Radio Sofia.

For the reception of the first QSL card in the series you are required to file in one reception report.

For the 2nd QSL card you need to file in two reception reports within a period of two weeks.

For the 3rd QSL card you need to file in three reception reports within a period of three weeks.

For the 4th QSL card you need to file in four reception reports within a period of five weeks.

For the 5th QSL card you need to file in five reception reports within a period of five weeks.

For the 6th QSL card you need to file in six reception reports within a period of eight weeks.

The last QSL card in the series will be accompanied by the Bronze Diploma of Radio Sofia.

Upon request you can get the conditions under which you can qualify for Radio Sofia's Silver and Gold Diplomas.

Competition Results

In the May issue, I mentioned the generous donation of the RMS-3 program for the Spectrum by John D'Neill. The prize goes to Warren Daly in Co. Cork. By the time you read this, he will have sat the RAE (hopefully successfully) and will go for the Morse Test next year.

He uses a Sony 2001D and has tried to get into SSTV and AMTOR using his Spectrum, but has found the options a bit too expensive, hopefully the RMS-3 will get him going properly. He has built a project for speech synthesis using the Spectrum and a speech i.c. from Greenweld Electronics.

DIY Radio

D-i-Y- Radio is the Radio Society of Great Britain's magazine for beginners and has now reach two-years old. It's size has been increased from 16 to 24 pages too. They've sent me a copy and details of a very good subscription offer. The first three readers of *Short Wave Magazine* to take out a subscription to *D-i-Y Radio* will get the second year's subscription free. Don't forget to mention which magazine you read about the offer in!.

The joining pack comprises a large map, a badge, pen and plastic wallet to keep your copies of the magazine in. An annual subscription is £9 for UK and BFPO readers, £10.55 for Europe and £12.18 overseas airmail, for this you get six bi-monthly copies.

The latest issue contains amateur radio news, some lovely simple projects, technical topics (written so as to be easy to understand) and letters amongst other things.

news

New Batteries

Ever Ready Ltd have introduced a new battery into the UK, the Energizer. Apparently, it's already the number one long-life battery in both the United States and Australia. All packaging carries a five year 'best before' date and this also appears on each battery. There is no added Mercury or Cadmium and Ever Ready claim they last up to six times longer than ordinary zinc carbon batteries.

WACRAL Conference '93

Christian radio amateurs are invited to attend the Annual Conference of the World Association of Christian Radio Amateurs and Listeners to be held this year at the St. Edwards Baptist Conference Centre at Malvern. Held over the weekend of October 8-10, a full programme of fellowship and amateur activities is planned.

The inclusive charge is £50 and bookings, or requests for further information, should be addressed to:

W.G. Peterson G4EZU, 124 Darnley Road, Gravesend, Kent DA11 0SN. Tel/Fax: (0474) 533686.

Lowes New Service

Lowe Electronics' customers can now call up a second-hand list directly from their own FAX machine. All you need do is dial (0629) 580008 from your FAX machine and then follow the voice instructions.

The heart of the system is based on a specially adapted computer into which Lowe Electronics feed information in the form of text and pictures.

Over the next few months, they will be adding to the information store and including product brochures, data sheets, price lists, new products and special offers just for customers using this service.

Apparently, there is no limit to the sort of information they can place on this service and they would like to hear from people using the service to see how it can be expanded.

New ISWL Publication

The International Short Wave League have recently published their summer '93 *Guide to English Short Wave Broadcasts to Europe.*

The information provided in this guide is written in a manner that is not only comprehensive, but practical and is printed in a clear and easy-to-read type-face. The details are presented in time order (UTC) with aligning programme time periods, country and station names, frequencies and programme details (news, features, sport, religion and World Service transmissions). All frequencies are given in kilohertz.

A chapter called 'The DX Week' gives comprehensive broadcast details of the many programmes of interest to short wave listeners and DXers, these are listed on a day-to-day basis.

This booklet is available direct from the ISWL HQ and costs just £1, two IRCs or postage stamps to the value of £1.

ISWL. 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA.

Television Videos

If you're into vintage television then Andrew Emmerson has just produced a remarkable bargain set of two E180 PAL VHS tapes. The 2 volumes are packed full with test cards, captions and idents going back to 1936, many recovered from original film in recent months. Both Baird and Marconi-EMI system captions are included. Content of the two tapes run from pre WW2 up to modern satellite offerings such as BSB and Comedy Channel. These two new 'slide' tapes are available now, in VHS PAL only, at £9.99 per tape including UK postage. Please allow 14 days for taping and postage.

Andrew Emmerson, 71 Falcut Way, Northampton NN2 8PH. Tel: (060) 844130.

Sony Replacement Filters

Good news for owners of the popular Sony ICF-2010/2001D range of receivers. Kiwa Electronics of Yakima USA have announced a range of replacement filters designed to improve performance. The LFH-4S is a replacement for the Sony wide filter and offers better performance in a number of areas. Not only is the -6dB bandwidth tighter at 8kHz, but the shape factor is improved to better than 1.8. The FM3.5/S offers similar performance, but with a bandwidth of 3.5kHz. Fitting both these filters has been made very simple and Kiwa claim that only modest soldering experience is required.

The LFH-4S costs $15 whilst the FM 3.5S is $40.00 plus $7.00 for airmail outside North America. For more information, contact: **Kiwa. 612 South 14th Avenue, Yakima WA 98902, USA. Tel: 0101 800-398 1146.**

New Synoptic Decoder

ERA Electronics, famous for their Microreader decoding system have just announced new decoder for Synoptic weather reports.

Weather reports are transmitted as five figure groups by many h.f. stations throughout the world. Although the data can be decoded manually, it's a laborious task and few have the patience to persist.

The new ERA decoder takes the ASCII output from a RTTY decoder, such as the Microreader, and converts it into plain English for all to understand. The output can be displayed on a computer screen or alternatively, printed out on a serial printer. Once you've tuned-in to a Synop station, the decoder will automatically lock onto the appropriate message format and display neatly formatted information.

The price of the Synop Decoder is £99.50 inclusive of VAT and delivery. It's also worth noting that all ERA products carry a two year guarantee. For more information contact:

ERA Electronics 26 Clarendon Court, Winwick Quay, Warrington WA2 8QP. Tel: 0925 573118.

Unfortunately, gremlins struck their advert last month and the telephone number went missing.

Unveiled at Dayton '93

j.Com unveiled its new W9GR DSPII audio filter at the Dayton Hamvention in April this year.

This filter is very easy to use as a single rotary switch selects any one of the 11 available filters. There are four filters for s.s.b. operation - an Optimised Noise Reduction filter, an Multiple Automatic Notch filter, a Optimised Notch filter and a Combination Denoiser and Automatic Notch filter.

There are four filters for c.w. operation - a 200Hz 'wide' bandpass filter, a 100Hz narrow bandpass filter, a 50Hz super narrow bandpass filter and a 100Hz bandpass filter centred on 400Hz for those who prefer a lower pitched c.w. tone.

Finally there are three special use bandpass filters. For RTTY the passband is 2075-2345Hz, for h.f packet the pass band is 1550-1850Hz and for SSTV the passband is 1150-2350Hz. Rejection outside the passband is 40-60dB.

A ten-segment bargraph displays the input audio signal level for performance optimisation. The gain control may be adjusted for comfortable listening. A 2W amplifier is built into the unit to drive the external speaker. Headphones may be plugged into the standard front-panel jack.

The W9GR DSP II Audio Filter is available for $299.95 plus $15 shiping and handling overseas from:

j.Com, 793 Canning Parkway, Victor, NY 14564, USA. Tel: 0101 716 924-0422.

AMSAT-UK Colloquium 1993

AMSAT-UK will host its 8th Annual Colloquium from July 29 to August 1 at Surrey University. For details of this event, readers should contact:

Ron Broadbent G3AAJ, Hon Sec AMSAT-UK, London E12 5EQ.

Radio & TVDX News

The Dutch government is actively considering giving the present terrestrial main broadcast networks a 10 year extension period of their broadcast licence. This, it is hoped, will give further encouragement to improve TV programmes and to offer competition to commercial rival RTL-4 that is extremely popular, and shortly will have RTL-5 on stream via Astra 1C to consolidate their viewing figures.

Political troubles loom for both the DSF sports network and VOX network in Germany. Berlin took action against the Bavarian authorities over the ownership and share holding of the DSF network succeeding in getting its licence suspended following investigation. Now Bavaria is taking action against Berlin's (North Rhein Westfalia) VOX service again over the question of ownership.

High power transmitters now operational in Western Latvia are Riga Ch. R3 150kW e.r.p.; Duldiga Ch. R1 at 10kW e.r.p. The UEIT test card is used with 'LATVIJAS TV' identification on home grown sourced programmes and 'UT' with digital clock for the Ostankino TV programme out of Moscow. The UIET test card with 'OP C' originates from the Kaliningrad area.

The Avoncroft Award

The Bromsgrove & District Amateur Radio Club have got together with Avoncraft Museum of Buildings in Worcestershire for this award. To obtain this award s.w.l.s and/or operators need to hear or work QSOs with:

Bromsgrove & District Club Stations (each 5 points) G3VGG, G6VGG, GE3VGG, GB2RUB, GB2WED, etc.

Bromsgrove & District club members (each 3 points)

Other amateurs in Worcestershire (each 1 point)

There is no date limit past or present to this award, but no repeater QSOs can be claimed. All the QSOs should be made or logged from one address and QSL cards may be required.

To claim the award you require:

World-wide - 10 points

Europe - 15 points

UK - 20 points

or v.h.f. all areas/region/DX - 15 points.

To send for the award, you need to send a log extract plus £1.50 or seven IRCs or $3.

John Harvey G4IVJ, QTHR.

Special Event Station

The Trowbridge and District ARC will use the callsign GX2BQY/P on h.f. and v.h.f. as part of the West Wiltshire '93 Trade and Commerce Exhibition between July 22 and 24. The station is being sponsored to help raise money for the Wiltshire Air Ambulance Appeal.

Airport Hotline

The Friends of Ipswich Airport (AUFIA) have set up a recorded information hotline containing the latest details on the fight to keep Ipswich Airport open. This is updates every 7-10 days. The number to call is: (0336) 407393.

Association of Users and Friends of Ipswich Airport, 26 Freehold Road, Ipswich, Suffolk IP4 5HY.

Diplomate PMR

The Diplomat VHF Mobile two-way radio has recently passed type approval testing to MPT 1326. At just 151 x 181 x 36mm, it is believed to be one of the smallest 25W two-way radios to comply with the standard.

It incorporates electronic pin number protection, remote reset, many on-air remote-control features, electronic serial number,

European Selcall standards and d.t.m.f. software for telephone interconnection. The unit is supplied complete with slide-mounting bracket, remote speaker, mic clip and power lead. It can also be programmed from any PC with a serial port and the appropriate windows style software.

Diplomat Communication Systems Ltd., Unit 3, Summerlea Court, Herriard, Basingstoke, Hants RG25 2PN. Tel: (0256) 381656.

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ICOM R7100E

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Full coverage of both civil and military bands make this a firm favourite with our airband fans.True portability, 100 memories, scanning and searching plus keypad entry make this one of the most easily usable scanners. In stock always!

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The Super-Regenerative Receiver

Older readers may remember the super-regenerative receiver as part of their early attempts to listen on frequencies above 30MHz. Younger readers may have encountered the receiver in the form of cheap 'walkie-talkies' intended for short range communication. R J Harry charts the history of this kind of receiver.

The super-regen is a simple receiver with very good sensitivity and capable of detecting both a.m. and f.m. transmissions, but it lacks selectivity, and suffers from an annoying hiss in the absence of a signal. Worst of all, it can radiate a broad-band noise, to the irritation of other near-by listeners.

Although little heard of today, the super-regen has played a part in the development of amateur radio, WWII aircraft electronics and post war television. Not bad for a circuit, which in its simplest form, consists of nothing more than a valve and a few components.

A valve version of the circuit in its simplest form can be seen in **Fig. 1**. Looking at the diagram it is difficult to distinguish it from a conventional oscillator. The difference is a subtle one, the value of the grid leak resistor and the grid condenser (10MΩ and 50pF) shown connected to the grid of the 9002 valve.

How it Works

Super-regenerative receivers should not be confused with regenerative receivers, which work by feeding some of the amplified signal back to the input. This improves both selectivity and sensitivity, and the trick is to maintain the high gain without allowing the receiver to oscillate. The super-regenerative receiver goes one step further, and oscillates readily, but the oscillations are switched at a supersonic rate, typically between 300 and 500kHz. The oscillations build-up to a point where their amplitude is limited by the characteristics of the circuit. The oscillations are then quenched (stopped), and then allowed to build up again, repeating the cycle. In effect, the oscillator is switched off, and then on again. This sounds complicated, but is achieved in the self-quenching version by choosing the value of the grid leak-resistor combination such that the oscillator 'squegs'.

The result is that the anode current consists of current that is repeated at the squegging frequency. When a signal is received, the time at which the anode current starts is proportional to the incoming signal. The average value of the anode current therefore varies with the incoming signal modulation.

There are different forms of super-regen; the self-squegging single valve version is shown in **Fig. 1**, but there are other forms where the quenching oscillator is separate from the signal frequency oscillator. This gives better control of the quench frequency, amplitude and waveform, but the input-output relationship is logarithmic. This can be overcome by using some form of gain control to provide a linear input-out ratio, hence a less distorted output for amplitude modulated signals.

To sum up, the simple self-squegging receiver has a logarithmic input-output characteristic, which can cause distortion of the modulation. The quenching can be provided by a separate oscillator, which allows for refinements in performance. For example, by adding automatic gain control the oscillations is quenched before the valve overloads, and a linear characteristic, and better reproduction of the modulation is achieved.

History

Enough theory! It should be clear that the super-regen has forms other than simple self-squegger loved by amateurs. The circuit was first described by E H Armstrong in 1922. It became popular with radio amateurs in the early thirties, especially in America where it was used in the 56MHz band. It even gets a mention in the 'bible' of pre-war radio, the 1938 edition of the *Admiralty Handbook of Wireless*.

The thirties was probably the golden age for the super regen, for those with an interest in the un-explored wastelands above 30MHz it was a low cost way of discovery. Simply by changing the valve of the grid leak resistor, a valve could change its function from receiver to transmitter. For the cost of two valves (and some complicated switching) one could go from super-regen with one audio amplifier to one valve transmitter with amplitude modulator.

The fact that a modulated free-running oscillator is not very stable, was no problem to a broad band receiver like the super-regen. In some cases, to get valves to oscillate it was necessary to break the valve base open to get direct connection to the electrode connections and so reduce the self induction caused by the long lead-outs to the valve pins.

The super-regen was not ignored in professional radio circles, the National Company Inc. makers of the well known HRO receiver, produced a super-regen receiver, the 'One-Ten' using six sets of coils to tune from one to ten metres (300 to 30MHz). Quite sophisticated by amateur standards, it had a pentode r.f. stage (type 954) a self-quenched triode detector (type 955) and two conventional audio stages, a 6C5 and a 6F6.

The 954 and 955 valves were advanced for the time. They were Acorn valves produced by RCA specifically for 'amateurs and experimenters' and were designed to work up to about 500MHz. They were made to have low inductance by using close electrode spacing and short terminal wires which sprouted from the sides, top and bottom of the acorn-shaped glass valve. An example of the radio has been on exhibition at the Science Museum, London.

The start of WWII did not see the end of either super-regens, or Acorn valves. In Britain, some versions of the well-known WS19 set contained two transmitter-receivers, one for communication between tanks (it was known as 'the tank set') and the other set (h.f.) for longer distance communication. Guess what the tank to tank set was? It was a super-regen operating between 229MHz and 241MHz with an output of 3 watts. Although less well-known, the WS17 set was a classic 'minimalist' super-regen, it used only two valves, one as a receiver/transmitter and the other as a audio amplifier/modulator. It had a tuning range of approximately 46 to 64MHz. It was curious also in being built into a wooden box, rather than the usual military 'soldier-proof' steel case. This may have been because the set was developed for searchlight communications on the Home Front, rather than active duty abroad.

War Service

As the war progressed, the development of radar included the use of the super-regen by both sides. Germany used the super-regen in the 'Lichenstein' series air-to-air radars designed to provide the Luftwaffe with an air

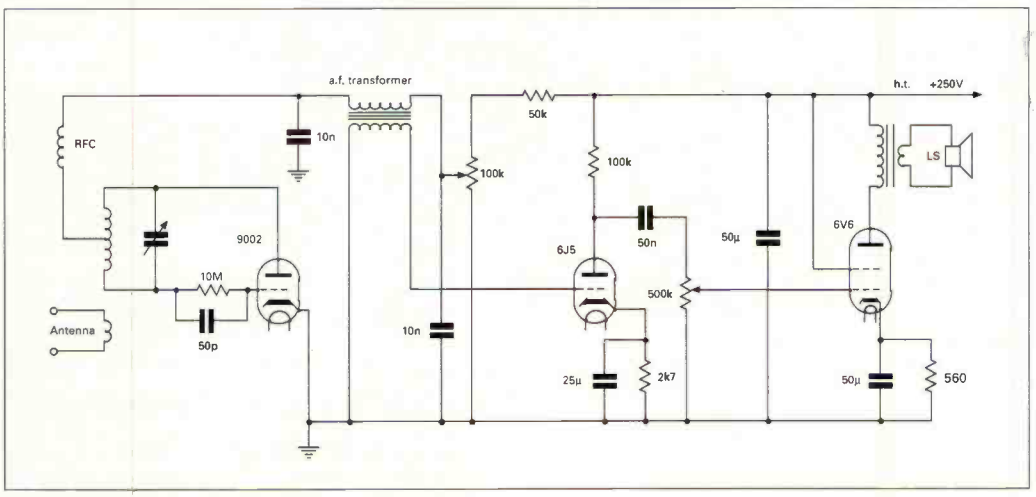

Fig. 1. (From *Super-regenerative Receivers* by JR Whitehouse.)

Here in the UK

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interception radar. It used a linear super-regen with automatic gain stabilisation. Operational frequencies varied during the war. In this role the broad bandwidth was not a problem as the receiver was detecting broadband signals (pulses of r.f. energy reflected by RAF bombers). However the tendency of the design to allow weak signals to be swamped by larger ones required measures to damp down the potential gain of the circuit to prevent jamming. Later versions of the set used a superhet receiver.

The British also developed IFF (Identification Friend or Foe) systems. The principle of IFF is that a receiver fitted to a friendly vessel or aircraft will respond automatically to a received signal by transmitting back an identifying pulse. Thus, a ground radar operator can identify 'friend from foe' by the difference in shape of the blip on his/her display. The IFF Mark III was produced in great numbers and used a linear super-regen circuit. A variation, known as 'Eureka' provided a homing facility for aircraft. The airborne part was called 'Rebecca'.

A more exciting application of the super-regen to aircraft was the 'S phone'. On moonlit nights, Lysander aircraft attempted to land agents or supplies to waiting partisans in occupied territory. The covert (by nature of its 100mW power, and very high frequency of 340MHz) 'S phone' allowed the aircraft to talk to those on the ground with little chance of interception. The ground receiver used an Acorn valve in a super-regen circuit.

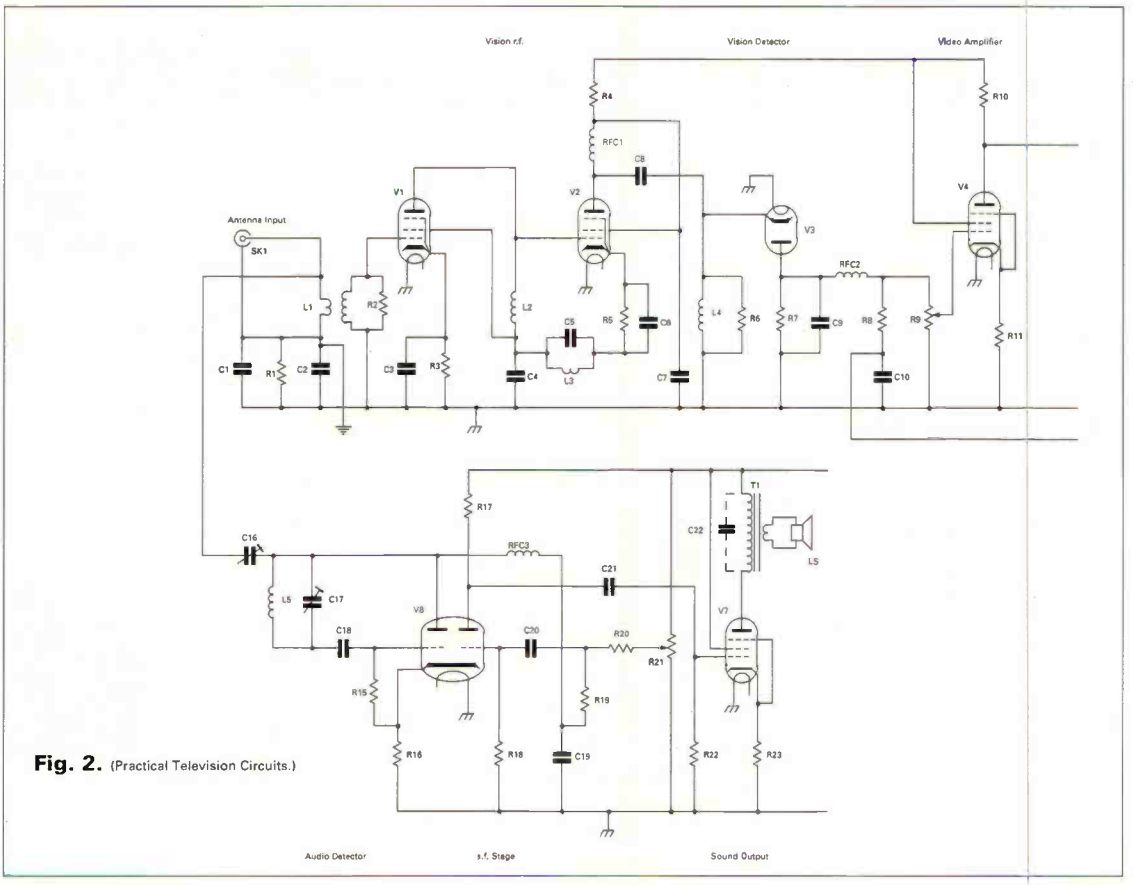

Fig. 2. (Practical Television Circuits.)

Peacetime

Post-war the tenacious super-regen appeared briefly as a f.m. broadcast receiver in a circuit known as the Hazeltine Fremodyne. This was a super-regen superhetrodyne using a 12AT7 double triode. One half was a local oscillator, the other a super-regen receiver operating at an intermediate frequency of 21.75MHz. Although the circuit is described in at least two text books, it is unclear whether it was ever taken up commercially.

The super-regen also appeared in early d.i.y. television circuits published by *Practical Wireless*. When television re-started after the war, only a small number of viewers could afford to purchase a brand new 'televisor', but with war-surplus equipment readily available at reasonable process constructional articles describing receivers built from surplus units began to be published.

The first television receivers had only one programme to receive. At that time the BBC had monopoly, and it was not until Independent Television (ITV) started in 1955, and provided an alternative channel, that receivers required to be tuned. Before that date, re-tuning was only required if you moved house, say from London to Birmingham. So the home-constructed sets were relatively simple, t.r.f. for the vision carrier and (in the simpler sets) super-regen for the sound. A part of a typical circuit taken from *Practical Television Circuits* of 1954 is shown in **Fig. 2**.

This seems to be the finale of the circuit. References in text books fade, and even amateur interest seems to have disappeared by the 1980s.

The last reference that I found was in *Amateur Radio Techniques* that describes a circuit using a transistor.

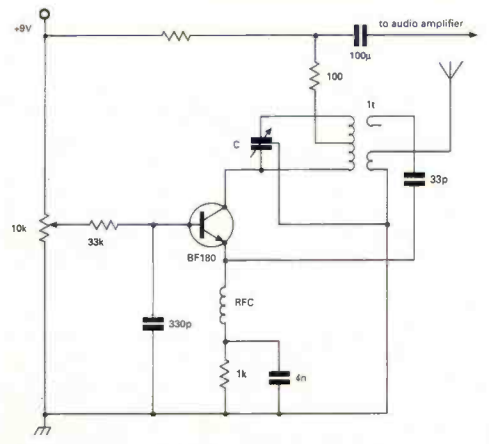

Fig. 3. *(Based on a circuit from Amateur Radio Techniques.)*

Try it!

For those readers who have never heard of a super-regen, as well as those who have, but would like to refresh their memory, the following circuit can be tried (**Fig. 3**). It is based on the *Amateur Radio Techniques* circuit, but with some changes in capacitance values. No audio amplifier is shown, but any convenient circuit can be used. The tuning range with the coil size shown was from about 80 to 150MHz. At the low end of the band broadcast, f.m. signals were strong, but music sound was distorted compared with speech.

A little further up the band a.m. aircraft transmissions were heard clearly. At the top of the range s.s.b. transmissions in the two metre amateur band were detected but were unintelligible. No amateur f.m. was heard, although in theory it should be possible to hear them. The antenna used was a 590mm length of wire, the super-regen is indeed very sensitive.

References

Super-Regenerative Receivers by J R Whitehead, CUP 1950.
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British Army Signals in the Second World War by M-Gen RF Nadler, Royal Signals Inst. London 1953.
Supplement to BVWS No 2 Dec 1991. ■

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Weather Facsimile, RTTY, Navtex, CW and FEC for the IBM-PC

All you need to produce superb reproduction of weather maps and amateur transmissions on the VGA screen of an IBM-PC. Extremely easy to use. Even the hardware to interface between your PC and an SSB receiver and a 9 to 25 pin interface adaptor are included.

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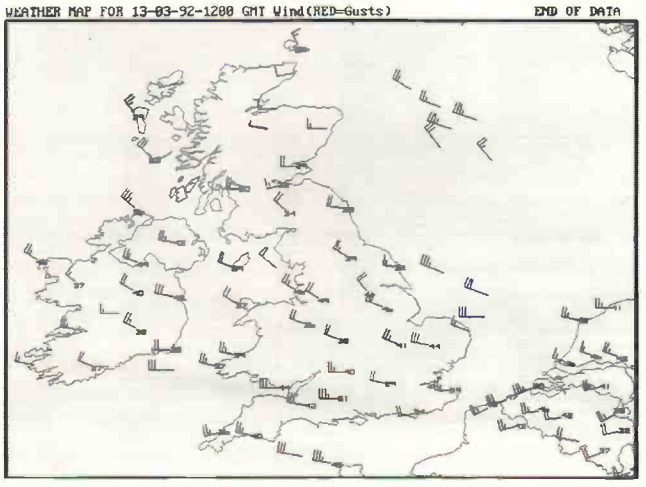

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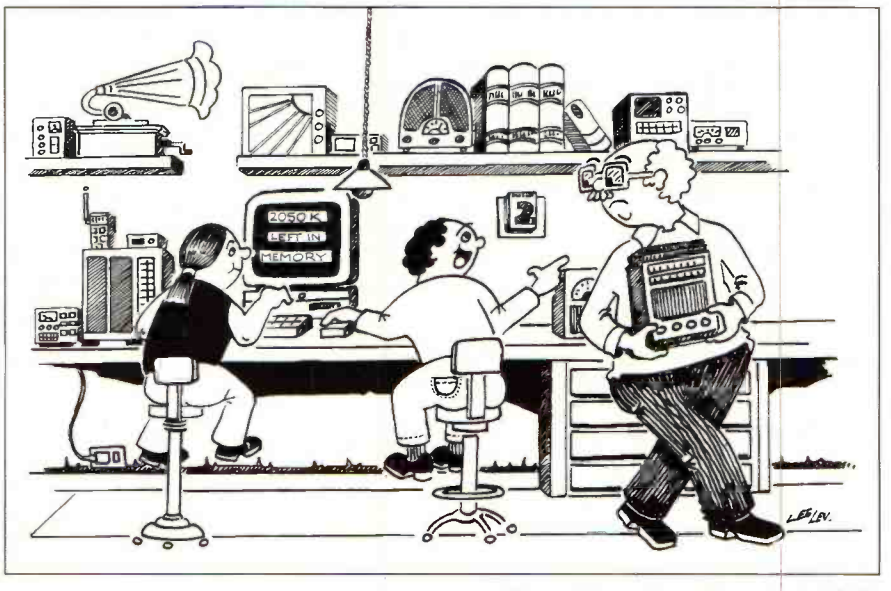
Listen With Grandad

by Leon Balen and David Leverett



Grandad, I've re-programmed your dates for the golf club dinner, the RAF re-union and the radio club meetings. Do you want me to include a reminder to invite great grandma for Christmas and new year?

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SANGEAN ATS803A

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

Specifications and features

★ 150-29.999 continuous tuning with no gaps. Phase locked loop-double conversion Superheterodyne ★ Full shortwave/AM/SSB 150-29999kHz no gaps! + FM87.5-108 mono/stereo ★ Five tuning functions: Direct press button frequency input auto scanning, manual scanning memory recall and manual tuning knob ★ Built-in clock and alarm. Radio turns on automatically at preset time and frequency. ★ Large digital frequency display. ★ Fourteen memories – nine memory channels for your favourite station frequencies. Last setting of mode and waveband stored in five memories. ★ Direct press-button access to all 12 shortwave broadcast bands. ★ Two power sources – battery or AC mains adaptor. ★ General coverage of all AM bands in LW/MW/SW (dedicated broadcast band coverage on all versions), plus of course the FM band for quality sound broadcasts in headphone stereo. ★ SLEEP function turns the radio

Tunable BFO SSB/CW!

on or off after an adjustable time of 10-90 minutes. ★ Separate BASS and TREBLE controls for maximum listening pleasure. ★ External antenna jack for better reception. ★ Adjustable RF GAIN control to prevent overloading when listening close to other strong stations or if there is interference. ★ New improved wide/narrow filter (6/2.7kHz) ★ BFO control (Beat Frequency Oscillator) enables reception of SSB/USB/LSWB (single side band) and CW (Morse Code) transmissions. ★ Illuminated display to facilitate night-time use. ★ Designed for both portable and desk top use. ★ Five dot LED signal strength indicator.

DIMENSIONS: 29.2cmx16.0cm (11.5inx6.3inx2.36in).
OUTPUT: 1200mW (10%THD).
WEIGHT: 1.7kg (3.75lbs) without batteries. Wide/narrow filter switch.

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Desk Top Antenna Model Desk 1300

Built and designed for use with scanners. Coverge: 25 to 1300MHz. Total height – 36ins – 9ins at widest point. Comes complete with 4 metres of RG58 coax cable and BNC connector fitted.. Ideal indoor – high performance antenna and can also be used as a car antenna when your car is static. REMEMBER YOUR SCANNER IS ONLY AS GOOD AS YOUR ANTENNA SYSTEM!

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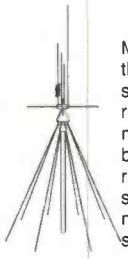
SKY SCAN V1300 Antenna



Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

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For improved performance, wide band reception, 25 to 1300MHz. Comes complete with protective rubber base, 4m RG.58 coax cable and BNC connector. Built and designed for use with scanners.

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NEW **100 Channel Scanner** **£199.99**

Netset PRO-46. Covers 66-88, 108-136.975 (AM), 137-174, 406-512 and 806-956 MHz. LCD display with backlight, search, priority, lockout, scan-delay, memory backup circuit. Belt clip. Requires 4 "AA" batteries or Adaptor. **20-9305**

NEW

50 Channel Scanner

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Netset PRO-44. Covers 66-88, 108-136.975 (AM), 137-174 and 380-512 MHz. LCD display with backlight, search, lockout, scan-delay and keyboard lock. Memory backup circuit for changing batteries. Belt clip. Requires 6 "AA" batteries or AC/DC Adaptor. **20-9304**

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Pro 2006 £299 **Pro 43 £249**

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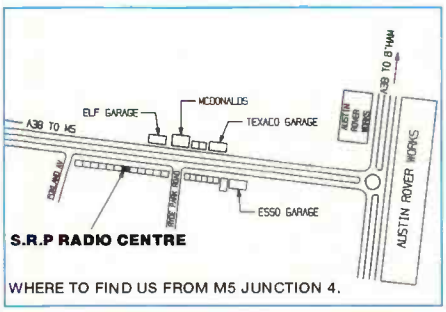

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Frequency coverage:

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(in 5kHz steps)
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(in 25kHz steps)
137-174MHz
(in 5kHz steps)
220-225MHz
(in 5kHz steps)
225.0125-400MHz
(in 12.5kHz steps)
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(in 12.5kHz steps)
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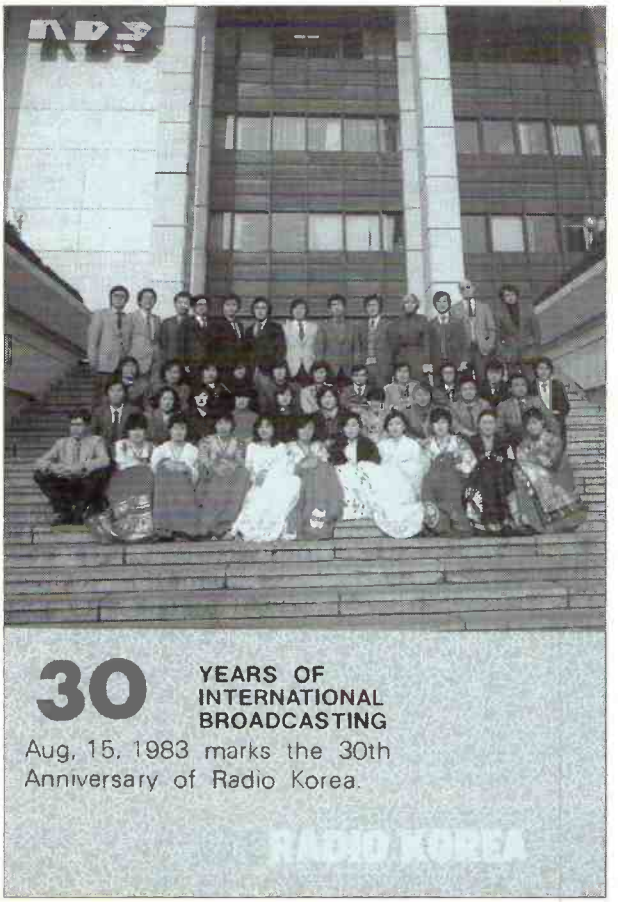
Let's go Out of Bounds

All keen DXers know the high frequency range of broadcast transmissions between 0 and 30MHz. is divided into many sectors are allocated, in theory, for specific purposes. Dick Moon looks at what can be found outside those sectors.

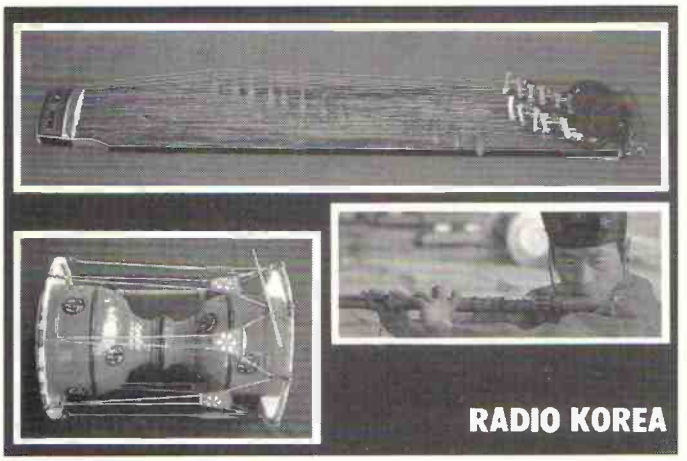
The short wave listener will be interested in those sectors that have been provided for commercial broadcasting; however the increased escalation in the number of broadcasting stations and the ever increasing demand for air space has lead to a number of countries to encroach on to non-commercial bands - in other words they have gone 'Out of Bounds'.

I have spent several fascinating hours scanning through these frequencies, and have been amazed at the vast assortment of signals that have appeared in my headphones. VOLMETs, marine, military and aeronautical, numbers stations, clandestine, feeder transmissions, as well as the out of banders that are the subject of this article, may be heard throughout these ranges.

A number of countries are represented in these bands, but the majority are within the Eastern bloc, with Radio Beijing heading the list, followed by Radio Pyongyang from North Korea. Many of these stations are domestic, and intended only for local listeners, which provide a challenge for the DXer. Identification is made easier by the fact that the majority of the frequencies carry only one transmission. My own tally of commercial stations identified stands at 48, which are set out below, but no doubt with careful monitoring additional ones could be logged. Why not spend some time fishing in these interesting waters and see what you can hook - it could be very rewarding.



Staff members of KBS, Radio Korea's ten language sections



▲ Traditional musical instruments of Korea from KBS, Radio Korea

▼ A Traditional Korean Farmers' Dance Troupe from KBS, Radio Korea

Freq MHz	Time UTC	Station	Freq MHz	Time UTC	Station
6.230	1950	TWR, Monaco	7.590	1605	R. Beijing
6.250	0430	R.Pyongyang	7.660	1520	CPBS, China
6.250	1950	R. Nac.Malabo	7.820	2100	R. Beijing
6.300	2130	WYFR, Taipei	7.935	1610	CPBS, China
6.305	0420	Voz del Cid	8.345	1612	R. Beijing
6.400	1620	R. Pyongyang	8.660	1623	R. Beijing
6.480	2210	KBS, Seoul	9.022	1820	VOIRI
6.540	2200	R. Pyongyang	9.064	2006	CPBS, China
6.550	1735	V. o Lebanon	9.080	2025	CPBS, China
6.576	1830	R. Pyongyang	9.170	1745	CPBS, Taiwan 2
6.750	2040	CPBS, China	9.325	1945	R. Pyongyang
6.840	1550	CPBS, China	9.345	1955	R. Pyongyang
6.955	1920	R. Beijing	9.375	1810	R. Tirana
7.412	1715	AIR, New Delhi	9.380	1500	CPBS. Taiwan 1
7.430	1925	V. o Greece	9.395	1815	V. o Greece
7.440	2130	R. Moscow	9.410	2017	BBC
7.445	1730	V. o Asia	9.425	1935	V. o Greece
7.470	1645	R. Beijing	9.435	2030	KOL, Israel
7.504	1735	CPBS, China	9.440	2022	R. Beijing
7.510	0456	KTBN	9.445	0508	WSHB
7.516	1745	CPBS, China	9.450	2028	R. Moscow
7.520	0345	WWCR	9.460	2030	Turkish RTV
7.525	2025	CPBS, China	9.490	2018	R. Moscow
7.550	2015	KBS, Seoul	9.495	0509	WHRI

The Canadian '58' Set

by Ron Ham

Most of the 'portable' sets used by the British Army during WWII tuned through the frequency range of 6 to 9MHz and the Canadian '58' was no exception.

WS-58 (Mkl) was made in Canada by Addison Industries in 1943 and in my view its compactness, ease of use and general appearance placed it among the leaders of its time. Although not obvious at first sight, the actual set, measuring approximately 265 x 125 x 80mm (10.5 x 5 x 3.5in), displayed in **Fig. 1** outside of its case, is housed in a sprung sub-frame that is bolted to four rubber/metal mounts inside the outer casing. Much of the sub-frame and the fixing point to one of the mounts (top right of the 'loose' connector) can be seen in **Fig. 1**.

When fitting the set, a single pin on the rear of the sub-frame automatically lines up with the antenna socket attached to a bracket on the rear of the chassis, **Fig. 2**. Four winged bolts are then tightened and the 'loose' 10-way connector, **Fig. 1**, is gently pressed home. The latter is an extension of the power input socket situated under the on/off switch on the left side of the main, military green, cabinet.

Construction

Unlike WS-18 and WS-38 which use the large Mazda octal valves, WS-58 has six, B7G, miniature valves (1 x 1R5, 3 x 1S5 and 2 x 1T4) and two larger and rarer types (1299A) with B8G bases. These particular B7Gs require 1.4V at 50mA on their filaments and 90V on their anodes, however, after a hunt, I found some gen on the 1299. This shows that its filament can be wired for 1.4V at 220mA or 2.8V at 110mA. The former with 135V on its anode provides a power of 0.5W and the latter with 90V gives a reduced output of 0.27W.

The rear view of the chassis, **Fig. 2**, shows the 1299As on the left and the B7Gs on the right, held in position by a 'T' shaped bracket with rubber grommets to protect their delicate glass pips. One interesting feature is that permeability tuning is used for both receiver and transmitter and half of the transmitter's tuner, showing the adjustable core extending from the coil while set to 7MHz, can be seen below the base of a 1299A, in **Fig. 3**.

One of my archive books *Wireless Terms Explained*, by 'Decibel', dated 1937, states that Permeability Tuning is:

"A system of tuning electrical circuits in which variable condensers are dispensed with and the inductance of the tuning coils is varied by adjusting the amount of magnetic material inserted within the coil."

As you can see this type of tuning was used in the 1930s and can be found in many car-radios today.

Power Pack

The voltage requirements for the WS-58 were produced from an oblong metal cased back-pack which housed a pair of two volt accumulators and a vibrator power unit (v.p.u.) and in the event of problems, a set of spare valves, fuses and a vibrator were kept in the pack's oversized lid.

The original accumulators, made by Willard, had 3 coloured balls indicating the state of their charge, all up fully charged, all down discharged etc. These floating indicators were seen through windows each side of the back-pack so that the operator knew when they needed a charge. The low tension for the valve filaments was provided by the accumulators and the high tension of 180V for the transmitter and 90V for the receiver came from the vibrator unit. These supplies were carried via a multi-core cable, terminated with a connector, which fitted the socket below the main on/off switch, top left in **Fig. 1**.

Fig.1: WS-58 out of its case.

Should a fault develop then a number of tests should be carried out by the operator with the meter switch, (top right, **Fig. 1**) by comparing the meter readings with those stated on the instructions in the lid.

With the 'On-Off' switch at 'On', check all voltages and currents by the following chart:

Meter Switch Position	Test Meter Reading	Indication
180	130* to 180 V	Sender h.t. Voltage.
90	65* to 90 V	Receiver h.t. Voltage.
A-Bat	1.1* to 1.5 V	l.t. Voltage.
R.Drain	4-7mA	Receiver emission current ('Recv.-Send' switch at 'Recv.' Vol. control on full.)
S.Drain	13-23mA	Sender emission current ('Recv.-Send' switch at 'Send'. no modulation.)

*If readings are lower than these values, the battery pack should be replaced or v.p.u. recharged.

Operating

The slow-motion receiver and sender dials are prominent on the front panel, **Fig. 1** and the smaller, hexagonal, knobs adjust the receiver's volume and antenna trim (top left), equipment testing (top right) and transmitter output (below meter). The return-biased send switch (bottom centre) can be finger operated, or locked on, from the panel or, when the lid is closed, by pressing a button which moves the switch via a mechanical linkage (centre lid **Fig. 1**). A pair of trailing sockets from the power input cable provided the combined headset/microphone connections for two operators. The net switch, situated by the receiver tuner, **Fig. 1**, was used to set the transmitter on to the same frequency as the incoming signal.

Finally, the instructions say, *"Place Set in position for operation by either strapping it on Operator or by placing it on a level spot on the ground. Remove Antenna from the canvas holder, assemble, and plug it into Antenna Receptical on the rear of set."* However readers, if you do find any of these military sets, take great care when working on them and don't use the transmitter.

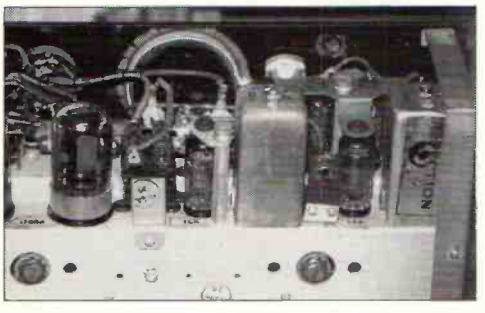
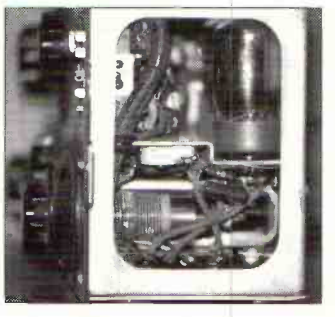


Fig 2: Rear view of WS-58 chassis.

Fig.3: Side view of WS-58 chassis showing tuning arrangement.



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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 strength ..... meter

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

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

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THIS RADIO IS ESPECIALLY SENSITIVE AT UHF FREQS. Set is supplied with mains power unit. **£389**

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★ 100 Memory channels
★ AM/FM on VHF
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£269

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

VT-125 UK CIVIL AIRBAND RECEIVER

Using the same technology as the VT-225, 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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★ Switchable audio squelch
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NEW MULTIMODE SCANNER
★ Receives 100kHz - 2036MHz.
Modes:- USB, LSB, CW, AM, FM, WFM **£899**

JAPANESE LOW LOSS COAX

Super low loss coax – essential for optimum performance with wideband UHF scanners and receivers. This cable is good for frequencies up to 3GHz.

Model 5D (8.1mm) ..... 75p per metre
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We stock a range of PL259, BNC & 'N' type connectors for the above cable ..... **£ CALL**

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BLACK JAGUAR BJ200 MKIV

NEW

A new and completely re-vamped version of this popular scanner. Now using surface mount technology performance is better than ever.

★ 50-88, 26-30, 115-178, 200-280, 360-520 MHz
★ Selectable AM/FM
★ 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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State which model when ordering

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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 **£399.99**

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Pocket shortwave plus VHF radio supplied with headphones, case and shortwave guide. This model won't hurt your pocket.! **£179.99**

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One of Sony's most popular VHF and Shortwave radios, 76-108MHz FM, 150kHz - 30MHz Shortwave receives AM, FM, SSB..... Well Rated.! **£179.99**

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A new multiband radio from Sony with dual canversion receiver that gives outstanding results.

★ 150kHz-30MHz, 76-108MHz
★ All modes including SSB
★ 125 multi-function memories

Plus lots more facilities **£279.99**

AN1

An external active antenna with built-in pre-amp, covers 150kHz - 30MHz. Fully portable with easy to mount fixing brackets. **£58**

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Active antenna for Aircraft and VHF reception, suitable for Sony Air 7 and others. **£58**

NEW SONY "PYXIS" GLOBAL POSITIONING RECEIVER

A portable satellite receiver that gives

★ Position in Lat./Long. and altitude accurate to 30–100 metres
★ Distance and direction to destination
★ Current speed and heading
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Track II A Satellite Tracking Program

There are a number of programs available for the PC that allow the satellite enthusiast to monitor the predicted positions of various space-craft. This one is specifically written for weather satellites by the British company Timestep Weather Satellite Systems Ltd and is reviewed by Lawrence Harris.

The software is easily installed on your hard disk and runs within the PROsat II program that I reviewed earlier this year. Obviously it can also run independently. The minimum requirement is for a 286 PC with 640Kb RAM, a hard disk and VGA monitor. Your mouse can be used, but it is not essential.

Newcomers to this fascinating hobby may not appreciate the different types of weather satellite so let me briefly mention that there are two main types - the low, near-polar orbiting satellites that have orbital inclinations between 82 and 99°, and operate at heights ranging from the Russian OKEAN series at some 640km, the NOAAS at 840km, the Russian METEOR class 2 satellites at 950km, to the more distant geo-stationary (METEOSAT-type) satellites which are at 35 800km and therefore take about 24 hours to orbit once around the earth, so appearing to remain stationary in the sky. This program is used to show the simultaneously calculated positions of a number of the polar orbiting satellites.

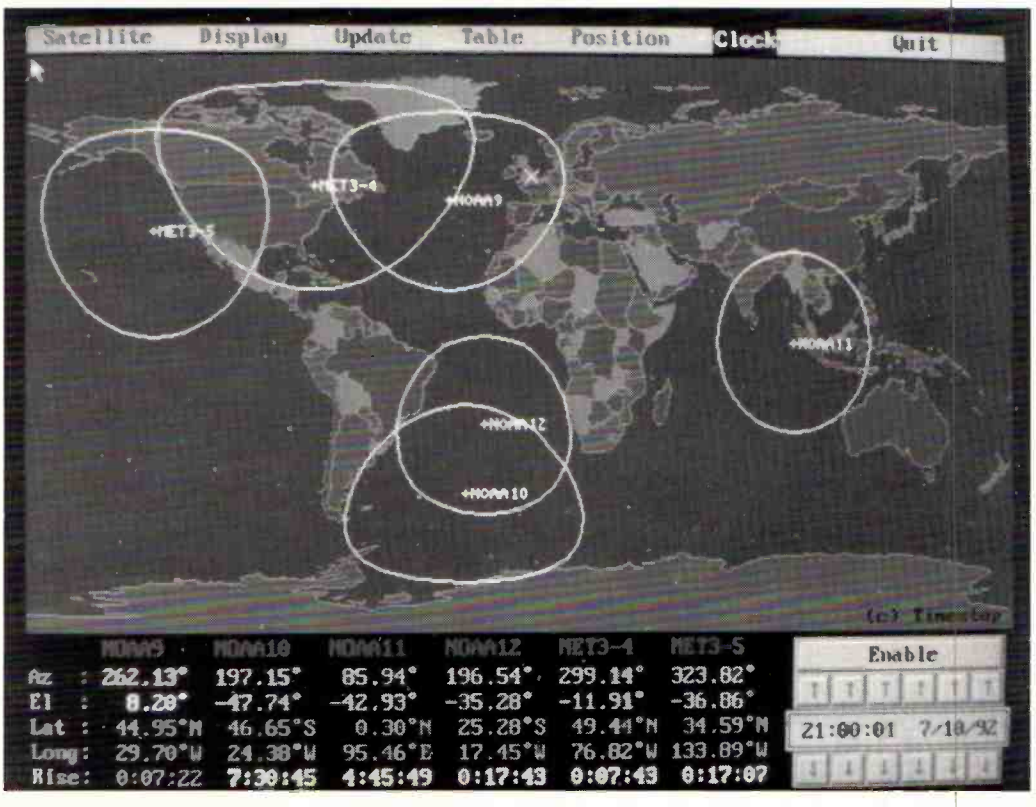
The Display

The larger part of the display is a Mercator projection of the earth and it is as good as one would expect on VGA graphics. Different countries have different colours to mark their boundaries, although the former Soviet Union is shown in one colour, despite recent changes!

The top line of the screen follows the PROsat II format, and offers **Satellite**, **Display**, **Update**, **Table**, **Position** and **Clock** as the main options. The lower part of the screen gives real-time information for those satellites selected for display. The parameters constantly displayed include azimuth and elevation, latitude and longitude (of the sub-satellite point) and the time before the next rise (or set) for each satellite.

Finally, at the bottom right of the display there is a section showing the current epoch (date and time) and the word **Enable**. Using a mouse, you can select **Enable** and then use the arrows to change any part of the epoch - e.g., the month, the date or hour, etc. The effect is to immediately update the displayed satellites to show the positions at the new epoch. By selecting **Cancel** the display reverts to real-time. This process is also duplicated via the **Clock** option. The data changes every second as the program updates each satellite. I switched my processor speed down to 16MHz (instead of its normal 33MHz) but there was no discernible difference. That is good because it means that the software is not limited to running on high speed machines.

I also ran it on my other computer which doesn't have a co-processor fitted (these have the effect of enormously speeding up calculations) and,



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as expected, there was a slight drop in speed, but this is inevitable with all programs, and does not affect the user.

The Options

All options can be selected by pressing the first letter, or by clicking your mouse on the option. The first one - **Satellite** provides the choice of adding to, or removing from the display, one satellite, or swapping one for another. You can display up to six satellites simultaneously but if you want to include the sun (in order to see where the day/night terminator is) then you can display up to five.

The **Swap** option allows you to exchange the last displayed satellite for a new one. At the time of writing, there were three NOAAs and three METEORs operating and so all could be monitored. The **Display** option includes **Trace**, **Footprint**, **Label** and **Beep**.

Trace (on) leaves a trail showing where the satellites have been; **Footprint** is the familiar term meaning the area from which the satellite can be 'seen' (i.e., where it is above the local horizon); **Label** (on or off) allows the satellites' identity (e.g., NOAA 11) to be shown or not); **Beep** on causes the computer to beep whenever a satellite rises above or sets below the selected station horizon.

Updating

The accuracy with which any program can calculate and display the position of a satellite depends on the program having both recent Kepler elements and an accurate station position. Kepler elements are those parameters which are used to accurately describe the exact position of a satellite in space. I have described them in my monthly column - 'Info in Orbit'.

Satellites are always subject to 'drag', that is the effect of the tenuous remains of the atmosphere through which even the highest orbiting satellites must pass. The lower the orbit, the more atmospheric drag it will experience. That is why the Russian space station MIR has to keep firing its motors every few weeks to raise its orbit to prevent re-entry.

The **Update** option allows you to select the most suitable method to update your elements. The frequency with which you update the elements depends on what errors you find acceptable. I update mine every seven days to ensure that identification of new signals is possible, and to provide good data for newcomers, but for routine purposes I would suggest monthly (or even less frequent) updating.

Sources of up-to-date elements are many and varied. Get a £100 modem and the world is your oyster! Dial up Timestep's own 'Bulletin Board' on (0440) 820002 and the available elements may be only a few hours old! Several other BBS are available, and numbers are occasionally given in my regular column. Finally, for those without a modem, I can supply printouts, see 'Info in Orbit' for the details.

Using a simple word processor, you can prepare a file containing either AMSAT or NASA 2-line element format data for your satellites, and **Update** option 1 will read this automatically. You can also update a satellite by manually editing using option 2. Options 3 and 4 allow additions or removal of a satellite from the program's database, and option 5 lets you export data - e.g., to the PROsat II program for grid calculation. I tried these options and they all worked perfectly, and (I was pleased to note) - are check-summed to minimise errors.

Printouts

From time to time you will want a printout of pass data, perhaps to plan a day's monitoring. The **Table** option gives you the choice of **Quick schedule** that provides a list of consecutive passes for a selected satellite; **Full schedule** that gives a detailed minute by minute positional analysis for one satellite, and **Next pass** that gives a summary of the next pass for each satellite in the whole database. The last option has extra flexibility, in allowing the selection of the minimum elevation to be accepted for printing. With all options you can have the data printed on the screen and/or your printer.

I think that a print facility is essential for serious daily monitoring. If you wish to check which satellites are operational during a certain period such as a Sunday afternoon, a printed schedule allows you to know exactly when to listen out, rather than feel tied to the scanner for hours.

Position allows the selection or editing of up to six different station locations. Those already provided include Timestep's Wickhambrook base, the north pole, Chicago and Seoul. When setting up your own location it is worth measuring your longitude and latitude (using a good atlas) as accurately as possible; this data will be used forever!

Finally, the **Clock** option allows the setting of the DOS clock, and therefore lets you also use temporary times for test purposes. Similarly the date can be re-set. The only programmed function keys are F4 and F5 of which F4 is used to put the program into a fast time mode, where time is accelerated so that up-coming movements can be seen. The **Slip** mode (F5) simply pauses the program. In either case, pressing **Escape** resets the clock - but only for function key operations. Setting your DOS clock is a permanent change - until you re-set it correctly. ■

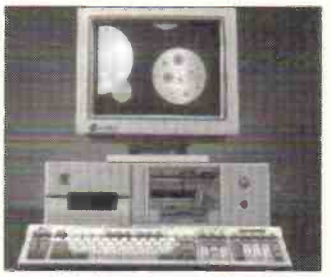
Summary

This program completes the suite that both run under PROsat II and independently, covering most requirements of a wxsat program on its own. For any satellite enthusiast you must start with a good tracking program if you are to understand the way in which different satellites orbit. The printouts are very useful, even if they do include 'by Timestep' on each one! It is also worth noting that this review was done without the use of a manual - a help facility is built into the program.

Price and availability

My thanks to **Timestep, PO Box 2001, Newmarket CB8 8QA. Tel: (0440) 820040** for the review software. A new version of Track is due to be released by Timestep in the near future. Keep your eyes on 'Info in Orbit' for details.

Computers - How to choose the one for you



There cannot be many people in Britain who have not yet had any involvement with computers, whether voluntarily or not! The main theme of this article, by Lawrence Harris, is to describe what current computers can do for you, and to suggest which types may suit certain groups of people - including radio hams, s.w.l.s, WXSAT and more general users. It cannot be a comprehensive review - that would require a book.

Computer Requirements

One of the most common questions that I am asked about computers is "What is the best machine for me to buy?" If I asked a garage proprietor what was the best car for me, I know what he would say! Before purchasing a new machine you need to spend some time writing down the jobs for which you expect to use the computer. This is a worthwhile exercise because it encourages you to work out why you really want one.

For example:

Business, correspondence, documentation, regular financial monitoring, job planning, data record maintenance, games??, hobbies.....

Readers of *SWM* will be most interested in the applications available for the various fields of radio use. This field is enormous. Glance through the different sections of *SWM* - you will see reports from people monitoring all parts of the radio spectrum. If you are considering the purchase of a computer specifically for work in this field, e.g., satellite tracking, RTTY and picture decoding, it can help to know something about computers before purchase.

Construction

Computers come in different shapes, commonly referred to according to their 'footprint' (desk coverage). Small units may be described as 'slimline'; the most common type is called a desk-top; a larger type is the half-tower, and the largest is the full tower. One reason for having different sized cases is to allow for different expansion requirements. A slimline case cannot easily accept further hard drives or even new boards for its internal expansion slots.

At the other extreme, a tower should have space for a variety of expansion possibilities. Expansion slots allow the addition of these new facilities including accelerators or even a FAX. They come in two sizes - half and full cards. My main advice is check the case construction - you want all metal - not plastics! Metal casing should minimise unwanted electrical interference coming from the computer - of critical importance when you are using it near radio receivers!

Compatibility

This refers to the ability to run 'IBM' software. Computers such as the Archimedes have their own operating system so cannot normally run programs designed for IBM and clone (copy) hardware. However, there is a type of software available that allows some IBM programs to run on some non-compatibles. Such programs are called 'emulators' and achieve compatibility with varying degrees of success!

Other terminology used to describe computers includes XT (extended technology) and AT (advanced technology). Avoid XTs. These were the earliest IBM machines of the PC type, and are virtually impossible to upgrade. Some are still available at very low prices.

Processor Speed and Type

The overall speed that a computer runs depends primarily on the operating speed of its main processing chip, and therefore on its type. The main types are the 80286, 80386 (DX) and 80486 (DX), plus some SX variations.

The processor in a 80286 chip usually runs at speeds between 12MHz and 25MHz. Faster speeds can be found with the 80386 and 80486 processors. You do not usually need such speed for utility work, but if you already have it then software will run faster.

Just a few years ago, lower priced computers (8086 or similar) were running at between 4 and 8MHz. This was ample for many applications; speed may be irrelevant when using a word processor! For sorting a large database, however, you may want the last ounce (megahertz) of speed that can be obtained. If you wish to run 'Windows' programs, a '286' is at the bottom of the recommended machines list!

The second, the 386(DX), was the first microprocessor to be able to run more than one program simultaneously - to multi-task. This feature can be very useful to the advanced hobbyist. It becomes possible to use one computer to receive data from a satellite, whilst also running a program to drive the receive antenna.

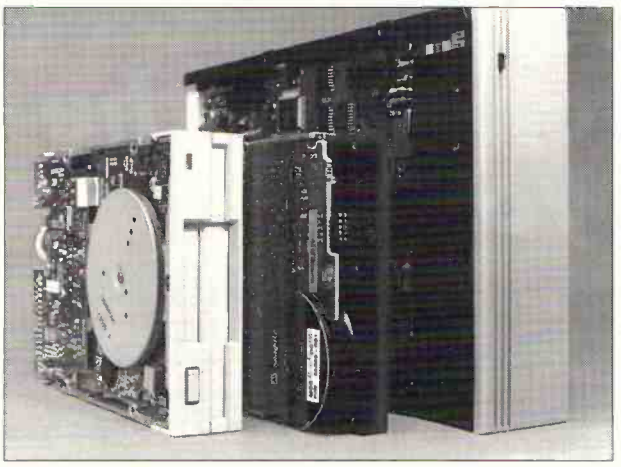
Need any Cache?

The 80486(DX) chip is similar to previous processors, but has an on-board co-processor (see later) and some cache memory. Cache is a special type of memory storage - it is extremely fast, (much faster than conventional RAM) so can speed up the flow of instructions to the main processor. Without cache the processor may have to wait for slower RAM to provide the next set of instructions.

For most users, cache is not essential; if you can afford this feature, look for about 64K cache - more is OK but may not significantly affect the operating speed.

The latest development in chip technology is the Pentium

Storage systems. *Top* – CD-ROM offers 600Mb; *Centre* – 5.25in high density floppy disk gives 1.2Mb; *Bottom* – 3.5in high density floppy disk gives 1.44Mb



Left to Right – 3.5in HD floppy disk drive, 120Mb 3.5in IDE hard disk drive and 20Mb 5.25in MFM gard disk drive

(or P5 or 586) processor. Its specification may include an operating speed of some 66MHz, with many other refinements. If you decide you want to buy a computer, do not put off purchasing a machine on the grounds of preferring to wait for this chip! Experience indicates that it will initially be expensive and have capabilities far outside our own requirements.

RAM

Random-Access-Memory is the amount of built-in memory available for programs and data. DOS normally uses up to 640Kb, but it has long been possible to physically add extra memory above this DOS limit, and some programs can now use this effectively.

For this reason, most modern computers have at least 1Mb RAM fitted, and for improved performance with some software you may have 4Mb fitted. For many WXSAT users and many radio applications 1Mb may be enough, but when possible, it is helpful to have more available. Installing extra RAM generally costs about £25 to £40 per Mb. Increasing use is being made of extra RAM by more recent imaging software, which can be used to hold animated images. I would never presume that someone would buy a computer **just** for hobbyist use, so it is important to appreciate the requirements of other programs. Many people want to run 'Windows' software (see later), and for these applications your machine needs that 4Mb to run efficiently.

Floppy Drives

These are the 5.25 or 3.5in drives that are usually mounted on the front of the machine and allow the loading in of programs and data. There are two types (or densities) for each disk size. The modern floppy disk will store 1.2Mb (for 5.25in), or 1.44Mb (for 3.5in). This storage capability is called high density (HD). The lower capacity disks are called double density (DD).

If you are specifying a drive as part of a package deal, go for a 3.5in - they are far more rigid. When buying new disks, remember to ensure that you buy the correct density. Your drive should be able to cope with both types, but if you are buying a second-hand model, check to see which type it is.

To appreciate the meaning of Kb, it may help to know that a sheet of A4 filled with text will occupy about 2Kb of storage. This means that you can hold the contents of an average book on one disk.

Storage Space

This refers to the size of the hard disk - the built-in storage medium that modern computers normally have fitted at the time of purchase. The minimum size considered workable is about 42Mb. By the time you have added several multi-megabyte programs, you may not have more than a few Mb left for data storage. Some applications can produce very large data files - my Meteosat Primary Data System can produce individual files of up to 30Mb, so I now use a 109Mb hard drive.

File compression programs are available which will compress your data before storage on a disk; these are increasingly being fitted as standard before sale. I remain wary of using these - give them a few more months!

Disk Access Speed

In recent years, the time taken for the disk drive head to move to a specific location on the disk, and then write or read data, has reduced dramatically. Some are now quoted at 15ms. For many applications you will find the slower speeds of 20 to 30ms to be fast enough.

There is one other factor though - these speeds become meaningless if you don't perform regular maintenance on your disk.

Disk Maintenance

After a period of several months use, your disk will contain an increasing number of fragmented files - these are files where the data is spread over a number of different areas on the disk. This is a consequence of the manner in which DOS works, and, over a period of time, can dramatically reduce the disk's effective performance. Using suitable software you can re-combine (de-fragment) all of the file sections, and also combine (make contiguous) the empty spaces, thus enabling the system to write data to one large area - very fast! Utilities such as the 'Compress' option, which is part of the 'PC Tools' software package, can perform this task.

Another fact of life for DOS (Disk Operating System) users is the gradual loss of small areas of the disk, which occurs during continual file storage and erasure. This loss is not physical - the storage area remains. It is just that DOS can lose 'track' of it. The problem is easy to correct if you know how! Use the program 'chkdsk' (check disk), which you should find in the DOS directory already on your computer. The DOS manual or the built-in DOS help screens explain how to do this.

These facilities can all increase the efficiency with which your computer operates.

Monitors, Pixels and Video Cards

The standard monitor barely exists! There are many variations so it can be confusing to a newcomer who wants to purchase a machine. Monitors are characterised by type (colour or black-and-white), the size of the screen (14in being 'standard'), and by the number and size of pixels (picture elements) both across and down the screen.

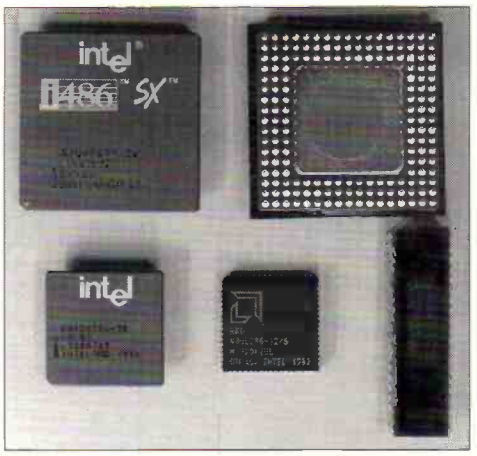
The actual physical resolution of a monitor depends on the dot pitch size, which should be quoted as a specification when you buy your computer. A fairly standard size is 0.31mm, but for the best quality pictures, you should try to obtain a 0.29mm dot pitch. For a black-and-white monitor there is one beam per pixel (giving generally sharper images). For a colour monitor, there are three single-colour beams, so each must focus on the same pixel to within 0.29mm!

The intensity of each beam must be specified so the more pixels that are used to display a picture, the greater is the memory requirement for the card used to control the monitor.

Let's briefly indulge in some revealing mathematics. Each pixel has an individual address, stored in the computer and used by the video card. We should appreciate the enormous memory needed to tell every pixel which of many colours it should be!

A VGA monitor can display 800 pixels across, and 600 pixels down the screen, so has a total of 480 000 pixels. Each needs information to tell it to what brightness level and colour it should be set.

One byte of memory



Some of the processors used in PCs. *Top row* 80486SX/20; *Bottom row* l.-r. 80387 maths co-processor; 80286/12; and 8088/4.77

represents eight individual bits, so can represent any of 256 different levels. This (800 x 600) display requires 480 000 bytes. Therefore, the card 'powering' the monitor needs to have at least this amount of memory fitted. Consequently, for this display quality, you must confirm that the card is properly populated with sufficient chips - 512Kb in this instance.

The Card

Such cards need RAM ranging from 256Kb to 1Mb RAM, but only to hold pixel information - don't be confused with program RAM which actually generates the picture. It is essential that the card produces a video display to match your requirements.

Sometimes one can 'upgrade' the video card, perhaps by buying more memory chips. This extra memory can then enable a higher resolution monitor to be used - or perhaps allow the monitor to display at its maximum capability.

Monitor Standards

There are so many that I will only cover the main types:

CGA: No! We just don't use the Colour Graphics Adapter any more. It was one of the earliest types, introduced in 1981 as an IBM standard, having the most rudimentary graphics capabilities. The CGA screen has few modes (choices of display resolutions), e.g., 320 by 200 pixels, each having one of four colours. Can you imagine trying to display high quality pictures in CGA? Don't! The only computers likely to use CGA displays are small, cheap portables and old, second-hand computers.

EGA: The EGA (Extended or Enhanced Graphics Adapter) originally supported 320 by 200 pixels, each having one of 16 colours. Later EGA cards provided 16 out of a potential 64 colours at the increased resolution of 640 by 350 pixels. I used an early version of this in my work place and it was a great improvement. Again you may see computers with these displays; they are all but obsolete. Modern software really needs better than this for optimum results.

VGA: The VGA (Video or Versatile Graphics Array) arrived a few years ago, and provides a greater choice of 320 by 200 pixels with 256 colours, or 16 colours for 640 by 480 pixels, which is usually the full resolution. A choice of 256 colours implies a total of 64 grey levels (because each grey level consists of the three individual colours having identical intensities). For WXSAT purposes VGA normally means 64 grey levels. There is at least one graphics card available which can provide 256 grey levels for some VGA monitors.

SVGA: The SVGA (Super VGA) monitor is currently near the top end of the scale, although there have been further developments (e.g. the XGA - eXtended Graphics Array). SVGA offers 800 by 600 pixels, each of which can be illuminated by any one of 256 colours which are themselves selectable from a palette of 262144. Of course this does depend on the software giving such choices.

Operating System

Virtually every computer comes with a Disk Operating System (DOS) already installed. New versions of DOS come out almost annually, and are straight forward if you study the manual (or a short-form book). These days, some people prefer not to learn DOS; this may because it requires the use of text instructions, even though the instructions are not difficult.

The most well-known alternative is the 'icon' system called Windows. This works on the principle that pictures (icons) are more easily understood and remembered. OK, I use and teach Windows, so I am familiar with both. Each system has an enormous range of facilities, many of which won't be used.

If you study the facilities that are available, you will be amazed at the efficiency and pleasure that you get from knowing what can be done.

Do remember that utility programs for decoding WEFAX, c.w., RTTY, etc., will usually be DOS based, so your Windows expertise may be kept for other applications!

Ports

Your computer can communicate with other computers by using common standards of data transmission. They are fitted with two type of port - a parallel port (often used for printers), and a serial port. Your mouse will be plugged into the serial port.

Many amateurs make regular contact using their computers and modems. Data can be passed between groups around the country and the world using this system. There are networks of computer users, often with specialist interests, such as satellite buffs, who are willing to share all manner of data.

Viruses

You will have heard about viruses. They are programs designed to cause various types of problems by interfering with normal computer operations in an unpredictable manner.

Virus writing and dissemination is a criminal act. To prevent your computer being 'infected' with a virus take common sense precautions. Do not allow free access to your computer; don't use disks from unknown sources without careful checks. This is the most common method of virus transfer.

Purchase?

When you have decided on the essentials of your ideal system you have a further choice! Buy locally or by mail order? You may pay extra when you purchase from a local supplier. His expenses become yours. However, he should be able to help if you get really stuck. Glancing at computer magazines shows that some good deals are available, and using your credit card can provide some protection. Don't be too shy about 'making an offer'! You may be pleasantly surprised.

Finally

I have not detailed peripheral devices - items like printers, add-ons such as WEFAX and RTTY decoders, image scanners, printers, and the multitude of other exciting things that can attached to your computer to enhance its use. Each device has a number of choices and types.

Every user will, in time, want to upgrade their computer - perhaps to extend a particular aspect of their hobby. Some of the products that I have been fortunate to review or to try out on behalf of *SWM* readers have shown me the ever increasing role that computers have to play in short wave utility work.

As with any purchase, the most important job is to carefully identify your personal requirements, and then decide on a budget. I hope that this article may have helped to clarify the perplexing variety of hardware that is waiting for purchase out there. ■

Scancat

Computer Aided Software for Communications Receivers and Transceivers

The combination personal computers and processor controlled radios has spawned a new breed of software packages. Scancat from J & J Enterprises is a typical example of how the two technologies can work together to help the listener. The Scancat system combines the facilities of a database and receiver control into one co-ordinated package. Mike Richards had a look to see what it could do.

To run Scancat you will need an IBM compatible PC with at least 512K RAM, one disk drive and a serial port. Although the program supports colour displays it will also work with monochrome systems. These modest requirements are likely to be met by just about every type of PC. Software installation was very simple thanks to the provision of INSTALL batch files that created the appropriate directory and transferred all the relevant files. In addition to running the system from a hard disk you could just as easily operate from a floppy. The only drawback is a reduction in operating speed due to the slow access times of most floppy drives. The connection between the computer and radio is made using the serial port for most makes of receiver. It's worth noting that many receivers require a special interface to link to a PC and you will have to budget for this when considering Scancat.

One important feature of Scancat is its ability to interface with a wide range of radios. The manual indicated that the following were all catered for:

AOR-2500 and 3000

Most Icoms including the R-71 and R-7000

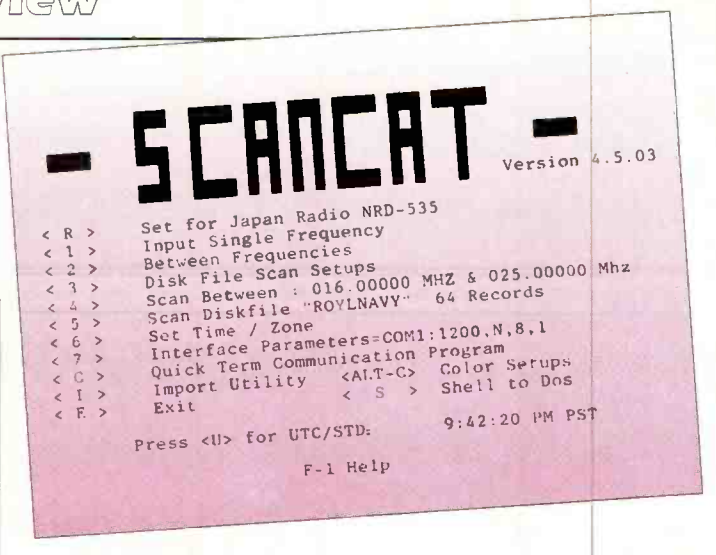
Japan Radio NRD-525 and NRD-535

Most Kenwoods including TS-440, R-5000 and TS-950

Yaesu FT-757GX, FT-757GXII, FT-767GXII and FRG-8800

Drake R-8

Once Scancat is running you are greeted with the main menu screen where the first task is to select the appropriate receiver model. There is also an option to manually set the appropriate communications parameters for your receiver.



Frequency Control

Although Scancat's main function is to support sophisticated scanning modes, you can also enter spot frequencies. This is done through the main menu and is supplemented by a user programmable step size. Once the required frequency has been selected you can use the up and down arrow keys to change the frequency by the pre-set steps. This is particularly useful when tuning around the marine and aeronautical band segments with their 3kHz channel spacing.

When searching for new stations you can use the Scancat's basic limit-scan mode. This enables the entry of upper and lower band limits and associated step size. You can also manually set the delay period which effectively controls the scanning rate. Once the scan is started you can maintain full control of the receiver through a number of sophisticated features. Anyone who monitors marine communications will find the duplex facility invaluable. This enables the operator to manually input the frequency off-set between the transmit and receive frequencies. Once this has been entered, you can add or subtract the off-set by pressing either the + or - keys.

The basic scan mode is further enhanced by the Scancat's ability to store pre-set scan limits. You could store up to thirty of these pre-sets for rapid recall. This should prove more than adequate for the most enthusiastic of listeners.

Frequency Analysis

As if this wasn't enough the Scancat included an impressive analysis mode. This gave a spectrum analyser type display which had two analysis options. Before you get too excited about this, I ought to point out that it was only available when using the Scancat with receivers that were able to send signal details over the control link. If you receiver supports this you could set the display to show either HITS or signal strength. The signal strength option is pretty much self explanatory and shows the signals against a scale marked one through to nine.

The HITS option provides a means of pin-pointing stable signals. It does this by incrementing the hit count for that frequency at each pass of the scan. You can use the HITs option very effectively to help set-up Scancat's frequency bypass mode. This mode is rather like the Lock-out facility provided on virtually all scanners. The subtle difference with this implementation is that you can specify a band of frequencies to be locked-out. Anyone with experience of scanning will know that unwanted or spurious signals often have a relatively wide bandwidth and are difficult to eliminate. The Scancat's frequency bypass mode largely overcomes this problem.

Utility Monitoring

The utility listener often has a problem with scanning programs as they don't facilitate easy switching to communications software. Scancat combats this with its own built-in terminal communications program. This is available from within the scanning modes and works well with any decoder requiring a simple driver program. Examples are most TNCs and self contained decoders such as the Universal M-7000.

Disk Files

In addition to the comprehensive search modes, Scancat supports scanning from disk files. This is likely to be one of the most used features of the program for most listeners. Each disk file is effectively a frequency list and is rather like the memories included with many receivers. The important difference is that the number of disk files is unlimited and you can add descriptions as well as frequency and mode settings. Each of the disk files can itself hold up to four hundred frequencies so you can see the system is extremely powerful. You can even create disk files while you're scanning. This is done through Scancat's logging feature. There are various options associated with this mode, but the key point is that active frequencies are automatically saved to a disk file. At the end of a logging session you can then use Scancat's built-in editor to tidy-up the file. ■

Summary

One of the main advantages of the Scancat is its ability to operate with a wide range of receivers.and I'm sure this will guarantee it a place in the market. The features were all very well though-out and easy to use. Scancat costs £38.50 and is available from **J&J Enterprises, 4001 Parkway Drive, Bossier City LA 71112, USA. Tel: 0101 318-683 2518** (1200-2100UTC).

A demo disk is available for $7.50 including postage.

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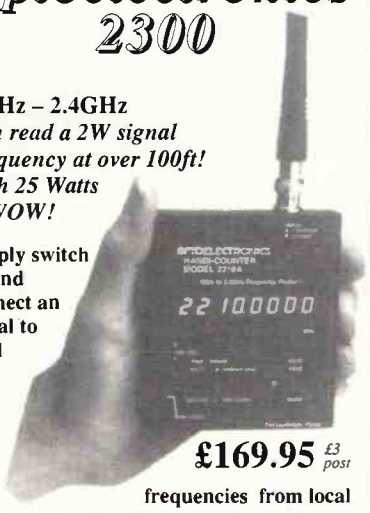

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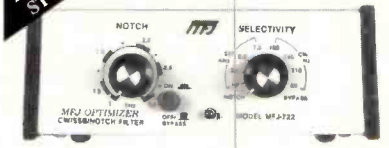

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Base discone 25-2000MHz

★ Totally weatherproof
★ Includes hardware

The discone is the favourite for scanning enthusiasts who demand the best possible antenna. It can also be used for transmitting on 6m/2m/70cm and 23cm ham bands. All the necessary mounting hardware is included. Ideal for outside or loft mounting.

Connector	50 Ohm "N" type
Height	1.7m
Weight	1kg

SCANNING ACCESSORIES
Scan King Base Aerial
500kHz – 1300MHz

The one major improvement you can make to your scanner is to install an outside aerial. This will improve your scanner's range tremendously. You will hear distant signals that before were inaudible when using the whip antenna. The Scan King is recommended by us as the ideal answer at a very reasonable price. It is fibre glass encapsulated and supplied with all mounting hardware for masts up to 2" diameter.

Length	110cm
Radials	4x20cm
Connector	"N" type

£39.95

YUPITERU MVT-7100
Factory Fresh
AM-FM-SSB-CW Scanner
Latest European Version
530kHz–1650MHz!
£449

Now in All Maplin Stores

WFM/NFM/AM/LSB/USB/CW
Widest Frequency Range Ever!
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500 Search-Pass Memories
Steps from 50Hz to 100kHz
Proper USB/LSB Switching
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30 steps per sec. scan rate!
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Send for full-colour leaflet

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Balance 12 Months
Direct sales only

See REVIEW in new "VHF/UHF SCANNING FREQUENCY GUIDE"

New items

HB-100	Quality desk stand for any hand-held. Fully adjustable, amazing little accessory	**£27.95**
AB-88V	Miniature magnetic mount with BNC socket and plug. For instant handy mobile but you helical on the mag.	**£29.95**
EP-300	High quality earclip pieces as supplied to the police. Zero fatigue.	**£13.95**
HX-9000	High gain dual band helical for 2m and 70cms hand-helds 2m – 2dB 70cms – 3.8dB. Total length is 19 inches. Also wideband receiver centred on 150/300/450/900MHz.	**£29.95**

Yaesu FRG-100 in stock £phone

MFJ-8100 – SHORTWAVE RECEIVER KIT

MFJ have just introduced a new short wave receiver kit designed for both the novice constructor and the old timer who wants to experience a little piece of nostalgia. Based on a regeneration design, first made popular in the 1920's, the receiver covers the range 3.5 – 22MHz in five switched ranges.
The kit is supplied complete with all components, metal work, knobs, etc. and a very detailed instruction manual running to 40 pages. Features of the kit are sensitive FET RF amplifier and detector stages, smooth regeneration, 6:1 slow motion dial, true AM-SSB-CW reception, dual headphone sockets, low current consumption using internal PP6 battery, and excellent signal strengths from only a few feet of wire.
We've built one ourselves and it is absolutely foolproof. When connected to 15ft or wire inside a house we copied all amateur bands 80 – 15 metres. On broadcast it is so sensitive you will find yourself backing off the gains! It's sensitive, very selective, and above all great fun and educational. **£71.95**

STOP PRESS – STOP PRESS
F-10 Interceptor from Optoelectronics hand-held receiver between 30MHz and 2GHz without tuning! Don't believe it. Well it's true. Phone for details.

Airband/Marine/Broadcast Monitor Receiver SAB-9 MkII

Ideal for the beginner and those on a budget. It covers the civil airband, marine, amateur, emergency and FM broadcast bands. One of our most popular "birthday presents" it offers hours of entertainment.
Very popular at air displays and the like, particularly at this price. It is powered by 4 x AA cells and covers LW/MW plus 108 – 176MHz. There is a headphone socket for private listening and a telescopic ship.
SAB-9EP – The above radio in presentation box with headphones and book. **£31.95**

ICOM YAESU KENWOOD ALINCO

RADIO HAMSTORES LONDON OPEN DAY

11 Watford Way Hendon London NW4 3JL Tel: 081 202 0073 Fax: 081 202 8873

CALLING ALL RADIO AMATEURS AND SHORTWAVE LISTENERS! ICOM (UK) PROUDLY PRESENT...

THE OFFICIAL OPENING OF OUR NEW LONDON HAMSTORE • SPECIAL BARGAINS INCLUDING: IC-737 • IC-W21ET • FRG100 • TS50 ETC • EQUIPMENT DEMOS • COFFEE • TEA • BUCKS-FIZZ • HAM SANDWICHES (SORRY) • CAKE • SPECIAL GUESTS • FREE RAFFLE • & LOTS MORE!

We would like to say thanks to all of you who have supported us over the last few months. If you haven't visited the London Hamstore yet - why not? We have bargains on new, used and ex-demo equipment. We will gladly take your good, clean, working gear in part-exchange - call us now for the best prices around. As well as ICOM, we also stock KENWOOD, YAESU and all leading brand names.

Do you know who the staff are at Hendon? Well there's Paul G7MNI who has had technical features published in many radio mags + Doug G0LUH/4S7DGG/4S0UK/8Q7AB, who would you prefer to deal with? salesmen or...

Saturday July 24th.

qualified staff with a wealth of experience and knowledge, we know, and *you* know it makes sense.

We have receivers, transceivers and every conceivable gadget you could want. If it's cash, credit or part-exchange - we do it. We are probably the world leaders in radio communications and have the best technical back-up and service facilities in the country. Call now for our daily-updated list of second-hand equipment.

Payment by Access, Visa, Switch and RSGB cards are welcome, finance can also be arranged (subject to status). Interest-free credit is available on selected new ICOM products. If you cannot visit a HAMSTORE in person, take advantage of our MAIL ORDER SERVICE. Items from stock normally dispatched within 24hrs. HAMSTORES stock AEA, AKD, Alinco, AOR, Barenco, Comet, Cushcraft, Davis, Dee Comm, Diamond, Icom, JRC, Kenwood, Lowe, Microset, MFJ, RSGB books, Toyo, Yaesu and Yupiteru equipment. **73 Doug & Paul.**

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Computer Programs

Free Gratis and for 'Nowt'

Well, OK, so maybe they are not entirely free - these days what is - but at least I caught your attention, says Garath Jones GW4KJW.

It's interesting to note that whilst the prices of 'proper' gear, receivers, transceivers and the like, seems to be ever rising, the price of the other most frequently encountered item in the shack, the computer, is continually falling. Just over ten years ago the 'Sinclair ZX80' complete with a massive 1K of memory, cost you a few pence less than £100. Many owners aspired to the day when they could upgrade to something like 'Commodore Pet' or 'Apple II', which with various configurations of memory, though always less than 64K, were around £700-£800. Today, you can buy computers much more powerful than anything available then, all with 500K+ of memory, for, in real terms a fraction of these prices, producing the undeniable more 'bangs per buck', so beloved by our transatlantic friends.

But having a computer alongside your radio gear, whilst proving an interesting topic of conversation, isn't much good unless you can actually do things with it. Doing things necessitates obtaining programs, be they Packet-Radio, RTTY, FAX, c.w. Tutors, Logbook, Circuit-CAD or whatever, preferably of a type having some relevance to amateur radio, the latest version of Space Invaders doesn't have the same effect when you are trying to impress visitors to your shack.

Programs

Particularly if you buy the latest commercial offerings, tend to be pretty costly. Of course, you can always set one of your mates to run you off a pirate copy of one of his, but however you try to justify it, this is still stealing. So if you've a conscience, this should be avoided. If you know how, you can even write your own programs. Don't worry, this isn't going to turn into one of these "teach yourself computer programming in three easy lessons' articles. So what's left.... Well, there's always Public Domain...

Public Domain, PD, software, are programs you can buy for little more than the cost of a new blank floppy-disk. There are PD programs available for all of the previously mentioned functions (Yes, even Space Invaders).

But first things first, just what is Public Domain software? All over the world many good computer programmers, including quite a few radio amateurs, have put a great deal of time and effort into writing programs, which when completed, instead of selling via some software company, they are virtually given away. Anybody can have a copy and once they have, they may do whatever he or she likes with it, they can even make further copies, as many as they like, and pass them onto their friends or anybody else who wants one, all without infringing the copyright of the original author.

Perhaps the most common method of distribution for these programs is via so-called Public Domain Libraries, the difference between these libraries and the more familiar book variety is that you don't get fined if you keep the program for more than two weeks, in fact once you 'borrow' a program from them, you keep it. The libraries stay in business by making small charge for the cost of the disk the program is supplied on and the cost of duplication, administration, etc The program itself is free.

Don't get the idea that if it's free it can't be much good. Many of these programs are up to the standard of their commercially available equivalents. They run the whole gamut of interests and hobbies, including amateur radio and electronics, which is what the remainder of this article is about.

Whilst it's true there are small, fairly limited ranges of PD programs available for machines like the Archimedes, Amstrad PCW, and Apple II and there is specialist, mostly educational PD software for the BBC and 480Z, by far the largest range of Public Domain programs are for IBM/PC (and compatibles), the Atari ST, the Amiga and the slightly older CP/M based machines.

Being of the ST persuasion myself, this is the machine I'll concentrate on in this article, perhaps with God and Editor (same thing?) permitting, a look at the others at a future date.

Packet Radio.

The Packeteer is well catered for in PD software, with versions of the well known WORLI program available for the ST.

As with the vast majority of PD software, the documentation for the program is included on the disk, you don't get a printed manual, you can either read it as a text file on your display screen or, if you have a printer there is nothing to stop you printing it out and making your own manual. The program works with most if not all the popular TNCs and include the required configuration files for the various models. As a bonus the ST version program disk, usually includes a RTTY program 'YARP' (which stands for Yet Another RTTY Program), this is a pretty much standard program working with both RTTY and ASCII codes, again full documentation for using the program comes on the disk.

I've used this program myself with great success and can recommend it.

FAX

A program called 'PK232 Fax' allows you to receive FAX pictures/charts on your ST - though you need at least 1M of RAM. With the aid of a PK232 terminal unit, this runs under GEM and includes on the disk some sample IMG files and, of course, all of the required program documentation. The program works very well I'm assured. Though I don't use this mode I've only seen it over the shoulder of other users.

Morse

Almost every model of popular computer has had Morse tutor programs written for them. They are after all one of the most straightforward programs to write, the ST being no exception. True, they may not have all of the fancy bells and whistles of some of the commercial packages, simulated on-air QRM/QSB, etc., but then again you really only need the tutor to get you through the Morse test and the Morse examiners/testers don't generate QRM/QSB during the test.

Logbook

Personally I prefer to keep my station log in a good old fashioned book, but with the licence regulations now allowing you to keep your logbook on computer, these are quite useful programs to have. Most allow you to extract the logged information in various formats for compiling contest entry sheets or for use in Database Programs. For those amateurs who like to keep personal names/details, etc., of stations worked. Logbook programs are usually packaged with one or more programs on the same disk.

Circuit Design

There are a number of good programs available to do various jobs under this heading. antenna design, e.r.p./output, p.c.b. planners, circuit component calculators, network analysis and wire-schedulers to name but a few. Also quite a number of useful odds 'n ends, like transistor and i.c. equivalent lists/identifiers.

Others

Of course, all of the old favourites are covered, QTH/MH locators, aurora predictors, great circle calculators and satellite orbit predictors. Grey-line calculators, contest/distance scorers and m.u.f. calculators, all come for the ST in many shapes and forms. Again, these are usually supplied in groups of similar programs on each disk.

With the cost of purchasing PD software disks being so low (90p - £2.50 dependant on source), you really cannot go wrong. At such prices you can try lots of software without it costing you a fortune.

The whole subject of disk viruses and the feeble-minded people who write such things is beyond the scope of this article. Suffice to say that all of the disks supplied by responsible libraries will have been checked for virus content, etc., and you can always check them yourself before use to be absolutely certain (reliable Virus Killer programs can be obtained from the libraries). Provided you are careful, you shouldn't have anything to worry about. So go on, give it a try.

The list below is just a few of the many PD software libraries. Contact them direct for program catalogues and prices. Please include a stamped addressed envelope to help keep their administration costs down.

ATARI ST - The ST Club, 2 Broadway, Nottingham NG1 1PS

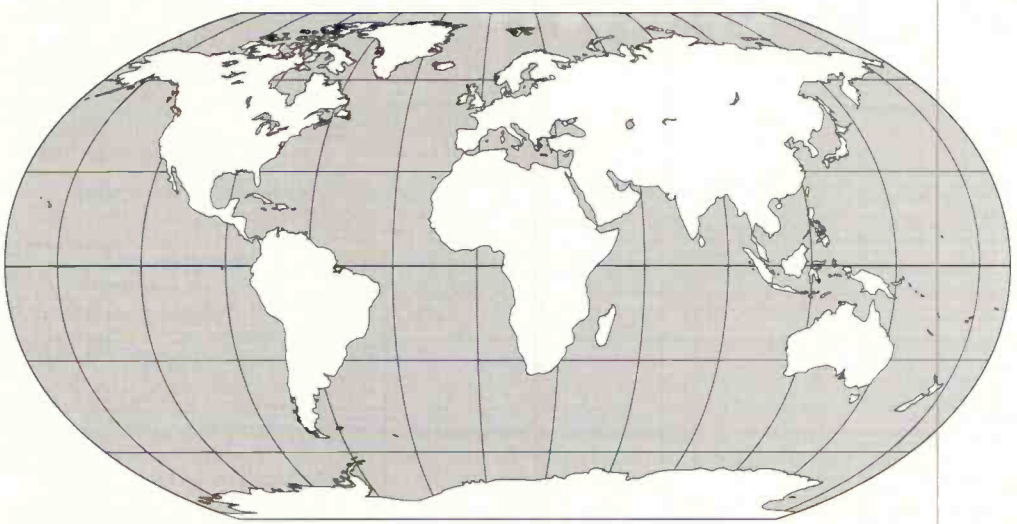
IBM/PC - PD Software Library, Winscombe House, Beacon Road, Crowborough, E Sussex TN6 1UL

AMIGA - Amos PD Library, 25 Park Road, Wigan, Lancs WN6 7AA

CP/M - The CPO/M User Group, 72 Mill Road, Hawley, Dartford Kent DA2 7RZ.

Do Your Own

Directional beam antenna are useful for short wave listeners. Greg Baker describes a simple home computer program to tell you where to point your beam.



Omnidirectional antennas can pull in signals but with some loss of signal strength from weaker stations. The way to improve the performance of your antenna system is to install a directional beam. The problem, of course, is to know exactly where to point the beam when you have it set up and connected to your receiver.

Browsing through a road map or atlas will give you a good idea but if your beam is highly directional or you want the biggest possible DX signal, a bit more precision is needed.

That precision can come from messing around with a calculator and set of formulas, but it can far easier come from a home computer. And now that most of us have computers or access to them, there's no excuse not to be spot on with our beam headings.

So, push the kids off the computer for a couple of hours and tell them to kick a football around the yard instead of playing computer games. Then type in the program listed below and run it on your favourite DX targets.

If you and the machine can't get on, call the kids back. They'll love to lord it over you and tell you what to do. Let them enjoy it, it's good for them. They can have the ego trip; all you want are the headings.

The program is written in BASIC, the standard home computer language. There are no fancy features used, so it should run without modification on most machines. It has been developed and tested using GW-BASIC on an IBM PC compatible computer.

As it is listed, the program assumes you are in London. If you are elsewhere, replace line 40 with your latitude in L(1,1) and longitude in L(2,1). Note that northern latitudes are positive, southern latitudes are negative; eastern longitudes are positive, western longitudes are negative.

Remember that latitudes and longitudes are the usual way to precisely locate a place on the face of the earth. Latitude is the number of degrees north or south of the equator running from zero at the equator to 90° at the poles. Longitude is the number of degrees west or east of the north/south line running through Greenwich.

Using the Program

When you RUN the program, it will ask you whether you want to change the origin latitude or longitude. If you are mobile or a friend wants to use the program from their location, you can temporarily change the origin here by typing Y and

```
Program
10 DIM L(2,2),D$(2)
20 D$(1) = "ORIGIN"
30 D$(2) = "TARGET"
40 L(1,1) = 51.5 : L(2,1) = -0.167
50 E = 57.29578 : PI = 3.14159
60 PRINT "NEW ORIGIN? Y OR N"
70 INPUT Y$
80 IF Y$ <> "Y" AND Y$ <> "y" THEN 110
90 K = 1
100 GOSUB 350
110 K = 2
120 GOSUB 350
130 P = L(2,1) - L(2,2)
140 PS = 1
150 IF P < 0 THEN PS=0
160 P = ABS(P)
170 PM = 0
180 IF P > 180 THEN PM = 1
190 P = P/E
200 PA = (90 - L(1,1))/E
210 PB = (90 - L(1,2))/E
220 Z = COS(P)*SIN(PA)*SIN(PB)+COS(PA)*COS(PB)
230 GOSUB 460
240 KM% = 6366.7 * M
250 Z = (COS(PB)-
COS(PA)*COS(M))/(SIN(PA)*SIN(M))
260 GOSUB 460
270 A = M * E
280 A% = ABS(360 * (PS-PM) * (PS-PM) - A)
290 PRINT "BEARING IS: "; A% ;" DEGREES"
300 PRINT "DISTANCE IS: "; KM% ; "KILOMETRES"
310 PRINT "CONTINUE? Y OR N"
320 INPUT Y$
330 IF Y$ <> "Y" AND Y$ <> "y" THEN END
340 GOTO 60
350 PRINT D$(K);" LATITUDE?"
360 INPUT L(1,K)
370 PRINT D$(K); " LONGITUDE?"
380 INPUT L(2,K)
390 FOR I = 1 TO 2
400 T = 90 + (I-1) * 90
410 IF ABS(L(I,K)) <= T THEN 440
420 PRINT "ERRDR: TRY AGAIN"
430 GOTO 350
440 NEXT I
450 RETURN
460 M = - ATN(Z/SQR(1- Z * Z)) + PI/2
470 RETURN
```

Beam Headings

INPUTing the new latitude and longitude. Otherwise type N to continue.

The program then asks for latitude and longitude of the target. Type in the target latitude and longitude using the list below. Remember to type in the minus sign for longitudes from the list.

If the target you want isn't on the list, turn to an atlas or gazetteer (list of place names) and look up the latitude and longitude of the target you want.

The program will work to and from places other than in the United Kingdom so if you want to listen in to what is happening elsewhere, use the latitude and longitude of the place you are interested in.

Make sure to place the correct sign on latitudes and longitudes.

You will need to convert the latitudes and longitudes you have found in your atlas or gazetteer to values which this program can use. Notice that the latitudes and longitudes from an atlas or gazetteer are written in the form of degrees and minutes. Convert these by dividing the minutes by 60 with a calculator and adding to the degrees. For example, Edinburgh is 55 degrees 57 minutes north, 3 degrees 13 minutes west. The latitude to use in the program is 55 + 57/60 = 55 + 0.95 = 55.95. Similarly, the longitude is 3 + 13/60 = 3 + 0.217 = 3.217 and this is -3.217 when you insert the negative sign for the west longitude.

Warning: The program may produce errors if your chosen target is within about fifty kilometres of the origin or you want to see if there is anyone transmitting from the poles. Still, in either case you wouldn't need this program anyway. Up to fifty kilometres you don't need the precision of this program, and for that lone transmitter at the pole, just point your beam due north or south.

Test Data

When you have typed the program into the computer and checked that you have typed it properly, you should test it on the following paths. Note that for each of the origins you will need to change the origin latitude and longitude where the program requests it.

How to Use the Bearings

The program will output the true bearing of the target from the origin and the distance in kilometres.

The distance is useful in finding out whether you are within the coverage of the ground wave, in the blank area within the skip zone but outside the ground wave coverage area or in useful DX range beyond the skip distance.

The true bearing differs from a magnetic bearing given by an ordinary compass and it differs by various amounts depending on where you are. The difference is called the local magnetic variation though sometimes it is called declination. To find the magnetic (compass) bearing from the true bearing output by the program, subtract the magnetic variation at the origin station from the computer calculated true bearing. Notice that when magnetic north is east of true north the variation is easterly and given a positive sign. When magnetic north is west of true north the variation is westerly and given a negative sign. Regardless of the sign though of the variation, you must subtract it from the true bearing to get magnetic bearing. To find the magnetic variation at origins you will need to check out an Ordnance Survey map at your local library.

Align the beam with this magnetic bearing, remembering to keep your compass away from large amounts of iron. Once you have found the bearings of your most usual DX targets, mark them near the beam so that you can easily align the antenna next time. ■

Place	Latitude	Longitude
Aberdeen	57.167	-2.067
Belfast	54.583	-5.917
Birmingham	52.500	-1.833
Bristol	51.450	-2.583
Dundee	56.467	-3.000
Edinburgh	55.950	-3.217
Glasgow	55.883	-4.250
Inverness	57.450	-4.250
Leeds	53.833	-1.583
Liverpool	53.417	-2.917
London	51.500	-0.167
Manchester	53.500	-2.250
Newcastle (Tyne)	54.983	-1.583
Norwich	52.633	1.300
Nottingham	52.967	-1.167
Plymouth	50.383	-4.167
Sheffield	53.383	-1.500
Southampton	50.917	-1.417
Swansea	51.633	-3.950

Selected Places and their Latitudes and Longitudes.

Origin: Manchester 53.5 N 2.25 W

Target	Degrees	Kilometres
London - 51.500 N/0.167 W	147	263
Stockholm - 59.333 N/18.050 E	54	1398
Origin: Cardiff - 51.5 N/3.217 W		
Target	**Degrees**	**Kilometres**
Madrid - 40.417 N/3.717 W	182	1232
Basle - 47.550 N/7.600 E	115	894
Origin: Valletta, Malta 35.75 N/14.533 E		
Target	**Degrees**	**Kilometres**
London - 51.500 N/0.167 W	331	2103
Brindisi - 40.617 N/17.950 E	28	618

If you don't get these results, you will find a typing error in your program.

OUT TO LUNC

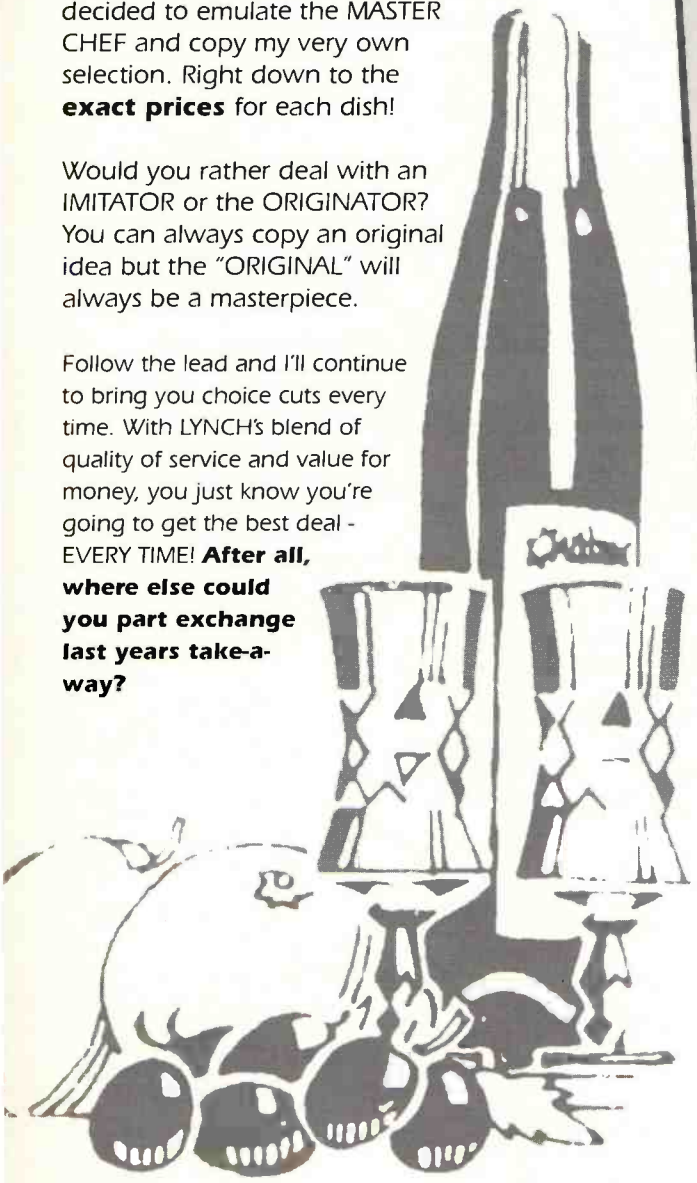
NO SURCHARGES here...

No 10% added on, no tips required, no problems with the staff...just good old-fashioned service and advice - that's the only way to keep my customers coming back for second helpings...again and again and again!

My summer menu looks tempting, so tempting that I see once again, like a good recipe, some of the competition have decided to emulate the MASTER CHEF and copy my very own selection. Right down to the **exact prices** for each dish!

Would you rather deal with an IMITATOR or the ORIGINATOR? You can always copy an original idea but the "ORIGINAL" will always be a masterpiece.

Follow the lead and I'll continue to bring you choice cuts every time. With LYNCH's blend of quality of service and value for money, you just know you're going to get the best deal - EVERY TIME! **After all, where else could you part exchange last years take-a-way?**



THE SHORTWAVE MENU

The new Yaesu FRG8800 has tasty features like keyboard entry & FM mode fitted as standard. I've also got some first rate pre-owned examples, saving you hundreds of pounds, and they're still available on interest free.
Deposit £169.00 & 9 payments of £55.55
Used from only £119.00 deposit & 9 payments of £45.00

The Kenwood R5000 has superb engineering and excellent audio, together with the VHF converter as an option make this an unbeatable meal for one.
Deposit £194.95 & 9 payments of £89.00
With VHF option, Deposit £309.00 & 9 payments of £99.00

An ideal starter. Now it's finally available on the menu, the Yaesu FRG100 is well worth a nibble!
Deposit £194.95 & 9 payments of £45.00

The LOWE HF150 is small & dumpy looking, but it's no dumpling! It works brilliantly and I've sold hundreds. Do you want to be the next proud owner?
Offered with keypad option, Deposit £40.00
& 9 payments of £39.89

The JRC NRD535, the quality of build & performance are hard to match. So is the price!
Deposit £370.00 & 9 payments of £125.00

The ICOM ICR71E, I've got a selection of excellent USED examples on the menu, just LOOK at the savings!
New, Deposit £259.00 & 9 payments of £88.88
Used with full 9 month warranty, Deposit £150
& 9 payments of £66.66

Try a nice portion of duck sir? The DRAKE R8E comes with all the filters fitted as standard. It's a real game bird and one that's outsold all other receivers so far this year!
Deposit £295.00 & 9 payments of £100.00
With VHF option, Deposit £340.00 & 9 payments of £120.00

The Icom ICR72E is the ideal alternative for those who don't want to over indulge with the ICR71E. KeyPad entry, Large display & speech announcement available as side dishes!
Deposit £159.00 & 9 payments of £77.77

If you must have the FM mode on a shortwave receiver & fancied the Lowe HF150, then the HF225 is the one to choose. Slightly larger than it's stable mate, I'm offering the unit with FM/ECS unit fitted for you, (it's a solder in job), and priced it to include the KeyPad, which is a must.
Deposit £154.00 & 9 payments of £45.00

A set meal for one! The FRG7700 from YAESU has digital display and all modes. They're used and in good condition, but still offered with 9 months warranty, with the following extras:
★ LONG WIRE SHORTWAVE ANTENNA
★ ANTENNA TUNING UNIT
★ QUALITY HEADPHONES
Deposit only £70.00 & 9 payments of £39.50

MARTIN

G4

286 NORTHFIELD AVENUE, EALING, LONDON W5 4UB

THE AMATEUR RADI

H WITH LYNCH

THE SCANNER MENU

The MVT7100 from "YOU-PIT-EROO" is the best ALL MODE hand held scanner on the menu. A real dish of the day.
Deposit £49.00 & 9 payments of £44.44

The AOR 1500 features all mode capability, this Handie offers excellent value including NICADS, CHARGER, FLEXI Antenna, CIGAR LEAD, CASE & much more, all included in the price!
Deposit £49.95 & 9 payments of £33.33

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. Eat now - pay later!
Deposit £241 & 12 payments of £59.00

For the keen AIRBAND connoisseur, the VT-225 from Yupiteru. Covering Civil & Military Airband only, this HANDIE scanner has it's performance optimised for those two bands leaving the wide band scanners unable to compete.
Deposit £69.00 & 9 payments of £22.22

The Icom ICR7100HF mk111 has found it's way into many commercial applications & even more listeners tables! 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

The MVT7000, despite the introduction of the 7100, is still popular on the menu, if you don't want 1000 memories and have a SW receiver with SSB already, then this is the dish for you. Brilliant performance
Deposit £69.95 & 9 payments of £33.33

AOR AR2000, 1000 memories & offered with all side dishes, in true AOR VALUE FOR MONEY tradition, try one & you won't be disappointed
Deposit £59.00 & 9 payments of £28.88

The ever so tiny Icom IC-R1E has still to be caught up with in terms of it's size and performance. A real "POCKET" scanner, devoured in their thousands by amateur and commercial users alike.
Deposit £39.50 & 9 payments of £39.50

The amazing VT-125 mk11 from YUPITERU still represents the best civil airband handie scanner available. Nothing comes close to it's performance or size. Offered with the very latest "AIR BAND FREQUENCY GUIDE"
Deposit £29.00 & 9 payments of £16.66

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The History of Com

Mike Richards takes a look at how we reached the type of machine used today.

Before I get into the detail of computing history it's worth spending a little time to establish just what we mean by a computer. To most people, a computer is an item of high tech electronics that's used for all manner of things from playing games to controlling a space mission. The *BBC English Dictionary* describes a computer as ".. an electronic machine which makes quick calculations and deals with large amounts of information." In this brief look at the development of computers I shall be concentrating very much on the development of the home computer that is used by so many today. In this context a computer is very much a general purpose machine which can perform a wide range of functions depending on the software that's loaded.

Early History

One of the earliest occurrences of computing was attributed to the famous French mathematician and physicist Blaise Pascal. In 1642 he devised an ingenious mechanical calculator based around the inter-connection of a number of pegged wheels. As in so many of the great inventions necessity was the mother of this unit - Pascal's father needed help with his business accounts.

At around the same period the German philosopher, mathematician and political adviser Wilhelm Leibniz also produced a mechanical calculator. More importantly he formulated a theoretical model that could be said to have paved the way for modern computing. In his model he stated that - ".. all reasoning, all discovery, verbal or not, is reducable to an ordered number of elements such as numbers, words, sounds or colours". This is precisely what happens in a modern computer where anything from sound and video through to pure calculations is represented in digital form within the computer.

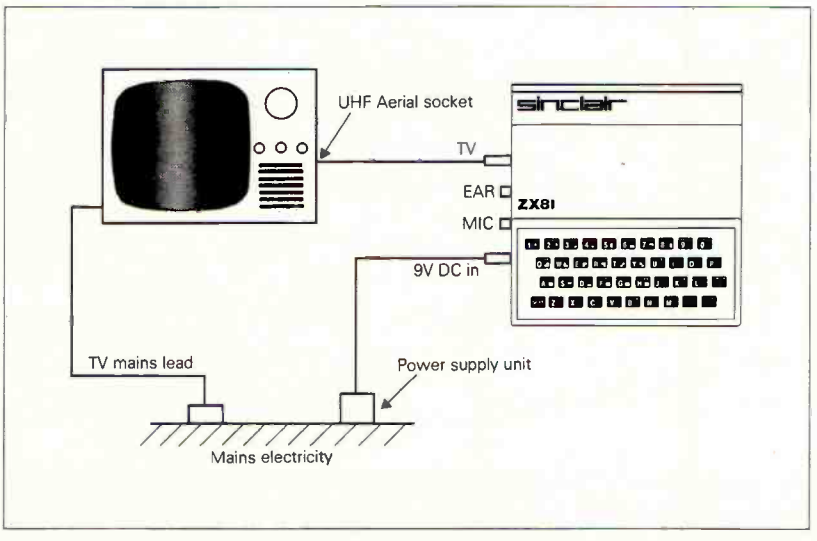
The next step forward came from Englishman Charles Babbage who put his home town of Teignmouth on the map. He has been credited with inventing the world's first automatic digital computer. The idea of calculating mathematical tables came to him around 1813 and he later built a mechanical calculator that worked to eight decimal places. His final project was to build a sophisticated computer with a capacity for working to twenty decimal places. This computer was known as the Analytical Engine and was sadly never completed due to the inadequacies of the mechanical fabrication processes of the day.

The theoretical concepts of computing were further extended by English mathematician George Boole. He produced a mathematical theory that developed Leibniz's earlier work and delivered a set of rules that later became known as Boolean algebra. Any of you who have spent time working with logic circuits will realise that these rules form the foundation of modern computing.

The link between Boolean algebra and electronic circuits was made by American Claude Shannon in 1938. He realised that electronic switching circuits operate with just two states (on and off) so can be expressed in two value Boolean algebra.

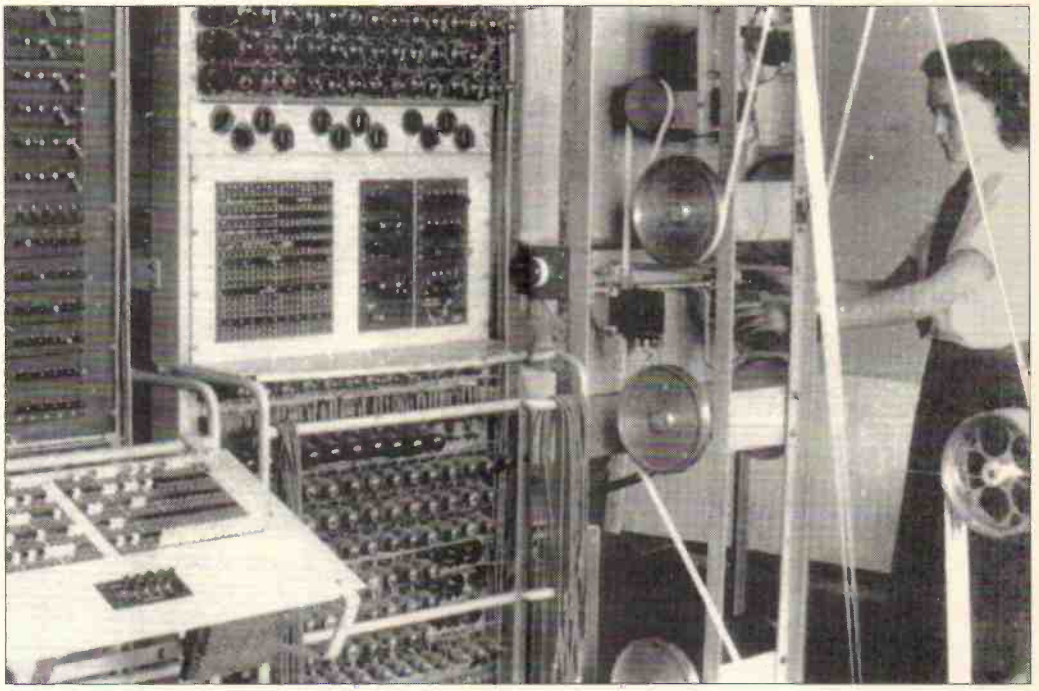
British mathematician Alan Turing completed the basic computing theory in 1936 with his universal Turing machine. This was an abstract computing device that would accept a data input and process it as defined by a set of instructions or program. Although this may not sound that revolutionary it became the foundation for computers as we know them.

Production of the first electro-mechanical computer is generally credited to the Automatic Sequence Controlled Calculator that was completed in 1944 by Howard Aiken of Harvard University in close association with the office machine giant, IBM. However, records released by the UK government in 1975 show that the Bletchley Park Government Code and Cypher School completed their *Colossus*



Clive Sinclair's ZX81 computer really opened up computing to the family. The ZX81 had a massive 1Kb of RAM expandable to a colossal 16Kb – but it worked!

puting



The world's first computer was Bletchley Park's Colossus. It was at work breaking the German Enigma codes in 1943

computer in the summer of 1943 - just ahead of the Americans. It was the *Colossus* that played a major part in the deciphering of German communications using what the Germans believed to be unbreakable code generated by the ENIGMA machines.

John von Neumann of the Institute for Advanced Study made the next step forward with his concept of a stored program computer. Up until this time the program and data were applied to the computer simultaneously. His ideas were put into practice in 1949 with the construction of the EDSAC machine at Cambridge University.

The pace of computer development hotted up over the fifties and sixties due to the major advances in electronics. The maturity of practical transistors in 1958 led the way to miniaturisation and the first logic integrated circuits in 1966. A key milestone in the commercial development came with the development of the mini-computer in 1965.

However, for the home market, a major step forward occured in 1971 with the development of the microprocessor. This Large Scale Integration (l.s.i.) circuit enabled comprehensive general purpose computing in a very small physical space. It also facilitated mass production techniques that brought the price down to affordable levels.

Personal Computing

Six years after the development of the first microprocessor, the home computer market started to flourish. The wealthy could set themselves up with one of the first Apple computers, though it would cost around £1000! For most, the only affordable route was to buy one of the single board kits that were starting to appear.

I have fond memories of the UK-101 or Ohio Superboard 6502 based machines. These were a great way for the enthusiast to get to grips with the new computer technology. The operating systems were held in ROM chips while programs were loaded using notoriously unreliable cassette based systems. The ultimate storage in those days was to get hold of a second-hand 8in disk drive!

Around the middle of 1978 came the launch of the Commodore PET and Tandy TRS-80 at reasonable prices. These two machines had a major impact on home computing and opened up computing to those without the skills to build their own computer. By 1979 the market was really moving and new machines were being developed at an amazing rate. That year also saw the development of the Intel 8088 and 8086 microprocessors which were to play such an important role in the IBM PC.

The years between 1980 and 82 were when Clive Sinclair's inovations opened the world of computing to a true family audience. This was through the ZX80, 81 and the Spectrum series. The success of these machines can be gauged by the fact that they are still in use today.

This was also the era that produced the BBC micro that again has survived remarkably well. But perhaps the most significant of all was the introduction of the first IBM PC. This machine has probably had a greater impact than any other in modern computing history. The key reason for this is not so much the machine itself, but the confidence vested in it by the software companies. No matter how technically good a machine is, it can only succeed if the right software is available.

On the home market developments continued with the likes of the Commodore C-64 and Atari and Amiga. These latter two really scoring well on the ever growing home games market. It was in 1983 that another innovator hit the market in the form of Alan Sugar and his Amstrad PC1512. This was the first IBM clone to open the IBM system to a wide audience. The First PC1512s sold for around £450 and were significantly cheaper and faster than 'real' PCs.

A Look Ahead

With IBM PC technology firmly established in the business world, most of the more recent developments have concentrated on making the systems smaller, faster and with even greater storage capacities. The main limitations of the IBM lie with the internal architecture but this is currently under attack and a solution will no doubt give this computer series a new lease of life. The domestic games market seems to have turned away from general purpose systems to specialised portable games machines. ■

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TH2SAT - A PC Weather Satellite Imaging System

Info in Orbit author, Lawrence Harris, looks at a PC-based weather satellite system.

There are essentially two roads that can be taken by those wanting to receive WXSAT pictures - the computer option and the framestore option. The first immediately branches again, with products for 'IBM compatible' computers, and for several other machines such as the Amiga and the Archimedes. This review is for the 'IBM compatible' user.

I first heard of TH2 Imaging during 1992 and invited them to send some details for mention in 'Info in Orbit'. I subsequently received their interface board, disk and manual to review their WXSAT decoding system. My half-tower 386DX computer was used for this review. The board is a half-card (see **Fig. 1**) that fits in an 8- or 16-bit expansion slot in a standard PC. The fit was marginally tight, but this could have been either my computer, or the card being slightly over size. The instructions for installation suggest a possible need to set switches, but I found that the system worked without the need for any adjustments.

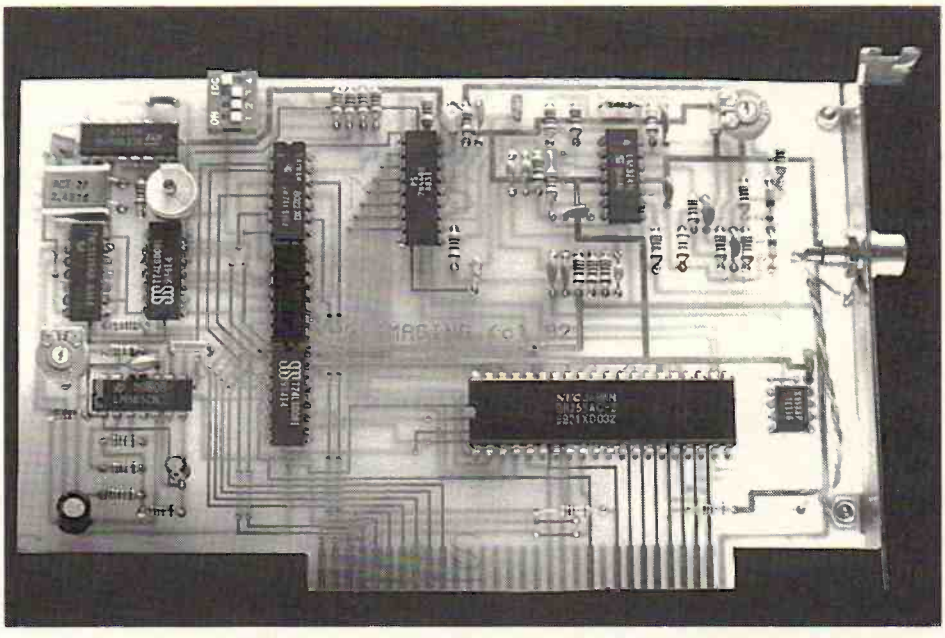


Fig 1: PC interface board - slots into a PC.

Equipment Required

For high quality results, it is essential to use a purpose-built WXSAT antenna and receiver. The antenna should be a right-hand circular-polarised crossed dipole, cut for 137MHz to match the signal characteristics. The signal from a general purpose scanner is not suitable for subsequent decoding of pictures owing to the nature of the signal modulation.

Dedicated WXSAT receivers are marketed, and some 'pager-immune' receivers are also available, though I have yet to try one of these. I used my usual WXSAT antenna, no pre-amp, and a Dartcom-based WXSAT receiver. I also tried some tape recordings made during recent years.

After fitting the card, I connected my WXSAT receiver directly to the input phono connector on the back. That was the hardware set-up completed. Software initialisation was virtually automatic. A 3.5in disk was supplied (5.25in is also available), containing the programs and a sample image. Installation creates a new directory (default name TH2SAT) on your hard disk but leaves the start program (a batch file) in the root directory. The installation program is called TH2SATSU (set up), in which the monitor card is selected - I had a Trident 8900 fitted; the program caters for many familiar cards. Signal levels are set up later under software control for each satellite mode.

Video Modes

When the main program (TH2SAT) is run, you choose a video mode, of which there are three:
V - standard VGA (300 x 200 by 256 colours). This will be used for cards fitted with 256Kb RAM.
S - super VGA (640 x 480 by 256 colours). This is additionally available for cards fitted with 512kb RAM.
H - high resolution SVGA (1024 x 768 by 256 colours). This provides the highest resolution for those cards having 1Mb RAM.

I would prefer to see this done as a one-off operation within the initial set-up procedure. My view was that selection would normally depend on the amount of RAM fitted to the card, but the author (Tyrone Howe) feels that users may sometimes prefer the smaller SVGA file. Images received and saved in one mode cannot be accessed in another, so after trying each mode I used the H option. The modes have individual file extensions e.g., ".IM2" for mode S.

Satellite Modes

Each group of satellites - NOAA, METEOR, METEOSAT - transmit their picture format with identical modulation - image data (black sea to white clouds information) amplitude modulating a 2.4kHz sub-carrier, which then frequency modulates the main 137MHz r.f. carrier. Where they differ is in the type of synchronising tones used, and the layout (format) of each line of the picture.

The CIS (Russian) WXSATS, when operating, transmit a single picture, either infra-red or visible. Picture data is accompanied by bars and grey scale that can be used to frame the image.

The American NOAA

WXSATS transmit a dual-image, visible and infra-red, side-by-side, each image preceded by a different tone, with minute markers and calibration scales. METEOSAT, the geostationary WXSAT operated by EUMETSAT, functions more like the METEORS in transmitting one single image line at a time (in a manner similar to FAX broadcasts), called WEFAX. Additional equipment is needed to receive these transmissions, which are on 1691 and 1694.5MHz. WEFAX pictures are transmitted in four-minute slots, preceded by several seconds of tone, marking the start of each picture. This is why one needs to tell the software what satellite, and therefore image tones, to expect.

Modes for METEOR and NOAA (visible and infra-red), and METEOSAT (two modes) are provided. I understand that other modes could be added if required.

Each mode includes various other parameters, such as a record of the input signal level and crystal synchronisation control. You can therefore optimise reception for each satellite mode - very useful because signal strengths can differ between each group. You can change this in real-time, but I would suggest such adjustments should be made infrequently.

Menu Structure

The Main Menu (F1) follows selection of video mode. From this (or any other) menu, F2 selects Image Processing, F3 selects the colour palette, F4 selects Unattended Operations, and F1 returns to the Main Menu. It is the starting point for primary options - image reception, loading or saving to disk, zooming, satellite mode and others.

The lower section lists the currently selected satellite mode, together with some general information such as free disk space. There are several 'hot keys' and I found it helpful to make a note of these to avoid constant switching to a specific Menu. 'Hot keys' are those which change the picture to enhance certain details e.g.., to add colour palettes.

Take Your Pass

The default satellite mode is METEOSAT mode 1, so you now select the required mode. The program does not store the complete line width of the NOAAs - you must choose either visible or i.r. If you want to look at both, you must record the satellite signal on a suitably adjusted cassette recorder (see later), and play it back twice, making two separate images.

NOAA signals include an accurate 2.4kHz sub-carrier mentioned before. In theory therefore, there is no need to use the computer to generate a 2.4kHz (or crystal) reference signal, and your pictures should align satisfactorily. However, if you start picture production near AOS you may suffer some signal fades causing the picture to 'slide' slightly sideways, spoiling the result. Selecting crystal synchronisation (using the asterisk key) will avoid this, but the resultant picture may then be slightly curved due to Doppler shift (the movement of the satellite relative to your stationary home base).

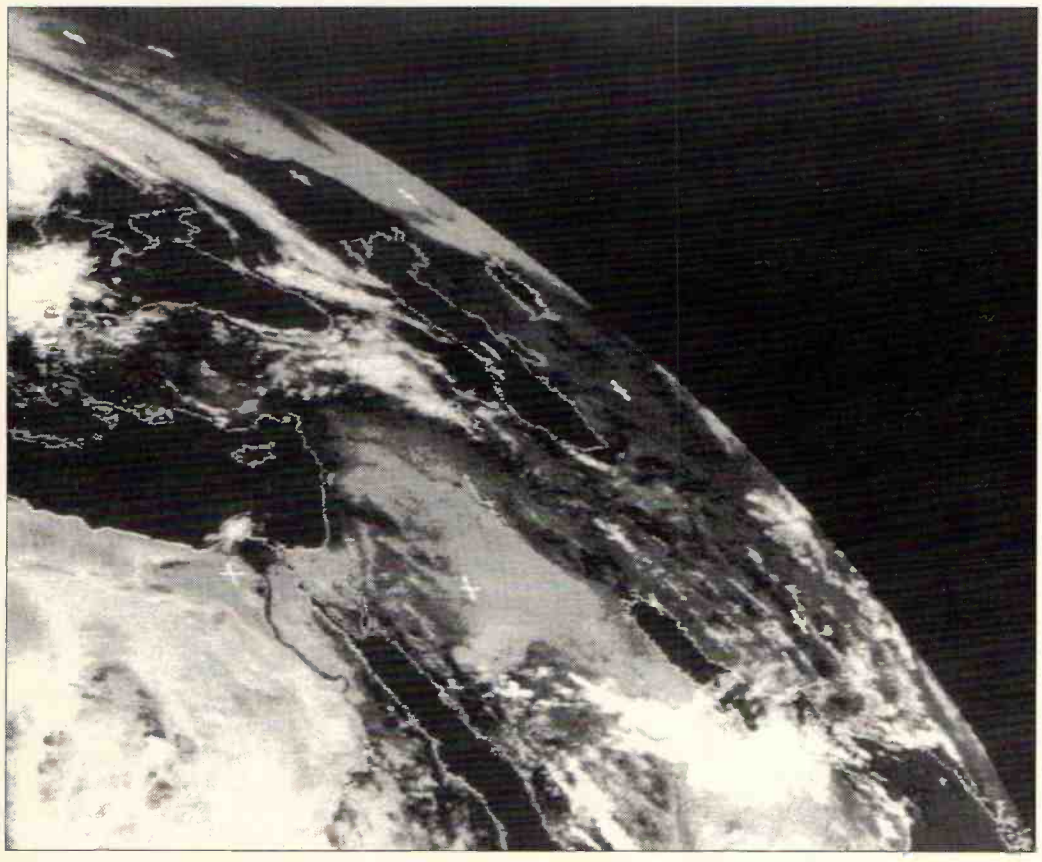
I found METEOR 3-4 visible pictures aligned well without crystal synchronisation, but METEOR 3-3 does require it because its sub-carrier appears to be somewhat variable. In all cases, bursts of noise may spoil un-synched images. The option to select or de-select crystal synchronisation, including during a pass (real-time), is a useful one.

Selecting **receive** causes the program to look for the tone marking the start of a line of picture, except for METEOSAT which waits for the image start tone. When this is found, or when 10 seconds have passed, the picture starts being drawn on the screen, always from bottom to top. This means that southbound satellite passes are not represented correctly in real-time, though they can be easily reversed after the pass.

The first pass taken in each mode may not have a correctly set input signal level; this can be recognised by examining the incoming image and perhaps noting that clouds are bleached out. All that needs to be done is to adjust the signal level with the + and - keys to obtain the best black and white balance. This setting is listed in the Satellite Mode menu. Once adjusted, it is retained. You can optimise this to show a good set of grey levels for each satellite mode.

The left and right borders of the picture are bars showing the current grey scale or colour palette, divided into three sections relating to the sea, land and cloud boundaries. Changes to the palette will be

Fig. 2: METEOSAT image, Middle East section.



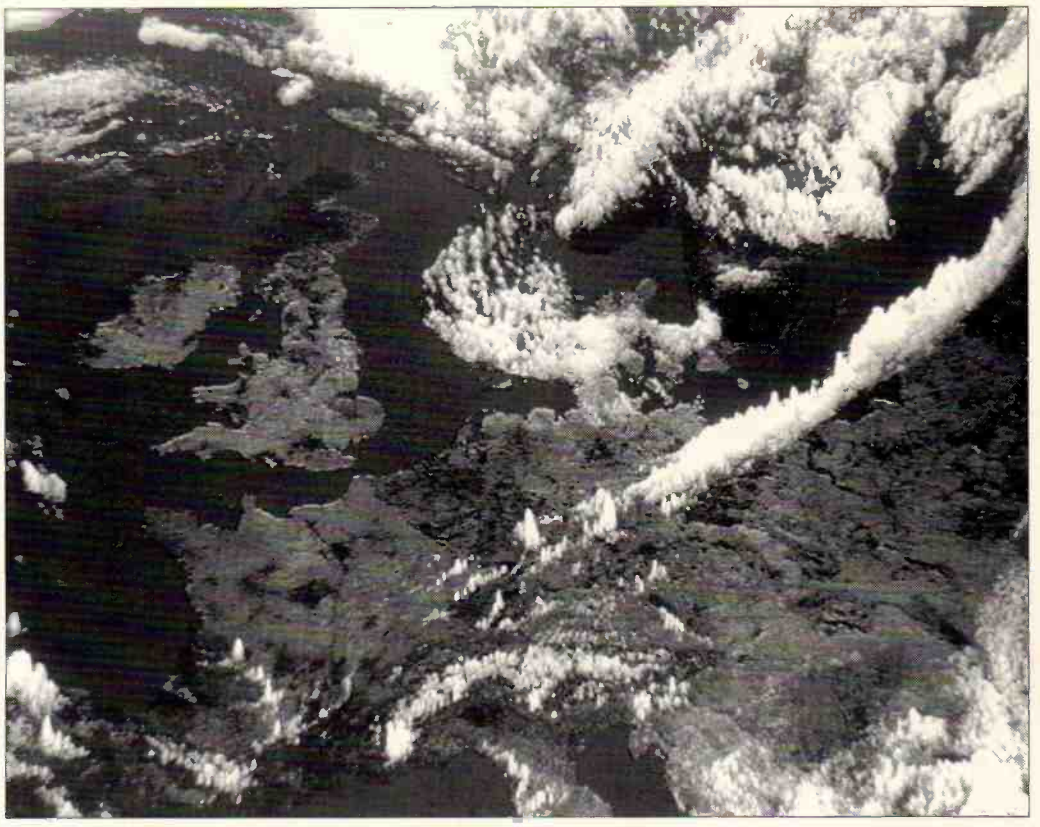


Fig. 3: 3-D plot showing clouds over Europe.

shown in these bars. The picture aspect depends on the video mode selected.

I found initial picture alignment with the polar orbiters was not always exact, but adjustments were easily made, left or right, using the shift keys; this worked well. You can also restart image reception by pressing the control key.

SAVE your data!

All images consist of one screenful. When image collection stops, the menu is superimposed on the picture. There is a **quick save** option in which image data is saved with minimal operator intervention, allowing you to restart data collection within a few seconds, so you don't lose too much of the pass. METEOR passes may last up to 18 minutes, producing at least two screens worth!

Most computers have at least 1Mb RAM fitted, and many have much more. It did seem surprising therefore that only a few minutes of data (about half of a NOAA pass) per screenful were taken. With suitable programming much more could be collected in available RAM; it is also possible to write data directly to disk. I understand that version 2 of this software will utilise XMS (extended memory) for animating METEOSAT images.
You can set the program to display METEOSAT pictures in cyclical mode, one after the other. Images overwrite previous images, or can be collected via the Unattended Operations Menu (F4) - see later. An excellent innovation is the automatic compression of images before saving - an average of 30% is claimed.

Picture Quality

If you use a dedicated WXSAT antenna and receiver, having made careful adjustments to input signal strength, you should expect to obtain high quality pictures. Virtually all of the images that I collected in real-time were to the standard I would expect of any system. The image supplied by TH2 Imaging was a visible light picture from NOAA of the UK and Europe, and those that I obtained were of comparable quality. I would have been concerned had they not been!

The use of the **zoom** facility in the Main Menu allows close examination of the image. Using an image of a clear UK, I looked at Dartmoor and was pleased that detail was revealed as expected. Before using **zoom** the picture must be **saved**. **Zoom** effectively destroys the original image in RAM by overwriting; no great problem after saving it because you can reload. I would prefer **zoom** to be reversible to allow different areas to be examined. It is worth noting that 3D projection and the filters also changed the original data in RAM.

Image Processing F2

Getting your picture on the screen is the first stage. Every image consists of a set of numbers representing brightness levels and, as so dramatically shown by the Hubble Space Telescope Image Processing team, numbers can be manipulated to reveal details that are there, but not easily recognised. The author of this software has provided most facilities that could be wanted.

For southbound satellites, we FLIP the picture. Most images will have a reasonable spread of grey levels, with pixel intensities ranging from 0 to near 255. With winter visible-light and night-time infra-red images, the range may not be so large and there is a **histogram** facility to show the actual range of intensities present in the image.

Equalisation can enhance any image, particularly dark, winter ones, by expanding contrast to reveal details not otherwise seen. The difference on METEOR images can be amazing - land details are often revealed better than those of the NOAA WXSATs. The **stretching** option is best used on images having just a small range of pixel intensities. Experimentation is worthwhile!

Three filters are provided - **median, low pass** and **high pass**, each for specific tasks. The **median** filter is a standard technique that reduces the effect of noise, and can minimise the appearance of country outlines on METEOSAT images. The **low pass** filter averages (smooths) out noise bursts. The **high Pass** filter has three intensities (soft, medium and hard) and is used to accentuate the edges of cloud or land. This has the effect of sharpening some details such as mountain peaks in the Alps above Italy. Tests showed that it could improve the overall appearance, particularly cloud detail I found that each filter operated well, some being more suitable for certain types of image.

The 3-D projection option re-plots white clouds in a form giving a three dimensional effect. There are five choices of projection and intensity settings to try! By using a **high pass** filter first, this 3-D option could produce a quite pleasing result.

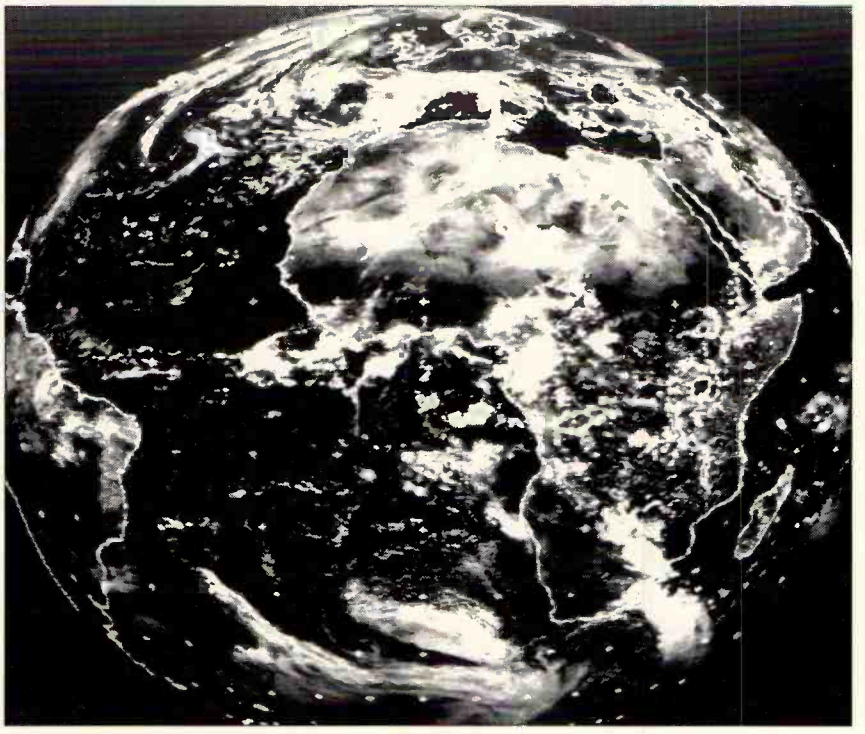


Fig. 4: METEOSAT whole disc visible image.

Palette Menu F3

Although the WXSATS do not transmit colour pictures, computers have made it easy to add artificial colour to enhance imagery. This has scientific merit, particularly for infra-red studies, and should not be seen as a gimmick.

There is a choice of four colour and three infra-red palettes. The starting image will be usually be monochrome and this can be re-selected by pressing 'M'. The three infra-red choices are described as ranging from **normal** to **fierce**. The **normal** palette represents cold as blue and ranges to red as warm. If you are not familiar with temperature colouring, this could be confusing at first. It is very effective when used on infra-red images collected during the day when land is hot. I once 'discovered' some strong warm water flows in the Mediterranean sea using i.r. palettes.

The four colour choices (G - green, Y - yellow, B - brown, R - variation on B) refer to land colouring; sea is always coloured from dark to light blue, with clouds ranged between mid-grey to white. After making your choice, the result may not be quite right - perhaps the clouds or sea mix with the land; this can be adjusted using the **colour boundaries** key - A. If the blue sea 'invades' the land you can change the boundary level using F5 and F6. Adjustment is a quick process, and can easily be reversed if you select the wrong key. You cannot expect perfection, but you can produce attractive pictures.

Image brightness can be changed, and **view** removes the Menu from the screen to let you see the full picture. You can make these colour changes from other Menus if you remember the key presses!

I found this colour system to be adequate, easy to use for all types of image, and unlikely to cause problems, even to a beginner in image processing. The manual explains each feature comprehensively.

Unattended Operation F4

Having collected images in real-time, I had to have a go at automatic data collection. At first I had some problems. It allows the programmed capture of successive passes of satellites on one frequency. You set your WXSAT receiver to (e.g.,) 137.85MHz, and the mode to (e.g.,) METEOR visible. From **unattended operation** you edit in a **time plan**. This is a list of the times for the computer to start collecting data. A predictions program is essential to calculate such times, and I added three minutes to AOS times to avoid noise.

Times are entered (taking care to remain consistent with your computer's clock); I keep to UTC. Selecting **start timed operation** produces a request for a **base filename** - this being the name for each image to be collected in the sequence. Entering this returns you to the Menu where you can then **start** the operation. I had trouble here, having inadvertently used times that had passed e.g., setting 1000UTC for a pass start when the current time was 1830UTC. My idea had been to collect data the next day. In fact the program caters for this if you attach the letter T (tomorrow) to indicate the change of date, as explained in the 40-page, well-written manual. I overlooked that but the program didn't point out my error - it simply kept returning to the filename request, to which I did not know how to respond. An error message here would be useful, and I understand that version 2 will contain improved messages.

Having finally realised my mistake, there were no further problems. Automatic reception worked, though experience taught me to allow more time before starting collection because pictures were not always synchronised. For each entered pass you can adjust the length of the data collection period, so you will collect two or more images per pass.

Some Notes

I came across few difficulties using this program. One irritation was the change in keyboard repetition rate. The author tells me he set this to a maximum to allow quick movement of the **zoom** box to the selected area. Unfortunately this has repercussions; the keyboard can detect more key presses than you want to register, so Menus tend to flash from one state to another. After **exiting**, I reset the computer to restore the default repetition rate. I feel that this should be modified.

A program is provided to convert images into PCX format for use in suitable graphics programs. I tried it and it worked excellently.

Finally, the **picture show** option lets you display a sequence of images cyclically instead of separate loading.

My thanks to **TH2 Imaging, 34 Princes Gardens, Margate, Kent CT9 3AR. Tel: (0843) 223831** for providing the product for review.

Pricing

I understand the inclusive cost of TH2SAT is £100 plus £5 P&P. A demonstration disk is available for £3.50 (including P&P), and includes sample pictures and a colour animation sequence.

Abbreviations

EUMETSAT	European Organisation for the exploitation of Meteorological Satellites.
VGA	Video Graphics Array
XMS	Extended Memory Specification
CIS	Commonwealth of Independent States (formerly Russia)
FAX	facsimile
WEFAX	weather facsimile

Satmaster for Windows

This software is for the professional satellite TV installer. It allows users to test the performance of a system before it is installed. It generates all the necessary 'look angles' for fixed and motorised dishes at any location in the world for existing and future satellites. The software even lists all the visible satellites and their longitudinal position from any receiving site in the world! It also calculates full link budgets and indicates the minimum size dish to maintain best quality pictures.

There are more that 20 satellite footprints already in the graphics file but operators can add their own via a scanner. In addition, there is a 20 000 word Hypertext technical guide with fault-finding, cable specs and site survey guide. Users can even add their own project notes via the Text Editor.

Satmaster Pro for Windows requires an IBM compatible PC 286/386/486 with MS DOS, Windows 3.1 and 2Mb hard disk space. It costs £99 plus £1 for 1st Class post.

Swift Television Publications. 17 Pittsfield, Cricklade, Swindon, Wilts SN6 6AN. Tel: (0793) 750620.

SCAN-PRO

SCAN-PRO is a UK computer bulletin board aimed specifically at scanning enthusiasts. It currently operates using V22bis from 1830 - 0800 Monday to Friday and 24 hours a day at the weekends.

The BBS is intended to provide scanning enthusiasts with a means of confidentially interchanging information and news. Callers hoping to download frequency lists may be disappointed but you will be able to examine a wide range of scanning related topics and software.

The system is being enhanced all the time and the number to call is: **(0305) 860086**. New users will, initially, only be given limited access until the system operator has verified their details. This is to try and prevent mis-use of the system.

Space Graphics

Acorn 32-bit users will be pleased to hear of the range of products available from Spacetech. They specialise in providing advanced support for these machines with a particular accent on high resolution graphics and the processing of satellite images. Weather Desk is a multi-tasking weather satellite station that can receive and store up to six animated views of the earth as a background task. This leaves the operator free to use the computer for other tasks such as word-processing, etc.

PDSview, on the other hand, is a professional standard image processing package that is particularly suited to the viewing of astronomical data. When used with a suitable weather satellite station it can produce stunning multi-spectral colour imaging. If you don't have a weather station or want a wider range of information, PDSview can be used to view CD-ROM images. Just to wet the appetite, Spacetech can supply a CD-ROM set containing 26 000 Voyager images. For those of you that are really image hungry, Spacetech have a new application available called PDSmap. This provides access to the 100Mb+ SPOT images that are becoming available on CD-ROM.

For those of you who would like a taster of Spacetech image quality they can supply a two-disk earth animation sequence for £5.00. This requires an Acorn 32-bit, RISC OS 3 and animation requires 4Mb RAM.

Should you decide to buy a Spacetech product, the £5.00 is refundable against this purchase. For more information contact:

Spacetech. 21 West Wools, Portland, Dorset DT5 2EA. Tel: (0305) 822753 or FAX: (0305) 860483.

AR-3000 Control Package

Nevada have released a software package for the PC to control the AOR AR-3000. The program contains several memory banks and search banks that can be interlinked as required. It also contains a large logbook that can be used to maintain a master frequency database, the contents of which can be exchanged between memory banks.

During operation, information contained in the logbook is displayed when the scanner is tuned to a frequency previously listed. Other features include a storage spectrum analyser-type display that can be switched to display either signal strength or the number of active passes. This can be very useful if you want to identify new frequencies within a particular band.

If you want to try the program, you can obtain a demonstration version on 5.25in disk for £1. The full-blown version costs £59.95 from:

Nevada Communications, 189 London Road, Portsmouth PO2 9AE. Tel:(0705) 662145.

Scanning Software

Future Scanning of Bartlesville USA have just introduced version 2 of their SCAN package for Icom and Amiga users. The program runs on all versions of the Amiga and links with Icom receivers through the CI-V port. For use with the Amiga 1000 an adaptor is required to cope with the non standard serial port of the machine. SCAN gives fully automated scanning with maximum speeds of over 1300 channels per minute. The interface also supports remote control of a tape recorder that can be programmed to operate when particular channels are active. There are many other sophisticated scanning modes designed to make life easy for scanning enthusiast.

The excellent graphics display of the Amiga is put to good use and all the functions are selected using the mouse and drop-down menus. This makes the system very easy to learn. Perhaps the best use of the graphics capabilities is the spectrum analyser display. This shows the frequency of any signals or hits and counts the number of hits on any one frequency. In fact, this feature can be used to initiate an intensive search. This mode starts a scan that ignores any signal that has been detected on a previous scan. The result being that the scan only stops on new signals.

If you have Icom h.f. and v.h.f. receivers, Future Scanning can supply a dual radio version of SCAN that enables you to scan through the spectrum under computer control.

SCAN version 2 currently costs $149 or $199 for the dual radio version. Post and packing outside North America is $15. For more information contact: **Future Scanning Systems, PO BOX 654, Bartlesville, OK 74005, USA. Tel: 0101 918 333 7474.**

Propagation

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

There are two special items this time, first the lack of 28MHz beacon signals, **Fig. 1** and second the good tropospheric opening toward the end of April. Although small, **Fig. 1** shows an increase of beacons heard in the UK, on April 6 that may well have been caused by the active plage seen on the sun's disc by **Cmdr Henry Hatfield** (Sevenoaks) with his spectro-helioscope at 1400 on the 5th. Having said that, there are two other interesting points from the beacon and sun watchers reports.

One, **Gordon Foote** (Didcot) said that, "from April 12 to 19, there wasn't even the vague sound of a beacon in the late afternoon/early evenings; let alone anything 100% identifiable" and two, **Patrick Moore** (Selsey) told me that the sun had a 'clear disc' at 1600 on the 16th.

From memory, this month's beacon chart, **Fig. 1**, is the shortest that I have prepared for a very long time, however, it is nontheless important because, when compared with the solar observations, more proof is added to show the direct relationship that exists between sunspot activity (or lack of) and the reception of long distant signals on the 28MHz band. Remember, it's well worth comparing your h.f. logs with the solar reports that appear in this column.

Solar

Patrick Moore sent a drawing of a sunspot group, **Fig. 2**, as he projected it at 0840 on March 26. **Ron Livesey** (Edinburgh), using a 2.5in refractor telescope and a 4.0in projection screen, found three active areas on the sun on the 30th and 31st. Henry Hatfield located 4 sunspot groups early on April 2, 5 on the 4th and 2 on the 5th. From his observatory in Bristol, **Ted Waring** counted 15 sunspots on the 2nd and 10 on the 25th. Patrick Moore also sent a drawing of the sun's disc, **Fig. 3**, as projected at 0830 on the 28th.

Fig. 1.

	March						April																				
Beacon	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
DL0IGI												X																		X	
KB9DJA	X								X	X								X													
KD4EC						X																									
OH2TEN			X																												
OH9TEN																			X												
SV3AQR	X		X		X							X	X	X	X																
VK2RSY												X																			
VK6RWA								X				X		X																	
W3VD	X											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	
Z21ANB																		X		X											
5B4CY	X	X	X		X		X	X	X	X		X	X	X	X		X		X	X		X					X	X	X	X	

Aurora

First of all, congratulations to **Jay Brausch** (Glen Ullin, North Dakota) on being awared the Merlin Medal by the council of the British Astronomical Association for his auroral work. Ron Livesey, the Asociation's auroral co-ordinator, said that Jay has reported on more than 1080 events and has the most cloud free location of all their observers around the world.

Ron received reports of 'quiet glow' for the overnight period on March 13/14, 16/17 & 24/25 from observers in North Dakota and Scotland; 'quiet homogenious arc or band' on 2/3, 11/12, 15/16, 24/25 & 25/26 from Canada, Iceland and Scotland; 'rayed arc or band' on 3/4 & 23/24 from Scotland, 'ray bundles' on 3/4 & 14/15 from Fair Isle and Scotland; 'active, moving, flaming or flickering' on 1/2 & 17/18 from N. Dakota; 'all sky aurora' on 14/15 & 23/24 from N.Dakota and 'unspecified form' on 11/12 & 12/13 from Canada. For your records, the auroral effect on radio signals, described as tone-A, were reported by **Tony Hopwood** (Upton on Severn) on March 1, 9, 10, 11, 23 & 24.

Magnetic

The variety of magnetometors used by Tony Hopwood, **Karl Lewis** (Saltash), Ron Livesey, **David Pettitt** (Carlisle) and **Tom Rackham** (Goostrey), between them, recorded strong activity on March 3, 8, 9, 10, 11, 12, 23, 24 & 25.

Propagation Beacons

As usual my thanks to Gordon Foote, Henry Hatfield, **Ted Owen** (Maldon), Ted Waring and **Ford White** (Portland) their 28MHz beacon reports and comments. It was their combined efforts that enabled me to prepare the monthly chart of beacons heard, **Fig. 1**, between March 26 and April 25. Among their comments were, "Looks like the end of the beacon 'season'," said Ted Owen, "ZS1LA kept things alive and was a rare oasis in a desert of beacons," remarked Gordon Foote and, "a very strange period for me," commented Ford White.

Tropospheric

During the tropospheric opening on April 27, **David Ashley** (Norwich) found about a dozen Dutch and German stations, some in perfect stereo, throughout Band II. "The only one I could recognise was Herlands Radio 3," said David.

More Band II information came from **Simon Hamer** (New Radnor) who told me that f.m. DXers can also find Germany's NDR2 and 4 and SWF3 on the Astra satellite. "Useful for helping with identification, but mind the delay from the satellite!", says Simon. He also added that BBC Radio Dorset is testing on 103.8MHz, with vertically polarised antennas, from Balcombe Hill. That's another one for you Northern DXers to look out for. The daily fluctuations in atmospheric pressure for the period March 26 to April 25 can be seen, along with other information about propagation, in my Television column, elsewhere in this issue.

Fig. 2.

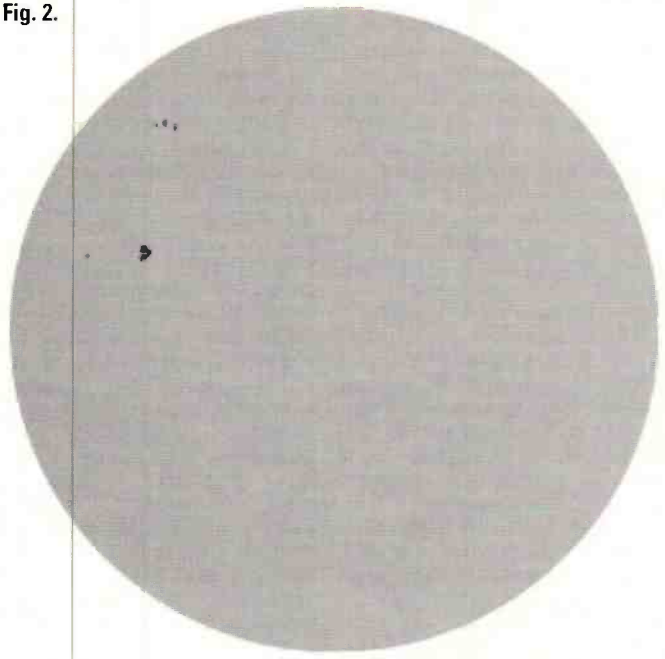
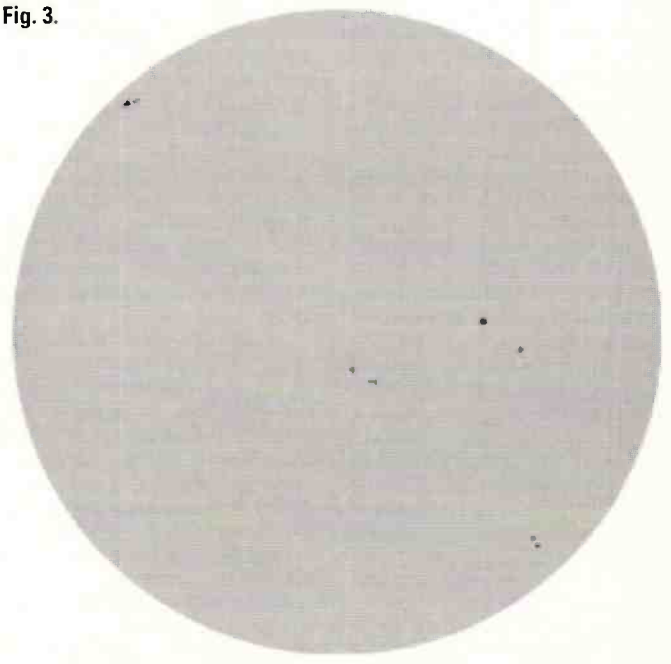


Fig. 3.



Satellite TV

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

As I prepare the first few lines of this column in the evening of May 16 I muse on the 1993 Eurovision Song Contest held in Millstreet, Co. Cork, Eire last evening. Despite a close scan across the Clarke Belt no sign was forthcoming that the OB site was satellite linking the programme back to RTE TV Donnybrook in Dublin. The EBU were carrying the OB over their normal European feed circuits on Eutelsat II F4 at 7°E using the sound in syncs (SIS) norm - absence of the link suggested that terrestrial microwave linking was feeding into the Cork to Dublin trunk rather than direct satellite to Brussels. If any more vigilant 'sat-zapper' found the direct site to studio link I'd like to know!

Perhaps the biggest mystery of the month that remained unsolved for two weeks relates to the relaying into Europe from a slot at about 32°W on May 5 of the Shuttle *Columbia* launch and in-flight activities from the craft. Early morning of the 5th, NTSC (525-line) test signals with 'Houston TV' and 'NASA TV' were seen at 11.130GHz vertical in both the UK and Holland, audio sub-carriers being measured at 6.6 and 8.3MHz. Other identifications showed a Shuttle flight no. 'NGT TV STS 55' with vision being transmitted through the day. Signals were fed from the 32°W slot into the European Space Agency (ESA) and the next day recordings of the flight were seen over 'ALL TV' (Kopernikus) at 28°E There was apparently a high degree of German involvement with the Shuttle flight, hence the more than average interest by Germany. It was later established that the signals were down-linked from Intelsat 504 now moved to 31.4°W from 40°W early March.

Astra 1C successfully launched May 11 and by the time these words are digested should be on test, most of the transponder load has already been leased to TV services, 1C will slot alongside 1A, 1B at 19.2°E.

Ian Waller (Lincoln Satellite Ltd) reports real satellite DX, he received the Spanish DBS service spotted into the East Americas via Hispasat from 30°W at 12.07GHz vertical, the 525-line NTSC signal is very weak even on Ian's large dish. Ingredients for this reception are a clear, cloudless night, reduced bandwidth and a receiver threshold extension circuit. The 12.08GHz signal comprises TVE Internacional during the daytime and TVE-1 during the night.

A query arose regarding past reception on the Russian Gorizont satellites at 11 and 14°W, though for much of the time 14°W carries news feeds into Western Europe in both 625- and 525-lines, with back-up feeds over 11°W (check out 11.52GHz for both birds), from time to time programming is carried, usually of the main national programme (1st Network). There has been noticed from time to time the identification 'TONIS' in an ellipse. Now **Paul Hickling** (Worcester) has advised that this is an ident for Harkov in the Ukraine, often showing Western films dubbed into Russian. Another problem solved for **Colin Paton** (Greenock) who had, on his scanner, been receiving various satellite programmes (Sky Movies, Eurosport, etc.) but at 34.225MHz and with the relating video signal (audible on the scanner as a video buzz) at 39.500MHz. As anticipated this was a neighbour's TV radiating at i.f.! Means for reducing the radiation could be incorporation of a ferrite toroid adjacent to the antenna input socket with the antenna feeder wound round the former several times, this assumes that the TV feeder itself is radiating rather than the TV chassis.

A letter from **Graeme Wilson**, station engineer for United Christian Broadcasters at Cauldon Buildings Caledonia Road, Shelton, Stoke on Trent ST4 2DN. His station is now radiating output via Astra transponder 20 (7.56MHz) with official launch back on May 17. Graeme (who is a former TVDXer) would appreciate reception reports particularly if you live on the 'fringe' of the Astra footprint.

Reader **Barroga** in the Philippines has sent in a long list of reception in C Band from the Indonesian Palapa B2P bird which now carries 13 TV downlinks in the clear with scrambling on GMA7-TV (Philippines) on an irregular basis. Apparently the 'World Transponder Loading Report' listed CNNI on this bird as horizontal - it is in fact vertical polarity. Still in C Band (4GHz) and Ian Waller again appears in the frame with news of Libya moving to Intelsat 512 at 1°W swapping seemingly with Algeria that has now decamped to 601 at 27°W!

A word of warning to overseas readers of *Short Wave Magazine* - Nicholas, an Australian satellite enthusiast bought from a UK supplier a copy of John McCormacs *BlackBook* (*European Scrambling Systems*), this a well-known publication for the trade that covers the theory and practice of encryption, circuit details of numerous decoders, hacking systems, anti-hacking measures, industrial espionage, etc., an engrossing read in fact! On arrival in Australia the customs seized the volume which has now been referred to the Attorney Generals Department for formal consideration by the Literature Classification Officer to establish its status as a prohibited Import. At the time of writing no statement had been forthcoming from the authorities, still the subject of debate. It may be wise therefore if any overseas reader (other than in Europe) is considering buying publications that delve into scrambling systems to delay the purchase until the outcome of the case is known and we can pass on more information. PAY-TV, MMDS and encryption is currently a hot political potato in Australia, the authorities being very touchy on copyright infringement. Books on hacking are considered unsuitable for bedtime reading!

Fig. 1: Identification for an NTSC 525-line feed for World Television News from the Jerusalem Capital Studios - a Ku band TV news feed received in the UK on an 800mm dish. Andrew *Sykes, W. Yorkshire*

Fig. 2: Deutsches Bundepost Usingen Earth Station dish no.2 feeding ALL-TV on Kopernikus at 28°E - 'ALL' indicates Universe or Space and there followed the feed from the Shuttle mission ex 'Houston TV' - see text.

Andrew Sykes, W. Yorkshire.

The Swiss authorities in Bern have authorised the Telecine Romandie TCR that (formerly transmitted from a Mont Blanc site on Ch. E69) to apply for an Astra 1C transponder offering a movie orientated format with children's cartoons operating 0700-0100 daily. The proposed channel 'Cinevision' will carry audio sub-carriers in French, English, Italian, Spanish and German. Monthly subscription will be around 15 SwFr (about £6 UK) though the eventual scrambling mode has yet to be announced.

The success of the RTL-4 Dutch TV satellite service operated by CLT has lead to the RTL-5 channel to be transmitted via Astra 1C though on a frequency just below the standard Ku satellite band coverage. RTL-4 has proved very popular and the Dutch terrestrial networks are now opening during the daytime to combat the high viewing figures that RTL are achieving.

The Children's Channel is to go international with a recent sign-up with Star TV Hong Kong for TCC to transmit via AsiaSat in a 6 Pay TV channel package launching next April. TCC will reach across South East Asia and access up to 11 million homes. The new service will be digitally compressed and be included alongside Chinese and English language movies, sports, documentary and business channels. Star TV reckon that by next April viewing figures will have topped 22 million for the C Band service.

With the political changes in the USSR/CIS in recent years there still remain problems over satellite control, particularly between the Ukraine and Russia. Various control stations operate within the Ukraine and Russia argues that she has overall control of these stations rather than the Kiev administration. The Ukraine argue that Russia is playing big brother politics against the smaller republic and recently Russia has 'taken control' of several low Earth orbit satellites (LEOs) and a Ukrainian meteorological bird.

Anik 2D, a Canadian Telecomms satellite has been sold to Arabsat and will move slot from 82°W to 19°E mid Summer '93 for TV/video linking. This is a temporary move pending the arrival in orbit of the Arabsat 2 series. Previously Telesat Canada sold earlier Anik craft to Argentina for their Paracom project.

And finally, Moscow is selling transponder space on their new 'Coupon' series birds to broadcasters across the World. Each of 3 craft will feature steerable up and downlink facilities enabling spot EIRP coverage from 30-50dBW. The trackable beams will mean less down-time for the transponder load since the up and downlink dishes can be redeployed to other customers quickly.

DXTV Round-up

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

The chance reception of a TV transmission originating hundreds, or even thousands of miles away, is all part of the fun and fascination of TV DX-ing", says **Simon Hamer** (New Radnor) in the introduction to the 3rd Edition of his popular book, *DX-TV For Beginners*. He rightly points out that, "the rapid development of satellite television over the past few years....is not what Traditional TV-DXing is about". Simon continues, "unlike satellite reception, long-distance television (DX-TV) signals are completely random in occurrence and in most cases their source cannot be determined in advance".

DX-TV For Beginners

HS Publications recently published Edition 3 of Simon Hamer's book *DX-TV For Beginners*, at £3.95 plus 85p for post and packing inside the UK. Within the 32-pages of this A5-sized book, Simon has included several photographs of international test-cards and a couple of pictures plus line drawings of receiving antennas.

It is obvious from the text, that the book is based largely on the author's wide experience and understanding of the subject. In fact, he tells the newcomer just what he or she needs to know about TVDXing and what equipment is required to get started. In addition to explaining the differences between the reception of amateur fast-scan TV, satellite television and long-distance (DX) television signals, he explains how each, in its own right, has a special interest. Simon talks about the detective work required to identify the origin of a signal and simplifies the meaning of receiving signals via auroral, 'F2', meteor trail reflection, Sporadic-E and tropospheric openings. All this plus pieces about antennas, tuners, receivers, recording, teletext, transmitting systems and more, make this book, in my view, a must for anyone thinking of adding DXTV to their general radio-interest.

Fig. 1: Vatican TV.

Recording

Neil Purling (Hull) has re-organised his room ready for the 1993 Sporadic-E season by installing a monochome portable receiver, a D100 converter and a v.c.r. with which he hopes to capture on tape some of the interesting logos and test-patterns.

While on the subject of video recording, I see that HS Publications are marketing their own production videos to interest and assist the television enthusiast. Among their titles are *BBC Globes On Video* at £12.95 and *DX-TV On Video Parts 1 and 2*, each at £13.95. One of the partners, Keith Hamer, told me that their latest release, *Vintage Test Cards On Video*, at £14.95, "features over 120 unique world-wide test-cards used during the sixties and early seventies". In addition they can supply Parts 1 and 2 of *DX-TV On Video*, on one cassette for £15.95, which is a considerable saving. Post and packing on each cassette is 85p extra. Readers' further interested can send an s.a.e. to HS Publications at 7 Epping Close, Derby DE3 4HR, for a descriptive leaflet, or, 72p for the latest catalogue on DX-TV equipment and technical publications.

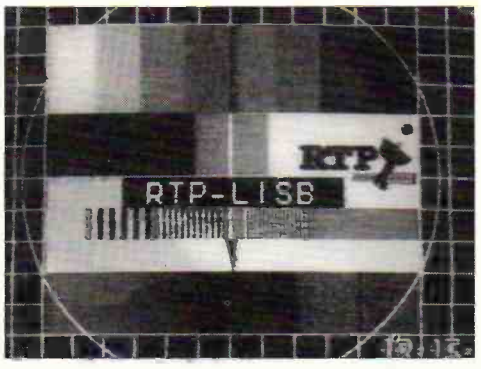


Fig. 2: Portugal.

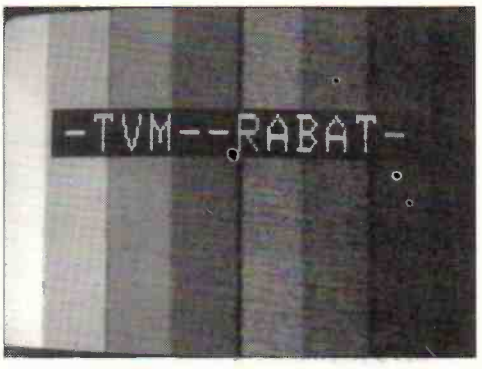


Fig. 3: Morocco.

Fig. 4: France.

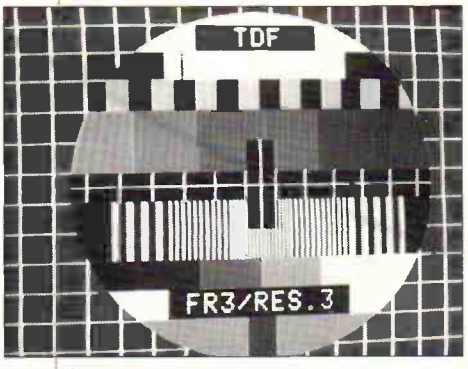


Fig. 5: TDF.

Picture Archives

From Leiden, Holland, **Peter de Jong** sent colour photographs of the pictures that he received last December of a logo from Vatican TV, **Fig. 1** and earlier this year, a test-card from Portugal, **Fig. 2** and a caption from Morocco, **Fig. 3**, via Eutelsat. Note the 'dish' antenna symbol next to 'RTP' on **Fig. 2**.

However, back on earth, **Andy Gilbert** (Findon) logged strong pictures from France, Canal +, **Fig. 4** and TDF, **Fig. 5** during a tropo-opening, disturbing Band III, in 1990.

The caption from Madras TV, **Fig. 6**, was received on Ch. E4, in Band I, by **Lt.Col. Rana Roy** (Meerut, India) in January 1992. The opening and clock picture, **Fig. 7**, from Sweden's TV1 was logged by **Bob Brooks** (Great Sutton), during a sporadic-E opening, back in 1986.

Meteor Scatter

Simon Hamer caught 'pings' of signals from unidentified television stations, via meteor trail reflection, on Chs. E3 and R2, around 1315 on April 13.

In addition to watching the screen for sudden bursts of pictures, it is worth remembering that you can get some idea as to the number of these 'pings' by setting a scanning receiver button to any of the vision and/or sound slots in Band I, while the event is in progress. For example, here the frequencies of the vision and sound for some popular channels:

Chs. E2 - 48.25/53.75MHz
Ch. 3 - 55.25/60.75MHz
Ch. 4 - 62.25/67.75MHz
Ch. IA - 53.75/59.25MHz
Ch. B - 62.25/67.75MHz
Ch. R1 - 49.75/56.25MHz
Ch. 2 - 59.25/65.75MHz

I suggest that you try this on or around August 12, October 22, November 3 and 17 and December 13 and 23 for the predicted peaks of the Perseids, Orionids, Taurids, Leonids, Geminids and Ursids meteor showers. Don't be surprised if you get a lot of signals in the upper part of the band because stations in Austria, Finland, Germany, Iceland, Scandinavia and Spain, using Ch. E4, share the same space with Italian stations on Ch.Ib. If it's a clear night, take a look with a pair of binoculars in the region of the sky that the shower's name suggests.

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Fig. 6: India.

Fig. 7: Sweden.

Fig. 8: Polish SSTV.

Fig. 9: Spanish SSTV.

Weather

The variations in atmospheric pressure shown in **Fig. 13**, covering the period from March 26 to April 25, were taken daily, at noon and midnight, from the recordings made by the Short & Mason barograph installed at my home in Sussex. I frequently mention this because our overseas readers will then know from what part of the UK the measurments were taken.

I recorded 4.93in of rain during April with amounts of more than 0.5in falling on days 1, 5, 9 and 13. This compares with 4.22in for the same period in 1992. The bulk of the 0.85in total on the 13th fell in about two hours from, I assume, a 'cloud-burst' with thunder and fork-lightning. Some areas within a 25km radius had no rain at all. Joan and I were out for the day, in bright sunshine and saw this very black sky in our home direction. Such events can suddenly alter the rain fall averages!

"I am happy to report that spring weather and improved tropospheric DX appears to have arrived here during the past week", wrote **David Glenday** (Arbroath) on May 3 and, from Norwich, **David Ashley** (Norwich) said that the weather in his area was surprisingly warm for the time of year with daytime temperatures averaging 67°F throughout the month.

Tropospheric

Despite checking the v.h.f. bands on most days, **John Woodcock** (Basingstoke) reported on April 26, "This has been a complete blank month here for TVDX".

During a mild tropospheric opening on April 15, Simon Hamer received pictures from Denmark (DR & TV2) and Sweden (SVT1 & SVT2) in Band III and the u.h.f. band respectively. However, while the major event was in progress on the 27th and 28th, he logged strong signals from Denmark, Germany (ARD1), Norway (NRK) and Sweden in Band III and from Belgium (BRT), Denmark, France, Germany (ARD1, HR3, MDR3, RTL, SWF3, VOX, WEST3 & ZDF), Holland (NED), Ireland (RTE) and Sweden (SVT2 & TV4) through Bands IV & V.

"The tropo-opening on April 27 turned out to be good", wrote **Andrew Jackson** (Birkenhead), after finding test-cards from Belgium (BRT1), Denmark and Germany (WDR1) on the v.h.f. band and Denmark (TV2 - Abenra, Hedensted, Tommmerup & Varde), Germany (RTL+ & ZDF) and Holland (NED1, 2 & 3) in the u.h.f. band. Next day, he received u.h.f. transmissions again from the Dutch networks plus Germany's ARD1, NDR, WDR1, WEST3 and ZDF. In addition he saw the caption 'Gutten Morgen Aus Berlin' and a clock from ARD1 on Ch. E22 and Nordtext from NDR on Chs. E28 and 44. Early on the 30th, he saw programmes, clock and test-card from Holland's NED3 on Chs. E30 and 35 and test-cards from 'NED1 and 2' on Chs.E29 and 39 and E27 and 32 respectively.

"As expected, conditions on Bands IV/V picked up during April, with some of the strongest DX ever on the 27th", wrote **David Ashley** (Norwich). He pointed out that, "ZDF was, if anything, producing a better picture on my set's loop antenna than it was off the main aerial". No doubt, David, the signal was so strong via your main antenna that it was overloading your set and the loop reduced the strength enough to give you a good picture.

During April, David received pictures in the u.h.f. bands from Holland and the UK (Central & Yorkshire) on the 2nd, Holland on the 3rd, 4th, 8th and 10th, Belgium (BRT TV1), Denmark, Holland and the UK (Yorkshire) on the 15th, Holland on the 20th and 21st, Denmark, Germany (N3 & SAT1) and the UK (Carlton, Central, HTV Wales, Tyne Tees & Yorkshire) on the 27th, Denmark on the 28th, Germany, Holland and the UK on the 29th and Belgium, Holland and the UK on the 30th.

In Scotland, **David Glenday** had a similar haul from the 26th to the 30th inclusive and, in addition to the European and Scandinavin stations he logged some home grown DX from Caldbeck and Emley Moor on the 26th, Craigkelly, Crystal Palace, Emley Moor, Sandale and Sandy Heath on the 28th and Sudbury on the 30th. Although Norwegian television is mainly in Band III, they do have u.h.f. transmissions listed from Ullandhaug on Ch. E35, Ringevike (E.41), Mistberget (E.44) and Lifjell on.52.

SSTV

Throughout April, **John Scott** (Glasgow) kept watch on the slow-scan television sections of the 3.5 (3.730MHz), 7 (7.042) and 14MHz (14.235) bands for signals and was rewarded with contest captions from Poland, **Fig. 8**, Spain, **Fig. 9**, Sweden, **Fig. 10** and Switzerland, **Fig. 11**, plus a close up scan of one of the operators, **Fig. 12**, with his gear.

John recently tested a new software driver and a Cannon BJ-10ex printer for making hard-copy of the pictures received via his Robot 1200 convertor. The printer is working well and has been added to the station equipment. John said that, "the Robot 1200 looks for an Epson printer". So, he has set the printer for 'Epson' for SSTV print-outs and has 'IBM' and 'BJ-130e' options for other uses via his PC.

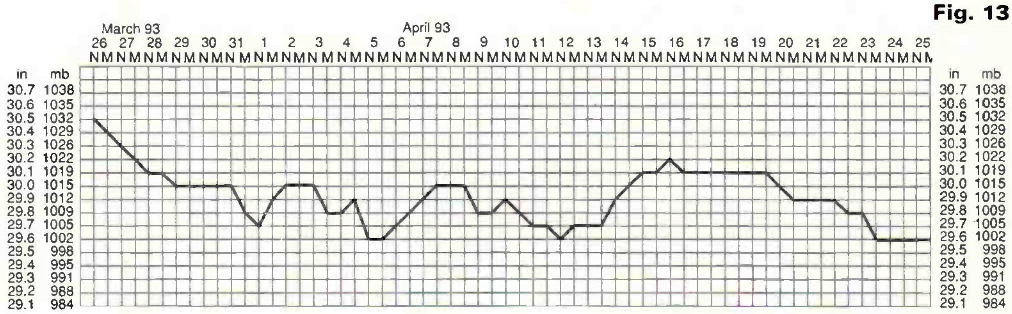
On the subject of computers, I recently upgraded the MS DOS 5, pre-loaded on my Packard Bell 900, to version 6 and found it well worth the effort and cost, if only for the Anti-Virus, Help - which explains all the DOS files on screen and the MemMaker programs that feature among the goodies in the package.

Fig. 10: Swedish SSTV.

Fig. 11: Swiss SSTV.

Fig. 12: SSTV.

Fig. 13



Bandscan

EUROPE
By Peter Shore

Cuts, cuts and nothing but cuts. This is the story that has been dominating the board rooms of international broadcasters around Europe over the last few weeks. Radio Sweden has been subjected to a cut of one third of its operating budget: that equates to around £1.5 million.

There was a hard fought attempt by the station to impress upon the Swedish Storting (or Parliament) that Sweden needed to maintain its voice abroad and that Radio Sweden was an inexpensive yet effective way of promoting the country in Europe and further afield.

But the Swedish Treasury won the battle and at the end of April, the Parliament voted in favour of the cut. This will be implemented on July 1, when Radio Sweden's Swedish language output will be replaced by relays of the domestic service, and French and Swedish language transmissions dropped.

Here in Britain, BBC World Service is threatened with cuts. World Service is funded not by the television licence but by a grant-in-aid from the Foreign and Commonwealth Office. The FCO is faced with the prospect of having its considerable budget reduced by the Treasury and wants to pass on a proportion of this to the BBC.

Somewhere between £8 million and £13 million would be taken off the World Service budget in 1994/95 and the following two years if the cuts are implemented. What this might mean in terms of reductions in language services is unclear, but the proposal has been met with a storm of protest from British MPs. More than 260 signed a Parliamentary Early Day Motion expressing their dismay - something of a record as Early Day Motions usually attract only a handful of signatories.

The British Press took up the battle, saying that it would be better for the FCO to cutback on some of its 'lavish' spending on Embassies and High Commissions and maintain World Service's funding at current levels. Many leaders in the broadsheets suggested that World Service is more effective than overseas missions in promoting Britain around the globe.

Meanwhile, the BBC has entered into arrangements that give it access to the transmitters of Radio Korea and NHK Radio Japan to beam English and other languages into the Far East whilst the recently refurbished Skelton transmitter site in Cumbria, northern England, broadcasts programmes from Seoul and Tokyo.

KBS Radio Korea can be heard in English at 2030 to 2100UTC on 6.035MHz, followed by French until 2145, with German at 2145 to 2230 on 6.03MHz. There is some co-channel interference to these frequencies when listening in south-east England, but this may be less problematic further into mainland Europe.

The relays of NHK Radio Japan are more extensive:

Japanese
0400-0500 on 7.23 & 5.96 MHz
0600-0700 on 7.23 & 6.05MHz
2000-2100 on 7.255MHz
2200-2300 & 0000-0100 on 6.125 & 6.06MHz

English
0500-0600 on 7.23 & 6.085MHz
0700-0800 on 7.23 & 6.05MHz
2300-2400 on 6.125 & 6.06MHz

German
0800-0830 on 7.23 & 6.05MHz

French
2130-2200 on 6.06MHz

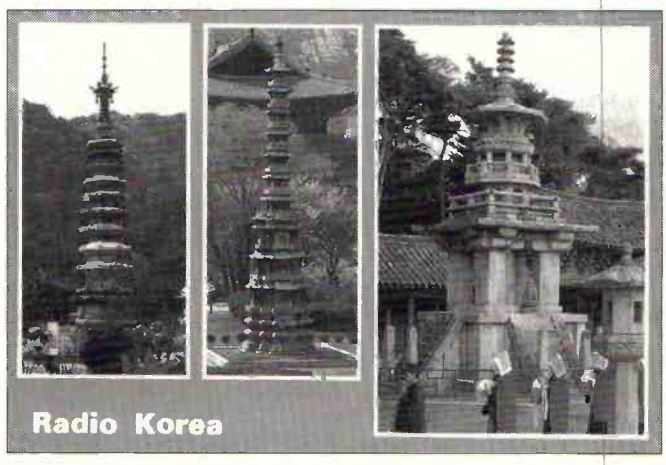
Russian
1900-2000 on 5.98MHz.

YLE Radio Finland seems safe from budget cuts, according to station director, Juhani Niinistö. He told me that in an effort to reach potential rebroadcasters around Europe, the station has decided to sign up with Eutelsat and the Helsinki-based station can now be received in studio quality on Eutelsat II f1 on the Deutsche Welle TV transponder at 11.162 GHz and the audio subcarrier is at 8.10 MHz.

Eutelsat is owned by European state telecommunication companies - including BT - and it is now becoming more aggressive and is attempting to attract more television and radio services so that it is more competitive with Astra. Currently the Paris-based Eutelsat company is courting BBC World Service Television - which at the moment is carried on Intelsat 601 to Europe - and CNN - on Intelsat and Astra.

Intelsat is particularly difficult to receive without a 900mm dish (or greater for northern parts of Britain) whilst Eutelsat is easier to catch and companies now market dual LNBs to allow owners of Astra dish antennas to receive Eutelsat as well. This market has apparently grown since the launch of Red Hot Television last year.

But there will be more choice from Astra in the early part of the summer as its third satellite, 1C, was successfully launched at the beginning of May. Tests are scheduled to begin in July and when operational, a further eighteen television channels together with many new audio channels, will be available.



The situation in the former Yugoslavia continues, at the time of writing, to be complex and unending. Radio Yugoslavia continues to broadcast from the capital of Serbia, Belgrade:

English
0030 to 0100 on 9.58 & 11.87MHz
0130-0200 on 9.58MHz
1130-1200 on 21.605MHz
1830-1900 on 17.71 & 6.10MHz
2100-2130 on 6.10 & 9.505MHz
and there is an irregular transmission at 1000 on 11.805 and 9.58MHz.

Croatian Radio, meanwhile, has adjusted its twenty-four hour a day channel in the 49m band to new 5.92MHz.

Finally a note about a major exhibition which will interest all readers. The Internationale Funkausstellung in Berlin is Europe's largest consumer electronics fair. It is held every two years and will take place this summer, from August 27 to September 5. The exhibition is held in more than 20 interconnected halls together with a huge outdoor area and most of Germany's national and commercial radio and television stations mount enormous shows with live audience participation.

All the large radio manufacturers exhibit, with Sony and Grundig taking the biggest stands. Both companies have large sections devoted to short wave radio, as well as to satellite equipment. I went along in 1991 and was amazed and impressed by the scale, so I recommend it to anyone able to get to Berlin when the show is taking place. This year, Deutsche Welle and the BBC will both have large stands, and I understand that a number of other international broadcasters may be pooling resources to take part. I hope to be there: if I am, watch out for a report in *SWM*.

Radio Communication Products from AOR

AR1500EX - One of many receivers & products produced by AOR. The very compact AR1500EX hand-held wide range receiver offers all mode reception including **SSB** as standard. Newly designed printed circuit boards have been incorporated to ensure this new version offers the very best performance. Frequency range is 500 kHz ~ 1300 MHz without gaps, **all mode** reception AM, FM(N), FM(W) & SSB (USB, LSB &CW - with BFO). The AR1500EX offers **full coverage** of the VHF, UHF and Shortwave Airbands **plus** Broadcast, Amateur band, Utility services etc. Many accessories included: NiCad pack, Charger, Dry battery case, DC lead, Soft case, Belt hook, DA900 VHF-UHF aerial, SW-wire aerial, Earphone, Comprehensive Operating manual... **Suggested Retail Price of £349.00 inc VAT.** **(UK Carriage free)**

AR2000 - this popular receiver continues and remains a firm favourite with listeners and enthusiasts. Features include coverage from 500 kHz ~ 1300 MHz and reception of AM, FM(N) & FM(W). Many accessories supplied as standard including Charger, NiCads etc. **Suggested Retail Price £309.00 inc VAT.** **(UK Carriage free)**

New ABF~125

VHF Air Band Filter for better strong signal performance...

The **ABF125** is a receive bandpass filter especially designed to improve the strong signal handling characteristics of receivers for VHF commercial Airband listening. The ABF125 is suitable for connection to most airband and wide range receivers on the market, it is not designed just for AOR branded products. The addition of this filter to the aerial signal path will provide additional selectivity which will enable the receiver's circuitry to cope much more easily with strong interfering signals such as Band-2 Stereo or Shortwave broadcast transmissions which can be manifest in many ways such as 'hissing', mixing of many signals together, music breakthrough and desensitisation of the receiver.

The ABF125 will provide useful additional selectivity (in many situations) to any receiver's 'front end' by reducing the multitude of unwanted strong signals from reaching and saturating the receiver's first mixer stage... this results is less interference and improved reception.

Of course 'stub filters' can provide a degree of rejection to unwanted signals but tend to be bulky being suitable for base station applications and usually have to be hand-made. The ABF125 on the other hand is ready made and very compact measuring only 73.5mm and weighing a mere 52g yet offers excellent out of band attenuation typically of 25dB from 0.3 ~ 75 MHz and 20dB from 190 ~ 400 MHz. This makes the ABF125 suitable for connection to both external aerials and for connection directly under the whip aerial of a hand-held receiver. A BNC socket (female) is fitted to the top of the ABF125 and a BNC plug (male) to the other making connection to an aerial easy and straight forward.

The ABF125 is not an amplifier so will not 'boost' signals, however the additional selectivity offered can significantly improve reception in many situations by removing unwanted strong signals which may overload the receiver and reduce it's effectiveness. When any connection is fitted to the aerial signal path some reduction of signal is resulted (attenuation) however the ABF125 in band attenuation level is very small due to the excellent in band V.S.W.R. of 2:1 resulting in a loss of only about 4dB.

Note: Remember to remove the ABF125 from the aerial when monitoring signals other than VHF Airband or signal strength will be dramatically reduced.

Suggested Retail Price £24.50 inc VAT. **(UK Carriage £1.50)**

With the **AR3000A** (base-mobile receiver) your listening horizons are truly extended providing receive coverage from 100 kHz all the way up to 2036 MHz without any gaps in the range. The AR3000A offers the widest coverage on the market today with a high level of performance and versatility from long wave through shortwave, VHF and onward to the upper limits of UHF and SHF. Not only will the AR3000A cover this extremely wide range it will allow listening on any mode: NFM, WFM, AM, USB, LSB AND CW. The AR3000A also features an RS232C port for computer control.

Suggested Retail Price £949.00 including VAT.
(UK Carriage free)

AORSC ~ Spectrum Coordinator

IBM-PC computer control of the AOR AR3000A, AR3000 & AR2500 receivers

AORSC is a powerful program for the IBM PC (and 100% compatible) computer, which allows you to control an AOR scanning receiver using a serial port (RS-232 interface) of the computer. Many facilities are offered to provide you with a high performance radio monitoring system. It is possible to switch instantaneously between the two VFOs with a single key press. A fixed VFO offset may be entered into the system and the VFOs locked together using the "tracking" facility so that an offset is maintained while tuning across the receiver's spectrum. Three thousand mode sensitive memory channels are provided in each memory file, each with dual VFOs and a 50 character comment. A selection of these memories is displayed on the screen so that you may review memory contents easily. The display of memories may be paged up or down so that it is possible to check on the contents of the entire bank of 3000 channels from the VDU. You may expand the memories by creating new memory files, each with 3000 channel as above. There is no limit to the number of files you can create, unless you run out of disk space. A comprehensive range of scanning facilities is provided with the software. It is possible to scan memories, free scan or perform band limited scans.
A descriptive 8 page booklet is available to request. The software is priced at **£75.00 plus £2.00 P&P.** AORSC is supplied on both 3.5 & 5.25 inch media for installation onto a hard drive. ***A DEMO disk (without RS232 support) is available on a 3.5 inch disk for installation onto a hard drive, Price is £3.00***

ACEPAC3A ~ IBM-PC control...

For those with a larger budget, ACEPAC3A is also available for the AR3000A & AR3000 receivers. Installation is recommended on a hard drive but can be run from 3.5 or 5.25 inch floppies depending on machine compatibility. Features are similar to AORSC but ACEPAC3A has a more versatile spectrum graph type display. A descriptive leaflet is available to request.
Suggested Retail Price £139.00 plus £2.00 P&P.

"Nearly New" stock offers substantial savings

*Occasionally we are able to offer "Nearly New" equipment with full **12 months' AOR warranty** at attractive prices. There can be many reasons for this stock, but most important for **'you'** is that we can offer substantial savings from Suggested Retail Price. All equipment is thoroughly tested before despatch to ensure full conformity to specification. (Carriage £6.00 extra).*

MODEL	DESCRIPTION	Suggested Retail Price	"Nearly New" Price	Saving
AR3000A	The ultimate. Unique all mode extremely wide band base-mobile receiver. Coverage is from 100 kHz - 2036 MHz with no gaps.	949.00	799.00	150.00
AR1500e	Compact all mode hand-held receiver. Receive coverage 500 kHz ~ 1300 MHz... AM/NFM/WFM & SSB using BFO. **Enhanced model.**	Was 299.00	250.00	49.00
AR1500EX	Compact all mode hand-held receiver. Receive coverage 500 kHz ~ 1300 MHz... AM/NFM/WFM & SSB using BFO. **Latest model.**	349.00	299.00	50.00
AR2000	Hand-held receiver 500 kHz - 1300 MHz without gaps. AM/NFM/WFM.	309.00	270.00	39.00
AR2800	Competitively priced full featured base - mobile scanning receiver. All mode operation AM/NFM/WFM & SSB using a BFO. Coverage is 500 kHz - 600 MHz & 800 - 1300 MHz. Includes internal NiCad battery.	449.00	375.00	74.00

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SSB Utility Listening

Peter Rouse GU1DKD

Future correspondence to: Graham Tanner, 42 David Close, Harlington, Middlesex UB35EA

Congratulations to **Keith Elgin** who is now the second reader to have logged those elusive Antarctic stations. Keith has not only logged Faraday base but has also received a QSL card. Keith asks if anyone knows who or what the callsign Canyon Passage belongs to. He heard this station having a somewhat confused conversation with Architect (RAF). He has also been monitoring activity in and around Yugoslavia and asks where the airfield locator LDZA has appeared from. I can tell him that it is Zagreb and as he rightly points out the other one regularly heard is LDSP which is Split.

Leslie Griffiths has also been monitoring Yugoslavian related traffic on 5.310 and 6.996MHz and says the UN forces employed on checking shipping going into Yugoslavia appear to be co-ordinated by the Italian Navy. Rome Radio is regularly broadcasting warnings to shipping that they should contact 'C in C Rome and advise any planned movement towards the Yugoslavian coast and allow boarding'.

Colourful Logs

Mike Le Ves Conte has never forgiven me for once spelling his name wrong and is now taking his revenge by submitting his logs on peach coloured notepaper that I have to hide in case my wife gets the wrong idea! They include a variety of number stations and single letter broadcasts (SLBs) on the following frequencies: 5.177, 5.230, 5.306, 5.308, 5.340, 5.426, 5.551, 6.697, 7.438, 7.452, 7.605 and 7.635MHz. Mike says the noise levels are reducing at last so he has aimed for some DX and that has included a clutch of African stations in the 8MHz aeronautical band including Camaroon, Brazaville, Nairobi, Luanda, Kinshasa and Mauritius. He also logged Karachi and Bombay on 10.018MHz and Madras and Calcutta working a Cathay Pacific flight on 10.066MHz.

On 8.703MHz he heard Manila, Waha, Libreville, Niamey and Luanda all around mid-evening time. He says stations working through the USAF GHFS system on 11.176MHz on March 11 were asked to change to 14.615MHz. This is an odd allocation as no adjacent frequencies are in military use.

One rare catch was McMurdo Centre on 8.797MHz as was Albrook (USAF) in Panama on 13.247MHz. Finally Mike asks if anyone knows of a logging program that will run on his XT computer. He wants to be able to enter as he listens rather than enter onto a scratchpad and sort later. The program should be able to retrieve by either name or frequency. If anyone can help let me know because I am sure there are other readers who would be interested as well. Surely there must be some PD or shareware out there somewhere.

CAP In Hand

At long last, someone may have logged an American CAP (Civil Air Patrol) station and that someone is **Ian Lockwood**. Using his AR-1500EX and 10m long wire he heard a brief snatch of conversation (American accents) on 7.635MHz. This is the national command net check frequency and in addition to any regular traffic, all stations check-in at 11.15 Eastern Standard Time daily. The other check-in frequency is 14.905MHz using u.s.b.. It is a pity Ian did not hear a callsign but as the frequency has not been listed as used by anyone else I am sure he is right in identifying it as CAP.

Ian's log also included CommSta Boston working Rescue 6008 on 5.696MHz and what may have been an air-to-air exchange between Roller 1,2,3 and 4 (possibly a formation flight) on 6.750MHz (USAF). Ian heard McClellan AFB (USAF California) testing on 6.750MHz and asks if this one of their regular frequencies. The short answer is no so it may be worth keeping an ear on this frequency to see if they intend to use it regularly.

Roger Syratt logged Dusty Dog One Zero 'phone patching through Lajes on 11.271. He believes the aircraft was US Navy but wonders if anyone can identify it. I suspect not because it sounds like a typical on-off tactical callsign to me but you never know. **Mr J.S. Kipling** has asked for more details of the American magazines *Popular Communications* and *Monitoring Times*. I can tell him that Axdon Books can supply *Monitoring Times* but *Popular Communications* is only available direct on subscription. Both are good magazines and if you are interested in broadcast stations as well as utilities it may be worth buying them. However, do bear in mind that much of their space is given over to such topics as scanning, new government radio regulations and other themes which have little or no bearing in Britain. That said, you can buy a sample copy of *Monitoring Times* from Axdon Books who have just released a catalogue. Ring them on (0738) 30707

A few words on getting going on utility listening because some readers still seem to have little or no success. **Cliff Stapleton** has experience of both broadcast and amateur band listening but says he is hearing nothing on the utility bands. First, it must be emphasised that it is not like listening in to the constant chat on a scanner. You can leave your receiver on one frequency for hours sometimes and only hear a handful of exchanges.

Assuming you are chosing the right bands for the season and time of day or night you should be able to log something by concentrating on specific operators. For instance frequencies between 3 and 7MHz are chocker with traffic from mid morning to mid afternoon on the aviation NAT tracks. There is often high activity on USAF channels day and night on frequencies such as 11.176MHz. Once you get the feel of these easy pickings spread your wings. One trick is to use the Volmet frequency lists and broadcast times shown in the companion book *Short Wave Communications* to check which areas are providing openings into the UK.

Cliff asks why the same book lists thousands of frequencies when there is little chance of logging most of them. The simple answer is that when you come across an unknown station you want to find out who it is and so an enormous (and often expensive) amount of research is done to try and cover all known operators. Cliff's comment actually prompted me to wonder if I now know why some newcomers have problems. I have never understood why some readers seem to log very little but is it possible they browse the lists and then chase after specific stations on specific frequencies? If so they are on a hiding to nothing. Check which bands are open and into what areas. Bear in mind time differences and use the lists only to to determine which segments of the spectrum you should sweep. When you find active USAF, civil air or other frequencies stay with them and see what you can log. That should provide much better results.

RAF VC10 Tanker refuelling two Jaguars in flight. Photo DPR (RAF). Crown Copyright.

And finally I bow out and leave you once again in the capable hands of Graham Tanner. Sadly my little tussle with Leukaemia means more treatment and we cannot keep swapping and changing so I have asked Graham to take over permanently. Thank you to all of you who have submitted logs in the past and wished me a speedy recovery. I have made many friends through the column even though in many cases we have not actually met. Good listening and give Graham your support.

I would like to take this opportunity to say a big thank you to Peter for all the hard work he has put in to establish his SSB Utility Listening *column in* Short Wave Magazine.

Over the years Peter has been of enormous help to me in establishing SWM *as the UK's number one magazine for listeners. His knowledge of the subject is wide and he is always willing to share it with his readers. I am sure that I speak for all* SWM *readers in wishing Peter success in his fight against Leukaemia. Without the continuing pressures inherent in compiling a regular monthly column he will be able to concentrate on more important matters.*

I know that Graham Tanner will be a worthy successor and I hope that you will support him.

Dick Ganderton

Future logs to:
Graham Tanner, 42 David Close, Harlington, Middlesex UB3 5EA.

Amateur Bands Round-up

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

This has been an odd sort of month; more than usually up-and-down, both in conditions and weather. But, we can always console ourselves with the thought that 'conditions' serve to relieve us of boredom!

Letters

Let's make a start with **Harry Richards** in Barton-on-Humber; Harry has a Matsui MR-4099 and a Grundig Satellit 700 fed from an AD-170 active antenna. The problem is simply this; Harry has difficulty copying callsigns. Perhaps they are spoken too fast, or there is a blast of interference or whatever. What is the problem?

First, there is the fact that many operators, on 3.5 and 7MHz in particular, 'gabble' their callsigns. Second, the problem of the interference is compounded by the lack of real selectivity in the receivers. Third, is the matter of practice - there is no doubt that a skilled listener can pull intelligence out of a rumpus, which is to the newcomer totally lacking. Perhaps the best way I know - and other readers may have different suggestions - is to stick around on one contact. They usually comprise several overs and repetitions of callsigns. Write down the bits you copy, so next time you can concentrate on the missing parts only.

In addition, it does definitely help if you plug a pair of headphones in. You will find headphones improve matters largely by simply shutting-out extraneous noises, but also they generally give a higher quality audio than the little speakers our rigs have built in. Try putting up an outside antenna and earth system; a loft antenna however good is limited by the amount of noise it picks up.

Finally, if you have a control labelled 'RF Gain' or 'RF Attenuator', try using it on a big signal and see what happens; there are two reasons for reduced r.f. gain, namely to keep the sideband signal level low enough to suit the carrier injection oscillator level and to avoid overloading the (usually) first mixer stage and generating unwanted noise and distortion in the receiver. On my TS-440S the attenuator is switched in for 90% of the time I am on 1.8/3.5 or 7MHz for just this reason.

In Southend-on-Sea lives **Robin Guppy**, who had thought 'short waves' died at the end of WWII.....until he bought a scanner to take to air shows. That started it, and so then he went to the library to read up, and back to the shop for a receiver able to take sideband signals. More reading, and a better antenna; more reading yet and an antenna tuning unit. Being very short of space, Robin next had to pacify the 'powers-that-be' so everything was built into a box that when closed was disguised to look like an old-time valved radio set. Out-of-doors there are now the random wire plus three Windoms cut respectively for 10, 14 & 24MHz.

Still with Robin, does anyone know of the correct address for a QSL to go to for 4U1UN? If so please drop him a line at 191A Hamlet Court Road, Westcliff-on-Sea SS0 7EL with the 'gen.'

Now **Mark Malone** in Great Horwood who bought an AR-1500 scanner, and tried it's claimed sideband capability - of which he implies he had doubts. Imagine his surprise to find TL8NG and UL7PI both on 14MHz. I wonder if Mark will become hooked on the amateur bands?

That G3RR card which adorned the April column netted a nice letter from G0RFQ in Colne who is the secretary of the **Rolls-Royce Barnoldswick G3RR Club**.They also have G6RRB for v.h.f. On the h.f. side there is a TS-940, a tribander, an end-fed wire, and an enormous delta loop. On v.h.f. they have gear for 50, 144 and 432MHz, plus packet and satellite facilities. Seemingly, it is not necessary to be a Rolls employee; most are retired, but people with no connection are still eligible to join. Meetings on Sunday mornings at around 1145 till lunchtime, plus Monday evening (2000) Morse classes and some Morse transmissions on S13. The venue is about 10 miles north of Burnley, six miles south of Skipton - a spot with which Rolls have been involved for half a century. It sounds like an interesting club for listeners in the locality.

Were any readers listening to the net on April 1, at 1941UTC, on 21.355MHz? **Gerald Bramwell** in Swinton was trying to copy a W9.../C6 who was RS56 - but the call was blotted out by a burst of QRM - and the chap didn't repeat the call! One wonders about this one for two reasons; the C6 reciprocals seem to put their own callsigns last in the modern manner, and secondly there was a group from W3 on at the time. Gerald listens to c.w. and RTTY as well as the telephony, and in his listings marks them accordingly; green for the teletype, black for the Morse and blue for the talkies. The list is fully three A4 sides, so I must select.

On Top Band, c.w. netted ON4UN, IV3PRK and GD4BEG, plus sideband from GM4PML. 3.5MHz Europeans included the usuals plus HV3NAC. Outside Europe the band produced all continents bar Africa,with a major in ZC4RAF75. 7MHz also saw a missing continent, this time Oceania; and on 14MHz some 145 calls listed covered the whole world, with 99 of them DX - perhaps the best of the bunch were the two Ethiopians, one on sideband, the other on RTTY.

Tim Allison in Middlesbrough has a Lowe HF-225 and an end-fed wire, and seems to specialise in listening to the DX nets. For those of you who like to listen, Dieter Konrad OE2DYL has produced a new edition of his *DX Nets Around the World* list. This gives details of some 160 of these to try for. Write him at Rosengasse 1, A-5020 Salzburg, Austria. The price is $4 or 12 IRCs - Dieter does not accept cheques because of the extra costs involved in cashing them.

Dennis Sheppard returns to the fold, listening again with a Trio 9R59DS from Earl Shilton. On 3.5MHz Dennis notes ZL1IU, ZL4AP, ZL4BO, ZL2APW, ZP5JCY, YS1RRD, XO1FG, CP5NU, PZ1EL, 7X2BK, PU2VJJ, TI2JJP, TI4CF, Z22JE, VK3EW and CX4CR; as for 28MHz here we see OA8K, YV5DEH, ET3DX, ZS6XB, J28GG and ZS5FG. Now he's on the lookout for either a JR310 or a JR599 receiver.

Another 'return to the fold' is **Luciano Marquardt** in Hereford, who is gradually picking up the veries since he came back to the receiver. This year so far has seen some 123 countries into the book, all on sideband.

Looking at Dennis Sheppard's list, and also the one from **Geoff Crowley** in Hafnarfjordur, Iceland I note how the falling solar activity results in propagation on 28MHz becoming N-S with E-W paths very quiet. The sign is worth recalling since it is also a hint that an open band is coming to close-down time.

In Iceland, Geoff says there are some 200 stations licensed, and a nice clubhouse in Rekjavik complete with h.f. and v.h.f. stations. Geoff's highlights included G4RQZ working ZP5XHP from a tractor, on 14MHz. As he says, to have a hobby that enables you to chat with Paraguay while you are at work can't be bad! Also on 14MHz, Geoff notes that disgusting performance around 14.315MHz - why don't the FCC put a stop to this? Geoff heard his first W on this band. 7MHz saw a huge pile-up on YI1HAS - but I could bear to be convinced this one was the authentic goods! Not much time on 18MHz, but for 21MHz I see all continents.

Andy Wright (Sawley) listens on most days with an R2000 tacked to an end-fed piece of wire about 25m long, plus a BP34 audio filter. 3.5MHz gave PJ2MI, VP2VA, TI4CF, CO1HJ, D44BC, VP5JM, HC8A, HK4DHL, KG4CW, HR2MOP & HR2BOC; on 7MHz we find VK7AAB, CN8FR & JW5NM, and on 14MHz there is VU2YK& 9H1FN. As for 21MHz, Andy notes DL9ZOG/MM, YC0TPB, 9A3VD & LA9DAA and ZP1HY to represent 28MHz.

Viv Franklin in Swindon selected out the good stuff in his list; 3.5MHz showing CN8AP, C31HK, C31SD, D2EL, FM5DM, FY5FY, FG5FC, UT0AJ, JW9VDA, JX3EX, OD5ZZ, TL8WZ, TA1AL, TA3D, T70A, T77T, TI4CF, VP2VA, VP2EY, XE1ABA, 3A2LU, 9V1XQ and 9K2WA. At the 14MHz mark on the dial CN8FR, EA9KB, JA2FG/P1, JA4EKO, JA4HM, LU3DFJ, PT7BZ, TK5BF, PY2GOU, 4X6SJ and 8P9EM; which allows for AP2JZB, CN8HB, EA9PX, HL5FXP, JA1MAO, W9TQA & 3X0HNU. 18MHz was also popular with Viv who offers JA2VPO, JO1DZA, KL7XD, OJ0/OH1VR (Market Reef), PJ8AD, TZ6VV, VE1DXR, VE3YJ, VK3FPG, VK4FG, ZL2AG, W0MKX and 5Z4FM.

D. L. McLean (Yeovil) found PY0FM on Eighty, plus W3LPL on 7MHz. 14MHz was surely the best band, and the N9NS/KH5K, Kingman Reef, expedition filled a gap in the list. On 18MHz V73C (who was previously V73CT), was heard with signals coming over the N Pole, arround 1115 several times. This band also opened up in the mornings between 0800-1100UTC to VK-ZL and JA. On 21MHz the Dutch group at 9G1AA was noted, while on 24MHz W5IJU/KP1 for Navassa was noted. Finally 28MHz and 9G1AA was the best of the bunch although there were openings to Africa, Asia and occasionally North America.

Conclusion

That's all for now. Letters, and yet more letters are always welcome, to arrive in my Box at the beginning of each month. If you have a query needing a direct reply please enclose a s.a.e. If a technical question is of general interest, I'll try and clear it up in the column. 'Bye now!

Airband

Godfrey Manning G4GLM
c/o The Godfrey Manning Aircraft Museum,
65 The Drive, Edgware, Middlesex HA8 8PS

Departure flow control is here to stay, much to the annoyance of passengers and airlines alike. It's the inevitable consequence of greater demands for the same aerodrome, airspace and air traffic control resources. At least it can be made more efficient and plans for this are well advanced, the latest update being the CAA's *AIC* 62/1993. In 18 months, London is to lose its Flow Management Unit as a Europe-wide centre near Brussels takes over. Slot requests will become a thing of the past, with automatic slot allocation being generated by computer on receipt of flightplans. Let's hope there aren't too many teething troubles.

Disappointing news about Heathrow. As previously mentioned, the 23 i.l.s. has been withdrawn and in fact the runway is shorter too. These are the effects of building more parking stands. It works like this. British Airports Authority (BAA) gains huge revenues from parked aircraft. Most of the time, 23 is not needed. On those few days when a south-westerly gale blows, larger aircraft will now need to divert to Birmingham or Manchester, unless they are lucky enough to squeeze into a place in the Stansted queue (this airport will be taking all the Gatwick and Luton diversions).

The loss of these few flights is more than offset by the extra parking revenue. BAA plc, privatised, just looks after itself and no longer needs to consider the requirements of the airlines. The losers are the diverted passengers. I am grateful to contributors to *The Log* for providing the background information from which I have deduced the most likely situation, as described here. If BAA plc or any other party would like to question these deductions, please feel free to write in.

Question Time

Christine Mlynek, often enjoys the sight of helicopters passing over her home town of Aylesbury. Pairs of Chinooks often pass to the west of the town, on a northerly or southerly heading. Less frequent is the flight of a lone Wessex cutting across the north of town heading north-east. I can't think where they come from or go to. Someone out there knows! Please write in.

Before anyone asks, here's one I can answer. In early May I was out for a walk in Edgware, mid-afternoon, when a formation consisting of a 748 leading a pair of 125s came over at quite low level (actually 1300ft above ground). This formation originates at RAF Northolt and was practising for its display appearances. Nice to think that they flew over just to cheer me up whilst I was going about my errands!

What else happens at Northolt? So asks **Tim Binder** (Est Grinstead). Although a military base, it is available to civil aircraft and some business flights do operate through here. The precision approach 'talkdown' radar is a rather eccentric way of doing things by today's standards and civil pilots often find this a novel experience. There are also transport squadrons based here, and you can tell by the above-mentioned aircraft types that they tend to carry v.i.p.s. One way to find out if anyone important is flying via Northolt is to look at the Court Circular/Diary in the national newspapers, and to listen to the Royal Flights recorded telephone service on (0500) 354802.

Now an answer to **Ian McCallum** (Ayrshire). Why do certain stations appear on two different frequencies on the Realistic PRO-9200? This effect is usually due to the image response of superhet receivers. In both cases, the frequency pairs are separated by twice 10.85MHz. So, could this be the answer? I visitied the local Tandy shop and looked at the receiver's specification. There it was: 10.85MHz is exactly the first i.f. as predicted! This is a common problem with wide-band scanning-type receivers, as manufacturers find it too expensive to provide adequate pre-mixer selectivity.

The front end circuit, that part of the receiver that is directly connected to the antenna, would need to be tuned to the correct frequency in order to exclude unwanted signals. Arranging for such a circuit to change its tuning in step with the rest of the receiver is too complicated, and I imagine that's what the problem is likely to be in this case.

Why can a.m. be received when the set is switched to f.m? Again, the receiver isn't discriminating hard enough against strong a.m. signals. In the receiver, f.m. signals are amplified and then limited, resulting in a fixed-size signal. A strong f.m. signal will come out of this circuit at constant amplitude. An a.m. signal should be likewise affected - thus removing its modulation! But in your case, Ian, I regret that strong a.m. signals seem to be beating the system.

Information Sources

A good range of aeronautical titles is available from our own *SWM* Book Service, see elsewhere in this magazine. And don't forget to send a pre-paid, self-addressed envelope to the Editorial Office in Broadstone for your free copy of 'Airband Factsheet.'

If *SWM* doesn't have the title you're looking for, you could try Axdon Books (32 Atholl Street, Perth, Scotland PH1 5NP) who make available a free catalogue.

Leslie Greville-Smith G4SUJ (Wolverhampton) is a retired DC-9 pilot who has enjoyed 'wandering around the world' again - as a passenger this time! He talked his way into the cockpit on one flight and was rewarded with a copy of the flight plan. Leslie has an idea that might enable aeronautical information to be shared. Licensed amateurs with an aeronautical interest could set up a regular net. If this is on 144MHz, several regional nets would be needed. Leslie asks if s.w.l.s could 'phone a known participant to introduce topics for discussion, but the terms of the licence make such third party traffic very difficult to incorporate. It may help that ordinary amateurs might be permitted to allow visitors to their stations to transmit greetings messages, but this concession hasn't been granted yet and will be limited. Any takers? Please write in!

Pitts Special at Bournemouth International Airshow.
Mike Richards.

Follow-Ups

What does a Bristol Type 188 look like (April)? To get an idea of the overall shape, imagine a Canberra but with longer engines, longer fuselage and a high tail. The aircraft was for Mach 3 research, a speed sufficient to melt aluminium! That's why it was fabricated from stainless steel, much too expensive and heavy for building airliners. Concorde only manages around Mach 2 but is made of aluminium alloy. Supersonic aerofoils can be almost any planform shape you like, as long as they are thin when viewed from the front. Above the speed of sound, the air molecules can't flow out of the way and so streamlining is irrelevant. The T188's wings are a mere 180mm thick at maximum. Concorde's wing is carefully shaped, because it must also handle well at subsonic speeds.

The 188 is one of the aircraft covered by Ray Sturtivant's book *British Research and Development Aircraft*. Jon Larcombe (The Watch House, 1 Coastguard Cottages, Mullion Cove, Helston, Cornwall TR12 7EP) can supply a limited quantity of this book at £8.95 plus postage and packing. Jon is on the lookout for *The Observer's Book of Aircraft* from the mid-1950s and will pay a fair price. Write to him direct. Congratulations to Jon on passing the RAE! Now he's going for the Morse, good luck and keep up the good work.

Skytext lists flights from selected airports, as mentioned in May. **Dave Devlin** (Hoddesdon) explains that this service is carried by the Astra satellite and that a Teletext TV is needed as well as the satellite receiver. No. 12 Transponder carries Sky News as well as Skytext 24 hours a day. No subscription is necessary. An alternative to a Teletext TV set is an appropriate expansion card such as those available for IBM PC compatible computers.

Another service, RTL-4, is sent by No. 13 Transponder and its index page is 140. Movements at Schiphol are listed; you need to translate the headings but they are obvious. Schema is scheduled time, vlucht = flight number, herkomst = point of origin, aankomsten = arrival (such as actual time) and opmerkingen = observations or comments.

Shackletons have been mentioned (and even seen!) in this column at various times. **Ron Swinburne** (Birmingham) was approaching Cyprus (Paphos) in a C.172 when his passenger spotted two Shacks parked on the field. I'm sorry the detail in the photo is too

Scanning

Alan Gardner
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With the increasing number of features and complexity of modern scanning receivers it is often difficult to remember how to operate little used functions when the need arises. This usually means resorting to the instruction handbook supplied with the receiver, which, depending on how it was written, may or may not solve the mystery.

Over the years I have operated quite a few scanners and I know just how difficult it can be to follow some of the directions given by manufacturers when they have been translated into English. In fact, many UK importers issue their own instruction books rather than the ones originally supplied with the set. I frequently receive requests for help in deciphering instructions, so it was with interest that I recently had a chance to look at one of the range of instruction books produced by Jonathan Clough of Javiation.

The handbook guides the reader through the various receiver functions in easy stages with plenty of handy operating hints, pauses for breath and humour. Reading the MVT-7100 handbook I certainly got the impression that it had been written by a scanner user for other users, rather than as an afterthought by the designer. So if you are having difficulty restoring locked-out search banks, storing frequencies in memories or simply can't find the on/off switch, this may just be what you are looking for.

Instruction books are currently available for the MVT-7000, MVT-7100, VT-225 and Fairmate/AOR 1000 series at a cost of around £3.50. You can obtain further details on these and other publications such as v.h.f. and u.h.f. airband frequency lists from: Javiation, Carlton Works, Carlton Street, Bradford, West Yorkshire BD7 1DA. Tel: (0274) 722627.

AOR Update

My attempt at correcting the AR1500EX reset procedure in the May column didn't go quite to plan. Gremlins got into both my keyboard and *SWM's* computer creating quite a mess. Rather than try and explain the mistakes I am going to tempt fate and include the procedure once again.

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	DOWN 249.125	ENTER
BANK 6	PROG 1106	LIMIT 1300	DOWN 556.325	ENTER

Airband Interference

I know that many readers suffer with interference to their reception and wonder if there is some form of filter available that can be used to remove the offending signal. This may sometimes be necessary if you have problems with signals on adjacent frequencies such as national f.m radio networks or from short wave broadcast stations.

It tends to occur with continuous coverage scanners, particularly hand-helds, as any very strong signals occurring within the tuning range of the receiver can overload the sensitive r.f stages. One solution is to include banks of suitably switched bandpass filters in the design, but this would tend to increase both the size and price of models.

I hope to feature this subject in a future issue of *SWM*, but in the meantime AOR have produced a useful accessory that will be of particular interest to v.h.f. airband listeners.The device is a small bandpass filter designed to fit in-line between the scanner and the antenna. Called the ABF125 it is designed to pass frequencies in the range 108-136MHz with a maximum loss of 4dB whilst at the same time attenuating frequencies in the range 0.3-75MHz and 190-400MHz by greater than 20dB.

The unit is housed in a small tube with a BNC male and female connector at each end which allows it to be fitted directly on the receiver antenna connector. The price? around £25.00. You can obtain more details from those awfully nice people at AOR (UK) Ltd, Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbyshire DE4 4BG or Tel: (0629) 825926.

Tandy PRO2005

My thanks to reader **Leslie Sargent** of Liverpool who has been experimenting with his PRO-2005 and has at last found out what the 13-way connector fitted inside the top left hand corner of the receiver actually does. Readers with long memories may remember that this question was originally raised by a couple of readers in the June 1990 column.

Leslie has deduced that the connector is actually used and that it is wired across the receiver keyboard matrix. In order to save on the number of individual connections to the keyboard most manufacturers arrange the keys to be in rows and columns. When a key is pressed one of the points forming a row is cross connected to another point in a column. The rows and columns are connected to the microprocessor control circuit which interprets which two points are cross connected and therefore which key has been pressed.

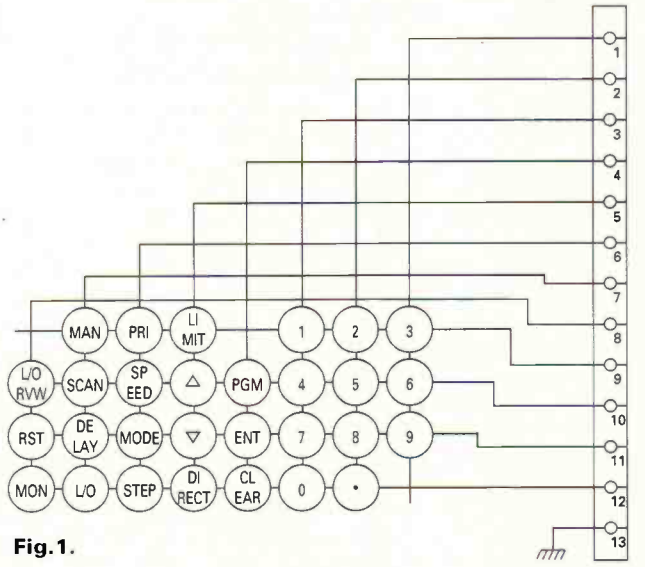

Fig.1.

This opens up a range of possibilities for further experimentation, such as adding an external keypad or putting the receiver under computer control. The connections are shown in **Fig. 1**. Note that not all of the cross-points are used, Leslie has tried connecting pins 121, 94 and 98 together but these seem to just perform the same function as other keys starting a scan of Banks 110.

One way of providing simple computer control is to connect c.m.o.s. switch arrays across the keyboard, the switches can then be operated by control signals generated by the PC. This idea has been used before in articles which appeared in *Practical Wireless* March 1985 and May 1987 and *Wireless World* during 1987.

If you don't fancy the idea of making you own interface or writing a computer program, a company in America is selling a suitable kit of parts which will interface the PRO2004/5/6 to a standard PC RS232 port. The HB232 kit includes a printed circuit board and essential components, control program and modification details. When completed the system permits auto logging and flexible programming of scanning modes. The price is currently around $175 and you can obtain more details from: COMMtronics Engineering, PO Box 262478P, San Diego, CA 921962478, USA.

One final point raised by Leslie was the possibility of extending the frequency coverage below 25MHz, as far as I am aware this is not possible. Several articles have appeared in American magazines describing different modifications but none have included this particular one.

Modification Handbooks

If are a keen experimenter and want to improve the performance of your scanner or wish to add additional functions there are a couple of handbooks that may be of interest to you. Called the *Scanner Modification Handbook* these books contain a wealth of information and practical advice. The Author, Bill Cheek, is well known in America for his modifications. In fact he was responsible for the design of the HB232 interface kit I described previously.

Vol 1 concentrates on the PRO-2004/5 series and includes information on adding S-meters, increasing memory capacity, squelch improvements as well as general information on topics such as power supplies, antennas and cable. Vol 2 includes modifications for the PRO-34, PRO-2022, Uniden BC-100/200/250/760/950 series, although many of the suggestions could equally apply to other models. The price of each handbook is £15.95 plus £1.50 P&P and you can obtain further details plus a list of other radio related publications from Axdon Books, 32 Atholl Street, Perth PH1 5NP. Tel: (0738) 30707.

Icom ICR-7000

Whilst we are on the subject of modifications here is a nice simple one for the Icom ICR-7000. The receiver in its standard form has a switch on the back that allows you to select the i.f. filter bandwidth used for n.b.f.m. reception between 6 or 15kHz. This also has the disadvantage of removing the

w.b.f.m. option in one of the switch positions.

The i.f. bandwidth used when receiving a.m. transmissions can only be changed by moving the position of an adjustable link on one of the printed circuit boards inside the receiver. This is a nuisance if you want to switch between the wide bandwidth setting to monitor v.h.f. aircraft communications which use 25kHz channel spacing and offset frequency working on some VOLMET channels and the narrow bandwidth for 12.5kHz channelised transmissions.

The modification involves a small amount of rewiring so that the w.b.f.m. mode is always selected with the 'FM' button and n.b.f.m. with the 'FMn' button, but the filter bandwidth for both n.b.f.m. and a.m. can be changed by means of the rear panel switch. This also means that w.b.f.m. frequencies can be stored in memory channels regardless of the filter switch setting.

As with all modifications please do not attempt anything unless you are satisfied of your own abilities and also remember that any work may invalidate your warranty.

The first step is to remove the receiver's outer covers. These are held on by several small cross-headed screws that mark very easily if the wrong sized screwdriver is used. One handy hint is to put a thin sheet of polythene over the screw before you use the screwdriver to avoid marking the head.

Once you have removed the covers identify the a.m. wide/narrow selection jumper J8 that is located on the top i.f. unit printed circuit board. Remove the jumper plug. Next locate diodes D26 and D46 that are near J8 and D45 that is towards the edge of the board in line with J8. You will need to connect to the cathode (the end with the band) of these components later.

Next try and withdraw the rear panel switch assembly from the back of the receiver. It is a little bit tricky but it can be done. The switch is a double pole slide switch mounted on a small printed circuit board. In its present form the two sections are interconnected by wire links W2 and W3, these must be removed. Check the colour codes of the wires going to the switch correspond to those shown in **Fig. 2** and rewire them according to the drawing.

Neatly solder the brown and green w.b.f.m. selection wires together and insulate them with some tape. Three new wires have to be added to one of the switch sections and should be run neatly inside the receiver to connect to the diodes previously identified on the i.f. printed circuit board. Check the wiring with a test meter before refitting the switch inside the receiver.

And that's it! You should now find it much more convenient to use the receiver and may well notice an improvement in a.m. reception if you hadn't previously realised that you could change the a.m. filter bandwidth.

Whilst we are on the subject I know many readers have owned R-7000s for some time now and it may be that the will start to have problems with a couple of common faults that seem to occur after a few years use. The first is that part, or all of the frequency display blanks, whilst the rest of the receiver works perfectly normally. This is due to capacitors C19, 20, 21, 22 and 23 on the display unit printed circuit board drying out and going high impedance. This prevents the display decoder i.c. from operating correctly. Replacing the capacitors cures the problem.

The other problem is that the audio becomes distorted when w.b.f.m. is selected. This is due to a floating input in an op-amp filter located on the i.f. printed circuit board. This gradually charges up to one of the supply rail voltages. The cure is to connect a 470kΩ resistor between IC6 pin 5 and 0 volts (the end of R142 that isn't connected to IC6 pin 3).

MVT-8100

Many readers will by now have spotted advertisements for a mobile version of the popular MVT-7100 hand-held. The new model is stated as having all the features of the hand-held but with the intriguing addition of an RS232 computer port, a move clearly designed to make it compete with the AOR AR-3000 series. Just one small problem – no one seems to have told Yupiteru that they will be making it. I think the advertisement must have been originally intended for the April issue! Or perhaps I have been fooled?

As usual you can write, phone or fax (0703) 262246 any information you feel may be of interest to other readers. Until next month – Good Listening.

small to reproduce here, but thanks for sending it. The picture was taken in February 1992, any idea what happened to the two aircraft after that?

Frequency and Operational News

More important changes are listed in the 4/93 GASIL from the CAA. At Heathrow, two approach frequencies have changed. Old 119.2 is replaced by 119.725 and 119.5 is replaced by 134.975MHz. Prestwick now has a.t.i.s. on 127.125MHz. A new n.d.b. is at Haverfordwest (HAV, 328kHz).

Both **I. Kirby** (Edgware) and **Jim Wright** (Bedford) were aware of these changes prior to the publication of this column. This raises the point that I am not providing a substitute NOTAM service as the lead time is too long. Pilots please keep up-to-date from the official sources! Jim adds a change that he has discovered: London TMA North 128.9 is replaced by 119.775, but Honington LARS now has 128.9MHz.

Note also the withdrawal of the ATZs at Dounreay, Fife/Glenrothes, Hibaldstow, Marston Moor and Skegness. It is not clear if all the corresponding airfields have been closed in every case. I thought that Glenrothes had enjoyed a recent revival? Dounreay was a private strip exclusively for flights serving the nuclear installation nearby. Reports from readers in each locality would be most welcome! Let's hope that these are not further examples of 'Let's sell the family silver' where airfields disappear so that their owners can sell the land for development. Wattisham's ATZ/MATZ closure, previously advised as temporary, might now be permanent.

On h.f., flights crossing the North Atlantic without taking one of the organised tracks now work Gander and Shanwick on the NAT-F family of frequencies. These are listed by **Tim Christian** (North Walsham, Norfolk) as follows: 3.476, 6.622, 8.831, 13.291, and at Shanwick only, 17.946MHz.

Ghostly Tales

There are plenty of unexplained observations on record. Just because the available information doesn't lead to an explanation, and just because a flying object is unidentified (as in UFO), doesn't necessarily mean that anything sinister should be implied. A reader from Berkshire recounts yet another strange experience, high altitude shiny objects travelling at speed close to known traffic at the same level.

You don't need to invoke aliens from other worlds in order to hypothesise a possible explanation. One problem is the human factor - sun angles, the effect of cloud and optically incorrect windows all provide visual stimuli that are capable of confusing our perceptions. Radar contacts are more objective.

On the theme of UFOs, do you think that visits by alien craft are possible? There are so many sun-like stars in the known universe that, on probability grounds, there is bound to be intelligent life somewhere. Unfortunately, the nearest likely star is a vast distance, many light-years, away. Our universe's laws of physics prevent travel faster than the speed of light. So, an alien craft would need to be underway for a considerable number of years in order to reach our solar system - even assuming that it travels close to the speed of light. What if alien intelligence has broken the light barrier? Then I conjecture that their universe has laws of physics different to our own. We can only detect craft by physical means. As their physical universe is different to our own, we would be unable to detect their presence - even if they actually did come to visit! After that, back to earth until next month.

The next two deadlines (for topical information) are July 9 and August 6. 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.

Abbreviations

AIC	Aeronautical Information Circular
a.m.	amplitude modulation
a.t.i.s.	automatic terminal information service
ATZ	Aerodrome Traffic Zone
C.	Cessna
CAA	Civil Aviation Authority
DC-	Douglas Commercial
f.m.	frequency modulation
ft	feet
GASIL	General Aviation Safety Information Leaflet
h.f.	high frequency
i.f.	intermediate frequency
i.l.s.	instrument landing system
kHz	kilohertz
LARS	Lower Airspace Radar Service
MATZ	Military ATZ
MHz	megahertz
mm	millimetre
n.d.b.	non-directional beacon
NOTAM	NOTice to AirMen
RAE	Radio Amateurs' Examination
s.w.l.	Short Wave Listener
TMA	Terminal Manoeuvering Area
v.i.p.	very important

Info in Orbit

Lawrence Harris
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We had some stormy weather in early April and several people collected images of the depression that came rushing in from the Atlantic. **Alan Wilkins** of Plymouth (who lives about two minutes walk from me) took a number of photographs - **Fig. 1** was from NOAA 11 on April 4 at 1600UTC. Its leading edge can be seen arriving in Devon and it blew vigorously overnight. Seasonal changes to WXSAT infra-red (heat) images continued during May.

The seas and oceans are generally warmer than the land in winter and early spring, so infra-red pictures from the polar orbiters (or METEOSAT) show the UK, and other European countries, rather lighter (cooler) than the North sea. I noticed that by early May the infra-red images of Norway and surrounding countries were already warmer than the sea.

Peter Finn of Dyfed was one of several *SWM* readers who requested copies of my METEOR image of Canada, mentioned some time back. Peter has a brother living in Canada and he was interested to see the frozen ice revealed while passing over the polar regions.

Fig. 1: NOAA 11 on April 4 from Alan Wilkins.

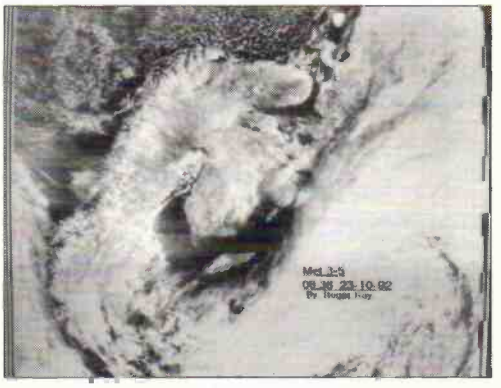

Fig. 2: METEOR 3-5 from Roger Ray.

Current WXSATS

From around March 19 the only CIS (Russian) WXSAT operating was METEOR 3-3 on 137.85MHz. This was transmitting continuously, giving quite good visible light pictures during the day and detailed infra-red images during the night. Using a satellite tracking program, its orbit could be seen to be well illuminated by the sun.

The next change that I logged came on May 6, when I heard METEOR 3-4 start transmitting visible imagery around 1520UTC on 137.30MHz. A couple of hours later, one or two callers confirmed that they had also heard later transmissions.

METEOR 3-4 seems to have a problem with its infra-red system; I left my tape recorder collecting overnight signals, and then played them back the following day. Transmissions started with visible light images during passage over the north pole, which is now in sunlight, but then there were numerous attempts by the on-board systems to turn on the infra-red sensing equipment.

The picture content appeared to be noise, but in fact I was getting good signals, so the image was presumably degraded i.r. This lasted for the whole pass, and was repeated during the next pass. The final (westerly) pass was blank, so perhaps the satellite operators switched it off.

Meanwhile METEOR 3-3 has continued to operate normally. By mid-June it will be approaching the terminator, so if 3-4 remains operational we could expect 3-3 to be rested for a few weeks. During passages near the night-day boundary, solar panels of spacecraft are receiving sunlight at low levels, so may be subject to power constraints. There is a NOAA launch scheduled for early June so perhaps by the time that you read this????

METEOSAT Maintenance

Some WEFAX users had problem pictures in early May. There is a periodic decontamination of its infra-red sensors. When this happens, data is collected by METEOSAT 5, located nearby. Images are then transmitted by METEOSAT 4. The problem is that both satellites have their carriers on, and being close together, small WEFAX dishes can hear both signals simultaneously. The result is that many WEFAX images received at that time will show interference bands. There is a usually a warning about this in the administration messages (transmitted every three hours from 0218UTC). I saw the interference even when using my 1.8m dish.

Beginners

Quite a large proportion of my mail comes from people who have recently seen this column and want to know more about WXSATS, preferably from square one. As well as hoping to cater for this group, I am also planning on doing pieces on h.r.p.t. and PDUS this year, for the more experienced readers, as mentioned in January.

Many enquirers are already s.w.l.s and some have heard satellite signals on their scanners. Tuning in to the main WXSATS band (137MHz) is very straight forward, and many receivers are capable of tuning here. Hand-held portable scanners can hear the NOAAs and METEORs, particularly when taken outside and left scanning the frequencies listed at the end of this column. At any time between about 1300 and 1800UTC you are guaranteed at least two NOAA passes. The 5W of power, even though lower than terrestrial broadcast stations, will not be ignored when the craft is passing overhead!

Many starting off in this field use ordinary receivers and find that they cannot get their WXSAT equipment to respond. As I frequently mention, these signals are easily monitored by scanners, but only a dedicated WXSAT receiver will pull in the full range of frequencies from the signals, and provide an output suitable for picture decoding. Let's look a little closer.

METEOR format

Listen to a METEOR signal (ideally while watching the picture appear on your computer, or framestore). In each second, two lines of picture are transmitted. This is fundamentally different from the production of a television picture which is transmitted at some thousands of lines per second!

Your computer may not actually show you this line as it comes in - common practice is to store the image in RAM, but to display only alternate lines, allowing you to ZOOM in after the pass. If the display showed you the full resolution in real-time (i.e., during the pass) then it could be distorted in one dimension and the result would not be satisfactory.

You can count the line rate from the METEOR signal simply by listening - you will normally hear a scan every 0.5 second. This line contains several types of information, but I should mention here that the format for visible METEOR images is different to that of the infra-red. To complicate matters further, earlier METEORS had infra-red images of a format different to those from the current series three WXSATS.

Each line includes a series of black and white phasing bars that can be considered as marking the picture start - see the left side of **Fig. 2** from **Roger Ray** (his picture from METEOR 3-5 was taken last October). For much of the rest of the line, the actual picture data is transmitted.

The section after the picture data, is in two parts (see the right-hand side of **Fig. 2**); there is a set of bars in digital format - the bars are either absent (black) or present (white). These represent the opening of the aperture through which the sensors image. The bars change every few seconds (as can be seen), according to the illumination level below the satellite. A year or so ago I ran a short piece on this feature of the METEORS.
The last section of the scan line is the grey scale, which includes tones ranging from black to white. All of these features can be seen in Roger's picture. Their images include just one type - visible or infra-red, so they have a higher potential resolution at ground level.

NOAA Format

If you now listen to a NOAA signal, you also get two complete lines per second. For compatibility between NOAA and METEOR signals - to enable them both to be decoded by the same equipment - their modulation and data rates have to be similar. The difference between METEORs and NOAAs is that the NOAA signal contains two images side-by-side, all within this half-second line.

NOAA pictures can usually be displayed in a choice of formats. To see the whole image, the display system must show both the visible light and the infra-red image side-by-side, together with the vertical columns that incorporate calibration sections. The full width of this image

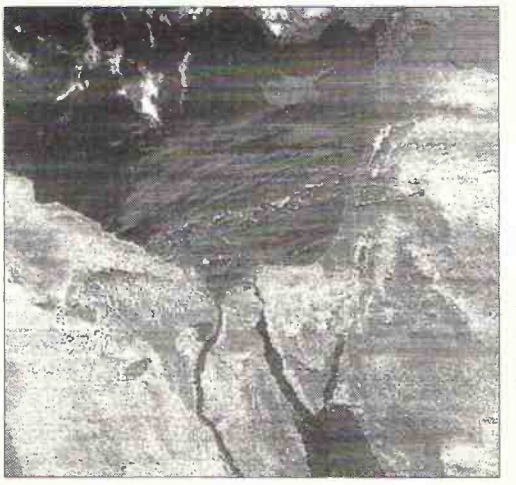

Fig. 3: METEOR picture from Casoni Giamlvca.

therefore takes 0.5 second to transmit, identical to the METEOR image.

The first short section of a NOAA picture is a synchronisation tone called sync A - a burst of seven cycles of 1040Hz tone. The next portion includes minute markers or space. The markers don't always synchronise with actual minutes. Then comes channel A picture data. Next comes a calibration section which, when more of the picture has been collected, shows itself to be a 'wedge', one of many which represent temperature and modulation (grey) levels.

This first half of the image frame (occupying a quarter second), containing channel A data, is followed by the second half containing channel B data. In this case, the tone burst has seven pulses of 832 p.p.s. Both sync tones allow hardware or software to extract the selected frame portion - either visible or i.r.

This is an important consideration when deciding on the purchase of WXSAT decoding systems. Without listing the benefits and drawbacks of any specific systems here, when you are going to use NOAA pictures, you may want to check whether a proposed system will capture all of the image or whether you have to select a specific section. This is not necessarily a problem. It is possible to record the whole signal on cassette tape and replay the pass to produce specific images. The choice is yours!

My first purchase of computer-based decoding equipment turned out to display only one portion of one section of the image! Full resolution pictures that only contain a small section of the whole image were not what I thought I was buying! I hope that these points will help prospective purchasers.

Modulation

In all cases, the final picture from a WXSAT will include sea, clouds and land. From space, using sensors that respond to brightness only (not heat or colour), the signal amplitude depends on how bright the image is, all along the scan line.

Imagine a WXSAT passing northbound over the Atlantic near the coast of Africa (at the time of writing, METEOR 3-4 was obliging!). It sees the ocean as dark, the clouds as bright, and the land as an intermediate grey level. The instantaneous signal is first amplitude modulated on to a 2.4kHz carrier signal (more correctly it is a sub-carrier). This produces a 2.4kHz signal of varying amplitude where the maximum carrier represents peak white and the minimum carrier represents dark. The resulting amplitude modulated signal is now used to frequency modulate the main 137MHz r.f. carrier, and this newly modulated signal is the one to that our receivers tune.

The polar orbiters are constantly moving in relation to a stationary ground QTH; this has the effect of modifying the received frequency - the Doppler shift. In practice several kHz are added to the WXSAT spectrum.

This illustrates two points: first we can now see why a standard, general purpose receiver cannot be expected to produce signals good enough for picture decoding! Second, METEORs, NOAAs, METEOSAT, FENGYUN and GOES all use the same a.m./f.m. techniques so that in principle all WXSAT decoding systems can produce images regardless of which satellite is being used.

With experience, one can listen carefully to the signal and spot certain characteristics. Seas appear dark, so large, clear areas can give a certain low level of tone to the audio. When METEORs are approaching the polar regions during winter, the low illumination level adds a characteristic hollow tone to the signal. Similarly, clouds give a high pitched ring to the audio. Shower clouds may be recognised by the rapid change in the picture line modulation from dark to light, which seems to give a 'walking in snow' sound.

METEOSAT Encryption

I have received some clarification from the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) regarding the future encryption of METEOSAT data.

Later this year, an encryption module is to be introduced at one of the uplink stations for METEOSAT, and test transmissions will continue of encrypted high resolution images during 1994. Analogue data (WEFAX) will not be encrypted, certainly not in the present generation of METEOSATs.

The METEOSAT Second Generation (MSG), which I have mentioned in a previous column, may carry a Low Rate Image Transmission (LRIT) in digital format, but this has not yet been agreed internationally. Users of METEOSAT data should always register their operations with the national authority, and for Britain this is the Meteorological Office. I am seeking further information on behalf of readers of this column and will provide more details when available.

Any readers wanting a personal response can write to: The Director, The Met. Office, London Road, Bracknell, Berks RG12 2SZ.

Foreign Correspondence

I often receive pictures taken by *SWM* readers living outside the UK, and these frequently include areas that we don't see from the polar orbiters over Britain. One such reader is **Casoni Giamlvca** of Rimini, Italy (my apologies if I have mis-spelt your name). He kindly sent me two laser printer dumps of a METEOR image (see **Fig. 3**), together with a disk containing the original pictures. I was impressed with these, never having seen eastern Mediterranean overhead images direct from a METEOR WXSAT. My QTH has a difficult south-east so I don't see the Suez region. I believe that Casoni uses Timestep Weather Systems VGASAT software on his computer.

Baldur Thorsteiunsson writes from Iceland, to say that he monitors WXSATs and uses a tracking program. Living so far north, I suspect that Baldur can receive signals from all of the operating WXSATS on probably every pass! I would really love to see an image collected from Iceland!

My thanks to **Peter de Jong** of Holland who sent me two ESA booklets, entitled *European Space* and *25 Years*. The first is a description of current ESA projects, presented in a very readable form. The latter describes past successes as well as current developments. They are available from ESA Publications Division, ESTEC, Postbus 299, 2200 AG Noordwijk, The Netherlands.

Ole Pagh wrote from Denmark about his QTH, which includes various utility receivers for FAX and maritime broadcasts. He has now entered the world of WXSAT monitoring with the purchase of a Timestep PROsatII system. Ole adds that he agreed with my review comments but wanted some more hardware documentation.

Ole has recently built a FAX decoder called 'Easy-Fax' from a German radio-amateur DF6JB which, he says, is a micro-controller based system requiring no adjustment. He has found that it works well with JV Fax 5.1 on both h.f. and WXSATs, and can use an SVGA monitor.

Australian reader **Gordon Griffin** sent greetings from New South Wales. He uses an AT386 computer running the American program Wefax and has an assortment of antenna and software. How about a picture from Australia, Gordon?

Back Home

John Henry wrote a nostalgic letter, reminiscing of the thirties when he used a two-valve receiver and a huge battery for the main supply! If you have any photographs John...

Karrl Richardson is the Assistant Scout Leader with the Northampton Scout Amateur Radio Group, which has a variety of equipment for activity on all h.f. bands as well as having plans for ATV. They have recently acquired WXSAT receiving hardware to use with an Acorn Archimedes computer.

Some editions ago I received a request from **A Malloy** aged 16, who unfortunately, did not give his address. He asked about hardware and software for the BBC model B computer which he wanted to use as the basis for a WXSAT set-up. If he will contact me again, I might have some good news for him!

Finally, a reader wrote to me from Bangor, asking for advice on setting up a WXSAT station, the availability of satellite prediction programs, etc., etc. but no s.a.e. was enclosed. Time I can give, but not money - I'm virtually unemployed (except for writing for those kind folks at *SWM*)!

Kepler Elements

For a print-out of the latest elements, send me 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.

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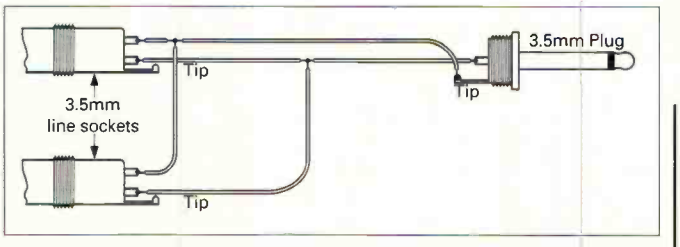


Do-it-yourself version of a 3.5mm Y adaptor to break into the audio output of a receiver

D Stevens of Newton Aycliffe has written in response to last month's feature on the Datong range of active filters. He asks how you listen to the signal and connect a decoder when using a Datong filter. As you probably know, pluging into the external speaker jack usually cuts off the internal speaker.

As you would expect. Datong have this well under control. Both the FL-2 and 3 have their own built-in audio amplifier with three outputs. One is a high level output that drives an external speaker. The second is a headphone jack and the third is a line output jack designed for driving a tape recorder. As is normal practice, plugging in a pair of headphones disables the speaker output. In my own station, I'm currently using an FL-3 with the excellent Lowe HF-150 receiver. For this I connect the FL-3 to the external speaker socket of the HF-150 and an external speaker plugged into the FL-3. The various decoders are then driven by the tape recorder output of the FL-3. This gives a signal level of around 200-300mV when the receiver's volume control is set to give a comfortable listening level with a typical external speaker. By connecting the filter in this way, you can use it to improve the reception of all types of signals.

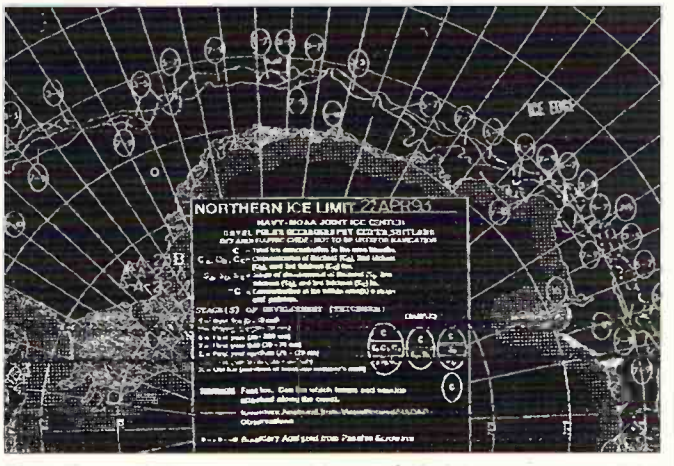
If you ever need to make two connections to the speaker jack of a receiver, there are a couple of ways to over come the problem. The simplest is to buy yourself what's known as a Y adaptor. This is simply two 3.5mm sockets moulded into the back of a 3.5mm plug. Alternatively, you could make your own version by buying two 3.5mm line sockets and wiring them to a 3.5mm plug. It's important to make sure you don't cross the wires when doing this or you could damage the output stage of your receiver. For those that want to have a go I've printed a simple wiring diagram to help. If you have any simple solutions like this one, why don't you drop me a line with the details.

Following my mention of Don Ward's XLATE program in the June Decode, **Ted Rickett** has written with more information. He points out that Axdon Books, 32 Atholl Street, Perth, Scotland PH1 5NP stock a good range of the more unusual books. One such item is the *Soviet Maritime RTTY Dictionary*. This comprehensive publication contains around sixteen hundred Russian words and phrases. According to Ted there are also Latin and third shift Cyrillic tables of Russian names and other useful data. This information is supplemented with a listing of Russian maritime frequencies and callsigns. In the latest catalogue the price is shown as £9.95 plus £1.00 post and packing which sounds very reasonable. If you would like more information or a free catalogue contact Axdon on (0738) 30707.

Weather Education

Dr Wood of Ledbury has written in response to my comments in a recent Decode where I expressed some concern that schools were getting a little carried away with satellite equipment. Dr Wood makes the very valid point that, when children are being taught about weather, they should start with the basics. I fully support his view that the best starting point is to observe and record the local weather conditions. The next stage would be to look wider afield to see how the local conditions are effected by larger weather systems.

It's at this stage that careful consideration has to be taken as to options for obtaining this this wider information. Whereas satellite systems provide an excellent pictorial view of major weather systems, it may be too coarse a step from local measurements. The solution could be to look at both RTTY SYNOP reports and h.f FAX charts. These provide a wide range of information that can be used to support any locally taken measurements. If you have an involvement in education and have any other ideas, please write and let me know.



Negative polarity can give better definition as in this ice chart received by Robert Hall from Pretoria Meteo on 13.5362MHz u.s.b.

ARQ Reception

Many new listeners write to me reporting success with RTTY and c.w. reception but great difficulty decoding the ARQ modes. As this is such a common problem, I thought I'd try and answer some of the questions here.

Before I get into the practical receiving tips, let's just run through this mode to see how it operates. I first need to clarify just what it is we are dealing with, as there are many systems that fall under the general term ARQ. By far the most common systems are the maritime SITOR system which is an acronym for SImplex Teleprinter Over Radio. The last part of the acronym is self explanatory, but the term simplex may be new to some. This defines the way two stations communicate.

In this context, simplex means that only one station can send information at any one time. This is much like an amateur radio contact where they take it in turns to speak (well at least most of the time!). The ARQ mode was developed to provide a more reliable way of sending Telex messages to ships at sea. Those of you who've spent some time monitoring RTTY signals will know that even strong signals are very prone to errors caused by interference. The most common of these being the loss a shift character which converts all the following message in to gibberish. Various techniques have been developed to minimise these problems, but the systems remains basically unreliable. Clearly, when sending important commercial messages to ships its totally unacceptable to loose great chunks because of interference.

Another problem with RTTY is that it is very much a manual system requiring a radio officer in attendance throughout the message. It was to tackle these shortcomings that the SITOR system was developed.

There are actually two SITOR modes, known as SITOR-A and SITOR-B. These two are often called other names such as ARQ modes A and B or just ARQ and FEC respectively. You're probably beginning to realise why these modes are often viewed with some confusion. Like all successful communications systems, there has to be a defined standard so that different manufacturers can produce systems that will work together. Incidentally, the two systems have very specific roles in ship-to-shore communication. SITOR-A is for communications between just two parties whereas SITOR-B is a broadcast mode that can be used to send to many ships. The standards used to define SITOR operation are contained in CCIR Recommendation 476-4.

Let's now take an overview of how the system manages work so much better than RTTY. At the heart of the system is the code that used to represent the various letters of the alphabet. In RTTY, this code is the familiar International Alphabet No 2 (ITA2). For ARQ operation we use a code known as the Moore code which has some special characteristics. The most important of these is the permutation of marks and spaces in the code. Each character is is represented by a combination of seven bits arranged as four spaces and three marks. It's this special combination that forms the basis of the error detection system.

At the decoder, each character is checked and only printed if this special combination is detected. To complete the process, we also need a way of correcting any corrupt characters.

HF Satellite image received by Laurence Patton

This is where some other elements of the Moore code come to play. The most important of these is the signal repetition or RQ (repeat request) code. As the name implies this is the code used to ask for a corrupt character to be repeated. There's little point in sending a complete message only to later find out that it needs to be sent again due to errors. On the other hand, there's no point in checking for errors after every character. The compromise used in SITOR-A is to send three characters at a time, checking for errors in-between. It's this timing that gives the signal it's characteristic 'chirp-chirp' sound.

Let's now move on to look at the differences between SITOR-A and B. As SITOR-B is a broadcast system, we can hardly have all the receiving stations sending RQs every time they detect an error! The solution is to send two copies of the message interleaved together. The decoder can then use the error detection system to check for errors and then select the good version for printing. This transmission technique results in a continuous signal that is instantly discernible from the SITOR-A system.

One final point concerns the baud rate of both SITOR variants. The standard is to use a speed of 100 baud. This is specially chosen to give an overall speed of 50 baud once the error detection systems have completed their task. This final speed of 50 baud also aligns precisely with that used for the Telex network.

Having described the system, let's look at a few techniques to help with successful reception. With all new modes the first rule is to find a strong clean signal. One of the best places to find this is in the h.f. marine bands in the range 4.1725-4.1815MHz and 6.263-6.2755MHz. You might also like to try the 14MHz amateur band between 14.07 and 14.08MHz. Once a signal has been found, set your decoder to ARQ receive and very carefully tune around the signal until your tuning indicator shows correct tuning. Because of the pulsing nature of the signal, you may find this quite difficult - patience is a virtue! With the signal correctly tuned you may have to wait a while before any messages are printed. This is because you may have tuned to a station that's in receive mode. Until the direction of transmission changes the station will only be sending RQs and other control signals. Once you've spent some time listening to these signals, you'll develop an ear for the mode and be able to identify the various transmission states very quickly.

Press Schedule

I haven't published any of these for some time, so when **Edwin Pavelin** sent me the latest MAP schedule, I though I'd better include it. Edward received this on May 6 from the Moroccan stations 1200UTC broadcast on 15.6549MHz so it's well up-to-date. Incidentally, his decoding set-up comprises a Matsui MR-4099 receiver with a 20m long wire and a homemade a.t.u. The RTTY decoding is done via his IBM PC.

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Western Europe - 14.76MHz (CNM61)
Eastern Europe - 19.1711MHz (CNM85/X11)
1530-1700UTC
Beamed towards:
Southern Africa - 18.265MHz (CNM78)
Western Africa - 18.2209MHz (CNM75/X9)
Eastern Europe - 15.6549MHz (CNM65/1X)
Western Europe - 7.8424MHz (CNM20/1X)
Western Europe - 10.6341MHz (CNM37/9X)
Eastern Europe - 19.1711MHz (CNM85/X11)
In English 1200-1400UTC
Beamed towards:
Middle East - 18.4961MHz (CNM80/X11)
Southern Africa - 18.265MHz (CNM78)
Western Africa - 18.2209MHz (CNM76/X9)
Eastern Europe - 15.6549MHz (CNM65/1X)
Western Europe - 7.8424MHz (CNM20/1X)
Western Europe - 14.76MHz (CNM61)
Eastern Europe - 19.171MHz (CNM85/X11)

Aeronautical RTTY

Paul Hamilton of Sydenham was attracted to short wave listening through his interest in civil aviation. This interest developed into RTTY when he discovered that flight lists are often sent using good old RTTY. Having set himself up with an Icom IC-R7100 and an AEA PK232 decoder, he's now looking for reliable sources of flight lists.

It's in this area that he has a problem, as he has yet to locate a good station for listings. He's particularly interested in the trans-Atlantic routes and would welcome any ideas. I must admit this is an area I often miss out when I'm tuning. However, I made a special effort this month and like Paul found a shortage of stations actually sending data. The only station I was able to log with messages was Nairobi Air on 7.423MHz. This station uses standard 50 RTTY with a shift of 400Hz. The messages are sent in English but there is a fair amount of code used to keep the messages brief. I'm sure the decoding of this information may well make a good topic for a future Decode.

However, if you would like to get started the *Klingenfuss Air and Meteo Code Manual* contains a wealth of useful information. I'm sure there are many readers with experience of aeronautical RTTY who could offer advice to us all. If you can offer help on any aspect of this, please write with the details.

Frequency List

Time for a round-up of selected loggings for the month. It's also time for a plea for help to support the log. Whilst I get lots of letters asking for advice, the number of logs received have been gradually reducing. I suspect this is because people feel their logs are perhaps not important enough to be worth sending in. I can assure you the opposite is true. The object of the monthly frequency list is to provide a selection of both simple and more complex stations. The important point is that the stations must all have been logged over the past month or so. By keeping to this rule there's a good chance that everyone will be able to receive the stations listed. If you can help, please send your logs to the address at the head of the column to reach me by around the fifteenth of the month.

For those craving more loggings I can supply the Decode list of stations or Day Watson's beginners frequency list. All you have to do is send three first or second class stamps to the address at the head of the column. When sending your request please mark your envelope either Decode or Beginners and include a self-addressed sticky label. By the way, I hope you all appreciate the new layout for the frequency list - it's certainly a lot easier on the eye!

Frequency	Mode	Speed	Shift	Callsign	Time	Notes
3.8399MHz	RTTY	75	750	LRO23	2245	NA Buenos Aries
5.7525MHz	ARQ	100	170	-	1735	UN Bosnia
7.64MHz	FAX	120	576	RST76	1730	Mensk Met
7.644MHz	RTTY	50	-	-	1800	Central African Republic
7.85MHz	RTTY	50	400	ZAA	1900	ATA Tirana
7.88MHz	FAX	120	576	DDK3	1910	Hamburg Met
7.996MHz	RTTY	50	400	YZD	1920	Tanjug Belgrad
8.083MHz	FAX	120	576	RIJ75	1930	Tashkent Met
8.1466MHz	FAX	120	576	IMB55	1940	Rome Met
9.318MHz	FAX	120	576	NRK	2000	USN Keflavik Iceland
11.080MHz	RTTY	50	400	-	1830	SANA Damascus
11.474MHz	RTTY	50	400	HMF52	1900	Korea
11.415MHz	RTTY	50	400	CNM31	1930	Map Rabat
12.2283MHz	RTTY	75	400	BZR62	1545	Xinhua Beijing
13.375MHz	RTTY	50	400	5YD	1900	Nairobi air
13.508MHz	FAX	120	576	CFH	1915	Halifax Canada
13.597MHz	FAX	120	576	IMB56	2000	Rome Met
18.1735MHz	RTTY	50	400	STK	2115	Khartoum air
18.3886MHz	RTTY	50	400	5AF	1315	Tripoli air
19.0317MHz	TWINPLEX	100	-	-	0632	MFA Islamabad
19.752MHz	FAX	120	576	6VU79	1835	Dakar met
21.4082MHz	FEC-A	96	600	-	1059	Unidentified

Long Medium & Short

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

Medium Wave Chart

Freq kHz	Station	Country	Power kW	Listener
520	Hof-Saale	Germany	0.2	A,N*
531	Ain Beida	Algeria	600	K*,O*
531	Torshavn	Faroe Is.	100	E*,M
531	Leipzig	Germany	100	D,H,K*,N*
531	Oviedo	Spain	10	K*,N*
540	Wavre	Belgium	150/50	D,H,L,N*,O,P*
540	Solt	Hungary	2000	H,N*
540	Sidi Bennour	Morocco	600	O*
549	Les Trembles	Algeria	600	H*,K*,O*
549	Bayreuth (DLF)	Germany	200	O,H,K*,N*
558	Rostock	Germany	20	N*
558	Valencia	Spain	10	N*
567	Berlin	Germany	100	H,N*
567	Tullamore (RTE1)	Ireland (S)	500	D,E*,H,K,O,P,Q,T
567	Marbella (RNE5)	Spain	10	H*,O*
576	Schwerin (NDR)	Germany	250	D,E*,H,N*,O,P*
576	Barcelona (RNE5)	Spain	20	O*
585	Paris (FIP)	France	8	H,N*,O
585	Madrid (RNE1)	Spain	200	N*,O*,P*,T
594	Frankfurt	Germany	1000/400	O,H*,N*,O
594	Oujda-1	Morocco	100	A*,H*
594	Muge	Portugal	100	H*,O*
603	Lyon	France	300	H,N*
603	Sevilla	Spain	20	H*,N*,O*
603	Newcastle (BBC4)	UK	2	D,N*,Q
612	Kiel	Germany	10	D
612	Athlone (RTE2)	Ireland (S)	100	D,H,Q,P,Q,T
612	Lerida	Spain	10	N*,O*
612	Vitoria	Spain	10	H*
621	Wavre	Belgium	80	D,H,L,N*,O,P*
621	Batra	Egypt	2000	A*
621	Barcelona	Spain	10	E*,H*,N*,O*
630	Vigra	Norway	100	E*,H*,N*
630	Tunis-Djedeida	Tunisia	600	O*
639	La Coruna	Spain	100	N*,O*,P*
648	Palma d Mallorca	Spain	10	H*,N*
648	Orfordness	UK	500	B,O,E*,H,N*,O,P,Q
657	Burg	Germany	250	N*
657	Madrid (RCE2)	Spain	20	N*,O*
657	Wrexham	UK	2	H,P,Q
666	Bodenseesender	Germany	300/180	N*,T*
666	Lisboa	Portugal	135	E*,H*,O*
675	Marseille	France	600	H*,N*,O*
675	Uzhgorod	Ukraine	50	A*
684	Sevilla (RNE1)	Spain	250	E*,N*,O*
684	Beograd	Yugoslavia	2000	N*
693	Berlin	Germany	250	A*,N*
693	Burghead (BBC5)	UK	50	E*,T
693	Droitwich (BBC5)	UK	150	E,P,Q
693	Postwick (BBC5)	UK	10	D
702	Aachen/Flensburg	Germany	5	A*,N*
702	Monte Carlo	Monaco	300	E*,H*,N*
702	Zamora	Spain	5	H*,O*
711	Rennes 1	France	300	D,H,N*,O,P*
711	Heidelberg	Germany	5	N*
711	Laayoune	Morocco	600	A*,H*,K*,O*
711	Murcia (COPE)	Spain	5	O*
720	Langenberg	Germany	200	O*
720	Lisnagarvey	Ireland (N)	10	O,T
720	Norte	Portugal	100	H*,N*
720	Lots Rd London.	UK	0.5	D,E*,H*,O,Q
729	Cork (RTE1)	Ireland (S)	10	N*,O,P,T
729	Oviedo	Spain	50	N*,O*
738	Paris	France	4	O
738	Barcelona (RNE1)	Spain	250	N*,O*,P*
747	Flevo (Hilv2)	Holland	400	B,D,E*,F*,H,N*,O,P*
756	Brunswick	Germany	800/200	N*,O*,P*
756	Redruth (BBC4)	UK	2	O
765	Sottens	Switzerland	500	H*,N*,O*
774	Enniskillen (BBC4)	Ireland (N)	1	N*
774	San Sebastian)	Spain	60	H*,N*,O*
783	Burg	Germany	1000	H,N*,O
783	Miramar (R.Porto)	Portugal	100	H*
792	Limoges	France	300	H*,N*,O,T*
792	Sevilla	Spain	20	N*,O*
801	Munchen-Ism'ing	Germany	300	N*
801	Burgos	Spain	10	H*,N*,O*
810	Voru	Estonia	5	O*
810	Madrid (SER)	Spain	20	H*,N*
810	Burghead	UK	100	E*
810	Westerglen)	UK	100	D,H,N,O*,P,Q,T
819	Batra	Egypt	450	H*
819	Toulouse	France	50	H,N*
819	Trieste	Italy	25	O*
819	Rabat	Morocco	25	N*
819	San Sebastian	Spain	5	H*
828	Barcelona (SER)	Spain	20	O*
837	Nancy	France	200	N*,O*,T
837	Sevilla (R.Popular)	Spain	10	H*,N*,O*
846	Rome	Italy	540	A*,E*,N*,O*
855	Murcia	Spain	125	E*,L*,N*,O*,T*
864	Paris	France	300	H,N*,O
873	Frankfurt (AFN)	Germany	150	E*,H,N*,O*,P*
873	Zaragoza	Spain	20	H*,N*,O*
873	EnniskillenUK		1	N*
882	Wachenbrunn	Germany	250	H*
882	Malaga (COPE)	Spain	5	H*,N*
882	Washford	UK	100	D,E*,H*,K*,N*,O,P,Q
891	Algiers	Algeria	600/300	A*,H*,K*,N*,P*
891	Huisberg	Netherlands	20	N*,O*
891	Vila Moura	Portugal	10	H*
900	Milan	Italy	600	A*,N*,O*
900	Bilbao (COPE)	Spain	10	O*
909	Palma d Mallorca	Spain	10	A*,H*
909	Brookmans Pk	UK	140	P,T
909	Moorside Edge	UK	200	D,E*,Q
918	Madrid	Spain	20	H*,N*
918	R.Ljubljana	Slovenia	600/100	O*
927	Wolvertem	Belgium	300	O,H,N*,O,P*
927	Izmir	Turkey	200	A*,N*
936	Bremen	Germany	100	N*
936	Lerida (SER)	Spain	2	N*,T*
945	Toulouse	France	300	H*,N*,O*
954	Madrid (RCE)	Spain	20	N*,T*
963	Pori	Finland	600	H,K,N*,O*,P*,U*
963	Paris	France	8	O
972	Hamburg	Germany	300	D,H,N*,O*,P*
972	Cordoba (RNE1)	Spain	5	H,O*
981	Alger	Algeria	600/300	F*,H*,K*,O*,P*
981	Megara	Greece	200	A*,H
981	Coimbra	Portugal	10	O*
990	Berlin	Germany	300	H*,N*
990	Redmoss	UK	1	N*
999	Madrid (R.Popular)	Spain	20	H*,N*,T*
1008	Flevo (Hilv-5)	Holland	400	O,H,N*,O,P*,Q
1008	Malaga	Spain	?	E*
1017	Rheinsender	Germany	600	E*,H,N*,O*,P*
1017	Burgos (RNE5)	Spain	5	O*
1026	Graz-Dobl	Austria	100	E*,N*
1035	Lisbon (Prog3)	Portugal	120	H*,N*,O*,T*
1044	Oresden	Germany	250	N*
1044	Sebaa-Aioun	Morocco	300	H*,O*
1053	Burghead (BBC1)	UK	20	T
1053	Droitwich (BBC1)	Uk	150	E*,P,Q
1053	Postwick (BBC1)	UK	10	D
1062	Kalundborg	Denmark	250	K*,N*,O*,U*
1062	Norte	Portugal	100	K*
1062	Diyabakir	Turkey	300	H*
1071	Brest	France	20	D,H*,N*,O
1071	Lille	France	40	A*,H*
1071	Bilbao	Spain	5	A*
1080	Katowice	Poland	1500	H*,O*
1080	Granada (SER)	Spain	5	N*,O*
1089	Brookmans Pk	UK	150	P,T
1089	Moorside Edge	UK	150	D,E*,Q
1089	Krasnodar	Russia	300	N*
1098	Nitra (Jarok)	Slovakia	1500	E*,H,N*,O*
1098	RNE 5	Spain	10	H*,N*
1107	Munich (AFN)	Germany	40	E*,H*,N*
1107	Barcelona (RNE5)	Spain	20	H*,N*,P*
1107	Caceres (RNE5)	Spain	5	O*
1107	Wallasey (BBC1)	UK	0.5	D
1116	Bari	Italy	150	N*,U*
1116	Pontevedra (SER)	Spain	2	H*,N*
1125	La Louviere	Belgium	20	D,N*,O
1125	Castellon	Spain	10	H*,O*
1125	Vitoria (RNE5)	Spain	10	H*,N*
1134	Valencia	Spain	10	O*
1134	Zadar	Yugoslavia	1200	A*,H*,N*,O*,P*
1143	Stuttgart (AFN)	Germany	10	N*,P*
1143	Messina	Italy	6	N*,O*
1152	Lerida (RNE5)	Spain	10	N*
1161	Strasbourg (Fr.Int)	France	200	N*,O*,T*
1179	Murcia (SER)	Spain	5	H*,K*
1179	Solvesborg	Sweden	600	H*,K*,N*,O*,P*,U*
1188	Kuurne	Belgium	5	D,H*,N*,O
1197	Munich (VOA)	Germany	300	N*,P*
1197	Vitoria	Spain	5	N*
1197	Virgin - Tx ?	UK	?	C,D,E*,H*,J,O,Q
1206	Bordeaux	France	100	H*,N*
1215	Kaliningrad	Russia	500	E*
1215	Castellon	Spain	2	N*
1215	Virgin - Tx ?	UK	?	E*,G,H,J,K,L,N*,Q,R,S
1215	Droitwich (Virgin)	UK	105	C,P
1215	Moorside Ed	UK	250	C
1215	Postwick (Virgin)	UK	1.2	D
1224	Vidin	Bulgaria	500	N*
1224	Madrid (COPE)	Spain	20	H*
1224	Virgin - Tx ?	UK	?	J*
1233	Liege	Belgium	5	H,N*
1233	Nitra	Slovakia	40	H*,N*
1242	Marseille	France	150	H*,T*
1242	Virgin - Tx ?	UK	?	C,L,N*,Q
1242	Stockton (Virgin)	Uk	1	D
1251	Marcali	Hungary	500	N*
1251	Huisberg	Netherlands	10	H*,N*,O
1251	Porto	Portugal	10	H*
1260	Valencia	Spain	20	N*,P*
1269	Neuminster	Germany	600	D,H,L,N*,O*,P*
1278	Dublin/Cork (RTE2)	Ireland (S)	10	B,E*,H,N,O*,P,T*
1287	Litomysl (RFE)	Czech Rep.	300/200	N*,O*
1296	San Sebastian	Spain	5	N*,O*
1296	Orfordness	UK	500	H,N*,O
1305	Rzeszow	Poland	100	H*
1305	Orense (RNE5)	Spain	5	E*,H*,N*,O*
1314	Kvitsoy	Norway	1200	D,E*,H,N*,O*,P*
1323	Leipzig (R.M'cow)	Germany	150	H,N*,P,T
1332	Brno (Domamil)	Czech Rep.	50/25	N*
1332	Rome	Italy	300	O*,P*
1341	Lisnagarvey	Ireland (N)	100	E*,H,O*,P,Q,T
1341	Tarrasa (SER)	Spain	2	H*,O*
1350	Nancy/Nice	France	100	E*,H,K*,N*,O,P*
1359	Berlin	Germany	250/100	H,N*,P*,T
1359	Melilla	Morocco	5	O*
1368	Foxdale (Manx R)	IOM	20	E*,H*,I*,K*,N,P,T*
1377	Lille	France	300	D,H,N*,O,P*
1386	Athens	Greece	50	A*
1386	Kaliningrad	Russia	500	E*,H,I*,N*,O*,P*
1395	Lushnje (R.Tirana)	Albania	1000	E*,H*,I*,K*,L*N*O*P*
1404	Brest	France	20	E*,H,N*,O,P*
1413	Zaragoza (RCE)	Spain	20	O*
1422	Heusweiler	Germany	1200/600	E*,H,N*,O,P*
1431	Dresden	Germany	250	N*
1440	Marnach (RTL)	Luxembourg	1200	O,H,N*,O,P
1440	Damman	Saudi Arabia	1600	N*
1449	Berlin	Germany	5	H*,N*
1449	Squinzano	Italy	50	A*
1449	Redmoss (BBC4)	UK	2	O,E*,H,N*
1467	Monte Carlo Monaco		1000/400	E*,H*,K*,N*,O*,P*
1476	Wien-Bisamberg	Austria	600	E*,H,N*,O*,P*
1485	Carlisle (BBC4)	UK	1	E*
1494	Clermont-Ferrand	France	20	H,N*,O,P*
1494	St.Petersburg	Russia	1000	K*,L*
1503	Stargard	Poland	300	B,H,L*,N*,O*,P*,T*
1512	Wolvertem	Belgium	600	D,H,K*,N*,O,P*,V*
1521	Kosice (Cizatice)	Slovakia	600	H,N*,O*
1521	Duba	Saudi Arabia	2000	H*
1530	Vatican R	Italy	150/450	B,H,K*,N*,O*,P*
1539	Mainflingen	Germany	700	H,L*,N*,O*,P*
1539	Valladolid	Spain	5	H*,O*
1557	Nice	France	300	H,N*,P*,T*
1566	Sarnen	Switzerland	300	H*,P*
1575	Burg	Germany	250	H,N*,O*,P*
1584	Orense SER	Spain	5	O*,T*
1593	Langenberg	Germany	400/800	B,D,E*,H,I*,N*,O*,P*T*
1602	Vitoria	Spain	10	E*,O*,P*
1611	Vatican R	Italy	5	A*,N*

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

Listeners:
A: Ted Bardy, N.London
B: Vera Brindley, Woodhall Spa.
C: Tim Bucknall, Congleton.
D: Sean Cooper, Wells-next-the-Sea.
E: Geoff Crowley, Hafnarfjordur, Iceland.
F: John Eaton, Woking.
G: Ron Galliers, N.London.
H: Gerry Haynes, Bushey Heath.
I: Simon Hockenhull, E.Bristol.
J: Richard Howard, Northampton.
K: Sheila Hughes, Morden.
L: Rhoderick Illman, Oxted.
M: Ross Lockley, Stirling.
N: Eddie McKeown, Newry.
O: George Millmore, Wootton I.O.W.
P: Sid Morris, Rowley Regis.
Q: Paul Pybus, Hull.
R: Eric Shaw, Chester.
S: Chris Shorten, Norwich.
T: Tom Smyth, Co.Fermanagh
U: Michael Williams, Redhill.
V: Julian Wood, Elgin.

In the next two or three months many listeners will be off to explore the delights of their holiday location. Whilst there, it may well be interesting to check the broadcast bands, so be sure to take a small portable receiver and a notebook with you.

Upon your return, please send along a copy of your log to the above address so that other listeners can read about your reception in LM&S.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, logs compiled in the four week period ending April 30.

A check at midnight by Charles Beanland (Gibraltar) revealed that the BBC R-4/WS broadcasts on 198kHz from Droitwich (500kW), Burghead (50kW) and Westerglen (50kW) do not reach the populated areas at the base of the Rock. However, the 2000kW transmissions from Allouis, France on 162 and Beidweiller, Luxembourg on 234 were received at SINPO 33333. As expected, potent signals were noted from Tipaza, Algeria on 252 (1500/750kW); Azilal, Morocco 207 (800kW) and Nador, Morocco 171 (2000kW).

Broadcasts from Allouis on 162 have also been reaching **Geoff Crowley** in Hafnarfjordur, Iceland. They were 42443 at 2347. He also heard DLF via Donebach on 153, peaking 22322 at 2348.

Medium Wave Reports

Conditions proved to be unsuitable for m.w. transatlantic DXing most nights in April. All the usual frequencies were frequently checked by **Ted Bardy** in N.London, but signals were so weak that none could be identified. However, on April 9 he picked up a music request programme from WNEW in New York on 1130. There was fast fading on the signal, rated 13131 at 0140. On April 14 he heard CJYQ in St.John's on 930. Their signal was 23332 at 0025 but it was weak or inaudible on all other nights except April 17, when it peaked 33333 at 0120.

CJYQ was also heard one night by **Ron Damp** in Worthing, logged as 32232 at 0022. In Congleton, **Tim Bucknall** found conditions very unfavourable. During his checks he heard weak carriers on 930 and 1200kHz, but the modulation was inaudible.

Generally good reception from stations in N.Africa and S.Europe was noted after dark by **George Millmore** in Wootton. A reduction in the SIO rating of many signals from Spain was evident, but plenty could still be heard. In contrast, reception from E.Europe was poor, except from the high power stations. Quite a few German stations could not be

heard at any time.

The signals from Virgin Radio on 1215, 1197 1224 & 1242kHz have been attracting many listeners. Reception is good in some locations, but deep rhythmic fading with by considerable phase distortion is present on the 1215 signal during the day in many areas. Such effects could be due to the use of six high power transmitters on the same frequency, see LM&S June. If their broadcasts are marred by these problems in your area then write to: Virgin Radio, No.1, Golden Square, London W1R 4DJ.

John Wells (E.Grinstead) informs me that BBC R.Bedfordshire have adopted the name 'Three Counties Radio' for their m.w. outlets on 630 & 1161kHz.

Short Wave Reports

Day to day variations in solar activity have affected the 25MHz (11m) band. Nevertheless, R.Australia's 250kW signal from Darwin on 25.750 (Eng to NE.Africa 0800-0855) has been heard here most mornings. It was 35553 at 0800 by **John Parry** in Northwich.

Also using the band are UAE R, Abu Dhabi 25.690 (Ar to Far East 0900-1100) 35443 by **John Eaton** in Woking; DW via Julich 25.740 (Ger to E.Asia 1100-1355), 45243 at 1328 by **Eddie McKeown** in Newry; also RFI via Issoudun 25.820 (Fr to Africa 0900-1545), 33322 at 1454 by **Gerry Haynes** in Bushey Heath. There were no reports to indicate how well they reach the intended target areas, but they were heard in Iceland! **Geoff Crowley** logged UAE as 31332 at 0954; DW as 55555 at 1248 and RFI as 55555 at 1237. Despite frequent checks in E.Canada, **Alan Roberts** (Quebec) was unable to hear any of them.

Although intended for other areas R.Australia's **21MHz (13m)** signals have reached the UK well in the morning: 21.595 to Pacific areas from Carnarvon (Eng 0100-0900) was 34553 at 0600 in Northwich; 21.525 to SE.Asia from Darwin (Eng 0200-0800) SIO434 at 0650 by **Cyril Kellam** in Sheffield & 21.725 to S.Asia (Eng 0800-1300) 24332 at 0928 by **Tim Allison** in Middlesbrough; 21.740 to Pacific areas from Shepparton (Fr, Eng 2300-0730) 34333 at 0727 in Bushey Heath; .

Also heard in the morning were R.Japan via Moyabi 21.520 (Eng, Jap to Eu, M.East, Africa 0700-0900) 45344 at 0840 in Newry; also 21.640 (Jap to Eu M.East, Africa 0800-0900) 44444 at 0840 in Hafnarfjordur; BBC via Woofferton, UK 21.590 (Ind, Mal to Far East? 1100-1130) 43332 at 1100 by **Rhoderick Illman** in Oxted; R.Pakistan, Islamabad 21.520 (Eng to Eu 1100-1120) SIO545 at 1120 by **Sid Morris** in Rowley Regis; BSKSA Riyadh, Saudi Arabia 21.505 (Ar [Home Service] 1100-1700) SIO444 at 1145 by **Bill Clark** in Rotherham.

During the afternoon UAE R.Dubai 21.605 (Eng to Eu 1330-1400) was 45544 at 1330 by **Ross Lockley** in Stirling; R.Kuwait via Kabd 21.675 (Ar 1315-1800) 55455 at 1415 in Woking; Qatar BS via Al Khaisah 21.460 (Ar to N.Africa, M.East [ident 1530]) 45554 at 1530 by **David Edwardson** in Wallsend; BBC via Limassol 21.470 (Eng to E.Africa 0430-1615) SIO222 at 1613 by **Julian Wood** in Elgin; WYFR via Okeechobee 21.720 (Russ to Eu, Africa 1700-1800) SIO444 at 1719 by **John Coulter** in Winchester.

Later, WYFR via Okeechobee 21.500 (Eng to Eu, Africa 1700-1900) was 44444 at 1750 by **Darren Beasley** in Bridgwater, 21.615 (Eng to Eu, Africa 1900-2000) SIO444 at 1925 by **Kenneth Buck** in Edinburgh & 21.525 (Eng to Eu, Africa 2000-2300) 44444 at 2145 by **Peter Hall** in Chichester; HCJB, Ecuador 21.455 (Eng world-wide u.s.b. + p.c.) 33333 at 1805 in Worthing & 21.480 (Eng to Eu 1900-2000) 43443 at 1921 by **Ken Milne** in Basingstoke; R.Nederlands via Bonaire 21.590 (Eng to Africa 1730-2025) 54444 at 1935 by **Chris Shorten** in Norwich; VOA via Greenville 21.485 (Port, Fr, Eng to Africa 1730-2200) 24543 at 2130 by **Eric Shaw** in Chester; VOFC Taipei via Okeechobee, USA 21.720 (Eng to Eu 2200-2300) 34333 at 2200 by **Sheila Hughes** in Morden.

Good DX reception has also been noted in the **17MHz (16m)** band. Three of R. Australia's broadcasts have reached here: 17.715 from Shepparton (Eng to Pacific areas 0100-0730) 34553 at 0610 in Northwich; 17.750 from Carnarvon (Eng to Asia 0700-0900) 43222 at 0711 in Bushey Heath; 17.790 from Darwin (Eng to SE.Asia 0700-0900) 24542 at 0735 in Wallsend.

Also logged here in the morning were Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) 44333 at 0736 by **Ron Galliers** in Islington; Voice of Greece, Athens 17.525 (Gr, Eng to Aust 0800-0950) SIO444 at 0800 in Sheffield; KHBI, N.Mariana Is 17.555 (Eng to

Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R	I	7.50	D,G,J*K,M,O,P,Q,S
585	R.Solway	B	2.00	D,M,N
603	Invicta SG (Coast)	I	0.10	C,D,G,K,M,N*O,PS
603	R.Gloucester	B	0.10	O,Q
630	R.Bedfordshire(3CR)	B	0.20	B,D,G,J,K,M,O,PQS
630	R.Cornwall	B	2.00	C,N*,O,S
657	R.Clwyd	B	2.00	D,G,J,M,N,O,P,R*S
657	R.Cornwall	B	0.50	O
666	DevonAir R	I	0.34	G,O,S
666	R.York	B	0.80	O,G,M,Q,S
729	BBC Essex	B	0.20	B,D,G,M,O,P*,Q,S
738	Hereford/Worcester	B	0.037	D,G,H,M,O,P,Q,S
756	R.Cumbria	B	1.00	D,G,N
765	BBC Essex	B	0.50	D,G,M,N*,O,P*Q,S
774	R.Kent	B	0.70	D,G,O,S
774	R.Leeds	B	0.50	B,D,Q
774	Gloucester (3CSG)	I	0.14	G,M,O,P
792	Chiltern (S.Gold)	I	0.27	D,G,K,M,O,Q,S
801	R.Devon	B	2.00	G,M,N*,O,S
828	Chiltern (S.Gold)	I	0.20	D,G,K,Q,S
828	R.Aire (Magic828)	I	0.12	Q
828	2CR (Cl.Gold)	I	0.27	O,S
837	R.Furness	B	1.00	N
837	R.Leicester	B	0.45	E,G,J,K,M,O,P,Q,S
855	R.Devon	B	1.00	K,O,S
855	R.Lancashire	B	1.50	N,O
855	R.Norfolk	B	1.50	B,D,G,J,O,Q,S
855	Sunshine R	I	0.15	G,J,M,P,S
873	R.Norfolk	B	0.30	D,G,I,M,O,Q,S
936	Brunel R (Cl.Gold)	I	0.18	G,H,O,P*,S
945	R.Trent (Gem AM)	I	0.20	O,G,L*M,N*O,P,QS
954	DevonAir (Cl.Gld)	I	0.32	G,O,S
954	R.Wyvern (WYVN)	I	0.16	G,H,M,P,Q,S
990	WABC (Nice & Easy)	I	0.09	D,G,M,P,S
990	R.Aberdeen	B	1.00	N
990	R.Devon	B	1.00	G,O,S
990	Hallam R.(Gt.Yks)	I	0.25	B,G,Q,S
999	R.Solent	B	1.00	G,O,S
999	R.Trent (Gem AM)	I	0.25	D,G,M,Q,S
999	Red Rose (Gold)	I	0.80	N
1017	Beacon R (WABC)	I	0.70	D,G,L*,M,P,Q,R*,S
1026	Downtown R	I	1.70	L,R
1026	R.Cambridgeshire	B	0.50	D,G,J,M,Q,S
1026	R.Jersey	B	1.00	G,J,O,S
1035	NorthSound R	I	0.78	D,G,Q
1035	R.Kent	B	0.50	G,O,S
1035	R.Sheffield	B	1.00	Q
1035	West Sound R	I	0.32	L,N
1107	Moray Firth R	I	1.50	D,G,L,N,R*
1116	R.Derby	B	1.20	O,G,M,N*,P,Q,S
1116	R.Guernsey	B	0.50	G,K,O,S
1152	BRMB (Xtra-AM)	I	3.00	M,P
1152	LBC (L.Talkback R)	I	23.50	A*,J*,O,S
1152	Piccadilly R(Gold)	I	1.50	F
1152	R.Broadland	I	0.83	A*,D,G,N*,S
1152	R.Clyde (Clyde 2)	I	3.06	L,N*
1161	Brunel R (Cl.Gold)	I	0.16	G,H,M,N*,O,S
1161	R.Bedfordshire(3CR)	B	0.10	B,C,G,S
1161	R.Sussex	B	1.00	J,O,S
1161	R.Tay	I	1.40	L,N*
1161	Viking R.(Gt.Yks)	I	0.35	D,Q
1170	GNR Teeside	I	0.32	N*
1170	Portsmouth (SCR)	I	0.12	G,O,S
1170	R.Orwell (SGR)	I	0.28	D,G,S
1170	Signal R.	I	0.20	F,L*,M,P
1170	Swansea Sound	I	0.58	H,N*
1242	Invicta Snd(Coast)	I	0.32	G,S
1242	Isle of Wight R.	I	0.50	G,M,N*,O,S
1251	Saxon R. (SGR)	I	0.76	O,G,M,N*,R*,S
1260	Brunel R (Cl.Gold)	I	1.60	G,N,O,S
1260	R.York	B	0.50	O,Q
1260	Sunrise R	I	0.29	C,G,I,M,P,S
1260	Marcher Snd (Gold)	I	0.64	N,R*
1278	Bradford (Gt.Yks)	I	0.43	D,G,M,N*,Q
1305	Barnsley (Gt.Yks)	I	0.15	D,G,M,Q
1305	Red Dragon (Touch)	I	0.20	G,H,M,O,S
1323	R.Bristol (Som.Snd)	B	0.63	E*,G,H,M,N,S
1323	Brighton (SCR)	I	0.50	G,O,S
1332	Hereward R.(WGMS)	I	0.60	D,G,K,L*,M,Q,S
1332	Wiltshire Sound	B	0.30	G,M,N*,O,S
1359	Essex R.(BreezeAM)	I	0.28	G,J,S
1359	Mercia Snd(Xtra-AM)	I	0.27	P,S
1359	Red Dragon (Touch)	I	0.20	H
1359	R.Solent	B	0.85	G,N*,O,S
1368	R.Lincolnshire	B	2.00	D,G,Q,S
1368	R.Sussex	B	0.50	G,J,O,S
1368	Wiltshire Sound	B	0.10	G,M,N*,O
1413	Sunrise R.	I	0.125	G,O,R*,S
1431	Essex R.(BreezeAM)	I	0.35	A,D,G,J,L*,N*,O,S
1431	R 210 (Cl.Gold)	I	0.14	G,J,L,O,S
1449	R.Peterboro/Cambs	B	0.15	D,N*,O,Q,S
1458	GLR	B	50.00	E*,G,O,R*,S
1458	GMR	B	5.00	F,L
1458	R.Cumbria	B	0.50	L,N
1458	R.Devon	B	2.00	O,S
1458	R.Newcastle	B	2.00	D,Q
1458	Radio WM	B	5.00	D,H,M,P
1476	County Sound	I	0.50	G,J,N*,O,S
1485	R.Humberside	B	1.00	B,D,Q
1485	R.Merseyside	B	1.20	G,M,N,P
1485	R.Sussex	B	1.00	G,J,O,S
1503	R.Stoke-on-Trent	B	1.00	D,G,L,N*,O,P,Q,S
1521	Reigate (Cty Snd)	I	0.64	G,J,N*,O,R*,S
1530	Sheffield (Gt.Yks)	I	0.74	D,G,L*,N*,O,Q
1530	R.Essex	B	0.15	G,O,S
1530	R.Wyvern (WYVN)	I	0.52	G,M,O,P,R*
1548	Capital R (Cap G)	I	97.50	E*,G,O,Q,R*,S
1548	R.Bristol	B	5.00	N*,O
1548	R.Forth (Max AM)	I	2.20	L,N*,Q
1548	R.Hallam (Gt.Yks)	I	0.74	B,D,Q
1557	Chiltern R.(Gold)	I	0.76	D,G,L*,M,N*,Q
1557	Southampton (SCR)	I	0.50	L*,O,S
1557	R.Lancashire	B	0.25	L
1557	Tendring (Mellow)	I	?	D,L,S
1584	Kettering (KCBC)	I	0.04	G,S
1584	R.Nottingham	B	1.00	O,G,N*,Q,S
1584	R.Shropshire	B	0.50	G,M,P,S
1584	R.Tay	I	0.21	L,N*
1602	R.Kent	B	0.25	D,G,N*,O,S

Note: Entries marked * were logged during darkness

Listeners:
A: Simon Bakewell, Moldgreen.
B: Vera Brindley, Woodhall Spa.
C: Tim Bucknall, Congleton.
D: Sean Cooper, Wells-next-the-Sea.
E: Geoff Crowley, Hafnarfjordur, Iceland.
F: Martin Dale, Stockport.
G: Gerry Haynes, Bushey Heath.
H: Francis Hearne, N.Bristol.
I: Richard Howard, Northampton.
J: Sheila Hughes, Morden.
K: Rhoderick Illman, Oxted.
L: Ross Lockley, Stirling.
M: Patrick McKeever, Birmingham.
N: Eddie McKeown, Newry.
O: George Millmore, Wootton, IOW.
P: Sid Morris, Rowley Regis.
Q: Paul Pybus, Hull.
R: Tom Smyth, Co.Fermanagh.
S: John Wells, East Grinstead.

Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	M*
153	Donebach	Germany	500	B,C,D,E*,G*,H*,I,J,K,L*,M,P
153	Brasov	Romania	1200	C,J*,K
162	Allouis	France	2000	A*,B,C,D,E*,F,G*,I,J,K,L,M,O,P
171	Kaliningrad	Russia	1000	C,J*,K,L,M,P*
171	Medi 1-Nador	Morocco	2000	A*
177	Oranienburg	Germany	750	C,D,J*,L*,M,P
183	Saarlouis	Germany	2000	B,C,D,F,I,J,K,L,M,O,P
189	Caltanissetta	Italy	10	Q*
198	BBC Droitwich	UK	500	B,D,F,I,J,K,L,N,O,P
198	BBC Westerglen	UK	50	C
207	Munich	Germany	500	H*,I,J,K,L*,M,P
207	Azilal	Morocco	800	A*,M*
216	RMC Roumoules	S. France	1400	C,D,J,K,L,M,O,P
216	Oslo	Norway	200	C,I*,J*
225	Raszyn Resv TX	Poland	?	I,J*,K,L*,M,P*
234	Beidweiller	Luxembourg	2000	A*,C,D,G*,J,K,L,M,P
234	St Petersburg	Russia	1000	C,J*
243	Kalundborg	Denmark	300	B,C,D,I,J*,K,L*,M,P,Q*
252	Tipaza	Algeria	1500	A*,I*,K,M
252	Atlantic 252	S. Ireland	500	B,C,D,F,H*,I*,J,K,L,M,N,O,P
261	Burg	Germany	200	D,K,L*,M,P
261	Taldom(Moscow)	Russia	2000	C,J,L
270	Topolna	Slovak Rep	1500	C,D,J,L,M*,P*
279	Minsk	Belarus	500	C,J*,L*,M*,P*

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

Listeners:
A: Charles Beanland, Gibraltar
B: Vera Brindley, Woodhall Spa
C: Kenneth Buck, Edinburgh
D: Sean Cooper, Wells-next-the-Sea
E: Geoff Crowley, Hafnarfjordur, Iceland
F: Martin Dale, Stockport
G: John Eaton, Woking
H: Simon Hockenhull, E. Bristol
I: Shiela Hughes, Morden
J: Eddie McKeown, Newry
K: George Millmore, Wootton, IOW
L: Sid Morris, Rowley Regis
M: Fred Pallant, Storrington
N: Paul Pybus, Hull
O: Tom Smyth, Co. Fermanagh
P: Phil Townsend, E. London
Q: Michael Williams, Redhill

Tropical Bands

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1850	O,G,I,O,P
2.325	ABC Tennant Creek	Australia	1940	D,G,I,O,P
2.485	ABC Katherine	Australia	1932	I
2.850	KCBS Pyongyang	N.Korea	2051	I
3.200	TWR	Swaziland	1831	I
3.210	Em Nacional, Maputo	Mozambique	1833	I
3.220	R.Togo, Lome	Togo	2124	G,I
3.230	ELWA Monrovia	Liberia	2051	I
3.240	TWR	Swaziland	1847	G,I,N
3.255	BBC via Maseru	Lesotho	2133	G,I
3.270	SWABC 1, Namibia	SW.Africa	2006	C,G,I,N
3.277	AIR Srinagar	India	1715	I
3.280	R.Beira	Mozambique	2009	I
3.300	R.Cultural	Guatemala	0144	I
3.315	AIR Bhopal	India	1702	G
3.316	SLBS Goderich	Sierra Leone	2118	G,I,R
3.320	Pyongyang	N.Korea	2008	I
3.320	R.Orion	S.Africa	2304	D,G
3.325	FRCN Lagos	Nigeria	2010	G,I
3.330	R.Kigali	Rwanda	1811	G,I
3.355	R.Botswana	Gabarone	1941	D,F,G,I
3.355	AIR Kurseong	India	1657	G
3.365	R.Rebelde, La Julia	Cuba	0445	F,S
3.365	AIR New Delhi	India	1821	G
3.365	GBC R-2	Ghana	2047	E,F,G,I,M,O,P,R
3.365	TWR	Swaziland	2300	D
3.380	R.Malawi	Malawi	2110	G,I
3.385	RFO Cayenne	Guiana	2250	C
3.905	AIR Delhi	India	1649	G,I
3.915	BBC Kranji	Singapore	1710	G,I,V
3.955	BBC Skelton	England	2100	D,I,J,N,O,U,V
3.960	RFE/RL Munich	Germany	1939	I
3.965	RFI Paris	France	2005	A,C,D,I,K,N,O,R,U,V
3.970	RFE Munich	Germany	2254	D,I,U
3.975	BBC Skelton	England	1941	I,U
3.980	VOA Munich	Germany	1942	C,D,I,K,N,O,R,S,T,U,V
3.985	China R via SRI	Switzerland	2100	A,C,D,J,K,L,N,O
3.985	SRI Beromunster	Switzerland	1905	I,K,O,S,U,V
3.990	RFE Munich	Germany	2028	I
3.995	DW via Julich	Germany	2250	C,D,I,N,O,U
3.995	Ch.Africa, Jo'burg	S.Africa	0400	Q
4.081	Ulan Batar 1	Mongolia	2213	B,I
4.130	V of the Strait 1	China	1653	I
4.190	CPBS Minority Sce	China	2214	I
4.220	Xinjiang PBS, Urumqi	China	1652	I
4.500	Xinjiang BS, Urumqi	China	2327	N,O
4.735	Xinjiang	China	2325	N,O
4.755	R.Educ CP Grande	Brazil	0121	N
4.755	Caracol Neiva	Columbia	2345	C
4.760	Yunnan PBS,Kunming	China	2234	G
4.760	AIR Port Blair	India	1623	I
4.765	Brazzaville	Pep.Rep.Congo	2110	C,O,P,U
4.770	FRCN Kaduna	Nigeria	2052	D,E,F,G,H,I,K,N,O,P
4.775	R.Gabon, Libreville	Gabon	2002	D,G,I
4.780	RTD	Djibouti	1955	I,P
4.783	RTM Bamako	Mali	2007	C,G,I,P
4.785	R.Tanzania	Tanzania	1947	I
4.790	AIR Shillong	India	1624	I
4.790	Azad Kashmir R.	Pakistan	1658	G,I
4.795	R.Douala	Cameroon	1918	I
4.800	AIR Hyderabad	India	1723	G,I
4.800	LNBS Lesotho	Maseru	1940	G,I,P
4.805	R.Nac.Amazonas	Brazil	2332	C,I,N
4.810	R.Suid-Afrika	So.Africa	1949	D
4.815	R.diff TV Burkina	Ouagadougou	2113	G,I,O,P
4.820	La Voz Evangelica	Honduras	0050	C,I,N
4.830	Gaborone	Botswana	2045	D,F,G,I,P
4.830	R.Tachira	Venezuela	0158	C,I,N
4.832	R.Reloj	Costa Rica	2158	D,F
4.835	R.Tezulutlan, Cohan	Guatemala	0005	C,I,N
4.835	RTM Bamako	Mali	2045	D,G,I,M,O,P,U
4.845	R.Cabocla, Manaus	Brazil	0202	I
4.845	ORTM Nouakchott	Mauritania	2009	C,D,F,G,I,K,N,O,P,U
4.850	R.Yaounde	Cameroon	2034	I,N
4.850	AIR Kohima	India	2010	D,I,P
4.850	Ulan Bator 1	Mongolia	2205	K
4.860	AIR New Delhi	India	1921	G,I,N
4.865	PBS Lanzhou	China	2225	I
4.865	L.V. del Cinaruco	Colombia	0005	C,I,N,O
4.870	R.Cotonou	Benin	2105	C,D,G,I,N,O,P,U
4.885	R.Clube do Para	Brazil	0040	C,F,I,N
4.885	Voice of Kenya	Kenya	1849	G,I,P
4.895	Voz del Rio Arauca	Colombia	0100	C,I,N,O
4.895	AIR Kurseong	India	1650	I
4.900	SLBC Colombo	Sri Lanka	1709	G
4.905	R.Nat.N'djamena	Chad	2010	D,F,G,I,N,O,P,U
4.910	AIR Delhi	India	1720	G,I
4.910	R.Zambia, Lusaka	Zambia	1824	I,P
4.911	Em Gran Colombia	Ecuador	0215	I
4.915	R.Anhanguera	Brazil	2339	M,N
4.915	GBC-1, Accra	Ghana	2019	D,G,I,N,O,P,U
4.915	Voice of Kenya	Kenya	1936	I,P
4.920	ABC Brisbane	Australia	2003	P
4.920	AIR Madras	India	1649	G
4.925	R.Difusora, Taubate	Brazil	0200	C
4.925	R.Nacional, Bata	Eq.Guinea	2038	G,I
4.935	R.Capixaba	Brazil	0212	I
4.935	Voice of Kenya	Kenya	2010	G,I,N,P,U
4.955	R.Marajoara, Belem	Brazil	0210	C,I,N
4.970	AIR Itanagar	India	1628	I
4.975	R.Uganda, Kampala	Uganda	1944	G,I,N,P
4.980	PBS Xinjiang	China	0015	C
4.980	Ecos del Torbes	Venezuela	0010	C,I,M,N,O
4.985	R.Brazil Central	Brazil	0025	C
4.990	Hunan 1, Changsa	China	1753	I
4.990	AIR via Madras	India	2144	D,N
4.990	FRCN Lagos	Nigeria	2052	G,I,N,P
5.005	R.Nacional Bata	Eq.Guinea	2045	U
5.005	R.Nepal, Kathmandu	Nepal	1702	G
5.010	R.Garoua	Cameroon	1947	D,G,K,O,P,U
5.010	R.Madagasikara	Madagascar	1814	G
5.020	ORTN Niamey	Niger	2202	D,G,N
5.025	R.Parakou	Benin	2130	D,G,N,P
5.025	R.Rebelde, Habana	Cuba	0040	C
5.025	R.Uganda, Kampala	Uganda	2007	G,P
5.030	R.Catolica, Quito	Ecuador	2319	F
5.035	R.Aparecida	Brazil	0215	I
5.035	R.Bangui	C.Africa	2014	G,I,N,P
5.040	Voz del Upano, Macas	Ecuador	0216	I
5.045	R.Cultura do Para	Brazil	0217	C,I,N
5.047	R.Togo, Lome	Togo	1948	D,G,I,N,P
5.050	Voz de Yopal, Yopal	Colombia	0035	C
5.050	AIR Aizawal	India	1650	G,I
5.050	R.Tanzania	Tanzania	1835	G,I,P
5.052	SBC R-1	Singapore	2230	G,I
5.055	R.Difusora, Caceres	Brazil	0538	F
5.055	Faro del Caribe	Costa Rica	0220	I,N
5.060	PBS Xinjiang	China	2315	I,N
5.075	Caracol Bogata	Colombia	2322	C,F,I,N,S
5.440	Xinjiang PBS, Urumqi	China	1647	I
5.800	Xinjiang BS, Urumqi	China	1645	I

DXers:

A: Vera Brindley, Woodhall Spa.
B: Tim Bucknall, Congleton.
C: Robert Connolly, Kilkeel.
D: Geoff Crowley, Iceland.
E: Ron Damp, Worthing.
F: Ron Galliers, N.London.
G: P. Gordon Smith, Kingston, Moray.
H: Peter Hall, Chichester.
I: Gerry Haynes, Bushey Heath.
J: Simon Hockenhull, E.Bristol.
K: Sheila Hughes, Morden.
L: Cyril Kellam, Sheffield.
M: Ross Lockley, Stirling.
N: Eddie McKeown, Newry.
O: Sid Morris, Rowley Regis.
P: Fred Pallant, Storrington.
Q: Alan Roberts, Quebec, Canada.
R: Eric Shaw, Chester.
S: Chris Shorten, Norwich.
T: Tom Smyth, Co.Fermanagh.
U: Kelvin Sutherland, Anglesey.
V: Phil Townsend, E.London.

NE.Asia 0800-1155) SIO322 at 0903 in Rotherham; Voice of Israel, Jerusalem 17.545 (Eng, Fr, Heb to USA, W.Eu 1000-1255) 44444 at 1008 by **Darran Taplin** in Brenchley; AIR via Aligarh 17.387 (Eng to Pacific areas 1000-1100) 55555 at 1045 in Bridgwater; R.Pakistan, Islamabad 17.900 (Eng to Eu 1100-1120) SIO333 at 1100 by **Michael Williams** in Redhill; R.Bulgaria via Plovdiv? 17.830 (Eng to USA 1030-1200) 44444 at 1144 in Oxted.

After mid-day R.Tashkent, Uzbekistan 17.745 (Russ?, Eng to S.Asia 1200-1230) was 34444 at 1225 in Chester; R.Nederlands via Flevo 17.610 (Eng to S.Asia 1330-1630) 24332 at 1332 in Middlesbrough; BBC via Antigua 17.840 (Eng to S/C.Am 1400-1615) 33333 at 1530 in Morden; Voice of Greece, Athens 17.525 (Gr, Eng, Sw to USA, Sweden 1500-1550) 44444 at 1539 by **Vera Brindley** in Woodhall Spa; WEWN, Birmingham 17.510 (Eng to Eu 1500-1555) 44434 at 1555 by **Martin Dale** in Stockport; Channel Africa, Johannesburg 17.710 (Eng to Africa 1600-1800?) 55545 at 1626 in Norwich; R.Algiers Int via Bouchaoui 17.745 (Eng to E/C.Africa? 1900-2000?) 44444 at 1920 by **Peter Pollard** in Rugby; VOA via Tangier 17.895 (Eng to Africa 1600-2100) SIO455 at 1940 in Edinburgh; R.Nederlands via Bonaire 17.605 (Eng to W.Africa 1930-2025) was 34333 at 1955 by **Gary Currah** in Peterborough.

After dark, VOA via Bethany 17.800 (Eng to Africa 1800-2200) 44444 at 2023 in Worthing; RCI via Sackville 17.875 (Eng to Eu 2030-2130) 44444 at 2040 by **Harry Richards** in Barton-on-Humber; R.Havana Cuba 17.760 (Eng to Eu, Africa, M.East 2100-2200) 24122 at 2115 in Newry; HCJB Quito 17.790 (Eng to Eu 2130-2200) SIO222 at 2130 by **Michael Griffin** in Ross-on-Wye; WSHB Cypress Creek 17.555 (Eng to N/C/S.America 2000-2355) 23333 at 2145 in Chichester; VOFC via Okeechobee 17.750 (Eng to Eu 2200-2300) 33333 at 2200 by **Robert Connolly** in Kilkeel and 55444 at 2233 in Hafnarfjordur; R. New Zealand Int via Rangataiki 17.770 (Eng to Pacific areas 2130-0658) was 22222 at 0007 in Gibraltar.

Quite a number of the **15MHz (19m)** signals to areas outside Eu were logged by UK DXers. In the morning, VOA via Selebi-Phikwe 15.600 (Eng to Africa 0500-0700) was 44554 at 0630 in Northwich; R.Australia via Shepparton 15.320 (Eng to S.Asia 2200-0730) 32233 at 0730 in Islington and 15.240 (Fr, Eng to Pacific areas 2300-0830) SIO444 at 0740 in Sheffield; BBC via Limassol 15.575 (Eng to M.East, N.Africa 0400-1500) 34443 at 0900 in Middlesbrough; AIR via Aligarh 15.050 (Eng to Aust, NZ 1000-1100) 35433 at 1020 in Brenchley; VOIRI Tehran 15.260 (Ar to M.East 0930-1130) 23332 at 1101 in Oxted; BBC via Antigua 15.220 (Eng to N/C/S.America 1100-1400) 23433 at 1141 in Basingstoke.

In the afternoon, R.Finland via Pori 15.400 (Fin, Eng, Sw to USA 1100-1355) was SIO434 at 1330 by **Tom Smyth** in Co.Fermanagh; Voice of Greece via Avlis 15.650 (Gr, Eng, Sw to USA, Sweden 1500-1550) SIO444 at 1500 in Ross-on-Wye; KTWR, Guam 15.610 (Eng to India, S.Asia 1500-1700) 55555 at 1515 in Morden; R.Pakistan, Islamabad 15.520 (Eng to E/S.E.Africa 1700-?) SIO333 at 1707 in Winchester.

Later, R.New Zealand Int 15.120 (Eng to Pacific areas 1855-2135) was 31321 at 1908 in Bushey Heath; BBC via Ascension Is 15.400 (Eng to W/C.Africa 1500-2315) as SIO544 at 1930 in Rowley Regis & 15.260 (Eng to S.America 2000-0330) 43333 at 2105 by **Robin Harvey** in Bourne, via Woofferton 15.070 (Eng to N/C.America 2100-0030) 34344 at 0010 in Gibraltar; VOA via Greenville 15.410 (Eng to Africa 1800-2200) 25342 at 2035 in Chester, via Selebi-Phikwe 15.495 (Eng to Africa 1900-2200) 22223 at 2035 in Peterborough; KTBN Santa Ana, USA 15.590 (Eng to USA 1600-0200) 33333 at 2305 in Woking; RTL via Junglinster 15.350 (Ger to E.USA 24hrs) 11121 at 0015 in Barton-on-Humber.

Also noted were some 19m broadcasts to Europe: RNB Brasilia, Brazil 15.265 (Eng, Ger 1800-2100) 32222 at 1807 in Woodhall Spa; Voice of Vietnam, Hanoi 15.010 (Eng 1800-1830) 45544 at 1815 in Bridgwater; SLBC, Sri Lanka 15.120 (Eng 1915-1930) 22222 at 1920 in Chichester; VOIRI Tehran 15.260 (Eng 1930-2030) SIO212 at 1955 by **Simon Bakewell** in Moldgreen; VOA via Tangier 15.205 (Eng 1700-2200) SIO544 at 2000 in Edinburgh; WEWN, Birmingham 15.695 (Eng 1800-2200) SIO222 at 2000 in Redhill; WRNO New Orleans 15.420 (Eng ?-2300, also to USA) 44223 at 2049 in Newry; R.Damascus, Syria 15.095 (Eng 2005-2105) 33323 at 2055 in Rugby; WCSN Scotts Corner 15.665 (Eng 2000-2155) 34434 at 2145 in Stockport; RAE, Argentina 15.345 (Ar, Eng, It, Fr, Ger, Sp 1700-0100) SIO333 at 2211 in Rotherham; WINB Red Lion 15.185 (Eng 2100-2245, also to N.Africa) 34533 at 2140 in Stirling and 32432 at 2221 in Hafnarfjordur; also 15.145 (Eng 2247-2345, also to N.Africa) 35553 at 2301 in Wallsend.

Programmes for European listeners may also be heard in the **13MHz (22m)** band. Some stem from WYFR Okeechobee 13.695 (Eng 0500-0800, also to Africa) 43343 at 0649 in Islington; BBC via Rampisham 13.745 (Eng lessons to CIS 0900-1030) 55555 at 0922 in Hafnarfjordur; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp 0500?-1900) 44444 at 1235 in Barton-on-Humber; R.Pyongyang, Korea 13.785 (Eng 1500-1550, also to M.East, Africa) 44444 at 1510 in Brenchley; R.Bulgaria via Plovdiv? 13.670 (Eng 1730-1900) 45224 at 1810 in Woking; R.Kuwait via Kabd 13.620 (Eng 1800-2100, also to USA) SIO444 at 1835 in Winchester; UAE R.Dubai 13.675 (Ar, Eng 0615-2100) SIO434 at 1955 by **Cliff Stapleton** in Torquay; WSHB Cypress Creek 13.770 (Eng 2000-2200) 43333 at 2000 in Rugby; RCI via Sackville 13.650 (Eng 2030-2130) 44444 at 2120 in Chichester; WHRI South Bend 13.760 (Eng 1800-0000) SIO232 at 2200 in Ross-on-Wye.

Whilst beaming to other areas SRI via Sottens? 13.685 (Eng, Fr to Aust, NZ, S.Pacific 0900-1000) 43553 at 0922 in Bridgwater, 13.635 (Eng, Fr to SE.Asia, Far East 1100-1200) SIO544 at 1125 in Rowley Regis & 13.635 (Eng, Fr to C/SE.Asia 1500-1600) 44545 at 1525 in Stockport, via Gabon? 13.635 (Eng, Fr to Africa 2000-2100) SIO211 at 2027 in Redhill; AWR Costa Rica 13.750 (Eng, Port to C/S.Am 1100-1400, also 1000-1100 Sat/Sun only) 44323 at 1002 in Bushey Heath; R.Australia via Darwin 13.605 (Chin, Eng to SE.Asia 1000-1430) SIO344 at 1120 in Edinburgh & via Carnarvon 13.755 (Eng to Asia 1430-1800) 35343 at 1530 by **Simon Hockenhull** in Lynmouth; WSHB Cypress Creek 13.760 (Eng to N/C/S.America 1400-1600) 34322 at 1400 in Morden; KHBI, N.Mariana Is 13.625 (Eng to SE.Asia, India 1000-1800) SIO322 at 1503 in Rotherham; R.Nederlands via Flevo 13.700 (Eng to S.Asia 1330-1630) 33222 at 1545 in Woodhall Spa; AWR (KSDA) Agat, Guam 13.720 (Eng to Africa 1700-1900, Sat/Sun only) 44433 at 1732 in Worthing; DW via Julich 13.790 (Eng to W.Africa 1900-1950) 34243 at 1949 in Oxted; VOA via Selebi-Phikwe, Botswana 13.710 (Eng to Africa 1600-2200) 34433 at 2123 in Basingstoke; R.Austria Int via Moosbrunn 13.730 (Eng to Africa 2130-2200) 23332 at 2133 in Middlesbrough; R.Vlaanderan Int, Belgium 13.655 (Du, Eng, Fr, Sp to S.America 2230?-0055?) 44444 at 2320 in Norwich.

The broadcasters using the **11MHz (25m)** band to reach listeners in Europe include HCJB, Ecuador 11.835 (Eng 0700-0830) 55555 at 0715 in Norwich; R.Slovakia Int, Bratislava 11.990 (Eng 0830-0857) 43444 at 0848 in Woodhall Spa; R.Finland via Pori? 11.900 (Eng 1230-1300) 44444 at 1233 in Brenchley; R.Romania Int, Bucharest 11.940 (Eng 1300-1400) 44444 at 1323 in Middlesbrough; R.Tunisia Int, Sfax 11.550 (Ar 0430-2300) 25222 at 1400 in Woking & 33334 at 1847 in Gibraltar; Polish R, Warsaw 11.840 (Eng 1500-1555) 32332 at 1505 in Peterborough; AIR via Bangalore? 11.620 (Eng, Hi 1745-2230) SIO434 at 1850 in Torquay; RAI Rome 11.800 (Eng 1935-1955) SIO232 at 1955 in Moldgreen; China R Int, Beijing 11.500 (Eng 2000-2157) SIO455 at 2000 in Edinburgh; R.Damascus, Syria 12.085 (Eng 2008-2108, also to USA) 54444 at 2008 in Worthing and 44444 at 2051 in Hafnarfjordur; R.Bulgaria, Sofia 11.720 (Eng 2000-2100, also to USA) 44444 at 2045 in Morden; R.Iraq Int, Baghdad 11.810 (Eng 2100-2300) SIO322 at 2100 in Redhill; R.Japan via Moyabi 11.925 (Eng 2100-2200) 32233 at 2110 in Rugby.

Also noted were R.Nederlands via Bonaire 11.895 (Eng to Pacific areas, Far East 0730-1025) SIO333 at 0730 in Ross-on-Wye; R.Australia via Shepparton 11.855 (Eng to SE.Asia 1300-1630) 23432 at 1430 in Chester & 11.910 (Eng to S.Asia 2100-0030) 32211 at 2100 in Bushey Heath; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) SIO433 at 1441 in Rotherham; Voice of Turkey, Ankara 11.955 (Tur, Ar to M.East 1000-1600) 33342 at 1458 in Oxted; R.Pakistan, Islamabad 11.570 (Eng to M.East 1600-1630) SIO433 at 1600 in Co.Fermanagh; DW via Trincomalee 11.785 (Eng to W.Africa 1900-1950) 32542 at 1915 in Bridgwater; also 11.785 (Eng to Aust, NZ 2100-2150) 34444 at 2105 in Chichester; VOA via Tinang 11.870 (Eng to Pacific areas 2100-2200) 43333 at 2125 in Bourne; R.Yerevan, Armenia 11.920 (Fr, Eng to N.Africa, S.Eu 2130-2200) heard at 2130 by **George Boulat** in Guilden Sutton; R.Nac da Amazonia, Brazil 11.780 (Port 0900-0200) 34543 at 2301 in Wallsend; UAE R, Abu Dhabi 11.710 (Ar, Eng to USA 2300-0000) 43233 at 2305 in Newry; R.Anhanguera, Brazil 11.830 (Port 0800-0300) 44544 at 2332 in Stirling.

The **9MHz (31m)** broadcasts from R.New Zealand were logged by a few UK DXers, but reception was frequently poor. At best their transmission via Rangataiki on 9.700 (Eng to Pacific areas 0700-1200) 24432 at 0800 in Stirling and 32332 at 0900 in Kilkeel. In contrast, two of R.Australia's broadcasts have been clearly heard here: 9.770 from Shepparton (Ind, Viet, Eng to SE.Asia 0900-1530) peaked 43343 at 1510 in Norwich; 9.560 from Carnarvon (Eng to S.Asia 1430-1800) was 33433 at 1600 in Brenchley; 9.540 from Shepparton (Eng to PNG 2100-2230) 32333 at 2110 in Rugby.

Also logged were R.Nederlands via Bonaire 9.630 (Eng to Pacific areas 0730-0825) SIO333 at 0730 by **Francis Hearne** in N.Bristol; VOIRI Tehran 9.022 (Eng to Eu, USA 1930-2030) 45555 at 2025 in Chester; R.Pyongyang, N.Korea 9.345 (Eng to Eu, M.East, Africa 2000-2050) 33323 at 2030 in Barton-on-Humber; Voice of Vietnam, Hanoi 9.840 (Eng to Eu 2030-2100) SIO411 at 2040 in Redhill; R.Yerevan, Armenia 9.450 (Fr, Eng to N.Africa, S.Eu 2130-2200) heard at 2130 in Guilden Sutton; China R.Int, Beijing 9920 (Eng to Eu 2000-2157) SIO444 at 2130 in Sheffield; AIR via ? 9.950 (Eng to W.Eu 2045-2230) SIO333 at 2213 in Elgin; RCI via Sackville 9.755 (Eng to Caribbean 2230-2300) 32332 at 2240 in Bourne; HCJB, Ecuador 9.745 (Eng to USA 0030-0430) SIO333 at 0144 by **Tony King** in Swindon.

In the **7MHz (41m)** band R.Australia via Carnarvon 7.260 (Eng to Asia 1800-2100) was SIO322 at 1800 in Co.Fermanagh, 43433 at 1940 in Bridgwater and 22322 at 2040 in Peterborough.

R.Australia has also been reaching the UK in the **6MHz (49m)** band: 6.020 to S.Pacific via Shepparton (Eng, Tok Pisin 0630-1300) 24432 at 0735 in Wallsend; 5.880 to Asia via Carnarvon (Eng 1800-2100) 54444 at 1802 in Woodhall Spa; 5.995 to Pacific areas via Shepparton (Eng 0800-2200) 43444 at 2115 in Rugby.

*Quarterly List of Equipment Used - +May, #June, *July*

+#*Tim Allison, Middlesborough: Lowe HF-225 + r.w.
*Simon Bakewekk, Moldgreen: Sailsho SW5000 + 10m wire
+#*Ted Bardy, N. London: Drake R8 or RA217 + half size 5RV or V Beam 18m long
+#Leo Barr, Sunderland:Roberts RC-818 or Sony ICF-SW7600 + r.w. in loft
#*Charles Beanland, Gibraltar: Sangean ATS-803 + a.t.u. + 6m wire or Howes AA2
+#*Darren Beasley, Bridwater: Philips D-2935 + Hexagon loop or a.t.u. + 15m wire
*George Boulat, Guilden Sutton: Realistic DX200
+#*Vera Brindley, Woodhall Spa: Sangean ATS-803A or Saisho 3000 + Whip or r.w. or Sangean SW-60
+#*Kenneth Buck, Edinburgh: Lowe HF-225 + s.w. loop
+#*Tim Buckhall, Congleton: Sony ICF-2001D + AN-1
+Duncan Cadd, Northampton: Philips TR-0885 cassette radio
+#*Bill Clark, Rotherham: Sony ICF-2001D + built-in whip or r.w.
+#*Robert Connolly, Kilkeel: Sangean ATS-803A + Sony AN-1 or 30m wire
*Sean Cooper, Wells-next-the-Sea: Pioneer F-656 + 20m wire
+#*John Coulter, Winchester: Yaesu FRG-7 + r.w.
+#*Geoff Crowley, Iceland: Yaesu FRG-7700 + dipoles + Datong AD-370
#*Gary Currah, Peterborough: Panasonic RF-B45 + r.w.
+#*Martin Dale, Stockport: Codar CR-70A + a.t.u. + 23m wire
+#*Ron Damp, Worthing: Racal RA17 + Hex loop or Sangean ATS-803A + 2 band Windom
+#*John Eaton, Woking: Lowe HF-225 + Datong A270 in loft
#Chris Edwards, Inverurie: Yaesu FRG-7700 + FRT-7700 + Mag Balun + 40m wire
+#*David Edwardson, Wallsend: Trio R600 + inverted V trap dipole
+Steve Ferminger, Oxford: Lowe HF-225 + 40m wire
+#*Ron Galliers, Islington: Philips D-2935 + a.t.u. + 30m wire
+#*Peter Gordon-Smith, Kingston, Moray: Icom R-72 + a.t.u. + helical dipole
+Richard Gosnell, Swindon: Regency MX-7000
+#*Michael Griffin, Ross-on-Wye: Sharp + built-in whip or 10m wire
#Bill Griffith, Texas, USA: Sony ICF-2002 + 7m wire
+P.R. Guruprasad, Vellore, India: Sony ICF-7600DA + built-in whip
+#Chris Haigh, Huddersfield: Drake R8E + 20m wire
*Peter Hall, Chichester: Lowe HF-225 + Mag Balun + 13m wire
+#*Robin Harvey, Bourne: Matsui MR-4099 + telescopic whip
+#*Gerry Haynes, Bushey Heath: Kenwood R5000 + a.t.u. + r.w.
+#*Francis Hearne, N. Bristol: Sharp WQT370 + r.w.
+*Simon Hockenhull, N. Bristol: HMV 1124 + 2.3m wire or Philips D2345 + built-in whip
*Richard Howard, Northampton: Grundig 3400
+#*Sheila Hughes, Morden: Sony ICF-7600DS or Panasonic DR-48 + 15m wire
+#*Rhoderick Illman, Oxted: Kenwood R5000 + Mag Balun + 19m wire or AN-1
+#*Cyril Kellam, Sheffield: Sony ICF-7600DS + AN-1 or 25m wire
+#Ronald Kilgore, Co. Londonderry: Drake R8E + a.t.u. + 30m wire
#*Tony King, Swindon: Panasonic DR-49 + indoor mag-mount CB antenna
+Zacharias Lianges, Thessaloniki, Greece: Philips D-2935 or Sony ICF-7600D + r.w.
+#*Ross Lockley, Stirling: Realistic DX-300 + 50m dipole or 20m wire
+#*Patrick McKeever, Birmingham: Lowe HF-225 + 14m wire + Mag Balun or loop
+#*Eddie McKeown, Co. Down: Tatung TMR-7602
+Roy Merral, Dunstable: Kenwood R5000 + 40m wire
+#*George Millmore, Wootton, IOW: Sangeanb ATS-803A or Racal RA17L + loops
+#*Ken Milne, Basingstoke: Matsui MR-4099 + whip or 6m wire
+#*Sid Morris, Rowley Regis: Kenwood R-5000 + 11m wire
+#*Fred Pallant, Storrington: Trio R2000 + r.w. in loft
#*John Parry, Northwich: Realistic DX-400 + 33m wire
+#Roy Patrick, Derby: Lowe HF-125 + 22m wire
+#*Peter Pollard, Rugby: Sony ICF-2001D + AN-1
+#Peter Polsonb, St. Andrews: Lowe HF-225 + loop or indoor Joystick
+Graham Powell, Pontypridd: Kenwood R2000 + r.w.
#*Paul Pybus, Hull: SOny ICF-SW55 + 25m wire or Fisher 58 tuner + loop+Richard Radford-Reynolds, Guildford: Sangean ATS-803A + 10m wire
+#Philip Rambaut, Macclesfield: Int. Marine Radio R-700M + r.w.
+Ernest Randell, Daltron: Lowe HF-225 + 15m wire
+#*Harry Richards, Barton-on-Humber: Grundig Satellit 700 + AD270 or Matsui MR-4099 + r.w.
*Alan Roberts, Quenbec, Canada: Lowe HF-225 + 41m or 11m dipole
#*Eric Shaw, Chester: Lowe HF-225 + 7m wire
+#*Chris Shorten, Norwich: Matsui MR-4099 + 10m wire
#Stephen Smith, Cwmbran: EX-333 or Realistic DX-302 + a.t.u. + r.w.
+#*Tom Smyth, Co. Fermanagh: Sangean ATS-803A or M. Richards R191 + whip
+Jon Snooks, Ludlow: Panasonic DR30
+#*Cliff Stapleton, Torquay: Trio R1000 + dipoles or r.w.
#John Stevens, Largs: Hammarlund HQ-180 or Icom R-79 + loop or r.w.
*Kelvin Sutherland, Anglesey: Lowe HF-225 + a.t.u. + 23m wire
#*Darren Taplin, Brenchley: Yaesu FRG-7700 + FRT-7700 + 35m wire or Sony ICF-SW7600
#*Phil Townsend, London: LF converter + Lowe HF-225 + loop or r.w.
+Vladimir Vassilev, Bratislava, Cz: JRC NRD-535 or ATS-803A + 20m dipole
+Ted Walden-Vincent, Gt. Yarmouth: Grundig Satellit 3400 + whip
+#*John Wells, E. Grinstead: RCA AR88D + loop
+Jim Willett, Grimsby: RCA AR-77 + 4m loop or Trio 9R-59DS + a.t.u. + X dipole
+#*Michael Williams, Redhill: Lowe HF-225 + loop or 10m wire
+#*Julian Wood, Elgin: Kenwood R2000 + Yaesu FRT-7700 a.t.u. + 5m wire

Transatlantic DX Chart

Freq kHz	Station	Location	Time (UTC)	DXer
		USA		
1010	WINS	New York, NY	0110	A
1050	WEVD	New York, NY	01050	A
1130	WNEW	New York, NY	0107	A
1210	WOGL	Philadelphia, PA	0145	A
1500	WTOP	Washington, D.C.	0153	A
		Canada		
590	VOCM	St.John's, NF	0037	A,B
710	CKVO	Clarenville, NF	0200	A
820	CHAM	Hamilton, ON	0225	C
930	CJYQ	St.John's, NF	0130	A,B,D,E,F
950	CHER	Sydney, NS	0043	A
1210	VOAR	Mount Pearl	0057	A,E
		C.America & Caribbean		
1375	RFO	St.Pierre/Miquelon	0130	A
1610	Caribbean B'con	The Valley,Anguilla	0103	A,B
		South America		
1220	R.Globo	Rio, Brazil	0100	A,E

DXers:
A: Ted Bardy, N.London.
B: Tim Bucknall, Congleton.
C: Robert Connolly, Kilkeel.
D: Ron Damp, Worthing.
E: Chris Edwards, Inverurie.
F: Gerry Haynes, Bushey Heath.

Off the Record

Andy Cadier,
28 Romney Avenue, Folkestone, Kent CT20 3QJ

It is surprising how so very few foreign English language broadcasts can be heard on medium wave in the UK. Have competing English broadcasts been obstructed, or has the diminished reception of alternative broadcasts simply been the result of an overcrowded band?

Radio Luxembourg on 1440kHz, 'The great 208' will always be remembered for being the most successful foreign station to broadcast to the UK. During the 60s the American Forces Network in Germany provided an alternative diet of music and US sporting events and was clearly heard during the evenings. This also provided a link with home for US servicemen and their families based in East Anglia and Hertfordshire. BBC local radio were allocated both frequencies, Radio Norfolk on 873kHz, and Radio Northampton on 1107kHz, rendering AFN totally inaudible. Another station carrying some English output is Vatican Radio once also clearly audible in most south-eastern areas of the UK. It's frequency of 1530kHz was allocated to several local radio stations, despite being most unsuitable. Low powered stations on this frequency suffer from acute reception problems after dark.

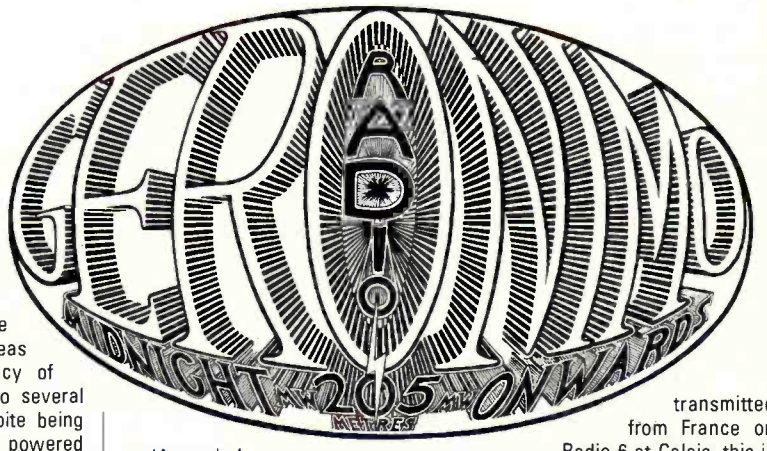
During 1969 Swiss businessman Yves Kuhn hired air time on Radio Andorra 701kHz (428m). At 0100UTC on March 2, he broadcast the *Caroline Revival Hour* which was compered by former Radio Caroline North DJ Don Allen. This was not a success as reception was simply too weak to provide acceptable audio quality.

SHORT WAVE IRREGULAR BROADCASTS CHART

Freq MHz	Programme Notes	Day	UTC	Monitors
3.910	**Scottish free radio**	**W/E**	**0945**	**A,G**
3.910	European reflections	Sun	1914	A,B,E,G,H
3.910	Dutch & German stns	W/E	2352	A,B,G
3.935v	Waterford, Ireland	W/E	2040	A,E,G,H
3.945	Scottish free radio	W/E	0647	H
6.200	Four Dutch stations	W/E	1240	A,B,F,G
6.200	European reflections	Sun	1504	A,B,E,G,H
6.210	Several stations	W/E	1245	A,B,C,G,H
6.219	Olst, Holland	Sat	0848	A
6.226v	Dun Laoghaire,Ireland	W/E	1124	A,B,C,E,F,G,H
6.235	3 stns, Irish relay	W/E	1520	A,B,F,G
6.240	Several relays	W/E	0755	A,B,F,G,H
6.250	English station	Sun	0902	A,B
6.252	German & English	Sun	0821	A,B,H
6.262	Chelmsford address	Sun	1115	B
6.265	Free London station	Sun	1141	H
6.268	From The Emerald Isle	Sun	1118	B,E
6.275	West Midlands address	Sun	1026	B,H
6.278	From Caledonia	Mon	1235	A
6.280	Irish Address	Sun	0951	A,B,H
6.295	Waterford	W/E	0830	A,B,E,F,G,H
6.296	Relay of 101 MHz FM	Sat	1150	A
6.400	Replacement to WNKR?	Sun	1103	A,B,E,H
6.555v	2 stations	Sun	1543	A
6.911	From Dublin	Dly	1311	A,B,C,F,H
7.380	Free radio service	Sun	1012	B
7.415	4 relays from France	W/E	1300	A,B,G,H
7.446	Scottish free radio	W/E	0828	A,B,D,E,G,F,H
7.460	Wuppertal, Germany	Sun	1000	A
11.405	Elburg or Ruurlo	Sun	1146	A,D,H

Dly = Monitored daily.
W/E = Heard on Saturday and Sundays
v = Variable frequency.

A: Free Radio Monitoring, Halesowen, W. Midlands.
B: Bob Marsh, Bexleyheath, Kent.
C: Tony King, Swindon, Wilts.
D: John Hichinbottom, Saltash, Cornwall.
E: Chris Harris, Kidderminster, Worcs.
F: David Williams, Southampton, Hants.
G: Tim Bucknall, Congleton, W. Midlands.
H: Gerry Haynes, Bushey Heath, Herts.



'Anoraks' (i.e. pirate radio supporters) will possibly remember the long standing Dutch pirate Radio Veronica having its frequency used for tests for Capital Radio in 1973. In April 1990, Radio Caroline found its frequency of 558kHz being used for tests for Spectrum Radio. 558 was a curious choice for use in London as it obliterates reception of the 500kW Irish station RTE 1 on 567kHz which until then could be received by the capital's Irish community.

The Voice of America transmitter at Munich (VOA Europe) carries English programmes on 1197kHz. However in the UK this frequency is now allocated to low power relays of the national rock station Virgin Radio. This network was previously occupied by BBC Radio 3.

Mail Box

Michael King writing from Lowestoft asks when will I report on the out of band CB type communications between 6.620 and 6.690MHz? Well how about now! Mike says these guys use l.s.b. and a favourite frequency for British operators is 6.673MHz. He reports monitoring a number of stations with non standard callsigns like RB28; BW252; and VO5, the call in each case being given in phonetics. He asks what other frequencies these stations use? I have monitored a few of these around 3.450 MHz, does any reader have further information?

From Dublin, **Anthony Niall** says he can hear Radio Caroline 'booming in' at an SIO of 444 with programmes from the *Ross Revenge*, and asks is the ship on air? The answer is no, however the Caroline Club say that the Bulgarian Communications Ministry have issued a licence for them to use a site in Bulgaria for both f.m. and short wave transmissions up to 30kW. The broadcast you heard was recorded on the Ross or at a studio at Highgate in North London, and relayed by a transmitter at Waterford in Ireland. Other Radio Caroline programmes are transmitted from France on Radio 6 at Calais, this is a local community station on 100.4MHz.

Alan Roberts in Quebec, Canada has been in touch again saying he has solved his own query mentioned in April's 'Off The Record'. The 25MHz signals he received were from low power entertainment/radio link systems for Alpine cable cars in French ski resorts. I hope they QSLed!

Chris Midgley with the help of readers, and those of the British DX Club, has launched ENIGMA 'European Numbers Information Group and Monitoring Association'. The first numbers station news-sheet includes active frequencies, operating times and identification details. The second issue will be available later this month from 195 Roberttown Lane, Roberttown, Liversedge, West Yorkshire. WF15 7LG.

Andy Craig, writing from Londonderry says the Northern Ireland Relay Service is to cease operations until a new transmitting site can be found. About two dozen stations have used NIRS on a regular basis.

Chris Edwards of Offshore Echo's sent me details of a new offshore station called 'Driot de Parole' (Right to Speak) anchored in international waters in the Adriatic. Basically this a peace ship financed by the European Commission and the French Liberty Association, programmes are directed at the warring factions in former Yugoslavia. This marine radio station is understood to be authorised by the United Nations and the French Government and transmits with a power of 50kW on 720kHz.

Tony Kirk of South London informs us that the Caroline Club has been revived. It previously existed in the 60s when annual membership was just 12/6d (about 63p) and members had their own Caroline Club request show. A year's subscription now costs £26.00 for UK residents, which includes 12 issues of their club publication Newsbeat.

As always your letters and logs are welcome, before August 1 if you want to catch the next article.

Trading Post

Fill in the order form on page 84 in BLOCK CAPITALS - up to a maximum of 30 words plus 12 words for your address - and send it, together with your payment of £2.35, to Trading Post, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. If you do not wish to cut your copy of *SWM*, or do not wish to use the order form provided, you must still send the cornerflash from page 76 of this issue, or your subscription number, as proof of purchase of the magazine. Advertisements from traders, or for equipment which it is illegal to possess, use or which cannot be licensed in the UK will not be accepted.

FOR SALE

AOR AR-950 scanner base or mobile with a.c. supply home base antenna, 100 memory channels, 10 search banks,in v.g.c., accept. £140. Tel: (0459) 119119 page number 7186,leave number to phone back on.

AR-77E, £70. Eddystone 840C, £60 with manuals. Cossor model 343 osc, 80kHz to 20MHz, £15. RadComs for past 10 years, offers. Wanted Racal 1772. Tel: 041-649 2328.

Bearcat DX-1000 h.f. RX, 10kHz-30MHz, microprocessor controlled, boxed, manual, £285. Global AT-1000, £60 o.n.o. Olivetti printer, £25. Sangean ATS-803A, boxed, manual, complete with all batteries, i.e. NiCads, £60. Tel: (0253) 860072 Blackpool.

Bush radio model type DAC90, early 1950, excellent working condition, £50. Tel: (0384) 258549.

Drake TR7 with matching p.s.u., v.f.o., speaker mic, fan, service manual, excellent order and condition, best offers. Tel: 081-558 5227 anytime.

ERA MkII Microreader, £100. ERA BP34 audio filter, £60. Lowe HF-225 DX receiver with digital frequency pad, £350. Buyer collects or pay carriage. Tel: (0633) 484577, Gwent.

FM Board for Yaesu FT-101ZD, new, unused, £50. Dodd. 1 Nansen Street, Bulwell, Nottingham NG6 9JE. Tel: (0602) 272880.

Grundig Professional 1400SL, like new, £120. Grundig Satellit 6000 multi-bands s.s.b. unit 1-6 to 30MHz m.w., l.w., f.m., noise limiters a.v.c./m.v.c. excellent condition, £85. FRG-7 plus f.m. digital v.g.c. , £120. Racal RA1792 150kHz-30MHz, offers. Tel: 081-813 9193.

Icom IC-728 100W all band transceiver, f.m. board installed, p.s.u., mic, six months old, hardly used, immaculate condition, genuine reason for sale, £720 o.v.n.o. Tel: (0270) 581987 Crewe, Cheshire.

Icom IC-R1, hardly used, boxed with manuals, as new (6 months old), £275 o.n.o. John. Tel: (046) 36874 evenings, Eire.

Icom IC-R9000 top of the range 100kHz - 2GHz receiver with screen display of all functions, only £2500 for quick sale (£5000 new!), tell your friends. Tel: (0203 670932).

JRC NRD-525 receiver, excellent condition, 18 months old and a.t.u., £650 o.n.o. Tel: (0977) 612963 after 6pm.

Kenwood TS-50 h.f. mobile transceiver, brand new, 1 week old, genuine reason for sale, cost £1000 sell £875. Tel: (0222) 881866 Caerphilly, Mid Glamorgan.

Lowe HF-225 a.m./f.m. sync detector, 12 months old, mint condition, £350. Tel: (0484) 530527 Huddersfield.

Lowe HF-225 and 20m MLB, £300. Tel: 031-669 9085 Edinburgh.

Nordmende v.c.r., PAL/NTSC/SECAM, L front loader, g.w.o., £100 o.v.n.o. Buyer collects. Loops made for l.w., m.w. beacon, 80/160, s.a.s.e. for details. Write: M.B. Evans, 120 Loughton Way, Buckhurst Hill, Essex IG9 6AR.

Panasonic RF-8000 costing £1800 only £300. Grundig 650 International new, £250. Grundig 700 new, £225. Tel: (0462) 441867.

PCSWL/PCHF FAX decode software by Comar Electronics, see any SWM, brand new never used, duplicated gift, £130. ICS FAX-1 decoder, as new, little used, can be seen working, £200. G6NXQ. Tel: (0272) 615713 Bristol.

Pocomtor AFR-2010 decoder, 5 extra boards fitted plus video monitor, £650, Yaesu FRG-9600 scanner plus discone, £375 o.n.o. Datong FL-2 filter plus p.s.u., £45. Andy. Tel: (0253) 595984 after 6pm, Blackpool area.

PRO-2004 scanner, good condition, 300 channels, £120. Patrolman 99 mobile scanner, good condition, £60. Hardly used. Discone antenna, needs connector wire, £15. All items kept well. Peter. Tel: (0494) 446838 afternoons only, High Wycombe.

R216 v.h.f. receiver with p.s.u., good working order, £75. Datong Morse tutor, £30. GM0OCH. Tel: (0851) 706448 after 5pm.

Realistic PRO-34 hand-held scanner, 68-88, 108-174, 380-512, 806-960MHz, 200 channel. Case scratched but otherwise g.w.o., £85. Nevada Scanmaster antenna, in good condition, £20. Tel: (0484) 536116 after 6pm, Huddersfield.

Realistic PRO-42 (USA) model hand-held scanner. Programmable over ten channels, range 30-54, 138-174, 380-512, full digital readout, f.m., nice hand-held for car portable or new starter to scanning, £50. Nigel. Tel: (0732) 870816 after 10am please, North Kent.

Sangean ATS-803A in mint condition, only used four weeks, boxed, batteries, £75 including P&P. Tel: (0472) 298538.

Save £100 on a perfect condition **MVT-7100 Yupiteru** all-mode scanner. All accessories and receipt/guarantee. Saving up for h.f. transceiver. Bargain at £350. Rob Adams. Tel: (0625) 878876, Stockport.

Signal R-535 v.h.f./u.h.f. airband RX, as new, boxed, still the most sensitive airband receiver available £210 o.n.o. Tel: (0509) 844166 after 6pm.

Sony ICF-7600, l.w., m.w., s.w., a.m., f.m., s.s.b., a.c. supply, antenna, case and manual, as new in box, cost new £1800, will accept, £100. Tel: (0459) 119119 page number 7186, leave number to phoneback on.

Sony ICF-SW77, new, £300 o.n.o. including manual. Freddy Hunter, Flat 418, Vivian Court, 128-134 Maida Vale, London W9 1PZ.

Sony SW-55, £195. Jupiter VT-125 airband, £95. Kenwood TH-7BE dual-band transceiver, wideband a.m./f.m. on RX, with speaker/mic, case, £325. All as new, boxed. Seiko, Pulsar gents watches, details o/r. John Lockwood. Tel: (0379) 652043 evenings and weekends, Diss.

WQ medium wave loop, excellent sensitivity, selectivity, £35. Triple tuned active antenna, remote Varicap tuning, £35. Tuned active antenna module, 2.5-30MHz, £8. Can supply circuit diagrams for above units, £1 + postage. Tel: (0302) 390604 anytime after 6pm, Doncaster.

Yaesu FRG-7 receiver, excellent condition with handbook, £120. Optrex AM807 digital frequency display and LFC2A ceramic filter, both unused - best offer accepted. Carriage extra on receiver. Tel: (0209) 215568

Yaesu FRG-7700 communications receiver, 150kHz-30MHz, u.s.b., l.s.b., c.w., a.m., good receiver at a good price, manual included, £150 o.n.o. Tel: (0705) 754849 Portsmouth.

Yaesu FT-747GX fitted f.m. with Astatic Teardrop mic, £575. Kenpro KT22 hand-held 2m, brand new, £100. Altai TW232 base power mic, £30. Uniden PRO-620 base CB, £110. All new or as new. Tom. Tel: (0536) 522007 any time, Kettering.

Yupiteru MVT-7100, brand new scanner, totally unused with all accessories, frequency guide and 11 months guarantee remaining. Unwanted present, must sell, offers? Can deliver locally. Tel: (0279) 652173 Herts.

Yupiteru VT-225 v.h.f./u.h.f. airband receiver, all accessories, £170. Microreader MkII latest, £110, ERA RS232 display, £115, BP34 bandpass filter, £50. All as new. MML transverter, 2m in, 6m out, 20W, £120. Tel: (0926) 54556 anytime.

Yuptieru VT-225 civil/military scanner, brand new, still in box, not yet programmed, genuine reason for sale, never used, £240. GW0PRM, QTHR. Tell (0492) 516812 after 4.30pm or (0492) 877870 9-5pm.

WANTED

1992 WRTH or cheap 1993 edition. Young. Tel: (0732) 354560 Kent.

Eddystone EC-958 receiver, any model but prefer Mk7. Non worker OK if complete and good condition. Paul. Tel: (0202) 690019 evenings or (0202) 744666 day, Poole.

Eddystone models 880, 880/2. 960, 1995, plus 1000 series, speakers 688, 697/8, 652, General 935, 899, 899/F, Plinth 906, signal strength meter, Edometer ED902, EO902 MkII for cash. Collection possible. Peter Lepino. FAX: (0372) 454381. Tel: (0374) 128170 anytime thank you.

Grundig Satellit 650 International, must be as new with spec. Clif. Tel: (0254) 852720.

Sony Global radio CRF-320, must be g.w.o. Tel: 081-749 3430.

Yaesu FRV-8800 v.h.f. converter, FIF-232C CAT interface unit, Icom CT-17 computer interface. Call collect. Martin. Tel: (0865) 374871 evenings or (085) 409882 days.

Yaesu FT-70F h.f. portable transceiver, must be mint condition with handbook if possible. GM0OCH. Tel: (0851) 706448 after 5pm.

EXCHANGE

Contamination meter No.1 Cat No. 5CG0012 complete and new in exchange for reasonable, working l.f./m.f. receiver. Cliff. Tel: (0753) 573500.

New/unused Meopta Color 3 enlarger, transformer, 50mm lens, Patterson exposure meter, test frame, Jobo CP2 motorised developing tank and accessories including papers and chemicals. Value £500+. In exchange for AOR-AR3000 or similar. Tel: 031-551 1846 evenings.

Closing Date for Adverts August Issue - 1st July, September Issue - 1st August.

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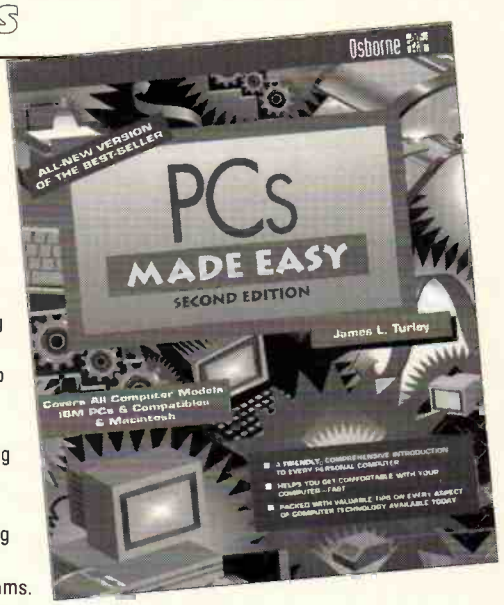


PCs Made Easy 2nd Edition
by James L. Turley
187 x 230mm soft-covered, 438 pages
published by Osborne McGraw Hill
Price £14.95, UK P&P £1.00, Overseas P&P £1.75.
Available from SWM Book Service, FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH 18 8PW. Tel: (0202) 659930.

Are you confused by all the jargon used by computer buffs? If so, this fascinating new book by James L. Turley, published by McGraw Hill, could be your salvation. One of the biggest complaints from people considering a their first computer is the seemingly unless stream of incomprehensible terms used by the 'experts'. All too often, this turns people away from computers with a fear that it's all too complicated. This book aims to strip away the confusion and provide plain language explanations that all can understand. Rather than concentrate on the IBM PC range, the text applies to all types of computers. However, a little extra space is taken up with details specific to the IBM and Mac systems.

The general style and layout is excellent, with mixed blue and black print and copious diagrams to aid understanding. The style was reminiscent of the manuals supplied with some of the more expensive computer programs.

In addition to taking a logical path through the various elements of computing, there were a couple of novel ideas to aid understanding. The first of these was the new word section. Every time an important new word is introduced, an explanation annotated with a magnifying glass symbol is presented. The explanation is often only a couple of sentences, but covers the topic very concisely. This is aided by the use of simple language wherever possible. The author has a great sense of humour that goes a long way to lighten-up what could be a heavy topic.

A second, similar section was used to provide additional explanatory notes. As an example, a note was used to explain how the ENTER key on one computer may be called RETURN on another. Simple stuff, but it's these oddities that cause much of the confusion for the beginner.

Moving onto the core of the book, the first few sections take you from understanding hardware and software through to dealing with disks and files. With this basic understanding complete, the book moves on to cover programs, operating systems and applications programs. Each of these topics warrants its own chapter and is covered in excellent detail.

The explanations continue with three chapters that look at the way the computers can be linked to the outside world. This includes such areas as printers, networks, modems, scanners and multimedia.

With all the basics wrapped-up, the author introduces a step-by-step guide through a typical program. This serves to illustrate how the previously described elements all work together.

Having given the reader a sound grounding, the author continues with a couple of chapters giving practical advice. These include a selection of important do's and don'ts plus guidance on buying a computer.

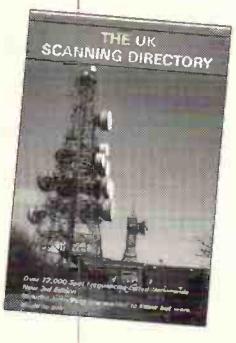
The book is rounded off with appendices that include an excellent glossary and comprehensive index.

You've probably guessed by now that I liked this book! Although it's aimed at the newcomer I feel sure that many existing computer users could learn a lot from this guide – I did! – I can thoroughly recommend this book and would suggest it's essential reading for anyone contemplating buying a computer for the first time.

Mike Richards

THE UK SCANNING DIRECTORY
Published by Interproducts, 8 Abbot Street, Perth PH2 0EB, Scotland
150 x 210mm, 250 pages. Price £16.95, UK P&P £1.00, Overseas P&P £1.75.
Available from SWM Book Service, FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH 18 8PW. Tel: (0202) 659930.

This comprehensive publication provides an extensive frequency listing for the scanning enthusiast. The frequency range covered is 24.999MHz right through to 1213MHz. For each frequency the directory lists the split frequency, mode, location and user information. Of the two-hundred and fifty pages, the first eleven gave the user an introduction to scanning and explained the terms and abbreviations used in the directory. The station listings were very comprehensive and included Formula One car links right through to TV broadcast stations. I'm sure this will prove to be essential reading for all scanner users. MJR



CANADIAN MILITARY RADIO FREQUENCY GUIDE
by Robert S. Ing
Published by Robert S. Ing Publishers, 1170 Bay Street - Suite 102, Toronto, Ontario M5S 2B4, Canada.
215 x 275mm, 67 pages. Price £13.95

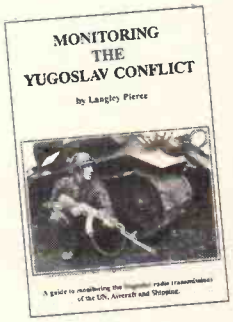
This book is dedicated to monitoring Canada's Military. It is written particularly for those who have had some basic background in radio monitoring and are interested in the specialised area of military radio. It covers the frequency range of 50kHz to 500MHz and covers such things as Canada's Maritime Services, Coast Guard vessels, military establishments and Tactical Air Group amongst its subjects.

AERIALS II
by Kurt N. Sterba & Lil Paddle
Published by Worldradio Inc., 2120 28th Street, Sacramento, CA 95818, USA.
219 x 280mm, 77 pages. Price £11 plus £2 shipping to the UK

This book is a compilation of columns appearing in *Worldradio* between 1985 and 1993. Kurt N. Sterba and Lil Paddle write a brilliantly funny column in *Worldradio* about antennas. This book brings together the best 43 columns. They have opinions on every type of antenna you can imagine. How about the antenna made from two shopping trolleys! Or how about the one made from a patio umbrella. Well, they're not all as unusual as that, Kurt also deals with thing like log periodics. The chapters are all very readable, and frequently raise a giggle, but I'm never quite sure if he's pulling my leg. Perhaps that's the attraction of the book. EKR

MONITORING THE YUGOSLAV CONFLICT
by Langley Pierce
Published by Interproducts, 8 Abbot Street, Perth PH2 0EB, Scotland
150 x 210mm, 28 pages. price £4.85
UK P&P £1.00, Overseas P&P £1.75.
Available from SWM Book Service, FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH 18 8PW. Tel: (0202) 659930.

This topical publication provides a wealth of monitoring information for those interested in this troubled area. In addition to providing monitoring information, the reader is taken through some of the background to the troubles. Details of where to listen are split into three chapters dealing with United Nations, Diplomats/propaganda and amateur/broadcast stations. The final chapters included a frequency list and some examples of propaganda transmissions. I found the presentation style very easy to use and was able to locate interesting transmissions very quickly. MJR



BOOKS

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Some titles are overseas in origin.

HOW TO ORDER. PLEASE USE THE ORDER FORM ON PAGE 83.

POST AND PACKING; add £1.00 for one book, £2.00 for two or more books, orders over £40 post and packing free, (overseas readers add £1.75 for one book, £3.50 for two or more for surface mail postage) and send a postal order, cheque or international money with your order to **PW Publishing Ltd, FREEPOST, Arrowsmith Court, Broadstone, Dorset BH18 8PW.** Please make your cheques payable to PW Publishing Ltd. Payment by Access, Mastercard, Eurocard or Visa also accepted on telephone orders to Poole **(0202) 659930**. Books are normally despatched by return of post but please allow 28 days for delivery. Prices correct at time of going to press. Please note: all payments must be made in Sterling.

LISTENING GUIDES

AIR BAND RADIO HANDBOOK (4th Edition)
David J. Smith
Extensively revised & updated (October 1992). Air band radio listening enables you to listen-in on the conversations between aircraft and those on the ground who control them, and is an increasingly popular and fascinating hobby. A new chapter on military air band has been added. The author, an air traffic controller, explains more about this listening hobby. *190 pages.* **£7.99**

VHF/UHF SCANNING FREQUENCY GUIDE (THE)
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 Wilcox
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 station, broadcasts in English and 'Making the Most of Your Portable'. *46 pages.* **£4.25**

FLIGHT ROUTINGS 1993
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 callsign. 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.* **£5.95**

GUIDE TO FACSIMILE STATIONS 12th Edition
Joerg Klingenfuss
This manual is the basic reference book for everyone interested in FAX. Frequency, callsign, 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 callsign 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**

INTERNATIONAL VHF FM GUIDE (THE) 7th Edition.
Julian Baldwin G3UHK & Kris Partridge G8AUU
This book gives concise details of repeaters & beacons world-wide plus coverage maps & further information on UK repeaters. *70 pages.* **£2.85**

MARINE UK RADIO FREQUENCY GUIDE
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 aerials, 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, callsigns, 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, aerials 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.**

ANTENNAS (AERIALS)

AERIAL PROJECTS *BP105*
Practical designs including active, loop and ferrite antennas plus accessory units. *96 pages.* **£2.50**

ANTENNA EXPERIMENTER'S GUIDE (THE)
Peter Dodd G3LDO
Although written for radio amateurs, this book will be of interest to anyone who enjoys experimenting with antennas. You only need a very basic knowledge of radio & electronics to get the most from this book. Chapters include details on measuring resonance, impedance, field strength and performance, mats and materials and experimental antennas.
200 pages. ***£8.90***

ANTENNA IMPEDANCE MATCHING
Wilfred N. Caron
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**

ARRL ANTENNA BOOK (THE) 16th Edition
A station is only as effective as its antenna system. This book covers propagation, practical constructional details of almost every type of antenna, test equipment and formulas and programs for beam heading calculations. *789 pages.* **£14.50**

ARRL ANTENNA COMPENDIUM (THE) Volume One
Fascinating and hitherto unpublished material. Among the topics discussed are quads and loops, log periodic arrays, beam and multi-band antennas, verticals and reduced size antennas. *175 pages.* **£9.50**

ARRL ANTENNA COMPENDIUM (THE) Volume Two
Because antennas are a topic of great interest among radio amateurs, ARRL HQ continues to receive many more papers on the subject than can possibly be published in *QST*. Those papers are collected in this volume.
208 pages. **£9.50**

ARRL ANTENNA COMPENDIUM (THE) Volume Three
Edited by Jerry Hall K1TD
As the title suggests, this book is the third in the continuing series on practical antennas, theory and accessories produced by the ARRL. The book reflects the tremendous interest and activity in antenna work, and provides a further selection of antennas and related projects you can build.
236 pages. **£9.50**

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 complied 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/GW0LNQ.
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.**

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TELEVISION

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Mike Wooding G6IQM
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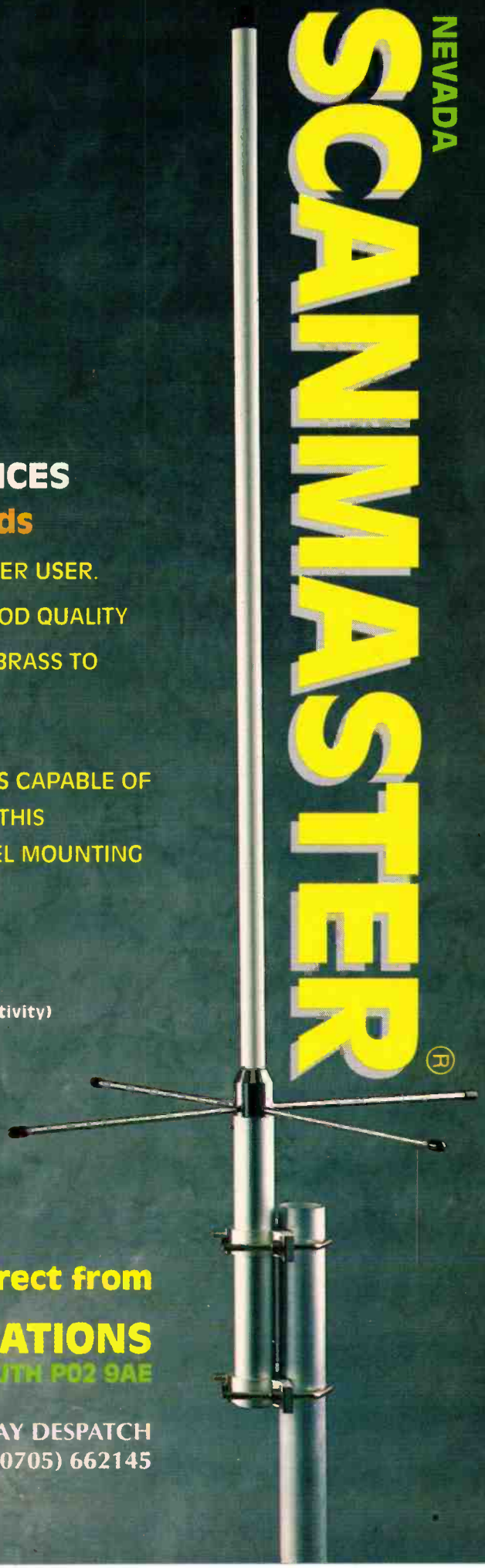

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