

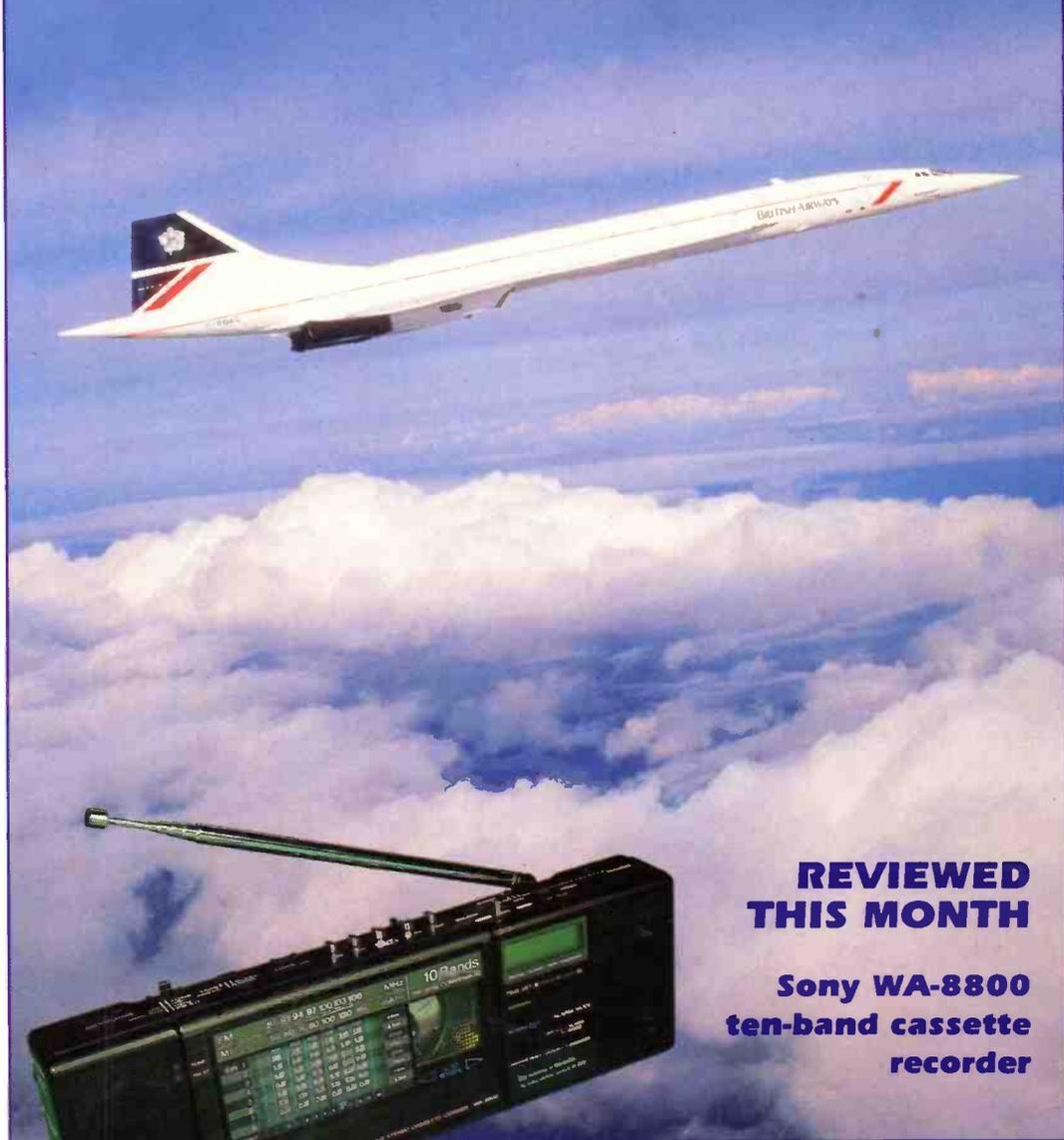
SHORT WAVE
MAGAZINE

shortwave magazine

December 1991 £1.75 ISSN 0037 - 4261

SPEEDBIRD CONCORDE ZERO ONE

Peter Rouse
flies to New
York at Mach 2



**REVIEWED
THIS MONTH**

**Sony WA-8800
ten-band cassette
recorder**

**YESTERDAY'S SPY SET
The 128 Set Revisited**

BUILD THE LONGWAVE LOOP ANTENNA

INDEX TO VOLUME 49



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EDITORIAL

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...GOOD LISTENING

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Crystal Set
Coupon Dec.

Trading Post
Coupon Dec.

editorial

SWM SERVICES

Subscriptions

Subscriptions are available at £21 per annum to UK addresses £23 in Europe and £25 overseas. Subscription copies are despatched by Accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £34 (UK) £37 (Europe) and £39 (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.

Back Numbers and Binders

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

Binders, each taking one volume of the new style SWM, are available price £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 p.c.b.s, back numbers, binders and items from our Book Service should be sent to **PW Publishing Ltd., FREEPOST, Post Sales Department, Enefco House, The Quay, Poole, Dorset BH15 1PP**, 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 Poole (0202) 665524. An answering machine will accept your order out of office hours.

Another year has almost ended and for me this has been a great one. We got off to a good start with the redesign of the front cover and a revamp of the inside of the magazine. The result of this effort, coupled with the enormous increase in interest in short wave listening, brought about by the Gulf War, meant that the circulation of SWM soared to new heights.

May saw Peg and myself leading a small party of readers on a visit to Quito, Ecuador and The Voice of the Andes - HCJB. We had a fantastic two weeks 9500 feet up as the guests of HCJB and, from what you have told me at rallies, you enjoyed the account of our adventures.

Our PC Special issue was

a success, as was *Weather Watching*, which we published earlier in the year. With the *International Radio* magazine in the October issue and *What Scanner* in November we had the two

largest issues ever - 100 pages, if you count the covers!

All that remains is for me to wish you all the best for 1992 on behalf of all the staff here at *Short Wave Magazine*.



letters

Dear Sir

Regarding the attitude taken towards listeners' reports by broadcasting stations, my own experience may interest your readers.

Recently returned to the hobby of short wave listening and readership of SWM after retirement from 43 years as a BBC engineer, my penultimate post was as Engineer-in-Charge of BBC Radio London, where for several years we ran a programme called *Sounds Good*.

Originally intended for hi-fi enthusiasts, we included a fifteen minute slot for radio hams. This attracted a large postbag, particularly as enthusiasts were taping the programmes and posting copies to friends all over the world. Reception reports and programme comments began to pour in. We received letters, photographs, maps and tapes by the sackful.

We were totally unprepared for this and had few suitable staff to deal with such specialist mail. I dealt with as much as I could in (rare) off-duty time, and answered some of it over the air. The worst offenders were those who

would send me a 120 minute cassette.

How could I give my full attention to two hours of uninvited information, often delivered in halting English and recorded at an odd speed with inaccurate tape azimuth setting?

Even more problematical were 3 or 5in reels of domestic standard 4-track tape recorded at one and seven eighths p.s. on all tracks, which our professional tape machines were quite unable to cope with. Eight or ten-page handwritten letters were not unusual either.

Reception reports and programme comments are always welcomed by staff, but don't get upset if you don't get a prompt reply. The chances are that your report and letter has been much appreciated and probably pinned up to the station notice board, but no-one sufficiently qualified has been available to write to you.

When writing to a broadcasting station, always remember that **you** are indulging in your favourite hobby, but **they** are doing their everyday work! You will

have more chance of success if you keep it **brief** and always enclose a stamp or IRC.

**John Longden
Uxbridge.**

Dear Sir

I have recently purchased a unit from J&P Electronics Ltd of Kidderminster. The unit was to give me packet receive and transit, plus multi-mode receiver for the Spectrum, all on EPROM. I had problems getting it to work properly, and after a few 'phone calls and a visit to their premises the problem was found to be my Spectrum, which was put right by them.

I found them most helpful and very patient sorting out my problem. It is nice to know that in this day and age you can still find a company who still care about their customers.

Many thanks J&P for your help and excellent product.

**Bob Taylor G6XNQ
Bristol**

letters

Dear Sir

One of the problems that many a broadcast listener experiences when receiving a programme schedule is that by the time it reaches them its 'shelf' life may be near to expiration.

May I therefore suggest that anyone writing to any broadcast station in future add a suggestion that since most international broadcasters are government funded, why not make their current schedule available to the listener via the nearest embassy or consul.

This would have the benefit of reducing costs to all concerned and providing a quicker (?) service to the listener. Even if return postage is needed, that surely must, in most cases be cheaper than the cost of 1 or 2 IRCs.

Since governments spend vast sums of getting their point across, anyone wishing to hear these broadcasts would be better served using these 'diplomatic channels'.

So come on you broadcast listeners, put in an appeal every time you write to a radio station. Sooner or later someone, somewhere will wake up to the benefits of providing schedules in this way.

Malcolm Goodman
Leeds

Dear Sir

Having just started interest in scanning, using a Realistic PRO-2024, also having only seen your May issue, you may like to know that, operating indoors completely with a commercial mag-mounted whip, I had some success, but considerably increased contacts using the coat-hanger dipole I finally made up, reducing the coaxial cable to 1m tuning the dipole to mid-band by cutting the dipole 'legs' to mid-band length according to the formula. With the home-made dipole stuck on to a vertical dressing-table mirror with adhesive tape in a built-up area in a tower block (2nd floor only) I obtained intelligible contacts on 90 frequencies (to-date), thus exceeding the 65-channel memory slots available. Except one, there were no ground contacts, as expected on v.h.f., but for aircraft the coat-hanger was a great success.

Eric Ratliffe
Stevenage

Dear Sir

At the RAE course held at Henley College, Coventry, I have a hand-out for candidates for guidance regarding distress messages. Part of which reads, "... It is very doubtful if an amateur or an s.w.l. would be the sole recipient of distress traffic under current conditions. However, if you do copy a message which you consider has not been generally received, then contact your local police headquarters by land line. Take all the details you can and request that the police telex the information to the International Rescue Centre at Plymouth or Air Traffic Control at West Drayton as appropriate. If you do take this action then the police and the Radio Communications Agency will certainly pay you a personal visit. So have your log and your gear in immaculate order!"

James Glanville, Coventry

Dear Sir

September *Short Wave Magazine* has been brought to my notice, and I read with great interest the article on the EF50. There are some comments I would like to make. The valve was developed in Holland before the war, see *Wireless World* for 16 February 1939, and incorporated in the Pye 45MHz straight television receiver. This was much used in airborne radar as an i.f. amplifier. Reference to the *Wireless World* article will show that the valve originally had no screening can and had locking pins.

Your photograph shows the production versions. Mullard denied that there ever was a different prototype, which was rather unfortunate since I have one, marked with a proviso that it is a prototype and production could not be guaranteed.

I also have a prototype EE50, of similar appearance. This valve is adequately described in *Wireless World* for 20 April 1939, but it never really caught on. The EF50 managed an adequate mutual conductance without recourse to secondary emission.

Incidentally, the ratio of mutual conductance to input capacity is generally regarded as the criterion of goodness for r.f. amplification, noise factor also being important and the RL7 (VR136) was the European leader at the time. However, the RL7 was not suitable for pulse circuits, and cost more, therefore it was used for head amplifiers only. The EF50 was the op-amp of that era, as I explained in an article on the Anode Follower in *SWM* some time in the late forties, when Austin Forsyth was the editor.

R. Brett-Knowles G3AAT
Havant

Dear Sir

John Wilson's letter in July's *SWM* is really very brave and full of knowledge. I have just bought an ICR-7000 (after the 7100 was announced) and although much slower than other scanners I would not change it. Its antenna is the lcom discone for it. Surprisingly, my Sony Air 7 connected to this antenna performs very well indeed without any kind of problem in the v.h.f. air and amateur band. On the other hand my reasonably good h.f. PRO 80 when used with its v.h.f. converter is not capable of handling many signals with its built-in antenna, whether you switch on the attenuator or shorten the whip antenna. I could go very much further in this matter, but I think it's not worth it. Added converters, for going up or going down, for many reasons are not advisable. And for ending the best thing is to go through the 'Trading Post' and you will find for sale brand new model receivers or scanners one month after another one. Some reason must be. My congratulations to Mr John Wilson for his very good letter.

Ernesto Hafner Caulfield
Tenerife, Canary Islands

Dear Sir

I am a scanning enthusiast and admit that I regularly listen to emergency service broadcasts, they are some of the easiest signals to receive and some of the most interesting. My interest in this facet of the hobby is now so great that I am hoping to change my career and join the police.

Recent media attention to 'joy riding' and 'ram raiding', however, has placed the spot light on scanning receiver, giving them a great deal of bad publicity. Until now, I believe, the government has turned a blind eye towards the use of scanner. This must surely be about to change. How can it be illegal to listen to such broadcasts, whilst it is perfectly legal to buy or sell a scanner? Surely the scanning receiver's days are numbered?

It does seem a great shame that such a small minority should spoil a fascinating pastime for thousands of enthusiasts, but then, that is true of many things these days.

Name & address withheld
£5 donated to the Police Benevolent Fund.

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER IS USED 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 other magazines. The views expressed in letters published in this magazine are not necessarily those of *Short Wave Magazine*.

grassroots

rallies

* Short Wave Magazine & Practical Wireless in attendance *

December 1: The Bishop Auckland RAC are holding their rally at the Sunnydale Leisure Centre, Shildon, Co. Durham. Doors open 11am (disabled 10.30am). **GOFBK. Tel: (0388) 606819.**

***December 8:** The Verulam Christmas Rally will be held once again at the Hatfield Polytechnic, Hatfield. Doors open at 11am. This is a good chance to get your presents before it's too late.

***December 15:** The Centre of England Amateur Radio Rally will be held at the British Motorcycle Museum, Bickenhill, near the NEC Birmingham (junction 6 M42). Doors open 10.30am, admission £1, OAPs 50p, children free. Over 60 trade stands in three large exhibition halls, Bring & Buy, talk-in on S22, bar and restaurant available, ample free parking, concessionary rates to visit museum. **Frank Martin G4UMF. Tel: (0952) 598173.**

1992

January 26: The 2nd Lancastrian Rally will be held at the University of Lancaster. Doors open 10.30am for the disabled and 11am for everyone else. **Sue G10HH. Tel: (0524) 64239.**

February 16: The Kidderminster & DARS rally will be held at the Harry Cheshire School, Habberley Road, Kidderminster, Worcs. Doors open 10am. **G8JTL. Tel: (0384) 894019.**

February 23: The Northern Cross Radio Rally will be held at Rodilian School, Lofthouse, West Yorkshire. Doors open 11am (10.30am for the disabled). On site parking for 1000+ cars. Dealers, craft stands, Bring & Buy, Morse Tests, Bar and Refreshments. Entry 50p (programme draw prizes). **Dave Gray G0FLX. Tel: (0532) 827883.**

March 7: The TARS annual rally will be held as a new venue this year, the Temple Park Leisure Centre in South Shields. **Jack G0DZG. Tel: 091-265 1718.**

April 5: The Launceston 6th Amateur Radio Rally will be held at Launceston College. Doors open 10.30am. **Maggie. Tel: (040921) 219.**

April 19: The Centre of England Easter Sunday Radio & Electronics Rally will be held at the National Motorcycle Museum, Bickenhill. Doors open 10.30am (10am for the disabled) and admission £1. Over 60 traders in three large halls, ample free parking, Bring & Buy, talk-in on S22, bar and restaurant facilities. **Frank Martin G4UMF. Tel: (0952) 598173.**

April 26: Bury Radio Society will be holding Hamfeast '92 at the Castle Leisure Centre, Bolton Street, Bury. **L.H. Jones, Mosses Community Centre, Cecil Street, Bury.**

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. Dec 18 - Problems in Setting Up an HF Station by G0JRY. Paul Truitt G4WQO. 071-938 2561.

Barnsley & DARC: Mondays, 7.15pm. Darton Hotel, Station Road, Darton, Barnsley. Dec 2 - Junk Sale, 9th - Jandek Kits, 16th - On the Air Night, 23rd - Construction Competition plus Xmas Raffle. Ernie G4LUE. (0226) 716339.

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. Dec 17 - Xmas Party. Geoffrey Milne. 081-462 2689.

Chelmsford ARS: 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford. Dec 3 - Radar by Stan Wood, 14th - Christmas Social. Roy Martyr. Chelmsford 353221 ext 3815.

Cheshunt & DARC: Wednesdays, 8pm. Church Room, Church Lane, Wormley, Nr Cheshunt. Dec 4 - Natter Night, 18th - Xmas Social, 25th - No Meeting! Roger Frisby. (0992) 464795.

Conwy Valley RC: 1st Thursdays, 7.15pm. The Studio, Penrhos Road, Colwyn Bay, Clwyd. Dec 5 - Satellite Communications by GW1VCN. Merfyn Jones GW4NNL, 72b Princes Drive, Colwyn Bay, Clwyd. (0492) 530725.

Coventry ARS: Fridays, 8pm. Baden Powell House, 121 St Nicholas St, Radford, Coventry. Nov 29 - Talk by Mr Allen. Neil Blair. (0203) 523629.

Derby & DARS: Wednesdays, 7.30pm. 119 Green Lane, Derby. Dec 4 - Junk Sale, 11th - Constructor's Contest, 12th, c.w. Enthusiasts Night, 18th - Xmas Party, 25th - No Meeting. Richard Buckby. Ambergate 852475.

Dorking & District RS: 2nd & 4th Tuesdays, 7.45pm. Friends Meeting House, South Street, Dorking. Dec 6 - Society Dinner, 10th - Informal at the Falkland Arms, 17th - Social. John Greenwell G3AEZ. (0306) 77236.

Edgware & DRS: Watling Community Centre, 145 Orange Hill Road, Burnt Oak. Nov 28 - The Novice Licence and Club Participation, Dec 12 - Junk Sale. Hank Kay G0FAB. (081-205 1023).

Fareham & DARC: Wednesdays, 7.30pm. Porchester Community Centre, Westlands Grove, Porchester, Fareham, Hants. Dec 4 - Reliability by G3XPH, 18th - Xmas Quiz. Rod Smith G0ERS. (0705) 373572.

Hastings E&RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey Close, Hastings. Reg Kemp. 7 Forewood Rise, Crowhurst.

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. Dec 5 - Liquid Crystals by Merck Ltd. S.W. Swain. (0705) 472846.

Keighley ARS: Thursdays, 8pm. The Cricket Club, Ingrow, Nr Keighley. Nov 28 - The Ionosphere by LM Dougherty,

Dec 5 & 12 - Natter Night, 19th - Xmas Buffet. Kathy Bradford. (0274) 496222.

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. Dec 5 - Christmas Social Evenings, families and friends welcome. Mary GONZA. (0623) 755288.

Midland ARS: 3rd Tuesdays, 7.30pm. Headquarters Unit 22, 60 Regent Place, Birmingham B1 3NJ. Dec 3 - Xmas Party. John Crane G0LAI. 021-742 8712 (evenings).

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St John Ambulance HQ, 61 Emscote Road, Warwick. Dec 10 - Xmas Pies and Wine, 24th - Net on 145.350MHz at 8pm. Mike Newell. Kenilworth 513073.

Nelson & DARS: Wednesdays. Llancaich Junior School, Nelson, Mid Glam. Leighton Smart. (0443) 411736 evenings.

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. Nov 27 - Informal, Dec 4 - Licence Conditions Q & A, 11th - Xmas Party, 18th - Night on the Air - very informal!, 25th - No Meeting. Jack Simpson G3NJQ. (0603) 747992.

North Ferraby United ARS: Sundays, 8pm. North Ferraby United Football Club Social Room, Church Road, North Ferraby. Nov 29 - RSGB Video with G3YCC, Dec 6 - The Way Ahead Meeting by G4VKK, 13th - LF Band DX by G4BYG, 20th - Xmas Quiz with G4XWA, 27th - Night on the Air. F.V. Lee. (0482) 650410.

Preston ARS: Alternate Thursdays. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood. Nov 28 - A Kenya Adventure by Mr Ruthven, Dec 12 - The Xmas Buffet, 26th - Xmas Recs. Eric Eastwood G1WCO. (0772) 686708.

Saltash & DARC: 1st & 3rd Fridays, 7.30pm. TOCH Hall, Burraton, Saltash. A.T. Blackmore. 3 Parkesway, St Stephens-by-Saltash, Cornwall. Tel: Saltash 843472, 842537 or 847705.

Sevenoaks & DARS: Sevenoaks DC, Council Offices, Argyle Road, Sevenoaks. December 2 - AGM and Christmas Social.

Shefford & DARS: Thursdays, 8pm. The Church Hall, Amphill Road, Shefford, Beds. Nov 28 - A Guide to Things IBM Compatible by G1JKF, Dec 5 - VHF Contest Through the Ages by G4LOO, 12th - The Constructors' Contest, 13th - Return Quiz vs Cambridge Club held at Cambridge, 19th - Chairman's Mince Pie Night. Nigel G1JKF. (0908) 274473.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. Dec 4 - Exhibition of Calligraphy with G0AWX, 11th - Xmas Party, 18th - HF Activity Evening, 25th - No Meeting. Len Baker. Whitchurch 832222.

Club Secretaries:

Send all details of your club's up-and-coming events to; 'Grassroots', Lorna Mower Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. Nov 28 - Construction Demo, Dec 12 - AGM. Brian Shelton G0MEE. 081-360 2453.

Stevenage & District ARS: Tuesdays, 7.30pm. Ground Floor Rear Suite, Sitec Building, Ridgemoor Park, Stevenage. Dec 3 - Practical Feedline Testing, 10th - Construction Projects Evening, 17th - Dutch Party & Quiz. Peter Daly G0GTE. Tel: (0438) 724991.

Stourbridge & DARS: 1st & 3rd Mondays. Robin Wood's Community Centre, Scotts Road, Stourbridge. Dec 2 - On Air Night. Dennis Body G0HTJ. QTHR.

Stratford upon Avon & DARS: 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford-upon-Avon. Dec 9 - Chaired Discussion Evening, 25th - Xmas morning greetings at 11am on 145.275MHz.

Three Counties RC: Alternate Wednesdays, 7.30pm. The Railway Hotel, Liphook, Hants. Dec 4 - Quiz Night. Dave G4VKK.

Todmorden & DARS: 1st & 3rd Mondays, 8pm. The Queen Hotel, Todmorden. Dec 2 - Annual Xmas Lecture by G3RJV, 16th - Social and Natter Night. Mrs E Tyler. (0422) 882038.

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. Dec 13 - Xmas Party. Walt G3HTX. (0803) 526762.

West Kent ARS: 3rd Fridays, 8pm. The School Annex, Albion Road, Tunbridge Wells, Kent. Dec 20 - Xmas Party. John Taylor G3OHV. (0892) 664960.

West of Scotland ARS: Fridays, 8pm. Scout Shop, 21 Elmbank Street, Glasgow. Dec 4 - Visit to BBC/IBA Blackhill, 6th - EME on a Shoestring, 13th - Kilmarnock Club, Bright Sparks Trophy, 20th - Equipment Specification Checking and Xmas Social. Jack Hood. (0698) 350926.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. Oct 25 - AGM, Nov 8 - Desert Island Radio Nov 29 - Meet the Committee Evening, Dec 13 - Xmas Social, 27th - No Meeting. Chris Frost. 081-397 0427.

Wirral ARS: 1st & 3rd Wednesdays, 7.45pm. Ivy Farm, Arrows Park Road, Birkenhead, Wirral. Dec 4 - SSB QRP Radio by G3RJV, 18th - Xmas Party.

York ARS: Fridays, 7.30pm. York City Social Club, Bootham Crescent, York. K.R. Cass G3WVO. 4 Heworth Village, York.

junior listener

British DX Club

This month, **David Kenny** of the British DX club has written with a host of information that should prove very useful for the junior listener. The club has been active since 1974 when it started as the Twickenham DX Club. Since then, it has grown steadily and it's monthly newsletter, *Communication*, recently reached its 200th edition. Having just received the October edition of this newsletter, I was very impressed with the contents. The newsletter comprises thirty-two A5 pages and is packed with useful information. The very comprehensive news sections featured items from all over the globe and were very informative. To supplement the news items were regular logs for medium wave, h.f. and the tropical bands. In addition to all this was a short review of the Yaesu FRG-7 and a number of specialist reports. As you have probably gathered I was impressed!

One of the services that they offer to members is the supply of ready-printed reception report forms. These contain the club logo and can be used to QSL with commercial radio stations around the world.

For those with an interest in UK broadcasting stations the club produces an excellent booklet entitled *Radio Stations in the United Kingdom*. This is a very comprehensive publication that covers all UK stations and includes address, phone number, power and transmitter locations. The main frequency list is also cross referenced to show the parallel transmissions. All this for just £1.50 to members or £2.00 for non-members!

Another interesting feature is the Tape Circle. This is an optional service for members and comprises a monthly ninety minute programme on a cassette tape. The tape contains recordings of DX catches as well as chat from members.

If I've wetted your appetite, the UK membership rates are £9.00 per year and enquiries should be addressed to:

The British DX Club, 54 Birkhall Road, Catford, London SE6 1TE. I would recommend membership as an ideal Christmas present for the young enthusiast!

HCJB Birthday Celebrations

How would you like an expenses paid trip to HCJB's station in Ecuador? If the answer is yes, all you have to do is send them a card with the words 'Happy 60th Birthday'. All the cards they receive will be entered in a prize draw that will take place on Christmas Day. The address to send your card is: HCJB, Box 691, Ecuador.

Still with HCJB, I have received news that they will be running a very special transmission from December 6 to 8. During this period HCJB's comprehensive antenna system will be used for amateur transmissions using the special callsign HC60JB. The frequencies in use will be 14.225, 21.3 and 28.5MHz \pm a few kHz.

The antennas to be used for the transmissions are actually located in Pifo which is 29km from the capital, Quito. Keith Clukey (KC6SMW/HC1) will be co-ordinating the event and plans to have two amateurs working simultaneously on two different bands. These amateurs will actually be operating from their homes and using their own antenna systems for reception. The transmit side being handled first by phone and then tapped into HCJB's microwave radio link. The reason for this is that there would be too much interference from HCJB's other transmissions to allow reception on site. Although HCJB's Siemens s.s.b. transmitters are capable of operating at 30kW they will be detuned to the amateur limit of 1.5kW for the special event station. However, the tremendous gain of the antennas mean that the signal strength will be boosted by between 18 and 25dB!

Of the 31 antennas on site, the amateurs will have the choice of a large rhombic with 8-13dB gain or perhaps the thirty storey high curtain antenna with eight parallel fed dipoles. There is also a steerable antenna that is capable of handling 500kW! Perhaps one of the most impressive is their 24-element quad antenna with four parallel fed arrays, each 6-elements deep! The quad antenna was invented by a former HCJB engineer, Clarence Moore specifically to overcome problems with high power broadcasting in the rarefied air of Quito's 9300ft Andes location. I've included a photo of the HCJB station so you can see how impressive it is.

If you would like to play a part in this special event, you can receive a very special QSL card if you log one of the amateur transmissions between 2100 on December 4 and 0030UTC on December 8. The address for your QSL card is:

HCJB, Casilla 17-01-00691, Quito, Ecuador, S.America.

Time Update

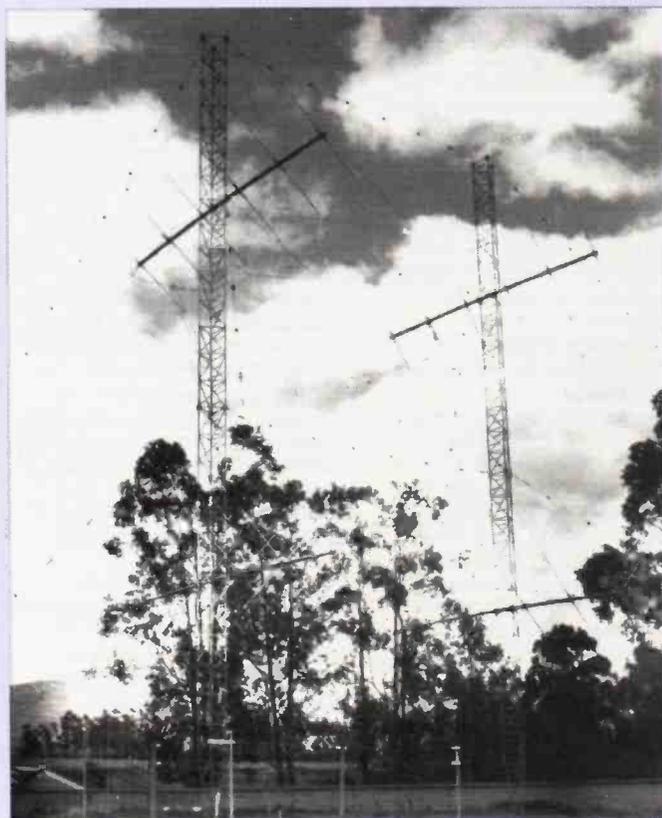
Following on from my feature on 'time' in the October 'junior listener', **Chris Broughton** of Southsea has written with news of a free publication that may be of interest. The book refers specifically to the standard time transmissions that are broadcast by a number of stations in the US. These stations usually transmit a carrier that is interrupted every second to provide an accurate reference. However, there is much more to these stations as they convey all manner of useful data related to time. The problem has always been where to get the details of what is sent. This is where the publication located by Chris comes in as it gives all this data. As well as the basic transmission data the book includes addresses for obtaining more detailed information. The title of this book is *Special Publication 432 (revised)* and the address is: National Institute of Standards and Technology, M/S 847, 325 Broadway, Boulder, Colorado 80303, USA. My thanks to Chris for this useful information.



Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

Radio Prague Monitor Club

This is a free club that anyone can join, so is bound to attract a healthy membership. To join all you have to do is provide regular reports of a range of programmes broadcast by Radio Prague. For those in the UK, a total of fifteen reports per year are required to secure membership. You will need to make sure the reports are marked 'For Monitor Club Membership' and numbered one to fifteen. You can either send your reports in together or just send them as you log the station. Once you have achieved membership status you will be sent a membership card and certificate. As a member you'll also be able to apply for their DX Diploma which is awarded for achievements in short wave listening. The frequencies to monitor for English transmission in Europe are: 5.93, 6.055, 7.345, 9.605, 11.685, 11.990, 17.84 and 21.705MHz.



Radio Polonia

Whenever you want to hear about Poland, Radio Polonia maintain they are the best source. It is the external service of Polskie Radio Warsaw and offers seven English-language broadcasts daily providing comprehensive and unbiased coverage of news events and all aspects of life in Poland.

Regular spots and features include:

News from Poland - current affairs coverage (Mon-Fri), news and commentary (Sat-Sun)

Panorama - weekly coverage of the Polish scene with hosts Jacek Detko and Michal Kubicki

Focus - on the arts and entertainment in Poland with hosts Rafal Keipuszewski, Michal Kubicki and Mirosław Lubon

Postbag - review of listeners' comment and queries with Jacek Detko and Ann Flapan

Topic of the Week - political analysis

What we Said - digest of the week's best on the English service

Jazz, Folk, Rock & Pop from Poland - the music scene with Jacek Detko, Roman Waschko, alternately with

Top Twenty - pop charts with Rafal Keipuszewski

DX Club Show - telecommunications magazine with Marek Lasota and Slawek Szefs

Request Concert - music requests and dedications with Stella Zielinska

0630-0725 - 9.675 & 7.27MHz

1200-1225 - 11.815 & 9.525MHz

1430-1455 - 9.525, 7.285, 6.135 & 6.095MHz

1600-1630 - 9.54 & 6.135MHz

1830-1855 - 9.525, 7.285, 6.135, 5.995 & 1.503MHz

2000-2055 - 9.525, 7.27 & 6.135MHz

2200-2255 - 7.27, 6.135, 5.995 & 1.503MHz

Your opinions and comments on Radio Polonia broadcasts are appreciated. Reception reports are confirmed with QSL cards. DXers are invited to join their DX Club (membership rules available on request or see 'junior listener' on page 5). Music requests are welcomed.

Please address all letters, reception reports, inquiries and requests to:

Radio Polonia, English Service, PO Box 46, 00-950 Warsaw, Poland.



HCJB's 60th Anniversary

If you'd like to add a rare QSL card to your collection then listen out from Friday December 6 at 2100UTC to Sunday December 8 at 0300UTC for the call HC60JB. Listen out on 14.225, 21.3 and 28.5MHz for the operators celebrating HCJB's 60th Anniversary.

The operators will have access to some of the world's most powerful short wave antennas, located at Pifo - a quick look back through 'DXing in Ecuador' over the last few months will give you an idea of what they're like.

Short wave listeners need to log the callsign of the station worked, the frequency, date and time in UTC. To get you special QSL card, send your logs to:

**HCJB, Casilla
17-01-00691,
Quito, Ecuador.**

DXTV News

Good news in Ghana, with the Tamale region enjoying TV after nearly a decade. Due to lack of funds and spares, the TV transmitters in that state have been off the air. Thanks to the USA firm Harris Allied International, two 'dual 10kW transmitters' have been supplied and being installed that should provide nearly 75% coverage with full servicing over the next 5 years. Thereafter, the Volta, Akatsi and Amedzofe regions of Ghana will have proper TV restored.

The new Maltese Broadcasting Bill will provide a further 10 v.h.f. radio frequencies for commercial radio with 3 already being taken by the Catholic Church (RTK) and 2 political parties (the Nationalists = Radio 101 and the Labour Party Radio Super One). By December, decisions will have been made on another 5 radio channels. A new cable TV service will be authorised and at the Gharghur transmitter side a 'new transmitter system' is to be constructed, alongside that of Xandir Malta.

The Israeli TV are

considering another TV channel, but the main problem is the lack of available TV channels - if a high co-channel interference protection ratio is to be achieved. It's likely that any new service will be delayed until the AMOS Israeli constructed satellite is available from 1995 onwards.

The Sri Lanka government owned 'Independent Television Network' (ITN) is to be privatised with shares being offered on the open market, though 30% will go to the government and a further 10% to employees. A 3rd TV channel operated by the Maharaja Organisation and based in Darwin (Australia!) is also likely to provide a satellite linked service into Sri Lanka offering general entertainment, films and sports - scrambled and with commercials.

A new independent TV channel in New Zealand is to be opened - Canterbury Television (CTV) - over the most populated part of South Island in former NZBC facilities.

Radio Bangladesh has but purchased 6 truck mounted v.h.f. transmitting units for

each main region that will offer outside broadcast facilities and improve news gathering - with the extreme cyclonic weather in that area bordering the Bay of Bengal, the mobile units will also provide radio contact with the outside world when the normal radio communication masts and cables are destroyed.

A new broadcasting region - the Mitteldeutscher Rundfunk (MDR) - was inaugurated July 1 and will offer 3 radio programmes and an additional MDR-3 TV programme, taking the mainstream ARD evening programme and with a local opt-out programme 1800-2000. Leipzig is the centre of the MDR with studio feed-ins from Halle, Landesrundfunkhauser, Erfurt, Magdeburg and Dresden. Licences for private TV in the MDR should be offered in 1992. The 3 Lander of Saxonia, Saxonia-Anhalt and Thuringia comprise the new MDR region.

The monopoly that the CLT Luxembourg has enjoyed for many years had ended with the government allowing a

public radio service with up to 40 local and 4 regional radio stations together with a new TV service - good news for radio/TVDXers!

Finally, this autumn saw the commencement of a Western financed cable company - Comsat Video Enterprises - in the cities of Moscow, Riga and Tbilisi with an initial 3 channel carriage rising to 8 as the customer base expands, including general news and sports (in English). With expansion both a children's and movie channel will be included. The cable service will be scrambled though decoder hire charge is very low - by UK standards.

BBC World Service

The BBC has signed an agreement that will put BBC Russian Service programmes onto Russian airwaves. Radio Russia will broadcast two half-hour BBC Russian Service current affairs programmes each weekend, starting early next year. Radio Russia's network reaches more than two thirds of the former Soviet Union's population. It spans the Russians Federation all the way from St. Petersburg across 11 time zones to Vladivostok on the Sea of Japan. The BBC programmes will be beamed to Moscow by satellite and then rebroadcast simultaneously all over Russia. Radio Russia will also be scheduling a Russian Service feature programme once a week from a selection of tapes sent from London. In return for this rebroadcasting arrangement, the BBC has agreed that one of the Radio Russia's broadcasters will come and gain work experience in London for six months with the Russian Service at Bush House.

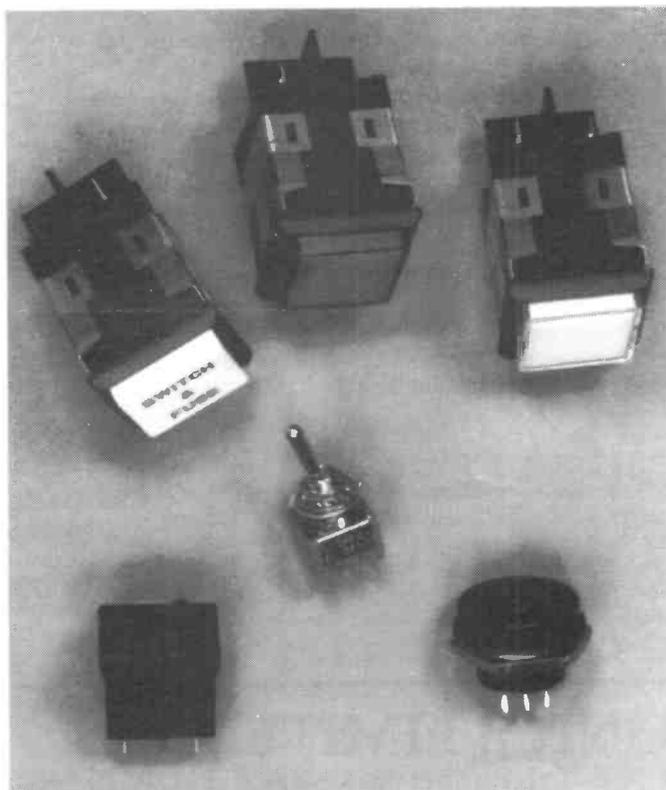
Also, the BBC World Service is to start broadcasting in Ukrainian early next year. It will be the first time the BBC has transmitted any Soviet language other than Russian and will bring the total number of languages broadcast by the World Service to 38. The BBC Ukrainian Service will add up to seven hours a week to BBC World Service's output which has now exceeded 800 hours, the highest weekly level since the end of WWII.

Switching Direction

Tremiver Ltd has recently revamped its switch product family. This is a continuation with their policy of only sourcing from the top European, North American and Far Eastern suppliers, most of whom have established brand names in their own right.

The new product family contains a range of switches available in differing specifications. The various configurations available are either fuse/unfused, illuminated, push button, toggle or rocker switches, panel or p.c.b. mount.

For more details, contact: **Tremiver Ltd., Unit 1, Summerlea Court, Alton Road, Herriard, Basingstoke, Hants RG25 2PN. Tel: (0256) 381514.**



New Catalogues

The new Henry's 300 pus page, colour catalogue is now available by post or at their shop. Complete with a Retail/Mail Order price list and £90 purchase vouchers and £2 off first purchase. The cost of the catalogue is £2 for callers or a C4 s.a.e. with £2.65 stamps affixed for UK by post.

A quantity price list is also available free to Trade, Industry, Educations & Training establishments. **Henry's Audio Electronics, 404 Edgware Road, London W2 1ED. Tel: 071-258 1831.**

The 1992 Greenweld catalogue is now out. New to this year's edition are a range of quartz clock movements, dials and hands, a section devoted to craft materials - timber, wheels, pulleys, propellers, balsa packs and adhesives; a choice of 28 analogue and digital multimeters from £9.95; a big selection of opto devices from subminiature 1.8mm l.e.d.s to 2.24in displays; a wide range of low-cost kits for railway and other modellers; 9 different radio receivers; many different soldering tools; plus, of course, a complete range of resistors, capacitors and semiconductors as well as a wide selection of test equipment from panel meters to oscilloscopes.

The catalogue costs £2.00 post free. **Greenweld Electronic Components, 27 Park Road, Southampton SO1 3TB. Tel: (0703) 236363.**

RAIBC News

The Radio Amateur Invalid & Blind Club (NI Area) is a charity with a difference. They realise that there are so many other charitable organisations asking for cash and donations from the public, so they are asking for donations of Air Miles, trading stamps and petrol coupons of all kinds as these generally clutter up the dash board of many cars until they are either cleaned up or go out-of-date.

Their efforts in this have been well rewarded in the past. These tokens, when converted into cash, are then used to provide home study courses and radio equipment for blind and disabled people who are, in some cases, house bound.

So, they would like to renew their appeal for readers to have a look in their cars and send them and tokens, vouchers and stamps that they can. They are especially looking for BP Lifestyle coupons which go out of date on 31 December 1991.

Your coupons can be sent, free of charge, to: **RAIBC (NI), FREEPOST BE1769, Belfast BT12 5BR.**

New Call-in Programme

HCJB are starting a new telephone call-in programme on November 4. 'Open Line' will be broadcast each Monday evening at 8.30pm Eastern Standard Time. It will offer people from around the world to call in and express their opinion on a variety of topics.

Ken MacHarg will host 'Open Line' and this will be the first regular programme involving specific topics for discussion. Initial topics, tentatively scheduled, are 'What makes for a good marriage?', 'Christopher Columbus: hero or villain?'; 'The environment: what is the Christian experience?'

If you want to take part, then the telephone number to remember is: 011-593-2-241-560. The line will not be answered until just before the caller is put on the air to save on telephone charges.

When it comes to sheer know-how Look to Lowe

The NRD-535 with a subtle difference



The NRD-535 is a fine receiver, and fully confirms the JRC leadership in this particular field. However, even the best can be improved in specific areas; and after lengthy evaluation of the NRD-535 we decided that there were worthwhile improvements which we at Lowe, with our knowledge and specialist expertise could introduce to the more discerning listener - for it is the true "listener" who will appreciate what we have done.

First; we thought that the audio from the NRD-535 was not totally easy on the ear, and detailed investigation showed that the audio response had been "tailored" to suit the rather round shouldered response of the IF filtering. So, we went back to the IF filters and specified a higher performance SSB crystal filter with a 6dB bandwidth of 2.4kHz and a typical shape factor of 1.8:1; with less than 1dB passband ripple. For AM, we fit a more expensive filter with a 6dB passband of 5.7kHz and a shape factor of 1.5:1. The response of these new filters is very flat within the pass band, with steep symmetrical sides giving excellent adjacent channel rejection. The use of these more expensive filters allowed us to flatten the audio response of the receiver giving a much cleaner sound quality and a real improvement in intelligibility both on communications and broadcast stations.

We have noticed in the past that the audio output power from most modern receivers is barely adequate for driving a good loudspeaker, and since we now had top quality audio from the NRD-535, we designed and fitted a completely new audio power amplifier with enough power (3W at 5% distortion) to enable the user to sit back and enjoy that quality to the full.

The use of synchronous AM demodulation and/or ECSS is an established feature of many newer receivers, and fitting the optional CMF-78 ECSS board to the NRD-535 provides the user with the potential to recover good audio from signals which are subject to selective fading.

However we noticed a tendency for the ECSS to unlock during deep fades and then fail to re-lock after the fade. We now have a series of detailed modifications to the ECSS unit which removes this tendency and also improves the recovered audio.

The Lowe Electronics modification pack definitely makes a good receiver into an outstanding receiver. When we sent a sample of our modified NRD-535 to Jonathan Marks at Radio Nederland, he confirmed that the results were quite remarkable and said so in no uncertain terms. We think that you will agree.

Naturally, these modifications cost a little more, but to complete the whole package we also pre-age the master reference oscillator in the receiver, check out the alignment, and issue an individual test certificate with each one. And because we are proud of our work we add a discreet badge to the front panel to tell you that you own a receiver with a difference.

The "Lowe" NRD-535. We make a good receiver into an outstanding receiver.

- New high specification IF crystal filter for SSB
- New high specification IF filter for AM
- New calculated audio bandwidth "flattening".
- New higher power audio output system.
- New tighter specification ECSS system.
- Pre-ageing and "burn-in" of master oscillator.
- Individual test certificate for each receiver.

Cost of modification before shipment . . £100 + VAT

Retro-fitted modification is not available at the moment due to the pressure on our skilled engineers, but may be available in the future. Contact us for details.

FREE

Send four first class stamps to cover the postage and we will send you, by return, your FREE copy of 'THE LISTENERS GUIDE' (2nd edition); a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will, I am sure, result in a 'good read'; but underneath the humour lies a wealth of experience and expertise. You will also receive detailed leaflets on our range of receivers and a copy of our current price list.



FOR DETAILS, TELEPHONE 0629 580800

LOWE ELECTRONICS LIMITED

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

When it comes to customer satisfaction Look to Lowe

5, MEADOW WALK, GREAT ABINGTON, CAMBRIDGE CB1 6AZ
Tel. (0223) 891997

Oct 29/91.

LOWE ELECTRONICS
CAMBRIDGE
OUT TOWN 94NBS.

Dear Tom, I felt I must write to you & your company to express the satisfaction I am receiving from the HF225 I had bought recently which I purchased from you about a month ago.

The performance is remarkable and in particular the selectivity & the S-meter letters provide a performance which is far superior than certain oriental receivers that I have had over the years.

The HF225 has significantly improved the enjoyment I receive from short wave radio & your company is to be congratulated on designing & producing this Super set. I am delighted to think that it is British made and great value for money.

I would appreciate it if you would pass my comments on those responsible in your company for this excellent product.

Yours sincerely,
J. Beardsall. C. Eng. M.I.E.E. J6174.

THE LISTENERS' BOOK OF THE YEAR GETS EVEN BETTER

The new 1992 issue of 'Passport to World Band Radio' is now with us and it's even better than before. The 200 pages have risen to almost 400 and every section carries the unmistakable authority of the world's best short wave companion.

Broadcasts are listed as before; not only in frequency order but also by language, country of origin AND the times of broadcasts. There are no less than 56 pages of receiver reviews, including the latest NRD-535 and Drake R-8, together with news, views and general information.

If you own a short wave radio, you simply MUST have the 'Passport' by its side. The price last year was £12.95; we have kept the price exactly the same this year at £12.95 (plus £1.55 for post and packing). Send off today.

*Bournemouth: 0202 577760 Bristol: 0272 771770 Cambridge: 0223 311230 Cumbernauld: 0236 721004
London (Heathrow): 0753 545255 London (Middlesex): 081-429 3256 Newcastle: Tel No TBA

*Closed all day Monday

Speedbird Concorde Zero One



One of the great technological achievements of our age. Concorde must be one of the most graceful aircraft flying. Photograph by Adrian Meridith, courtesy British Airways.

*Peter Rouse
GU1DKD
recently flew
to New York at
twice the
speed of
sound. In this
article he lets
us share his
experiences.*

"Speedbird Concorde Zero One is cleared to line-up and hold zero nine right." Twenty seconds later came the clearance to go and Captain Viv Gunton eased up the throttles to zero power surging through the four Rolls Royce - Snecma *Olympus 593* engines. On went the afterburners and at 10.58am London time G-BOAD roared down Heathrow's runway *Zero Nine* at the start of her flight to New York's John F Kennedy airport propelled by 38000 pounds of thrust. The acceleration was phenomenal and although I have travelled in a lot of aircraft I have never felt such thrust. G-BOAD swept down the runway through VI and V2 and then, just under three and half thousand metres along *09 Right*, came 'rotate' at 215 knots and we roared up from the ground like a rocket heading east towards the city of London. Seconds later came a fairly hard right turn towards the south and a throttling back of the engines as noise abatement procedures were implemented. Throughout the brief sequence I was amazed to see the air vaporising over the leading edge of the wing, such was our speed. It was as if a layer of fog was whipping over the wing's surface. Within four minutes we had broken through the layer of cloud at 5000 feet that was blanketing Southern England

as our course took us via Reading and on to the Bristol Channel where we would go supersonic. The turn continued as we came round through 180° to head towards the Woodley beacon (Whiskey Oscar Delta on 352kHz). From there Concorde has a special clearance direct towards the Bristol Channel and onwards to the magic position known as 'Accelpoint', 51.24 North, 03.50 West (go on, look it up on a map and you will find it roughly half-way between Cardiff and the coast of Cornwall. But let us step back for a moment because from lift off I was jotting down times and all the data that appeared on the big I.e.d. displays in the cabin. 11 minutes from lift off and we already at 23000 feet and climbing at 15000 feet per minute at a speed of 620 miles per hour. The Machmeter was showing 0.89 and the outside air temperature was minus 23 degrees Celsius.

Champagne

The steward and stewardess in our section were by now pouring out Champagne although I opted for a lager accompanied by derisory howls from the rest of the press party. The simple fact is that I just do not like Champagne although the Champagne houses of France are quite welcome to sponsor me on a trip on one of the Air

France Concordes to try and persuade me that I am grossly mistaken. Anyway, I digress. Still we kept climbing and within a few minutes we were holding a steady Mach 0.97. In other words Concorde was being flown with its speed kept a trickle below the magic Mach 1, the speed of sound. Then the overhead loudspeaker murmured into life and Captain Viv Gunton announced that we would feel a slight lurch as power was applied and we went supersonic. Sure enough, seconds later at 19 minutes into the flight and with the approval of ground controllers, the Machmeter hit 1 and kept going up.

The Name of the Game

By now you will probably gather that everything is done to make the entire flight, not just the supersonic bit, as fast as possible and that is the name of the game. People who pay to fly on this aircraft fork out something like two and a half thousand pounds one way and they expect to get to JFK in the shortest possible time. They also expect something a bit special in the way of on-board service and so, leaving the technical aspects aside for a moment, I decided to carry out a subjective (no test gear with me) review of the cuisine and wines. The sea food salad was excellent, the steak with a

Julienne of pepper strips was superb. The *Chateau La Forte de la Tour 1978* was served at exactly the right temperature and had obviously been allowed to breath for the right amount of time. If you are into this sort of thing then the Chef is Anton Mossiman (seen him on the Beeb) and the man who choses the wines is Hugh Johnson of wine book fame. All of this is served on real China, in real glasses and with proper cutlery. Richard Branson and cheap and cheerful Virgin 'it aint', but then you are paying a wee bit more. And before the writs fly, as well as the 'planes, I might add that Virgin are an excellent airline with whom I usually fly on my visits to the USA. There were then sweets, cheese and biscuits, vintage port and anything else your little heart desired whilst sitting back in well spaced seats, which are upholstered in genuine grey leather. The inside of Concorde is small compared with the wide-bodied Jumbos and seating is two-by-two. Even the windows are tiny measuring a mere 127 x 89mm. The view outside is quite odd. At 58000 feet altitude the earth's curvature is quite pronounced when viewed through the windows and the upper sky is a deeper blue than you would normally see from the ground.

SelCal BDAK

Back to the exciting bit - yawn! Thirty minutes into the flight and we are now travelling at

Mach 1.73 which is 1130 miles per hour at an altitude of 43500 feet. The outside air temperature is now a staggering minus 54 degrees Celsius and we are still accelerating. What is more we are now losing v.h.f. contact with Shannon and being transferred to Shanwick Oceanic on h.f. Track *Sierra Mike* will take us on the shortest route to run us across the Atlantic and down the east coast of the USA (the West-East track is slightly different and known as *Sierra November*). Communication with Shanwick is on 8.879MHz and 'Concorde Zero One' is assigned the SelCal BDAK. Although Viv Gunton talks to operators in Shannon, all the communications are routed to controllers at Prestwick in Scotland. The Shanwick organisation is slightly unusual in that the voices you hear on the oceanic frequencies are not those of controllers but professional radio operators. The idea is that the controllers at Prestwick get on with the job of controlling whilst the operators at Shannon do what they are best at; receiving and sending messages under conditions that are not always ideal.

I was interested to learn both on the Concorde flight and the return British Airways Jumbo trip that the crews do not like h.f. They sneeringly refer to it as a throwback to World War 2. But then they are hardly radio enthusiasts and they wonder why they cannot

have something clearer and simpler such as satellite communications. Pulling rank ("I work for Britain's leading communication magazine") I managed to get a quick chat with the crew in the cockpit. I learned that G-BOAD was one of seven Concorde operated by British Airways with Air France having the same number of aircraft. The crew consists of the captain, first officer and flight engineer. That's exactly the same as on a Jumbo which actually has less room in the cockpit. What the crew modestly did not mention was that they and the six cabin crew are the best of the best and are specially selected by the airline.

Mach 2

One and half hours into the flight our speed was up to Mach 2 (1320 m.p.h.) and our altitude had increased to 58000 feet. As the fuel is burned off and the aircraft becomes lighter it is simply allowed to rise and get faster. Half an hour later we started tracking down the eastern seaboard of Canada and the USA. Communication was now back to v.h.f. and first contact was with Gander on 125.900MHz. Contact with Gander was quite brief because at this stage, although G-BOAD was just off the coast, she was still supersonic. A few minutes later Concorde was passed to Moncton on 135.300MHz and contact was maintained until she reached the New York area. At 1.55pm

British time she finally returned to subsonic speed at an altitude of 32000 feet. Descent was then quite rapid and G-BOAD flashed across the New York State coastline just seven minutes after going subsonic. Ten minutes later the wheels touched the ground and massive retrothrust was applied to slow down the aircraft. British time was 2.12pm and our journey had taken just three hours and fourteen minutes. We may have just had lunch but it was now breakfast time in New York. We hardly seem to have been in the air before we were there and that's what I call travelling - no gritty eyeballs, no soggy clothes and no cramped joints. However, I hear the question asked: "Yes, but would you spend two and a half thousand pounds of your own money going by Concorde?". I will be honest with you and British Airways. No, I would never have dreamed of doing it. But having experienced it I know that I would have missed out on one of lifes great experiences. There is no doubt that flying on Concorde is a remarkable experience - during my time in New York I occasionally mentioned that I had travelled there on the aircraft and jaws dropped in amazement. Funny how we take the aircraft for granted, some British people even sneer at it as being a great folly, yet the Americans I spoke to saw it as one of the great technological achievements of our age and were clearly envious. ■



Concorde's hi-tech cockpit. Photograph courtesy British Airways.

The author would like to thank British Airways for arranging the trip and in particular Peter Crespell, who is their Station Manager in Jersey.

A Basic RTTY Receive-only Terminal Unit - Part 2

This month Bernard J. Greatrix G4ICZ describes the construction of the simple RTTY terminal unit and gives the software listings needed to run RTTY on the Commodore C64 computer.

The layout of the circuit is shown in Fig. 2.1. Veroboard is used and the layout has been designed for a CA084 op-amp with a dual polarity supply rail. The completed Veroboard is fitted in a plastics RS Components box (Electromail 508-598). Sticky Fixers could be used to secure it in place. By increasing the length of the Veroboard to 68 holes it can be simply dropped into the internal moulded slots. This leaves room for a transmit section to be added later if desired. The front panel carries two switches labelled FORWARD-REVERSE and 1445-2125Hz (or your preferred alternative frequencies). The back panel is furnished with input and output sockets.

For the sockets either phono or 3.5mm jack would be suitable as there are standard leads available for each of these.

For the output socket a 5-pin DIN allows provision for all the necessary connections to the computer. Fig 2.2 shows the connections to the board from the switches and sockets. Connections for the oscilloscope are again either two 3.5mm jacks, two phono

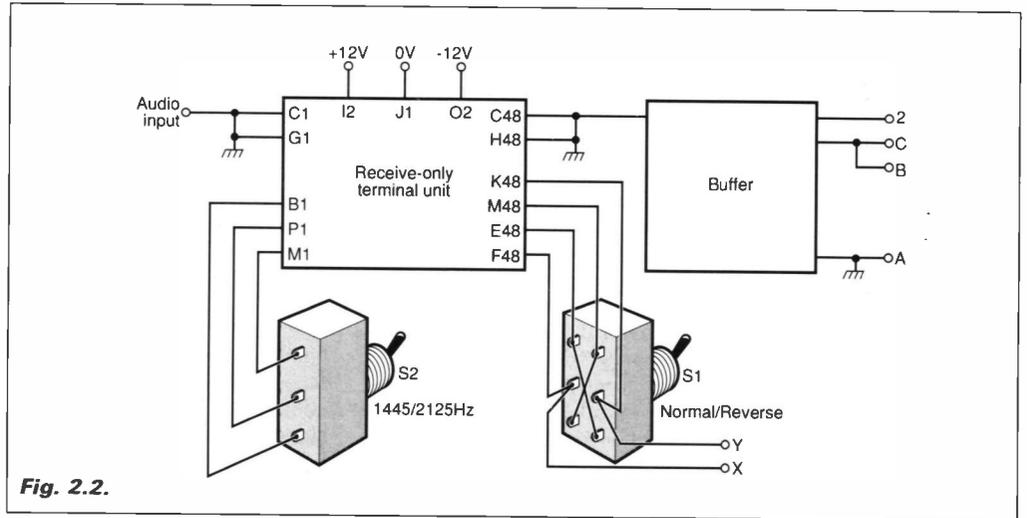


Fig. 2.2.

sockets or a single 3-pin DIN socket to suit the availability of cables.

Setting Up

Setting up the filters is a straight forward affair and merely consists of applying a "space" signal of 1275Hz to the input and adjusting R9 (approximately 178Ω) to give a maximum +ve signal on the cathode of D3 with the direction switch set to REVERSE.

A "mark" signal of 1445Hz is set by adjusting R8

(approximately 139Ω) to give a maximum +ve signal on the cathode of D3 with the direction switch set to NORMAL.

For those of you only wanting a single 170Hz shift unit, R21 may be omitted and replaced by a link between B2 and P1. If however a secondary tone is to be used a "mark" signal of 1700 or 2125Hz should be set by adjusting R21 (approximately 100 or 64Ω) in the above manner.

Obviously we need an audio signal generator to help

in this task, don't we? Well - not really. The Commodore 64 is furnished with a programmable sound chip and we can make this do the job for us. A DIN plug, a short length of screened cable, a couple of small crocodile clips and some more software is all that is required.

LISTING 2 gives the bare bones of a program to generate a square wave tone (perfectly adequate for this job) either from a stored value (1275, 1445, 1700, 2125Hz) or from a frequency value entered on the keyboard. With

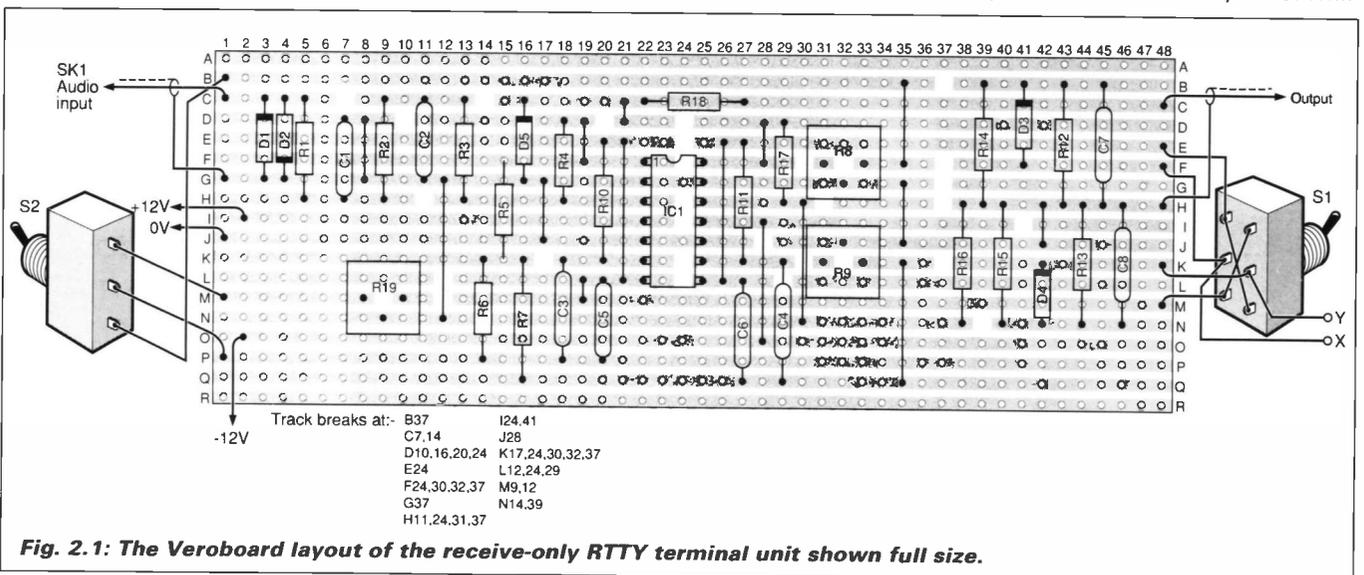


Fig. 2.1: The Veroboard layout of the receive-only RTTY terminal unit shown full size.

Listen to AOR

The **AR3000** now extends your listening horizons. Frequency coverage is from 100 kHz to 2036 MHz without any gaps in the range. All mode: USB, LSB, CW, AM, FM (narrow) FM (wide). 400 memory channels are arranged in 4 banks x 100 channels. 15 band pass filters before the GaAsFet RF amplifiers ensure high sensitivity throughout the entire range with outstanding dynamic range and freedom from intermodulation effects. An **RS232** port is provided to enable remote operation by plugging directly into most personal computers.

ACEPAC3 is an exclusively developed multi-function IBM-PC based program to further increase the versatility of the AR3000. A sweep facility provides a spectrum analysis graph. The very latest version displays frequencies in X axis and squelch opening percentage on each frequency in the programmed frequency search range. This indicates 'how active' the frequencies are in the programmed search range. In addition to the graphic display, ACEPAC3 can produce a detailed numerical list from the graphic information. One memory file has 400 channels divided into 4 banks of 100 channels. More than one memory file can be created to increase the memory storage capability. If you make just one extra memory file you can store 800 memory channels!

DA3000 Wide band 16 element discone aerial for external mounting. Frequency range 25 MHz to 2000 MHz (2 GHz). The aerial is supplied with approx 15m of coax terminated in a BNC connector ready to plug in and use with any AOR receiver. 'V' bolts and clamps are provided, however an additional supporting pole will be required for installation.



AR2000 ultimate portable monitor receiver...

AOR have followed on from the successful AR1000 and have made the specification of the AR2000 even better. (One major change is the replacement of the 154.825 MHz crystal with a highly-stable 12.8 MHz reference and multiplier chain). Whether out in a field running hand-portable, in the car or at home the AR2000 enables you to listen to both VHF and UHF airbands. Of course if you get tired of listening to airband, you can push a button or two and the world is yours! 'If it moves you can monitor it' - *well almost*. The choice of listening is endless, marine, Amateur band, airbands even BBC radio 2 on VHF FM. There are 1000 memory channels and 10 search banks, even a rotary tuning control is fitted to further enhance operation.

Search banks:

Bank 1	Shortwave	2 - 30 MHz	5 kHz step	AM
Bank 2	VHF FM	88 - 108 MHz	50 kHz step	WFM
Bank 3	VHF Air	108 - 138 MHz	25 kHz step	AM
Bank 4	UHF Air	225 - 400 MHz	50 kHz step	AM
Bank 5	VHF Amateur	144 - 146 MHz	12.5 kHz step	NFM
Bank 6	UHF Amateur	433 - 435 MHz	25 kHz step	NFM
Bank 7	VHF Marine	156 - 163 MHz	25 kHz step	NFM
Bank 8	VHF PMR	165 - 174 MHz	12.5 kHz step	NFM
Bank 9	C-Mobile	890 - 905 MHz	12.5 kHz step	NFM
Bank 0	C-Base	935 - 950 MHz	12.5 kHz step	NFM

UK Specific:

For ease of operation in the UK, the search banks have been pre-programmed at the factory. They may be easily re-programmed by the user. Each of the ten numeric keys is labelled with the corresponding search band, simply press one button and the receiver starts looking for interesting frequencies.

Frequency coverage:

The receiver has an exceptionally wide frequency coverage from 500 kHz to 1300 MHz (1.3 GHz) with no gaps. The modes available are AM, FM (narrow) and FM (wide). Any available mode may be selected at any frequency within

the receiver's coverage. There is no frustration in mode selection encountered here, you are *not forced* to listen to a specific mode at a specific frequency or band.

Accessories supplied:

- DA900 single wide band whip aerial for VHF and UHF
- AC charger
- 4 x AA High capacity rechargeable NiCad batteries
- 12V DC lead fitted with a cigar lighter plug for mobile operation
- Soft case with carry strap
- Belt hook
- Earphone

Everything you need is included to just switch on and start listening - today.



*Also available: AR2800, AR2500, etc.
For a complete set of leaflets and price list please send a S.S.A.E. (34p).*

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RECEIVING O.K.?

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The **FRG8800** HF communications receiver. A better way to listen to the world. Continuous coverage from 0.15-30MHz optional module for VHF coverage from 118 to 174MHz. SSB, CW, AM & FM modes. Direct frequency entry keyboard.

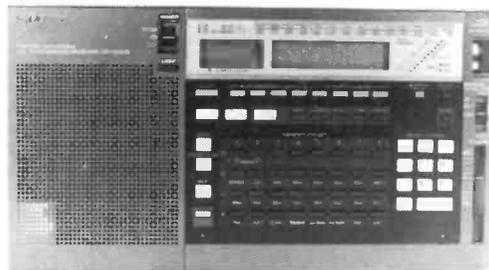
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The **ICFSW7600** is a sophisticated portable receiver that combines power and flexibility with one-touch convenience. Freq. range AM 150-29995kHz and FM 76-108MHz.

The **ICFSW1E** is possibly the world's smallest shortwave radio, fully featured with a multiple tuning system and PLL synthesised circuitry for digital precision. AM 0.15-30MHz & FM 76-108MHz.

The ultimate Multiband receiver, the **ICF2001D** combines sophisticated shortwave technology with the ease and versatility of both digital and analogue tuning. Freq. range AM 0.15-30MHz, FM 76-108MHz and AIR 116-136.6MHz.



The **ICFPRO80** is a handheld professional receiver with air band capability and an 8-way tuning system. Frequency coverage 150kHz-108MHz and 115.15kHz to 223MHz with FRQ 80 frequency converter.

The **Air 7** is an all purpose handheld multiband receiver with continuous waveband coverage including air band and utilising a 6-way tuning system AM 150-2194kHz, FM 76-108MHz, Air 108-136MHz and PSB 144-174MHz.

The compact **HX850E** is a basic scanner with a few memories. Ideally, suitable for a novice in the scanner market. AM/FM modes and a frequency coverage of 60-89, 118-136, 140-174 and 406-495MHz.



The **NRD525** is a high-class, general coverage receiver with expandability looking to the future. Combining traditional technology unique to JRC with the most advanced digital technology gives superb performance whilst remaining extremely easy to use. The NRD525 covers 90kHz-34MHz and with an optional VHF/UHF converter also covers 34-60, 114-174 and 423-456MHz. Modes of operation CW, SSB (USB/LSB), AM, FM and RTTY with optional demodulator.

The **HP200E MKII** is a 1000 channel, programmable, handheld scanner. AM, FM and FM wide for commercial channels covering 500kHz - 600MHz and 805-1300MHz. Supplied complete with NiCad charger, Antennas, DC cable, shoulder strap, outclip, carry case and earpiece.



The **Bearcat 200XLT** is the cream of the Bearcat handheld scanner range. With 200 memory channels and simple operation these are proving very popular. Freq. coverage 66-88, 118-174, 406-512 and 806-956MHz.



The **AIR HANDY** is a compact thumbwheel controlled handheld receiver. Light in weight and easy to use makes it an ideal introduction to receive. The AIR handy covers 118-136MHz and is AM.



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Project

the program running the signal from pin 3 of the 5-pin DIN (Audio/Video) socket on the back of the computer is fed to the input of the terminal unit [4 pages 396-397]. This signal is about 1V peak to peak, with the level set to the maximum value by the value 15 in LINE 40. There are many improvements that can be made - screen layout for one, adding filtering to the sound for another. My only comment is 'do it!'.

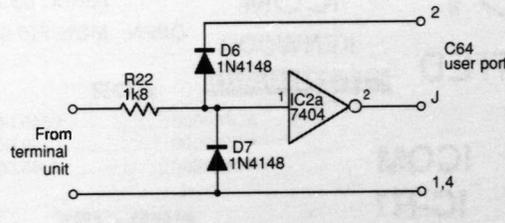
We could also make use of the joy-stick port with a suitable interface, and again some more software as the voltmeter also needed, but this is probably taking this project too far when a general purpose multimeter should be in every toolkit.

Software

Now to the conversion of the digital information into readable characters. Given in LISTING 3 is a simple RS232 receive program for use with the Commodore 64. Unfortunately, not having access to other micros, the author is not able to advise on conversion. However, it is believed that many of the popular machines (e.g. BBC and Spectrum) have access to the 'user ports' and can be programmed to accept a RS232 signal. With this in mind it is hoped that the following comments will both help in the understanding of how the C64 can be made to comply, and also how other machines may respond :

Line 10. Opens a communications channel to device No. 2 (Modem) and sets this channel as 5 bit (baudot), 1 start bit, 1 stop bit, half duplex. It also sets the baud rate to 50.

Fig. 2.3.



Line 11. Use as an alternative to line 10 if 45.45 baud is required.

Lines 12-15. Dimensions an array to 65 and reads into this array the alphabet and numerals etc., also sets an arbitrary 'flag' character to zero.

Lines 20-25. Gets a character from the input port and converts it into an ASCII value.

Lines 26-28. Picks up figure shift/letter shift and modifies the ASCII accordingly.

Line 30. If there is a character available prints its image in black (the black square is a Commodore 'special' character, see *User Manual*).

Line 40. Go back to line 20 and do it all again.

Obviously such a program is very limited and variations are given later for those who wish to experiment. Any noise in the receive chain will undoubtedly cause figures in the place of letters and vice versa with obvious confusion and the only way to deal with this 'hiccup' using such a simple program is to:

a: Wait for the sender to insert the correct 'shift'. He probably won't bother whilst he's sending something interesting. You'll have to wait ages.

b: Stop the program and restart hoping that the correct shift is in use - most unlikely. Don't forget Murphy.

c: Insert a line in the program to check the

keyboard so that the operator can modify the display accordingly.

For this last option and other 'useful' additions see LISTING 4. This extends the simple program to permit the user to vary the baud rate in 1 or 10 baud steps and also change the 'shift' from letters to figures and back again, during receive

I should point out that whilst the upgraded program is a little larger there are no major surprises that should cause problems in interpretation except for lines 200 to 350. These lines are specific to the Commodore 64 in that, having read the keyboard instructions to change the baud rate, values

are 'poked' into the RS232 registers within the C64 memory.

All that remains to do now, having built the unit is to connect it to the computer (via a TTL buffer, if you're as cautious as I am) as suggested by Fig. 2.3 and run the program.

I would suggest searching around 14.090MHz for suitable amateur signals or 145.300MHz if you have an active v.h.f. group in the area.

Finally it has not been the intention to steer any would be purchasers away from the ready made 'black boxes'. Rather, the aim has been to encourage the reader to experiment with simple circuits, and explore the realms of basic computer programs both of which do work reasonably well, and then hopefully, to enable them to decide from a position of experience what would suit them best.

Turn to page 17 for the program listings.

YOU WILL NEED

Resistors

Carbon Film 0.25W 5%

1.8kΩ	2	R1, 2
4.7kΩ	3	R5, 16, 18
22kΩ	3	R3, 14, 15
100kΩ	2	R12, 13
220kΩ	2	R6, 7
390kΩ	2	R10, 11
5.6MΩ	2	R4, 17

Potentiometers

Cermet preset

200Ω	4	R8, 19, 20, 21
------	---	----------------

Capacitors

Polyester

15nF	6	C1, 2, 3, 4, 5, 6
22nF	2	C7, 8

Semiconductors

Diodes

1N4148	4	D1, 2, 3, 4
4.7V 400mW	1	D5

Integrated circuits

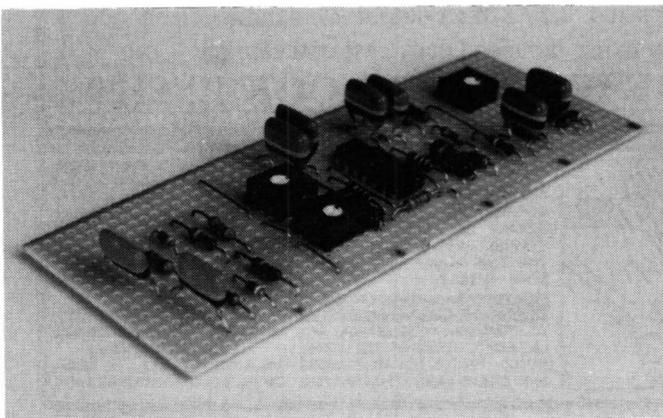
CA084	1	IC1
-------	---	-----

Miscellaneous

Veroboard 50 holes x 18 tracks (see text); Plastics box (Electromail 508-598); Sockets (see text); Switches (see text).

Veroboard Connections

Signal input.	C1
Signal ground.	G1
+12V	I2
0V	J1
-12V	O2
Select 1445Hz.	B2
Select 1275Hz.	M1
Selected value.	P1
Output signal.	C48
Signal ground.	H48
Select Forward.	E48
Select Reverse.	M48
Return connections.	F48 & K48



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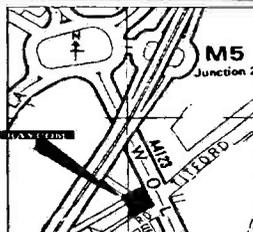
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Project

```
1 REM ::: LISTING 2
2 :
3 REM ::: PROGRAM TO EMULATE AN
4 REM ::: AUDIO SIGNAL GENERATOR
5 :
6 REM ::: G4ICZ JANUARY 1991
7 :
8 REM ::: SET UP SOUND PARAMETERS
9 REM ::: TO GENERATE SQUARE WAVES
10 :
20 S=54272:
30 FOR X=0 TO 24: POKE S+X,0: NEXT
40 POKE S+24,15: POKE S+5,0: POKE S+6,240
50 POKE S+3,8: POKE S+1,HI:POKE S,LO: POKE S+4,65 60 :
100 PRINT "1.. 1275HZ"
110 PRINT "2.. 1445HZ"
120 PRINT "3.. 1700HZ"
130 PRINT "4.. 2125HZ"
140 PRINT "5.. ANY OTHER FREQUENCY"
150 GET A$: IF A$="" THEN 150
160 A=VAL(A$): IF A<1 OR A>5 THEN 150
170 ON A GOSUB 500,510,520,530,550
180 F=F/.058717
190 HI=INT(F/256): LO=F-(HI*256)
200 GOTO 40
210:
500 F=1275:RETURN
510 F=1445:RETURN
520 F=1700:RETURN
530 F=2125:RETURN
550 INPUT "ENTER FREQUENCY";F
560 IF F<100 OR F>3000 THEN 550
570 RETURN
```

Note. 1. The value of 0.058717 in LINE 180 was the value needed to make **my** C64 produce correct frequencies. This is a variation on the 'correct' value, which I've put down to variations in clock crystal frequencies between the USA and the UK.

2. The frequency limit has been set to 100-3000Hz by LINE 560. Little or no other error checking has been added.

```
1 REM ::: LISTING NO 3
2 :
3 REM ::: SIMPLE RTTY
4 REM :::RECEIVE PROGRAM
5 :
6 REM ::: G4ICZ JANUARY 1991
7 :
8 :
10 OPEN 2,2,0,CHR$(96+1)+CHR$(16)
11 REM :OPEN 2,2,0,CHR$(96)+CHR$(16)+CHR$(243)+CHR$(41)
12 DIMD(65):P=0
15 FOR N=1 TO 64:READ D(N): NEXT
20 GET#2,A$
25 N=ASC(A$+CHR$(0))
26 IF N=31 THEN P=0
27 IF N=27 THEN P=32
28 N=N+P
30 IF A$<>"*" THEN PRINT "*"CHR$(D(N)):
40 GOTO 20
50 :
100 DATA 69,32,65,32,83,73,85,13,68,82,74,
78,70,67,75,84,90,76,87,72,89,80
110 DATA 81,79,66,71,32,77,88,86,32,32
120 DATA 51,32,45,32,39,56,55,13,32,52,32,
44,37,58,40,53,43,41,50,92,54,48
130 DATA 49,57,63,64,32,46,47,61,32,32
140 :
150 REM: CONNECT INCOMMING SIGNAL
```

```
151 REM: TO PINS B & C OF USER PORT
152 REM: PROGRAM AS LISTED RUNS
153 REM: 50 BAUD
154 REM: TO RECEIVE AT 45.45 BAUD
155 REM: DELETE LINE 10 AND THE
156 REM: "REM" IN LINE 11
157 :
158 REM: NOTE "*" IN LINE 30
159 REM: SHOULD BE CONTROL/1
160 REM: (IE PRINT IN BLACK)
```

```
1 REM ::: LISTING NO 4
2 :
3 REM ::: MODIFIED RTTY
4 REM :::RECEIVE PROGRAM
5 :
6 REM G4ICZ JANUARY 1991
7 :
8 :
10 OPEN 2,2,0,CHR$(96+1)+CHR$(16)
11 :
12 DIM D(65):P=0:B=50:PRINT B" BAUD"
15 FOR N=1 TO 64: READ D(N): NEXT
20 GET#2,A$
25 N=ASC(A$+CHR$(0))
26 IF N=31 THEN P=0
27 IF N=27 THEN P=32
28 N=N+P
30 IF A$<>"*" THEN PRINT "*" CHR$(D(N)):
40 GOSUB 200: GOTO 20
50 :
100 DATA 69,32,65,32,83,73,85,13,68,82,74,
78,70,67,75,84,90,76,87,72,89,80
110 DATA 81,79,66,71,32,77,88,86,32,32
120 DATA 51,32,45,32,39,56,55,13,32,52,32,
44,37,58,40,53,43,41,50,92,54,48
130 DATA 49,57,63,64,32,46,47,61,32,32
140 :
200 IF K$="+" THEN B=B+1
210 IF K$="-" THEN B=B-1
220 IF K$="I" THEN B=B+10
230 IF K$="D" THEN B=B-10
234 IF K$="L" THEN P=0
236 IF K$="F" THEN P=32
240 PRINT: PRINT B"BAUD": PRINT
250 GOSUB 300
260 RETURN
300 F=0.98525E6
310 HI=INT((F/B/2-100)/256): POKE662,HI
320 HA=INT((F/B/)/256): POKE 666, HA
330 LO=INT(F/B/2-100-(HI*256)+.5): POKE661,LO
340 LA=INT((F/B-(HA*256))): POKE665,LA
350 RETURN
360:
400 REM: CONNECT INCOMMING SIGNAL
401 REM: TO PINS B&C OF USER PORT
402 REM: PROGRAM AS LISTED RUNS
403 REM: 50 BAUD
404 REM: TO MODIFY USE _____
405 REM: '+' INCREASE BY 1 BAUD
406 REM: '-' DECREASE BY 1 BAUD
407 REM: 'I' INCREASE BY 10 BAUD
408 REM: 'D' DECREASE BY 10 BAUD
409 REM: 'L' CHANGE TO 'LETTERS'
410 REM: 'F' CHANGE TO 'FIGURES'
411 :
412 REM: NOTE "*" IN LINE 30 SHOULD BE
413 REM: CONTROL/1 (IE PRINT IN BLACK)
```

RECEIVERS ARE 'IN' AT WATERS & STANTON

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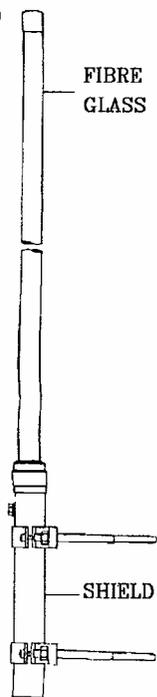
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Base Station Aerial D707

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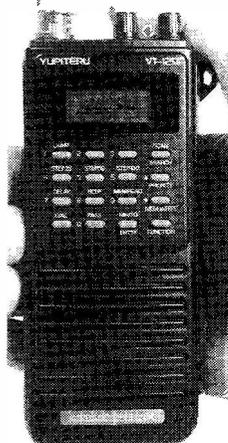
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24mA (Battery save.)
Dimensions: 110 x 53 x 37mm
Weight: 370g
Configuration: AM/FM Triple conversion
Sensitivity: NBFM -8dB (12dB SINAD)
AM -2dB (10dB S/N)
Memories: 100 in banks.

STOP PRESS!!!
"Sensitivity far better than its
obvious rivals"
says Japanese magazine
review

Up until now most handheld scanners have been large and cumbersome with low grade plastic cases using technology that has been around for several years. The arrival of the ALINCO DJ-X1 has changed all that. This brand new receiver is ruggedly built, compact, and above all, ultra sensitive. ALINCO are the first major manufacturer of communications equipment to produce a new generation of scanning receiver. All of a sudden its competitors seem drab, old fashioned and lacking in sparkle and performance.

The new exciting DJ-X1 should be available now at your local dealer. Try it out for yourself, experience the superior design and performance. Compare it with "yesterday's" models and find out just how far advanced the new ALINCO scanner is! But just to wet your appetite, here's a few of its features:

★ 3 scanning speeds ★ 3 scanning modes ★ 100 memories in 3 banks ★ Auto memory loading ★ Priority channel ★ Dual rate battery saver ★ Large battery pack ★ Rotary frequency control ★ Illuminated key pad ★ Auto illumination mode ★ Dual antennas ★ 5 programmable bands ★ Widest range of frequency steps ★ Super front end sensitivity ★ Memory lockout ★ Mode scanning ★ Auto power off ★ Wide range of battery packs ★ Wide range of accessories ★ Intelligent mode programme ★ Rapid tuning rates of 1MHz-10MHz.

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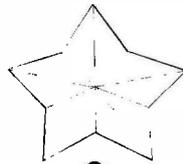
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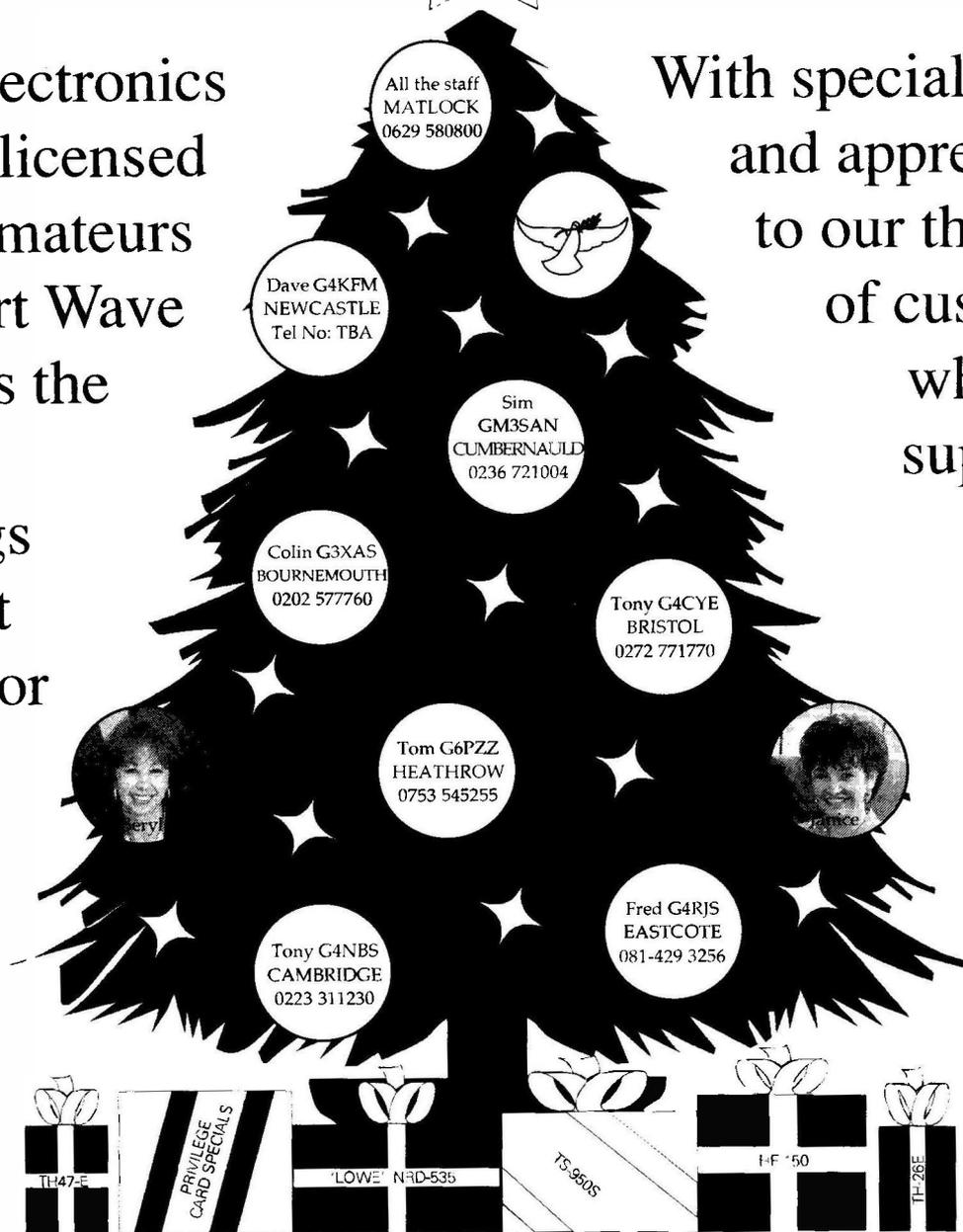
*And there were in the same country shepherds abiding in the field, keeping watch over their flock by night.
 And lo, the angel of the Lord came upon them, and the glory of the Lord shone round about them; and they were sore afraid.
 And the angel said unto them, Fear not: for, behold, I bring you good tidings of great joy, which shall be to all people.
 For unto you is born this day in the city of David a Saviour, which is Christ the Lord.
 And this shall be a sign unto you: Ye shall find the babe wrapped in swaddling clothes, lying in a manger.
 And suddenly there was with the angel a multitude of the heavenly host praising God, and saying,
Glory to God in the highest, and on earth peace, good will toward men.*

Luke 2, v.8-14



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Radio Times

*When I twiddle the knobs on my old wireless set,
Through the crackle and whines funny programmes I get.
Though reception is fading and quality's harsh,
I'd swear I can hear Much Binding in the Marsh.*

*Yes, old Kenneth Horne's joking and Murdoch is witty,
And even Sam Costa is singing a ditty.
But next on the dial, in the Light Programme slot,
Dick Barton and pals are receiving their lot.*

*Will they get out of prison or will snakes get them first?
No, Dick, Snowy and Jock all break free with a burst.
A quick flick of the wrist and we travel in time
To Mrs Dale's Diary - a programme sublime.*

*She's worried to bits about dear hubby Jim,
But all will be well once mixed him his Pimm.
It's five o'clock now and nice Uncle Mac's here.
Yes, it's Children's Hour time - hide the fags and the beer.*

*In Toy Town we listen to Larry the Lamb
Sipping hot Ovaltine, eating bread, marg and Spam.
Then with nice Wilfred Pickles we all Have a Go
Before proving with Brains Trust there's loads we don't know.*

*But next on the air in a voice loud and clear
Come the words "Mr Handley, it's Mrs Mopp here."
"Can I do you now sir", and, "TTFN"
Then it's over to laugh with Beyond our Ken.*

*I turn to the Home Service to see what is on,
But Appointment with Fear has just ended and gone.
So on through the wavebands till music we hear
It's In Town Tonight full of Henry Hall cheer.*

*The programmes are endless, the talent is great,
And for Educating Archie I can hardly wait.
Paul Temple is solving a strange murder tale.
And Life with the Lyons for me just cannot fail.*

*So if I feel lonely you safely can bet
I'm happy to twiddle with my wireless set.
My friends will all join me, their message is clear,
I know they'll all help me to Take it from Here.*

David Leverett

How many different radio programmes are referred to, directly or indirectly, in David Leverett's poem? List them all on a piece of paper and send it to: Radio Programme Competition, *Short Wave Magazine*, Enefco House, The Quay, Poole, Dorset BH15 1PP to arrive no later than 9 January 1992. You must enclose the Radio Programme coupon from the foot of the Contents Page of this issue with your entry. The first correct entry drawn out of the 'hat' will win a prize of a replica vintage radio. The Editor's decision is final and no correspondence will be entered into in respect of this competition.

Educational Software for Basic Electronics

Part 10

J.T. Beaumont G3NGD continues with Pythagoras' Theorem, Energy, Heat and Temperature and Resistivity.

Pythagoras' Theorem

Knowledge of Pythagoras' Theorem is of importance to students involved in Electrical engineering. The Theorem is used when solving problems associated with Impedance, Reactance, Tuned Circuits, Power factor, etc.

When the program is RUN the student is presented with a menu. After the data has been entered a triangle is drawn, to scale, on the screen. This has a two-fold advantage. In addition to finding the third side of a right angles triangle, there is the opportunity to measure the angles using a protractor. The triangle is drawn on the screen using a procedure called Proc-draw and is located at line 600 in the program. (S24.)

Energy, Heat and Temperature

This program is used for revision purposes. When the program is RUN the following options are presented on the screen:

1. Introduction to Energy.
2. Introduction to heat.

3. Transmission of Heat.
4. Introduction to Temperature.
5. Calculations.

The material includes: joules, watt-seconds, kilowatt-hours, specific heat capacity, conduction, convection and radiation, Celsius, Fahrenheit and Kelvin.

The calculation section converts the following:
Degrees Celsius to Fahrenheit and Kelvin.
Degrees Fahrenheit to Celsius and Kelvin.

Celsius and Kelvin.

Degrees Kelvin to Celsius and Fahrenheit.

One of the screens, showing formulae, is shown in S25.

Resistivity

When this program is RUN the following options are presented on the screen:

1. Resistance and conductor length.
2. Calculation by Ratio, Resistance to Conductor

length.

3. Resistance and Cross-sectional Area.

4. Resistivity.

5. Resistivity Calculation information.

6. Resistivity Calculation.

7. Exit the Program.

In this program graphics are used to compare the ratio of resistance between conductors of rectangular cross-section and those of circular cross-section.

Two calculation options are available to enable students to check their answers. These are:

Calculation of Resistance ratio.

Calculation of Resistivity.

A typical screen is shown in S26.

The complete suite of programs is available on a 5¹/₄in 40 or 80 track floppy disk direct from *Short Wave Magazine*. The software is only available for the BBC Computer, price £8.95 post free. Please remember to specify 40 or 80 track.

```

Pythagoras' Theorem
-----
DO YOU WANT TO CALCULATE:
1. The Hypotenuse
2. The Vertical Side
3. The Base
4. or EXIT from the program

      Hyp      Side
       / \     /
      /   \   /
     /_____\ /
    Base

Press the number key to select
-----
    
```

S24.

```

-----
To convert °C to °F
-----
°F = 9/5 °C + 32

-----
To convert °F to °C
-----
°C = (°F - 32) * 5/9

-----
To convert °C to Kelvin
-----
Kelvin = °C + 273

Press the space-bar to continue
    
```

S25.

```

-----
RESISTIVITY
-----
Material      Resistivity Ωm
-----
Aluminium     2.7 x 10-8
Brass         7.2 x 10-8
Copper        1.7 x 10-8

The formula to calculate resistance is

R = ρ * l / a

R is the resistance in ohms Ω
l is the length in metres
ρ is the resistivity in Ωm
a is the area in square metres

Press the space-bar to continue
    
```

S26.

A.R.E.

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SM2™ is designed to be upgradable, and will run many different radios with just a change of software and connecting leads. It will accept Plug-In Boards to further expand its power and usefulness. Once you have used SM2™ you will wonder how you ever used a Scanning Receiver without it !!

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Available Now...

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Software available for:

AR3000 AR2002 CHASE IC-R7000 IC-R9000 FRG9600

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Brief Thoughts on the ATU

Modern receivers are designed to 'look at' an unbalanced (coaxial) antenna feeder, either by way of antenna and earth terminals, a coaxial socket, or even both. Most people just hang their antenna and earth wires onto these terminals and set off to explore the bands. Paul Essery offers some thoughts on the subject of antenna tuning units.

If you visit one of the dab hands at short wave listening, you will probably find that he has a box labelled 'antenna match' or 'Z-match', 'a.t.u.' or something similar, with the antenna and earth connected to the receiver through it. The box may provide for alternative antennas to be switched into use - my own provides for two coaxial-fed antennas to be fed directly to the receiver and in addition an end-fed wire is transformed into 50Ω by an a.t.u. circuit. There is a dummy load in the box as well.

What is the a.t.u. doing?

The antenna has a property called its 'impedance', which can be summed-up as being like resistance plus, in series or parallel, either capacitance or inductance. The values of resistance, capacitance (or inductance) vary between wide limits. Now, if we are to suck from the antenna the maximum signal impressed on it by the distant transmitter, we must transform this impedance to be the same as the nominal impedance of the receiver input. To do this, any capacitance must be balanced out by the equivalent inductance, or vice versa as the case may be. Further, the resistive component must be transformed to equal the resistance of the receiver input circuit. What does this mean in practice? Imagine that you have an old-fashioned

transmitter with the pi-tank output on Top Band, and no a.t.u., feeding a 20m end-fed wire; this is about 1/8 long. You tune up and are surprised to find the output capacitor, instead of being almost fully meshed, is almost out of mesh. The rest of the capacitance is, in fact, lurking up the antenna! Now imagine you have a change-over switch which changes the wire over to the receiver. Lo! the capacitance up the antenna is now shunting the receiver. Now, you wouldn't expect to hang, say, a 1000pF capacitor between antenna and earth terminals of the receiver and still have the receiver performing as it could if properly matched, would you? Obviously most of your signal would take the line of least resistance and go to earth through the invisible shunt capacitor!

So - that's what an a.t.u. will do; tune out the reactance so that everything the antenna can give is not shunted away. In addition it does a similar service for the resistive component, so all that the antenna can give is swallowed by the receiver. If, like most of us, you have an end-fed wire of random length, we can say that, depending on the frequency we choose to listen to and the length of the wire, we gain up to three S-points by correct a.t.u. adjustment. If we have an accurately cut and pruned coaxial-fed dipole for the

middle of, say, 14MHz, we can reckon it will cover the band nicely with minimal losses and without an a.t.u. - but only, mark you, if it has been pruned to resonance in its final home. For the transmitting amateur, that's easy; all he does is measure the s.w.r. at various frequencies and draw a graph, adjusting the length of each leg equally until the best s.w.r. appears at the middle of the band. For the s.w.l., it is a matter of getting an amateur to come and use his transmitter, or of your doing the best you can with a dip oscillator, either alone or with a sensitive s.w.r. bridge. If you haven't these tools, assume the worst and use an a.t.u.

Umpteen Circuits

Which a.t.u.? There are umpteen circuits to try and as many commercial units you could buy! About all you can say is that any circuit or unit can find itself up against an impedance combination it can't cope with. Doesn't happen often, but it happens! What to do then? Assume our end-fed piece of wire. First of

all, check that the a.t.u. can in fact 'hit the band' - hang a non-inductive resistor between the a.t.u. antenna and earth terminals, and see if you can find a setting of the a.t.u. controls where the 'sharsh' in the speaker peaks. Next consider the possibility of changing the length of the antenna itself. Let's say you are stuck with this length, thanks to a convenient chimney or whatever. You can make a wire look longer by adding a small amount of inductance in series with the antenna (i.e. between the a.t.u. antenna (A) terminal and the start of the antenna), or you can make the wire look shorter by putting a variable capacitor in series. If you try this, sit the capacitor on a bit of paper so it doesn't short to the a.t.u. case! By the same token, you can also try hanging a bit of inductance or capacitance between the antenna and earth terminals of the a.t.u. (Fig. 2). Usually the amount of inductance or capacitance, whether in series or in parallel, will be quite small; use as little as you can to achieve the desired end.

Alternatively, try a different a.t.u. circuit! ■

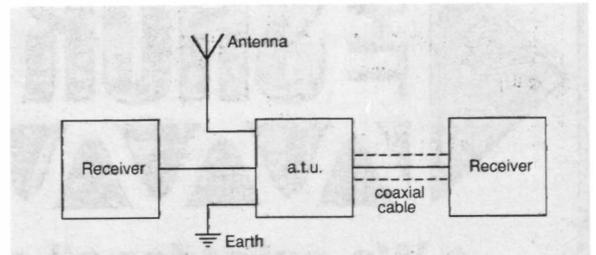


Fig. 1: The use of an a.t.u.

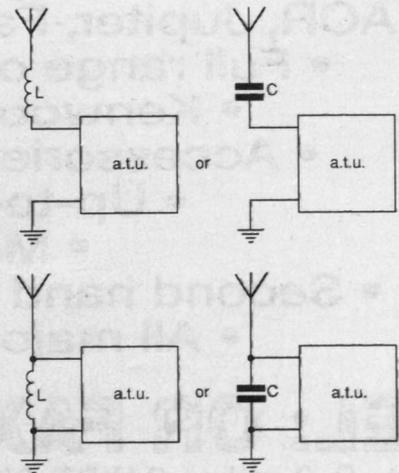


Fig. 2: When the a.t.u. cannot cope.

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Sony WA8800 Ten-band Radio-Cassette Recorder

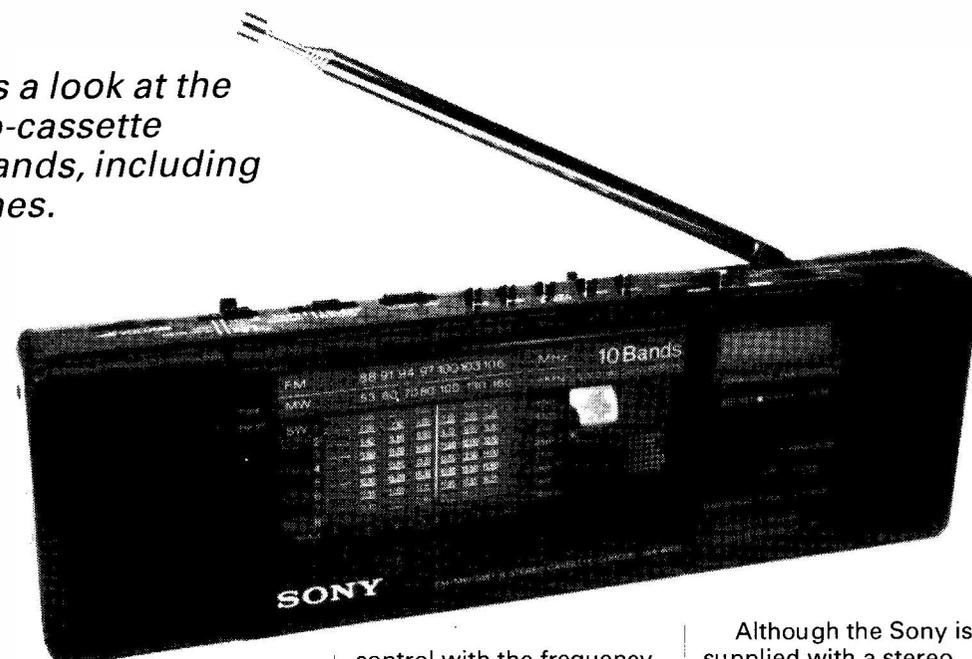
Mike Richards takes a look at the Sony WA8800 radio-cassette recorder with ten bands, including eight short wave ones.

The new Sony WA-8800 is an amazingly compact radio-cassette recorder that's likely to have particular appeal to the traveller. The WA-8800 features full medium wave and stereo v.h.f. f.m. coverage plus eight short wave bands. This is supplemented by a built-in auto-reverse stereo cassette recorder. All this is contained in a very stylish unit measuring a mere 250 x 81 x 39 ! I ought to add that, unlike many stereo portables, the WA-8800 includes stereo speakers - quite an achievement considering the size. Without more ado let's take a closer look at the WA-8800.

As the WA-8800 is designed as a portable unit, it comes complete with all that's necessary for normal operation. Power is provided by two AA cells, housed in a compartment at the rear. For those who need to use an external power source there is coaxial power socket on the side panel. The power requirement was very modest and Sony can supply optional adaptors for connection to mains or car battery power sources.

Although the WA-8800 is fitted with stereo speakers a 3.5mm jack is provided for connection of stereo headphones. The use of a 3.5mm jack gives the user the flexibility to use one of the very wide range of headphones that have been produced for the Walkman market.

The only other external connection was for a stereo microphone. Again this was via a 3.5mm stereo jack on the side panel. There was also a



stereo lapel mic supplied with the WA-8800 which was handy for general recording.

It may be worth noting that there was no external antenna socket. However, it was possible to connect a wire antenna to the collapsed telescopic antenna to pull in those weak stations.

Operation

Sony have done a good design job in keeping operation very simple. To aid this, all the main controls are laid out along the top panel. This is backed-up by a very good instruction manual. This follows the usual multi-lingual format with instruction in English, French and Spanish, each language being allocated about twenty-five pages. There were also plenty of illustrations to clarify many of the features.

Moving back to the operation, band selection is performed using a combination of two switches. The first is used to select f.m./m.w./s.w. whilst the other is used to select one of the eight short wave bands.

Tuning is via an edge

control with the frequency indicated by an analogue dial on the front panel. In fact this analogue dial is a vital space saver as it's located in the door of the cassette deck. The volume was controlled by another edge control and was complimented by a two position tone control switch. This switch also doubled as a replay equalisation switch for the tape deck.

The tape deck was controlled by a set of six push buttons on the top panel. One useful extra was a slider that disabled the tape controls. This successfully prevented inadvertent operation while in transit. Operation of the tape deck was very simple and included a setting that automatically reversed the tape direction. When recording from the radio there's a three position switch that adjusts the bias oscillator to minimise heterodyne interference. This same switch doubles as a mono/stereo switch for v.h.f. f.m. reception.

With any travel radio it's very useful to have a clock and alarm. The Sony includes this feature along with a conventional snooze control that turns the radio off after an hour.

Although the Sony is supplied with a stereo lapel microphone, the input socket can be used to make recordings from other sources. However, you will need to be careful as this input is very sensitive at 0.2mV.

In Use

I must admit that I was quite taken by this extremely compact unit. It's ideal for taking on foreign holidays where space is at a premium. I was initially concerned at the very short tuning scale - I thought tuning on the short wave bands could be extremely difficult. In practice my fears were unfounded and I experienced no real difficulty. The only limitation was caused by the lack of a digital read-out. This meant that finding a particular station involved a certain amount of trial and error. This was far less of a problem on the m.w. and v.h.f. bands.

The stereo effect from the built-in speakers was remarkably good. This is surprising when you consider that the speakers were a mere 45mm in diameter and spaced some 200mm apart. The main limitation of the small speaker size was the lack

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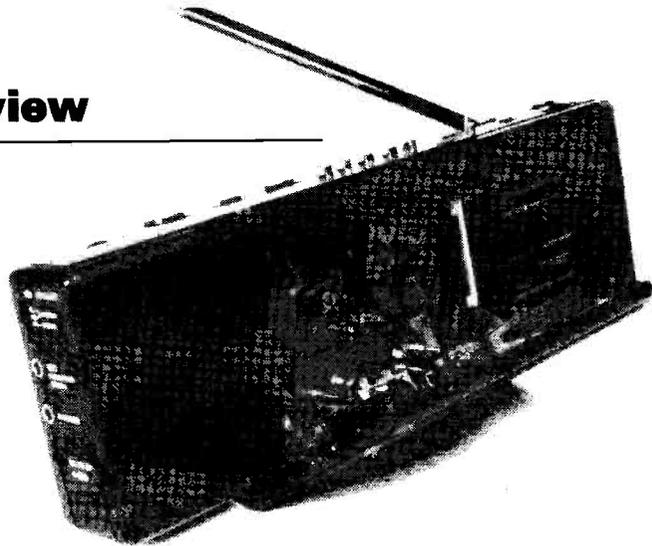
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Review



Specifications

Radio Section

Frequency Range:	v.h.f.	87.6-107MHz
	m.w.	530-1605kHz
	s.w. 1	5.85-6.35MHz
	s.w. 2	7.0-7.5MHz
	s.w. 3	9.4-9.9MHz
	s.w. 4	11.6-12.1MHz
	s.w. 5	13.5-14MHz
	s.w. 6	15.1-15.6MHz
	s.w. 7	17.55-18.05MHz
	s.w. 8	21.4-21.9MHz
Antennas:	v.h.f.	telescopic
	s.w.	telescopic
	m.w.	ferrite rod

Tape Recorder Section

System:	4-track, 2-channel stereo
Speakers:	45mm
Fast wind:	3 min 10 sec with C-60 tape
Response:	80-9000Hz (-10dB)
Inputs:	Mic low impedance stereo 0.2mV
Output:	3.5mm stereo jack 115+115mW into 8-32Ω

General

Power:	2 x R6 (AA) cells or optional AC-D2L a.c. adaptor or DCC-70 car battery adaptor
Dimensions:	250 x 81 x 39mm
Weight:	550g

of bass. However, when listening with good quality headphones the audio performance was transformed. The quality was really very impressive and there was plenty of power. The performance of the tape recorder section was well up to expectations. Recordings made using the supplied lapel mic were very good especially when played through a good quality hi-fi unit. The only problem I found was that the cassette loading was a little tricky. It wasn't a serious problem - you just needed to be careful.

Summary

The Sony WA-8800 was certainly a very impressive little unit. The combination of radio and tape in such a compact unit gives it particular appeal to the traveller. The main limitation is the small speakers but this can be rectified by using one of the add-on units readily available.

The WA-8800 is available from all Sony dealers and costs £229.99. My thanks to Sony UK for the loan of the review model.

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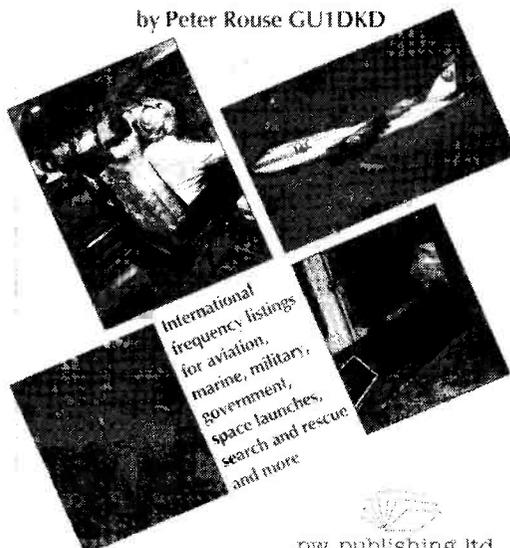
Available from PW Book Service, post and packing free on orders placed before 31 December 1991.

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Newcomers to the hobby will be delighted to find a copy in their stocking this Christmas.

SHORT WAVE COMMUNICATIONS

by Peter Rouse GU1DKD



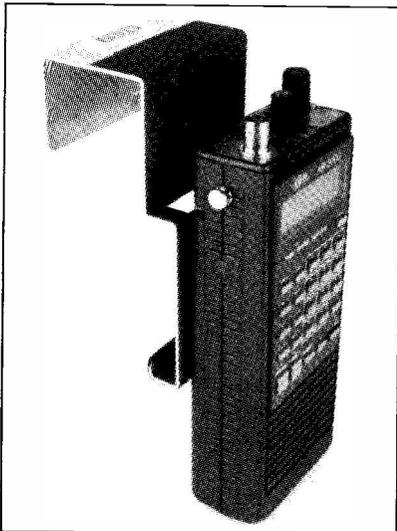
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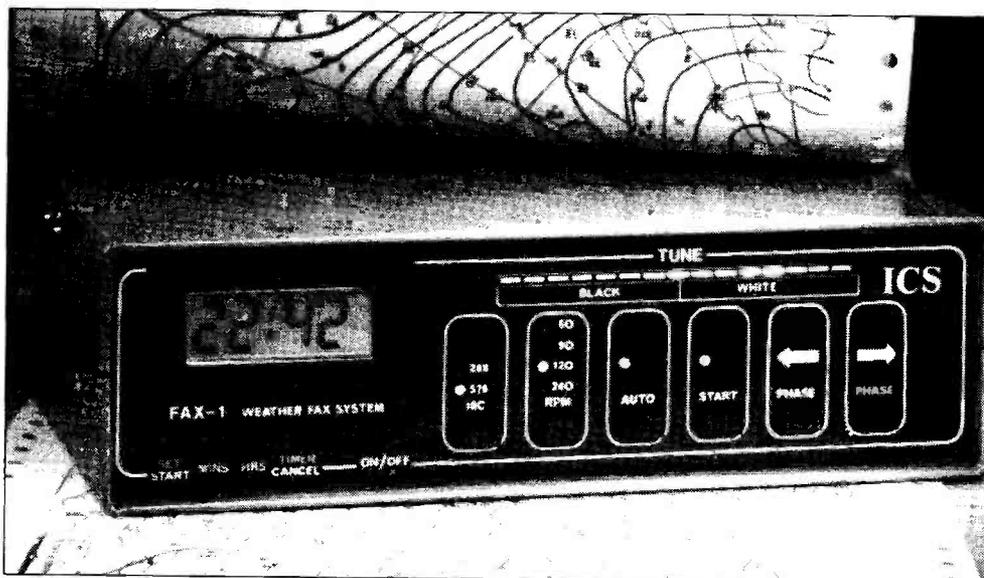
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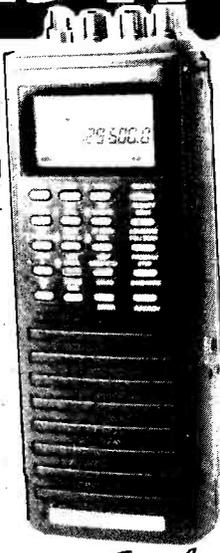
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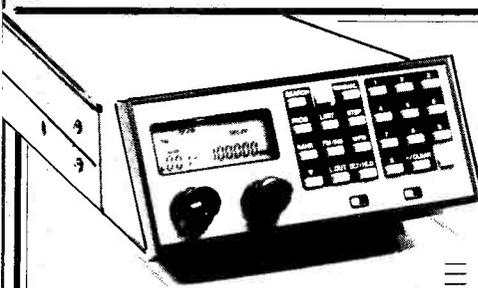
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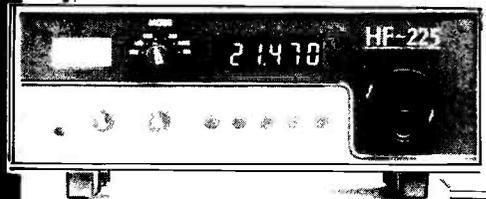
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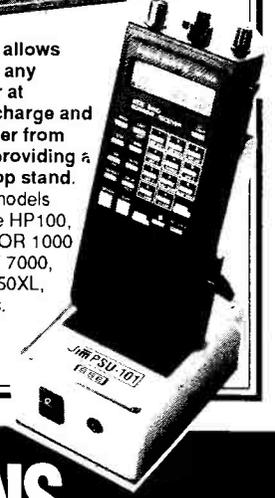
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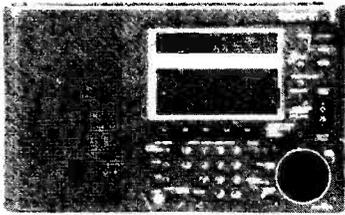
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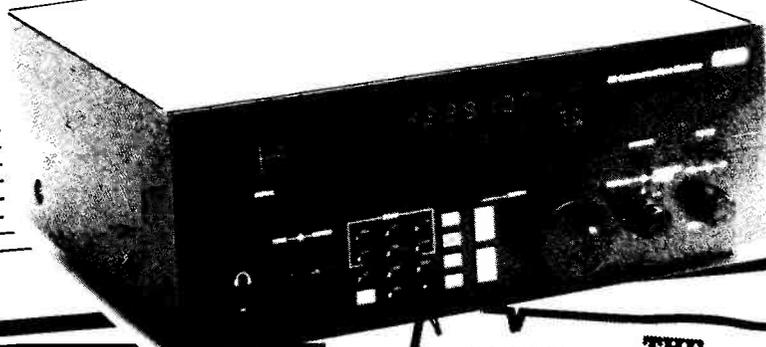
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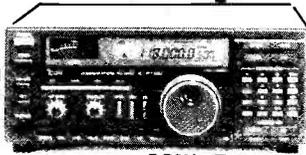


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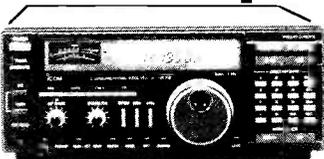
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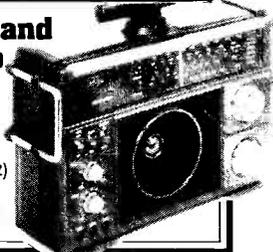
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There is a lot of worldwide long wave activity, including a.m. broadcast stations in Europe, North Africa, the near East and Asian USSR, worldwide navigational beacons and information stations There is also the USA low power 1750m amateur band - unlikely to be received in the UK except under freak

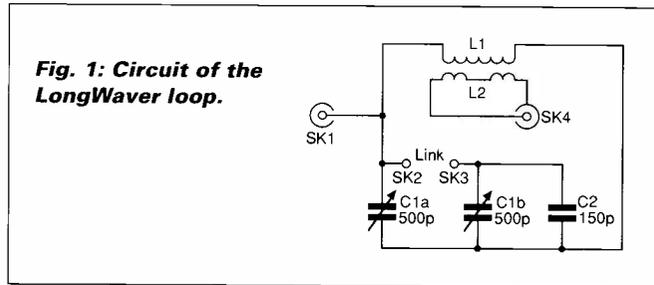


Fig. 1: Circuit of the LongWaver loop.

conditions, as well as some c.w. and weird stations!

The long wave broadcast band covers from 150kHz (2000m) to 300kHz (1000m) - but, in fact, broadcast stations have been occasionally heard up to about 375kHz (800m) and may be low power Russian relay stations in Asia. On occasion an unidentified broadcast station has been heard just l.f. of 150kHz (2000m).

To get the best l.w. reception results, without using a large outdoor antenna you need a loop antenna. The trouble with l.w. loops is that few published designs exist and they need three to four times as much wire as their m.w. counterparts. This means that they are usually massive things for indoor use, and yet this is not necessary. A good l.w. loop is much more 'pick-up' efficient than a m.w. loop of similar size. It also has to be more robust because of the volume and weight of wire.

Convenient Size

The 'LongWaver' has an overall width of 610mm and is 838mm high; this being the maximum convenient size to fit the available operating and storage space. It is resonated with a single control knob, and a pre-amplifier is unnecessary with my receivers. When serious listening is required it is stood on a turntable alongside the receiver. In appearance it is domestically acceptable, being neat, with all wooden parts teak stained and polished and components hidden away. The frequency range is approximately 525kHz (571m) to 146kHz (2050m), with facilities to extend well below this frequency.

Description

The circuit is shown in Fig.1. It consists of the Loop L1,

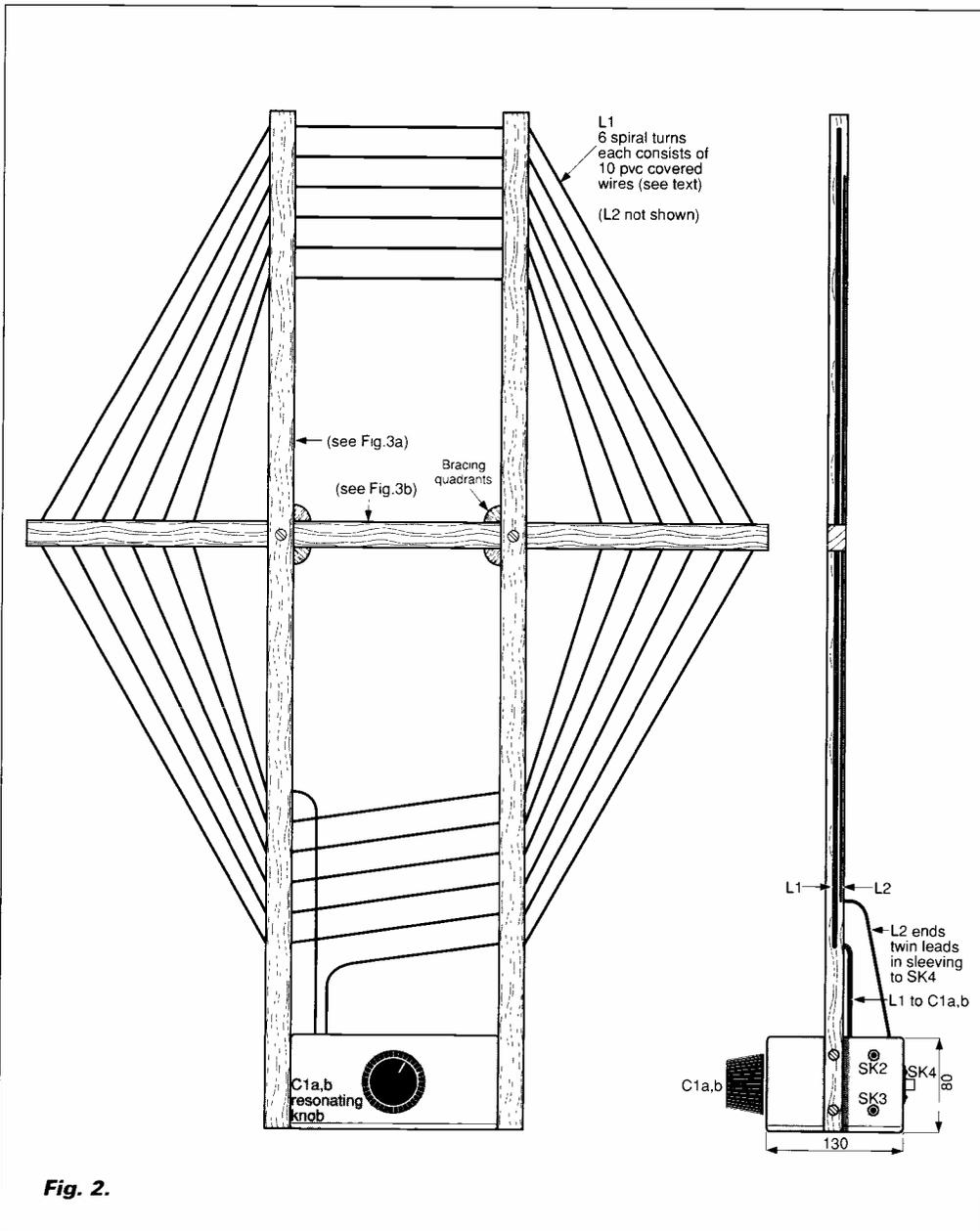


Fig. 2.

r Loop Antenna

band. There is, however, an increasing interest by enthusiastic listeners looking for a 'compact' loop, which gives excellent reception and nulling.

resonated by C1a and coupled to the receiver with L2 via a coaxial feeder. In this form it covers the above frequency range. Inserting a link into SK2/SK3 brings in C1b, plus C2, in parallel with C1a and extends the range down to approximately 100kHz. Alternative values of C2 can be substituted to extend the range even lower. The loop can also be used as a useful end-fed antenna on the h.f. bands, by using SK1. Variable capacitor C1 is a 2-gang x 500pF per section air-spaced variable capacitor and C2 is 150pF.

The loop (L1) is of unusual configuration, consisting of 60 turns of thin pvc covered wire, wound in a 6-turn spiral group, with each group consisting of 10 pile wound turns. Coupling coil (L2) is also unusual being 4 turns wound as 2 pairs in series. The framework structure is three stout wooden arms, each stained with teak wood dye and wax polished, screwed onto a plastics box into which C1 is mounted together with C2 and SK1-4.

Construction

Two vertical arms each 838mm long (21mm x 15mm section) are bolted to the specified black abs plastics box, with the lid at the bottom. A horizontal arm is fitted, with cut joints and braced with corner pieces as shown. The handyman could substitute a strong well constructed wooden box for the plastics box specified.

Holes are drilled in both horizontal and vertical arms as shown. Holes 1-6 must be drilled with a sharp 6.3mm diameter twist drill, and slightly countersunk each side. These are used for L1. Holes 7 and 8, for L2, are drilled with a 1.5mm diameter drill. The wood is then stained and

polished. The drill sizes given are important. Capacitor C1 and SK1-4 are mounted as shown.

Winding the Loop

Having assembled the structure, the winding of L2 should proceed using single strand 1/0.6mm pvc covered

wire. The colour of the pvc insulation could be chosen to match the decor of your shack!

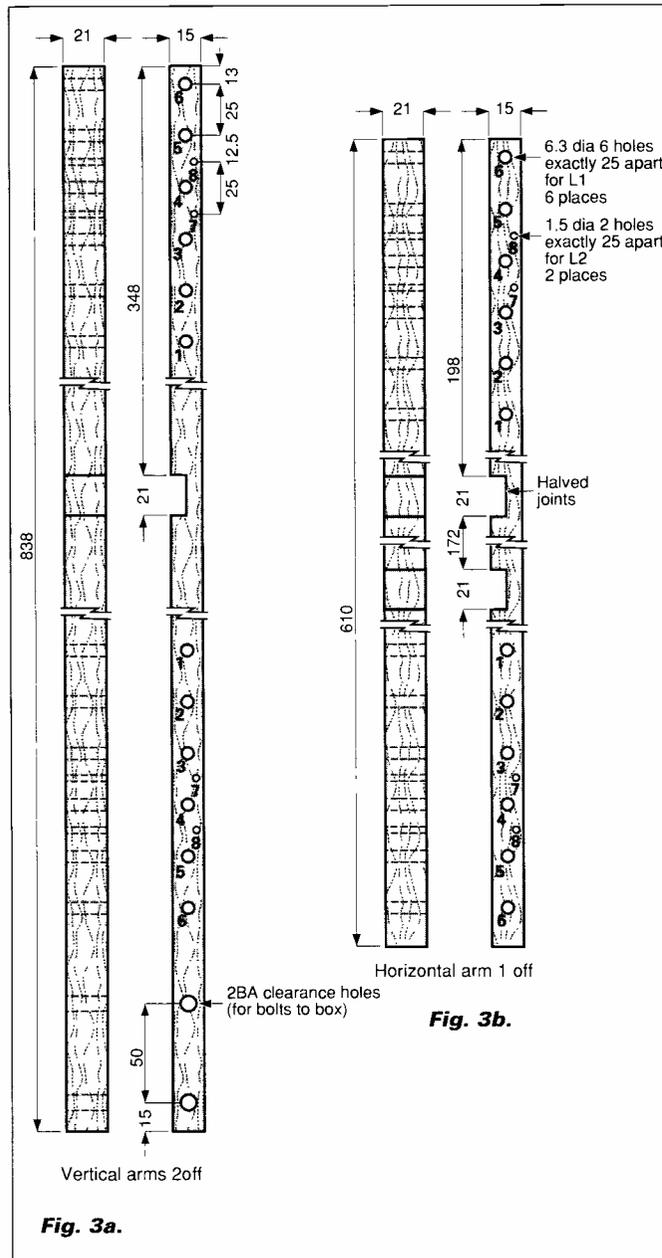
The winding starts as hole 1, on the bottom of the left hand vertical arm and proceeds clockwise. A long-lead-out is taken through a small hole drilled in the plastics box and connected to C1a.

Ten complete turns are wound through the outer set of holes, with the tenth turn 'dropping down' one hole as it passes between the bottom of the two verticals. This is repeated for the second set of holes. When the winding is complete, at the bottom of the right hand vertical (hole 6), the wire end is taken through a hole in the box, to C1a.

In practice it was found that there is a limit to the number of turns which can be easily wound/threaded through the holes with a single length of wire. So L1 is wound five turns at a time. Five lengths of wire, each long enough to form one complete turn, are placed together and threaded through the outer holes in each arm. One length of wire is longer than the other four so as to be able to form the start of the complete winding. The next five turns are wound and four of them soldered to four of the previous five turns in the bottom space between the two uprights, pieces of heat shrink sleeve being put over each soldered joint. The fifth wire end is soldered to the start of the next set of five wires. This procedure is repeated until all sixty turns are wound and you have just the start and finish leads free.

Coupling Coil

The coupling coil L2 is wound through holes 7 and 8. Two wires are wound through each hole (7 and 8) giving 4 turns total, terminated in a 'T' at the middle bottom, with a length of heat shrink sleeving pushed up to tighten the turns. The wire ends, in the sleeving, are pushed through a hole drilled in the rear back of the box top, and connected to SK4. A short length of RG58 coaxial cable is taken to the receiver, with appropriate coaxial plugs at either end.



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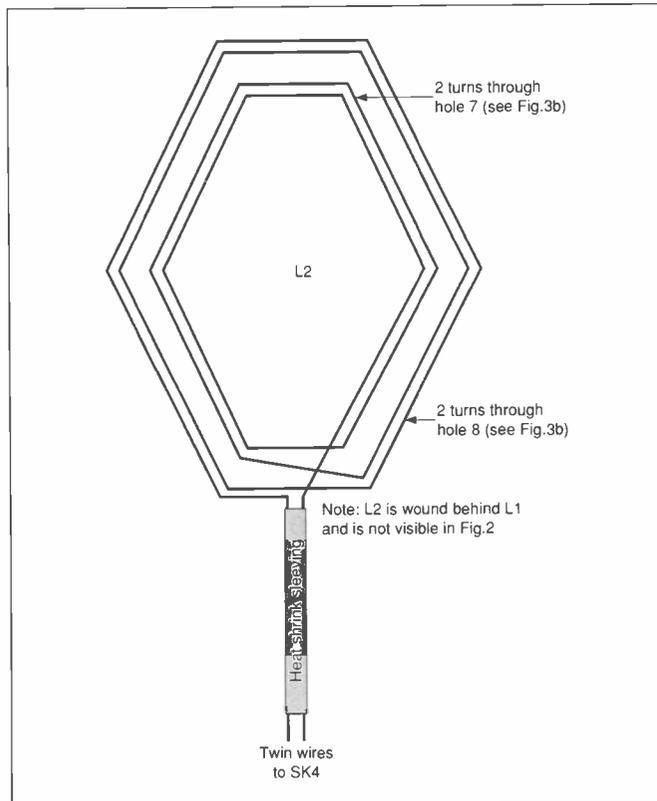
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Project



Testing

It is essential that the long wave receiver used is not be fitted with an internal ferrite rod or frame antenna, even if it is fitted with an external antenna socket. The reason being that the polar diagrams of the LongWaver and the receiver's built-in antenna, will not coincide. It is also an advantage to have the a.v.c. ON/OFF switch on the receiver.

Nulling may be difficult or impossible on the odd high power a.m. broadcast station, such as BBC Radio 4, because local relays may be used in some areas, to boost the signal; and the bearing of the relay station and parent station will be different. However the 'LongWaver' is not intended for local high power station use.

The LongWaver, without the 'LINK', covers approximately 525kHz (571m) to 146kHz (2050m) which is more than enough for many receivers. The range can be extended to about 100kHz (3000m) with insertion of a

shorting link into SK2 & 3. Experiment with higher values of C2, presently 150pF, will lower the frequency way down further.

It will be found that with the spiral style configuration loop used, the 'signal pick-up' can be quite dramatic, and stations can be received, with a good receiver, which are just not there with a goodish transistor radio with built-in ferrite antenna. Some of the older ex-military or marine, all-valve, communications receivers have much more extensive frequency ranges than the modern l.w. receiver, and they can be purchased at quite a reasonable price. Most have high r.f. gain, with one or two r.f. amplifier stages; plus r.f.o. and a.v.c. ON/OFF switches. They are ideal for serious l.w. and l.f. listening, or for experimental work with antennas.

The LongWaver can also be used as quite an effective non-tunable end-fed all-wave antenna by connecting the receiver to SK1. Adjusting C1 will only have a minimal effect, in this case. ■

YOU WILL NEED

ABS Plastics box 215x130x85mm (Circuit 21-06043); C1, 2 x 500pF ganged variable air-spaced capacitor (J Birkett); C2 150pF ceramic or silver mica capacitor (see text); Single strand 1/0.6mm pvc covered wire (o/d 1.2mm). (Marco Trading CBL/EW1/Orange); Wood 21x15mm, 2 pieces 838mm long and 1 piece 610mm long; Coaxial Sockets (2); Banana Sockets (2); Banana plugs (2); RG58 Coaxial cable fitted with coaxial plugs; Knob; 2BA nuts, bolts & washers (4); Heat shrink sleeving.

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YESTERDAY'S SPY

The 128 Set was never made in great numbers, so don't be surprised if you have never heard of it - although you may have seen one! Richard Burton used one to call his HQ in the Alistair McClean thriller film Where Eagles Dare. June Stirrat takes a look at this intriguing piece of history.

World War Two gave birth to special military operations as we know them today. Airborne landings, commando raids and clandestine work by the then British SOE and United States' OSS.

Mass-produced, military radio equipment was of little use to these units. The 38 Set was an infantry field telephone with a radio range of about 2km. The famous 19 and 22 Sets were an absolute penance to use without a vehicle to carry them in. The set, lead acid battery and pedal generator had to be split between three personnel.

Clandestine service sets, such as the B2 'Polish Suitcase' radio ran 15 to 25W of r.f. This amount of power from a valved set entailed using mains supplies or generators and many readers will be familiar with the 'flickering lights' theme of many thriller films.

A set for special 'marching' operations had to be as light-weight as possible - personnel had many other things to carry. It also had to operate from modest dry batteries for sustained periods and satisfy both short and long range communication needs.

The remarkable 128 Set did this. Remarkable? Yes - in its sheer simplicity.

Biscuit Tin

The overall size of the 128 transmitter and receiver put together is about the same as an old-fashioned biscuit tin. The prototype was probably built in one. That's the way

things were done in those days.

The transmitter and receiver are built into separate light steel boxes, each 210 x 120 x 110mm deep. The receiver sits above the transmitter in a custom-made square haversack, power cable and antenna patch cord linking the circuits.

There are two large pockets on the sides of the haversack. One of these held the dry cells, the other carried headphones, Morse key, long wire antenna and copper earth spike. A flat pocket on the haversack flap held message pads and pencils and a couple of small pockets were sewn on the

inside to hold quartz crystals for the transmitter. Traces of wax on the haversack suggest operation by candle light. The haversack could be carried like a briefcase or slung on belt, back or chest with webbing attachments.

Transmitter and receiver each have two switched bands, 2-4MHz and 4-8MHz. This was the standard military 'short wave' band of the day. The 128 Set is a 'short wave radio' in the truest sense of popular imagination.

The receiver dial is calibrated every 100kHz and tuned through a 10:1 friction drive. The tuning knob also provides a 0-100 logging scale so the dial can be re-set with accuracy. The other receiver controls are very basic - a.f. gain, b.f.o. on/off and b.f.o. tune.

Crystal Controlled

The transmitter is crystal-controlled with a panel meter, variable capacitor and switch-tapped coil tuning output. A push button brings in the crystal oscillator to 'net' the receiver, although the set can work on 'split frequencies' and probably did from time to time. The on/off switch is unusual. A rotary wafer switch with nine positions: OFF, RX, TX1, spare, spare, spare, TX2, RX, OFF. The set is powered by separate h.t. and l.t. supplies - h.t. 135V at 8mA, l.t. 1.5V at 150mA. Dry cells are connected to the TX from which power is fed to the RX via an 8-way patch cord.

The antenna provided is a quarter wave, long wire cut to length and put up with 'stone and string'. This is loaded against an earth spike thrust

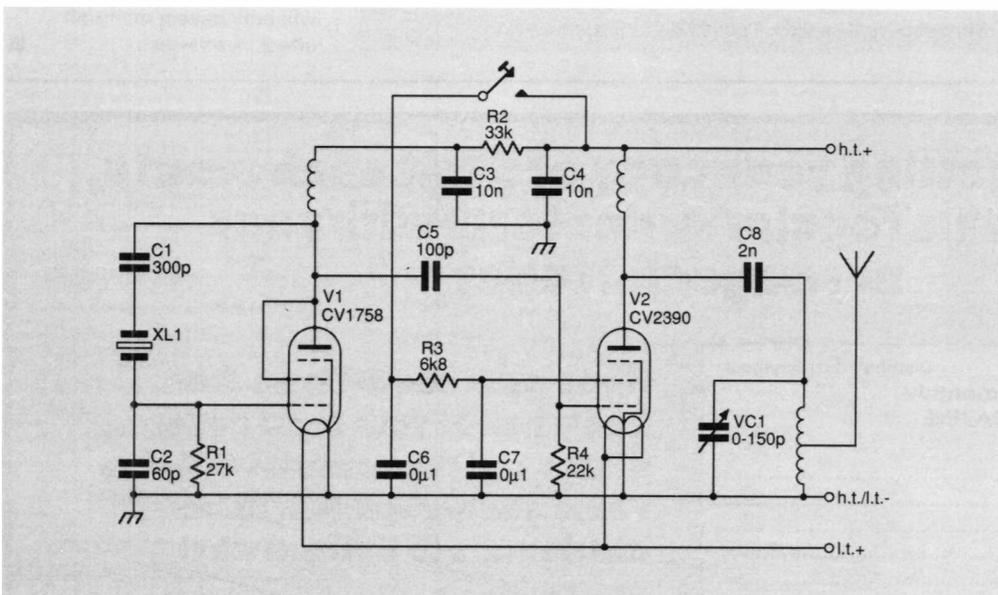


Fig. 1: Simplified circuit diagram of the 128 Set transmitter section.

SET - THE 128 SET



The 128 Set in its natural habitat.

into soft soil wetted from a water-bottle. The earth spike is only about 300mm long but, with a star-shaped cross section, it has a good surface area.

The transmitter is a simple crystal oscillator followed by a low-power amplifier. There is no side tone on send and no form of break-in keying. An interesting feature inside the transmitter is the provision of four, spare, unwired valve holders. These were used to carry spare TX valves. If the receiver was out of order, the operator could still transmit 'blind' at 'sked' times to keep HQ informed about the progress of an operation or to request an air drop.

The TX power output is less than one watt but the set has a very pleasant and distinctive tone on the air, rather similar to the sound of a wineglass. I found the c.w. tone very penetrating and unusually readable in the presence of QRM or if the transmitted signal was very weak.

The receiver is a simple superhet with five valves, one of which is the b.f.o. The receiver is not only functional but quite pleasant to listen to.

Easy to Tune

When the 128 Set was made the short wave bands were a lot less crowded than now. Even so the h.f. ends of both bands are cramped and I doubt if the receiver was ever of much use on them. By contrast, the l.f. ends of both bands are quite open and easy to tune, even in today's conditions. The 128 Set remains useful for receiving m.f. shipping and also aircraft on the 5.45MHz allocation where its s.s.b. performance is adequate.

The receiver tuning is too cramped for the set to be of anything other than novelty value on the 3.5 and 7MHz amateur bands and for any serious work the transmitter would have to be used with a better bandspread receiver.

However, the receiver does tune down to about 1.95MHz without modification. This is of limited value for calling CQ but useful enough for sked working on an amateur licence.

The 128 Set can be re-aligned to cover all of Top Band and to give better bandspread on 3.5MHz for that matter. However, this may not be worth doing on a set of this age that is more of a collector's item than anything.

The 128 Set was issued to

airborne units and others at various times. In its military role it would have provided reliable, short range c.w. links by l.f. ground wave. Despite its low power and simple receiver the 128 Set stood a good chance over 'European distances' of 240km or so when working back to high-grade receivers such as the AR88.

Low power c.w. had an obvious advantage for clandestine operations. Unless an enemy interception unit was within a kilometre or so, they might have failed to recognise the transmission as local, supposing it to come from a higher powered station further away.

The Best Secret

Some of the circumstances under which 128 Sets were actually used will probably never be known. The best secret will always be that which someone keeps to themselves. ■

First Aid

Having recently acquired a Collins TCS-12 transmitter-receiver, I discovered that the complete installation also should have a remote control unit and p.s.u. together with connecting leads. I also need four 'feet'. Has anyone got the missing items and prepared to sell? Advice on these items gratefully received.
Ian D. Wye, 113 Sweets Way, Whetstone, London N20 0NX.

I would like to thank all those people who helped me sort out a

problem I had with my FRV-7700 converter, with special thanks to GW3RJR who sent me a manual!

I now wonder if anybody can now help me with information on a Yaesu FR-101 receiver, which I have got my hands on in a sorry state. Any help would be very welcome.

Once again pass on my thanks to all those who helped me with the converter.

N. Alford, 56 Marlowe Road, Larkfield, Kent ME20 6TW.

A Short Wave Crystal Set

Crystal sets are normally associated with mediocre reception of nearby medium or long wave broadcast stations and quickly get discarded when performance is found to be marginal. This is a pity as you will be amazed at what can be heard with a short wave crystal set, such as this one described by Roger Laphorn G3XBM!

Stations thousands of kilometres away can regularly be heard with circuits whose simplicity defies belief. Take for example the circuit described here (Fig. 1). It requires a total of four components, including the earpiece!, yet pulled in stations from over thirty countries and four continents within a few hours of being built; It is capable of world-wide reception given some patience and careful listening at optimum times.

Sensitivity

Crystal sets need no batteries, deriving the power to drive the earpiece or headphones entirely from the detected signal being received at the time. The sensitivity of the circuit shown is such that the signals of about $500\mu\text{V}$ are just audible and about 1mV is needed for comfortable listening in a quiet room. This is about 1000 times (60dB) less sensitive than a modern communications receiver. This may seem a major handicap, and it is if you want to hear all that is going! However, many short wave broadcast stations now run hundreds of kilowatts and, not surprisingly, are receivable with signals strengths of over 1mV in a

50Ω receiver, i.e. audible on a crystal set.

Selectivity

The main limitation, if one is not hunting for weaker broadcast stations, is not sensitivity but selectivity. That is the ability to separate stations close together in frequency. This depends on the unloaded Q of the tuned circuit, the tightness of antenna coupling and the loading of the diode and earpiece. What is needed is the loaded Q to be just enough to ensure maximum sensitivity with acceptable selectivity.

The Circuit

The circuit couldn't be simpler and wiring it up is trivial, taking about two minutes! There are any number of ways of building the circuit, including using brass drawing pins and a piece of plywood, choc-bloc connectors or even soldering the components together. The choice of variable capacitor depends on budget, the lower cost poly-varicon capacitor, salvaged from a discarded m.w. pocket radio will have a slightly lower Q than an air-spaced component but this is unlikely to be very noticeable in

practice. The toroidal inductor used ensures a high Q can be achieved. The earpiece **must** be a high impedance crystal type - the more commonly found earpieces today are low impedance and will not work. The components specified can be obtained from Cirkit, while suitable air-spaced variable capacitors can also be obtained from J. Birkett.

Operation

With the components shown the tuning range will be from about 5.5 to 25MHz. The exact coverage will depend on the maximum and minimum capacitance, the wire diameter and ferrite permeability.

Connect an antenna, preferably about 10-20m long and as high as possible, and an earth. In my case this was just a connection to a bedroom radiator but a good outside earth should be used if possible.

Tuning across the band in the daytime it should be possible to hear between 10 and 20 stations at audible level. European broadcast stations will predominate but you will also hear some c.w. and SITOR utility transmissions between the broadcast bands, especially around 6.5-7 and 8-9MHz. In

theory, these shouldn't be detectable with an envelope detector such as a crystal set and it is probably only possible because of the cross modulation that occurs with other stations. In this way, coast radio stations have been positively identified from all over northern Europe.

With a little patience it is possible to identify the various broadcast bands from the station frequency announcements. If possible, calibrate the dial every megahertz using a signal generator. This makes station identification easier, especially of signals from utility stations.

Some of the signals received will be clear of interference but many will be fighting for dominance over others in the same band. The technique is simply to keep waiting for conditions to alter, as they frequently do, until some of the other signals become audible and identifiable. In this way it is possible to hear what might be considered remarkable DX for a set with four components. Signals from as far away as Australia, on the other side of the globe, have been identified positively this way.

Some signals received are not transmitted directly from the country of origin, but are

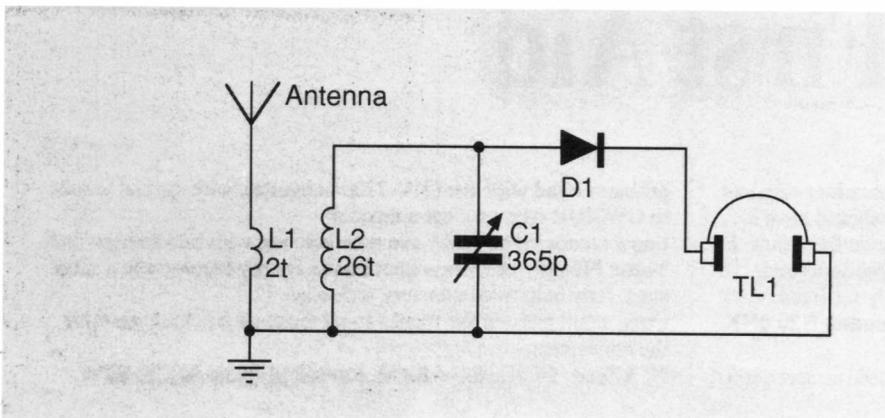


Fig. 1: The circuit diagram of the short wave crystal set.

Abbreviations

c.w.	continuous wave (Morse)
dB	decibels
DX	long distance
m	metres
m.w.	medium wave
MHz	megahertz
mm	millimetres
mV	millivolts
pF	picofarads
Q	the 'goodness' of a tuned circuit
r.f.	radio frequency
μ V	microvolts
Ω	ohms

relayed from transmitters nearer the target area. For example, Radio Japan has a relay in Gabon, West Africa and Radio Beijing has a relay in Switzerland.

The higher frequency bands will be most productive in daylight hours but may be quiet at night. After dark, concentrate on the lower frequency bands but remember that the lowest path losses are those just below the maximum usable frequency so keep and ear out just in case on the higher bands.

Improvements

There are a number of improvements possible to the short wave crystal set. These include an antenna matching unit and a full wave detector to make use of both half

cycles. However, if the most for the least is the aim then this circuit takes my prize.

One interesting idea worth pursuing is an active circuit making use of rectified r.f.

energy from all the signals apart from the one being received. I have not worked out how much power might be extractable from all the signals between 0 to 30MHz but it

would probably be a microwatt or two. This might allow a simple circuit with some amplification to be possible - and all for free.
Good crystal set DXing!

YOU WILL NEED

Variable capacitor 0 - 365pF, C1 (Cirkit 06-05250); High impedance crystal earpiece (Cirkit 43-00574); Germanium diode, D1 (Cirkit 12-00916 or 12-00476); T50-2 toroidal inductor (yellow) (Cirkit 55-00502).

Cirkit, Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (0992) 444111.
J. Birkett, 25 The Strait, Lincoln LN2 1JF. Tel: (0522) 520767.

Coil Winding Details

L1: 2t wound on top of L2.

L2: 26t 0.5mm dia enamelled copper wire.

L1 & L2 are wound on a T50-2 toroidal inductor.

COMPETITION

To encourage you to build your own crystal set we have decided to run three competitions. All you have to do is build a crystal set from the circuit diagram in this article, take a photograph of it and submit a log of the stations received on it between 20 December 1991 and 20 January 1992. Each winner will receive a one year subscription to SWM.

Prizes will be awarded in the following three categories:

1. The best constructed crystal set.
2. The best log.
3. The best log from a listener under the age of 16 years.

Rules.

The best log in categories 2 & 3 will be judged on the overall quality of the entries, not merely quantity. Although QSLs are not being asked for, logs must be capable of being submitted to the stations concerned for verification in the recognised manner. The logs should contain details of each station heard including Time (UTC), frequency, SINPO rating and a detailed description of programme content. Details of the antenna used should also be given.

All logs must be signed by the entrant certifying that the stations were logged on the crystal set in the photograph.

Entries in category 3 must be countersigned by a Parent or Guardian stating the age of the entrant. Age will be taken into account in this category.

Entries in all categories must be accompanied by a photograph of the crystal set together with the Crystal Set coupon from the foot of the Contents Page of this issue.

All entries must be received at the Editorial Offices of *Short Wave Magazine* no later than 31 January 1992. The Editor's decision is final and no correspondence will be entered into regarding the competition.

propagation

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

As usual, solar observers, with their wide variety of instruments, have provided us with some first class information. For example, **Ron Livesey** (Edinburgh), using a 2.5in refractor and a 4in projection screen located 10 active areas on the sun's disc on August 22 & 25; 11 on days 19, 20 & 23 and 12 on the 17th, 18th & 20th and between 2 and 7 on the remaining days. **Cmdr Henry Hatfield** (Sevenoaks) operating his spectroheliocope, observed 3 sunspot groups, 18 filaments and 7 quiescent prominences at 1445 on September 5; 3gp, 18f & 8qp at 1138 on the 7th; 4gp, 15f, 8qp & a shallow loop prominence on the NW limb at 1025 on the 8th; 2gp, 17f, 4qp, a large 'hedgerow' q.p. on the SE limb and a medium pillar prominence on the E-limb at 1145 on the 17th and 2 double spots, 14f & 8qp at 1317 on the 22nd.

Patrick Moore (Selsey) kindly sent a drawing of the sunspots he observed at 0940 on the 9th. At his observatory in Bristol, **Ted Waring**, also projecting the sun's image, counted 22 sunspots on August 26, 20 on September 6 and 15 on the 19th. **Clive Brook** (Plymouth), with a 60mm refractor, 25mm eye piece and projection screen, located 2 sunspot groups on September 4, 5, 6, 7 and 26; 3 on days 17, 18, 20 and 22; 4 on the 8th, 9th, 10th, 21st and 25th; 5 on the 12th and 13th and 6 on the 15th. His observation times during the month varied between 0818 and 1630 depending on the amount of cloud and haze. Henry Hatfield's radio telescope recorded individual bursts of solar noise at 136MHz, on the 8th, 16th and 25th and at 1297MHz on the 8th and 25th.

Auroral and Magnetic

Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of auroral 'glow' overnight on August 10/11 and 11/12; 'ray bundles' on 12/13, 14/15, 18/19 and 30/31; 'active forms and light changes' on 5/6, 6/7, 12/13, 17/18, 20/21, 21/22 and 31/01 and 'coronal structures' on 30/31. In Wishaw, **Doug Smillie** heard tone-A radio signals on the 50 and/or 144MHz bands around 1645 on the 6th, 1505 on the 11th, 1115/1710 on the 12th, 1829/1913 on the 27th, 1555/1620 on the 30th and 1439/1705 on the 31st. The various magnetometers used by **Tony Hopwood** (Worcester), **Karl Lewis** (Saltash), **Ron Livesey**, **David Pettitt** (Carlisle) and **Doug Smillie**, between them, recorded most activity on August 2, 3, 4, 11, 12, 13, 14, 19, 20, 21, 22, 27 and 31.

Propagation Beacons

First, my thanks to **Gordon Foote** (Didcot), Henry Hatfield, **Ted Owen** (Maldon), **Fred Pallant** (Storrington), **Ted Waring**, **Ern Warwick** and **Ford White** (Portland) for their detailed

28MHz beacon logs from which I was able to compile the monthly chart covering the period August 26 to September 25. Henry Hatfield reports that DL0IGI was 'very loud' on September 2 and 3. Ted Owen copied PT8CA on the 22nd but with the letters 'CO' on the 24th.

Judging by the number and frequency of the Australian beacons logged it seems that conditions greatly improved in that direction from the middle of September on. I see that the new Darwin beacon VK8VF is still with us and Ern Warwick tells me that he copied VK4RTL, Townsville, on 28.270MHz for the first time at 1310 on September 19. **Peter Barlow** (Wigan) uses an Icom R-72E receiver, a.t.u. and a long-wire antenna and asks about the power and upkeep of such beacons. Broadly speaking Peter, these are tiny transmitters providing a 24 hour signal from strategic sites around the world. This worthwhile international service is organised by the RSGB and the instruments are usually installed and maintained, on a voluntary basis, by dedicated radio-amateurs. Because of the scientific value of this service the sites are often provided by large organisations throughout the world such as broadcasters, military and telecommunications departments, to whom we all say a big THANK YOU.

Tropospheric

The slightly rounded atmospheric pressure readings from August 26 to

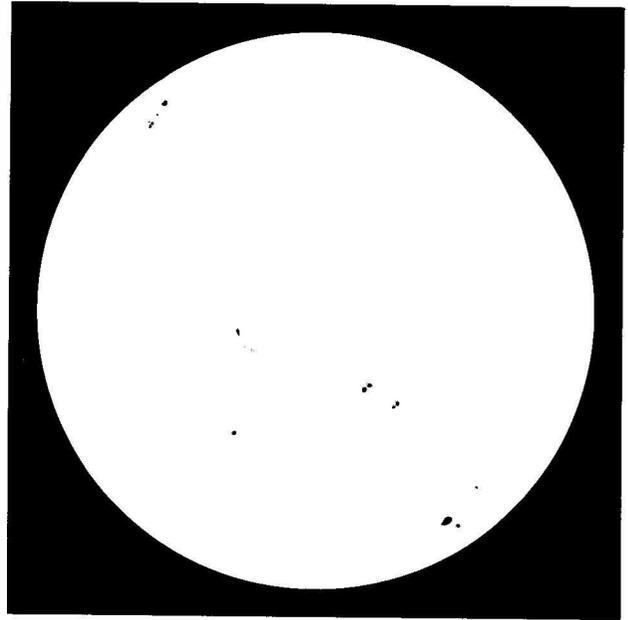


Fig. 1.

September 25 can be seen in my 'dxtv roundup' column elsewhere in this issue. Reports are still coming about that end of August opening when the weather conditions were just right for a tropospheric opening. The 30th was really 'livened up' for 14-year-old **Michael Larsson** (Cheadle) when, between 1010 and 1330 he tuned through Band II (88.75-106MHz) and received signals, both mono and stereo, from stations in Denmark and Germany and a wide variety from

England and Wales. He identified transmissions from Denmark's Radio P1 and P2; Aurich, Deutschlandfunk and Hessischer Rundfunk in Germany and his UK log of BBC and/or ILR stations specifically mentions Hull, Holme-Moss, IOM, Lancashire, Leeds Llangollen, Liverpool, Manchester, Merseyside, Moel Y Parc, Preston, Stockport, Stoke-on-Trent, Winter-Hill and Wrexham.

"Probably the best period of v.h.f. f.m. reception I have ever encountered since I first started listening 5 or 6 years ago," wrote **Leo Barr** (Sunderland) after finding Band II, 'full of foreign tongues' on the 30th. Leo, using his Matsui portable, counted more than 40 stations from Germany, Holland and Scandinavia. The opening was good enough for him to receive good stereo signals from AFN Rheinecgg, Radio Bremen and NDR-1 Aurich in Germany, NOS programme 3 from Holland and NRK programme 2 from Norway.

On August 27, **Roy Patrick** (Macclesfield) using an Audioline 415 receiver with its own telescopic rod antenna received Century Radio from Dublin and while on holiday in Caister, Norfolk, from September 7 to 14, he found Belgium's BRT2 audible all week with an excellent signal on the 8th and a 'fairly good' signal from Viking Radio, Hull, on the 9th and 12th. **George Garden** (Edinburgh) while staying in Beaconsfield tuned through the broadcast band, with an elderly Philips personal stereo around 0100 on the 15th and heard BBC Radio Sussex and ILR County Sound, Chiltern Radio, Jazz FM, LBC and, a French station around 103MHz. George caught this lot while the weather was quite hot and humid at night with the prevailing high pressure keeping it settled.

Beacon	August					September																								
	26	27	28	29	30	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
DF0AAB	x																													
DL0IGI	x																													
EA3JA	x																													
EA8RCM	x	x	x	x	x	x	x	x	x	x																				
HG5GEW																														
IY4M	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
KC4DPC	x																													
KD4EC	x																													
KE2DI																														
KF4MS	x	x																												
KJ4X	x																													
KW7Y																														
LA5TEN	x																													
NX20																														
OK0EG	x																													
OH2TEN	x	x																												
PY2AMI																														
SK5TEN	x	x	x																											
VE2HOT																														
VE3TEN																														
VK2RSY	x																													
VK4RTL																														
VK5WI	x																													
VK6RWA																														
VK8VF																														
WA4DJS	x																													
WB4JHS																														
WC8E																														
W3VD																														
W8UR																														
W9UXO																														
ZD8HF	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
ZL2MHF																														
ZS1LA																														
ZS5VHF																														
ZS6PW	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Z21ANB	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
5B4CY	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	

Fig. 2.

ssb utility listening

Peter Rouse GU1DKD

Barcroft, Rohais de Bas, St Andrews, Guernsey, C.I.

It seems like only yesterday that I pounded the keyboard to get out the first issue of 'ssb utilities' and here we are at the end of our first year. I say 'our' because it has become as much your column as mine and over the year I have made a lot of new friends and am indebted to several readers who have gone beyond the call of duty to send in detailed information. It was nice to meet many of you personally at the Leicester Show, where the book based on this column was finally launched (you will find an advertisement elsewhere in this column should you wish to contribute to my early retirement fund!).

Most reactions to this page have been good, but there have been adverse comments occasionally and the military frequencies in the first issue attracted a lot of unwanted attention from the national media. There have also been comments about the moral aspect of listening to transmissions we are not licensed to receive.

The whole question of listening to non-broadcast communications raises several questions. On the legal front, the Department of Trade and Industry has already issued guidelines to the police in document RA/POL 3/91. It states that listening to CB, aircraft or international channel marine messages is an offence under section 5(b) (i) of the Wireless Telegraphy Act 1949 but is considered 'relatively harmless'. So what about the moral aspect? It has been put to me more than once, that the most interesting communications I come across concern disasters, warfare or similar situations and surely it is wrong that I should derive entertainment from such incidents. My answer is simple. I am not entertained by such events. On the contrary, my ability to hear a situation first hand has given me a compassion and understanding that I would never have got from the media reports.

The Tragedy of Yugoslavia

All of this leads to a letter from **Geoff Searle** of Southampton who picked up tragic messages from Dubrovnic Radio on October 1 on 2.182MHz at 1130UTC. The first warned ships and craft to stay clear of Dubrovnic because it was under attack from the Serbian navy. The second message said Dubrovnic was under attack from the air by the Serbian Air Force and on land by the Serbian Army. It urged any listeners to call their ministers and try and stop the war in Croatia. The operator went on to say that communication lines were cut and they could not connect with other towns or countries. Ironically, both messages were preceded by 'Pan-Pan, Pan-Pan, Pan-Pan' which strictly speaking means an urgent message but no lives are in immediate danger.

Your Logs

If **Paul H.** says September was a quiet month, then you know it was exactly that. It was so quiet that he wrote to me about some v.h.f. satellite frequencies and left it that. **C. McCormack** of Galway (Sony ICF-2001D) picked up an odd occurrence on the search and rescue channel on 5.680MHz on the night of September 16. At around 1055UTC he heard a male voice say "568". Five minutes later a female voice also said "568" and then proceeded to read out a string of five digit numbers. At around 1105 one of the regular stations on this channel asked for a radio check. The station that replied (with a Scottish accent) said the interference, referring to the numbers station, would stop in five minutes and sure enough it did. Mr McCormack says the female operator dropped down to three figure groups and then a string of zeros before closing down at 1110. He asks two questions: Who was the operator with the Scottish accent? Who are the numbers stations?

The first answer is easy (I think). It was Edinburgh Rescue who monitor this frequency around the clock. The second question is a real poser. I regularly monitor this channel, but have never heard this station nor do I recall any previous mention of a numbers station on this frequency. **Simon Mason** has supplied the most comprehensive list of stations so far for the so-called spy stations, but nothing on his list is anywhere near this frequency. Why they should use a search and rescue channel I do not know, but if anyone has any information or theories then let me know and I will share the information.

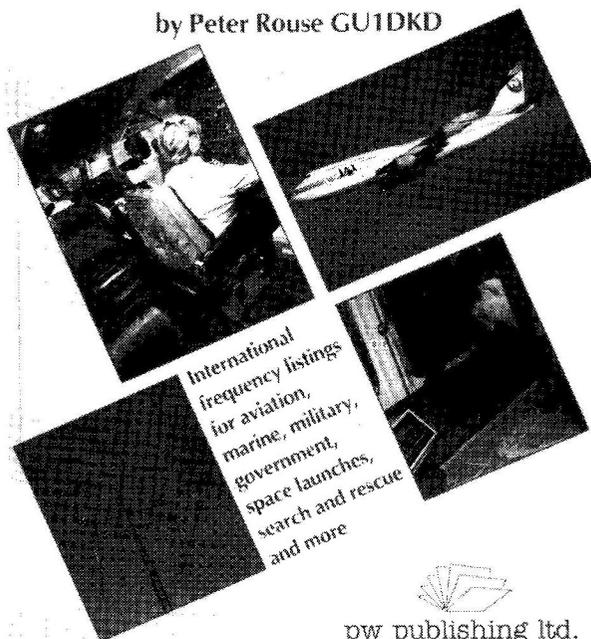
John Spillett who lives near Ringwood reports hearing an American Forces Network news feed on 10.5400MHz at 1900UTC in September. This is interesting as I have not seen this one logged or listed before. If you are not familiar with news feeds, then let me tell you that these are the rough and ready sound feeds fed from one point to another (not intended for reception by the public). Only at the receiving ends are the sound feeds cleaned-up, and put on tape or cartridge for broadcast. In the business this is known as 'topping and tailing'.

Despite being a quiet month some military traffic was heard. **Colin Latham** of Brentwood reports hearing a USAF transport aircraft with the callsign 60-196 talking to Croughton on 11.176MHz. The aircraft reported that the flight engineer had received puncture wounds to his thigh and they were directed to land at Naples where they would be met by a medical team. This all happened on October 7 and Colin is curious to know how the flight engineer managed to get his injuries. The only likely answer to that will come from my

HOT OFF THE PRESS!

SHORT WAVE COMMUNICATIONS

by Peter Rouse GU1DKD



This book, written by Peter is available from the SWM Book Service for £8.95, the usual postage and packing charges are being absorbed on all orders placed before 31 Dec 1991.

old friend Paul H. who will no doubt also supply the man's wife's maiden name! (I never dare ask where his information comes from).

Still with military matters and this time the RAF. **Ron Galliers** of London uses a Philips D2935 and a Lake TU1 antenna tuning unit fed by a 30m long wire antenna. Ron has been monitoring Neatishead on 4.710MHz and wants to know what the station does. Neatishead is in Norfolk and comes under the control of RAF Coltishall and is an Air Defence Radar Unit (ADRU) and part of the NATO network that coordinates between the AWACS (Airborne Warning and Control Systems) and fighters. In other words, it vectors fighters onto likely targets. Ron asks about other frequencies for this station and the only two I can supply are 4.710 and 6.748. However, other known RAF tactical frequencies worth trying are as follows: 3.120, 4.707, 4.739, 4.743, 5.747, 6.686, 6.693, 6.715, 6.733, 6.740, 6.743 & 6.765MHz.

Ron logged quite a few operational

callsigns on the Neatishead frequency, but I have to say that past experience has shown that these have no tactical significance and change almost daily. He says stations referred to 4.710MHz as being an 'Architect' guard frequency. This is a new one on me as the latest RAF en-route supplement does not show that frequency against any Architect (Strike Command Integrated Communications System - STCICS) listing. However, the frequency has been heard carrying tactical traffic.

And Finally

From Chateau Rouse may I wish you the very best for Christmas and a hope that Santa Claus leaves some exciting goodies in your stocking. Catch you in the new year when we will look at a systematic method of station searching which may provide results for newcomers to the hobby who complain of missing a lot of the action logged by other readers.

AUSTRALIA

Greg Baker

Spring and summer have come with a vengeance here in my corner of New South Wales. The drought continues and the fire season looks like being severe. For the first time in years, the fire look-out tower on nearby Mount Budawang will be manned throughout the summer. The local Forestry Commission office is advertising for a person to spend their days scanning the nearby forests and national parks for signs of smoke. Perhaps I should apply and take some listening gear up there with me. At around 1150m, and nearly twice the altitude of my usual QTH, that could pull in quite a few new signals.

BBC in New Zealand

The BBC World Service service being broadcast on domestic transmitters in New Zealand came to an end in September. According to my New Zealand contact, the service had been broadcast in Auckland on 91.8MHz f.m. and in Wellington on 1233kHz a.m.

These two frequencies were temporary frequencies made available while the issue of frequency allocation was finalised. The company stopped broadcasting apparently because they could not get guaranteed frequency allocations.

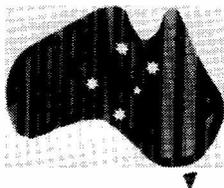
Because the signal was pulled off satellite and then rebroadcast the signal quality was excellent. Broadcasting was 24 hours a day interrupted only by the odd frequency change.

The audience for this service in New Zealand would always be small according to my contact, but it was certainly growing. If it had been better promoted and permanent, it would probably have assured itself of around 2% of the listening audience in both centres.

BBC World Service devotees in New Zealand are now forced back to short wave where, apparently, reception is variable but reasonable in the local evenings.

Outback Emergency

Australia was kept on tenterhooks for a couple of days in late September, when distress signals were received at the Royal Flying Doctor Service (RFDS) base at Charleville in Queensland. Apparently, the signals were coming from a station hand who had come off his motor bike somewhere in



outback Queensland. His leg was injured, but worst of all he appeared to have suffered some memory loss. He could not tell radio operators his name or even where in Queensland he was. As time went by and authorities desperately tried to locate him, the RFDS manned their radio listening for the weakening signals. By the time Department of Transport and Communications (DoTC) radio direction finding expertise could be brought to bear from fixed facilities in Brisbane and portable facilities in Mackay, the signals had ceased. Since then authorities have checked all outback stations, but no-one has been reported as missing.

When I hear more I'll pass it on; in the meantime there's plenty of scope there for imagination.

Western Australian Emergency Services

Emergency services are finally getting their act together in Western Australia. Though police, ambulance and fire brigade services have operated efficient radio communications services for many years, they each operate on different frequencies and have had no common communications channel. Following negotiations with the DoTC, new frequencies have been released and several channels compatible with all three systems have been made available. In addition, the St. John Ambulance organisation in Western Australia has also been issued with licences to operate these frequencies as the 000 emergency services telephone number co-ordinating body.

Digital Audio Broadcasting

The DoTC Communications Lab in Canberra is testing a new digital audio broadcasting (DAB) system. As *SWM* readers may be aware, such a system is currently being demonstrated at Rennes in France. According to technical material from the Communica-



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tions Lab, DAB could be thought of as the third generation of broadcasting after a.m. and f.m. stereo.

Before recommending the introduction of such a system to Australia, the Communications Lab needs to study propagation, interference immunity and worst case ghosting.

Basically, the system allows the simultaneous transmission of up to 16 audio programs. To do this, it uses filters to divide each source signal into around 40 frequency bands covering the audible range 20Hz to 20kHz. Each frequency band is digitised into a bitstream, which is then coded with identification, error detection and error correction data. The result is several hundred digital data bitstreams each with the information needed to reconstruct a small part of one of the programs.

Each of these bitstreams modulates one of several hundred r.f. carriers occupying a total 4MHz bandwidth. The modulation technique is called 'coded quadriphase shift keying' (CQPSK) which sounds to me like an essential acronym for all *SWM* readers to remember.

Because each of the bitstreams represent only a small part of one program, the bit rate to be transmitted is low and bit length time is quite long. The advantages of this are that reflected signals arriving simultaneously at the receiver adds energy to the r.f. representation of the bit being received. Thus multi-path effects reinforce, rather than degrade, reception as with a.m. or f.m. In addition, it means that transmission area gaps can be filled with low powered transmitters pushing signals into the shadow area on the same frequency.

At the same time fading effects will be minimised because each program is spread over a wide range of frequencies. Where fading does occur, it only affects a few bits of digital data in any program and error detecting and correcting code can usually overcome the problem.

The microchips to do all this at the receiving end sound fiendishly complicated to me, but no doubt if it all turns out here and in Europe we'll be seeing a *SWM* do-it-yourself receiver in due course.

International Space Year 1992

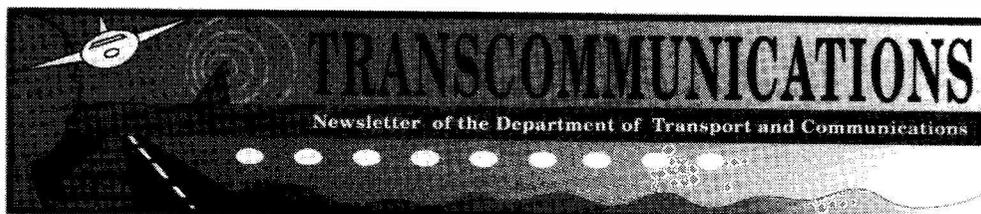
A colleague and I are writing a teacher's resource book for the 1992 International Space Year. During our research we have interviewed many people associated with space and astronomy in this country. And we've visited quite a few establishments where fundamental research is taking place.

Our latest foray has been to the Tidbinbilla tracking station near Canberra. Part of NASA's Deep Space Network, Tidbinbilla sports one 70m dish, two 34m dishes and a 26m dish. Through these antennas the Australian staff track as many as a dozen space probes around the clock. Because it is US designed and must be strictly compatible with the two other stations in the network, those at Goldstone in California and near Madrid in Spain, the station runs on 110V 60Hz power rather than the 240V 50Hz standard in Australia. And though it is connected into the mains grid via rotary converters there is 5MW of diesel standby generation capacity ready to swing into action, particularly on critical encounters.

On the main antenna there are four feed horns to cover the S, X and Ku bands.

And for transmitting signals to spacecraft there are three transmitters. Power outputs are 20, 100 and a massive 400kW. Because the station is in a valley the nearest horizon is only a couple of kilometres away. I sure as anything wouldn't like to be standing on the valley rim when they beamed that sort of power past me.

I welcome any news and comments. In particular, I am interested in any s.w.l. information on Australian stations heard by *SWM* readers so I can chase up more details and interesting snippets from this end. My address is PO Box 208, Braidwood, NSW. 2622, Australia. For personal replies please send 2 IRCs.



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

Following last month's report on the rescue of the rogue Olympus satellite, the craft has been seen back in service with the Plymouth Polytechnic educational programming in Telecom band and RAISAT on its DBS allocation. Signal levels in the Telecom band were at their former high strengths, suggesting that the satellite is in excellent condition following her trip round the earth. Another new signal source, available across Europe, are the programmes of the Norddeutscher Rundfunk 3 (NDR-3) from the Hamburg studio and downlinking from Astra transponder 25 (on 1B) as from September 25 for 16-18 hours daily. BSkyB have launched on an adjacent transponder their 'Comedy Channel', though for copyright reasons it is transmitted in Videocrypt and available only to their Movie Channel subscribers as a free perk.

Galavision, the Spanish language service produced in Mexico City and aimed for the Iberian audience, is now transmitting directly into that target area from PanAmSat PAS-1 - 45°W (11.515GHz horizontal). Up to the end of September, PAS-1 had been used to link Gala's European programme feed into London Teleport, where it was standards converted (525 line to 625) uplinked onto Eutelsat II F1 13°E for transmission down into Western Europe. The direct path feed over 45°W originates ex-Mexico in 625 lines PAL. Now on the vacated 13°E transponder is the 'London Teleport' idented colour bar pattern. The same pattern, at the time of writing, also appears over Intelsat V1 F4 27°W (11.505 hor) and from time to time has been involved with Scansat feeds.

Filmnet and Eurocrypt

I can confirm that Filmnet will go to D2MAC Eurocrypt at a future date as advised by a contact involved by that group, be aware of this development should you be considering a Filmnet pirate decoder that may well have a useful, but limited, life. Digital sound is still in use over Filmnet other than between film promos and to date, only 2 decoder suppliers are known to have working models available. The Scansat services are also going over to a D2MAC Eurocrypt standard on all Astra downlinks, changes should have been completed by the time this hits the bookstands.

October 1 produced tests for a suspected new Turkish channel 'Mega 10' on Eutelsat II F2 10°E at 10.98GHz with a rolling caption 'Iyi Aksamlar', 'Bu Bir Test Yayinidir', these tests are for a new channel that will be produced by the Social Democratic Party in Turkey.

Another new signal source was 'TV Campus' carried over the 10°E bird again on October 9 at 12.58GHz vertical (Telecom Band) - programme feeds

comprised yachts at sea, a marina, etc., packaged into inserts, and interspersed with colour bars. Campus TV is a 'student' channel in the French language and at the time of writing these are test transmissions. Normally, this transponder carries B MAC video and this is the first time I've seen them in the clear and unusually in PAL.

During October, I have seen the Rugby World Cup from Lansdowne Road and many news/sports feeds have been seen - outbound to Australia and New Zealand over Intelsat VI F4 27°W from London Teleport on 11.15, 11.47 & 11.51GHz vertical - both continuous match coverage and celebrity interviews from the Rugby world.

One new catch for me was the Tele X satellite 5°E with caption indicating the uplink from Aagesta Earth Station on Ch. 40 at 12.475GHz with sound sub-carrier at 6.5MHz - a good signal on a 1.5m dish despite the signal being left hand circular polarisation.

Yugoslavia

At the time of writing the conflict in Yugoslavia continues and updates can be seen out of RTV Belgrade during the evenings from around 1700UTC over Eutelsat IF5 at 11.47GHz horizontal - and on the regular programme feed of RTV Belgrade over Eutelsat IF4 7°E 11.178GHz horizontal. Regular updates of fighting with location maps are often shown (not unlike a road traffic report!) though some of the news material shown illustrates vividly the horror and brutality of war.

Reader Ken Kirkley lives in Botswana and operates mainly in C Band (4GHz) for his satellite entertainment. A 5m dish in use! Ken advises that BOP TV out of Bophuthatswana and carried over 27°W 4.053GHz will scramble its signal from November 5 as advises a caption on their output that Ken has monitored. Ringing Bop TV, Ken was told that the decoders weren't quite ready and still being tested, once Bop had confirmed that their decoders could be used outside of South Africa then one would be supplied. Another Bop' area TV service - Mabbatho TV - is airing her

output also over 27°W. Meanwhile the M-NETTV service over 66°E using MAC is experiencing problems, the satellite is in inclined orbit (i.e. it is unstable and moves within her allocated slot) and is expected to move, possibly onto 27°W. Films carried over M Net are graded for parental guidance and subscribers can nominate their decoder grading level - M Net can then over the air switch off appropriate decoders should 'X rated' material be transmitted, regrading to a higher 'X rating' level can only be achieved by writing to M Net where upon they can switch you back on! Despite the size of Ken's dish, satellite reception is becoming popular and over a dozen such installations can be seen around his area.

Orbital News

Both the Eutelsat II F3 and Intelsat K launches intended for October 24 and a winter launch respectively have been delayed pending component changes to II F3. Hopefully F3 will fly early November into a 16°E slot and operational during December. Eutelsat have also advised that the Lithuanian Republic has joined the Eutelsat organisation as from mid-October and will be able to both uplink from and receive into the Republic. Out into the Pacific and Television New Zealand is for a trial period providing a satellite born programme service into Fiji, originally the Australians had intended to provide the service but a local military coup terminated the project which now TVNZ intends to re-open for a 6 month period. TVNZ currently provides programming for the Cook Is, Niue and Nauru regions.

South Korea continues her DBS project and during the coming year launch services and 5 earth station construction contracts will be issued. On-air date is projected for 1994.

The South African channel 'M NET' which beams down a scrambled service into Southern Africa has recently announced doubled profits and with a further boost by the government allowing a 2 hour period of unscrambled programming. The SABC have announced the possible launch of a new channel with

restructuring of their TV/3 services, it's possible that M Net will be left a clear field for entertainment in South Africa if SABC return to a public service commitment.

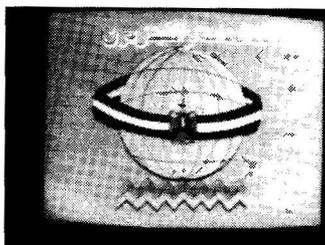
Ted Turner, provider of the famed CNN World News service is now considering a World-wide children's channel, he's hoping to purchase the Hanna-Barbera production company and with additional acquisitions from early MGM and Warner Bros material, many thousands of hours of kids' programming will be available for his projected service. And in Japan, November 25 will see the first experiments of 'Hi-Vision' over the BS-3a satellite (the NHK version of HDTV - offered for 8 hours daily), intended for a permanent HDTV service over the BS-4 satellite series in 1994 onwards.

With the Germans proceeding with their PAL PLUS development, interesting to note the UK's DTI are to part fund the BBC's work into the improvement of PAL transmission, and to seek a common improved PAL standard throughout Europe.

GBC Gibraltar is now encrypting her programme output during BBC programmes downlinked from the BBC TV World Service but only up to 1900 hours local, apparently there have been problems with the Irish made decoders with a 10% fault rate and pending new supplies only part scrambling will be carried out, though by early November it is intended to scramble full time, using the Swedish Cryptovision standard.

'Egyptian Satellite Channel' is now available in London on Videotron cable fed via an ARABSAT downlink - the service is totally in Arabic!

Finally the OIRT (the East European 'Organisation of International Radio and Television') have agreed in Helsinki to pursue research into their SECAM PLUS - rather than adopting the common West European PAL standard. Several countries are testing variations of SECAM, there seemingly being problems in adopting PAL within their transmission system. With pressure in the West to adopt D2MAC and/or PAL PLUS, having part of Europe considering going into a SECAM PLUS will lead to further confusion.



Figs. 1 and 2: Two logo identification screens from Egyptian TV as carried over the Arabsat system in S Band (2.5GHz), and captured by a reader on the south coast of England.

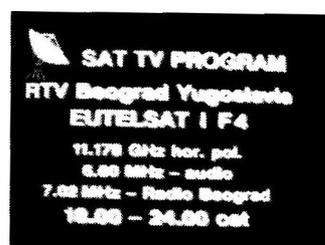


Fig. 3: Off-air details of RTV Belgrade, Yugoslavia from ECS I F4 7°E.

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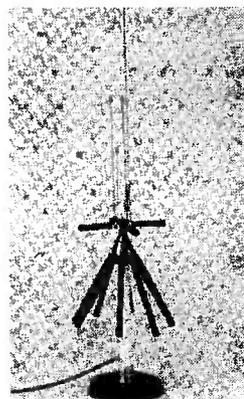
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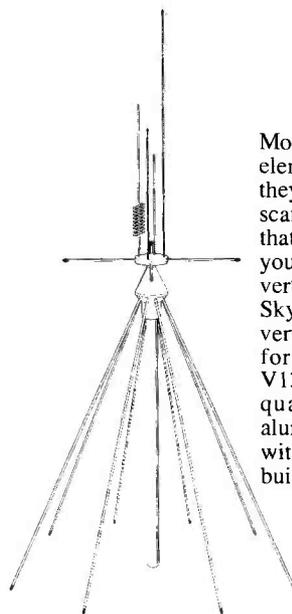
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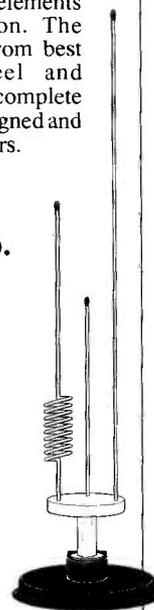
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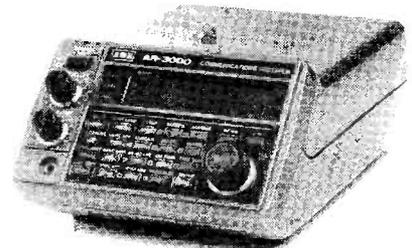


HP-2000

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AR-2800 £395.00



AR-2000

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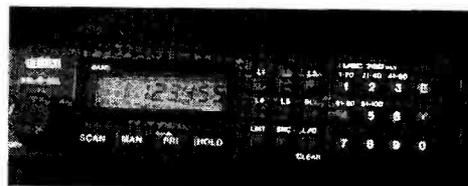


HP-1000AB

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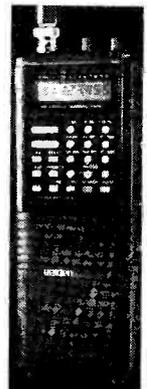
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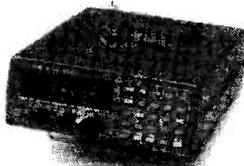
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amateur bands round-up

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

Quite an eventful month, in retrospect. The ZAs didn't just appear, they flooded the bands! They seem to have appeared on all bands from 1.8 right up to 50MHz, so much so that at the time of writing there are ZA calls to be heard actually calling CQ without anyone biting!

Jeremy Ali (Preston) enrolled for RAE at the local college, and only three entrants plus the instructor appeared on the first night...so it seems his class has folded before it started. Sad. However, to be fair to colleges, for at least 25 years they have had a 'minimum number' requirement before a course will be allowed to start, and another level below which an existing course will be closed. The only advice I can offer is to join the nearest club, start studying at home, and ask the club members on any knotty points you may come across.

Computer Logging

Turning to Jeremy's list, I find he uses computer logging software, and listens at various times with an FRG-7700 and indoor Howes active antenna, with c.w./RTTY decoding by means of a Microreader Mk 2. Interestingly enough, Jeremy's log doesn't show anything of Africa or South America, though all the other continents are handsomely represented - it suggests that maybe there is something local 'blocking the way' to the south.

Brian Lucas reports from the Home Counties Training School, where he uses amateur radio listening and construction as a 'training aid'. On 7MHz SL3ZV was noted for a 'special' while on 14MHz, he noted ZA1A, 5B4SA, ES1AR, VKs, KC5WJ, ZLs, VEs, W/Ks, 4N4A, UM8NU, 4X6XZ, A71BS, 9K2YA and JE2AIN, along with Europeans. 18MHz gave K1PEO, AK1SF, UL0A, W4FLE and KA2PHQ. 21MHz yielded UH8EA, VK3RS and TK5CV and on 28MHz they came across SV0BY, RH0E, 5B4SA, TA3PB, UA6PBJ and Europeans.

CW Preferred

Eric Pickering (Blackburn) prefers the c.w. mode and 7MHz; this produced CO7MF, T77Z, 4K1B, UA700XWV (QSL via UZ9XWV), PU1LOG, VK5FE, CX3EU who was running 2W, HF0POL (QSL to SP3HLM), VS6WV, another QRPer in PY6ML and yet another in PT7VJD, HB0/Y81XH, 9H8F, UA0WB, UF6FAL, YCOUNC, 3DA0BK (Box 122 Eveni, Swaziland), a couple of ZSs, LU2XR, JW0GB DK7VWV/5B4 UJ8JMM, UA0QFC and UA0QE, both in Tiksi, Zone 19, U0AG in Krasnoyarsk, UM8NC, JW/DJ5PA, JE1CGC, UA0ABB, UL7FCG, 9K2ZZ, UI9ACQ and UI8IZ in Samarkand.

Peter Cain (Newcastle-upon-Tyne) went on 28MHz to copy AP2JZB, A25AA, A92EV, BY5RA, CE2BMU,

CX3DAV, DU1DFU, DU8AN, D44BC, FR5DX, HZ1AB, P43WLP, TR8GL, TT8GA, VP8CFM, VP8CGL, XY0RR, ZA1QA, ZP5CF, 5H3RA, 5T5HH, 9K2IC, 9K2NG, 9M8FH; while 21MHz produced AP2JZB again, BY5RA, CE2CC, CE3BFZ, CE4IEY, CO7JC, CX7BF, C53BF, DUs, FM5CD, FP9SPM, FY5EM, HC1MN, HC1OT, HF0POL, HK1PZC, HK3JJH, HK0NZY, HL2KAT, HL9AA, HZ1AB, KH6XT, KP2A, KP4YA, NP2BW, OA4BCZ, OD5ET, OX3KM, PJ2MI, P29MND, QY9JD, ST0DX, TL8FT, TU2XB, VU2DNL, VU2TRC, V31SW, V51EG, WP4AZT, XY0RR, ZA1A, ZD7CRC, Z21HJ, Z27JV, 4S7JR, 4S7NMR, 5Z4DU, 6Y5DA, 7Q7LA, 8P9AP, 9J2BO, 9K2ZZ, 9L1US and 9L2JK. As for the 14MHz log, it contains such as A22BW, A35KB, AL7MI, BY4WNG, CE2EZE, CN8NY, CP6EN, CX3CE, DU1COO, DU1EIB, DX1DBT, DU9EK, FK8EB/M, FK8CP, FM5CD, FO5JV, HC2HVE, HZ1AB, J88AQ, JY3ZH, KC6DX, KH6WU, KL7KJ, NL7J, OA4OS, ST0DX, SV2ASP/A (Mt Athos), S79HX, TG9NX, VP2EXX, V63AR, V85GA, VP8CEN, VP8GAV, VU2JJQ, XE1L, XV9MA, XY0RR, Y11BGD, YJ8RN, YN1CB, ZA1A, ZD7CRC, ZP5JCY, 3B8CF/3B7, 3B8FU, 3B8GA, 4K2BCA, 7X2DG, 8R1JV, 9M2CW and 9M8LL.

P. Clarke (Eccles) has a shiny NRD-535 receiver to play with, to match this, a change to the antenna has resulted in a 120m wire through an a.t.u. for general use, plus 'slopers' made up for the 3.8MHz band. The next step is a planned 3-element wire beam for 7MHz in time for the CQ WW DX Contest. So far the listing includes such 3.5MHz numbers as VK3CR, ZB2AZ, ZL1B0Q, VK3RE, VE7ZG, VE2RP, K1ZM, N1AU, VU2GNA, VE4JK, K8EYU, N5CG, N2LVC, TA3PB, KA2TGB, N6DX, W8LZA, K9RSG, VE3POS, HJ1RZB, H80MA, CM4TIY, K60YI, W4UHI, JA4SLT, JA4WFO, PJ8AD, VK2WF, KL7XV, PY2TN, PY6OE, PY2LVI.

Now to **Gerald Bramwell** (Swinton) who uses all bands between Top Band and 28MHz, s.s.b. Top Band only gave

the odd G and EA3, but on 3.5MHz W10J, V01FG and VE1ZZ appear, along with RY7D, 5H3RA, VK2AVA and the Europeans. On 7MHz no Ws, but UL8LYA, RA9CO, UL7LS, UA9CDT, ZW5B, PY4LYS, 9M8PV, 5B4ES and HF0POL and the EUs. 14MHz bristled with Ws, mainly East Coast, and VEs, plus ZA1A, CU2YA, 9H1ALC, PT700, EA8NM, ZL1AQ, 9J2SZ, KP4AOD, HF0POL, CE60MY, 9K2YA, PY1DC, 4X4MU, PY0FF, VP8CDR, 7X2DJ, LU1PNC, ZW5B, 4X6UO, 4X1BD, CO2OM, CE9GEW, HK4YCR, VK7EK, JA9IPF, VP8CEN, EA8BN, VK6VU and CX7CB and the usual smaller fry. 18MHz yielded East Coast Ws, the odd 'zero' plus lots of EUs and relatively small-fry DX. The Ws on 21MHz include some of the Western Reaches, the zeros and sevens, VEs, VY, YV1CLM, YV1EDG, HC1OT, PU1Z, 6Y5DA, 4X1MO, HC2OM, PY2BDY, VU2WAP, WP4HHK, XV9MA, LU4LAV, CE5FSB, LU5FIC, PY1BL, CP6RW, LU3HQ, EA8RR, LU5FCI, KP4CHY, VP8CGR, and CM8DC. Turning to 21MHz, coverage appears into W6, W0, as well as the commoner Eastern states of USA, while on 24MHz we find W6s again, VEs, YB0CN, 9H1IT, ZS1ATY, VP2M/G0AZT, various PT7s, CX3CG, and the smaller beer. Finally on 28MHz we find USA well covered, plus proportionally more G/EU signals, ZW5B, PX5A, TI2CF, 5H3RA, EA8IN, TA3PB, and various local and DX stations using n.b.f.m.

John Heys (Hastings) mentioned that he has been playing around with 433MHz equipment, and at the other end of the spectrum he located ZA1HA on Top band.

Nice spread

Angela Sitton from Stevenage mentions c.w. from various Ws, ZA1HA and some Asian U stations on 28MHz, while on 21MHz there were a nice spread of Ws out to W6 and 7, plus JAs, VE3GFE, PY4BV, UV9CDC and UA9DM. Down lower to 14MHz where the scalps in-

cluded another spread of Ws, HK3RO, PR7PO, PP2JT, 4U4BVN, UV9CO, R50DPK, 4L1QRQ, and 4J4GO in Yerevan. ZA1HA, 4X4NJ, 9H3PF, 9L1US, Ws, EA6/G3VW, UL7MG, R3DIR, UA9CK and UA9CM were booked in on 7MHz; On 3.5MHz it was Europeans all the way, while on Top Band I note ZA1QA calling CQ with no takers.

Vince Cutajar (Malta) stuck to the WARC bands where he copied (24MHz) 9K2ZZ, 3X0HNU, RJ4X, PY0FF, UI8DX, HC8GR (Galapagos), VP5VEQ, YL2AG, VP9MN, VP2MR, V63AO, UF6FL, 7Z1IS, 5H3A and 4J3GM plus 18MHz loggings of OD5ZZ, UL7ACI, 9M2HB, 9K2ZZ, 4S7EA, LY1BY, YV5DEM, HK4EB, UF6FL, VP8GAV (Antarctica), 3C1EA, and VP8CFM (S. Orkney).

Nice to hear again from **Colin Bates** (Marston Magna). He has replaced his old long wire with a Dressler active antenna and finds this a great improvement, as it seems the nearby power lines were sucking signal away from the old antenna. Yeovil member XX9AW can be found at 0900 or 1000UT on 28.950MHz and glad to have UK contacts.

Don McLean (Yeovil) found EJ2VLP (Aran is) on 7MHz, and then turned to 14MHz for JT1BG, JY3ZH, P29DX, VKs, VU2PEP, VU2TDZ, XX9AW (QSL to KU9C), XY0RR, ZA1A, ZA1QA, 3B8FU, 3B8CF/3B7, 3B9FR, 3DA0AY, 4K4BG, 5H3DC and 9M8AJ. On 21MHz the log noted BY5RY, CP1FF, CP6RW, DU3RCM, ES1QD/O, FFOXX, HL9AA, OA4ANR, P29AS, P29DX, RO6/RB5FF, TI2MEN, UA0FF for Zone 19, VKs, VK2DXI/9M2, VP2VER, VP9WS, WP4AZT, XW8KPL, XY0RR, YE7T, ZA1A, ZL4AAG, 3D2XV (Rotuma), 4J4DGN and 9M8FH.

VHF and UHF Bands!

I am surprised at how few of you make any reference to v.h.f. or u.h.f. activity. Given a reasonably decent antenna there is quite a lot of interest to listening above 30MHz, and not just to repeaters. A modern receiver, a 3-element or more horizontal beam on a short mast and a car-ride up on to the hills can be very rewarding indeed and good fun, though to be sure winter weather in the high places can be far more severe than lower down, as anyone who has been up, say, Snowdon in summer even, will agree. In flat territory, a similar beam well in the air or even in the loft, and made rotatable, can be very rewarding.

Finished!

That's the lot for this time; keep them coming, to arrive by December 1, Jan 10, and February 10 respectively. If you have a query which can be best answered by a direct reply, I'll be pleased to help but only if a stamped addressed envelope is included.



QSL card from I3MKH sent to the staff of Practical Wireless. I3MKH is Mizko Boscolo who lives in Venice - obviously!



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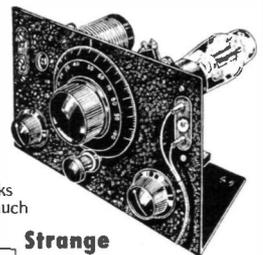
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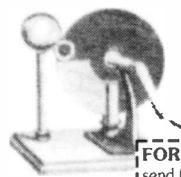


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I am always pleased to have reports from our overseas readers because it gives us here in the UK a chance to see what the various atmospheric disturbances do to signals in other parts of the world.

During the 1991 Sporadic-E season, **Sergei Olejnik** (Kalush, Ukraine), using an Elektron-280D receiver from a communal antenna system, received pictures from the USSR (Georgian TV) on Ch. R2 (59.25MHz) and Syria (STV) on Ch. E4 (62.25MHz) in May; Norway (Norge Gulen) on Ch. E2 (48.25MHz), Denmark (Danmark Radio), Jordan (JTV) and Norway on Ch. E3 (55.25MHz), Italy (RAI-Uno) on Ch. 1b (62.25MHz) and something Arabic, Germany (ARD), Holland (NED 1), Spain, Switzerland (French programme) and Syria on Ch. E4 in June; Finland (YLE TV1), Germany (ZDF), Holland, the Norwegian regionals (Gamlem, Greipsted, Gulen and Melhus), Spain, Sweden (Kanal1-Sverige) and Syria in July; Germany, Norway (Melhus), Spain and Sweden in August and Syria in September.

"Reception on E2 & E3 is difficult because on R1 is a very strong transmitter of Soviet TV-1", wrote Sergei and enclosed pictures of an announcer **Fig. 1**, a caption, **Fig. 2** and a weather forecast **Fig. 3**, that he received from Syrian TV during the period. While Sporadic-E disturbances were in progress on June 13, 14, 15, 22, 23, 24 and 27, **Lt. Col Rana Roy** (Meerut, India) received pictures from Bangkok TV (**Fig. 4**) on Ch. E3, Dubai TV on Ch. E2 and the USSR on Chs. R1 (**Fig. 5**) and R2. In addition to digital clocks on captions from the USSR and Teletext from Dubai, he saw cartoons, cycle-racing, discussions, football, tennis and, at times,

a number of Indian stations fighting for predominance on the screen. Around 1720 on September 7, Rana received strong, smeary and fluttering signals, typical of an 'F2' opening, in the Channel E2/R1 area. "Some of the pictures appeared to be Chinese," said Rana. However, at 1722, he logged an unidentified caption, **Fig. 6**, from South East Asia, at 1723 he saw adverts, at 1745 more from that area with clear sound which he thought was Chinese and at 1800 he heard songs on Ch. E3 that sounded like Thai.

Band I

In September, **Bob Brooks** (Great Sutton) received programmes and/or test-cards from Spain and the USSR on the 2nd, Denmark on the 3rd, Portugal (RTP) and Spain on the 4th, Spain on the 7th, Denmark on the 12th, the Norwegian regionals Bagn, Gamlem, Hemnes, Melhus and Steigen and a programme from Spain on the 13th, the USSR on the 30th and Norway Spain and the USSR on October 1. **Simon Hamer** (New Radnor), logged pictures from Norway, Sweden and the USSR on September 13 and Denmark, Finland, Iceland (RUV Island), Norway, Sweden and the USSR on October 1.

Weather

The slightly rounded atmospheric pressure readings, for the period August 26 to September 25, **Fig. 16**, were taken at noon and midnight from the Short and Mason barograph installed at my home in Sussex. In my part of the world, the atmospheric pressure was generally high with fine warm weather

from August 25 to September 14 and periodic variations produced the right conditions for DX in the v.h.f. and u.h.f. bands. During the month, I recorded 2.56in of rain, compared with 2.19in in September 1990, all of which fell between the 15th and 30th, with relative humidity levels of between 80 and 84% on days 16, 18, 23, 24, 25 and 29.

Tropospheric

While tropospheric openings were in progress on June 15, 16, 22 and 24, **Rana Roy**, received pictures, in Band III, from Bhatinda, Bhawalpur overlapping Mussoorie on Ch. E10, Delhi and Gwalior overlapping on Ch. E7, Jalandhar, Kasauli and Lahore. He saw adverts, Bugs Bunny cartoons, an Urdu play in strong colour and an announcer with a digital clock top right (**Fig. 7**) from Lahore and breakfast TV, programme schedules and weather on other stations. Rana also heard signature tunes and prayers.

Bob Brooks received pictures in Band III from Holland on September 1, Denmark on the 2nd and 3rd, Norway on the 3rd, Belgium (RTBF) on the 4th and France (Canal+) on the 5th. Soon after the BBC2 transmission from Craigkelly, on Ch. E27, had closed down early on the 5th

George Garden (Edinburgh) noticed a weak signal that was obviously from one of the stations sharing the channel. He soon realised by the adverts that it was an ITV signal and the film they were showing was John Wayne in *The Commancheros*. This was followed by *America's Top Ten* and ITN news and, through his local knowledge, one of the adverts ruled

out a transmitter in Scotland. With his usual detective work at such times, George was surprised, but sure, it was coming from the Rowridge, Isle of Wight, transmitter of Television South. He wrote immediately to TVS, in Southampton, explaining his interest and they confirmed that it was their programmes reaching the north and that the cause was due to atmospheric conditions. Well done George, you have proved that when the weather and the pressure is right there is u.h.f. DX to be found when the strong local station goes off the air.

Simon Hamer had a good tropo haul in September when he logged pictures in Band III from Belgium, Eire, France, Holland and all Scandinavian countries on the 17th, Germany (ARD/SWF1) and Switzerland (+PTT/SRG) on the 18th, and Germany (HR1 and SWF1) on October 3. Also among those days he received u.h.f. pictures from Belgium, Denmark (TV2), France, Germany (Hessen 3, RTL+, SWF3, & ZDF), Sweden (SVT2) and Switzerland (+PTT/TSI). Early on October 11, **Carl Bowen** (Strelley) received strong pictures from Lopik (PTT-NED1) on Ch. E4 in Band I, various system 'L' French stations in Band III and Belgium (BRT TV2) and Holland (Ned.1, 2 & 3). The Dutch signal on Ch. E29 was very strong in full colour and with accessible Teletext. **John Woodcock** (Basingstoke) logged pictures from France in Band III on September 22 and 29. **Craig Obrien** (Washington) is getting excellent u.h.f. pictures with his ex-car boot-sale Sony 9-90UB receiver which he hopes to use for DXing in Bands I and III. Congrats on spotting this multi-band set Carl.



Fig. 1: Syria.



Fig. 2: Syria.

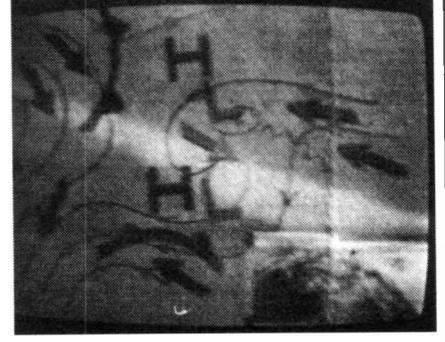


Fig. 3: Syria.



Fig. 4: Bangkok.

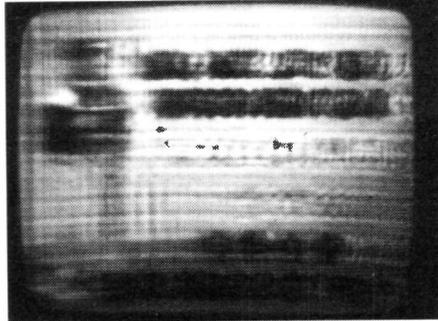


Fig. 5: USSR.

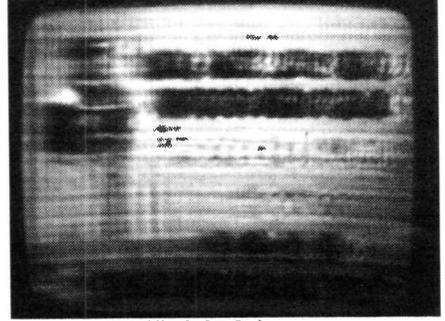


Fig. 6: Unidentified, SE Asia.

Satellite TV

Pete De Jong (Leiden, Holland) has installed an Amstrad SRX200 satellite receiver with a 600mm 'dish' antenna and recently received a news feed caption from Spain (TVE Galicia) **Fig. 8**, on Eutelsat ECS II F2 at 10°E and a test-card from Yugoslavia (JRT Beograd) **Fig. 9**, on Eutelsat ECS 4 at 7°E. Both transmissions were in good colour in the 11GHz band. My thanks to Pete for telling me that the caption, **Fig. 6**, in my October column, which I understood came from Czechoslovakia, was in fact from the USSR. The Cyrillic letters 'TCH' = 'TSN' 'Televizyonnaya Sluzhba Novostev' = TV News Service.

SSTV

During the month prior to October 7, **John Scott** (Glasgow) copied slow-scan television signals, around 14.230MHz, from stations in England, France, Germany, Spain, **Fig. 10**, the USSR and Wales. Among the ident frames were pictures of equipment **Fig. 11**, an operator **Fig. 12**, a map of Spain and such captions as 'NAME IS SLAUA' and 'OKEY VIDEO 100%'. John recently added an ERA BP12 data filter to his equipment and he tells me that the book, *SSTV Companion*, is very interesting and that, "it shows the first SSTV picture transmitted across the Atlantic by Cophorne Macdonald WA2BCW on 20 December 1959 and the received picture, received in England by John Plowman G3AST".

In Derby, an old friend, **Fred Ward G2CVV**, a past President of the RSGB, uses a TS-520 receiver, Spectrum 48K computer with the RX4 program from Technical Software to resolve SSTV pictures and an Alphacom 32 printer for the hard copy. In September, he logged 'CQ' captions from stations in Germany, **Fig. 13**, Italy, **Fig. 14** and the USSR, **Fig. 15**, around 14.235MHz. The seven horizontal lines on the right of **Fig. 13**, almost blotting out the callsign

letters 'SCY', are caused by interference to the incoming signal. Many years ago, Fred and I had the honour to be guest speakers at the annual gathering of St. Dunstan's Amateur Radio Society at Ian Fraser House, near Brighton.

Astronomical Gen

Readers who have a general interest in astronomy or are looking for specific data about the night sky, lunar and planetary happenings, eclipses, occultations and meteor showers in

1992 should consider adding the *1992 Yearbook of Astronomy* to their bookshelves, written by Patrick Moore, a good friend to my 'propagation' column and is available in hardback (ISBN 0-283-06094-8) at £12.99 or paperback (ISBN 0-283-06095-6) at £9.99.



Fig. 7.



Fig. 8: Spain.

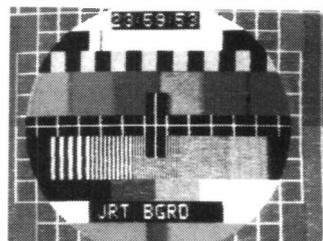


Fig. 9: Yugoslavia.

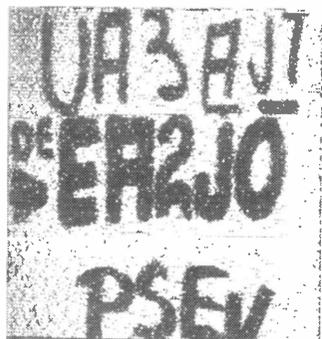


Fig. 10: SSTV, Spain.



Fig. 11: SSTV.



Fig. 12: SSTV.

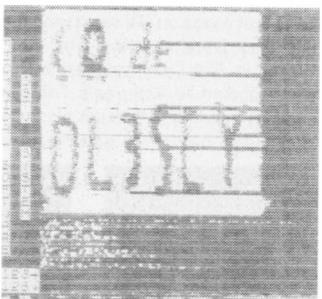


Fig. 13: SSTV, Germany.



Fig. 14: SSTV, Italy.

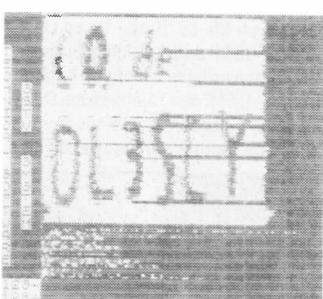
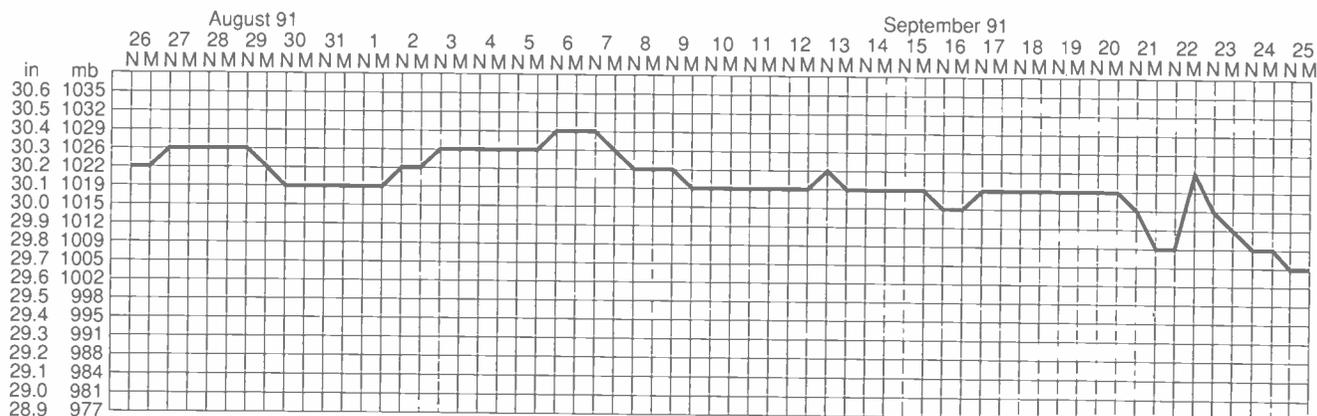


Fig. 15: SSTV, USSR.

Fig. 16.



Godfrey Manning G4GLM
c/o The Godfrey Manning Aircraft Museum,
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If you would be interested in a pleasure flight next year, please let me know. I need a sufficient number of participants before I can organise this event.

As an amateur museum curator, I do like to publicise other worthwhile ventures. Take a tip from **Tim Christian** (North Walsham) and visit the Newark Air Museum. One of the exhibits is a Hastings fitted for training Vulcan radar operators and it is open for visitors. When's my own Museum open? Ex-military air traffic controller **Ted Crease** (Bradford), and any other interested readers, can make an appointment to view by ringing 081-958 5113, weekday evenings only, please.

Radio Happenings

In September, I briefly described the satellite data link that transmits oceanic clearances to suitably equipped aircraft without them needing to speak to a controller. This has set **Dave Wright** (Sheffield) pondering about the future. My opinion is that satellites will eventually replace the inconsistent performance of the h.f. networks, certainly over the North Atlantic. Presently, the satellite only provides clearance delivery and it will take time for the conservatively-inclined aviation world to approve and convert to this new means of communication.

London Flight Information (example: 124.75MHz) covers a large area, so how can aircraft as far apart as Isle of Wight and Manchester ensure that they don't transmit simultaneously, thus making their signals unreadable to the controller? **L. Buckingham** (Manchester) wonders about this, as aircraft at 3000ft (QNH?) won't often be able to hear each other directly over that distance. My guess is that the distant transmitters relay signals from other parts of the country so that other aircraft know not to transmit. I don't know this for certain, perhaps an air traffic control expert would enlighten us?

Follow-Ups and Foul-Ups

Quick off the mark is **Denis Boshier** (Gwynedd) who immediately noticed the scrambled captions in November. Both pictures on page 51 of that issue were taken earlier this year at The

Shuttleworth Trust, Old Warden, by Chris. Top is a Tiger Moth in military colours and below is one of only two flying Miles M.14A Magisters (also known as the Hawk Trainer in civilian use) in trainer yellow scheme. Denis worked with Amy Johnson at Stag Lane in 1930 and if this de Havilland factory hadn't closed, then it would have been Edgware's own airfield! The inverted engine on Amy's aircraft suggests a Moth, predecessor to the Tiger (it also has less visibility from the front cockpit owing to different wing struts). Shuttleworth have one of these, too, and it is superfluous for me to remark that all these old types are kept in immaculate condition. Chris was particularly moved by Angus McVitie's display flying of Jean Batten's Percival Gull Six G-ADPR.

At the PFA Rally (where the photo on November's page 53 was taken), I did see one of the Moth family complete with a 'Made in Edgware' emblem on the fin. It will not have escaped readers' attentions that Edgware is my home town and my Museum is within 3km of the old de Havilland site. Denis asks about PFA - the Popular Flying Association, based at Shoreham Airport (Tel: (0273) 461616). The Association's main objective is the encouragement of good quality amateur construction of aircraft. Responsibility for inspecting such aircraft and issuing Permits to Fly is often delegated to the PFA by the CAA. If you're interested, the PFA is organised into local branches called Struts which often hold their own fly-ins.

Please note that all replies appear in this column, I don't enter into direct correspondence.

DC-10-30CF N112WA (47820) was last mentioned in November. **Paul Hilton** (Newbury) provides photographic proof that it was in World Airways (new) colours in August so this correspondence is now closed!

Your Flying Experiences

Lucky **Mrs. B.** (Isle of Man) has just returned from Orlando - having spent most of the flight in the cockpit! As previously mentioned, this is a special treat and readers should not expect this to happen as a matter of course. If, like Mrs. B., you demonstrate exten-



Fig. 1: Junkers Ju-52, also known as 'Iron Annie' or 'Tante Ju'.

sive knowledge of the procedures involved in the flight then the aircrew will be suitably impressed!

I'd like to devote a whole article to your comprehensive description, Mrs. B., but I just haven't the space - which is a pity. I've summarised the route elsewhere in the column, which is the least I can do. The Captain is also a reader of 'Airband', so thanks are passed on via these pages.

The route is rather to the north, near Iceland. This is because of your aircraft type: a twin-engined B.767-200, which can only cross the Atlantic under the extended range operations rules. Failure of one engine on a B.747, which has happened many times, is relatively inconsequential in the cruise, but loss of an engine on a twin is far more serious. You don't want to be too far from an aerodrome if this happens and hence the rules required you to fly a route that was never further than a specified flying time from an aerodrome. I don't remember the time - they keep extending it. Points to watch out for are whether the flying time is based on single engine airspeed, and whether or not there is an accessible alternate should the nearest aerodrome be closed due to weather. Perhaps the crew of this flight would care to contact me with the latest thinking on these operations?

Information and Equipment Sources

Tim Christian regrets that he has no more copies of his Consol guide (see October's issue). He does sell the 1991 updated issue of *World HF Aeronautical-Mobile R/T Frequency Allocations*.

Lancaster *Aries* was described in previous issues. **H.A. Lewis** (Surrey) has found this aircraft depicted on the video *Lancaster - The Story of the*

World's Greatest Bomber (DD242 from W.H. Smith, £15.30). The relevant clip starts 38min 45s into the programme. A Christmas present for someone?

Several military items have been acquired in good condition by **Tony Claydon** (London) who is making them available for sale. The bomb timers, dimmers, push-buttons, radio altimeters, etc., are even in original wraps despite being perhaps 30 years old. Make your offers directly to Tony on 081-361 8881 (day or evening). More Christmas presents?

Nick Ashby (Ruislip) discovered The Aviation Hobby Shop, 4 Horton Parade, Horton Road, West Drayton, Middlesex, to be a good source of the items and information that this column's readers will be interested in.

Hovercraft

Although the CAA are responsible for safe operations by public transport hovercraft, it is hard to call these machines aircraft. Nonetheless, I sampled the delights of one of these half-ship half-plane modes of transport. The last day of scheduled cross-Channel operations was on September 28 and I went to Calais and back on Hoverspeed's SRN-4 Mk. 3 GH-2007 *Princess Anne* (built 1969). Powered by four Bristol/Rolls-Royce marinised Proteus reverse-flow gas turbine engines (a combination I last experienced in 1968 on a Bristol Britannia) each driving a four-bladed variable-pitch propeller, and with two auxiliary power units, 400Hz electrical supplies and optional ground power, the aeronautical parallels are obvious.

The cockpit looks like an aircraft's with control yoke and rudder pedals. Instrumentation includes a directional gyro similar to that fitted to some aircraft; also an airspeed indicator, the pitot head of which sticks out forward from the cockpit roof. Unlike an aeroplane, each engine's instruments are laid out horizontally instead of in columns. The ride was slightly bumpy, waves being felt through the floor. The craft is remarkably stable and does not pitch noticeably up and down; roll is also minimal. Despite bad sea state, the hovercraft was far less conducive to motion sickness than a floating vessel would be. There was no sense of speed despite being able to cover 22nm in half an hour, but the vibration was about as bad as I remember from

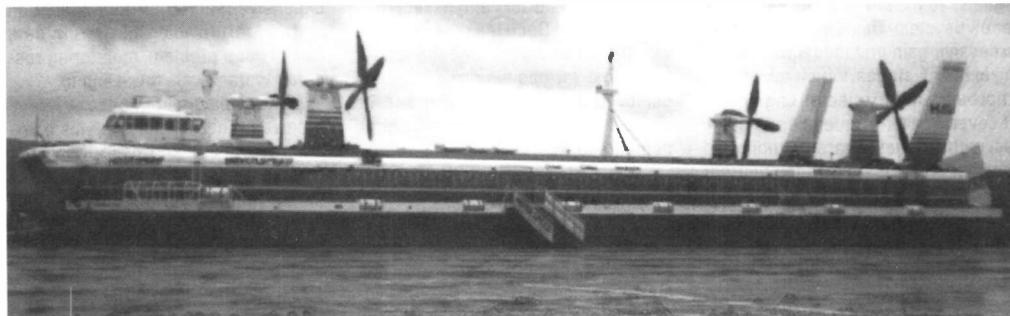


Fig. 2: Hoverspeed's SRN-4 Mk. 3 GH-2007 *Princess Anne*. Godfrey was on the final Channel crossing.

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

Imagine my surprise when I received details of what most of been one of the best kept secrets in the scanning world - a new hand-held scanner from the company Alinco. Although the name may be new to scanning enthusiasts, many amateur radio operators already know of them and own their products. The scanner, known as the DJ-X1, has been designed to perform to the standard you would expect from a top of the range product with a frequency coverage ranging from 0.5MHz to 1300MHz, a large number of programmable tuning step sizes, 100 memory channels, detection of a.m, n.b.f.m and w.b.f.m signals with a very high degree of sensitivity, all in a case measuring 110 x 53 x 30mm which makes it about two thirds the size of its main rivals.

I don't want to say much more about it, as you will already have seen the advertisements by now, but I hope to try one of the first batch when they arrive in this country. From the brief details I have been given I would expect it to prove very popular especially at the anticipated retail price of £269. You can obtain further details from Waters and Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835.

Tandy also have new models in the pipeline, but judging by the details I have seen so far I don't think that it is worth saying much more about them. As with most Tandy designs they seem to be based on scanners originally made for the American market and as such are not entirely suitable for use in the UK (with the exception of the PRO2004/5/6 series). I would expect these models to sell to ordinary members of the public via their high street stores as their price means that they don't compete too well against the more sophisticated models offered by other manufacturers that are advertised in magazines such as *SWM*.

In an interesting new development, Icom has announced two new amateur band transceivers offering the widest frequency coverage on receive currently available in such equipment. The Icom IC-2SRE is a 144MHz transceiver and the IC-4SRE a 430MHz transceiver both of which are capable of receiving over the range 25-950MHz. Because the equipment is capable of transmission you need an amateur radio licence before you can legally use it. The Wireless Telegraphy Apparatus (Receivers) (Exemption) Regulations 1989 (SI 1989 No.123) only dispenses the requirement for a licence from any Wireless telegraphy apparatus, "Which is inherently incapable of transmission". This would seem to be true of any of the large range of amateur transceivers offering extended receive coverage, so beware of the legal requirements before you part with your cash.

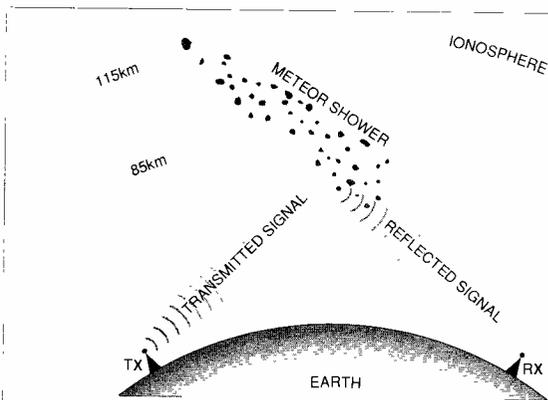


Fig. 1: Propagation by Meteor Scatter.

Law & Order

I am still going through all of the letters you have sent to me relating to the law and scanning receivers, some of which I hope to feature in a future column. Until then, I would just like to mention a point raised by a reader who is in the police force. This concerns the comment I made about chasing police cars whilst using a scanning receiver. He says that this is definitely not a good idea as you may be charged with 'going equipped' or 'being an accessory' if discovered with a scanner loaded with police frequencies at the scene of a crime. Both of which are substantially more serious than the charge of illegal listening you might anticipate receiving if caught.

Detective Work

A colleague of mine recently came across a communication system he thought would be of interest to readers of this column. The story begins when he was asked to help resolve a problem with a low power radio microphone system. This was occasionally experiencing interference in the form of a rapid machine gun type noise, which became noticeable when signals from the microphones dropped below a certain level. A quick check with a scanning receiver tuned to the frequencies used by the microphones revealed no sign of any interfering signals, so his attention turned to the receive system. This was found to have excessive gain and inadequate filtering in the r.f. stages, which resulted in it not being able to reject strong signals at several other frequencies. A quick test with a signal generator confirmed that there were many frequencies that the receiver could unintentionally receive, one of which, when monitored with the scanner was found to have a very strong pulse transmission on it.

As this was at a frequency just below 47MHz, the first thought was that it was more than likely to be an

illegal, and faulty, long range cordless telephone, many of which used to be used on farms in the area until the DTI Radiocommunications Division had a crack-down a few years ago. As tracing the source of the interference seemed an easier option than modifying the receivers - and more interesting - he decided to adopt this course of action. After borrowing some mobile direction finding equipment our hero rode off, estate car bristling with antennas, into the sunset.

After driving around in ever decreasing circles, he finally traced the source of the signal to a farm track out in the middle of nowhere - a little known village near Newbury! By this time it was getting fairly dark as he carefully made his way down the track expecting to find a farmhouse with an exotic TV antenna at the end of it. However, a few hundred yards down the road a large lattice tower loomed out of the darkness complete with four very large 3-element beam antennas aimed at each point of the compass. Rather excessive for a cordless telephone he thought!

Who could it belong to? 47MHz marks the top end of an international broadcasting band, but it has not been used in the UK for several years. The only other people using this band are the military but the installation didn't particularly look like a military installation. As he stood looking at the mast a farmer suddenly came marching down the track (or more accurately his track) and asked what was going on! Once the reason for the visit had been established the farmer was most forthcoming and supplied useful details about the site and its owners as well as a few telephone numbers to try.

Shooting Stars

To cut a long (and rather shaggy) story short, the site turned out to be the master station for a commercial communications system. This operates by reflecting signals from ionised particles

formed in the upper layer of the earth's atmosphere when meteorites pass through it. Around 10 billion meteors enter the earth's atmosphere each day. Most of these are microscopic in size and immediately burn up when they enter the earth's atmosphere.

However, a sizable proportion survive and produce the ionised trails and spectacular shooting stars you can sometimes see on clear dark nights at the peak of the annual meteor showers. As you may guess, this mode of propagation is called 'Meteor Scatter' and is frequently used by radio amateurs to provide short duration, long distance v.h.f. contacts. The 50 and 70MHz bands being particularly suitable for this purpose. As the meteor trails form at a height of around 85 to 115km above the earth this gives a potential communication range of around 2000km between stations.

How it Works

In the commercial system, the master station operates like a radar transmitter, continuously sending short duration pulses which may, or may not, be reflected back from an ionised meteor trail. If a reflection is detected, the master station then transmits a high speed data burst which will hopefully also be reflected from the meteor trail and received at the outstations. Data can be sent to, and received from, individual outstations and although the transmitted data bursts are quite rapid the actual data transfer rate is very slow. By listening to the number of data bursts occasionally transmitted instead of the more frequent pulses you can obtain an idea of the current number of meteors. The system is designed to operate effectively even during the lowest periods of activity.

By now you may be asking who would want to use such a system and why? Well there are many organisations such as water boards and oil companies who need to collect data from remote sites like mountain streams, lakes, oil platforms, meteorological sites, lighthouses, buoys and beacons, etc., all of which may be out of the range of a normal radio system especially if only a limited power supply is available. In such cases, a meteor communication system can be an inexpensive method of data collection and control providing that the low data rate is not a problem, monitoring reservoir water levels for example.

Since being told this story, I have received other similar systems operating on 40.925 and 41.650MHz, the rapid pulses of the master stations fading up and down in strength as propagation conditions changed. As I was hearing these stations at the same time as American Fire departments on 33MHz it could be that these two systems are also American. I know several systems are operating in the

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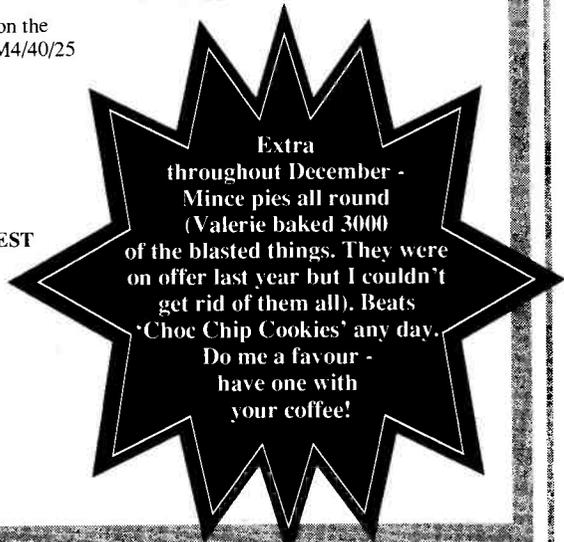
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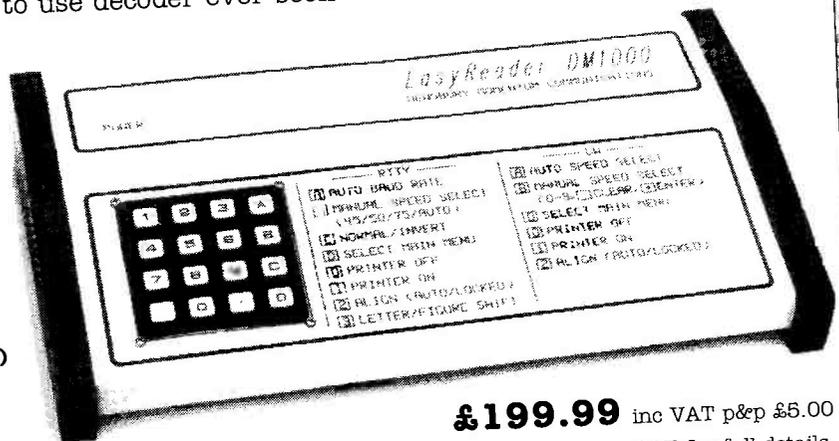
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Piscids	May 3-10	May 7	30
Nu Piscids	May 11-14	May 12	20
Arietids	May 30- June 18	June 8	60
Zeta Perseids	June 1-16	June 8	40
June Perseids	June 22-30	June 26	30
Nu Geminids	July 9-15	July 12	60
The Perseids	July 20-Aug 18	Aug 12	65
Taurids	Oct 10-Dec 5	Nov 1	16
Geminids	Dec 7-15	Dec 13-14	55
Ursids	Dec 17-24	Dec 22	18

US where they are used by trucking companies to provide data links on long haul routes. However, as far as I am aware there is only the one system operating in the UK giving a coverage of most of Northern Europe. No doubt we will hear more systems such as this operating as the requirement for data links steadily increases during the next decade.

Long Distance Signals

Whilst we are on the subject of long distance communications the winter is now with us and so too is enhanced propagation on the lower v.h.f. bands. This is as a result of changes in the ionosphere F2 layer, which occur during the winter months. I included a description of this mode of propagation in the September 1990 column if you need more detailed information.

Most American services use

n.b.f.m. with 20kHz channel spacings, but I find it worthwhile tuning in 5kHz steps as there are many other stations operating between the US channels. These include East European transmissions on 34.2, 34.425, 34.5, 34.6 and 34.7MHz with Spanish and Italian sounding signals on 34.5 and 35.08MHz. Although I suspect that these last two signals may originate from South American countries.

I don't use any special antenna, it would seem if you can hear stations then almost any antenna will work. I have tried switching between a CB

antenna tuned to 35MHz, a 50MHz folded dipole, Datong active antenna and my normal 70-1300MHz log-periodic with only a slight difference in intelligibility, although it must be said that there was quite a big difference in received signal strengths. At some stage, I hope to experiment with a horizontal antenna in order to see if I can use its directional properties to separate stations on the same channels. The only other problem with monitoring foreign stations in this band, apart from the high level of computer-generated hash encountered in most

urban areas, is being able to understand the many different accents being used by what are nominally English speaking people.

I know that there are already several readers who regularly monitor these bands, so how about dropping me a line and letting me know what you have heard and when you heard it. Along with any other relevant information, I will include details from the most interesting letters received in future columns.

So until next month - Good listening.

53

airband

the Britannia! The cabin has aircraft-type seat tracks and 3+3 seats but there are no lap straps and there is the feeling of space only shared by wide-bodied aircraft. Big windows are fitted instead of portholes.

On the radio side, there are marine m.f. sets, two primary radars (true and relative motion), Decca Navigator and Doppler. Unlike aircraft, collision avoidance is by on-board radar. A radar operator, surrounded by black-out curtains, sits behind the pilot and feeds him information on possible conflicts. I was told that hovercraft talk to each other on marine (f.m.) Channel 33 (vessel transmits on 157.65 and receives on 162.25MHz), but I'm not sure how the full duplex works between craft as distinct from ship-to-shore. At each hoverport is a control tower that allocates parking stands on channel 35 (vessel transmits on 157.75 and receives on 162.35MHz). What a sad day that these quick, smooth, efficient and technically fascinating craft are being withdrawn.

Frequency and Operational News

GAJIL 10/91 from the CAA announces a new approach/v.d.f. frequency at Oxford: 125.325MHz. As mentioned in my review of Tim Christian's booklet, the Novair (Gatwick) h.f. circuit has ceased operations (6.654 & 10.021MHz).

Once again the CAA has revised three charts. They are UK Airspace

Restrictions and Hazardous Areas RAC 5-0-1; UK Areas of Intense Aerial Activity, Aerial Tactics Areas and Military Low Flying System RAC 5-0-1.1 and UK Winch Launched Activities RAC 5-0-2. There is also a new chart: UK ATS Airspace Classifications RAC 3-0-1. If you need these million-scale charts then they are free of charge from CAA Chart Room, Room T1120, CAA House, 45-59 Kingsway, London, WC2B 6TE but a self-addressed adhesive label is appreciated as it saves the CAA staff's time.

The new airspace classifications are worth a mention, although I doubt if readers (including pilots) will notice much practical difference compared to previously. In order to fall in line with international standards, UK airspace is now divided into seven categories. Five are controlled airspace (only four are actually used at present) and two uncontrolled. This redefines various control zones and special rules areas. For full details, which are complex, consult AIC 86/1991.

At Birmingham, the new Eurohub has caused the stand numbers to change as follows. Eurohub replaces stands C30, C32, D31 and D33 and the Common Travel Pier. Instead there are now stands 1-5 inclusive, 12-16 and 30. On the International Apron are 31, 32, 40-44 inclusive, 51-58 and 63-69. Quite logical?

JetRanger pilot Derek Roe (Reigate) saw a new miniaturised d.m.e. ground transponder at the Helitech show. British made, one's on test at Fair Oaks ('TST' channel 119Y, paired with 117.25MHz). Such a convenient device is in demand by many smaller aerodromes, but finding sufficient spare channels for them will be a problem.

G-HEMS (pictured in October) was seen to navigate by Greater London Atlas grid squares when it called in to a park in Edgware. What's more Ron Galliers (London) has found out that its call sign changes from Mike Sierra to Medivac when actually 'on a job'. Ron is puzzled by military aerodromes that use 122.1MHz. This is a NATO common standby frequency and all military aerodromes should have it. No matter what else, pilots visiting strange bases should consistently be able to make contact on this frequency. Hence it's often used to control airshows. If there's a military aerodrome traffic zone penetration service to help overflying civil pilots, then this is normally on a different (published) frequency. Not all military bases have this however - Lakenheath hasn't one, for instance.

Let me help Ron out with information on Neatishead. The h.r.t.a. is a high-intensity radio transmission area. Not only is this the controlling authority for North Sea danger areas EGD316/7, but it also provides RAF Operations on 4.710MHz. The frequency is listed in Tim Christian's book; the danger areas are shown on RAC 5-0-1; see above. Pilots needing to cross the danger areas should first telephone Neatishead for activity information (the number is also on the RAC 5-0-1 chart).

Propagation Predictions

Tim Christian suggests the following to be likely paths to the UK around now. Pacific (morning 10.048MHz; late afternoon 11.384). South Pacific (early morning 8.867MHz, improving through the winter). South America (early morning 6.649MHz, grey line).

Some from Geoffrey Powell (Tamworth). South Atlantic (morning 8.855, 5.526, 3.479MHz). China (evening 8.942MHz).

The next three deadlines (for topical information) are November 29, January 10 and February 7. Please send all correspondence intended for 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS.

Britannia Flight BY392A Manchester - Orlando, Florida (Boeing 767)

Extended-range twin-engined operation, outside the organised track system. Hence within v.h.f. range for so much of the flight. Cruise FL390. Route goes up to Scotland, passes Iceland and Greenland and then follows the American East Coast as follows: Manchester - Benbecula - N59W10 (Oceanic entry) - N61W20 - N63W30 - N64W40 (most northerly point) - N62W50 N60W60 - Fassa - Bangor - Boston - Richmond - Virginia - Orlando. Frequencies (MHz): Iceland 127.85; Reykjavik 125.7; Reykjavik NAT-D 132.2; Sondrestrom 121.3; Gander 124.8; Gander Centre 125.9.

Britannia Flight BY392B Orlando, Florida - Manchester (Boeing 767)

Almost the reverse of BY392A except for the Oceanic section as follows: Schefferville (Oceanic entry) - N60W60 - N63W50 - N64W40 - N63W30 - N60W20 - N58W10 - Benbecula. Frequencies (MHz): West of W30 132.6; Gander 133.9; Moncton 121.3.

Lawrence Harris
5 Burnham Park Road, Pevereil, Plymouth, Devon PL3 5QB

After a period of 'steady as she goes' (no pun intended) with the weather satellites, problems seem to have hit METEOR 3-4 during late September, and then METEOR 3-5 during October. I leave my scanner on while doing other work, and noticed that 3-4 didn't come on for the 1117UTC pass on September 26. It came back on during the evening, seeming to be a little early, causing me to suspect that its orbit had been changed. Then its infra-red transmissions ceased. On October 5, it came on as expected at about 1020UTC, but then I heard it switch off. It was travelling northbound over the Atlantic and the transmissions started again a few minutes later! This most eventful pass continued with 3-4 again switching off after two or three more minutes. As it was over the Atlantic, I don't think that it was being commanded from the Russian control centre, though I do know that there are ships that can command it. Following that pass, METEOR 3-4 remained transmitting visible light pictures but with no infra-red during the night-time part of its orbit.

I left my tape recorder set to record overnight transmissions on 137.30MHz, but there were none until on October 9 when I recorded a full tape. Playing it back, I was able to correlate the scene with my tracking program and identify METEOR 3-5. This was confirmed later when a live pass was taken. Since then, METEOR 3-5 has remained on continuously, providing both visible and infra-red transmissions. METEOR 3-4 was switched off around mid-October, at which time an apparent fault developed on 3-5 with the picture being replaced by irregular grey shadings. By October 23 its picture had returned to normal. METEOR 2-20 has been operating on 137.85MHz as usual.

OKEAN

For several weeks I had not heard, or recorded, any transmissions from either OKEAN 2 or 3, and reports from regular correspondents such as **Peter de Jong** of Leiden in Holland, also mentioned the lack of OKEAN transmissions. So the few seconds of recorded data that I found on September 29 were very welcome. It was a short radar image taken around Norway, with 'piano-key telemetry' but no numbers (which can identify the time). The next few days saw the same area being scanned with the on-board radar system, and producing very clear pictures. My tracking program suggested that it was OKEAN 3 at about 0500UTC. The typical OKEAN 3 imagery recorded by **Ron Hogben** of Dover is shown in **Fig. 2**. His picture shows the 'piano-key telemetry' section on the left and the image of south-east Greenland on the right.

METEOSATS 3 & 4

During the autumnal equinox (the period around September 23), the sun crosses the celestial equator where geostationary satellites orbit and so a ground-based antenna pointing at METEOSAT or GOES, etc., will have the sun pass through the beam at about mid-day. This is followed by the satellite itself being eclipsed by the earth's shadow at local midnight. Satellite controllers call this phenomena the 'eclipse season' and transmission schedules are adjusted to avoid using them. METEOSAT 3 continues to provide a p.p.t. of excellent quality from its location near the eastern seaboard of the USA.



Fig. 1: Brian Taylor's NOAA 11 picture on August 30.

GOES Update

Here is an up-to-date summary of the various GOES satellites, taken from a BBS file kindly provided by **Paul Wilson** of Macclesfield who sends me regular files from foreign BBS.

GOES-2: This is in the stand-by position at 60°W, sometimes heard in the UK during the day, and provides WEFAX and digital broadcasts (taken by GOES-7). It is using an eight metre antenna, and transmits its operating schedule daily at 1055UTC. From western Britain GOES-2 reaches about 20° elevation around mid-day, falling to about 4° near mid-night. At 1800 and 0600UTC it is about 12° elevation. Counties further east will not get such good elevations.

GOES-3: This is also on stand-by, positioned at 174°W so cannot be heard in the UK.

GOES-6: Positioned at the GOES-West location at 136°W, so cannot be heard in the UK. It provides WEFAX and other data and its schedule is also broadcast at 1055UTC. It relays METEOSAT data as well, and uses a 13m antenna.

GOES-7: Positioned at 97°W is the prime operational satellite, but is invisible from the UK.

Coming Launches

The next few weeks should include a further METEOR WXSAT (presumably 3-6) that is scheduled for a November launch from Plesetsk in the USSR. December 10 should see the next NOAA satellite, number 13, due to be launched from the Western Test Range on an Atlas E rocket. The next Shuttle flight is *Atlantis*, currently scheduled for launch in November.

Other Satellites

Following requests from some correspondents, I periodically mention the satellites transmitting in the bands near to 137MHz. Tuning into the 149MHz band, you should hear a series of Cosmos navigation satellites:

Cosmos 2004 and 2154 on 149.94MHz

Cosmos 2142 on 150.03MHz

Cosmos 2016, 2100 and 2125 on 149.97MHz

Cosmos 2074 on 149.91MHz

There are also at least three satellites using 150.00MHz, namely Nadezhda 1, 2 and 3. All of these satellites are easy to hear and even a portable scanner used outside should pick some of them up within half-an-hour or so. My thanks to **Geoffrey Falworth** of Penwortham for providing the satellite identification. The early British satellite X3, also known as PROSPERO can still be heard on 137.56MHz, unless it has been recently switched off. Finally, MOS 1B can be heard transmitting on 136.11MHz. Its companion MOS 1 was also using this frequency but now appears to be off.

Dipole Phasing

A letter from **Peter Wade** of Sevenoaks explained about the problem that he had in getting a consistent signal from the polar orbiting satellites, even though his antenna has clear views all round. Peter described the symptoms that pointed to an incorrectly phased crossed dipole. A simple dipole can be used to test a system at ground level and this would show that good signals are available, lasting some 10 or more minutes, which could then indicate that the roof antenna connections are the wrong way round. My own antenna had a similar symptom though the fault turned out to be a broken phasing harness that the suppliers immediately replaced. A second letter from Peter told me that the fault had been located - in his receiver!

ESA

The European Space Agency publishes a number of periodicals designed to keep organisations and individuals aware of its activities. The *ESA Bulletin* is a quarterly magazine containing some technical papers as well as articles of general interest. The latest edition features pieces on Hermes, the retrievable manned spaceplane that will be able to visit MIR and FREEDOM. *Earth Observation Quarterly* is mostly

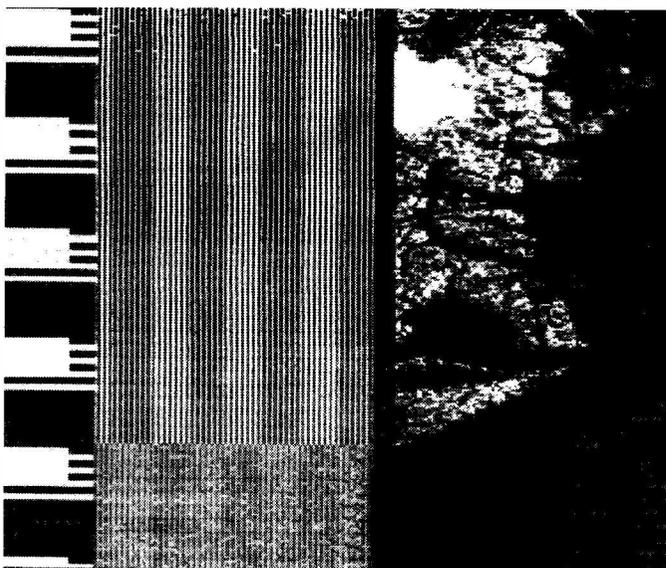


Fig. 2: Ron Hogben's OKEAN 3 picture from August 19.

about the applications of remote sensing, i.e., using the high resolution sensors on board satellites such as NOAA and METEOSAT. The articles are fascinating, if technical, and include pictures from SPOT as well as those mentioned. 'Reaching for the Skies' discusses the rocket systems used by ESA and the latest edition looks at the effect of launches on the ozone layer, currently a topic of discussion. Finally, ESA has just started a new periodical *Preparing for the Future* which is another technical publication dealing with the technology of space hardware. I will try to obtain some ESA photographs for publication in this column.

Letters

Gerard Melia of Stockport has recently set up a Cirkit receiver to feed his '286' computer running PCGOES. There will be a new version of this program soon and I shall provide details in a month or two. **Brian Dudman** of Harrow is a regular reader of this column (thanks Brian, that makes at least two of you!) and operates two computers, one for picture decoding and the other for satellite tracking. He sent me several pictures, and one from METEOSAT is shown in Fig. 3. He has recently bought Prosat 2 (a later development from PCSAT3), which I am also reviewing shortly. Brian comments that his purchases have made WXSAT monitoring an expensive hobby! He also asks about receiving OKEAN signals - they are few and far between. The best method is undoubtedly to leave a tape recorder operated by the SQUELCH control on the receiver; when a signal is heard on 137.40MHz the SQUELCH will open the circuit and start the tape recorder. There may be a long time between transmissions, however!

M Griffin GU8THM of Cardiff has recently taken an interest in weather satellite monitoring and uses an AOR 2002 scanner. As has been mentioned previously in this column, virtually any scanner that can tune into the 137MHz band should be capable of hearing WXSAT signals because they are fairly strong. Even the short whip antenna often supplied will pick up some signal when a satellite is high above the horizon. Producing a good picture though is another matter - the bandwidth used by most scanners is not optimised for WXSAT use and so that type of scanner is best used for monitoring rather than decoding. I use an unmodified Tandy PRO-2004 scanner, fed from either an external WXSAT antenna or the discone in my loft. With either antenna I can monitor a large number of satellites.

The framstore continues to be popular amongst readers of this column and **Alan Thompson G6TKM** of Nottingham has adapted his to provide

four picture animation. His receiver is the Dartcom unit and he has built a 1.2m dish which is positioned some 4m above ground level - see Fig 4. Alan has set up a tracking system for his dish, guided by a Dragon 32 computer. **J Howe** of Horsham wishes to use his Sony ICF-SW7600 receiver for FAX charts and satellite images but is unsure whether that receiver is suitable. With a good antenna and a sideband capability, fax charts should be decodable, but I also referred him to Mike Richards who is the resident *SWM* expert on FAX reception.

One of the few correspondents to write about the Cirkit receiver is **Andrew Melia** of Stockport. He comments that after some teething problems he got his first image from NOAA 11, showing almost the whole of Europe. He uses a '2086' computer.

Monitoring MIR

I must mention a letter from **R Hastie** of Exeter who was able to hear the Russians aboard the MIR space station in late September because of a broadcast from Radio Devon which had a local astronomer in their Plymouth studios. The times of MIR's flight over Britain were given and so tuning in on 143.625MHz his family were able to hear both the voices and the data transmissions. MIR's orbit has an inclination of about 51° which brings it over Britain for about five or six consecutive orbits every 90 minutes or so, followed by a gap of several hours before the next group of passes. I am glad that my broadcast was of help!

R D Matthews of Romford uses an Atari 1040 computer and Meteosat convertor, and asks about the availability of software to receive live pictures in colour rather than just blue or

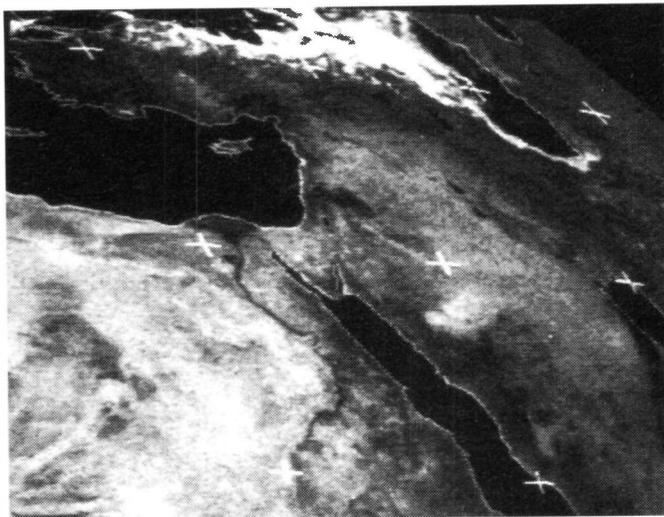


Fig. 3: Brian Dudman's METEOSAT 3 picture from August 25.

grey. I'm not sure what software he uses to produce the pictures but assume that it does not have a colour option. It is important to remember that none of the weather satellites actually transmit colour pictures. The scene below the satellite is scanned and the image is analysed for its brightness, temperature, or other component. This information is then coded and transmitted in real-time (live). It is possible to add artificial colour by allocating colours to sections of the grey scale e.g., the black section can be represented by blue shades, and intermediate greys by greens etc. Under the right circumstances a very realistic colour image can be obtained. Brian Taylor of Woking has sent me one of the best colour pictures that I have seen - see Fig 1 and use your imagination! Brian has a Dartcom/British Aerospace system.

Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz
NOAAs 10, 12 on 137.50MHz
METEOR 2-19 or 2-20 on 137.85MHz
METEOR 3-4 or 3-5 on 137.30MHz
OKEAN 2 or 3 on 137.40MHz occasionally
FENGYUN 1-2 was on 137.80MHz (keep watching)

Bulletin Boards

For those able to dial up the American BBS the number of the Celestial Bulletin Board which I understand carries recent Kepler elements, is 513-427-0674. There are also BBS in the UK which I hope to include next month after checking with the providers!

Kepler Elements

For those readers who don't have access to the electronic bulletin boards just mentioned, I will send a print-out of the latest set upon receiving an s.a.e. All known weather satellites are included, together with their transmission frequencies if operating. My set is from data kindly supplied by NASA. **Norman Darnborough** of Checkheaton asks how often one should update the elements in a tracking program. I would suggest between four to six weeks is reasonable. By that time, METEOR predictions will still be within a couple of minutes, NOAA times maybe three minutes out, and OKEAN perhaps five minutes or so. The errors are less with the higher orbiting satellites because atmospheric drag is reduced.

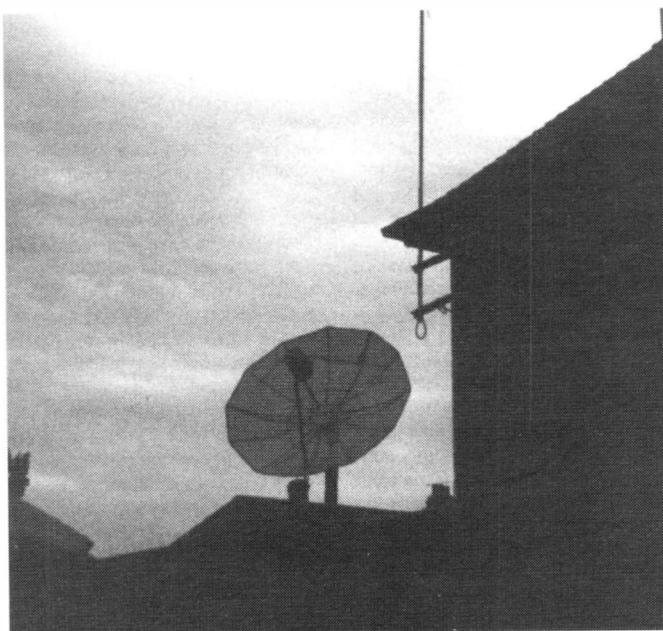


Fig 4 Alan Thompson's dish.

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

William Eyre of Stockport wrote some time ago asking for advice on how to solve his interference problem. He'd just changed over to an Amstrad PC-2086 computer running the Code-3 decoding package. In his letter, he reports that the final solution was to change his computer for an ICL DRS M45, this completely cured his interference problem. I have to say though that it's usually the interconnections that cause the interference rather than the computer itself. The worst offender is usually the video monitor and its connecting leads. When you change the computer, you usually end up changing all the interconnecting leads as well and this often has the greatest impact on the interference levels. With reference to the Amstrad PC-2086, I've been running this unit for some time with the Code-3 package and suffer no significant interference problems.

William is one of the first people I've heard from to QSL with the Swiss Radio International RTTY service, mentioned last month. His QSL card arrived recently.

I also have a couple of pleas for help this month. The first comes from **Victor Lateo** of Slough. He currently runs the Bonito system on his Amiga computer and would like to move-on to receive SSTV and SITOR. Does anyone know of a source of suitable software?

S. Robinston from Middlesbrough has been building-up a system from designs published in the Maplin magazine. These units have been combined to make-up a basic terminal unit for RTTY reception. The only problem he has is a lack of suitable software. His main interest is RTTY and FAX, though I suspect his terminal unit will only be suitable for RTTY type signals. Can anyone help with a source of decoding software for an Amiga 500 with 1Mb of RAM.

John Robertson of Northumberland is a newcomer to utilities and has set himself up with one of the popular ERA Microreaders. However, he wants to couple it up to his BBC B computer so he can take advantage of the larger screen. He has made the lead and loaded the program I printed a few months back. The only trouble is that the interference from the BBC B wipes out any usable signals. John has written asking if I have any tips to reduce this interference to more reasonable levels. Interference problems are never easy, but the BBC B has been well documented. The most common cause of interference is the RGB video output and colour monitor. You might like to try the using the u.h.f. output of the BBC B with a monochrome television. Other points to check is that your station is properly earthed with ONE earth point and that all signal connecting leads are screened. You could also try wrapping some of the connecting leads around lengths of ferrite rod.

Serial Data?

With the large numbers of newcomers to the world of utility listening, I think it's appropriate to include the odd tutorial in the column. For this month, I've picked on an area that many find difficult to grasp - serial data. With the majority of utility stations transmitting serial data, it's clearly an area that should be understood.

Rather than give a highly theoretical view, I'll try to keep to practical examples to simplify the explanation.

Let's start by considering how we could communicate between two computers in the same room. If the computers were both the same, we could put the information we want to send on a floppy disk and simply move the disk between computers. But what if the computers are different types with incompatible disk drives? One option would be to wire the computers together, but we need to think about what to connect and how many wires we would need.

Fortunately, there is a comparatively simple answer to this as most modern computers are supplied with a serial port, often called an RS-232 port. This port or connector operates to an internationally agreed standard so enabling different computers and auxiliary equipment to be connected together. Before we go on to examine the connection in more detail, let's take a look at the information that we want to send.

For the sake of this example, let's assume we've written a message on one computer and want to transfer it to another. Although we would have typed letters on the keyboard, the computer can only work with numbers. Because of this, the computer converts each key-press into a number and then stores the number. The conversion process operates very simply by using a look-up table to convert between letters and numbers. To make sure that all computers use the same look-up table, it's been standardised and is known as ASCII or American Standard Code for Information Interchange. The standard character set uses numbers between 0 and 127 to cover upper and lower case letters plus numbers and punctuation.

For the next stage, we need to understand a bit about the type of numbers used by computers. Although computers may appear very clever, they only use very simple logic to carry out tasks. The trick is that they operate very quickly and don't make mistakes! This simple logic results in their being only two states for the electrical circuits - on or off. This means we can't use the familiar decimal numbering system. What we need is a numbering system that can operate with two states that we'll call 1 and 0. The answer is to use the binary system which operates to base 2 instead of the base 10

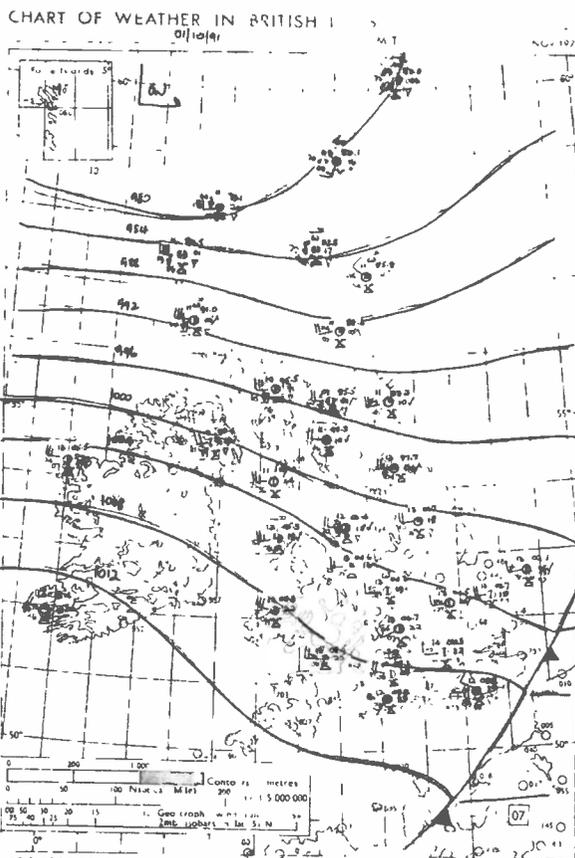


Fig. 1.

used in the decimal system. For those of you that aren't familiar with this system here's a simple (I hope) explanation.

Referring to **Fig. 1**, you will see that in the decimal system each column represents units, tens, hundreds, thousands, etc. For the binary system the principle is the same except in this case each column represents units, twos, fours, eights, etc. So the binary system will need more columns than the decimal system to represent a given number.

At this point I need to introduce some new terminology - bits and bytes. A bit is an acronym for Binary digit so each digit in a binary number is called a bit. A byte, on the other hand, is a number made up of eight bits - simple really.

Returning to the way text is stored. The ASCII look-up table uses numbers from 0 to 127 and some simple maths shows that seven bits are required to represent this numbering range. Within the computer this number is moved about using seven wires - a system known as parallel data. This is because you can imagine the signals all travelling along their own exclusive wires at the same time or in parallel.

Returning to our original problem of communicating between computers, we could do this by connecting seven wires between the two computers and sending the information as parallel data. In fact, this system is in common use for communicating between computers and printers. Whilst seven data lines is not too much of a problem over short distances, it's not so practical for longer distances. The ideal would be to reduce this to two wires - data and ground.

The way to achieve this is with serial data. Instead of sending all seven

bits of the data at the same time we send them one at a time. It's quite obvious when you think about it! However, to make the system actually work there are a few refinements required.

The first is what is called handshaking. This is needed so that the sending computer can indicate that it's about to send and the receiving computer can say it's ready to receive. The handshaking can be done in a number of ways, but I'll describe what's known as the hardware method. For this to work, we need two more connections, these are called RTS and CTS. The RTS or Request To Send lead is used to indicate that data is about to be sent. The CTS or Clear To Send lead is used to indicate that the distant computer is ready to receive. With those two formalities out of the way the transmission can begin.

However, before we can really get going we need some agreement between the computers on the following:

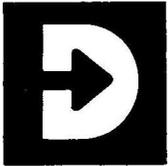
- 1: In what order will the data bits be sent?
- 2: How fast will they be sent?
- 3: How will the beginning and end of each number or byte be marked?

The answers to these important questions are quite straightforward.

Starting with the first one, the normal convention is to send the least significant bit (units) first, followed by the rest in ascending order.

The sending speed is where the term baud rate comes in. 50 baud means that binary 1s or 0s are being sent at 50 per second. The agreed common set of baud rates for computers are: 300, 600, 1200, 2400, 4800, 9600 and 19200 baud.

Finally, we have to mark the beginning and end of each number. This is done by adding extras bits that are



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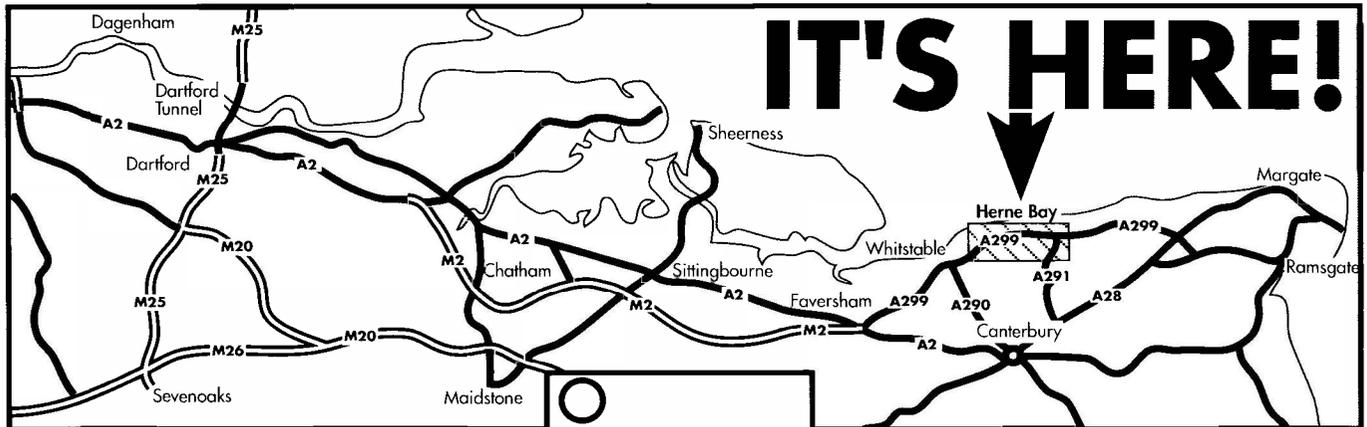
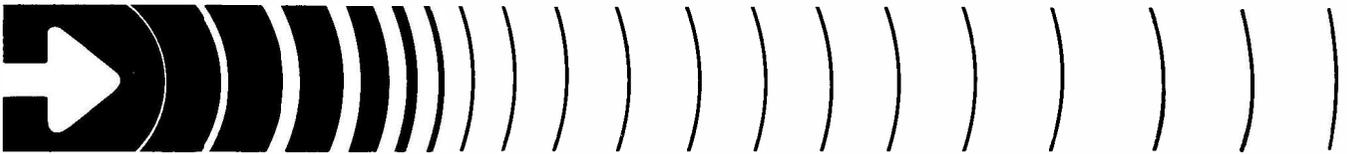
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long medium & short

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

During the year, many listeners have sent in detailed and interesting reception reports for inclusion in LM&S and I would like to express my sincere thanks to all those concerned. May I wish all readers a very happy Christmas and good listening in 1992.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during the four week period ending Oct 5.

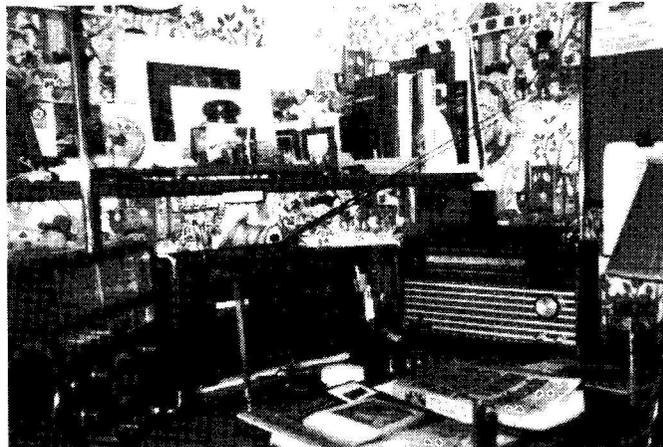
Newcomers should note that l.w. signals from some of the more distant stations can only be received via sky wave paths after dark. Your location may determine how well you receive the ground wave signal during daylight, e.g. the long sea path enables signals from Motala, Sweden on 189kHz to reach **Kenneth Buck** in Edinburgh at S10544 during daylight, but the signal is weak or non-existent in many areas of the UK. A different situation arises

after dark, because the ionosphere reflects the high angle component of the transmitted signal, which may reach the UK.

Reception in Storrington during daylight and after dark has been compared by **Fred Pallant**. He checked each l.w. channel and found that signals from Bechar 153, Tbilisi 189, Konstantinow 225, Tipaza 252 and Topolna 270 could only be heard after dark. A similar check at your location may prove to be interesting, but remember that the sky wave paths often change.

Medium Wave Reports

Using a giant 4m square loop ahead of his receiver in Grimsby, **Jim Willett** heard signals from stations in Canada, the USA, the Caribbean and S.America. The first was CJYQ in St.John's on 930kHz, the signal peaked S10333 by 0020. Another in St.John's, VOXM on 590, was heard at 0110 and a further ten were logged over the next three



Ted Walden-Vincent's listening post in Great Yarmouth.

hours, all rated S10222. Jim is now awaiting a QSL/letter to confirm his log of WWLW in Moore, OK, which runs just 1kW on 640kHz.

Although **Tim Shirley** (Bristol) heard WINS in New York on 1010 at 2300 on Sept 15, most of his loggings were heard much later. He was delighted to get a QSL from WOSO in San Juan, Puerto Rico confirming their

signal on 1030kHz. He is still awaiting confirmation from R.Reloj in Trinidad (CMGI), which he heard on 610 at 0330.

Signals from N.Africa also reached here after dark. From Algeria: Ain Beida 531kHz (600/300kW) 2222 at 2240 by Sheila Hughes in Morden; Les Trembles 549 (600kW) 32232 at 0504 by **Ron Galliers** in N.London; Alger 891 (600/300kW) 32333 at 2140 by **Noel Carrington** (Sutton in Ashfield); also Alger 981 (600/300kW) heard by **Sid Morris** in Rowley Regis. From Morocco: Sidi Bennour 540 (600kW) 33333 at 0515 in Morden; Oujda 594 (100kW) 32322 at 0504, Sebba-Aiou 1044 (300kW) 33343 at 2131 in N.London. From Tunisia: Tunis-Djedeida 963 (200kW) 22222 at 2225 in N.London.

Low power relays in Spain have been heard here after dark. In Co.Down, **Eddie McKeown** logged COPE via Malaga on 882kHz (5kW) as 21311 at 0137, RNE5 via Burgos 1017 (5kW) as 21311 at 0152 and COPE via Valencia 1296 (5kW) as 34233 at 2349. More surprising, the 2kW relays in Castellon 1215 and Alicante 1395 were logged in N.London, both 32322 at 0115.

Many m.w. channels are shared, it may be possible to separate stations by using a loop or ferrite rod antenna with your receiver. **John Wells** (E.Grinstead) used a loop to 'null-out' R.Bedfordshire via Luton on 630kHz (200W) and log co-channel R.Cornwall via Redruth (2kW) for the first time. A similar technique was used by **John Case** in Frodsham. He rated Redruth as 23232 at 1045.

Listeners:

A: Leo Barr, Sunderland.
 B: Tim Bucknall, Congleton.
 C: Noel Carrington, Sutton-in-Ashfield.
 D: John Case, Frodsham.
 E: Sean Cooper, Wells-next-the-Sea.
 F: Ron Galliers, N.London.
 G: Francis Hearne, Bristol.
 H: Sheila Hughes, Morden.
 I: Rhoderick Ilman, Oxted.
 J: Eddie McKeown, Co.Down.
 K: George Millmore, Wootton, IOW
 L: Sid Morris, Rowley Regis.
 M: Roy Patrick, Caister.
 N: Chris Shorten, Norwich.
 O: Phil Townsend, E.London.
 P: John Wells, East Grinstead.

Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p. kW	Listener	Freq kHz	Station	ILR BBC	e.m.r.p. kW	Listener
558	Spectrum R.	I	7.50	B,C,F,J*,K,L,M,P	1161	Viking R.(C.Gold)	I	0.35	B,E*
585	R.Solway	B	2.00	B,J,L*	1170	Ocean Sd.(SCR)	I	0.12	H,K,P
603	Invicta Snd(Coast)	I	0.10	E*,F,K,O,P	1170	R.Orwell	I	0.28	M,N,P
603	R.Gloucester	B	0.10	B,C,K,L,P	1170	Signal R.	I	0.20	B,C,L
630	R.Bedfordshire	B	0.20	B,D,F,H,K,L,O,P	1170	Swansea Sound	I	0.58	J*
630	R.Cornwall	B	2.00	D,K,P	1242	Invicta Snd(Coast)	I	0.32	F,L,M,O,P
657	R.Clywyd	B	2.00	B,C,F,K,L,O,P	1242	Isle of Wight R.	I	0.50	J*,K,L*
657	R.Cornwall	B	0.50	K	1251	Saxon R.	I	0.76	E*,F,J,M,N,D,P
666	Devon Air R.	I	0.34	G,H,K,P	1260	GWR (Brunel R.)	I	1.60	H,K,P
666	R.York	B	0.80	B,C,F,L*,P	1260	Leicester (GEM-AM)	I	0.29	B,L,P
729	BBC Essex	B	0.20	B,C,E*,F,K,L*,N,O,P	1260	Marcher Sound	I	0.64	B
738	Hereford/Worcester	B	0.037	B,C,F,K,L,O,P	1278	Pennine R.(C.Gold)	I	0.43	B
756	R.Cumbria	B	1.00	B,J	1305	R.Hallam (C.Gold)	I	0.15	B,C
756	R.Shropshire	B	0.63	B,C,F,K,L,P	1305	Red Dragon (Touch)	I	0.20	K,L,P
765	BBC Essex	B	0.50	A,B,C,E*,F,K,L,O,P	1323	R.Bristol (Som Snd)	B	0.63	F,L,P
774	R.Kent	B	0.70	E*,F,K,N,O,P	1323	S'thern Sound(SCR)	I	0.50	K,O,P
774	R.Leeds	B	0.50	B,C	1332	Hereward R.P'boro	I	0.60	B,C,E*,H,J*,O,P
774	Severn Sound (3CR)	I	0.14	B,K,L	1332	Wiltshire Sound	B	0.30	J*,K,L*,P
792	Chiltern R.	I	0.27	B,C,E*,F,J*,K,L,O,P	1359	Essex R.(Breeze)	I	0.28	E*,F,I,O,P
801	R.Devon	B	2.00	B,J*,K,L*	1359	Mercia Snd(Xtra-AM)	I	0.27	B,L
819	Hereford/Worcester	B	0.037	B,F,G,K,L,P	1359	Red Dragon (Touch)	I	0.20	G*
828	Chiltern Radio	I	0.20	F,O,P	1359	R.Solent	B	0.85	K,P
828	R.Aire(Magic 828)	I	0.12	C	1368	R.Lincolnshire	B	2.00	E*,P
828	R.WM	B	0.20	B,L	1368	R.Sussex	B	0.50	F,H,K,O
828	2CR	I	0.27	K,P	1368	Wiltshire Sound	B	0.10	K,L
837	R.Cumbria	B	1.50	B	1413	Sunrise R.	I	0.125	I,K,O
837	R.Furness	B	1.00	B	1431	Essex R.(Breeze)	I	0.35	F,K,O,P
837	R.Leicester	B	0.45	B,C,F,G,I,K,L,O,P	1431	Radio 210	I	0.14	K,P
855	R.Devon	B	1.00	K	1449	R.Peterboro/Camb	B	0.15	B,K,M,P
855	R.Lancashire	B	1.50	B,C,J,L*	1458	GLR	B	50.00	G*,K,P
855	R.Norfolk	B	1.50	E*,F,H,D,P	1458	GMR	B	5.00	B,J*
873	R.Norfolk	B	0.30	C,E*,F,H,I,K,L*,O,P	1458	R.Cumbria	B	0.50	J*
936	GWR (Brunel R.)	I	0.18	B,H,I,K,L,P	1458	R.Devon	B	2.00	P
945	R.Trent (GEM-AM)	I	0.20	B,C,F*,J*,K,L,P	1458	Radio WM	B	5.00	B,C,G,L
954	Devon Air R.	I	0.32	H,K,P	1476	C'ty Snd(1st Gold)	I	0.50	H*,J*,K,P
954	R.Wyvern	I	0.16	B,L,P	1485	R.Humberside	B	1.00	E*,N
990	WABC (Nice & Easy)	I	0.09	B,C,L	1485	R.Merseyside	B	1.20	B,J,L
990	R.Aberdeen	B	1.00	J*,M	1485	R.Oxford	B	0.50	K,P
990	R.Devon	B	1.00	K,P	1485	R.Sussex	B	1.00	H,K,P
999	R.Solent	B	1.00	F,H,I,K,P	1503	R.Stoke-on-Trent	B	1.00	B,J*,K,L,P
999	R.Trent (GEM-AM)	I	0.25	B,C,P	1521	R.Mercury	I	0.64	H*,K,O,P
999	Red Rose R.	I	0.80	B	1521	R.Nottingham	B	0.50	B,C,J*,L
1017	WABC Shrewsbury	I	0.70	B,C,K,L,P	1530	Pennine R.(C.Gold)	I	0.74	B,J*
1026	R.Cambridgeshire	B	0.50	B,E*,F,H,N,O,P	1530	R.Essex	B	0.15	I,K,O,P
1026	R.Jersey	B	1.00	H,K,P	1530	R.Wyvern	I	0.50	B,K,L
1035	Northsound Radio	I	0.78	E*	1548	Capital R. (Gold)	I	97.50	E*,J*,K,P
1035	R.Kent	B	0.50	F,K,O,P	1548	R.Bristol	B	5.00	J*,K,L*
1035	R.Sheffield	B	1.00	B,C	1548	R.City (City Talk)	I	4.40	B
1035	West Sound	I	0.32	J*	1548	R.Hallam (C.Gold)	I	0.74	B,C
1107	R.Northampton	B	0.50	F,I,K,L*,P	1557	Chiltern R.(Gold)	I	0.76	B,J*
1116	R.Derby	B	1.20	B,C,J*,L,P	1557	Ocean Sound (SCR)	I	0.50	H,J*,K,P
1116	R.Guernsey	B	0.50	H,K,P	1557	R.Lancashire	B	0.25	B
1152	BRMB (Xtra-AM)	I	3.00	C,L	1557	Tending R (Mellow)	I	?	M,P
1152	LBC (L.Talkback R)	I	23.50	H*,K,P	1584	Gatwick	I	0.10	K,P*
1152	Piccadilly R.	I	1.50	B	1584	Heathrow	I	0.10	O,P
1152	R.Broadland	I	0.83	E*,J*,P	1584	R.Nottingham	B	1.00	B,C
1161	GWR (Brunel R.)	I	0.16	H,J*,L*	1584	R.Shropshire	B	0.50	B,L
1161	R.Bedfordshire	B	0.10	P	1602	R.Kent	B	0.25	A,B,E*,J*,K,L*,M,O,P*
1161	R.Sussex	B	1.00	H,K,P					

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

long medium & short

Medium Wave Chart

Freq kHz	Location	Country	Power kW	Listener					
520	Bilbao	Spain	20	K*	981	Ceske Budejovice	Czech	30	K*
531	Ain Beida	Algeria	600	G*,J*	990	Berlin	Germany	300	G*,K*
531	Leipzig	Germany	100	G*,K*,L,M*	990	Bilbao	Spain	10	G*,K*
531	Oviedo	Spain	10	G*,J,K*	990	Twyryn	UK	1	B
531	Beromunster	Switzerland	500	G*	999	Hoyerswerda	Germany	20	C*
540	Wavre	Belgium	150/50	C*,G*,J,K*,L,M*,N,Q	999	Madrid	Spain	20	G*,J,K*
540	Sidi Bennour	Morocco	600	G*,I	1008	Fievo	Holland	400	C,G*,K*,L,M*
549	Les Trembles	Algeria	600	G*	1017	Rheinsender	Germany	600	C*,F*,G*,K*,M*
549	Bayreuth	Germany	200	C*,G*,J,K*,L,M*	1017	Burgos	Spain	5	K*
549	Thurau	Germany	200	Q	1026	Graz-Dobl	Austria	100	C*,K*
558	Valencia	Spain	20	C,K	1035	Milan	Italy	50	K*
567	Berlin	Germany	100	C*,K*	1044	Dresden	Germany	250	C*,G*,K*
567	Tullamore	Ireland (S)	500	C*,F*,G*,J,L,M*,Q	1044	Sebaa-Aioun	Morocco	300	G*
567	Marbella	Spain	10	K*	1044	San Sebastian	Spain	10	G*,K*
576	Vidin	Bulgaria	100	G*	1053	Zaragoza	Spain	10	K*
576	Muhlacker	Germany	500	G*	1053	Postwick	UK	10	C,F*
576	Stuttgart	Germany	500	K*,L,Q	1062	Kalundborg	Denmark	250	C*,F*,G*,K*
585	FIP Paris	France	8	L,Q	1071	Brest	France	20	L
585	Madrid	Spain	200	C*,G*,K*,M*	1071	Lille	France	40	G*,K*
585	Dumfries	UK	2	B	1080	Katowice	Poland	1500	G*
594	Frankfurt	Germany	1000/400	C*,F*,G*,K*,M*	1089	Moorside Edge	UK	150	B,F*
594	Oujda-1	Morocco	100	G*	1089	Krasnodar	USSR	300	K*
594	Muge	Portugal	100	G*	1098	Bratislava	Czech	750	C*,G*
603	Lyon	France	300	G*	1098	?	Spain	10	G*,K*
603	Sevilla	Spain	20	K*	1107	Munich	Germany	40	C*,F*,G*,K*,M*
603	Newcastle	UK	2	B,C,F*,K*	1107	Santander	Spain	10	K*
612	Kiel	Germany	10	G*	1107	Wallasey	UK	0.5	B
612	Athlone	Ireland (S)	100	C,G*,L,M*	1116	Bari	Italy	150	K*
621	Wavre	Belgium	80	C,G*,K*,L,O,Q	1125	La Louviere	Belgium	20	G*,K*,L
621	Barcelona	Spain	10	G*	1125	?	Spain	10	K*
630	Vigra	Norway	100	C*,D*,K*	1125	Llandrindod Wells	UK	1	B,G
639	Praha	Czech	1500	G*,K*	1134	Valencia	Spain	10	K*
639	La Coruna	Spain	100	C*,G*,K*,L	1134	Zadar	Yugoslavia	1200	C*,G*,K*,L
648	BBC Dordfness	UK	500	F*,H,I,K*,L,M*,Q	1143	Stuttgart	Germany	10	G*,K*,L,M*
657	Napoli	Italy	120	G*	1143	Oublin	Ireland (S)	?	B,C*,K
657	Madrid	Spain	20	C*,G*,K*	1161	Strasbourg	France	200	G*,K*,M*
657	Wrexham	UK	2	B,C,G*,M*,Q	1170	Krasnodar	USSR	500	K*
666	Bodenseesender	Germany	300/180	C*,K*	1179	Murcia	Spain	5	O*
666	R.Vilnius	USSR	500	K*	1179	Santiago	Spain	10	K*
675	Marseille	France	600	K*,M*	1179	Solvesborg	Sweden	600	A*,C*,E*,F*,G*,H*,K*,L,M*
675	Lopic	Holland	120	C,G*,L,K*,L,P,Q	1188	Kuurne	Belgium	5	G*,K*,L
684	Sevilla	Spain	250	C*,G*,K*	1188	Reichenbach	Germany	5	K*
693	Berlin	Germany	250	K*	1188	Szolnok	Hungary	135	G*
693	Droitwich	UK	150	B	1197	Munich	Germany	300	F*,K*,M*
693	Postwick	UK	10	C,F*	1197	Enniskillen	Ireland (N)	1	B,C,K*
702	Aachen/Flensburg	Germany	5	G*,K*	1197	Bourneomouth	UK	0.5	L
702	Monte Carlo	Monaco	300	C,K*	1206	Bordeaux	France	100	C*,G*,K*
711	Rennes	France	300	C,F*,G*,K*,L,Q	1206	Wroclaw	Poland	200	C*,G*
720	Langenberg	Germany	200	K*	1215	Kaliningrad	Lithuania	500	K*
720	Lisnagarvey	Ireland (N)	10	B,C	1215	Castellon	Spain	2	G*
720	London	UK	0.5	F*,L	1215	Lisnagarvey	UK	10	C*
729	Cork	Ireland (S)	10	C,K*,L	1215	Moorside Edge,UK	100	B	
729	Oviedo	Spain	50	K*	1215	Postwick	UK	1	F*
738	Paris	France	4	C*,G*,K*,L	1224	Vidin	Bulgaria	500	C*,G*,K*
738	Barcelona	Spain	250	G*,K*	1233	Melnik	Czech	400	C*,G*,K*
747	Flevo	Holland	400	C,F*,G*,J,K*,L,M*,P,Q	1242	Marseille	France	150	C*,K*
756	Brunswick	Germany	800/200	C*,G*,K*	1251	Marcali	Hungary	500	G*
756	Red'uth	UK	2	L	1251	Huisberg	Netherlands	10	C*,G*,K*
765	Sottens	Switzerland	500	K*	1260	Rhodes	Greece	500	C*,F*
774	Enniskillen	Ireland (N)	1	K*	1260	Valencia	Spain	20	C*,G*,K*
774	Cacores	Spain	60	K*	1269	Neumunster	Germany	600	C*,F*,G*,K*,L,M*
783	Burg	Germany	1000	C*,F*,G*,K*,M*	1278	Strasbourg	France	300	K*
792	Limoges	France	300	C,L	1278	Oublin/Cork	Ireland (S)	10	C*,F*,K,L
792	Sevilla	Spain	20	K*	1287	Litomysl/Liblice	Czech	300/200	C*,G*,K*
801	Mur-chen-Ismaning	Germany	300	G*,K*	1296	San Sebastian	Spain	5	K*
801	Burgos	Spain	10	G*,K*	1296	Dordfness	UK	500	C*,F*
801	Madrid	Spain	20	G*,K*	1305	Rzeszow	Poland	100	G*
810	Westerglen	UK	100	B,C,F*,G*,K*,L,M*	1305	Orense	Spain	5	G*,K*
819	Toulouse	France	50	K*	1314	Kvitsoy	Norway	1200	C*,F*,G*,K*,L,M*,P
819	Warsaw	Poland	300	G*,K*	1314	Valladolid	Spain	10	G*
837	Nancy	France	200	C*,G*,K*	1323	Leipzig	Germany	150	G*,K*,M*
837	Sevilla	Spain	10	G*,K*	1332	Rome	Italy	300	C*
846	Rome	Italy	540	G*,K*,L,M*	1341	Lisnagarvey	Ireland (N)	100	B,C*,F*,G*,L
855	Berlin	Germany	100	C*,K*	1350	Nancy/Nice	France	100	C*,F*,K*,L
855	R.Bucharest	Roumania	750	G*	1359	Berlin	Germany	250/100	K*
855	Murcia	Spain	125	G*,K*,L,M*	1368	Foxdale	IOM	20	B,C,K
864	Paris	France	300	G*,K*,L,M*,Q	1377	Lille	France	300	C,G*,K*,L,Q
864	Cd. Real	Spain	10	G*	1386	Kaliningrad	Lithuania	500	G*,K*,M*
873	Frankfurt	Germany	150	C*,F*,G*,J*,K*,M*	1395	Lushnje,Albania	1000	G*,I*,K*,O*	
873	Enniskillen	UK	1	B,K*	1395	Alicante	Spain	2	G*
882	Malaga	Spain	5	K*	1404	Brest	France	20	K*,L,M*
882	Pennon	UK	10	B	1413	Zaragoza	Spain	20	G*,K*,M*
882	Twyryn	UK	5	B	1422	Heusweiler	Germany	1200/600	F*,G*,K*,L
882	Washford	UK	100	F*,G,K*,L,M,Q	1431	Oresden	Germany	250	K*
891	Algiers	Algeria	600/300	C*,G*,J*,K*,M*	1440	Marnach	Luxembourg	1200	F*,G*,J*,K*,L,M*,O
891	Huisberg	Holland	20	G*,L	1449	Squinanzo	Italy	50	K*
900	Milan	Italy	600	G*,K*	1467	Monte Carlo	Monaco	1000/400	F*,G*,J*,K*,M*
909	Moorside Edge	UK	200	B,C,F*	1476	Wien-Bisamberg	Austria	600	K*,M*
918	Madrid	Spain	20	G*,K*	1494	St.Petersburg	USSR	1000	G*,J*,K*,K*
927	Wolvertem	Belgium	300	C,F*,G*,K*,L,M*,P,Q	1503	Stargard	Poland	300	G*,K*,O*
936	Bremen	Germany	100	C*,G*,J,K*	1512	Wolvertem	Belgium	600	F*,G*,J*,K*,L,O
945	Toulouse	France	300	G*,K*	1530	Rome	Italy	150/450	F*,G*,I*,J*,K*
945	Rostov-na-Donu	USSR	300	G*	1539	Mainflingen	Germany	700	G*,K*,M*
954	Dobrochov	Czech	400	G*,K*	1557	Nice	France	300	K*
954	Madrid	Spain	20	G*	1568	Sarnen	Switzerland	300	G*,K*
963	Pori	Finland	600	C*,F*,K*,M*	1575	Burg	Germany	250	G*,K*,M*
963	Seixal	Portugal	10	I*	1593	Langenberg	Germany	400/800	F*,G*,K*,L,M*
963	Tunis-Djedaida	Tunisia	200	G*	1611	Rome	Italy	5	K*
972	Hamburg	Germany	300	C*,G*,K*,M*					
981	Alger	Algeria	600/300	C*,G*,J*,K*,M*					

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

Short Wave Reports

Although solar activity has remained high, there have been less disturbances than before and good DX reception was noted some days. However, many signals have been marred by heavy co-channel interference since changes were made to schedules at the end of September.

Some broadcasters are still taking advantage of the good conditions in the 25MHz (11m) band. Most days, very strong signals have reached here from the Voice of the UAE in Abu Dhabi on 25.690MHz. Their Arabic broadcast was SINPO 55555 at 1140 by **Chris Shorten** in Norwich. The Darwin signals from R.Australia 25.750 (Eng to Asia, M.East 0900-1100) have also reached us well. Often weak at 0900, the signal usually improved by 1000. In Swanwick, **Jim Cash** logged it as 44243 at 1019. In Edinburgh, it peaked SIO455 at 1050.

Also using 11m are RNI Oslo 25.730, DW Cologne 25.740, R.Moscow 25.780 and RFI Paris 25.820, but they tend to be poor here as they are beamed to areas outside Europe. In Canada, **Alan Roberts** logged the Voice of UAE as 55555 at 1230; RNI as 35333 at 1100; DW as 45444 at 1150; R.Australia 25222 at 1050, R.Moscow as 25222 at 1310 and RFI as 45444 at 1525. In September, he found propagation good on 9 days.

Some of R.Australia's 21MHz (13m) signals have reached the UK. Those to C/SE.Asia via Darwin 21.525 (Eng 0100-0800) were heard at 0700 by **Don Phillips** in Bridlington; to Asia via Carnarvon 21.775 (Eng 0100-1000) SIO444 at 0850 by **Bryan Kimber** in Hereford; to SE.Asia, M.East 21.720 (Eng 1100-1330) 24333 at 1140 in Swanwick.

Most 13m signals to Europe reach their target well. R.Japan via Moyabi 21.575 (Eng 0700-0800) was 54344 at 0735 in Norwich; R.Pakistan, Islamabad 21.520 (Eng 0800-0845) 32133 at 0800 in Co.Down; HCJB, Ecuador 21.455 (u.s.b. + p.c. 24hrs) SIO222 at 1122 by **Julian Wood** in Elgin; R.Moscow, USSR 21.465 (Russ 1200-1700) SIO444 at 1320 by **John Coulter** in Winchester; RCI via Sackville 21.545 (Eng, Fr 1400-1530) 54544 at 1425 by **John Nash** in Brighton; WCSN 21.670 (Ger, Eng, Fr 1405-1555) SIO444 at 1500 by **George**

- Listeners.
A: Leo Barr, Sunderland.
B: Tim Bucknall, Congleton
C: Noel Carrington, Sutton in Ashfield.
D: John Case, Frodsham.
E: Jim Cash, Swanwick.
F: Sean Cooper, Wells-next-the-Sea.
G: Ron Galliers, N.London.
H: Francis Hearne, Bnstol.
I: Sheila Hughes, Morden.
J: Rhoderick Illman, Oxted
K: Eddie McKeown, Co.Down.
L: George Millmore, Wootton 10W
M: Sid Morris, Rowley Regis.
N: Roy Patrick, Caister
O: Don Phillips, Bridlington.
P: Chris Shorten, Norwich.
Q: Phil Townsend, E.London

Long medium & short

Long Wave Chart

Freq kHz	Location/Station	Country	Power kW	Listener
153	Bechar	Algeria	1000	H*,J*
153	Donebach	Germany	500	A,B,C*,D*,E,F,G*,H,J,K
153	Brasov	Romania	1200	A,C*
162	Allouis	France	2000	A,B,C*,D*,E*,F,G*,H,K
171	Kaliningrad	Lithuania	1000	A,C*,D*,E*,F,G*,H,K
171	Nador	Morocco	2000	B
177	Oranienburg	Germany	750	A,B,C*,E*,F,G*,H,K
183	Saarlouis	Germany	2000	A,B,C*,D*,E*,F,G,H,K
189	Motala	Sweden	300	A,C*,J*
189	Tbilisi	USSR	500	H*
198	Droitwich	UK	500	B,C*,D,E,F,G,K
198	Westerglen	UK	50	A
207	Munich	Germany	500	A,B,C*,E*,F,G*,H,K
216	Roumoules	Monaco	1400	A,B,C*,E*,F,G*,H,K
216	Oslo	Norway	200	A,E*
225	Konstantinow	Poland	2000	A,B,C*,D*,E*,G*,H*
234	Junglinster	Luxembourg	2000	A,B,C*,E*,F,G,H,K
234	Leninrad	USSR	1000	E*
243	Kalundborg	Denmark	300	A,B,C*,D*,F,G*,H,K
252	Tipaza	Algeria	1500	D*,H*
252	Atlantic 252	Ireland	500	A,B,C*,D*,E*,F,G,H,K
261	Burg	Germany	200	C*,F,K
261	Moscow	USSR	2000	A,B*,C*,F,G*,H*,K
270	Topolna	Czech	1500	A,B*,C*,D*,E*
279	Minsk	USSR	500	A,B*,C*,D*,E*

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

Listeners

- A: Kenneth Buck, Edinburgh
- B: Noel Carrington, Sutton in Ashfield.
- C: Ron Galliers, N.London.
- D: Sheila Hughes, Morden
- E: Eddie McKeown, Co.Down
- F: George Millmore, Wootton, IOW
- G: Sid Morris, Rowley Regis
- H: Fred Pallant, Storrington.
- I: Don Phillips, Bridlington.
- J: Tim Shirley, Bristol.
- K: Phil Townsend, E.London.

Millmore in Wootton; R.Japan via Moyabi 21.700 (Eng, Jap 1500-1700) 45333 at 1600 by **Darren Beasley** in Bridgwater; WYFR 21.615 (Eng 1900-2145) 33323 at 1905 in N.London; HCJB, Ecuador 21.480 (Cz, Eng, Ger, Sw, Sp 1800-2230) 44444 at 1933 by **Rhoderick Illman** in Oxted; VOFC via Okeechobee 21.720 (Eng 2200-2300) 34533 at 2254 by **David Edwardson** in Wallsend.

Broadcasts for outside Europe were also heard: SRI via Schwarzenburg 21.695 (Eng, It, Ger, Fr to Pacific areas 0745-1000), SIO434 at 0745 by **Cyril Kellam** in Sheffield; R.Norway Int, Oslo 21.590 (Norw to Aust, NZ, W.Africa, S.Am 1000-1030) SIO444 at 1029 by **Philip Rambaut** in Macclesfield; BSKSA, Saudi Arabia 21.505 (Arto N.Africa ?-1700) SIO455 at 1100 in Edinburgh; SRI via Schwarzenburg 21.695 (Eng, Fr, It, Ger to Asia, Pacific areas 1315-1500) 55555 at 1500 by **Charles Beanland** in Gibraltar; R.Moscow, USSR 21.685 (Eng to Africa ?-1930) 44444 at 1530 in Morden; VOA via Tangier 21.625 (Eng to Africa 1600-2200) 44444 at 1725 by **Ron Damp** in Worthing; VOA via

Greenville 21.485 (Eng to Africa 2000-2200) 44554 at 2030 by **John Parry** in Northwich.

Some days, R.New Zealand's **17MHz (16m)** signals to Pacific areas have been heard clearly here. The 100kW signals from Rangataiki, N.Island on 17.770 (Eng 2200-0630) was 34434 at 0650 by **Leo Barr** in Sunderland and 43333 at 2200 in Norwich. Some of R.Australia's signals have also reached Europe. Those to E/SE.Asia via Carnarvon 17.630 (Eng, Chin 0000-0900) were 21331 at 0737 in Oxted; to Pacific areas via Shepparton 17.715 (Eng 2200-0530) were heard at 2200 by **Sergi Olejnik** in Kalush, Ukraine.

Morning broadcasts included R.Denmark via RNI 17.765 (Da to NZ 0730-0755) heard at 0730 in Bridlington; R.Japan via Yamata 17.890 (Jap, Eng to Oceania 0600-0800) SIO333 at 0730 in Sheffield; KHBI, N.Mariana Is 17.555 (Eng to NE.Asia 1005-1155) 24332 at 1018 in Brighton.

Later, Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) was 55555 at 1510 in Bridgwater; RFE Munich 17.805 (Ro to Eu 1500-1755) SIO

433 at 1615 in Winchester; RSA Johannesburg 17.840 (Eng to W.Africa 1555-1800) 54444 at 1652 by Oarran Taplin in Brechley; WWCR 17.525 (Eng to USA, Europe 1500-2000) SIO444 at 1700 in Macclesfield; RCI via Sackville 17.820 (Eng to Europe 1900-?), heard in Rowley Regis; HCJB, Ecuador 17.790 (Eng to Europe 1900-2000?) SIO444 at 1915 in Edinburgh; R.Sofia, Bulgaria 17.875 or 17.825 (Eng to ? 1945-2030) 42243 at 1945 in Co.Down; Voice of Israel, Jerusalem 17.575 (Eng to ?) 44444 at 2000 in Morden; RHC, Cuba 17.705 (Eng to Eu-

rope, N.Africa 2000-2100) SIO433 at 2045 in Hereford; VOA via Tinang 17.735 (Eng to E.Asia 2100-0100) 32233 at 2217 in N.London; VOFC via Okeechobee 17.750 (Eng to Europe 2200-2300) 55454 at 2240 in Swanwick.

UK listeners have noted good DX reception in the 15MHz (19m) band. The signals from R. New Zealand Int. to Pacific areas on 15.120 (Eng 1800-2200) were 42433 at 1950 in Bridgwater. R. Australia via Shepparton 15.320 (Eng to Asia 2030-0800) 55444 at 2105 in Norwich. The domestic service from ABC via VLW15 Wanneroo, W.Australia on 15.425 (Eng 2300-0945) was logged by **Simon Hamer** in New Radnor as SIO232 at 0530.

Some broadcasts to Europe stem from HCJB, Ecuador 15.270 (Eng 0700-0830) 45554 at 0728 in Wallsend; R.Algiers via Bouchaoui 15.160 (Ar, Fr, Sp 0700-1800) SIO433 at 1515 in Winchester; FEBA, Seychelles 15.330 (Eng to Asia 1500-1600) 42333 at 1530 in Bridlington; WWCR Nashville 15.690 (Eng, Sp 1200-0000) 44433 at 1600 in Brighton; R.Sofia, Bulgaria 15.330 (Eng 1800-1830) 44444 at 1815 in Oxted; R.Korea, Seoul 15.575 (Eng 1800-1900) SIO555 at 1840 in Edinburgh; RNB Brasilia 15.265 (Eng, Ger 1800-?) 21112 at 1840 in Co.Down; HCJB, Ecuador 15.270 (Eng 1900-2000) 22322 at 1912 in N.London; WSHB Cypress 15.665 (Eng, Ger 1800-2155) 54444 at 2019 in Swanwick; RAE Buenos Aires 15.345 (Eng, Fr, It, Ger 1900-2300, also to Africa) SIO333 at 2107 in Macclesfield and 54454 at 2138 in Gibraltar; SLBC, Sri Lanka 15.120 (Eng 1830-2130) SIO333 at 2110 in Grimsby; WRNO New Orleans 15.420 (Eng 1900-2300, also to USA) SIO444 at 2245 in Hereford.

Those to other areas include VOA via Kavala 15.205 (Eng to M.East 0500-

Tropical Band Chart

Freq MHz	Station	Country	UTC	DXer	Freq MHz	Station	Country	UTC	DXer
2.350	Sarwon/Hwanghae	Korea	0240	M	4.830	Gaborone	Botswana	0036	G
2.485	ABC Katherine	Australia	2205	M	4.830	R.Tachira	Venezuela	2219	E,M
2.560	Xinjiang	China	2230	D,K	4.832	R.Relej	Costa Rica	0535	D
3.210	R.Mozambique	Mozambique	1820	I	4.832	Altai	Mongolia	2200	I
3.220	R.Togo, Lome	Togo	2240	M	4.835	RTM Bamako	Mali	1826	B,D,E,G,J,K,M
3.240	TWR	Swaziland	1800	I	4.845	RTM Kuala Lumpur	Malaysia	1445	I
3.255	BBC via Maseru	Lesotho	1730	I	4.845	ORTM Nouakchott	Mauretania	1828	B,E,J
3.270	SWABC 1, Namibia	S.W.Africa	2130	M	4.850	R.Yaounde	Cameroon	1826	A,B,C,E,G,J,K
3.280	R.Beira	Mozambique	1730	I	4.850	AIR Kohima	India	1810	B,J
3.295	Reykjavik	Iceland	2047	C,D,E,K,M	4.850	R.Tashkent 2	USSR	0046	G
3.315	SLBS Freetown	Sierra Leone	2100	M	4.860	AIR New Delhi	India	1700	K
3.325	FRCN Lagos	Nigeria	0439	G	4.865	PBS Lanzhou	China	2100	C,D,E,G,K
3.355	AIR Kurseong	India	1650	I	4.865	R.Mozambique	Mozambique	1700	I
3.365	GBC Radio 2	Ghana	2130	D,E,G,J,K	4.870	R.Cotonou	Benin	1805	B,J,K,M
3.380	R.Malawi	Malawi	2015	I,M	4.875	Super R.Roraima	Brazil	0055	C
3.905	AIR Delhi	India	1630	I	4.875	R.Tbilisi	USSR	2058	B
3.915	BBC Kranji	Singapore	1912	E,G,J,L	4.885	Voice of Kenya	Kenya	1828	I,J,M
3.925	AIR Delhi	India	1650	I	4.890	ORTS Dakar	Senegal	2000	I
3.950	PBS Qinghai Xining	China	2220	E,I	4.895	Voz del Rio Arauca	Colombia	0443	E
3.955	BBC Daventry	England	1800	E,G,K	4.895	R.Moscow (Kalinin)	Lithuania	1920	J
3.965	RFI Paris	France	2349	E,G,L	4.905	R.Regio, Rio	Brazil	2355	M
3.980	VOA Munich	Germany	1920	E,G,L	4.905	R.Nat.N'djamena	Chad	2045	B,E,J,K
3.985	R.Beijing, China	via Berne	2100	G,K	4.910	R.Zambia, Lusaka	Zambia	1828	J
3.985	SRI Berne	Switzerland	1908	E,F,G,H,L	4.915	PBS Guangxi, Nanning	China	2200	I
3.995	DW Cologne (Julich)	Germany	2350	E,G,H	4.915	R.Ghana, Accra	Ghana	2145	B,G,J,K
4.035	PBS Xizang Lhasa	Tibet	2250	M	4.915	Voice of Kenya	Kenya	1828	J
4.050	R.Frunze 2	USSR	0033	G	4.930	R.Moscow	USSR	2150	B,E,G,K
4.055	R.Moskva 1 (Kalinin)	USSR	1955	B	4.935	Voice of Kenya	Kenya	1828	D,I,J,K
4.220	PBS Xinjiang	China	2300	K	4.940	R.Kiev 2	Ukraine	2050	B,D,E,G,J,K,L
4.330	PBS Xinjiang	China	0000	K	4.950	R.Nac.Luanda	Angola	2050	J
4.500	Xinjiang	China	2200	D,G,K	4.958	R.Baku	USSR	1935	G,K
4.600	R.Baghdad	Iraq	2000	B,G,K	4.960	AIR New Delhi	India	2200	B
4.635	R.Dushanbe Tadzhi	USSR	1823	D	4.965	R.Juan	Bolivia	2330	M
4.680	R.Nac.Espejo	Ecuador	0030	M	4.975	R.Uganda, Kampala	Uganda	1830	J
4.735	Xinjiang	China	2200	D,E,G,K	4.975	R.Dushanbe	USSR	0240	D
4.740	R.Afghanistan	via USSR	0227	D	4.980	Ecos del Torbes	Venezuela	0300	M
4.750	R.Bertour	Cameroon	1823	J	4.990	FRCN Lagos	Nigeria	1831	B,E,G,J,K
4.750	PBS Xizang, Lhasa	China	2321	E	5.005	R.Nepal, Kathmandu	Nepal	1500	I
4.755	R.Maranhao	Brazil	0050	M	5.010	R.Garoua	Cameroon	1831	J
4.760	Yunnan Kuming	China	2200	E,K	5.010	R.Madagascar	Madagascar	1900	M
4.760	TWR	Swaziland	1630	I	5.010	SBC Singapore	Singapore	1500	I
4.760	R.Frontera	Venezuela	0120	M	5.015	R.Vladivostok	USSR	2325	E
4.765	Brazzaville	Pep.Rep.Congo	2000	B,E,G,J,K,M	5.025	R.Uganda, Kampala	Uganda	1940	I
4.770	FRCN Kaduna	Nigeria	1825	B,D,E,G,J,M	5.030	R.Catolica, Quito	Ecuador	2330	K
4.790	Azad Kashmir R	Pakistan	1700	I	5.035	R.Bangui	C.Africa	2052	J
4.790	TWR Manzini	Swaziland	1826	J,K,M	5.035	R.Alma Ata	USSR	2130	B,G,K
4.795	R.Douala	Cameroon	2055	E,J,M	5.040	R.Tbilisi 1	USSR	2140	B,G
4.800	PBS Xinjiang	China	2252	D	5.045	R.Cultura do Para	Brazil	2250	K
4.800	AIR Hyderabad	India	1600	I	5.047	R.Togo, Lome	Togo	1832	E,G,J,K
4.800	LNBS Lesotho	Maseru	1826	J,K,M	5.050	SBC Singapore	Singapore	2220	M
4.805	R.Nac.Amazonas	Brazil	0020	C	5.055	RFO Cayenne(Matoury)	French Guiana	0545	G
4.810	R.Moscow Yakutsk	USSR	2225	C	5.065	R.Candip, Bunia	Zaire	1936	J
4.810	R.Yerevan 2	USSR	1933	B,E,G,J	5.163	R.Beijing	China	2100	I,K
4.815	R.diff TV Burkina	Ouagadougou	1826	J	5.260	R.Alma Ata 2	USSR	2100	C,E,G,K
4.820	E.Prov.Huila	Angola	2200	I	5.290	R.Moskva 1Krasnoyarsk	USSR	2239	E
4.820	R.Moskva 4 (Khanty-M)	USSR	1933	E,J,K	5.440	PBS Xinjiang	China	0000	K
4.825	R.Moscow	USSR	1933	B,D,E,J,K	5.451	Machupo	Bolivia	0515	C

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Transatlantic DX Chart

Freq kHz	Station	Location	Time UTC	DXer
USA				
640	WWLS	Moore, OK	0230	B
700	WLW	Cincinnati, OH	0350	B
710	WOR	New York, NY	0500	A
1010	WINS	New York, NY	2300	A
1050	WEVD	New York, NY	0250	B
1210	WOGL/WCAU	Philadelphia, PA	0255	A,B
Canada				
590	VOQM	St. John's, NF	0110	A,B
710	CKVO	Clarenville, NF	0320	B
930	CJYQ	St. John's, NF	0020	A,B
960	CFX	Kingston, ON	0600	A
1200	CFGO	Ottawa, ON	0350	B
1290	CHRM	Matane, PQ	0530	A
1570	CKLM	Montreal, PQ	0255	B
C. America & Caribbean				
610	CMGI	R. Relo, Trinidad	0330	A
1030	WASO	San Juan, Puerto Rico	0700	A
1505	R Anguilla	The Valley, Anguilla	0400	A
1610	Caribbean Beacon	The Valley, Anguilla	0230	A,B
South America				
1220	R.Globo	Rio, Brazil	0300	B

DXers:
A: Tim Shirley, Bristol.
B: Jim Willett, Grimsby.

0700) 55544 at 0450 in Worthing; Vatican R, Rome 15.090 (Eng, Hi, Mal, Ta to Asia 1500-1545) heard in Rowley Regis; RSA, S.Africa 15.270 (Eng to Africa 1500-1800) SIO222 at 1625 in Elgin; R.Algiers via Bouchaoui 15.205 (Fr to M.East, N.Africa 0500-2200) 45554 at 1630 in Northwich; REE via Noblejas 15.375 (Eng to Africa 1900-2000) 44444 at 1900 in Morden; RSA, S.Africa 15.365 (Fr to W.Africa) SIO433 at 1937 in Storrington; AIR via Bangalore 15.265 (Eng to Pacific areas 2045-2230) 44433 at 2051 in Brenchley; TWR Ned.Antilles 15.445 (Port to S.Am 2155-2315), heard at 2200 in Kalush, Ukraine.

Good reception of some R. Australia's 13MHz (22m) signals have been noted here. Their Carnarvon transmission to Pacific areas 13.755 (Eng 1500-2100?) 35333 at 1915 by **Roy Patrick** in Derby; to Pacific areas via Shepparton 13.605 (Eng 1600-2130) SIO333 at 2000 in Edinburgh; to Asia via Carnarvon 13.705 (Th 2300-0000) 34443 at 2302 in Wallsend.

Also noted were BRT via Wavre 13.675 (Eng to Europe 0900-0925), heard in Bridlington; AWR Agat, Guam 13.720 (Chinto C.Asia 0300-1000) 24322 at 0925 in Brighton; R.Korea, Seoul 13.670 (Ger, Eng, Fr, Sp to Europe 0600-1145) 22322 at 1117 in N.London; SRI via Sottens 13.685 (Eng to M.East 1515-1700) heard by **Taff Rees** in Worcester Park; R.Austria Int, Vienna 13.730 (Ger, Sp, Eng, Fr to Europe 0400-1700) SIO444 at 1640 by **Phil Townsend** in E.London; KHBI, N.Mariana Islands 13.625 (Eng to SE.Asia, India 1600-1800) SIO242 at 1730 in Grimsby; WHRI Noblesville 13.760 (Eng to USA, Europe 1600-0000) 33332 at 2032 in Oxted and 55555 at 2132 in Gibraltar; R.Nederlands via Flevo 13.700 (Eng to W.Africa 2030-2125) 45433 at 2035 in Bridgewater; WCSN Scotts Corner 13.770 (Eng to Europe, M.East, Africa, USA 2000-2200) SIO433 at 2145 by **Aff Gray** in Birmingham; Voice of the UAE in Abu Dhabi 13.605 (Ar, Eng to N.Africa 2200-0000) 44343 at 2303 by **Robin Harvey** in Bourne.

Many 11MHz (25m) signals to Europe reach their target well. Those noted were R.Korea via Sackville 11.715 (Eng 1030-1100) 54444 at 1040 in Norwich; R.Pakistan, Islamabad 11.570 (Ur, Eng 1700-1800) heard at 1700 in Bridlington; REE via Aganda 11.790 (Eng 1900-2000) 44444 at 1905 in N.London; R.Beijing, China 11.500 (Eng 2000-2200) 34433 at 2000 in Wallsend; WYFR Okeechobee 11.915 (Eng 2000-?) 43443 at 2000 in Bridgewater; Voice of Israel, Jerusalem 11.585 (Eng 2000-2030, also to USA) SIO333 at 2010 in Birmingham; R.Damascus, Syria 12.085 (Eng 2005-2105, also to USA) 35444 at 2034 in Co.Down; R.Romania Int, Bucharest 11.940 (Eng 2100-2125) heard in Rowley Regis; R.Yugoslavia, Belgrade 11.735 (Eng 2100-2145) SIO222 at 2123 in Elgin; AIR via Aligarh 11.620 (Eng 2045-2230) 44333 at 2144 in Swanwick; VOFC via

Okeechobee 11.580 (Eng 2200-2300) SIO333 at 2205 in Hereford; R.Japan via Moyabi 11.735 (Eng 2300-0000) SIO333 at 2315 by **Francis Hearne** in Bristol.

Also noted were a few to other areas: KTWRR, Guam 11.805 (Eng to Australia 0800-1000) 25232 at 0920 in Brighton; Voice of Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) 32232 at 1420 in Oxted; R.Beijing, China 11.575 (Ta, Pa to S.Asia 1400-1555) SIO333 at 1540 in Macclesfield; Voice of the UAE in Abu Dhabi 11.965 (Eng to USA 2200-0000) SIO555 at 2201 in Edinburgh; R.Globo, Rio de Janeiro 11.805 (Port to S.Am 0900-0300) SIO323 at 2320 by **Antonio De Abru-Teixeira** in Durham.

Although for listeners in Pacific areas the 9MHz (31m) broadcasts from R. New Zealand Int. can often be received in the UK. Their signals on 9.700 (Eng 0630-1110) 33333 at 0810 in Worthing. Two of R.Australia's broadcasts to Asia have also been audible here: 9.770 via Shepparton (Eng 1430-?) 34333 at 1430 in Norwich and 9.860 via Carnarvon (Eng 1800-2100) as 44433 at 1851 in Brenchley. Also logged here were WSHB Cypress Creek 9.495 (Eng to USA 1000-1400), SIO544 at 1030 in Hereford; RCI via Sackville 9.755 (Eng to USA 2200-2230) 33433 at 2209 in Bourne; Voice of Israel, Jerusalem 9.435 (Eng to USA) SIO222 at 2235 in Elgin; R.Cancao Nova, Brazil 9.675 (Port 0800-0300) SIO424 at 0030 in Durham.

Programmes for European listeners stem from WCSN Scotts Corner 9.840 (Eng 0600-0800), rated 22242 at 0753 in Sunderland; HCJB, Ecuador 9.695 (Eng 0700-?) 45444 at 0800 in Derby; AWR via Sines 9.670 (Eng 0800-?, Sun only) 44444 at 0830 in Wallsend; R.Yugoslavia, Belgrade 9.830 (Cr, Eng 0900-?) 44434 at 0900 in N.London; R.Pyongyang, N.Korea 9.325 (Eng 1500-1600, also to M.East, Africa) 55534 at 1526 in Brighton; VOIRI, Iran 9.022 (Ger, Eng, Fr, Sp, Ar 1800-2230) heard at 1830 in Bridlington; R.Sweden via Horby 9.655 (Eng 1930-2030, also to M.East, Africa) 35553 at 1930 in Northwich; Voice of Vietnam, Hanoi 9.840 (Eng 1800-1830, 2030-2100) 44333 at 2042 in Swanwick; R.Beijing, China 9.920 (Eng 2000-2200) 32233 at 2108 in Co.Down; R.Budapest, Hungary 9.835 (Eng 2100-2200) heard in Rowley Regis; R.Sophia, Bulgaria 9.700 (Eng) 53553 at 2148 in Bridgewater; R.Vilnius, Lithuania 9.675 (Eng 2130-?) 44444 at 2230 in Morden; RHC, Cuba 9.710 (Eng 2200-?) SIO544 at 2230 in Edinburgh.

Noted in the 7MHz (41m) band during the morning were R.Polonia, Warsaw 7.210 (Eng to Europe 0630-0730) 43333 at 0630 in Morden; WHRI South Bend 7.315 (Eng to USA 0000-1100) SIO444 at 0700 in Hereford; R.Yugoslavia, Belgrade 7.240 (Eng, Cr to Europe 0800-?) 33333 at 0800 in N.London; R.Prague, Czechoslovakia 7.345 (Ger, Fr, Eng to Europe 0700-1300)

55555 at 0840 in Worthing.

Later, RCI via Daventry 7.235 (Eng, Fr to Europe 1900-2000) was 54444 at 1917 in Gibraltar; R.Korea, Seoul 7.550 (Kor, Ar, Eng to M.East, Africa 1700-2130) 54444 at 2055 in Norwich; R.Abidjan, Ivory Coast 7.215 (Fr to W.Africa 1700-0000) SIO222 at 2200 in Grimsby; AIR via Aligarh 7.412 (Eng to Europe 2045-2230) 44333 at 2211 in Bourne; CPBS-1 China 7.935 (Chin 1958-2330) SIO232 at 2240 in Quebec.

Many 6MHz (49m) broadcasts are directed to Europe. Among those noted in the evening were R.Sweden via Karlsborg 6.065 (Eng 1930-2030, also to M.East, Africa) 44554 at 1940 in Northwich; R.Pyongyang, Korea 6.575 (Eng 2000-2100) 44344 at 2005 in

Co.Down; Vatican R, Rome 5.895 (Eng 2050-2110) 44444 at 2050 in Morden; R.Korea, Seoul 6.480 (Eng 2030-2130) 44333 at 2100 in Norwich; R.Austria Int, Vienna 5.945 (Ger, Eng, Fr, Sp 1700-2300) SIO444 at 2145 in Bristol.

Also logged were the King of Hope, Lebanon 6.280 (Eng to M.East, S.E. Europe) at 2030 in Bridlington; PBS, China 5.800 (Uig to China 2300-0200) 24432 at 2305 in Wallsend; CKZN, Newfoundland 6.160 (Eng to USA, Canada 0930-0500) SIO232 at 2345 in Grimsby; R.Santa Cruz, Bolivia 6.135 (Sp 0900-0100) SIO342 at 2350 in Durham; R.Japan via Sackville 5.960 (Eng, Jap to USA 0100-0300) SIO444 at 0115 in Hereford.

Equipment Used

Leo Barr, Sunderland: Matsui MR4099 + r.w. in loft.
Charles Beanland, Gibraltar: Sangean ATS-803 + Howes AA2.
Darren Beasley, Bridgewater: Philips D2935 + a.t.u. + 10m wire.
Kenneth Buck, Edinburgh: Lowe HF-225 + r.w. in loft or loop.
Tim Bucknall, Congleton: Sony ICF-2001D + AN-1.
Noel Carrington, Sutton in Ashfield: Philips D2999 + a.t.u. + G5RV antenna.
John Case, Frodsham: Lowe HF-225 + 1m Sq Loop.
Jim Cash, Swanwick: Kenwood R5000 + trap dipole.
Sean Cooper, Wells-next-the-Sea: Pioneer F-656 tuner + loop.
John Coulter, Winchester: Yaesu FRG-7 + r.w.
Ron Damp, Worthing: Racal RA17 + 30m inverted V dipole.
Antonio De Abru-Teixeira, Durham: Sony ICF-2001D + 9.5m wire.
David Edwardson, Wallsend: Trio R600 + inverted V trap dipole.
Ron Galliers, London: Philips D2935 + a.t.u. + 30m wire.
Alf Gray, Birmingham: Codar CR70 + PR30 + a.t.u. + Ex-Army whip.
Simon Hamer, New Radnor: Lafayette HE30/Grundig S1400/Sony ICF-2001D + a.t.u. + r.w. or loop.
Robin Harvey, Bourne: Matsui MR-4099 + s.w. loop.
Francis Hearne, Bristol: Sharp GFA3 cassette radio + r.w.
Sheila Hughes, Morden: Sony ICF-7600DS; Vega 206 + loop/Panasonic DR48 + 15m wire.
Rhoderick Illman, Oxted: Kenwood R5000 + r.w.
Cyril Kellam, Sheffield: Sony ICF-7600DS + AN-1 or 25m wire.
Bryan Kimber, Hereford: Zenith R7000/Realistic SX190 + 20m wire.
Eddie McKeown, Co.Down: Tatung TMR-7602.
George Millmore, Wootton, IOW: Tatung TMR-7602/Racal RA17L + v.l.f. converter + r.w. or loop.
Sid Morris, Rowley Regis: Kenwood R5000 + 31m wire.
John Nash, Brighton: Kenwood R5000 + Datong AD370.
Sergei Olejnik, Kalush, Ukraine: Ishim-003 + 70m wire.
Fred Pallant, Storrington: Trio R2000 + r.w. in loft.
John Parry, Northwich: Realistic DX-400 + 33m wire.
Roy Patrick, Derby: Lowe HF-125 + 44m wire.
Don Phillips, Bridlington: Yaesu FRG-8800 + a.t.u. + r.w.
Philip Rambaut, Macclesfield: Int.Marine Radio R.700M + r.w.
Taff Rees, Epsom: Philips D2935 + Howes AA.
Alan Roberts, Quebec, Canada: Lowe HF-225 + 11m or 31m dipole.
John Sargeant, Bolton: Lowe HF-225 + 20m wire.
Tim Shirley, Bristol: Icom R-71E or Trio R600 + loop or r.w.
Chris Shorten, Norwich: Matsui MR-4099 + 10m wire.
Darran Taplin, Brenchley: Yaesu FRG-7700 + FRA-7700 or FRT-7700 + 80m Zepp.
Phil Townsend, London: Lowe SRX-30 + loop.
John Wells, E.Grinstead: RCA AR88D + loop.
Jim Willett, Grimsby: RCA AR77 + 4m loop or a.t.u. + X dipole.
Julian Wood, Elgin: Kenwood R2000 + Yaesu FRT-7700 a.t.u. + 6m wire.

Maritime Beacons

Long Wave Maritime Beacon Listening

Brian Oddy G3FEX

Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

A holiday in Melvick on the north coast of Scotland enabled **John Stevens** (Largs) to check the band from a new location. He says, "Taking my Icom R70 receiver up there was a revelation and when the local people found out that I was gathering information about the maritime radiobeacons transmitted from lighthouses in the area, I was besieged by a crowd of enthusiasts who thought that listening for beacon signals was great fun. As a result I was rushed round the countryside from one lighthouse to another and many people gained a smattering of Morse code into the bargain!"

During his checks, John found that the beacons on Strumberg Head (SB), Stroma Island (OM) and North Ronaldsway (NR) operate sequentially on 291.9kHz twenty-four hours a day.

If you are new to this hobby, it is important to remember that most of the maritime radiobeacons around our shores operate in groups and up to six beacons may share a particular frequency. Usually, each beacon sends its callsign in Morse code four to six times, followed by a 25 second dash

and then its callsign once or twice followed by a silent period of 5 seconds. This pattern is then repeated by the next beacon in the group. When logging a beacon it is advisable to continue monitoring the frequency, since one or more of the other beacons in the group may become audible before the original signal is heard again.

Down in Cornwall **Pat Manning** (Torpoint) compiled an interesting list for the chart during daylight over a three week period. He was surprised to find beacons to the north more difficult to receive than those from the south, since there are clear sea paths in both directions except for the 95km or so of the Devon/Cornwall peninsula. Beacons to the east were scarce, but that was expected since the ground waves have to travel over land to reach him. Pat is now using a Sony AN-1 active antenna with his Philips D2935 receiver and finds that combination works well.

My thanks to Pat for clarifying the locations of two of the beacons detailed in the SWM charts. He says, "Round Island Lighthouse is on the



The lighthouse on Stroma Island that radiates the beacon signal OM on 291.9kHz.



north side of the Scillies on Round Island, just between St. Martins and Tresco. The Channel Light Vessel is midway along a line drawn approximately between Start Point and the Channel Islands". He also mentioned that the Berry Head beacon (BHD) on 318kHz is intended for aeronautical purposes. Some aeronautical beacons can also be used for direction finding at sea, but since this is a rather grey area they are not included in the chart.

The many aeronautical radiobeacons which operate in this part of the spectrum tend to confuse DXers. Several of the beacons logged by **Tony Moore** in Barnet proved to be

aeronautical and had to be excluded from the chart. However, he heard four of the maritime ones along the north coast of France and several others. He has asked me state the limits of the maritime beacon band in this article and inform readers where they may obtain a list of the European maritime radiobeacons. Most of the maritime beacons operate between 285 and 312.6kHz, but there are a few higher up the band. Relatively few guide books cover this part of the spectrum. One of the most popular is *Reed's Nautical Almanac*. A new edition is published each year by Thomas Reed, 178-185 High Street West, Sunderland Tyne and Wear. The 1991 edition may be available for reference purposes at your local public library. It is also worth noting that Thomas Reed sell back issues at low prices.

In Bridgwater, **Darren Beasley** has been concentrating on this band after dark. Although he logged several new beacons he found that some which are normally audible during daylight disappear after dark. Unfortunately some DXers are prevented from taking advantage of the propagation changes which occur after dark by the high level of electrical noise which exists in many areas. Writing from Epsom, **Taff Rees** says, "I have tried listening after dark, but received such heavy interference that I was forced to give up. The beacons whose callsigns I was able to read were all heard during daylight." In E. London, **Phil Townsend** has severe problems with electrical interference throughout the day, but he managed to log Start Point (SP) 298.8, Grosser Vogelnd, Germany (VS) 301.1 and Pointe d'Ailly, France (AL) 310.3 for the first time.

A change in equipment can sometimes produce unexpected results. Until recently, **John Sargeant** (Bolton) used a Racal RA17 Mk 2 receiver with an active dipole and he was disappointed by results. While trying out his new Lowe HF-225 receiver with a 20m random wire he was very surprised to hear so many beacon signals. A Lowe HF-225 receiver and a 650mm square loop was used by **Kenneth Buck** in Edinburgh while compiling his list for the chart. He powered the set from batteries to prevent electrical interference from reaching it via the mains.

DXers

- A Darren Beasley, Bridgwater
- B Kenneth Buck, Edinburgh
- C Colin Jermy, Ruslip
- D Colin Jermy, Cromer
- E Cyril Kellam, Sheffield
- F Pat Manning, Torpoint
- G George Millmore, Wootton, IOW
- H Tony Moore, Barnet
- I Fred Pallant, Storrington
- J Taff Rees, Worcester Park
- K John Sargeant, Bolton
- L Tim Shirley, Bristol
- M John Stevens, Largs
- N John Stevens, Melvick
- O Philip Townsend, E London

req kHz	call-sign	Station Name	Location	DXer	Freq kHz	call-sign	Station Name	Location	DXer
287.3	BY	Bressey LH	Shetland Is	L,N	298.8	RD	Roches Douvres LH	Channel Is	F
287.3	CM	Cromer LH	Norfolk	B,D,K*	298.8	SP	Start Point LH	S Devon	F,O
287.3	CR	Channel LV	??	F	301.1	BA	Punta Estaca Bares	N Spain	F
287.3	FN	Walney Island	off Lancs	B,K*	301.1	BG	Hatteberget LH	Sweden	B
287.3	GA	Outer Gabbard LV	off Suffolk	B	301.1	CN	Cregneish	IOM	B,K*
287.3	LV	Dudgeon LV	off Norfolk	B,K*	301.1	GE	Skarvoy Eggersund	Norway	B
287.3	PS	Point Lynas	Anglesey	B,G,K*	301.1	HO	Hirsholm Main LH	Denmark	K*
287.3	RS	Rosnaes	Denmark	B	301.1	NF	North Foreland LH	E Kent	H,J,K*,O
287.3	SK	Smith's Knoll LV	off Norfolk	B,D,K*,O	301.1	SR	Skerries LH	Anglesey	B,F,K*
287.3	SL	Sletterherge	Denmark	B	301.1	SU	South Rock LV	Co Down	B,F,K*
289.6	D	Rota	Spain	L*	301.1	VS	Grosser Vogelnd	Germany	O
289.6	FD	Fidra LH	F of Forth	B	301.1	WK	Wicklow Head Light	Co Wicklow	A*,B,C,F,K*
289.6	LP	Loop Head	S Ireland	L*	303.4	FB	Flamborough Hd LH	E Yorkshire	B,K*,O
289.6	SM	Pte de St Mathieu	France	F	303.4	FP	Fife Ness Point	Fife	B,K*
289.6	TN	Thyboron LH	Denmark	B,G	303.4	LT	Longstone LH	Berwick	B,K*
291.9	CP	St Catherine's Pt	IOW	F,G,I,O	303.4	NH	Newhaven	E Sussex	G
291.9	ER	Pointe de Ver LH	N France	G,H,O	303.4	SJ	Souter Light	Sunderland	B,K*
291.9	FG	Pointe de Barfleur	N France	C,F,H,I,K*,O	305.7	CB	Corbiere	Jersey CI	A*,F,G
291.9	KD	Kinnairds Head LH	Aberdeen	B,K*,N	305.7	CS	Calais Main LH	N France	I,J,K*,O
291.9	NR	N Ronaldsay LH	Orkney Is	B,N	305.7	FS	Fall's LV	off Kent	A*,G,J,K*,O
291.9	OM	Stroma Pt LH	Caithness	B,N	305.7	KY	Oksoy LH	Norway	B
291.9	PB	Portland Bill LH	Dorset	F,G	305.7	LS	Hirtshals	Norway	B
291.9	SB	Sumburgh Head	Shetland Is	B,K*,N	305.7	SW	Skagen	Norway	B
291.9	TI	Cap d'Antifer	France	G,H,K*,O	305.7	WH	West Hinder	off Belgium	K*,O
294.2	AH	Altacarry Head LH	Antrim	B,K*,M	308.0	BD	Barra Head LH	Is of Barra	B,F,K*,M
294.2	DA	Pladda LH	Is of Arran	B,K*,M	308.0	CA	Pointe de Creach	France	F
294.2	ER	Eierland LH	Holland	G	308.0	GL	Eagle Island LH	W Ireland	B,K*
294.2	KI	Kiel LH	Germany	L*	308.0	HK	Texel	Germany	B,K*
294.2	LG	Eilean-Glas LH	Is of Harris	B,F	308.0	MZ	Mizen Head LH	S Ireland	A*,F
294.2	MW	Mew Island LH	off Co Down	B,K*,M	308.0	RC	Cabo Roca LH	Portugal	K*
294.2	OR	Ough Sgeir LH	off Is Rum	B,N	308.0	RR	Round Island LH	Nr Cornwall	A*,B,F
294.2	RN	Rinnis of Islay	Is of Islay	B,K*,M	308.0	TY	Tory Island LH	N Ireland	B,M
296.5	BH	Blaavandshuk LH	Denmark	B,K*	310.3	AL	Pointe d'Ailly LH	France	F,G,I,J,O
296.5	BN	Ballycotton	Ireland	F	310.3	DU	Dungensis LH	S Kent	C,F,G,I,J,K*,O
296.5	HM	Hanstholm	Denmark	B,K*	310.3	GD	Girdle Ness	Aberdeen	B
296.5	LA	L sta LH	S Norway	B,O	310.3	PH	Cap d'Alprech	France	F,G,H,I,J,K*,O
296.5	LS	Lundy Is S LH	off N Devon	F	310.3	VI	Cabo Vilano	Spain	F
296.5	MY	Cabo Mayor	Spain	K*	310.3	VR	Ultvaer	Norway	B
296.5	NK	Inchkeith	F of Forth	B	312.6	FN	Feistein	Norway	IB
296.5	NP	Nieuwpoort W Pier	Belgium	F	312.6	GU	Geltungane	Norway	B
296.5	NP	Nash Point	S Wales	A*	312.6	KH	Kish Bank	E Ireland	B,F,K*
296.5	OH	Old Head Kinsale	S Ireland	F	312.6	MA	Marstein	Norway	B
296.5	SB	South Bishop LH	Pembroke	A*,F,K*	312.6	NB	Nab Tower LH	off Sussex	G,I
296.5	TR	Tuskar Rock	S Ireland	A*,F,K*,M	312.6	PT	Souter Pt	Durham	B,K*
298.8	AD	Ameland	Holland	B,K*	312.6	RB	Cherbourg	France	F,G
298.8	BL	Butt of Lewis	Is of Lewis	B,N	312.6	UK	Sunk LV	off Essex	H,K*
298.8	CW	Cape Wrath LH	Sutherland	B,N	312.6	UT	Utsira	Norway	B,L*
298.8	LK	Sule Skerry LH	off Orkney	B,N	313.5	BN	Cap Bon	Tunisia	K*
298.8	LZ	Lizard LH	S Cornwall	F	313.5	PQ	Ile Porquerolles	France	K*
298.8	MF	Muckle Flugga LH	Shetland Is	B,N	318.5	RS	Ristna	USSR	G
298.8	PE	Penlee Pt	UK	F	319.0	LEC	Stavanger	Norway	A*,B,E,H,K*
298.8	QS	Casquets LH	Channel Is	A*,F,G,K*	397.2	DHE	Helgoland Lt	off N Germany	B,C,K*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight.

WANTED Parmeko transformer model 6000/8 and Leak TL25 amplifier. Tel: (0661) 852874 evenings.

FOR SALE FT-480R transceiver all mode, mint, boxed, £175. PSU, £40. CapCo RMA loop antenna, £50. RCA AR88LF receiver, £30. Tel: (0706) 33968.

FOR SALE PC SWL, £50. Tel: 041-632 2793 evenings.

WANTED Yaesu 9600 scanner or similar. Exchange for complete darkroom equipment, cash adjustment if necessary. Altree. 1 Brid Close, Bridesstowe, Devon EX20 4EJ.

FOR SALE ICS FAX-1, Navtex, RTTY decoder, mint condition, £150. Datong FL3 top of range electronic filter, v.g.c., £65. Tel: (0304) 830192 Dover.

FOR SALE Reftec home-base CB934 Autoscan, 40-channel transceiver, £200. Reftec mobile CB934 with two interchangeable antennas, £95. Cybernet mobile 40-channel, £20. Midland 3001 40-channel, £60. Would exchange for 120-80 Bass Accordion, button or piano type or £320 the lot. Mr J.V. Nicoll. 22 Sowden Park, Barnstaple, Devon EX32 8EH. Tel: (0271) 71836.

FOR SALE SEM h.f. to v.h.f. frequency converter, as new, £30. Tel: (0344) 360113 East Berkshire.

FOR SALE 1943 Canadian military transceiver model 58 MkI, £50. Trio h.f. receiver, model 9R-590, £60. Pye Reporter transceiver TX 170.8375 RX 166.0375, £50. Bearcat 70XLT with charger and case, mint, boxed, £70. Tel: (0983) 296624 Isle of Wight.

FOR SALE Reftec 934 transceiver, mag mount antenna, £150. Mustang CB3000, mag mount antenna, s.w.r. meter, £40. Prestel Modem, interface, software for Sinclair Spectrum 48K, £35. Tel: (0883) 349785 after 5pm.

FOR SALE Sony ICF-2001D receiver, 9 months old, perfect condition, all accessories, £150. Can deliver in north of England. Tel: (0274) 606078 Bradford, West Yorks.

FOR SALE or **EXCHANGE** Icom R71E receiver, f.m. board fitted, immaculate condition, £500 o.n.o. Or exchange for Amiga computer hardware/software. Tel: (0903) 506276 evenings Worthing.

FOR SALE AOR3000 scanner h.f., v.h.f., u.h.f., 100kHz-2036MHz, s.s.b., f.m., a.m., c.w., 400 memories, £585. Black Jaguar MkIII a.m./f.m., £140. Both as new, manuals, boxed. Tel: (0926) 54556 Kenilworth.

WANTED in first class condition AOR2002 or Lowe HF-225. I have a Realistic PRO206 and AOR2001 in good condition. The PRO2006 is a 400-memory scanner and is still under guarantee and is insured for three

years. H. Finney. Tel: (0782) 836787 Stoke-on-Trent.

FOR SALE Sony CRF-320 World Zone 32-band digital, one best of Sony, mint condition, boxed, £450. Yaesu FRG-7700 digital 0-30MHz receiver, like new, Manual, £250. Racal RA17L very good condition, £175. Table model RA17L, £200. Exchange possible. Tel: 081-571 5759.

FOR SALE Vintage reception set R107 1.2-17.5MHz b.f.o. audio filter r.f. gain 'phone/speaker output 240V 24 x 13 x 13in. Heavy, good working order, £30. Buyer collects. Tel: (0276) 856866 Woking, Surrey.

FOR SALE Signal R535 complete with NiCad pack, case and two antennas plus NiCad charger and power pack, £200. Plus Yupiteru MVT6000 mobile and power pack, £180. Downes. Tel: Stevenage 367535 evenings.

WANTED National Panasonic RF-9000 receiver must be in new condition. Tel: (0472) 358896 anytime.

FOR SALE AOR900 scanner perfect condition, boxed, £130. Icom O2E f.m. 144MHz hand-held transceiver, boxed, £150. Both plus postage. Tel: (0905) 355381 Worcester.

FOR SALE Sony PRO-80 hand-held receiver 150kHz-30MHz plus AIR and PSB bands with converter, excellent condition with box and manual, £175. Tel: (0452) 310394 Gloucester.

FOR SALE Trio R1000 s.s.b., l.s.b., c.w., a.m., good condition with Hamgear pre-selector, £200 o.n.o. Tel: (0222) 709456 Cardiff.

FOR SALE PRO34 scanner to 960MHz with frequency list and manual, 12 months old, £150 o.n.o. Sony ICF-7600DS boxed with frequency book and manual, perfect condition, £100 o.n.o. Tel: 051-608 1930 Wirral.

FOR SALE Computer BBC-B type with 40/80 5.25in disk drive, ROM manager, Genie pop-up diary, modem, Morely Teletext adaptor, manuals and magazines, complete, little used, new condition, starter package, bargain, £295. Tel: (0378) 560053 Epping.

FOR SALE Racal RA17L good condition, recent service, £125. Andy. Tel: (0706) 843294.

FOR SALE Racal AR88D general communications receiver, recently re-values, beautiful condition with manual. Fine example of a much sought after WWII receiver, £100 o.n.o. John G4NMV. 30 West Street, Banwell, Weston-super-Mare, Avon BS24 6DB. Tel: (0934) 823313 anytime.

Fill in the order form on page 80 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, Enefco House, The Quay, Poole, Dorset BH15 1PP. 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 corner flash or your subscription number as proof of purchase of the magazine. Advertisements from traders, apparent 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 Brand new Lowe HF-225 unwanted gift, £280. Yupiteru MVT5000 plus discone antenna, both boxed, as new, 18 months old, £120. Also G5RV, £10. Paul. Tel: (0705) 833402 Portsmouth.

WANTED Drake RX types RR1, RR3, DSR2, MSR2, R4245. Also NB for RR2 receiver. Any condition, working or not. Interested in any Drake professional state receivers. Will import. G3YFK. Tel: (0743) 884858.

WANTED remote control unit 310 (10L/171), working condition, your price. The RCU 310 was used in conjunction with transmitter T1509. Dick Fixter. 18 Linley Drive, Boston, Lincs PE21 7EJ. Tel: (0205) 360044 evenings.

FOR SALE Grundig Satellit 2100 short wave receiver, s.s.b. unit built-in, good working order, £85 carriage extra. Service manual for the Satellite 2100, £5. Seon. Tel: (0436) 71181.

FOR SALE AR3000 as new, boxed, £560. Tel: (0253) 725587 after 6pm Blackpool area.

WANTED ERA MkII Microreader. Will pay up to £80. Tel: 051-260 5064.

FOR SALE Marconi 995B/2 signal generator 2-220MHz in good working order with manual, £65. Buyer collects. New, unused d.f.m. 10kHz-150MHz not in case, £45. Tel: (0297) 53523 evenings and weekends Devon.

FOR SALE Yaesu FRG-7700 all mode communications receiver 150kHz-30MHz with FRT7700 a.t.u., original box and manual, v.g.c., £235. Tel: (0843) 63445 East Kent.

FOR SALE Black Jaguar BJ200 MkIII, a.m. and f.m. on all bands, covers civil, military, CB, amateur, includes case, charger, two antennas, boxed, excellent condition, £130 o.n.o. Gone CB. Tel: (0492) 875433 Llandudno.

FOR SALE Lowe HF-125 f.m. and keypad, £200. AT-1000, %0. AR1000 scanner, £150. Sony AN-1 Antenna, £30. Trio 0-30MHz signal generator, £40. All mint and boxed. Sony 2001 good condition, £100. Mark Robinson. Tel: (0925) 727889 Warrington.

WANTED Electronic warfare items APA, APQ, APR, APT, ALR or similar UK. Exchange for radio of navigation items similar age or possibly buy. R. Kidd. Tel: (0293) 883871 Crawley.

FOR SALE Sony 2001D receiver complete with manual accessories and boxed plus Rooke table top stand. All as new, £160. Tel: (07048) 77234 Formby, Merseyside.

FOR SALE Yaesu FRG-9600 fitted h.f. PAL video 'N' socket, £475. Heathkit A/ a.t.u., £40. KW Tuner, £30. Eddystone M680 100kHz-30MHz, £40. Spectrum 48K+ proper keyboard c/w RTTY, SSTV, c.w., AMTOR software, £75. Second Spectrum 48K+ complete with RX/TX software RTTY plus leads, £40. All v.g.c. Steve. Tel: (0296) 435690.

FOR SALE Yaesu FRG-8800, FRV-8800 converter, instruction manual, frequency list, earphones, very little used, 2 years old, £550 o.v.n.o. 23 Morton Crescent, Exmouth, Devon EX8 1BG. Tel: (0395) 265201.

FOR SALE Racal RA17L 0-30MHz receiver, mint condition, £200. **WANTED** IC-7000, R5000, may consider any receiver part ex above receiver or upto £500. Tel: (0332) 372696 Derby.

FOR SALE Eddystone 940, plinth mounted, one previous owner, stored ten years, excellent condition, £180. J. Poulton. Tel: (0686) 626153 Powys.

FOR SALE Pye 3 channel v.h.f. Europa c/w tone burst and crystals fitted for any simplex/repeater or packet channel(s) as required, £65 with 1 channel fitted. Further channels or info available. Tel: (0928) 717014 after 6pm and weekends.

FOR SALE Realistic PRO-2022 base/mobile scanner, 68-960MHz, modified scan/search rate of up to 60 channels/steps per second, backlight switch fitted, six months old, unmarked, £120. Tel: (0253) 694106 Blackpool.

FOR SALE Grundig Satellit receiver, f.m. stereo, a.m., u.s.b., l.s.b., two clocks, 42 memories, synchronous detector, station name store, c/w four rechargeable cells and Grundig NR90 charger, £235. Ken. Tel: 081-455 8831 NW London.

FOR SALE/EXCHANGE Technical Software RX8 (BBC Micro) currently £259 for £160. **WANTED** IBM compatible system, Timestep/ICS/Spacetch/Comar/Martelec. Cash either way. Tel: (0745) 886295.

FOR SALE AOR AR3000 100kHz-2036MHz, all modes plus auto taper control and RS232, 2 months old, boxed, £635. Derek. Tel: (0294) 217915 Ayrshire after 6pm.

FOR SALE Fairmate HP-100E MkII hand-held scanner 15MHz-1.3GHz, a.m., f.m., v.f.m., 1000 channel memory, as new, boxed, complete, £160. Tel: 0603 746085 after 5pm

**More Trading Post
on Page 70.**

trading post

FOR SALE Mosley V3 vertical antenna, £30. Sapre telescopic antenna for FT-290R Mk1, £4. 430MHz mobile collinear, £5. Scanning satellite receiver 137MHz, £50. Meteosat dish and feed, unused, £85. John. Tel: Coventry 4653286-7pm.

FOR SALE HF-225, Datong FL2, ERA BP34, a.t.u., all under 12 months old. Also Datong ANF, £560 the lot to include regulated p.s.u. May consider splitting. Tel: Leeds 683618.

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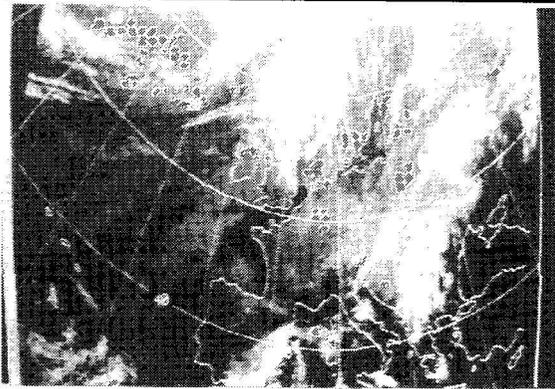
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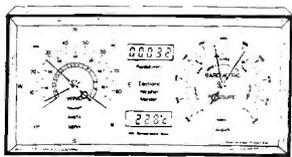
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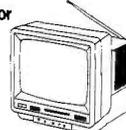
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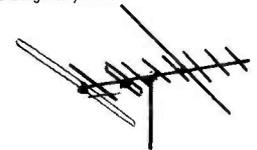
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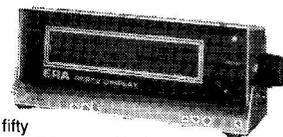
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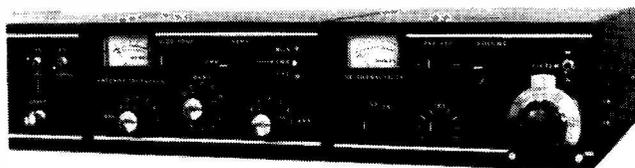
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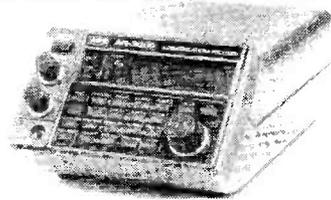
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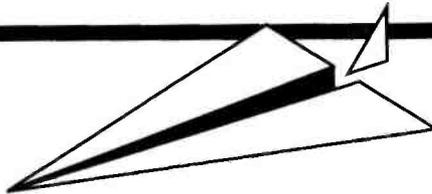


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practical Wireless

LOOK OUT FOR OUR NEW FRONT COVER LOGO STARTING NEXT ISSUE

It's appropriate that, as *Practical Wireless* enters its 60th anniversary year, we're making sure that we do so in style. We're all very proud of the magazine's heritage, and there's a new logo starting with the next issue.

Along with the new logo, one of the biggest improvements will be a change to a higher quality glossy paper. There will be full colour and two colours available throughout the magazine. There will also be much higher quality photographic reproduction, with advantages to be had for everyone.

The new printing system will enable our art editor Steve Hunt to use his artistic expertise and the second colour to full effect. As a result technical articles with circuit diagrams, p.c.b. designs and appropriate overlays will be more attractively designed, providing a much easier read.

Rob Mackie, our photographer and technical artist, in conjunction with Steve, will be able to use many more of the production and presentation aids to produce an even better magazine for our readers.

So, we'll be entering the new year in style. There are some interesting projects under way, and I hope to be letting you have news of one or two of them very soon. In the meantime, everyone on the *Practical Wireless* team is looking forward to sharing the enjoyment of a wonderful hobby with the support of our new technology and most importantly, you the reader.

73 DE Rob Mannion G3XFD

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Nevada - Yupiteru MVT7000 Scanner	7	Mar
New Lowe Shop	6	Mar
NT Diamond Jubilee Award	7	Apr
Obituary - Peter Brownbridge	7	Apr
Phillips - DC777 s.w. Car Radio	7	Jan
Prize Winners	7	Oct
Radio New Zealand	6	May
RAE Classes - John Beaumont G3NGD	7	May
Rapid Results College	6	Jan
Raycom Communications Systems Ltd - American Kits	6	Jul
RNARS Award	6	Jan
Satellite Newsletter	7	May
Sherwood Forest Award	6	Mar
Solid State Electronics (UK) - Power Supplies	7	Oct
Sony - ICF SW77 & ICF SW55 Short Wave Receivers	6	Sep
STC Electronic Services - Audio Connectors	6	Jun
STC Mercator - Ceramic Trimmers	6	Feb
Stewart Harding Communication Development Specialists Ltd - Power Protection	7	Jan
The Instrument Centre - Digital Multi-test	6	Mar
The Salisbury Award	6	Oct
Tiare Publications - Writers Wanted	6	Jun
Toroid Technology Ltd - Toroidal Transformers	6	Aug
Tremiver Ltd - Fuse Holders	7	Aug
TVDX News	6	Apr
Ungar - New Tools	6	Apr
Ungar - Soldering/Desoldering Station	7	Mar
Ungar - Peelable Soldering Mask	6	Oct
WACRAL Conference	6	Aug
Waters & Stanton - Jupiter VT-125	6	Jun
Waters & Stanton - Mammoth Radio Sale	7	May
Winter SWL-Feast	7	Feb

Weather Watching

Beginners' Guide to Weather Satellite Reception	Lawrence Harris	6	Apr
Here is the Shipping Forecast	Joan Ham	8	Apr
Listening to Weather Forecasts	P.C. Mitchell	10	Apr
Radio Auroras	by Charlie Newton	14	Apr
Technical Software Weather Satellite & FAX Receive System	Lawrence Harris	13	Apr
<i>Weather Satellite Handbook</i> 4th Edition by Dr Ralph E. Taggart	WB8DQT	12	Apr
Weather Satellite Reception	by Chris Hornby	14	Apr
Weather Watching Product Guide		3	Apr

International Radio Magazine

Editorial	3	Oct
Frequencies to Try	11	Oct
International Radio Station Profiles	8	Oct
Short Wave Radio Receivers	13	Oct
The European DX Council	7	Oct
Twenty Things You Always Wanted to Know About International Radio	12	Oct
Voices Waiting to be Heard	4	Oct

What Scanner

What is a Scanner		Alan Gardner	Nov
Marine band Frequencies on the Fairmate HP 100E		T.A. James	
International Scanning in the UHF Bands		David Simpson	
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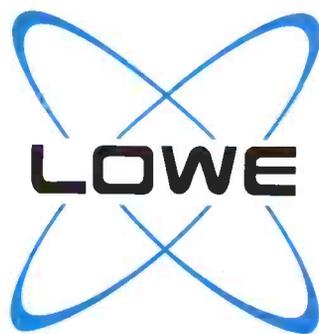
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