

# shortwave magazine

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World Radio History

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### DXTV SPECIAL by Keith Hamer & Garry Smith



**COVER SUBJECT**  
You too can be a TVDXer,  
Garry Smith and Keith Hamer  
bring you all you need to  
know to get started.

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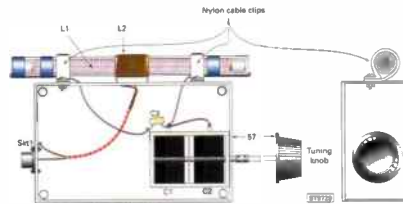
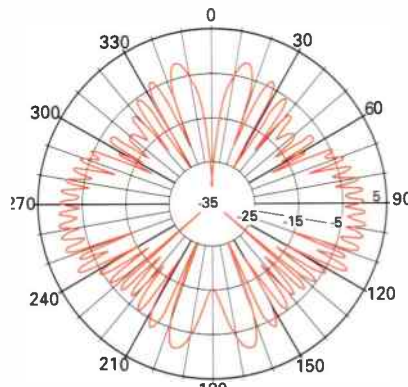
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**45** RANDOM LENGTH MARCONI ANTENNAS  
*Joe Carr K4IPV guides us through the characteristics of a plain old random length antenna.*

**50** AN EFFECTIVE LF RECEIVING SYSTEM  
*How low can you go? Richard Q. Marris provides us with a home build budget alternative for l.f. reception.*

**55** THE VOLTAGE-PROBE ANTENNA  
*Remarkable performance, easy to build. Try this novel antenna brought to you by Peter Buchan.*

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### 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, **KANGA PRODUCTS, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

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We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for SWM are £2.99 each and photocopies are £2 per article. Binders are also available (each binder takes one volume) for £8.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate. A complete review listing for SWM/PW is also available from the Editorial Offices for £1 inc P&P.

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### Technical Help

We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by SWM, then please write to the Editorial Offices, we will do our best to help and reply by mail.

# ed's comments

## Small Type and Backgrounds

As you will see on the adjacent page, we have had some readers who were unimpressed with the small type size we have used in some recent issues. The point is taken and we will ensure that we don't continue with such small sizes. I did have one reader who seemed to think that he was getting less for his money this way. We have used smaller type sizes to enable us to include more material so I'm not sure I follow the argument. I personally find it very frustrating when, due to space constraint, I have to commit important information to the bin. I guess I'm going to have to do it a little more than I have been. As it stands, SWM is one of the most densely packed magazines available on the news stands. I estimate that it contains twice the word count of some similar titles. See what incredible value for money *Short Wave Magazine* is.

## UK Scanning Directory

If you subscribe to the SWM Readers mailing list then you'll have already noticed that the Book Store now has stocks of the latest (7th) Edition of the *UK Scanning Directory*. You can order your very own copy of this updated tome for £19.50, plus P&P using the order form page 91 of this issue. If you don't subscribe to the E-mail list, you have an Internet connection and you'd like to, then simply send a blank E-mail to [swm\\_readers-on@pwpublishing.ltd.uk](mailto:swm_readers-on@pwpublishing.ltd.uk) and you will be automatically subscribed. The list is available in both feed mode - where you receive each and every message separately, or daily digest mode - where one posting is sent to you containing the day's list traffic. Join now and join your fellow readers for some lively debate. Next month we'll have some snippets from the list to show what goes on.



## Sound Samples

I received an E-mail from Noel Green, see Top QSL, following my comments on REA4 in last month's 'Ed's

Comments'. As is often the case when writing about or discussing signals received, there has been some confusion as to exactly what one monitor has been listening to.

Without a spectrum display and a correct understanding of b.f.o. offsets of your receiver it can be difficult to specify the **exact** frequency of a transmission that you are monitoring. Without the ability to be totally sure of the frequency under discussion, it is highly likely that there will be confusion as to which signal is being specified. A few hundred hertz either side of a spot frequency on h.f., will quite often yield a totally different signal. Particularly when the target is suffering a poor propagation path to the monitor's location. In this particular case, the REA4 station was definitely using c.w. Noel mentions receiving a "sound". However, the obvious way to avoid confusion is to use a sound sample of what's being received. As I mention in my reply on the page opposite I believe that the transmissions that he has been logging are military data modems manufactured by Harris. They have a very distinctive sound and once heard can not be forgotten. To share the sound with all of you who have access I will place a sample WAV file on the SWM web site. There are lots of resource around with good examples of data mode samples, our own CD from April of this year, to mention just one. If you have any samples that you wish to share with other SWM readers, send them to me at the Editorial Offices and I'll add them to the web site too.

## Scanning

This month our regular Scanning column takes a break, next month it'll be back with our new regular author. Don't miss it.

## Seasonal Greetings

All that's left now from me as I type the last few words for this issue and indeed this century, is to thank all our readers and contributors for their involvement in our somewhat specialist and unique publication on behalf of all of us at PW Publishing Ltd. May you all enjoy the festivities and other activities that you choose to indulge in. Wishing you all a peaceful and prosperous Christmas and New Year, and lots of good listening. See you next century.

VY 73 KEVIN NICE G7TZC



**Dear Sir**

Re: Presentation of Table 1, Page 76, SWM December 1999.

Having taken SWM and PW on and off for many years, with periods of subscription inbetween, I am now reviewing my feelings about renewing my subscription. Why?

Being primarily interested in the 'Decode' column, I was utterly disgusted with the size of the typeface used in displaying the table of complex modes. I am inherently short sighted, but with seven dioptre correction, I have 20/20 vision. The only way the table could be read by several friends was with the aid of a magnifier or in my case to remove my spectacles, hold the page three inches away from my nose, note down the frequency, etc. then replace my spectacles and set the frequency on my receiver, not a very satisfactory method.

As you can hopefully see from the paragraph above, eight point size is fairly difficult to read, yet on measuring the type size I have used is 25% larger than the one used in the table. I cannot find a six point in any of my fonts or I would have used it, as it would have been nearer to the one used in the table.

I would like to suggest that the next 'freeby' offered with SWM is a Fresnel page magnifier.

**Dave Jowett G8FJR**  
W. Yorkshire

*I took the decision that a table with small type was better than no table. I have spoken to Dave on the 'phone and he now has a copy of the 'Complex Frequency Table' he can read. I will place the file on the website so it will be available to those who wish to download it. - Ed.*

**Dear Sir**

I have been a subscriber to SWM for many years surviving even the great SWM introduction to DTP with all the colour problems associated with that event. Never once have I complained, always satisfied with the general content of this superbly produced and edited magazine.

Now it could be due to the insidious creeping advance of time or maybe a gradual deterioration in my eyesight, but I find that I am unable to read the extremely small print that you use in many of your articles. I refer in particular to page 41 of the November issue of SWM. I cannot read the table at the foot of the page. It was only with the aid of a magnifying glass that I found out that part of the table was in Russian letters.

If you should continue to produce this excellent

**Dear Sir**

I read with interest your piece about the signal being noted by 'lots of monitors around the globe' on 6.895MHz. It has also attracted my interest, and that of a fellow hobbyist, for several months now.

I am new to the computer and not really a 'utility' enthusiast and so have not been following the debate in the WUN pages. I came across the same type of transmission elsewhere when listening for broadcast stations.

My fellow enthusiast - who knows far more than I about various utility signals - have heard differing types of signals adjacent to the mystery one, such as SITOP, with it's c.w. ID. Both of us disagree with the theory you mention - a Russian WX station.

I have done two scans from about 1.680 up to about 23.000MHz. During the last one, I logged this noise on no less than 63 different frequencies between 1680 (the lowest) to 8.702MHz, between about 0715-0845UTC.

I scanned the higher end of the spectrum later the same morning around 1115-1230UTC and found another 29 frequencies operating. Some weather station!

Interestingly, three frequencies in the 90m band - 3.326, 3.366 & 3.386MHz (approximate, because I don't know how to measure frequency exactly) - are heard as strongly at midday on a portable receiver with a whip antenna and were similarly back in July/August, etc. And others in the 2, 5 and 6MHz ranges were/are too.

You are an amateur and will know how far to expect reception on 160 & 80m in daytime. Personally, I make the location of many frequencies to be in the UK.

Since I did this survey, some frequencies have been dropped - 5.851MHz for instance, and this frequency now carries some other type of data transmission (as well as Brother Stair via Juelich-D during our afternoons). 6.251, though, is still going strong, as is 5.162 and many others.

Has anyone considered that these transmissions might be connected with a HAARP project (High Frequency Active Auroral Research Programme). *Monitoring Times of October 1996* carried a most interesting article about the one built in Alaska, and apparently there are other sites too, in Sweden, for example. With so many transmitters in operation someone with a bit of brass has to be behind it. The Russians supposedly have none, but what about Uncle Sam.

Have a tune through the spectrum and see how many you can count. The noise is so obvious and recognisable it can't be missed.

**Noel R. Green**

*It would seem that the signals to which you refer are military PSK 39-tone modems. They have a harsh 'jet' type sound. Perhaps if you send me a sample of the sound you refer to, then I can identify it for sure. If this is the case, then most certainly many of these transmissions originate in the UK. - Ed.*

publication in such small letters, may I look forward to a similar reduction in my annual subscriptions.

**John D Knox**  
Ferndown

*Every month we are faced with the dilemma of whether to drop material or 'squeeze things in'. It seems that we have squeezed just a little too much. For those that we have caused a problem, please accept my apologies. - Ed.*

TOP  
QSL

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

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(1 Year)



## Marketing Moves

**Tim Ayris** has joined **World Radio Network** (WRN) in London as its new Marketing and Rebroadcasting Manager. Tim was previously head of marketing for British Satellite News (BSN) and before that London Radio Service (LRS). Both of these services are produced for the British Foreign and Commonwealth Office by Associated Press Television News (APTN).

At LRS, Tim substantially increased the take-up of the syndicator's radio news and programmes with public service broadcasters such as All India Radio, ABC NewsRadio in Australia and Radio Television Morocco, as well as a number of commercial broadcasters including Radio Rediffusion in Kuala Lumpur, Malaysia and Radio Silver Rain in Moscow.

At WRN, Tim will be responsible for the rapid expansion of the company's rebroadcasting affiliates, including a.m. and f.m. stations and cable and satellite outlets, thereby allowing global audiences across to WRN's six world class international radio channels. Along with Jeff Cohen, WRN's Director of Development, Tim will also grow the company's transmission business. WRN currently provides cost-effective regional and international transmission solutions for broadcasters such as CBC Radio in Montreal, Classic FM and Virgin Radio in London, NRJ in Paris and Voice of America in Washington.

"This is an incredibly exciting time to join WRN," says Tim, "particularly with the launch of the European Radio Network in the new year." He continues, "WRN has a high profile brand image and one of the most exciting rebroadcasting products available in the international radio market. This represents a real challenge for me to build upon and expand the company's client base still further."



## Christmas Social

The **Hoddesdon Radio Club** has a Christmas social on Tuesday 21st December from 2000 at the Conservative Club, Rye Road, Hoddesdon, Herts. Further details on **0181-245 8119**.

## New Mini 70cm Transceiver

**Waters & Stanton PLC** are distributing a new Maxon u.h.f. low powered transceiver. The model is the SR-214 10mW u.h.f. hand-held, covering 70cm frequencies between 433.075 - 434.775MHz. Powered by four AA cells, (not supplied), the transceiver is very compact with excellent performance and priced at only £29.95 inc. VAT.



Contact Waters & Stanton at **Spa House, 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835/204965, FAX: (01702) 205843** or E-mail: **sales@wspc.demon.co.uk** for more information.

Make  
your New Year's  
Resolution  
now - turn to  
page 5!

## FEBA's New Chief

One of the UK's senior policemen is to become the new Chief Executive of international charity, **FEBA Radio**. **John Bartlett**, recently retired Chief Superintendent with Greater Manchester Police, will



**John Bartlett, FEBA's new Chief Executive.** (Howard Barlow).

## Lake's New Kit

**Lake Electronics** have introduced yet another very simple receiver, this time for the medium wave band. Along the same lines as their increasingly popular short wave receiver, this new kit has a quality printed circuit board and all components, including, of course, the all important tuning capacitor and a crystal earpiece. Build it in an hour or so, connect up to the PP3 battery, a 5 or 10m length of wire for an antenna, and you're away! There is no setting up to worry about - it's fun to build and fascinating to use!

Ideal for the young (and the not so young) newcomer to the hobby, this new simple receiver fully meets the requirement for one of the practical projects in the Novice RAE Course. Sensibly priced the same as the other two kits in the 'Novice' range, the short wave receiver and the audio amplifier, all three kits are priced at just £8 each, postage is £1 for either one, or all three kits.

Further details from Lake Electronics at **7 Middleton Close, Nuthall, Nottingham, Tel: 0115-938 2509** or E-mail: **radkit@compuserve.com**

formally take over the job as Chief Executive of FEBA Radio from Michael Roemmele on 1st January 2000.

John has been a policeman for over 30 years and a Chief Superintendent for the past six years. For three years he was in charge of the Bolton Division, with over 700 officers and staff under his command. Since 1997, he has been commander of the Development and Inspectorate Department, Greater Manchester Police.

Throughout his career, John has spent a considerable time actively involved in his local church where he serves as a Deacon and Church Secretary. He has a keen interest in his local area and a particular concern for the needs of the inner city.

John has also spent ten years on the Executive Committee of the Manchester City Mission and has assisted with children's PACT holiday camps. For the last four years John has completed an annual charity cycle ride from Manchester to Blackpool, an impressive 100km.

John is looking forward to his new role and the challenges that lie ahead. He says that his new position will allow him to combine the management expertise acquired during his police career with his passion for sharing the Gospel of Christ. "Feba", he said, "is a forward looking dynamic charity that is entering an exciting period of change and expansion that will open up new opportunities in the world".

His appointment has been welcomed by the staff and council of FEBA Radio. Chris Matthews, Chairman of FEBA Council said, "We are delighted that John is joining Feba. He brings a wide range of management experience and leadership skills to this vital role. But just as importantly, he has a real belief in, and heart for, the particular task FEBA Radio has in world mission".

For more information about FEBA, contact them at **Ivy Arch Road, Worthing, Sussex BN14 8BX, Tel: (01903) 237281** or **FAX: (01903) 205294**.

## MicroTechnologies For The New Millennium

The UK Chapter of the International Microelectronics And Packaging Society has announced details of a two day European Conference to be held at the Novotel Hotel, London, on 24-25th January 2000.

MicroTechnologies For The New Millennium will, over the two days, offer delegates from the electronic industry an opportunity to hear a total of 23 papers presented by experts from leading international companies, research centres and universities.

Day one of the Conference covers MultiChip Modules EC-MCM2000 and will be IMAP's 6th European Conference on MultiChip Modules. Day two will focus on Microsystems Packaging.

Commenting on the announcement of IMAP's Conference, Dr Malcolm Wilkinson said, "This will be one of the largest ever Conferences held in the UK covering the MicroTechnology industry. It will be truly international in it's scope, with 23 papers being presented over the two day period.

Expert speakers will be representing leading companies, research centres and universities from the UK, Ireland, France, Germany, Netherlands, Italy, Switzerland, Slovenia and the USA. As we approach the new Millennium we feel that now is the time to present and discuss the future of the MicroTechnology industry".

If you would like further information on the IMAPS Conference, contact **The Secretariat IMAPS, 4 Station Court, Great Shelford, Cambridge CB2 5NE, Tel: (01223) 257512, FAX: (01223) 504918**, or see their web site at: <http://www.imaps.org.uk/imaps/events/htm>

## Store 54!

Central Croydon now has its very own **Maplin Electronics** store - which was opened back at the end of October 1999. Mayor Shafi Kahn, the London Borough of Croydon Mayor, kindly opened the store. The Croydon store opening brings the overall Maplin store network to 54 locations.

Customers are able to choose from an impressive product range, helped by Maplin's enthusiastic and highly trained staff. Everything from the latest in-car hi-fi's, speakers, home and business security systems, the latest Global Positioning Systems (GPS), computer accessories and specialist tools are on show.

"We've been trying to come into Croydon for some time now", comments Graham Caldwell, Retail Operations Director, "now we are here, we



Mayor Shafi Kahn seen here officially opening the store with store manager Simon Head (centre).

intend on bringing a new and fresh shopping experience to this area!"

The new 54th store is located at **166 North End, Croydon, Surrey CR9 1SE, Tel: 0208-686 6081**.

## An International Affair

The 8th Radio Solutions show, organised by the **Low Power Radio Association (LPRA)**, took place back on October 20-21 at the National Motorcycle Museum, Birmingham. This year showed a significant increase in the number of exhibitors (65) over previous years, including companies from Germany, Holland, the US, France, Switzerland and, for the first time, Russia.

New product lines this year from many exhibitors concentrated on designs for the new 868MHz European frequency for short range devices.

Keynote speaker, Trevor Bayliss, gave a rip-roaring address on his experiences as an inventor, particularly on the batteryless radio. He was followed by speakers covering in-depth technical and regulatory issues, including a view of the future of low power radio in Europe over the next ten years. Registrations for the conference exceeded all previous records.



Winner of the most innovative product.



Most eye-catching stand.

r.f. and power components, won the 'most eye-catching stand'.

Feedback from exhibitors has been enthusiastic, despite the fact that the number of visitors was slightly down on the first day (England playing in the Rugby International?), all mentioned that the 'quality' of visitors was of the usual high standard at Radio Solutions and one US company said that they planned to drop some of the other exhibitions they regularly attend in favour of Radio Solutions as they had over £1 million worth of enquiries.

The LPRA have also just secured a venue and fixed dates for their next event - this will be at the Arabella Sheraton, Munich, on 13-14 March 2000. This event will be called Radio Solutions Munich, and you can find out more by looking at their web site at [www.lpra.org](http://www.lpra.org)

Winner of the 'most innovative product' was Studio Systems Electronics, who offer portable video and audio microwave links. Coilcraft Europe, who offer an extensive range of wire-wound

Continued on page 10...

## rallies

### Attention Please!

Would you like to have your Rally publicised? If so, all you have to do is put together as much information as possible about the Rally, i.e. date, location, times, who to contact, etc. and send it to the Editorial Offices.

### 2000

**January 23:** The Lancastrian Rally will be taking place at Lancaster University. Routes from south - leave M6 at J33, routes from north - leave M6 at J34. Doors open at 1100, 1030 for disabled visitors. Entrance fee is £1.50. There will be a Bring & Buy, Morse tests on demand - two passport photos required. Licensed Café on site. For booking details contact (01772) 621954.

**January 16:** Oldham ARC will be holding their rally at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancashire. Doors open 1100, 1030 for disabled visitors. Event features the usual traders and a Bring & Buy stall, Morse tests available on demand. Talk-in on S22 via GB40RC, commencing 0730. Refreshments and free parking will be available. Further details on (01706) 367454, E-mail: [m1cvi@netcomuk.co.uk](mailto:m1cvi@netcomuk.co.uk)

**February 6:** The 15th South Essex Amateur Radio Society are holding their Radio & Computer Rally at the Paddocks, (situated at the end of the A130), Long Road, Canvey Island, Essex. Doors open from 1030 and features include Amateur Radio, Computer & Electronic components exhibitors, Bring & Buy, RSGB Morse testing on demand (two passport photos required). There will also be home-made refreshments, free car parking with space outside main doors for disabled visitors. Admission is just £1. More information from Brian G7HIO on (01268) 756331 before 2100 please.

**February 6:** Harwell Amateur Radio Society will be holding a Radio & Computing Rally at the Harwell Science & Engineering Centre located just off the A34 between Oxford & Newbury. Doors open 1030-1530. Signposted from A34. Talk-in on 145.550MHz. Further details from Ann G8NVI on (01235) 816379 or on <http://www.hamradio.harwell.com>

**February 13:** The Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield, in one large hall, just out of town on

Continued on page 11...

Send your news to Zoe Shortland at the Editorial Offices

# HAYDON COMMUNICATIONS



★ ★ MAIL ORDER: 01708 862524 ★ ★



NEXT DAY DELIVERY TO MOST AREAS, £10.00.

## RECHARGEABLE ALKALINE CELLS

Starter kit includes charger & 4 x AA cells. **£13.99** + £2.50 P&P.

Please note that only the special cells can be recharged with this charger.

Extra cells available @ Rechargeable Alkaline. No memory effects. 1.5V cells. 3 x 4 x AA pack £5.99 £1 P&P capacity of nicads. 4 x AAA £6.25 £1 P&P **NO QUTBBLE WARRANTY**

## SCANMASTER SP-55

Boost reception of your scanner with this pre-amp. 25-1500MHz, variable gain, band pass filters.

**OUR BEST SELLER** SUPERB VALUE **£59.95** P&P £3.50

## POLICE STYLE HOLSTER "HHC-2"

Matches all hand-helds can be worn on the belt or attached to the quick release body holster.

**£22.95** P&P £1

## EP-300

Deluxe over the ear earpiece.

20 PIECES ONLY **£9.95** + P&P £1

## MA-339

Mobile holder for hand-helds.

ONLY

**£9.99** + P&P £2

QS-200 Air vent holder .....£9.99 P&P £2

## QS-300

A fully adjustable desk top stand for use with all hand-helds. Fitted coaxial fly (FAI) with BNC & SO239 connectors.

ONLY **£14.95** P&P £2

## Q-TEK HF INDUCTIVE INTERFACE

Allows the connection of any HF antenna to any scanner that has a BNC connector. Simply connect the long wire antenna to the push terminal on the top of the interface and attach to your scanner in place of your existing antenna.

ONLY **£14.95** P&P £1

## GARMIN PRODUCTS



## GARMIN GPS-III PLUS

Upgradable GPS system supplied with data lead and free on-board maps. Shows cities, airports and much, much more.

SALE PRICE **£315.00**

Soft case for GPS-III Plus .....£20.00  
GPS-III UK version with moving map .....£249.95  
GPS-12 Navigator .....£129.95  
Cigar power lead .....£20.00  
Active magmount antenna .....£39.95  
In-car dashmount holder .....£9.99  
Magmount antenna .....£22.95



## NEW GPS-12 NAVIGATOR

(now with 24 hour battery life) 12 channel receiver. Includes:- UTM, ordnance survey, waterproof to IPX-7 standard.

SALE PRICE **£110.00**

GPS-12XL (Includes Europe C.P.D.) .....£209.95  
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Cigar power lead .....£20.00  
Optional active magmount antenna .....£39.95

**NEW 7th EDITION UK SCANNING DIRECTORY**  
ONLY **£19.50** P&P £2.50

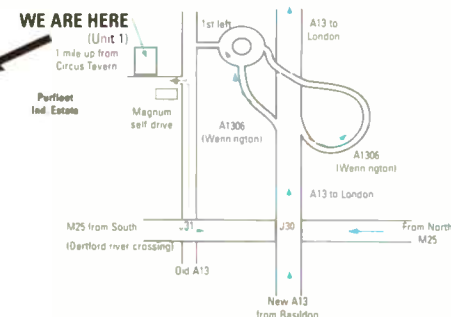
## QUALITY USED EQUIPMENT

## KENWOOD R-5000

Communications receiver. As new. **£449.95**

R-5000 With filters .....£449.95  
IC-8500 As new .....£1149.95  
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Sony SW-77 Short wave portable .....£249.95  
Sony SW-55 Short wave portable .....£179.95  
IC-R10 Wide-band hand-held .....£199.95  
AR8200 As new .....£299.95  
AR8000 VGC .....£199.95  
WS-1000 Miniature scanner .....£129.95  
AR1500EX Hand-held scanner all mode 0.5-1300 .....£89.95  
PRO-2042 As new .....£125.95  
Opto 2600 Frequency counter .....£29.95

Plus much more



## Q-TEK WSK-2000

SAVE OVER **£50**

● Professional 137MHz 2 element crossed dipole kit for receiving weather satellite pictures.  
● Due to unwanted commercial order we have 100 pieces to sell off at a silly price.

Includes: ● Reflectors ● Baluns ● Phasing harness ● Dual polarisation (circular) ● Incl's N-sockets & mast clamps ● Assembles in seconds &

incl's free s/ware ● Instant free reception of live colour pictures from orbit  
~~£89.95~~ ONLY **£34.95** Del £8.50



## ALCATEL DIGITAL CORDLESS TELEPHONE

★ Up to 12 hours track time / 70 hours stand by  
★ Up to 300m range in ideal conditions  
★ Up to 50m indoors  
★ 10 name & number memory  
★ Up to 6 hand-sets per base station - call hold & transfer, free internal calls ★ The ideal Xmas gift

LIMITED STOCK. Once they've gone they've gone!

ONLY **£59.95** P&P £5



## B.T. DIVERSE 2016

★ Up to 300m in range  
★ Digital, no tape required  
★ 10 name & number memory  
★ Caller display ★ Full remote access to answer machine ★ Time day stamp  
★ The ideal Xmas gift

ONLY **£139.95** P&P £5

## INTERFERENCE - STOP IT!

Rectangular snap-fixing ferrite cores suitable for: Radio coax / TV / mains / telephone / PC & data cables. Plastic teeth prevent it from sliding on cable. Simply snap close onto cable and job is done!

BULK PURCHASE hence **2 for £5** (P&P £2.50). HURRY - LIMITED STOCK

## Q-TEK LW-2

The ultimate in high quality long wire antenna kits. Complete ready to go wire antenna that should last forever - don't forget you get what you pay for! (0-30MHz) length - adjustable up to 150ft.

**£39.95** P&P £5.

(All parts - high quality and replaceable)

**W. MIDLANDS SHOWROOM**  
Unit 1, Canal View Ind. Est., Brettel Lane, Brierley Hill, W. Mids. DY5 3LQ  
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**SHOWROOM & MAIL ORDER:**  
Unit 1, Thurrock Commercial Park, Purfleet Industrial Estate, Juliette Way, Nr. Aveley, Essex RM15 4YD  
TEL: 01708 862524  
FAX: 01708 868441  
Open Mon - Fri 8am - 4.30pm.  
Sat 8am - 1.00pm

**NEW OPENING TIMES**

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COMMENTS SUCH AS:- WE'LL BEAT ANY ADVERTISED PRICE BY £10, £100, £1000 IN OUR OPINION IS RIDICULOUS. WHAT DOES THIS MEAN? WE BELIEVE EVERY CUSTOMER SHOULD GET THE BEST DEAL FROM THE START. WE OFFER THE KEENEST PRICES AROUND. HOWEVER, SHOULD YOU SEE A LIKE FOR LIKE PRODUCT ADVERTISED CHEAPER, WE'LL BEAT IT! WE SIMPLY SELL FOR LESS.



## Q-TEK APOLLO 2000MkII

A brilliant new compact indoor antenna that covers 0-1650MHz and is just 20" tall (collapsed). Supplied with coax and BNC plug fitted.

ONLY **£49.95** P&P £5

Comments from John Griffiths

*I have to say that I'm not a fan of indoor antennas like this as earlier desk mounted antennas tended to look like a mad scientist invention. However, I was surprised by the quality of construction of this piece of equipment and it appears to be up to the job it is designed to do. Without getting technical, the Apollo 2000 claims to be able to cover 0-1650MHz. I used it between 108-400MHz: approx and was surprised by what it was able to do. It produced clean copy and there was good reproduction with very little breakthrough.*



## Q-TEK D.C. 2000

A high performance wideband disccone offering superb performance from 25-2000MHz. Transmit range:- 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type connector. Supplied with mounting brackets.

OUR PRICE **£54.95** P&P £8.50

Comments from John Griffiths

*Putting the DC-2000 up gave me a tremendous boost to all signals with the ancient AR-2000 coming alive! Signals were well received and I found that I wandered out of airband - my usual haunt - into all manner of areas that previously have been less than good here due to my location!*



## Q-TEK INTRUDER

Superb quality wideband receiving antenna. Covers 100kHz-2GHz (all mode). Wall mounting.

ONLY **£99.95** P&P £6.00



## NISSEI HS-8000

Miniature wideband scanning antenna with magmount (25-2GHz) BNC fitted. RRP £24.99.

ONLY **£14.99** P&P £3.

## AIR-44 (Airband base)

Prof quality base antenna for AIRBAND. (Civil & military). With SO-239 fitting (1.7m long). Gain 4.5/7dB.

**£69.95** P&P £8.50

AIR-33 (As above) 1m long. Gain 3/6dB. £44.95 P&P £5



## DB-32

A miniature wideband antenna. Receives 30 - 1200MHz. BNC fitting only 1.5" long. It's superb (for its size).

RRP **£29.95** P & P £1.

TSA-6671 BNC magmount .....£22.95

## REGULAR-GAINER RH-770

BNC 21cm flexible whip that is ideal as replacement

OUR PRICE **£14.95** P&P £1

## SUPER-GAINER RH-9000

BNC 40cm flexible model for the ultimate in gain.

OUR PRICE **£19.95** P&P £1



## Q-TEK HF-30

An amazing new design concept in compact HF antennas. Thanks to its six-stage multi-resonant coil system stacked vertically utilising a magnetic balun at the base you can obtain better results than ever experienced from a compact-vertical HF antenna. (SO-239 fitting:- 4' high - clamps to any mast up to 2" dia). 0-30MHz.

ONLY **£84.95** (DEL £10.00)

SUPERB HF SHORTWAVE ANTENNA

"Mario Gongolsky" - Freelance journalist for German magazines - brief comments after testing HF-30... your HF-30 kept all the promises you have made. Smooth reception on a suprisingly low noise level. The HF-30 supplied a very clear signal to the receiver. Continuous good performance throughout the whole frequency range.

## NEW SP-1 SPYWIRE

Ideal for any receiver. Receives all short wave bands. All mode, no ATU required. Built in balun. SO239 connection.

**£29.95** + £3 P&P



## NEW Q-TEK BALUN

Short wave magnetic long wire adaptor for any short wave receiver. Simply screw onto receiver & connect the wire via supplied screw terminal. (It's brilliant).

PL-259 ONLY **£22.95** P&P £1



## Vectronics AT100

Active SW antenna Covers 0.3-30MHz with adjustable sensitivity. Simply connect to a

receiver and away you go. SUPERB VALUE **£69.95** P&P £4 (includes pre-selector)



## GLOBAL AT-2000

Deluxe SW ATU 0-30MHz. SO239 fittings.

ONLY **£85.00** P&P £4

(Probably the best ATU around)



## SANGEAN ANT-60

Portable SW reel antenna. Connects to a 3.5mm jack or clips onto your telescopic antenna. ~~£14.95~~

ONLY **£8.99** P&P £1

## COPPER ANTENNA WIRE

	(All 50mtr rolls)
Enamelled.....	£12.95 P&P £5
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Multi-Stranded (Grey PVC).....	£9.95 P&P £5
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Flexweave (H/ duty).....	£30.00 P&P £5
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## CLOCKS/WEATHER STATIONS FROM OREGON PRODUCTS



### RM-913 RADIO CONTROLLED CLOCK.

● 12/24hr function ● Auto clock from "Rugby" RF signal ● Alarm function ● Backlight & more ● Incl's batteries

**£11.99** P&P £2



### RM-338 EXECUTIVE CLOCK.

● Jumbo LCD ● 12/24hr clock ● 100yr calender ● Temp (°C/°F) ● Wall or desk mount ● Backlight ● Incl's batteries

**£24.99** P&P £2



### RM-318P PROJECTION RADIO CONTROLLED CLOCK.

● Auto clock from "Rugby" RF signal ● 12/24hr function ● Dual time display ● Bright wall projection facility ● Dual alarm & backlight ● Incl's batteries + PSU

**£29.99** P&P £3



### BA-312E WEATHER CLOCK.

● 5 weather forecast ● Temp (Min/max) ● "Higlo" illumination ● Alarm/calender ● Much more ● Incl's batteries

**£27.99** P&P £2



### BAR-888U

WEATHER/RADIO CONTROLLED CLOCK. ● Supplied with one remote (wireless) sensor ● Weather forecast ● Barometer ● 24 hr "radio" clock ● Thermometer

**£69.95** P&P £4



### BA-888

ELECTRONIC BAROMETER/CLOCK. ● Temp/weather/forecast/pressure barometric trend ● 24hr bargraph ● 12/24hr clock & alarm ● Humidity ● Table/wall mount

**£69.95** P&P £4



### JM-838 JUMBO WALL/DESK CLOCK.

● Wide screen /2" digit time display ● Barometer ● Calender ● Temp ● Auto RF synch clock from Rugby

**£59.95** P&P £4

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Mini Scout + AR8200 complete with lead.....all for £519.00  
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Scout MkII + AR8200 Full Scout with reaction lead.£689.00  
Scout MkII + AR8000 (lead modification included).£599.00  
Hunter (10MHz-3GHz) incl's nicads/charger & antenna .....£59.95 + free case  
Opto Mini Scout 10MHz-1.4GHz frequency counter with bargraph and "reaction tune" caperbility (incl. nicads and charger) With free case worth £14.99 .....£139.00  
Opto Scout MkII frequency counter .....£349.95  
Opto Cub frequency counter .....£99.95  
Techtoyz micro counter.....Sale price £49.95  
R-11 nearfield receiver (30MHz-2GHz) .....£249.00  
Xplorer surveillance receiver .....£799.00

... continued from page 7

## January Meetings

### Members of the **Hordean & District Amateur Radio Club**

meet on the 1st and 4th Tuesday of each month at Lovedean Village Hall, 160 Lovedean Lane, Lovedean, Hants, starting at 1930. Visitors are always welcome.

January 4th is a Club Social Evening and on the 25th, there will be an illustrated talk by Walter Vandome entitled *A Little Bit of Japan*.

More information from **Stuart Swain G0FYX**, Club Secretary, on **023-9247-2846** or E-mail Stuart at **g0fyx@msn.com**

## Wimbledon & DARS

The **Wimbledon & District Amateur Radio Society** meet every second and last Friday of the month at St Andrews Church Hall, Herbert Road, Wimbledon, London SW19. On 14 January, there is a talk on Near Vertical Incidence Radio Propagation by George G3DWW. Further information on **(01737) 356745**.

## Craft Chart

The **United Kingdom Hydrographic Office** (UKHO) has produced a *Small Craft Radio Services Chart* (SC5700) following the recent changes to maritime radio communications as a result of the moves to GMDSS. The first *Small Craft Radio Services Chart*, covering the English Channel, will be launched at the London Boat Show in January 2000.

The *Small Craft Radio Services Chart* is an exciting new concept in the depiction of maritime radio information. Designed specifically for use by the leisure yachtsman, SC5700 graphically depicts all radio information for the English Channel, including essential maritime safety information.

On the reverse, the chart contains information on marinas and yacht havens, harbours with Small Craft facilities, national/local radio, forecast area maps and nav-warning maps. The Chart will be reprinted as changes dictate.

Published in A2 sized format in full colour on durable waterproof paper, the *Small Craft Radio Services Chart* can be easily slotted into a Small Craft Folio plastic wallet. Available from Admiralty appointed Chart Agents at £9.95 (UK RRP), The *Small Craft Radio Services Chart* will also be on sale at the London Boat Show 2000.

The United Kingdom Hydrographic Office can be reached at: **Public Relations, Admiralty Way, Taunton, Somerset TA1 2DN**.

## High Profile Operation

Herne Bay based **Icom (UK) Ltd.** has recently helped England's bid to host the 2006 Football World Cup. At short notice, they supplied RAF Northolt with a specialist airband transceiver, which was then used to relay essential information for the helicopter transfer of the FIFA Inspection Team, in and out of London's Wembley Stadium.

The radio was instrumental in assisting the Royal Air Force Traffic Control staff on the ground, allowing them to co-ordinate the three helicopters' arrival and departure from the famous stadium. This was by no means a straightforward task, due to the restricted size of the landing site, unique obstructions and the unusual wind turbulence created by such a structure.

The six strong FIFA delegation were transported in RAF helicopters from 32 (The Royal) Squadron and were given special permission to land on the pitch. Staff from RAF Northolt provided the necessary expertise on the ground.

Icom's IC-A3E radio, used in this high profile operation, is a simple to use v.h.f. airband transceiver. Compact in size, the handportable has superior audio that's easy to hear, even without a headset. The model is one of the latest in a range of radio products that Icom (UK) Ltd. has been distributing for the last 25 years.

Squadron Leader Nick Stoner, Senior Air Traffic Control Officer at RAF Northolt, said, "This equipment helped us immensely. This was not a straightforward operation and I feel that the radios were vital in assisting the safe movement of the helicopters and VIPs."

**Dale Blackman**, Icom (UK) Ltd.'s Marketing Manager, said,



## Radio & TVDX News

'TV Bucuresti' is a new commercial terrestrial TV station that opens in the Rumanian capitol next Summer 2000 and will provide a 24-hour service to around two million viewers. Interesting that the project has been largely financed by both Canadian and UK interests.

The French government are hoping that the first digital terrestrial TV (DTT) will be on-air approx. Autumn 2001 and are seeking proposals from current broadcasters on how digital TV can be introduced together with allocation of frequencies.

Meanwhile in Australia, the ABA has just announced plans for DTT in Melbourne, Hobart, Canberra and Adelaide opening January 1, 2001. This date is mandatory for the main population areas, DTT transmissions in the countryside will be delayed though should be on-air by January 1, 2004. The ABA are recommending existing v.h.f. channels for digital and with fill-ins at u.h.f. With the possibility of digital interference on existing v.h.f. analogue, temporary u.h.f. analogue relays will be opened.

Each year Neil Bone, director of the Meteor Section, The British Astronomical Society, kindly provides a listing of the main meteor shower dates to help v.h.f. DXers in optimising their MS sightings. The year 2000 MS dates are as follows:

### Main Meteor Shower Dates For Year 2000.

Name	Overall Period	Peaking
Quadrantids	January 01 - 06	January 04, 0500UTC
Lyrids (April)	April 19 - 25	April 21 - 22
Aquarids (May)	April 24 - May 20	May 04 - 05
Cetids	May 07 - June 09	May 14 - 25
Delta Aquarids	July 15 - August 20	July 28, 29 & August 06
Perseids	July 24 - August 20	August 12, 0900UTC
Orionids	October 16 - 27	October 20 - 22
Taurids	October 20 - November 30	November 01 - 07
Leonids	November 15 - 20	November 17, 0800UTC
Geminids	December 07 - 16	December 13, 1600UTC
Ursids	December 17 - 25	December 22

**NB: the minor October shower *Giacobinids* is unlikely to provide any worthwhile activity in 2000.**

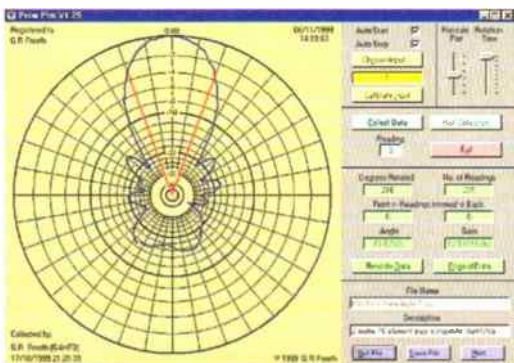


"We are only too happy to help. Meeting customers' deadlines at short notice is something that we do every day, although usually the equipment is destined to meet a ship or plane, not help land us the World Cup tournament! Everyone here is proud to know that we may have helped to bring the tournament back to this country."

Icom (UK) Ltd. can be contacted at **Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742** or check out their web site at [www.icomuk.co.uk/](http://www.icomuk.co.uk/)

## Polar Plot Program

The Newsdesk has recently heard from **Bob Freeth G4HFQ** who has just completed development of a program to measure the polar diagram of a beam antenna in its installed location, which uses nothing more than an audio connection between receiver and the sound card of a standard PC.



The published polar diagram of a given antenna design is mostly the result of theoretical calculation and with the antenna operating under ideal conditions and against a perfect earth - reality is generally quite a different story!

*Polar Plot* is a program that lets you see what the polar diagram of a rotatable beam antenna actually looks like where it is operating. The program plots the polar diagram in dB and gives an indication of the gain in dBd of the receiving station antenna or the transmitting station antenna.

The polar diagram is presented in ARRL dB polar form with a range from maximum to minimum of 40dB. Colour and black and white print out and standard windows filing systems are provided.

The program uses a connection from the receiver audio output to the computer sound card input with no requirement for any specialised interface equipment. Measurements can be saved and re-loaded later; plots can be printed in colour or greyscale; screen shots can be captured and pasted into graphics programs for saving and subsequent transmission by SSTV; the effect of that last 'improvement' or what's happened after last night's storm can be seen.

With *Polar Plot* all that is needed (apart from your rig of course!) to measure your own or someone else's antenna is a standard PC with a sound card. *Polar Plot* runs on *Windows 95/98* and *Windows/NT*, desktop machines and even laptops

If you would like more information about *Polar Plot*, check out Bob's web site at <http://www.bob.freeth.dial.pipex.com> - you can download the program to see if you like the look of it.

All of the program works with the exception of being able to collect data, so you can see if your sound card and printer would work, and view some real plots of real antennas.

If you like what you see and wish to register, the price is £25. On registration, you will be given a user name and registration number which will enable you to collect your own data. Registered users also get support by E-mail and **free upgrades for a year.**

## Limited Offer!

**Haydon Communications** have recently taken a huge delivery of commercial grade crossed dipoles with phasing harness - 'Turnstiles' - for receiving WXSAT pictures at 137MHz. Due to a cancelled commercial order, Haydon are offering these dipoles at an amazing price of **just £29.95**. Haydon are also throwing in a **free WEFAX software disc** so the package is ready to use. (Commercially, these antennas cost over £100!).

So, for under £30, you will be able to decode and display on your computer superb colour high quality pictures live from orbit (all you need is a computer and a receiver capable of receiving 137MHz).

The antenna is supplied with a mast fixing bracket and will only require coaxial feeder, available from Haydon, for a quick and easy installation. Because the antennas are built for the commercial market, assembly is extremely easy and requires no special tools whatsoever. However, should you have any queries or worries, Haydon have engineers available to give instructions or advice via the telephone.

### Contact

Haydon  
Communications  
at **Unit 1  
Thurrock  
Commercial Park,  
Purfleet Industrial  
Estate, London  
Road, Aveley,  
Essex RM15 4YA,**  
Tel:  
**(01708) 862524,**  
FAX:  
**(01708) 868441.**



## Annual Quiz Night

On Wednesday January 5th, the **Bangor & District Amateur Radio Society** are holding their annual quiz night. Visitors, visiting teams and new members are most welcome. For more information, contact **Mike G14XSF** on **028-4277-2383** or check out the club's web site at <http://welcome.to/bdars>

## rallies

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

The Editorial Staff of *SWM* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers.

If you have any queries about a particular event, please contact the organisers direct.

Editor

the Horbury Road, easy access from M1 J39 & J40 - well signposted and with talk-in on 2m and 70cm. Doors open 1100 (1030 for disabled visitors and Bring & Buy). Details from **Roy GOTBY** on (01924) 893321 (combined telephone and FAX number), E-mail: [rally@sandalmagna.demon.co.uk](mailto:rally@sandalmagna.demon.co.uk) or check their web site at: <http://www.sandalmagna.demon.co.uk/rally/>

**February 13:** Cambridge & District ARC are holding their annual club Rally and Car Boot Sale in the Ambulance station at Addenbrookes Hospital, Cambridge. Opens at 1000 for disabled visitors, 1030 to the general public. There will be a Bring & Buy, WC, Bar, Talk-in on S22, car park, adults £1.50, children free. For further information contact **John Bonner G0GKP, 40 Lyles Rd, Cottenham, Cambridge CB4 4QR** or telephone (01954) 200072.

**March 11/12:** The London Amateur Radio & Computer Show. There will be the usual mix of exhibitors including: computer software providers, special interest groups, a large Bring & Buy, local clubs, large and small amateur radio equipment dealers, electronic component vendors and lots more. In addition there will be free parking, family attractions (sport, cinema, swimming, golf, etc.), bar and restaurants, lectures, on-demand Morse tests, disabled facilities and a talk-in. Further information is available from **RadioSport** on (01923) 893929.

**March 12:** The Wythall Radio Club are holding their 15th Annual Radio & Computer Rally at Wythall Park, Silver Street, Wythall, near Birmingham. Doors open 1000 till 1600 and admission is only £1.50. Plenty of traders in three halls and a large marquee with bar and refreshment facilities on site plus a big Bring & Buy stand. Talk-in on S22. There will also be a unique free park and ride for easy and comfortable parking. Contact **Chris GOEYO** on 0121-246 7267 evenings, weekends for details, FAX: 0121-246 7268 or E-mail [chris@g0eyo.freeserve.co.uk](mailto:chris@g0eyo.freeserve.co.uk)

■ BRIAN ODDY G3FEX, THREE CORNERS, MERRYFIELD WAY, STORRINGTON, WEST SUSSEX RH20 4NS



# LM&S

Many of the international broadcasters introduced new s.w. transmission schedules at the end of October. Some altered the times by one hour to compensate for the summer to winter time changeover in some countries. Others simply rearranged the sequence of the languages used during their broadcasts and deleted or added to them as they saw fit. Quite a few decided to move the operating frequency of their transmission to another point within the same band and then altered the languages and the times, no doubt leaving many listeners wondering where their favourite programmes have gone!

The reports for this article were compiled during October and the changes rendered quite a few of the s.w. entries therein 'no longer applicable'.

## 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 October.

At 2330UTC on October 24th **Simon Hockenull** (E.Bristol) noticed that Saarlouis on **183kHz** was 'off air', so he tuned to **189kHz** hoping to hear the 300kW RUV outlet at Gufuskalar, W.Iceland, but it was inaudible. However, on **180kHz** he picked up a broadcast of music, which probably originated from TRT via their 1200kW outlet at Polatli, Turkey. The transmission was peaking SINPO 24343 at 2330UTC but it had faded out by 2355.

Over in Co.Down **Eddie Mc Keown** (Newry) checked the band during the morning of the 31st and he was surprised to log Sasnovy, Belarus, on **279kHz** as SINPO 25122 at 1022UTC. Their broadcasts were also picked up during the evening of the 31st by **Fred Pallant** in Storrington. Enhanced conditions were in evidence that day and he observed co-channel interference on the transmission from Atlantic 252 between 2110 and 2225UTC - it originated from Tipaza, Algeria.

radio stations. He picked up the ground waves from some along the south coast and two in the Channel Is - see chart. The most distant were ILR Capital Gold via Bexhill on **945**, rated 25454 at 0955 and BBC Southern Counties Radio via Bexhill on **1161**, rated 14442 at 0950.

## Short Wave Reports

A newcomer to the **25MHz (11m)** band has been observed since the schedule changes at the end of October! The broadcast on **25.740** (Ger to Africa? 0800?-1400?) originates from Deutsche Welle (DW) - it was rated 43334 at 0850 in Stalbridge and 45444 at 1150 by **Alan Roberts** in Quebec.

The daily broadcasts from R.France International on **25.820** (Fr to E/C.Africa 0900-1300) continue. No reports arrived here from the intended target area but their transmission was rated 45543 at 1250 by **John Parry** in Larnaca, Cyprus, and 'close to perfect' in Quebec. It was also received in some areas of the UK via back scatter and other modes and logged as 25443 at 0930 by **Fred Wilmshurst** in Northampton; 25132 at 1004 in Newry; 25333 at 1046 in Storrington; 44333 at 1140 by **John Slater** in Scalloway, Shetland; 34443 at 1200 by **Robert Connolly** in Kilkeel; 25533 at 1245 in E.Bristol.

Many broadcasters are now taking advantage of the propagation conditions in the **21MHz (13m)** band to reach listeners in selected areas. During the morning they include the BBC via Rampisham, UK **21.830** (Eng to M.East? 0700-1300), rated 44333 at 0805 by **Sheila Hughes** in Morden & 45554 at 0840 in Larnaca, Cyprus; RAI Rome **21.520** (It to Africa 0600-1300) 44444 at 0935 by **Thomas Williams** in Truro; R.Austria Int, Moosbrunn **21.765** (Eng to Australia? 0930-1000) 45444 at 0938 in Newry; BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to SE.Asia 0900-1200) 34444 at 1045 by **Robert Hughes** in Liverpool; DW via ? **21.780** (Eng to Africa 1100-1157) SIO 555 at 1100 by **Tom Smyth** in Co.Fermanagh; Vatican R, Italy **21.850** (It, Fr, Eng to Eur?, Asia?) 45544 at 1132 in Northampton; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.]) 34444 at 1140 by **David Hall** in Morpeth.

After mid-day UAER, Dubai **21.605** (Ar to Eur 1055-1330) was 33333 at 1215 in Kilkeel; Swiss R.Int via Sottens **21.770** (Eng, Ger, Fr, It to Asia 1100-1330) 35522 at 1305 in E.Bristol; R.Australia via Shepparton **21.820** (Eng to Asia 0900-1400) 43334 at 1300 by **Gerald Guest** in Dudley & 44444 at 1320 in Scalloway; Channel Africa via Meyerton, S.Africa **21.530** (Eng to Africa 1300-1455? Sat/Sun) 24232 at 1305 in Newry & 43433 at 1400 by **Stan Evans** in Herstmonceux; BBC via Cyprus **21.470** (Eng to Africa 1400-1700) 45532 at 1450 by **David Edwardson** in Wallsend; R.Portugal Int via Sines? **21.830** (Port to Brazil? 1130?-?) 54445 at 1500 in Stalbridge; Voz Christiana, Chile **21.500** (Sp to N.America 1100-2100?) SIO 333 at 1520 by **Philip Rambaut** in Macclesfield;

In the **18MHz (15m)** band R.Denmark via R.Norway **18.950** (Da to ? 1330-1400) rated 55545 at 1348 in E.Bristol; R.Norway Int **18.950** (Norw to N.America? 1400-1430) was 45444 at 1400 in Storrington.

R.New Zealand Int is now making more extensive use of the **17MHz (16m)** band. Their broadcast via Rangitaki, N.Island on **17.675** (Eng to Pacific areas) is now 'on air' from 1750 until 1005UTC. It was rated 54434 at 1750? by **Richard Reynolds** in Guildford, 25532 at 0025 in Wallsend & 33333 at 0705 in Morpeth.

R.Australia is also active in this band - their broadcast via Shepparton on **17.750** (Eng to Asia 0000-0500, 0600-0830)

## Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	E*
153	Donebach DLF	Germany	500	C*,D,E*,G,H,I*,J
162	Allouis	France	2000	B,D,E*,F,H,I*,J
171	Nador Medi-1	Morocco	2000	E*,G*
171	B'shakovo etc	Russia	1200	A*,D,E*,G*
177	Oranienburg	Germany	500	A*,D,E*,G*,H,J
180	Polati	Turkey	1200	A*
183	Saarlouis	Germany	2000	B,D,E*,F,H,I*,J
189	Gufuskalar	W.Iceland	150	G*
198	Droitwich BBC	UK	500	B,C,D,F,G,H,I*,J
207	Munich DLF	Germany	500	A,D,E*,G*,H,J*
207	Azizal	Morocco	800	G*
216	Roumoules RMC	S.France	1400	C*,D,G,H,I*,J*
216	Ganca	Azerbaijan	500	G*
225	Raszyn Resv	Poland	?	A*,C*,D,E*,F,G*,H,J*
234	Beidweiler	Luxembourg	2000	C*,D,E*,G,H,I*,J
243	Kalundborg	Denmark	300	A*,C,D,E*,G,H,J
252	Tipaza	Algeria	1500	C*,E*,I*
252	Atlantic 252	Eire	500	B,C,D,E*,F,G,H,I*,J
261	Burg(R.Ropa)	Germany	85	C*,D,E*,G*,H,J*
270	Topolna	Czech Rep	1500	A*,C*,D,E*,G*,H,J*
279	Sasnovy	Belarus	500	D,E*,G*,H,I*,J*

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

### Listeners:-

- (A) Simon Hockenull, E.Bristol.
- (B) Simon Hockenull, while in Coverack, Cornwall.
- (C) Sheila Hughes, Morden
- (D) Eddie McKeown, Newry
- (E) Fred Pallant, Storrington
- (F) Tom Smyth, Co.Fermanagh
- (G) Ernie Strong, Ramsey, Cambs
- (H) Phil Townsend, E.London
- (I) Thomas Williams, Truro.
- (J) Fred Wilmshurst, Northampton.

## Medium Wave Reports

The longer hours of darkness encouraged quite a few listeners in the UK to search the band for the sky waves from stations in the Middle East, N.Africa, Europe and Scandinavia. They compiled some interesting logs - see chart.

From time to time **Bernard Curtis** (Stalbridge) listened to R.Luxembourg on **1440kHz** in the hope of hearing a broadcast in English, but he found that they are still all in German, despite rumours of a possible revival of the 'oldies' English service.

Whilst on holiday for a week in Coverack, Cornwall, **Simon Hockenull** searched the band one morning for distant local

was rated 33222 at 0813 in Newry. Also noted during the morning were the BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500), rated 45554 at 0840 in Larnaca, Cyprus; R.Pakistan, Islamabad **17.835** (Eng to Eur 1100-1105) 45333 at 1102 by **Tony Hall** in Freshwater Bay, IoW; Israel R, Jerusalem **17.535** (Fr, Eng to Eur, N.America 1100-1135) SIO 555 at 1130 in Macclesfield.

After mid-day R.Bulgaria, Sofia **17.500** (Eng to Eur 1200-1300) was rated 54444 at 1227 by **Tom Winzor** in Plymouth; Israel R, Jerusalem **17.545** (Heb [Home Scer] to W.Eur, N.America) 54554 at 1320 in Liverpool; R.Canada Int via Sackville **17.820** (Eng, Fr to Eur, Africa 1430-1600) 32233 at 1430 in Dudley; BBC via Ascension Is **17.830** (Eng to Africa 7-2100) 54433 at 1900 in Herstonceux; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1700?-2300?) 34333 at 1905 in Scalloway; R.Nederlands via Bonaire, Ned Antilles **17.605** (Eng to Africa 1830-2025) 34433 at 2025 in Kilkeel; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200?) 44444 at 2010 in Stalbridge; RCI via Sackville **17.820** (Fr, Eng to Eur, Africa 2000-2200) 45544 at 2020 in E.Bristol; R.Portugal via Sines? **17.680** (Port [Sports Com] to C.America?) 44333 at 2022 by **Rhoderick Illman** in Oxted; VOA via Greenville, USA **17.725** (Eng to Africa 2000?-2200?) 44333 at 2150 in Morden.

Despite the improving conditions in the higher frequency bands extensive use is still made of the **15MHz (19m)** band. The occupants before noon include the BBC via Skelton, UK **15.485** (Eng to Eur, Africa 0700-1600), rated SIO 222 at 0700 in Co.Fermanagh & noted as 'Fair' at 1510 by **Robert Hughes** whilst in Spain; R.Australia via Shepparton **15.415** (Eng to Asia 0100-0400, 0600-0900) 33333 at 0710 in Morpeth; R.Kuwait **15.110** (Eng, Ar to SE.Asia 0500-0930?) 54544 at 0720 in Guildford; R.Austria Int via Moosbrunn **15.410** (Ger, Eng to Eur, N.Africa, M.East 0500-0730) SIO 444 at 0744 by **Francis Hearne** in N.Bristol; V of Armenia, Yerevan **15.270** (Various to Eur [Eng 1000-1030] Sun) 54544 in Herstonceux; WEWN via Vandiver, USA **15.745** (Eng to Eur 1100?-2200?) SIO 444 at 1125 in Macclesfield.

During the afternoon R.Bulgaria **15.700** (Eng to W.Eur 1200-1300) was 54444 at 1225 in Plymouth; R.Romania Int **15.390** (Eng to Eur 1300-1356) 54544 at 1345 in E.Bristol; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1205?-2200) 24222 at 1457 by **Vera Brindley** in Woodhall Spa; Israel R, Jerusalem **15.650** (Eng to Eur? 1500-1530) 55444 at 1500 by **Clare Pinder** in Appleby; VOA via Morocco? **15.205** (Eng to Eur, N.Africa, M.East 1500-1700) 43343 at 1530 in Liverpool; R.Algiers Int via Bouchaoui **15.160** (Eng to Eur, M.East, N.Africa 1600-1700) 35433 at 1602 in Newry; Africa No.1, Gabon **15.475** (Fr to W.Africa 1600-1900) 32342 at 1637 in Storrington.

Later, RAE Buenos Aires, Argentina **15.345** (Sp) was 32332 at 1950 in Kilkeel; KTBN Salt Lake City, USA **15.590** (Eng to N.America 1600-0000) 33333 at 2026 in Oxted; BBC via Ascension Is **15.400** (Eng to Africa 0800-1130, 1500-2300) 44444 at 2035 by **Robert Season** in Nottingham; V of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 34543 at 2040 in Wallsend; RCI via Sackville **15.325** (Fr, Eng to Eur, Africa 2000-2300) 45444 at 2106 in Freshwater Bay, IoW; VOA via Greenville, USA **15.580** (Eng to Africa 1800-2200) 54444 at 2130 in Morden; Christian Science SWB via WSHB **15.665** (It?, Eng, Ger, Fr to Eur 1830?-2157) 45444 at 2147 in Northampton.

The broadcasters now using the **13MHz (22m)** band include Swiss R.Int via Julich, Germany **13.635** (Fr, Ger, It, Eng to Africa 0600-0800), rated 55555 at 0743 in Newry; Swiss R.Int via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030) 33333 at 0840 in Truro; VOA via Guam? **13.650** (Eng to ?) 33323 at 0915 in Stalbridge; R.Australia via Shepparton **13.605** (Eng to Pacific 0800-1200) SIO 322 at 0938 in Macclesfield; BBC via Skelton, UK

**13.660** (Ar to N.Africa 1200-1800) 43343 at 1320 in Liverpool and 'Very Good' at 1535 in Spain; R.Austria Int via Moosbrunn **13.730** (Eng to Eur 1330?-1400) SIO 555 at 1330 in Co.Fermanagh; VOA via Selebi-Phikwe, Botswana **13.710** (Eng to Africa 1600-2130?) 43344 at 1600 in Dudley; Vatican R, Italy **13.765** (Eng to Africa 1730-1800) 44444 at 1735 in Morden; UAER, Dubai **13.675** (Ar to Eur 1640-2058) 44444 at 1950 in Kilkeel; R.Nederlands via Flevo **13.700** (Eng to Africa 1830-2025) 43433 at 2012 in Oxted; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 2000-2200) 44434 at 2107 in Freshwater Bay; R.Havana Cuba **13.750** (Eng to Eur 2030-?) 22222 at 2130 in Nottingham; WINB Red Lion, USA **13.790** (Eng to Eur, Africa 1700?-2300?) 24222 at 2150 in Woodhall Spa; RCI via Sackville, Canada **13.690** (Eng, Fr to Eur, Africa 2000-2300) 34443 at 2000 in Storrington.

Broadcasts from many areas reach the UK in the **11MHz (25m)** band. Mentioned in the reports were FEBC Bocaue, Philippines **11.635** (Eng to Asia 0930-1100), rated 34333 at 1030 in Scalloway; R.Prague, Czech Rep **11.640** (Eng to N.Eur 1130-1157) SIO 323 at 1130 in Co.Fermanagh; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) was 55555 at 1340 in Plymouth; R.Canada Int via Skelton, UK **11.740** (Eng to Eur 1430-1500) 44444 at 1430 in Dudley; R.Nederlands via Tashkent **12.070** (Eng to S.Asia 1430-1625?) 44444 at 1437 in

Continued on page 15.

## 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
1170	1170AM, High Wycombe	I	0.25	E,H,I,J	1242	Capital G, Maidstone	I	0.32	E,I
558	Spectrum, London	I	0.80	D,E,H,J	1251	C.G Amber, Bury StEd	I	0.76	A,E,H,I
585	R Solway	B	2.00	A	1260	Brunel CG, Bristol	I	1.60	F*
603	Capital G, Lut:brne	I	0.10	A,E,H,I,J	1260	SabrasSnd, Leicester	I	0.29	F*,H,J
630	R Bedfordshire(3CR)	B	0.20	E,H,I,J	1260	R York	B	0.50	A
630	R Cornwall	B	2.00	A	1278	Cl Gold 1278 W.York	I	0.43	A,F*,H
657	R Clwyd	B	2.00	A,E,G,H,I	1296	Radio XL, Birmingham	I	5.00	A,E,H,J
657	R Cornwall	B	0.50	A	1305	Magic AM, Barnsley	I	0.15	A
666	Cl Gold 666, Exeter	I	0.34	A,B,C,D,E,H,J	1305	Premier via ?	I	0.50	E,H,J
666	R York	B	0.80	A,D,E,H	1323	Capital G, Southwick	I	0.50	E,I*
729	BBC Essex	B	0.20	E,G,H,I,J	1323	SomersetSnd, Bristol	B	0.63	A,C
738	Hereford/Worcester	B	0.037	A,E,H,I,J	1332	Premier, Battersea	I	1.00	E
756	R Cumbria	B	1.00	A,H	1332	Cl Gold 1332, Pt'bo	I	0.60	A,H,J
756	The Magic 756, Powys	I	0.63	A,E,H,J	1359	Breeze, Chelmsford	I	0.28	E
765	BBC Essex	B	0.50	D,E,H	1359	Cl Gold 1359, C'try	I	0.27	E,H
774	R Kent	B	0.70	E,H,I,J	1359	R Solent	B	0.85	C
774	R Leeds	B	0.50	E	1368	R.Lincolnshire	B	2.00	E,H,J
774	Cl Gold 774, Glos	I	0.14	E	1368	Southern Counties R	B	0.50	D*,E,I
792	Cl Gold 792, Bedford	I	0.27	D,E,H,I,J	1368	Wiltshire Sound	B	0.10	E
792	R Foyle	B	1.00	A	1377	Asian Sd, Rochdale	I	0.10	A,E*
801	R.Devon & Dorset	B	2.00	A,C,E	1413	R.Gloucester via ?	B	?	H,J
828	Cl Gold 828, Luton	I	0.20	D,E,H,I,J	1413	Premier via ?	I	0.50	E,H
828	Magic 828, Leeds	I	0.12	A	1413	Fresh AM, Skipton	I	0.10	A,H
828	2CR CG, Bourne-mouth	I	0.27	C	1431	Breeze, Southend	I	0.35	E,H,I
837	R Cumbria/Furness	B	1.50	A	1431	Cl.Gold, Reading	I	0.14	E,J
837	Asian Netwk Leics	B	0.45	E,H,I,J	1449	R.Peterboro/Cambs	B	0.15	A,E,H,J
855	R Devon & Dorset	B	1.00	C	1458	R.Cumbria	B	0.50	A
855	R Lancashire	B	1.50	A,H	1458	R.Devon & Dorset	B	2.00	A
855	R Norfolk, Postwick	B	1.50	D,E,H,I	1458	1458 Lite AM Manch'	I	5.00	G*
855	Sunshine 855,Ludlow	I	0.15	D,E,J	1458	Sunrise, London	I	50.00	D,E,H,J
873	R Norfolk, W.Lynn	B	0.30	D,E,H,I,J	1458	Asian Netwk Langley	B	5.00	H
936	Brunel CG, W.Wilts	I	0.18	E,H,J	1476	CountySnd, Guildford	I	0.50	B*,E,I,J
936	Fresh AM, Hawes	I	1.00	A,E	1485	Cl Gold, Newbury	I	1.00	E,J
945	Cl Gold GEM, Derby	I	0.20	A,E,H	1485	R.Humberside (Hull)	B	1.00	H
945	Capital G, Bexhill	I	0.75	C,E,I	1485	R.Merseyside	B	1.20	A,G
954	Cl Gold 954 via ?	I	?	158,H	1485	Southern Counties R	B	1.00	C,E,J
954	Cl Gold 954, Torquay	I	0.32	C,E	1503	R.Stoke-on-Trent	B	1.00	A,D*,E,H,I*
954	Cl Gold 954, H'ford	I	0.16	E,J	1521	Breeze, Reigate	I	0.64	E,H,I
963	Asian Sd, E.Lancs	I	0.80	A	1530	R.Essex, Southend	B	0.15	E,H,I
963	Liberty R, Hackney	I	1.00	D,E,H,J	1530	Cl Gold W.Yorks	I	0.74	A,H
972	Liberty R, Southall	I	1.00	D,E,H,J	1530	Cl Gold Worcester	I	0.52	J
990	R Devon, E. Devon	B	1.00	A,C,E	1548	R Bristol	B	5.00	C
990	Magic AM, Doncaster	I	0.25	H	1548	Capital G, London	I	97.50	A,E,H
990	Cl G, Wolverhampton	I	0.09	E,H,J	1548	Forth AM, Edinburgh	I	2.20	E
999	C.Gold GEM Nott'ham	I	0.25	E,H,J	1557	R Lancashire	B	0.25	A
999	Magic 9-99 P'stn	I	0.80	A	1557	Cl.Gold 87,N.hant	I	0.76	E,H,I,J
999	R Solent	B	1.00	E,I	1557	Capital G, Sol'ton	I	0.50	E
1017	Cl G, Shrewsbury	I	0.70	A,E,F*,H,I	1584	London Turkish R	I	0.20	E,H
1026	R Cambridgeshire	B	0.50	D,E,H,I,J	1584	R Nottingham	B	1.00	D*,E,H
1026	Downtown R, Belfast	I	1.70	A,G	1584	R Shropshire	B	0.50	A,E
1026	R Jersey	B	1.00	A,C,E	1584	Tay, Perth	I	0.21	E
1035	RTL Country 1035	I	1.00	E,H,J	1602	R Kent	B	0.25	E,H,I
1035	N.Sound 2, Aberdeen	I	0.78	A,E*					
1116	R Derby	B	1.20	A,E,H,J					
1116	R Guernsey	B	0.50	C,E					
1152	Cl G Amber, Norwich	I	0.83	H					
1152	LBC 1152 AM	I	23.50	D,E,H					
1152	Pic'ly 1152, Manch'r	I	1.50	A					
1152	Cl G, Birmingham	I	3.00	J					
1161	R Bedfordshire(3CR)	B	0.10	E,H,I,J					
1161	Brunel Cl G, Swindon	I	0.16	E					
1161	Magic AM, Humberside	I	0.35	A					
1161	Southern Counties R	B	1.00	C,E					
1170	Cl G Amber, Ipswich	I	0.28	H,I					
1170	Magic 1170, Stockton	I	0.32	A					
1170	Capital G, Ports'm'th	I	0.50	E					
1170	Signal 2, Stoke-on-T	I	0.20	A					

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

Listeners:-

- (A) Robert Connolly, Kilkeel.
- (B) Simon Hockenhuil, E.Bristol.
- (C) Simon Hockenhuil, while in Coverack, Cornwall.
- (D) Sheila Hughes, Morden.
- (E) Brian Keyte, Bookham.
- (F) Eddie McKeown, Newry.
- (G) Tom Smyth, Co.Fermanagh.
- (H) Marie Strong, Ramsey, Cambs.
- (I) Phil Townsend, E.London
- (J) Fred Wilmshurst, Northampton.





**£89.95**

**LOG PERIODIC MLP32**  
 Freq. Range 100-1300MHz  
 Length 1420mm Wide Band 16 Element directional beam which gives a maximum of 11-13Db Gain Forward and 15Db Gain Front to Back Ratio. Complete with mounting hardware.

*(The Ultimate Receiving Antenna - a must for the Dedicated Listener.)*

**LOG PERIODIC MLP62**

Freq. Range Receive 7 transmit  
 50-1300MHz Length 2085mm  
 Wide Band 16 Element directional beam which gives a maximum of 12-14Db Gain Forward and 17Db Gain Front to Back Ratio. Complete with mounting hardware.

**£169.95**

**£49.95**



**ROTATOR AR-300XL**

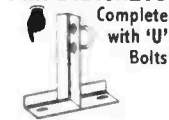
- \* Rotation Torque-222Kg
  - \* Vertical Load-45Kg
  - \* Mast Size - 28-44mm
  - \* Control Box-230v AC
  - \* Cable-3 core
  - \* Direct Compass Bearings
- (Ideal for Light to Medium Beams, i.e. LOG PERIODIC above.)*

**6" STAND OFF BRACKET**  
 Complete with 'U' Bolts



**£6.00**

**T&K BRACKETS**  
 Complete with 'U' Bolts



**5' SWAGED POLES**

- Heavy Duty Ali (1.2mm wall)
- SINGLE 1 1/4"..... £6.00
- SET OF FOUR 1 1/4"..... £19.95
- SINGLE 1 1/2"..... £9.00
- SET OF FOUR 1 1/2"..... £29.95

**CONNECTORS**

- PL259/9..... 0.75 each
- PL259/6..... 0.75 each
- PL259/7 for mini 8 1.00 each
- BNC (Screw Type) 8 1.00 each
- BNC (Solder Type) 8 1.00 each
- N TYPE for M58 .....2.50 each
- N TYPE for RF213 .....2.50 each
- SO239 to BNC .....1.50 each
- PL259 to BNC .....2.00 each
- N TYPE to SO239 .....3.00 each

**CABLE**

- RG213 MILITARY 0.85 per mtr.
- MINI RF8 ..... 0.85 per mtr.
- RG58 STANDARD 0.35 per mtr.
- RG58 MILITARY 0.60 per mtr.

**MICRO MAG MTS42**

Freq. Range  
 25-2.1 GHz  
 Length  
 225 mm

**TURNSTILE 137**

Freq. 137.5 MHz  
 Length 1000mm

This Antenna is designed for external use to receive weather satellite signals.

Complete with mounting hardware.

**£39.95**

*(Simple and easy to install a must for the enthusiast who has it all.)*

**£29.95**

**SUPER SCANAIR BASE (Airband)**

(Stainless Steel)  
 Freq. Range Receive  
 117-140MHz  
 Transmit  
 117-140MHz  
 Length 825mm  
 Connector-N TYPE

This is a transmitting & receiving antenna designed for the aircraft frequency range. *(For the control tower & aircraft listener.)*

**SUPER SCAN STICK**

Freq. Range 0-2000MHz  
 Length 1000mm

It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. *(Ideal for the New Beginner and the Experienced Listener alike.)*

**£49.95**

**SUPER SCAN STICK II**

Freq. Range 0-2000 MHz.  
 Length 1500mm.

This is designed for external use. It will receive all frequencies at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. *(For the expert who wants that extra sensitivity)*

**MULTISCAN STICK**

Freq. Range Receive - 0-2000 MHz.

Transmit  
 144 - 146 MHz gain 2.5 DBd  
 430 - 440 MHz gain 4.5 DBd  
 Length 1000 mm.

Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike. Comes complete with mounting hardware and brackets. *(Ideal for the amateurs ham radio - user.)*

**£89.95**

**IVX 2000**

Freq. Range Receive - 0-2000 MHz.

Transmit  
 50 - 52 MHz gain 2.00DBd  
 144 - 146 MHz gain 4.00 DBh  
 430 - 440 MHz gain 6.00 DBd  
 Length 2.5 m.

For external use, but at a pinch can be used in the loft. It has been finely tuned to make this Antenna the best there is. It has stainless steel radials and hardware. **(THE BEST)**

**MWA-H.F. WIRE ANTENNA**

Freq. Range 1.1-30MHz Adjustable Length up to 60 Metres  
 Internal or external use. The long wire is known to be one of the best antennas for shortwave (HF) receiving. Comes complete with con box and dog bones, wire etc. *(A must for the short wave listener.)*

**£29.95**

**SWP 2000 FREQ. 25 - 2000 MHz. Length 515mm.**

Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. *(Good for the car user who doesn't want an external antenna.)*

**£29.95**

**SWP HF30**  
 Freq. Range 0.05-30MHz Length 770mm

Although small, surprisingly sensitive for the H.F. user. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. *(Good for the car user who doesn't want an external antenna.)*

**£39.95**

**TRI SCAN III**

Freq. Range 25-2000MHz  
 Length 720mm

Desk Top Antenna for indoor use with triple vertical loaded coils. The tripod legs are helically wound so as to give it its own unique ground plane. Complete with 5mts of low loss coax and BNC plug. *(Ideal for Desk Top Use.)*

**£34.95**

**ROYAL DISCONE 2000**

(Stainless Steel)  
 Freq. Range Receive 25-2000MHz  
 Transmit 50-52MHz

144-146MHz  
 430-440MHz  
 900-986MHz  
 1240-1325MHz  
 Length 1540mm  
 Connector-N TYPE

The Ultimate Discone Design. 4.5DB GAIN OVER STANDARD DISCONE!

Highly sensitive, with an amazing range of transmitting frequencies. comes complete with mounting hardware & brackets *(The Best There is).*

**£49.95**

**G. SCAN II**

Freq. Range 25-2000 MHz. Length 620 mm.  
 Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. *(Good for when you are driving about)*

**£19.95**

**HF DISCONE**

Freq. Range 0.05-2000MHz  
 Length 1840mm

Internal or External use (A Tri-Plane Antenna). Same as the Super Discone but with enhanced HF capabilities, comes complete with mounting hardware and brackets. *(Ideal for the Short Wave H.F. Listener.)*

**£49.95**

**SUPER DISCONE**

Freq. Range 25-2000MHz  
 Length 1380mm

Internal or External use (A Tri-Plane Antenna). The angle of the ground planes are specially designed to give maximum receiving performance within the discone design. The Super Discone gives up to 3DB Gain over a standard conventional discone. Comes complete with mounting hardware and brackets. *(Ideal for the Experienced Enthusiast.)*

**£39.95**

**DISCONE**

Freq. Range 70-700MHz  
 Length 920mm

Internal or External use. (Classic Antenna Design. Comes complete with mounting hardware and brackets. *(Ideal for the Beginner.)*

**£29.95**





Newry; R.Australia via Shepparton **11.660** (Various to Asia 1430-1700) 45554 at 1455 in Walsend.

During the evening the BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0700-1900) was 53443 at 1830 in Liverpool; R.Damascus, Syria **12.085** (Ger, Fr, Eng to Eur 1805-2105) 55444 at 1932 in Northampton; VOA via Philippines **11.870** (Eng to Asia, Pacific 1900-2000) 32333 at 1945 in Kilkeel; R.Nac da Amazonia, Brazil **11.780** (Port 0900-0200) 54434 at 2006 in Guildford; R.Nederlands via Madagascar **11.655** (Eng to Africa 1730-2025) 44333 at 2013 in Oxted; R.Australia via Shepparton **11.880** (Eng to Pacific areas, N.America 1700-2200) 32223 at 2020 in Stalbridge; WCCR Nashville, USA **12.160** (Eng to N.America, Eur 1400?-2200) 44444 at 2030 in Morden; R.Kuwait via Kabd **11.990** (Eng 1800-2100 to Eur, N.America) 33333 at 2045 in Nottingham.

Later, AIR via Bangalore **11.620** (Eng, Hin to Eur 1745-2230) was 45444 at 2103 in Freshwater Bay, IoW; BBC via Rampisham, UK **11.680** (Eng to Falkland Is 2130-2145, Tues & Fri) 34333 at 2130 in Woodhall Spa; BBC via Ascension Is **12.095** (Eng to S.America 7-0200) 25322 at 2335 in E.Bristol.

Noted in the **9MHz (31m)** band before noon were HCJB Quito, Ecuador **9.780** (Eng to W.America 0500?-0900?), rated 44444 at 0745 in Plymouth; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 54544 at 0935 in Herstmonceux; R.Nederlands via Bonaire, Ned.Antilles **9.820** (Eng to Asia, Pacific 0930-1125) 44344 at 0940 in Freshwater Bay, IoW; TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0900?-0950?) 55354 at 0835 in Newry and 33333 at 0945 in Stalbridge; R.Nederlands via Wertachtal **9.855** (Eng to Eur 1130-1325) SIO 555 at 1130 in Co.Fermanagh.

After mid-day, Swiss R.Int via Julich, Germany **9.535** (Eng, Ger, Fr, It to SW.Eur 1100-1330) was 44243 at 1309 in Newry; V of Russia **9.480** (Eng to Eur 1700?-2100?) 43433 at 1709 in Woodhall Spa; Africa No.1, Gabon **9.580** (Fr to C.Africa 0500-2200) 33343 at 1931 in Storrington; VOA via Morocco? **9.760** (Eng to Eur, M.East, N.Africa 1700-2200?) 43343 at 1935 in Liverpool; China R.Int via ? **9.535** (Eng to Eur 2000-2100) 44444 at 2000 in Dudley; R.Nederlands via Flevo **9.895** (Eng to Africa 1830-2025) 44433 at 2014 in Oxted; RAI Rome, Italy **9.710** (Eng to E.Africa?, M.East? 2025-2045) 322222 at 2024 in Appleby; VOIRI Tehran, Iran **9.022** (Ger, Fr, Eng to Eur 1730-2030) 22222 at 2028 in

### Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Wurzburg (BR)	Germany	0.2	F*	1197	Virgin via ?	UK	?	C,F*,H,J*,L
531	Ain Beida	Algeria	600/300	I*	1206	Bordeaux	France	100	B*,C*
531	Torshavn	Faeroe Is.	100	E*	1215	Virgin via ?	UK	?	F*,H,J*,L
531	Berg	Germany	20	F*	1224	Lelystad	Holland	50	F*,I*
531	RNE5 via ?	Spain	?	D*,F*,J*,L	1224	COPE via ?	Spain	?	I*
531	Beromunster	Switzerland	500	A,D*,I,J,L	1233	Virgin via ?	UK	?	F*,J*,L
540	Wavre	Belgium	150/50	A,C,D,F*,I,J,L	1242	Marseille	France	150	B*,F*,I*
540	Sidi Bannour	Morocco	600	F*,J*	1242	Virgin via ?	UK	?	F*,I*
549	Les Trembles	Algeria	600	D*,F*,I*	1251	Mercali	Hungary	500	F*,I*
549	Sasnovy	Belarus	1000	I*	1251	Huisburg	Netherlands	10	F*,I*
549	Thunau (DLF)	Germany	200	F*,J*,J,L*	1250	Guildford (V)	UK	0.5	H
558	Espoo	Finland	50	I*	1269	Neumunster(DLF)	Germany	600	A*,F*,I*,J,L*
558	RNE5 via ?	Spain	?	F*	1269	COPE via ?	Spain	?	I*
567	Tullamore(RTE1)	Eire	500	C,D,E,I,J,H,L	1278	Dublin/Cork(RTE2)	Eire	10	E,F*,H,I*,J,L*
567	RNE5 via ?	Spain	?	D*	1287	RFE via ?	Czech Rep.	?	F*,I*,J,L*
576	Muhlacker(SDR)	Germany	500	A,D*,F*,I*	1287	Lerida(SER)	Spain	10	I*
576	Riga	Latvia	500	I*	1296	Valencia(COPE)	Spain	10	I*,J*
576	Barcelona(RNE5)	Spain	50	I*,J*	1296	Orfordness(BBC)	UK	500	F*,H,J*
585	Paris(FIP)	France	8	B*,D*,J,J	1305	RNE5 via ?	Spain	?	F*,I*
585	Madrid(RNE1)	Spain	200	B*,D*,F*,I*,J*,L*	1314	Kvitsov	Norway	1200	C*,F*,I*,J*,L*
585	Dumfries(BBCScot)	UK	2	D*,F*	1323	W'brunn (V.Russia)	Germany	1000/150	D,F*,G*,J,K*,L*
594	Frankfurt(HR)	Germany	1000/400	A*,D*,F*,I*,J*,L*	1332	Rome	Italy	300	F*,I*
594	Oujda-1	Morocco	100	D*	1341	Lisnagarvey(BBC)	N.Ireland	100	A,E,H,I*,J*,L*
594	Muge	Portugal	100	I*	1350	Cesvaine/Kuldiga	Latvia	500	I*
603	Lyon	France	300	B*,J*	1359	Madrid(RNE-FS)	Spain	600	I*,J*
603	Sevilla(RNE5)	Spain	50	I*	1368	Foxdale(Marx R)	Is of Man	20	D*,E,F,H
603	Newcastle(BBC)	UK	2	E,F*,H,I	1377	Lille	France	300	C,F*,J,J
612	Athlone(RTE2)	Eire	100	A,C,E,H,I*,J	1386	Bolshakovo	Russia	2500	D*,F*,J,L*
612	Sebaa Aioun	Morocco	300	I*	1395	Filake	Albania	1000	I*
612	Tallinn	Estonia	100	I*	1395	TWR via Filake	Albania	500	F*
621	Wavre	Belgium	80	A,C,F*,J,L*	1395	Logic	Netherlands	120/40	I*,J,L*
621	RNE1 via ?	Spain	10	I*	1404	Brest	France	20	F*,I*,J,L*
630	Vigre	Norway	100	F*	1413	RNE5 via ?	Spain	?	I*
630	Tunis-Djedeida	Tunisia	600	F*,J*	1422	Heusweiler(DLF)	Germany	1200/600	F*,I,J,L*
639	Praha(Libice)	Czech	1500	F*,J*	1440	Mamachi(RTL)	Luxembourg	1200	A,F*,J*
639	RNE1 via ?	Spain	?	F*,J*,L	1440	Dammen	Saudi Arabia	1600	L*
648	RNE1 via ?	Spain	10	F*	1449	Redmoss(BBC)	UK	2	F*
648	Orfordness(BBC)	UK	500	A,E,F*,J,L*	1458	Filake	Albania	500	I*
657	Napoli	Italy	120	J	1467	Monte Carlo(TWR)	Monaco	1000/400	F*,J*,L
657	Madrid(RNE5)	Spain	20	F*,I*,L*	1476	Wien-Bismarberg	Austria	600	F*,I*,J
657	Wrexham(BBC Wales)	UK	2	E,F*,H,I	1485	SER via ?	Spain	?	I*,L*
666	Messkirch(Rohrd.SWF)	Germany	150	F*,J	1494	Clermont-Ferrand	France	20	F*,I*,J*
666	Situnai(R.Vilnius)	Lithuania	500	F*	1494	St.Petersburg	Russia	1200	B*,F*,J*,L*
666	Lisboa	Portugal	135	I*	1512	Wolvertem	Belgium	300	D*,F*,G*,J,L*
675	Lopik(R10 Gold)	Holland	120	A*,D,F*,J,L*	1521	Kosice(Cizartice)	Slovakia	600	F*,J*
684	Sevilla(RNE1)	Spain	500	F*,I*,J*,L*	1530	Vatican R	Italy	150/450	E,F*,J,L*
683	Tortosa(RNE1)	Spain	2	F*	1539	Mainflingen(ERF)	Germany	350/700	F*,J*,L*
683	Droitwich(BBC)	UK	150	I,L	1539	SER via ?	Spain	?	I*
683	Enniskillen(BBC)	UK	1	H	1575	Genova	Italy	50	F*,I*
702	Flensburg(NDR)	Germany	5	F*,I*	1575	SER via ?	Spain	5	F*,I*
702	Monte Carlo	Monaco	40	I*	1584	SER via ?	Spain	2	I*
702	Presov	Slovakia	200	I*	1583	Holtkirchen(VOA)	Germany	150	F*,I*,J*,L*
711	Rennes 1	France	300	A,B*,C,F*,J,L	1602	SER via ?	Spain	?	I*
711	Laayoune	Morocco	600	I*	1602	Vitoria(EI)	Spain	10	F*,J*,L*
720	Langenberg	Germany	200	I*	1611	Vatican R	Italy	15	E,F*,I*,J
720	Norte	Portugal	100	F*,H					
720	Lots Rd.Ldn(BBC4)	UK	0.5	E,H,I*					
729	Cork(RTE1)	Eire	10	B*,C,F*,H					
729	RNE1 via ?	Spain	?	D*,F*,J*,L*					
738	Paris	France	4	B*					
738	Barcelona(RNE1)	Spain	500	F*,I*,J*,L*					
747	Flevo(Hilv2)	Holland	400	A,F*,J*,L*					
756	Braunschweig(DLF)	Germany	800/200	F*,J*,J,L*					
756	Bilbao(EI)	Spain	5	I*,J*					
785	Sottens	Switzerland	500	B*,D*,F*,J,L*					
774	Enniskillen(BBC)	N.Ireland	1	F*,H					
774	RNE1 via ?	Spain	?	F*,I*,L*					
783	Leipzig(MDR)	Germany	100	A*,F*,I*,J,L*					
792	Limoges	France	300	B*,J					
792	Lingen(NDR)	Germany	5	F*					
792	Sevilla(SER)	Spain	20	J					
792	Londonderry(BBC)	UK	1	H					
801	Munchen-Ismaning	Germany	300	F*,I*,J					
801	RNE1 via ?	Spain	?	F*,I*					
810	Madrid(SER)	Spain	20	I*					
810	Westerglen(BBCScot)	UK	100	A,E,F*,H,J*,L*					
819	Batra	Egypt	450	I*					
819	Toulouse	France	50	F*,J*					
819	S.Sebastian(EI)	Spain	5	I*,J*					
828	Rotterdam	Holland	20	F*,J					
837	Nancy	France	200	B*,F*,H*,J					
837	COPE via ?	Spain	?	F*,I*					
846	Rome	Italy	1200	F*,J*,L*					
855	Berlin	Germany	100	F*					
855	RNE1 via ?	Spain	?	C,D,F*,I*,L*					
864	Santah	Egypt	500	F*,I*					
864	Paris	France	300	A,B*,D,F*,J					
864	St.Petersburg(TWR)	Russia	?	F*					
873	Frankfurt(AFN)	Germany	150	D*,E,F*,J,L*					
873	Zaragoza(SER)	Spain	20	D*					
873	Enniskillen(R.U.I)	UK	1	F*,H					
882	COPE via ?	Spain	?	I*					
882	Washford(BBCWales)	UK	100	C,E,F*,H,I*,J,L					
891	Algiers	Algeria	600/300	C*,F*,I*					
891	Huisburg	Netherlands	20	F*,L*					
900	Milan	Italy	600	F*,J*					
900	COPE via ?	Spain	?	I*					
909	Lisnagarvey(BBC5)	N.Ireland	10	H					
909	B'mans Pt(BBC5)	UK	140	I*,L					
918	Domzale	Slovenia	600/100	F*,J,L*					
918	Madrid(R.Int)	Spain	20	I*					
927	Wolvertem	Belgium	300	C,F*,J,L*					
936	Bremen	Germany	100	F*,L*					
936	RNE5 via ?	Spain	?	I*					
945	Toulouse	France	300	B*,I*					
954	Brno (Cro2)	Czech Rep.	200	I*					
954	Madrid(CI)	Spain	20	F*,J*					
963	Pori	Finland	600	F*,I*					
972	Hamburg(NDR)	Germany	300	F*,I*,L*					
981	Alger	Algeria	600/300	I*,J*,L*					
981	Megara	Greece	200	I*					
990	Berlin	Germany	300	F*,I*,J,L*					
990	R.Bilbao(SER)	Spain	10	I*					
990	Redmoss(BBC)	UK	1	F*,H*					
990	Twynn(BBC)	UK	1	E					
999	Madrid(COPE)	Spain	50	I*,J*,L*					
1008	SER via ?	Canaries/Spain?	?	I*					
1008	Flevo(Hilv-5)	Holland	400	F*,H,I*,J,L*					
1017	Rheinsender(SWF)	Germany	600	A*,F*,H,J*,L*					
1035	Milan	Italy	50	I*					
1044	Tbilisi	Georgia	100	I*					
1044	Dresden(MDR)	Germany	20	F*					
1044	S.Sebastian(SER)	Spain	10	I*					
1053	Talk R.UK via ?	UK	?	F*,H,I*,L					
1062	Kalundborg	Denmark	250	F*,J,L*					
1062	R.Uno via ?	Italy	?	F*,I*					
1071	Cairo	Egypt	100	I*					
1071	Bilbao(EI)	Spain	5	I*,L*					
1071	Talk Radio UK via ?	UK	?	F*,I*					
1080	SER via ?	Spain	?	F*,I*					
1089	Talk Radio UK via ?	UK	?	F*,H,I*,L					
1098	Nitra(Jarok)	Slovakia	1500	F*,L					
1107	RNE5 via ?	Spain	?	F*,I*					
1107	AFN via ?	Germany	10	F*,L*					
1107	RNE5 via ?	Spain	?	I*					
1107	Talk R.UK via ?	UK	?	C,F*,H,I*					
1116	Barri	Italy	150	I*					
1125	La Louviere	Belgium	20	I*,L*					
1125	Deanovec	Croatia	100	J					
1125	RNE5 via ?	Spain	?	F*,J*					
1125	Llandrindod Wells	UK	1	E,I*					
1134	Zadar(Croatian R)	Croatia	600/1200	F*,I*,J,L*					
1134	COPE via ?	Spain	2	F*,I*					
1143	AFN via ?	Germany	1	F*					
1143	COPE via ?	Spain	2	I*					
1179	SER via ?	Spain	?	I*					
1179	Solvesborg	Sweden	600	C*,F*,I*,J,L*					
1188	Kuurne	Belgium	5	F*,I*,J,L*					
1197	Munich(VOA)	Germany	300	F*					

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

Listeners:-</



## Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
4.860	AIR Delhi	India	1824	A,G,H,J,K	4.870	R Cotonou	Benin	0650	D
4.870	R Cotonou	Benin	0650	D	4.870	Voz del Upano	Ecuador	0010	A
4.870	Voz del Upano	Ecuador	0010	A	4.885	R.Clube do Para	Brazil	0258	F,K
4.885	R.Clube do Para	Brazil	0258	F,K	4.885	KBC East Sce Nairobi	Kenya	1805	G,J,K
4.885	KBC East Sce Nairobi	Kenya	1805	G,J,K	4.890	RFI Paris	via Gabon	0445	D,F,J,K
4.890	RFI Paris	via Gabon	0445	D,F,J,K	4.915	GBC-1, Accra	Ghana	1833	A,G,J,N
4.915	GBC-1, Accra	Ghana	1833	A,G,J,N	4.920	R.Quito, Quito	Ecuador	0515	E,J,K
4.920	R.Quito, Quito	Ecuador	0515	E,J,K	4.920	AIR Chennai	India	1632	K
4.920	AIR Chennai	India	1632	K	4.927	RRI Jambi	Indonesia	1647	K
4.927	RRI Jambi	Indonesia	1647	K	4.930	R.Internacional	Honduras	0307	F
4.930	R.Internacional	Honduras	0307	F	4.935	KBC Gen Sce Nairobi	Kenya	1807	G
4.935	KBC Gen Sce Nairobi	Kenya	1807	G	4.940	AIR Guwahati	India	1600	K
4.940	AIR Guwahati	India	1600	K	4.950	AIR Snnagar	India	1713	A,G,H,K
4.950	AIR Snnagar	India	1713	A,G,H,K	4.950	VDA via Sao Tome	Sao Tome	2030	E,F,I,J,K,N
4.950	VDA via Sao Tome	Sao Tome	2030	E,F,I,J,K,N	4.955	R Nac de Colombia	Colombia	0352	E,K
4.955	R Nac de Colombia	Colombia	0352	E,K	4.960	VDA via Sao Tome	Sao Tome	0521	E,F,J,K,M
4.960	VDA via Sao Tome	Sao Tome	0521	E,F,J,K,M	4.965	Christian Voice	Zambia	1828	G,J,K
4.965	Christian Voice	Zambia	1828	G,J,K	4.975	R.Uganda, Kampala	Uganda	1856	A,F,G,J,K,N
4.975	R.Uganda, Kampala	Uganda	1856	A,F,G,J,K,N	4.980	PBS Xinjiang, Urumqi	China	1615	A,K
4.980	PBS Xinjiang, Urumqi	China	1615	A,K	4.980	Ecos del Torbes	Venezuela	0332	A,F,J,K
4.980	Ecos del Torbes	Venezuela	0332	A,F,J,K	4.985	R Brazil Central	Brazil	0015	A,J
4.985	R Brazil Central	Brazil	0015	A,J	5.005	R.Nacional, Bata	Eq Guinea	1809	G
5.005	R.Nacional, Bata	Eq Guinea	1809	G	5.005	R Nepal, Kathmandu	Nepal	1625	K
5.005	R Nepal, Kathmandu	Nepal	1625	K	5.009	R TV Malagasy	Madagascar	1625	K
5.009	R TV Malagasy	Madagascar	1625	K	5.020	La V du Sahel, Niamey	Niger	1927	D,G,J,K,N
5.020	La V du Sahel, Niamey	Niger	1927	D,G,J,K,N	5.025	R.Parakou	Benin	1946	A,J
5.025	R.Parakou	Benin	1946	A,J	5.025	R Rebelde, Habana	Cuba	0331	A,D,F,J,K
5.025	R Rebelde, Habana	Cuba	0331	A,D,F,J,K	5.025	R Uganda, Kampala	Uganda	0434	F
5.025	R Uganda, Kampala	Uganda	0434	F	5.030	AWR Latin America	Costa Rica	0657	J
5.030	AWR Latin America	Costa Rica	0657	J	5.035	R Bangui	C.Africa	1920	A,J,N
5.035	R Bangui	C.Africa	1920	A,J,N	5.047	R Togo, Lome	Togo	1947	A,D,J,N
5.047	R Togo, Lome	Togo	1947	A,D,J,N	5.050	R.Tanzania	Tanzania	1859	G,J,K
5.050	R.Tanzania	Tanzania	1859	G,J,K	5.055	RFD Cayenne(Matoury)	French Guiana	0309	F,J
5.055	RFD Cayenne(Matoury)	French Guiana	0309	F,J	5.060	PBS Xinjiang, Urumqi	China	1620	A,K
5.060	PBS Xinjiang, Urumqi	China	1620	A,K	5.075	Caracol Bogota	Colombia	0025	A
5.075	Caracol Bogota	Colombia	0025	A	5.100	R.Liberia, Totota	Liberia	2050	G,J,K,N
5.100	R.Liberia, Totota	Liberia	2050	G,J,K,N					

- DXers:-  
 (A) Robert Connolly, Kilkeel.  
 (B) Bernard Curtis, Stalbridge.  
 (C) David Edwardson, Wallsend.  
 (D) David Hall, Morpeth.  
 (E) Sheila Hughes, Morden.  
 (F) Eddie McKeown, Newry.  
 (G) Fred Pallant, Storrington.  
 (H) John Parry, Larnaca, Cyprus.  
 (I) Clare Pinder, while in Appleby.  
 (J) Richard Reynolds, Guildford.  
 (K) John Slater, Scalloway.  
 (L) Tom Smyth, Co.Fermanagh.  
 (M) Phil Townsend, E.London.  
 (N) Fred Wilmshurst, Northampton.

Nottingham; R.Australia via Shepparton **9.500** (Eng to Asia 1430-2130) 44444 at 2040 in Truro; R.Nac del Paraguay **9.735** (Sp [Football] 0800-0400) 33553 at 2154 in Wallsend; RCI via Sackville **9.755** (Fr, Eng [CBC progs] to USA, Caribbean 2230-0400) 45433 at 2237 in Northampton; R.Nederlands via Bonaire, Ned.Antilles **9.845** (Eng to N.America 2330-0125) 24343 at 2332 in E.Bristol.

There are quite a few broadcasts to Europe in the **7MHz (41m)** band. Some originate from R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700), rated 44433 at 0630 in Herstmonceux; Adventist World Radio (AWR) via Forli, Italy **7.230** (Eng 0930-1000 Sun) 44333 at 0930 in Morden; R.Polonia (Polish R), Warsaw **7.285** (Eng 1800-1900) 44444 at 1813 in Woodhall Spa; Voice of Greece, Athens **7.475** (Eng 1900-1930) 44333 at 1900 in Newry; R.Norway Int **7.485** (Norw 2000-2030) 54445 at 2020 in Stalbridge; All India Radio (AIR) via Bangalore **7.410** (Hi, Eng 1745-2230) 33342 at 2047 in Oxted.

At least two stations in N.America have been reaching the UK in this band during the early morning, namely WJCR Upton, USA **7.490** (Eng to E.USA 24hrs) rated 33333 at 0625 in Morpeth; KTBN via Salt Lake City, USA **7.510** (Eng to N.America 0000?-1600?) SIO 222 at 0915 in Macclesfield.

Some of the many broadcasts to Europe in the **6MHz (49m)** band come from Deutsche Welle (DW) via Julich? **6.140** (Eng Service), rated SIO 444 at 0600 in Co.Fermanagh; R.Japan via Skelton, UK **5.975** (Eng 0600-0700) 55555 at 0630 in Herstmonceux; R.Nederlands via Julich **6.045** (Eng 1130-1325) 45343 at 1130 in Newry; V of Russia **5.965** (Eng 54445 at 2035 in Stalbridge; R.Canada Int via Skelton, UK **5.995** (Fr, Eng 2000-2200) 43444 at 2045 in Oxted; R.Sweden via Horby **6.065** (Eng 2030-2100) SIO 444 in E.Bristol; R.Budapest, Hungary **6.025** (Lang? 2100-2130) 54444 at 2100 in Appleby; R.Prague, Czech Rep. **5.930** (Eng 2100-2127) 21222 at 2102 in Nottingham; Vatican R, Italy **5.883** (Various

55544 at 2110 in Northampton; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 55444 at 2240 in Northampton. Good reception was noted by some listeners in the UK of R.Nederlands relay to N.America from Bonaire, Ned.Antilles on **6.165** (Eng 2330-0128, 0430-0525) - a typical rating being 44444 at 0005 in Kilkeel.

### LIST OF EQUIPMENT USED -

#### LM&S for \$November, #December'99, \*January 2000.

- \$ Darren Beasley, Bridgwater Yaesu FRG-100 + a.t.u. + 15m wire.
- \$\* Robert Beason, Nottingham, JRC NRD-545 + 14m wire or Grundig Yacht Boy 400.
- \$\* Vera Brindley, Woodhall Spa Roberts R867 or Sangean ATS-803A + r.w.
- \$\* Robert Connolly, Kilkeel JRC NRD-525 + Timewave DSP9+ filter + Datong AD370 or Sangean ATS-803A.
- \$\* Bernard Curtis, Stalbridge Realistic DX400 - loop or rod.
- \$\* David Edwardson, Wallsend Tno R-600 + 22m long trap dipole.
- \$\* Stan Evans, Herstmonceux Kenwood R-2000 + Balun + 11m wire in loft
- \$ Bill Giffith (W London), while near Paris Sony ICF-SW55 + 5m wire
- \$\* Gerald Guest, Dudley Roberts RC818 + r.w.
- \$\* David Hall, Morpeth ADR AR7030 + Global AT-2000 + 13m wire
- \$\* Tony Hall, Freshwater Bay, IoW Yaesu FRG-7 + 13m wire or RF.B45
- \$\* Francis Hearne, N Bristol Sharp WQT370 + r.w.
- \$\* Simon Hockenhill, E Bristol Roberts R617, R617, R876, ITT Colt
- \$\* Simon Hockenhill, while in Coverack, Cornwall Roberts R876
- \$\* Robert Hughes, Liverpool ADR AR7030 + 15m indoor wire or Drake R8E + RF Systems MTA on roof.
- \$\* Robert Hughes, while in Spain Grundig 305 portable
- \$\* Sheila Hughes, Morden Sony ICF-7600DS + loop or Panasonic DR48 + 16m invert L
- \$\* Rhoderick Illman, Dxted Kenwood R-5000 + r.w. or AN-1, Sony ICF-7600DS
- \$\* Brian Keyte, Gt Bookham ADR AR7030 - loop or a.t.u. + r.w.
- \$\* Brian Keyte, while at Rhue by Ullapool ADR AR7030 + top strand of roadside fence
- \$\* Conway Longworth-Dames, Brixham, Yaesu FRG-100 + r.w.
- \$\* Eddie McKeown, Newry Tatung TMR 7602 or Sangean ATS-818
- \$\* George Millmore, Wootton, IoW Rascal RA17L + vlf converter + loop or Sangean ATS-803A + loop.
- \$\* Fred Pallant, Storrington Tno R-2000 + Howes CTU8 a.t.u. + r.w.
- \$\* John Parry, Larnaca, Cyprus Realistic DX394 + r.w.
- \$\* Clare Pinder, while in Glasgow Sony ICF-SW55.
- \$\* Vic Prier, Colyton Rascal RA17L or RCA AR88LF or Redifon R551N + a.t.u. + r.w. or active vertical in loft.
- \$\* Philip Rimbaut, Macclesfield, ITT Mackay Marine Radiu 3031 + r.w.
- \$\* Richard Reynolds, Guildford Sangean ATS-803A + 10m T antenna via a.t.u. or 60m loaded dipole or 11m dipole - all in loft.
- \$\* Harry Richards, Barton-upon-Humber, Grundig Satellit 700 + AD270 or r.w. or Grundig Yacht Boy 400 or Matsui MR4099.
- \$\* Alan Roberts, Quebec, Canada Lowe HF-225 + 11m vertical dipole
- \$\* John Slater, Scalloway, Shetland Lowe HF-150 + a.t.u. + 20m wire
- \$\* Tom Smyth, Co.Fermanagh, Morphy Richards R191 or ATS-803A
- \$\* Ernie Strong, Ramsey (Cams) Yaesu FRG-8800 or AKD HF3 + 43m wire + Watson Balun.
- \$\* Norman Thompson, Dady Icom IC-R?? or Matsui MR4099 + 20m wire in loft.
- \$\* Phil Townsend, London Lowe HF-225 + preselector + r.w. or loop
- \$\* Martin Verner, St.Austell Matsui MR4099 or Yupiteru MVT-7100 + Global AT-1000 + 30m wire.
- \$\* Thomas Williams, Truro, Gundig Yacht Boy 206 or Sharp 5454 + r.w.
- \$\* Fred Wilmshurst, Northampton Icom IC-R70 + Global AT-1000 + r.w. in loft
- \$\* Tom Winzor, Plymouth, Kenwood R-2000 or Yaesu FRG-7 + Datong active antenna

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# Bandscan Europe

Radio in the UK received a shot in the arm in mid-November - it was a digital injection that ushered radio onto two new delivery platforms. On 12 November, Sky Digital launched a bouquet of radio services on its satellite system. The service carries all the BBC's national radio channels (including the long wave and f.m. variants of Radio 4), plus Classic FM, Virgin Radio and Talk Radio.

The following Monday, 15 November, the first national commercial DAB Digital Radio services launched, run by Digital One, a partnership of GWR Group (that runs Classic FM and a range of local commercial stations) and NTL, the giant cable and transmission company. Digital One also started two new radio services, Planet Rock and The Core.

Planet Rock is a 24 hour-a-day rock music station and The Core is aimed at young people with a chart-based music format. Both Planet Rock and The Core are also available on the Sky Digital platform. For more information about Digital One, check out the web site at: [www.digitalone.co.uk](http://www.digitalone.co.uk)

## Classic FM

Listening to Classic FM on the way home on the Digital One launch day, the station was taking calls from listeners who had heard the new digital transmissions, and all declared that the quality was superb. More than 300,000 people have taken up subscriptions to Sky Digital and can now listen to radio via the Sky platform.

This rather outweighs the terrestrial DAB receiver population where industry experts say that just 3,000 DAB Digital Radio receivers have been sold - mainly hi-fi tuners made by Cambridge-based Arcam at £799. Prices of DAB sets are expected to tumble next year and a DAB plug-in card for PCs is expected from another UK firm in the early part of 2000.

## Digital Revolution

The digital revolution is sweeping across Europe. Radio Vlaanderen Internationaal, the Belgium international radio station, has said that it is dropping analogue satellite in favour of digital. From 3 January, RVI's been on Astra digital and Astra analogue will end in March.

In Africa there's another digital change underway. WorldSpace, the US company that's built a digital radio satellite, launched services in late October. Signals from the *AfriStar* satellite in L-Band (1452-1492MHz) beam down from geostationary orbit to portable radio receivers.

The content is a mix of African stations (such as the Kenya Broadcasting Corporation) and international providers like Radio France Internationale and CNN. Quality is reported to be superb with penetration of the satellite signal even through roofs, which goes to demonstrate the power of the satellite.

WorldSpace is the only company in history to launch a brand new consumer electronics product in the developing world, and only in the future will we be able to judge if it's a success. It is believed that the total cost of developing WorldSpace's delivery system, which will have satellites above Asia and Latin America in the next 12 months, exceeds US\$1 billion. Can revenues from radio stations possibly cover that up-front cost and make a profit for the investors?

## Poor Reception

Quality of reception has been poor for some listeners to BBC Radio 4 in Scandinavia. They have been tuning to 198kHz long wave to hear the BBC, but now Poland is back on the air from Warsaw on that channel. The result is severe interference to listeners in southern

Sweden and northern Denmark.

Naturally, Radio 4 is not designed to be heard outside the UK, but nonetheless if you've enjoyed something for a long time and it's suddenly taken away, you are likely to complain. Polish Radio's engineers are reported to be looking into the situation.

## Back On Air

Remember good old 208? Radio Luxembourg's English service beamed into the UK for more than fifty years and was the first commercial broadcaster to be regularly heard in Britain. Now after an absence of a decade or so, 'Luxie' is due back on the air. The UK's Davric Productions is behind the plan, co-operating with CLT-UFA, the giant multimedia group that owns the Radio Luxembourg transmitters across the English Channel in the Grand Duchy.

Eric Wiltsher, the chief executive of Davric Productions, says "We look forward to working closely with CLT-UFA to ensure that the return of Radio Luxembourg offers a style and sound that is 100 per cent 'Radio Luxembourg'. Audiences across Europe will once again be able to enjoy a unique blend of music, from golden oldies to the latest releases, done the Luxembourg way."

As this edition of *SWM* goes to press, the 208m frequency continues to carry one of RTL's German-language pop music stations. But keep your radio tuned to 1440kHz to catch the return of Radio Luxembourg.

## Irish Scene

The Irish radio scene is as interesting today as it always has been. Driving through Dublin a couple of weeks ago, I tuned the radio and was amazed to hear an enormous range of stations on the f.m. band. It turned out that most are pirates, yet each has a good audience and most transmit RDS station name identification to make finding them easier!

Now the Irish Independent Radio and Television Commission has awarded licences to four new official radio stations: Spin FM, Lite FM, News Talk 106 FM and Raidio na Life, an Irish-language station. I asked some colleagues in the media in Dublin whether they thought that the pirates would be scaled down now that there's to be more legitimate choice in the city. The answer was a resounding **no**, so Dublin will continue to be a hot bed of pirate radio activity for a good while to come.

## Internet Access

More than five million UK homes now have access to the Internet according to a survey undertaken by Continental Research reported in late November. The Internet revolution is also convincing people to stay up later in front of their computer screens as opposed to the television. Maybe this is because there is so much radio available on the World Wide Web.

Check out [www.broadcast.com](http://www.broadcast.com) to get radio on demand from the BBC and a variety of other stations. Look at the web sites of every major European international broadcaster to listen to programmes in English and a wide range of other languages whenever you want them. There is no fading and distortion (although there may well be congestion on the Internet that makes the audio stop and start from time to time!).

Remember, though, that listening to the radio via the Internet is expensive, as you have to remain logged on via your modem for the whole time that you're listening.



## Final Chance

There's a final chance to listen to Austria's domestic English-language station, Blue Danube Radio. BDR is to close in February, with a youth station replacing the English station that was originally set up to serve the English-speaking community in Vienna, home to a range of international organisations. You can listen to BDR via the Internet - check out <http://www.via.at/fobdr/>

Some stations start, others close - radio reflecting the cycle of human life. With that, until the next roundup of broadcasting news from Europe and Africa, good listening!

## Web Watch

Listen to BDR via the Internet at <http://www.via.at/fobdr/>

Check out [www.broadcast.com](http://www.broadcast.com) to get radio on demand from the BBC and a variety of other stations.

Digital One's web site is at: [www.digitalone.co.uk](http://www.digitalone.co.uk)

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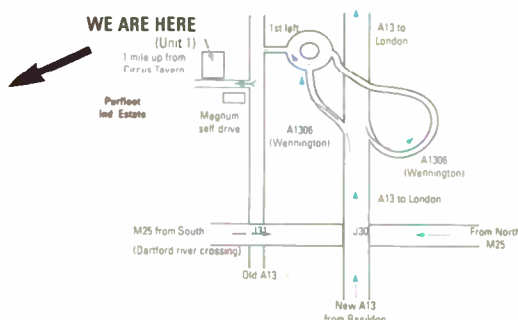
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# All You Need To Know To I

In this 'DXTV Special' Keith Hamer and Garry Smith will be taking an in-depth look at the art of long-distance television reception, DXTV for short.

## Introduction

As we begin the new Millennium, perhaps this is an appropriate time for radio enthusiasts to consider looking at another radio-related hobby which is very rewarding and challenging and, at the same time, reasonably inexpensive to start.

In this special edition of *SWM* we will be taking an in-depth look at the art of long-distance television reception, or 'DXTV' for short. Receiving signals which are not

normally available has always held a fascination for many people interested in radio. Whether the interest lies in the reception of amateur or broadcast signals depends upon the individual's taste.

The collection of QSL cards is perhaps an added fascination. For many decades, long-distance TV reception (DXTV) has been part of the DXing culture, although satellite reception has offered a diversion for those enthusiasts simply wishing to peruse the test cards and graphics on offer.

# Propagation

"Under normal reception conditions, a typical main transmitter can be received reliably up to a distance of about 80km"

Propagation is a common factor to any type of DXing. Under normal reception conditions, a typical main transmitter can be received reliably up to a distance of approximately 80km, depending on certain aspects such as the local terrain. Beyond this distance, reception can be regarded as a bonus with weather conditions having some influence on the behaviour of the signals.

Viewers living in coastal areas such as East Kent will know only too well how volatile reception conditions are with signal levels fluctuating almost constantly! Needless to say, such an area is a haven for picking up TV and f.m. broadcasts from countries such as France, Belgium and the Netherlands with virtually no effort required whatsoever. Strictly speaking, this cannot be regarded as true 'DXing' but the reception of Rumanian TV or f.m. signals would be considered an achievement!

There are various types of propagation which allow signals to be received over vast distances, all with different characteristics.

## Tropospheric Propagation

This type of propagation will normally be encountered by accident. Noticing 'Venetian-blind' effects over the pictures, or heavy snow (caused by digital broadcasts encroaching on the same frequency) may tempt the viewer into fiddling with the TV tuning. Signals which are not normally visible may then be discovered, sometimes matching the strength and quality of local programmes. During intense tropospheric lifts, Continental stations may be unearthed using the existing domestic receiving antenna.

Tropospheric lift conditions provide a more stable type of

propagation, mainly affecting the f.m. band and above, although reception below 50MHz does occasionally occur. A skip-distance is not involved as with other types of propagation, so the enhancement of semi-local signals and transmissions up to a distance of 400km usually occurs. This distance can be vastly extended during very intense lifts.

A tropospheric lift is caused by temperature inversions which can occur when there is an anticyclone (also referred to as a high-pressure system). Examining the TV weather charts for anticyclones will give some idea as to whether lift conditions are a possibility. Foggy weather is also a good sign that the correct weather conditions are present.

Tropospheric reception can occur at any time during the year and tends to be at its best during the evening and early morning with conditions reverting to normal throughout the day. However, some of the 'super' lifts experienced over the years, usually around October and November, have provided daytime activity. Such intense lifts have lasted for over a week.

## Ducting

Distant signals may be received without the closer transmissions being present. This 'ducting' effect often occurs towards the end of a 'super' opening. Very often the signals will rapidly vanish and the opening is over.

## Sporadic-E Propagation

This is perhaps one of the most spectacular and mysterious forms of propagation with a charm all of its own.

As most readers will know, short wave radio communication is possible due to reflections within the various layers of the Earth's ionosphere, including the 'E' layer situated at approximately 120km above the surface of the Earth. Although it is capable of reflecting short wave signals, it is normally transparent to television transmissions, these subsequently being lost forever in space.

During the summer months, ionised gas layers form within the E-layer and if the electron density is sufficiently high, TV and f.m. radio signals within Bands I and II (approximately 40-100MHz) will be reflected, or more accurately, refracted back







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## NRD545

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## Icom PCR100 & PCR1000



### Icom PCR100 & PCR1000

For those of you that like to combine scanning and computing, these two Icom receivers are for you!

The PCR100 offers 100kHz to 1300MHz with AM, FM and WFM reception, it covers all popular broadcast and communications channels, including TV sound. There is a choice of operating screens

including a multi-function control panel, with bandscope, memory list and scan controller screens just some of the options. There are multiple scanning functions too as you would expect and the software can store multiple files of 1000 memory channels giving unlimited choice

The original PCR1000 offers a similar specification but adds SSB reception and IF shift so is able to monitor the many utility stations to be found in the short-wave bands. An option DSP processor can also be added for improved performance.

Prices from **£199.00** for PCR-100 & from **£349.00** for PCR-1000.



## ICOM IC-R2



The Icom IC-R2 is the lowest priced full coverage scanner available today. It's also tiny but don't let that fool you! There's frequency coverage from 495kHz right up to 1309.995MHz with no gaps, 400 memories, clear back-lit display and it even includes a CTCSS tone scan.

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GPS receivers from **£149.00**

## Icom R75E



Icom's latest receiver combines analogue

and digital technology to bring you a receiver with excellent performance at an excellent price. With expanded frequency coverage from 30kHz right up to 60MHz it will truly expand your listening horizons.

On the technical side, it features a high stability receiver circuit and better than 100dB dynamic range. Synchronous AM detection, twin passband tuning and optional IF filters help to reduce distortion and interference and at the audio stages, an optional Digital Signal Processor unit adds noise reduction and notch filtering. Operation is easy with several tuning step sizes and direct frequency entry complementing the tuning dial and FM is provided as standard. For those who need them, there are 101 memory channels that can also be named and optional computer control will extend many of the functions. The May 99 Short Wave Mag said it all - "little I could not resolve, even in poor conditions" ... "remarkably easy to programme" ... "I can't praise it too highly" ... Need we say more?  
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## AOR AR5000

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World Radio History

...continued from page 25

with fancy, tastefully coloured, on-screen menus which, in the absence of a stable signal, become virtually unreadable due to the missing line syncs. Some are so complex that they defy all logic and then when you have spent twenty minutes or so entering the various data and pressing buttons in a complicated sequence, the receiver refuses to store the signal and the channel is lost!

Many designs display a bright blue screen in the absence of a signal, or when its level dips below a certain threshold. Avoid these unless there is some easy method of disabling the video muting. Many receivers of this type refuse to acknowledge weak signals and since there is a delay factor associated with the muting, these receivers would hardly be of use with Meteor-Shower work.

Beware of receivers with a one-way tuning search. It goes without saying that if you happen to miss the required channel you will have to wait until the receiver reaches the top end of the band before it commences its ascent once more. Ensure that the receiver has enough memory. If it can memorise a maximum of only 16 channels then you could run into problems later.

### System Switching

Some designs automatically switch standards once an incoming signal is detected. This is a wonderful innovation for the completely non-technical DXer whose main aim is a picture without the fuss. However, for the dedicated enthusiast, it can actually impede chances of signal identification because it is not easy to readily discriminate between different TV standards. Some receivers have a simple slide-switch for system selection.

### Scanners

If a scanner is at hand covering v.h.f. and u.h.f. TV frequencies then this may be used to recoup the sound channel if the TV receiver only resolves the UK sound system. Sporadic-E propagation can be frequency-selective so sometimes a situation occurs where the best sound channel accompanies the worst video signal. Using a scanner, the best sound can be matched to the best video. At times it is extremely difficult to resolve sound on the lower Band I channels E2 and R1 via Sporadic-E propagation.

A scanner can be used to measure exactly the frequency offset of a particular channel. By referring to published lists the exact transmitter can often be identified.

Some scanners feature a video output but reports suggest that this type of receiver tends to be a little on the insensitive side.

### Computer TV Boards

This could be one solution to the problem of obtaining v.h.f. facilities and could also have the advantage of allowing snippets of reception to be stored on disk.

### External Converters

Until recently, a customised external tuning system, known as the D-100, was available. This featured r.f. outputs to feed a normal u.h.f. TV receiver and f.m. radio. The idea was to marry the sound to the picture, or use each function separately, i.e. watch a vision carrier but listen to radio links or Eastern European f.m. radio stations. The system featured progressive

i.f. bandwidth reduction which provided superior selectivity and weak-signal enhancement compared with normal TV receivers.

### Modifying Equipment

Years ago, modifying an existing TV set would have provided a custom-built DXing system, but high voltages and a 'live' chassis should not be the playground for those with only limited technical knowledge.

In this present age of the disposable video recorder, use could be made of the tuner/i.f. strip arrangement, once a suitable v.h.f. tuner has been added. Be prepared to experiment a little as you may need to get involved with providing band-switching and perhaps a separate potentiometer for v.h.f. tuning.

The output of the i.f. strip may then be viewed via the r.f. modulator using a normal TV set. Video recorders are generally safe regarding voltage levels and do not have a 'live' chassis but do not get involved unless you have the necessary technical skills and the service manual handy. One slip of the screwdriver might ensure a glorious pyrotechnic display from the power-supply department!

Scrapped video recorders seldom have i.f. or tuner faults; mechanical problems with worn-out decks are usually the reason for their demise. If you can repair the mechanical problems then you have the bonus of being able to record the DX reception.

Incidentally, modifications of any description will inevitably invalidate any guarantees. Never modify a hired machine - the rental company will go crackers!

### Sound Modifications

Some modification is necessary to the equipment if the sound channel is to be resolved. This will involve realigning the intercarrier sound stage from the British 6.0MHz spacing to either 5.5MHz for Western Europe or 6.5MHz for Eastern European countries.

In modern sound i.f. strips a ceramic filter will be found in place of the quadrature detector coil. This will need to be changed to suit the new sound frequency. Another ceramic filter may be fitted at the input of the sound i.f. amplifier. This will also need to be replaced.

### FM Receivers

With RDS receivers becoming commonplace, identifying the source of transmission is relatively simple, provided you have access to station lists. The days of hoping the signal would not fade before hearing some form of station identification are now a thing of the past.

Some f.m. receivers are available with switched selectivity which means that very weak signals can be lifted above the noise without interference from strong stations on adjacent frequencies.



Fig. 3: Using a spectrum analyser is an elegant, but very expensive, way of receiving signals!



Fig. 4: An Orion colour portable equipped with v.h.f. and u.h.f. TV facilities plus a radio tuner.



Fig. 5: A DXTV alarm which emits a warning tone when a signal is encountered.



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# Collecting The Signals

## Band I Antennas

Since Sporadic-E signals arrive at an angle, antenna height is not critical but five or six metres above the ground is considered to be the recommended minimum. Sporadic-E reception is frequently very strong. This means that the humble dipole can be initially pressed into service until the urge for a more ambitious antenna takes over. In some cases, the rod antenna of a portable TV receiver is sufficient; so is a length of wire connected to the inner of the antenna input socket!

Most high-power transmitters favour horizontal polarisation in which the receiving antenna has to be mounted horizontally or 'flat'. Consequently it is recommended that the dipole should be so positioned.

Occasionally, a polarisation change takes place en-route and signals which started out in life as horizontally polarised arrive at the receiving site as vertical ones. Surprisingly, many enthusiasts rely solely on an array mounted horizontally, but an additional vertically-mounted dipole could prove advantageous when polarisation changes do occur.

A dipole mounted vertically will respond to vertically polarised signals arriving from all directions but with a horizontally-mounted dipole, maximum signal pick-up occurs when it faces the transmitter. With any horizontally-mounted antenna, some method of rotating it is essential in order to obtain the best reception.

## Larger Systems

Band I arrays of three or more elements are quite common as they provide gain and improved directivity when compared with a dipole. Band I antennas with elements in excess of five are seldom encountered because of their size. Having said that, a visit to Tenerife will reveal domestic Band I antennas featuring up to eight elements!

A design for a rather ambitious home-made Band I antenna used by a DXTV enthusiast in Hungary is shown in this article. This type of antenna is recommended if you wish to annoy your neighbours!

## Loft Systems

Not every DXer has the space to erect an outdoor Band I array and often has to resort to a loft installation. The rear reflector of a Band I array is approximately 3m in total length, which may prove difficult to rotate in a confined space. Some DXers rely on two dipoles mounted at right-angles to provide reasonable all-round coverage. The dipoles can be phased together to form a search array, or switched to select a particular direction.

One type of antenna which has been used successfully by enthusiasts for Band I reception is the discone. This particular antenna covers 50-500MHz and is primarily intended for v.h.f. scanner applications.

The antenna should be mounted away from obvious interference sources such as computers and

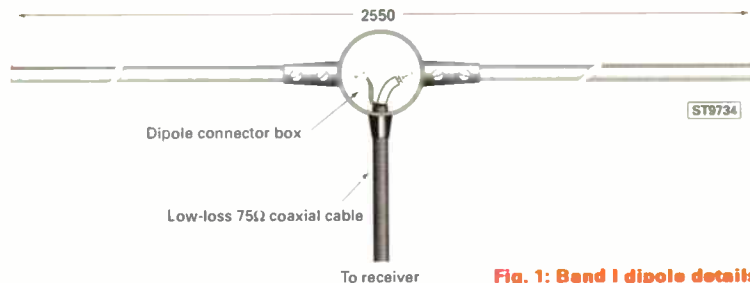


Fig. 1: Band I dipole details.

badly designed TV receivers which radiate interference at v.h.f.

## Loop Antennas

Some enthusiasts have reported good results from hand-held loop antennas. One design is based on a half-wave dipole shaped to form a quadrant. The ends of the loop are not connected. Nulls can be exploited to provide co-channel interference rejection.

A tuneable loop antenna installed indoors has been used successfully over a number of years by at least one experienced DXer. The performance of the antenna can be peaked on any particular Band I frequency. The main drawback is that it cannot be used to supply several receivers tuned to different frequencies.

## FM Antennas

For Sporadic-E reception a dipole will suffice. Multi-element arrays are commercially available for enthusiasts wishing to exploit this band to the full.

## Band III Antennas

In recent years, p.m.r. has encroached to such an extent that unless you live in a 'quiet' area, the reception of Band III signals can be difficult, even though there is a 1MHz 'guard' to protect European channels from interference. Although arrays with 13 or more elements are available, many DXers opt for something more comfortable in size such as a six-element or even an eight-element antenna. To save on mast space this could even be attached to the boom of the Band I antenna.

## Antenna Construction

It is a relatively easy task to construct your own multi-element antenna covering Band I and f.m. Band frequencies. Suitable 12.5mm diameter alloy tubing can be obtained from most metal stockists. Other hardware such as weatherproof dipole junction boxes and element clips can often be obtained from the various antenna

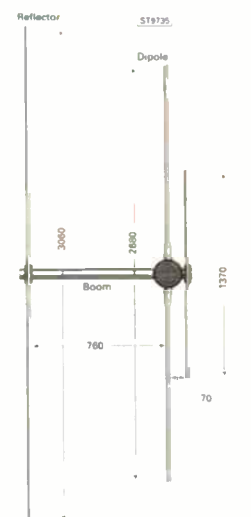


Fig. 2: Wideband antenna covering approximately 47 to 108MHz.

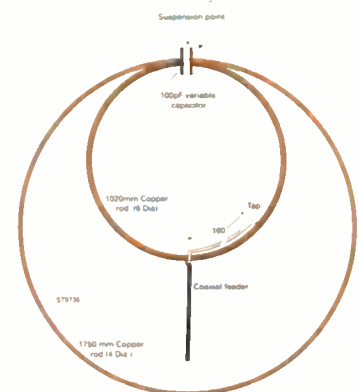


Fig. 3: Wideband loop antenna design used by Peter Barber in Coventry. The vertically-suspended antenna covers approximately 43 to 73MHz.

Continued on page 32...





# credible technical support

control, many have software available as a free internet download



## Every AOR radio receiver has one special feature - technical support!



With every new model, equipment is getting more and more complex, while the latest AOR models have well thought out comprehensive 'English' language operating manuals, it is comforting for many operators to know that technical support is on hand to answer queries and provide support when required. There are many 'so-called high-tech' products in the radio market but few offer the same high technical standards of support, those who do are deserving of great success.

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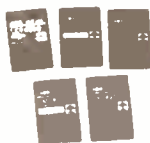
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The **AR8200** has been the first hand portable wide band all mode production unit to arrive on the market place with the new airband channel step of 8.33kHz correctly implemented. Add to this memory bank re-sizing, extensive step adjust capabilities to trace unusual band plans, an editable (via PC) meaningful auto mode bandplan, **free internet download** PC Windows software, optional SLOT CARDS and you have just the tip of the iceberg. The facilities offered by the AR8200 are stunning... take the 'step-adjust' feature for example. If you have a frequency of say 151.010MHz and wish to step in 15kHz increments, most receivers would simply assume 151.000 MHz then step 151.015, 151.030 etc. However, the AR8200 may be programmed to step in the desired manner of 151.010, 151.025, 151.040, 151.055MHz etc. Other real life examples would be the 27.60125MHz CB frequency incremented in 10 kHz steps, no problem... also the 900MHz band which implements 25 kHz steps but a 12.5kHz offset. Add to this the foresight of 8.33kHz airband steps and you have a very flexible unit!

**AR8200 £399**



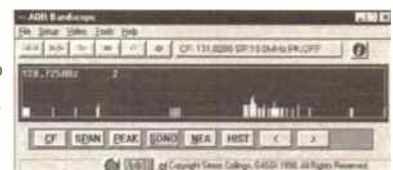
**Shown here with optional slot cards**

**Full computer control** is provided by the AR8200 receiver (via the optional CC8200 interface or equivalent), **not just clone of data**. You can set frequencies, edit memory channels, add text comments, customise search banks, edit the auto-bandplan data etc etc. The **'8200 toolkit'** software is available as a **free download from the AOR web site** and is provided with the optional CC8200 computer control interface.



**When comparing the AR8200 with other models ask the following important questions:**

- ✓ Is **FULL computer control** available and can you set frequencies from the PC?
- ✓ Is 'official' **software** provided by the manufacturer as a **free download** from the internet?
- ✓ Are **NiCad rechargeable batteries** and charger provided and can you charge them inside the radio?
- ✓ Can the radio be connected to an **external 12V** supply (such as the car cigar lighter socket) using the standard supplied lead?
- ✓ Are both search AND **SCAN speeds** fast?
- ✓ Has it correct implementation of programmable scan delay from when the squelch closes?
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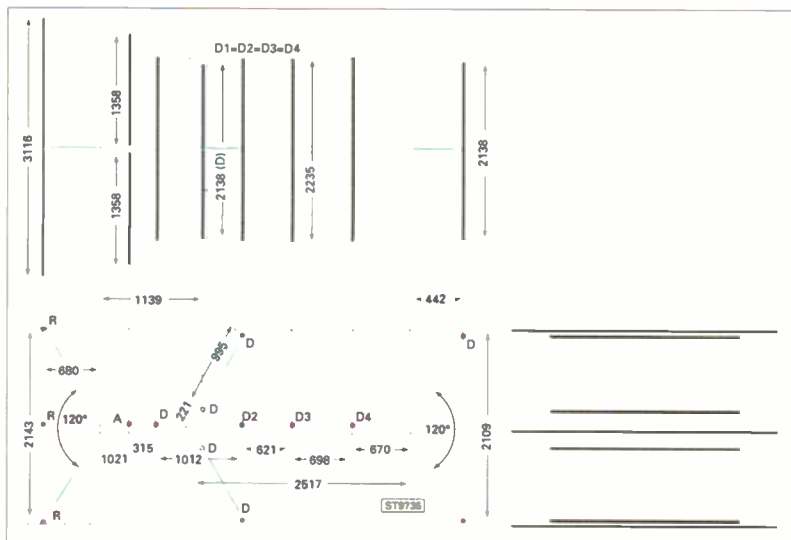


Fig. 4: A rather complex Band I antenna design used by an enthusiast in Hungary

...continued from page 29

equipment suppliers at radio rallies.

### UHF DXing

DXers living in East Anglia and the south-east should have no problems capturing French, Dutch and Belgian signals, even under relatively flat conditions. In these areas, DXing antennas are unlikely to point at other UK main transmitters and relays which would otherwise block vacant channels.

DXers inland are perhaps less fortunate, particularly now that digital TV has arrived, blocking even more channels. Sadly, in our area of Derby, u.h.f. DXing is virtually a thing of the past!

RSL TV (Restricted Service Licence) services are regarded as both welcome and unwelcome intrusions into what is an already overcrowded u.h.f. band. Some DXers see these as further blocked channels while others see them as a

new source of signals.

### Choosing A UHF Antenna

A glance along the skyline of a typical road will reveal u.h.f. receiving antennas of all shapes and sizes. Generally speaking, the bigger the antenna, the more 'powerful' it is, i.e. the higher its gain is, and the better the reception.

Grouped or wideband antennas are available and their use is dictated by the channels used in a given location. For a given number of elements, a grouped antenna has a slightly higher gain. A grouped antenna could be exploited to give optimum results from a distant transmitter which might be receivable on a regular basis. However, most enthusiasts settle for a single wideband array for ease of operation. Usually this is rotatable.

### Types Of Antenna

Wideband systems at u.h.f. tend to fall into two main categories: the wideband grid and the Lambda array, often referred to as the Continental-style Yagi. Both arrays have different characteristics. Most

manufacturers produce both types of antennas and there are variations on a theme.

### The Lambda Array

This type is easily recognised by its large reflector assembly and its chain of X-director assemblies affixed to a long boom. It provides good directional properties and high gain, as much as 17 or 18dB. Inherent in its design, its gain slope is steep and the increasing gain towards the upper end of the u.h.f. spectrum produces a progressively sharper signal acceptance angle. This means its optimum directional performance will be achieved on the higher u.h.f. frequencies rather than at the lower channels throughout Group A.

### The Wideband Grid

The wideband grid, or 'bowtie' as it is affectionately known in some quarters, is perhaps the most well-known throughout the DX fraternity because of its compact size and cost-effectiveness. It consists of four stacked dipole assemblies mounted about 100mm in front of a rectangular rod or mesh reflector. The grid has a gentler gain slope throughout the u.h.f. spectrum but it has a wide signal capture angle, typically 45°.

Its gain is typically 13dB maximum with a front-to-back ratio of 25 to 30dB. Some grids have a 'launch' director mounted in front of the dipole assembly to enhance performance on the higher u.h.f. channels. A Latvian company markets a grid which is claimed to cover Bands I, III and u.h.f. channels. How this performs in practice is not clear.

### Combined Performance

Following the introduction of digital TV in the UK towards the end of 1998, manufacturers began offering a more glamorous range of products. For example, a strange but elegant-looking antenna marketed by a Spanish company called 'Televés' is now available in the UK. These antennas have dominated the skylines of Spain and the Canary Islands for many years and are instantly recognisable by their triple booms fanning out from the dipole assembly. Their plastic bits are orange, adding a splash of colour. The design combines the advantages of a long-Yagi and a grid, namely high gain with a gentler gain slope.

### Log-Periodic Array

One antenna worth mentioning is the log-periodic, although only the mature antenna riggers seem to have heard of these! The log-periodic is an inherently wideband design but, unlike the Yagi, all the elements function as dipoles which are cut to respond to different frequencies. As a consequence, this type of antenna is more structurally complex than the Yagi and at a given frequency only part of the array actually contributes to the gain. This makes it lower relative to the number of elements when compared with the Yagi design.

A typical log-periodic array attains a gain of only around 8dB. On the credit side, it has an exceptionally clean polar response with very few side lobes and the gain is virtually constant throughout the u.h.f. spectrum. In the past, it has failed to seek the approval by enthusiasts due to its low forward gain, although it is used as an industry standard for field testing by transmitter personnel.

### UHF Antenna Groups

Following the introduction of Channel 5 in 1997 (using previously unused channels), the colour coding

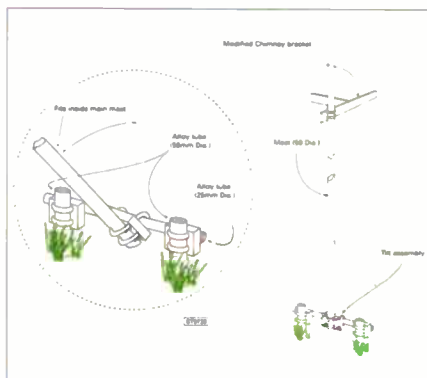


Fig. 5: Home-brew tilt-over mast using readily available fittings.

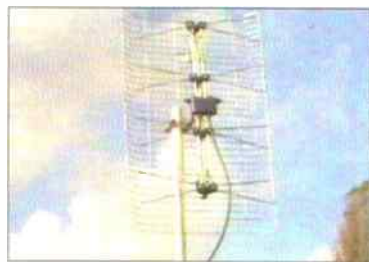


Fig. 6: A typical wideband u.h.f. grid.





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ICOM	IC-T8E 2 m 70m & 6m HANDIE	£230.00	KENWOOD	TS-850SAT TRANSCEIVER 0-30MHz	£895.00	YAESU	G 1000SDX ROTATOR	£295.00
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ICOM	IC-735 TRANSCEIVER	£450.00	MFJ	784 TUNABLE DSP FILTER	£150.00	YAESU	FT-747 TRANSCEIVER	£350.00
ICOM	IC-275E 25W MULTI MODE	£550.00	NETSET	PRO-2032 BASE SCANNER	£95.00	YAESU	FT 757GXMK11 TRANSCEIVER	£450.00
ICOM	IC 706 Mk1	£599.00	REALISTIC	DX-394 AS NEW HF	£90.00	YAESU	FT-840 0-30MHz TRANSCEIVER	£495.00
ICOM	IC-737 BASE TRANS, INC TUNER 0-30MHz	£600.00	REALISTIC	PRO-2045 BASE SCANNER	£120.00	YAESU	FT 840	£500.00
ICOM	IC-275H 100W 2M MULTI MODE	£650.00	SGC	230 SMART TUNER	£200.00	YAESU	FT 890 HF Gen as new	£600.00
ICOM	IC-706MK 11 DSP TRANSCEIVER	£650.00	SGC	2020 10W MULTI MODE HF	£325.00	YAESU	FT *36 270 AC TRANSCEIVER	£695.00
ICOM	IC-821 DUAL BAND BASE	£750.00	UNIVERSAL	M-8000 TERMINAL	£500.00	YAESU	FT-990AC	£695.00
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ICOM	IC 746 HF/VHF	£999.00	YAESU	SP-8 SPEAKER for 1000MP etc	£80.00	YAESU	FT-1000 MP DC AS NEW	£1 400.00
ICOM	IC-970H P S WIDE RECEIVE 900MHZ	£1 495.00	YAESU	FT-10 HANDIE 2M	£100.00	YAESU	FT-1000MP AC	£1 500.00
KANTRONICS	KPC-4 DUAL PORT TNC	£130.00	YAESU	FT-11 HANDIE 2M	£100.00	YAESU	FT 757GXMK1 TRANSCEIVER	£400.00
KANTRONICS	KAM PLUS TNC	£220.00	YAESU	FT-10 2M HANDIE	£125.00	YUPITERU	MTV-9000 AM FM USB/LSB/CW SCANNER	£245.00
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# Identifying DXTV Reception

"With the explosion of satellite TV and the multitude of channels, on-screen logos are the norm with almost every terrestrial TV service in Europe displaying one."

The test card must be the most obvious method of identifying a distant transmission source, but round-the-clock programmes mean that it has now been banished from our screens. Programme breaks, where the test card was once shown, are now replaced with programme schedules, sample teletext pages or, in countries such as Switzerland, Slovenia and Austria, 'live' weather pictures from mountain resorts.

## Logos

Many years ago, once the station had opened, it was often difficult to identify reception from the programme content. With the explosion of satellite TV and the multitude of channels, on-screen logos are the norm with almost every terrestrial TV service in Europe displaying one.

To keep the graphic designers in a job, on-screen logos tend to change frequently, especially from one Sporadic-E season to the next. This leads to inevitable confusion when a new logo appears on the scene.

Another trend is to use a '1' indicating the 1st network, but we now have the situation where most countries have adopted a similar-looking figure '1'. Some stations broadcast several logos, maybe a different one during a news programme, or where several programme contributors share air-time.

## Direction

The general direction from where the signal comes from is perhaps an obvious clue, and this is one advantage of using a rotatable antenna system. Very often, several neighbouring countries will be present during openings. For example, Swiss, Slovenian and Hungarian broadcasts may appear at the same time as signals from Italy.

The type of programme may also yield clues, especially those portraying national past-times, national dress and sport. It goes without saying that bullfights originate from Spain (and Portugal), rather than Finland!

## Maps & Clocks

News programmes can be tricky to base decisions on because maps and place names shown often refer to the news item. Weather maps are a fairly safe bet, especially if you make a note of where all the attention is focused. It is a good idea to dig out the old atlas from the attic and brush up on geography since some weather maps show only the outline of the country. Sometimes a studio clock is seen without any form of logo or other identification present.

Time differences can be useful, but a certain amount of caution is needed. Only a few years ago, enthusiasts noted a Russian clock at UTC +3 hours, instead of the normal 2-hour difference. It was assumed that the signal had come from a transmitter located in another time zone, further east than normal.

The outcome was simply that Russia had decided to advance their clocks by an extra hour during the summer! Having said that, an Iranian signal on channel E2 was positively identified a few years ago by a large digital clock incorporated in the test card showing a time difference of 3½ hours. India has a time offset of 30 minutes.

## Frame Bar

The more dedicated DX enthusiast tends to make use of the

VITS (Vertical Interval Test Signal) as an additional means of establishing the origin of the transmission. The VITS is located within the frame blanking pulse at the top of the picture and if the frame hold is adjusted to produce the black bar, it will be revealed. It takes the form of a series of small white dots and dashes which tend to differ in appearance depending on the broadcaster. Of course, initial identification is necessary and changes do occur periodically.

## Technical Differences

We'll now take a look at the various TV transmission systems in use and ways of exploiting their technical characteristics to establish the likely origin of the received signal.

Despite great efforts to standardise terrestrial television systems where possible, technical and political considerations means the co-existence of several different standards for many years to come. Perhaps digital terrestrial television (DTT) will promote a common standard?

The most important variable parameters which make up a television system are as follows:-

- 1) Number of scanning lines: 625 or 525.
- 2) Field frequency: 50 or 60Hz (depending upon the electricity supply frequency).
- 3) Video modulation sense: negative-going or positive-going.
- 4) Method of sound modulation: intercarrier f.m. (frequency modulation) or a.m. (amplitude modulation).
- 5) Spacing of the sound carrier from the vision frequency: 4.5, 5.5, 6.0 or 6.5MHz.
- 6) Colour System: PAL, SECAM or NTSC.
- 7) Stereo sound system: NICAM or dual-intercarrier.

As one might expect, the differences in TV systems have largely been brought about by political decisions, mainly in the early days of television. As a consequence, most former Eastern-bloc countries favoured the same system as Russia which, not surprisingly, differed from the one adopted by most Western European countries.

Within recent years, countries such as Hungary, Poland, the Czech Republic and Slovakia have transferred to PAL from SECAM but have retained the same parameters as before, such as a 6.5MHz sound carrier spacing.

Nearly all services in Europe currently use 625-lines with negative vision modulation with intercarrier sound. These are similar in many respects to our u.h.f. system. The main exception is France where 625-lines, positive vision modulation and a.m. sound is the order of the day.

The American 525-line system can be found in some countries serving American Forces personnel stationed at the various military bases. These are usually low-power outlets.

The only outlet of any significant power which used to be regularly received in the UK via tropospheric reception was at Soesterberg on Channel A80 (E72). Its e.r.p. was 20kW, but it was moved lower down the band some years ago and there are no longer reports of this transmitter being received.

Some American Forces Band 1 outlets operating in Spain are listed in the *World Radio TV Handbook*, but according to enthusiasts who have visited those areas, there were no signs of transmissions.



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73 from Dave G4KQH, Technical Manager.

Most kits can also be supplied as assembled PCB modules. Optional hardware packs are also available for most kits - please see our website or send for more details.



# Data Panels

In this special issue of *SWM* Keith and Garry are presenting the most comprehensive compilation of test cards and identification captions ever published in a national magazine. Many of the photographs are extremely rare and have not been previously published.

The Data Panels are divided into five sections covering Standard Test Cards (from which most of the later test cards were derived), Monoscopic Test Cards (covering many unique designs), Electronically-Generated Test Cards, Clock Captions and a selection of Identification Captions, past and present.

Before anyone reaches for their quill and velum or

despatches an E-mail, monoscopic test cards are, strictly speaking, derived from special tubes onto which the test card has been etched and subsequently scanned by an electron beam. But many enthusiasts refer to any test card as being 'monoscopic', even if it is a transparency or an opaque picture mounted on a glass or plastic sheet. Basically, the term 'monoscopic' is generally used when referring to any test card which is not electronically-generated such as those featured in Data Panel No. 3.

It should also be noted that the original names of the countries which used specific test cards or identification captions have been used. Thus we include the names of countries such as East Germany, Yugoslavia and the USSR which, of course, no longer exist.

## Data Panel No.1: Standard Test Cards

Fig. 1: **BBC Test Card 'C'**. This has been used by many television services throughout the world with suitable modifications. The original version was first transmitted by the BBC in 1947.

Fig. 2: **BBC Test Card 'D'**. This was introduced on April 20th, 1964 on BBC-1.

Fig. 3: **BBC Test Card 'E'**. This was introduced on April 20th, 1964 and is virtually identical to Test Card 'D' except for the frequency gratings which were specially designed for the new u.h.f. 625-line transmission system.

Fig. 4: **S.M.P.T.E. Test Card**. This monochrome test card was designed by the Society of Motion Picture and Television Engineers. This particular version was used by the BBC for u.h.f. field trials in 1963.

Fig. 5: **EBU Bar**. This test card was used by some members of the European Broadcasting Union in the 60s and 70s.

Fig. 6: **Marconi Resolution Chart No. 1**. This version was used by TNT 9 in Australia during the 60s.

Fig. 7: **'Bull's Eye' Test Card**. This was used by many stations in the USA but this particular version was radiated in Perth, Australia, by TWV 7.

Fig. 8: **RMA Resolution Chart 1946**. This was a very popular test card in the 50s and 60s. This version was used by NOS in the Netherlands.

Fig. 9: **RETMA Resolution Chart 1956**. This photo shows the test card radiated in the former Yugoslavia by RTV in Ljubljana.

Fig. 10: **Telefunken TO5 Test Card**. This was used by West Germany and Austria in the 60s and 70s.

Fig. 11: **Philips Test Chart**. This was used in only a few countries including Thailand.

Fig. 12: **Test Card 'G'**. This was used by many European TV services but it was never transmitted by the BBC despite the similarity with Test Card 'C'.

Fig. 13: **ORTF Test Card**. This was used in France and various other French-speaking countries as well as in Chile.

Fig. 14: **Philips PM5540 Test Card**. One of the earliest monochrome electronically-generated test cards. This version was used by the IBA in Israel and included their logo in the lower left-hand corner.

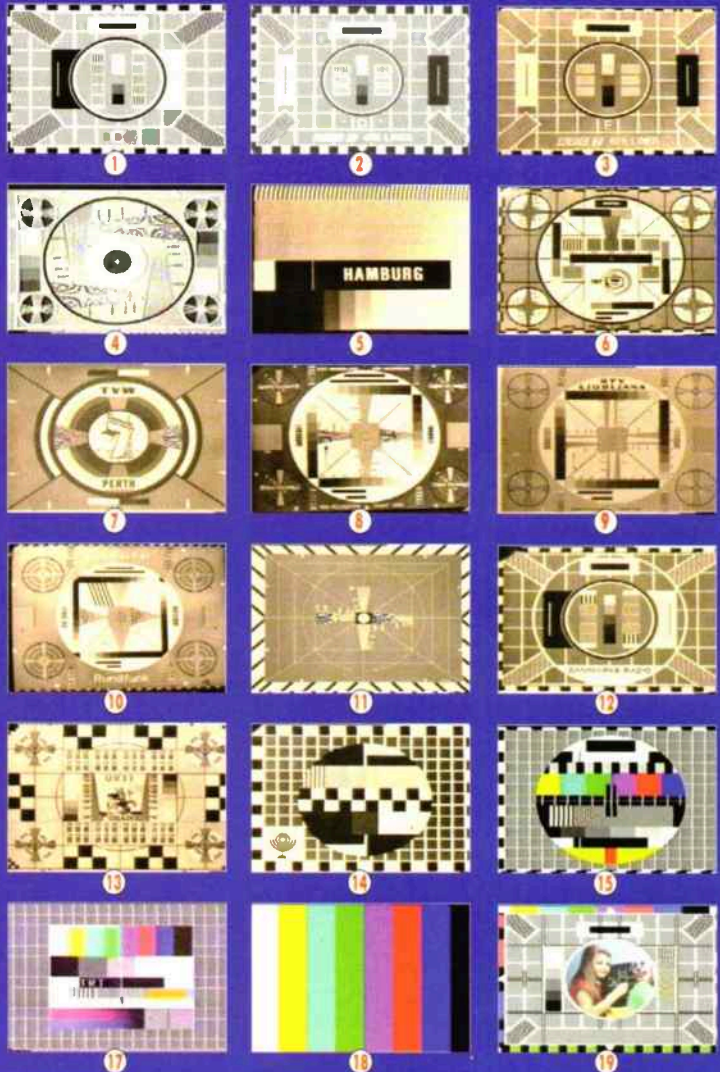
Fig. 15: **Philips PM5544 Test Card**. This electronically-generated test card replaced many of the more exotic monoscopic test cards from the late 60s onwards.

Fig. 16: **Philips PM5534 Test Card**. This is virtually identical to the PM5544 but it includes a digital clock. This photo shows the test card used by RTA in Algeria.

Fig. 17: **FuBK Test Card**. This was designed by the Funkbetriebskommission (abbreviated to FuBK) in West Germany in the late 60s. This photo shows the test card used by TRT in Turkey.

Fig. 18: **Standard Colour Bars**. This is used by many TV services around the world. This particular set of Colour Bars is used by the BBC.

Fig. 19: **BBC Colour Test Card 'F'**. The original version was introduced on July 1st, 1967 and has since been used by a number of countries including Norway, Australia, New Zealand and Bahrain. This photo shows the current digitally-generated version.



## Data Panel No.2: Monoscopic Test Cards



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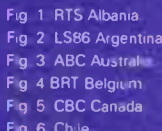
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Fig 1 RTS Albania  
Fig 2 LS86 Argentina  
Fig 3 ABC Australia  
Fig 4 BRT Belgium  
Fig 5 CBC Canada  
Fig 6 Chile  
Fig 7 CST Czechoslovakia  
Fig 8 CST Czechoslovakia (later version)

Fig 9 DFF East Germany  
Fig 10 RTE Eire  
Fig 11 RTE Eire  
Fig 12 EIPT Greece  
Fig 13 IIVRI Indonesia  
Fig 14 NIRT Iran  
Fig 15 RAI Italy  
Fig 16 RTI Ivory Coast

Fig 17 NHK Japan  
Fig 18 Malta  
Fig 19 NZBC New Zealand  
Fig 20 NZBC New Zealand  
Fig 21 NRK Norway  
Fig 22 RTP Portugal  
Fig 23 TVR Rumania  
Fig 24 TVE Spain (early Sixties)

Fig 25 TVE Spain (late Sixties)  
Fig 26 SR Sweden  
Fig 27 SR Sweden  
Fig 28 SR Sweden  
Fig 29 SR Sweden  
Fig 30 +PTT/SRG/SSR/TSI Switzerland  
Fig 31 TSS USSR ('0249' Test Card)

## Data Panel No.3: Electronically-Generated Test Cards

Fig 1 One of the monochrome test cards used by ARD in West Germany during the Sixties and Seventies

Fig 2 The monochrome test card radiated by DFF in East Germany during the late Sixties and early Seventies

Fig 3 RTL in Luxembourg used this monochrome test card in the Seventies. It carried an advertisement for their medium wave radio station.

Fig 4 CST in Czechoslovakia used this monochrome test card in the Seventies.

Fig 5 RUV in Iceland transmitted very few programmes in the Seventies and Eighties so this test card was radiated for much of the day and even during the night.

Fig 6 One of the colour test cards favoured by some Australian networks such as SEQ.

Fig 7 This test card has been radiated by the TV service in Fiji.

Fig 8 The 'RS-KH' colour test card used by CST in Czechoslovakia.

Fig 9 An unusual colour test card used in Czechoslovakia.

Fig 10 The Hungarian colour test card radiated by MTV in Budapest.

Fig 11 The colour 'Blockboard' from East TV in Estonia.

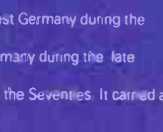
Fig 12 The East German DFF-1 colour test card.

Fig 13 A variation on a popular Eastern bloc test card. This version was used by TVP in Poland.

Fig 14 The 'G-204' colour test card which is still radiated by the CIS (formerly the USSR) TV services.

Fig 15 The current colour test card transmitted by TVE in Spain. It has also been used by the TV service in Equatorial Guinea.

Fig 16 The current colour test card transmitted by TVE in Spain. It has also been used by the TV service in Equatorial Guinea.



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# DX Television



Fig. 1: Identification caption used by the German-language TV service SF-DRS in Switzerland.



Fig. 2: Graphics used for the SF-DRS News programmes in Switzerland.



Fig. 3: News programme from the regional TV service 'TV Baern' based in Bern, Switzerland.

October was quite a pleasant month with no less than four different types of propagation providing the r.f. entertainment.

F2-layer propagation has been the most rewarding, as the last real bout of activity occurred in the early Nineties! Thai TV has been identified in Finland on Channel E2. In the UK, various low-level vision buzzes on E2 and R1 have indicated that conditions are building up nicely.

Towards the end of the month there were Sporadic-E (Sp.E) openings to Lithuania, Spain, Portugal and Italy. For those who do not mind reception short but sweet, Meteor-Shower (MS) activity provided 'pings' of signals from Scandinavian stations.

Tropospheric reception in Band III and at u.h.f. brought in Dutch, Belgian and French stations. FM reception was limited to mainly transmitters in the United Kingdom.

## Reception Reports

Stephen Michie (Bristol) concentrates on Channel E3 for Meteor-Shower reception. The best times for identifying reception seem to be around 0700UTC when Scandinavian stations are showing test cards. The Danish PM5534 test card is easy to spot as it consists of a modified version with a large expanse of white.

Lithuanian transmissions on Channel R2 were identified by Simon Hockenull (Bristol) and Peter Barber (Coventry) during a Sporadic-E opening between 2025 and 2103 on the 17th. The main news programme was screened at 2100. Peter witnessed another Sporadic-E opening on the 28th with Spain and Italy from 1000 culminating in Portugal until 1334UTC.

Peter regularly monitors Channel E4 for signs of the Lopik transmitter in the

Day	Log
1	Meteor-Shower reception including Denmark (DR-TV) E3 (Fyn) showing the PM5534 test card at 1004 and 1009.
2	Meteor-Shower with unidentified E3 programme at 0759.
3	Meteor-Shower with Denmark E3 (Fyn) with PM5534 at 0741.
4	Meteor-Shower with Denmark E3 (Fyn) with PM5534 at 0719 and 0743.
5	Sporadic-E reception with Spain (TVE-1) E3 between 1108 and 1139. Tropospheric reception with France (Canal Plus) L7 (Rouen) and L9 (Caen), Belgium (RTBF-1) E8 (Wavre) and Belgium (VRT TV1) E10 (Wavre transmitter).
6	Sporadic-E:- Spain (TVE-1) E3 between 1835 and 1854. Tropospheric:- France L5 (Lille) and L7 (Rouen).
7	Tropospheric:- France (Canal Plus) L7 and L9; Belgium (RTBF-1) E8; Belgium (VRT TV1) E10.
8	Meteor-Shower:- Unidentified E3 programme at 0938.
9	F2-layer propagation:- p.m.r. between 34 and 35MHz at 0915; Russian speech around 37MHz at 1000.
10	Unidentified E3 programme via Meteor-Shower at 1055. Tropospheric:- Netherlands (NED-1) E4 (Lopik); UK f.m. stations (Mendlesham and Croydon).
11	Tropospheric:- Netherlands (NED-1) E4 (Lopik).
12	Sporadic-E:- Spain E3 between 1233 and 1249.
13	Tropospheric:- UK f.m. stations.
14	F2-layer propagation:- p.m.r. between 34 and 35MHz, 1130-1200. Tropospheric:- France L5 (Lille), L7 (Rouen) and L9 (Caen); Belgium (RTBF-1) E8 (Wavre); Belgium (VRT TV1) E10 (Wavre); Netherlands (NED-2) E27 (Lopik); Netherlands (NED-3) E30 (Lopik); UK f.m. stations.
15	Tropospheric:- Netherlands (NED-1) E4; France L5 (Lille) and L9 (Caen).
16	Tropospheric:- UK and French f.m. stations.
17	Sporadic-E:- Lithuania (LRT) R2 between 2025 and 2103; Unidentified R1 programme at 2035. Tropospheric:- France L5 (Lille); UK and French f.m. stations.
18	Tropospheric:- Netherlands (NED-1) E4 (Lopik); France L5 (Lille); Belgium (RTBF-1) E8 (Wavre); Belgium (VRT TV1) E10 (Wavre); UK f.m. stations.
19	Tropospheric:- Netherlands (NED-1) E27 (Lopik); Netherlands (NED-3) E30 (Lopik); France L5 (Lille), L7 (Rouen) and L9 (Caen); UK and French f.m. stations.
21	F2-layer propagation:- Russian p.m.r. between 34 and 35MHz at 1340 (also 1510 until 1600); pulsed data at 40.920MHz at 1342. Meteor-Shower:- Denmark E3 (Fyn) with PM5534 test card.
22	Meteor-Shower:- Unidentified E3 programmes at 0738 and 1211; Sweden (SVT-1) or Norway (NRK-1) with PM5534 at 0745. Tropospheric:- Netherlands (NED-1) E4 (Lopik).
23	Meteor-Shower:- Unidentified E3 programmes at 0649, 0650, 0710 and 0802; Sporadic-E:- Sweden E3 between 1040 and 1055. Tropospheric:- Netherlands (NED-1) E4 (Lopik).
24	Meteor-Shower:- Denmark E3 (Fyn) at 0636 and 0731.
27	Sporadic-E:- Italy (RAIUNO) IA between 1457 and 1518.
28	Sporadic-E:- Spain E2 and E3 between 1000 and 1012; Italy (RAIUNO) IA and IB at 1029; Italy (TVA) IA (Monte Faito) at 1032; Portugal (RTP-1) E3 (Lousa) programmes until 1334.

Netherlands. This occasionally flutters up by tropospheric scatter. Not bad considering only an indoor dipole mounted horizontally is used. To take advantage of polarisation shift, a vertically-polarised tuned loop antenna has been constructed.

## October Reception Log

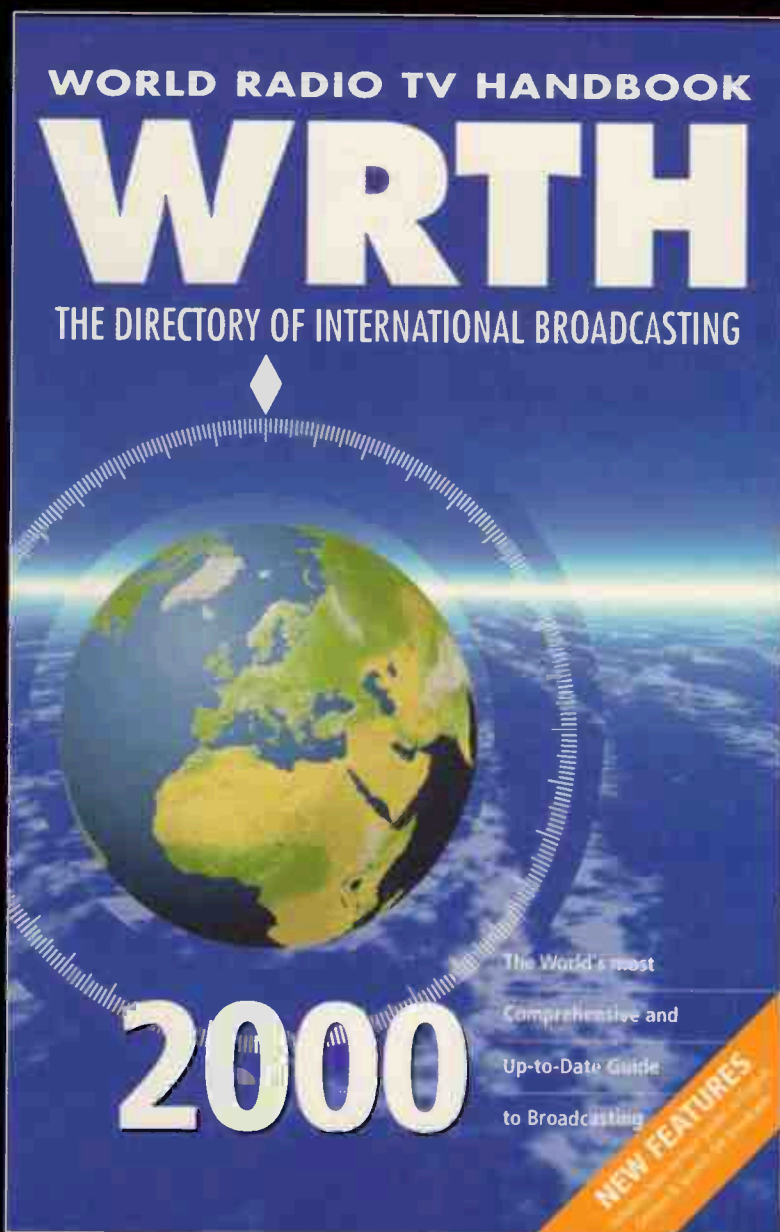
Many thanks to Stephen Michie, Simon Hockenull and Peter Barber for submitting reception reports for the compilation log. All times are in UTC.

# Further Reading

Several publications covering the fascinating subject of DXTV are available from the SWM Book Store. These include *Guide To World-Wide Television Test Cards - Edition 3*, *DX-TV For Beginners* and *Guide To DX-TV* (this book is intended for the more advanced TV DXer).



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# A Closer Look at...

## Random Length Marconi Antennas

If I were a betting man, I would lay money on the claim that the simple random length Marconi antenna is one of the most popular high frequency short wave receiving antennas. It is also probably the first antenna used by many s.w.l.s who later erected more sophisticated antennas. Why? Because of its utter simplicity.

All you need to build a random length Marconi is 10 to 30m of copper wire, and a place at the far end to anchor the wire. Such an antenna is shown in Fig. 1. It is 30m long, 3m from the ground at the receiver end, and forms a 30° angle with respect to the ground. I've built many antennas like this one over the years using whatever wire was at hand, or if I had a few extra coins in my pocket, a 30m roll of 16s.w.g. Copperweld™ wire.

The random length Marconi works reasonably well as an antenna for either beginners or those with no practical other alternatives. This antenna will certainly receive short wave signals well enough. But why are they disdained by so many ("real radio guys don't use random length wires!"). Over here in the USA, telling some people that you use a random length Marconi is a bit like a Redneck telling a Boston "blue-blood" about the glories of country music.

The short wave spectrum is the high frequency (h.f.) band between 3 and 30MHz. Table 1 shows these frequencies and their associated wavelengths in metres. The same data is plotted in Fig. 2. These data were derived by looking at the length of the wire as a function of wavelength:

$$L_{\lambda} = \left( \frac{30\text{-m}}{0.96 \times F_{\text{MHz}}} \right) \quad (1)$$

The wavelength is adjusted by a factor of 0.96 to account

for the velocity factor of the wire used to make the antenna.

One of the things that make the random length Marconi antenna perform very differently at different frequencies is that the cut frequency in wavelengths varies considerably over the h.f. short wave band. At

with a serious impedance mismatch), while at the upper end of the range there is enough wire hanging out there to make a long-wire antenna.

### HF Radiation Patterns

If you use one of these antennas you will undoubtedly note different

azimuth and elevation patterns to follow were modeled using the Nittany-Scientific *Nec-Win Basic* software. The software is based on the *NEC-2* 'Numerical Electromagnetic Computation' software developed by the Jet Propulsion Laboratory in the USA. A public domain DOS-based version of a similar program called *mini-NEC* is available from various world wide web sites.

The *Nec-Win Basic* single-wire model was built using the specifications of the antenna in Fig. 1. A total of eleven segments were used to make the calculations.

At 3MHz the antenna is only 0.31λ long, so is near to the length of a standard quarter wavelength vertical. The impedance will not be in

### Joe Carr K4IPV guides us through the characteristics of a plain old random length antenna.

3MHz, the physical length is only 0.313λ, while at 30MHz it is more than 3λ. At the low end of this range, the antenna tries to work in a manner similar to the quarter wavelength vertical (although

performance at different frequencies. We discussed the reason for this observation above. Now let's try to graphically depict the performance by looking at radiation patterns. The

F (MHz)	W (λ)	F (MHz)	W (λ)	F (MHz)	W (λ)	F (MHz)	W (λ)	F (MHz)	W (λ)	F (MHz)	W (λ)
3.00	1.04	8.25	2.86	13.50	4.69	18.75	6.51	24.00	8.33	29.25	10.16
3.25	1.13	8.50	2.95	13.75	4.77	19.00	6.60	24.25	8.42	29.50	10.24
3.50	1.22	8.75	3.04	14.00	4.86	19.25	6.68	24.50	8.51	29.75	10.33
3.75	1.30	9.00	3.13	14.25	4.95	19.50	6.77	24.75	8.59	30.00	10.42
4.00	1.39	9.25	3.21	14.50	5.03	19.75	6.86	25.00	8.68	30.25	10.50
4.25	1.48	9.50	3.30	14.75	5.12	20.00	6.94	25.25	8.77	30.50	10.59
4.50	1.56	9.75	3.39	15.00	5.21	20.25	7.03	25.50	8.85	30.75	10.68
4.75	1.65	10.00	3.47	15.25	5.30	20.50	7.12	25.75	8.94	31.00	10.76
5.00	1.74	10.25	3.56	15.50	5.38	20.75	7.20	26.00	9.03	31.25	10.85
5.25	1.82	10.50	3.65	15.75	5.47	21.00	7.29	26.25	9.11	31.50	10.94
5.50	1.91	10.75	3.73	16.00	5.56	21.25	7.38	26.50	9.20	31.75	11.02
5.75	2.00	11.00	3.82	16.25	5.64	21.50	7.47	26.75	9.29	32.00	11.11
6.00	2.08	11.25	3.91	16.50	5.73	21.75	7.55	27.00	9.38	32.25	11.20
6.25	2.17	11.50	3.99	16.75	5.82	22.00	7.64	27.25	9.46	32.50	11.28
6.50	2.26	11.75	4.08	17.00	5.90	22.25	7.73	27.50	9.55	32.75	11.37
6.75	2.34	12.00	4.17	17.25	5.99	22.50	7.81	27.75	9.64	33.00	11.46
7.00	2.43	12.25	4.25	17.50	6.08	22.75	7.90	28.00	9.72	33.25	11.55
7.25	2.52	12.50	4.34	17.75	6.16	23.00	7.99	28.25	9.81	33.50	11.63
7.50	2.60	12.75	4.43	18.00	6.25	23.25	8.07	28.50	9.90	33.75	11.72
7.75	2.69	13.00	4.51	18.25	6.34	23.50	8.16	28.75	9.98	34.00	11.81
8.00	2.78	13.25	4.60	18.50	6.42	23.75	8.25	29.00	10.07	34.25	11.89

Table 1: Length of the 30m random wire in wavelengths.

Continued on page 48...

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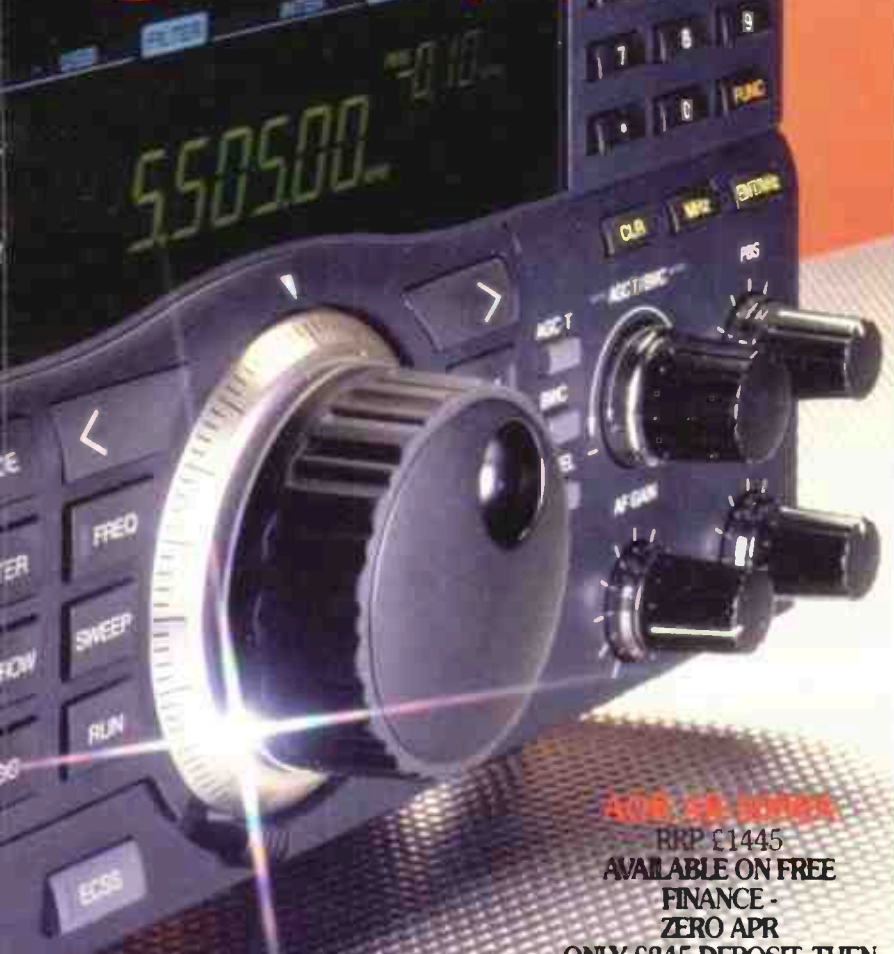
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 Noise figure 1.5-2dB -1000MHz  
 1.8-2.5dB -1500MHz  
 2.5-4dB -2000MHz  
 3rd order IP +35dB typical  
 Output impedance 50-75 ohms coaxial  
 Connector standards N type connector at the antenna. BNC male connector to the receiver  
 Power supply 12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna  
 Length 450mm  
 Dimensions Diameter 90mm  
 Weight 2kg  
 Accessories Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 12m coaxial cable and mast mounting clamps

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#### FINANCE EXAMPLE

All examples do not include P&P.

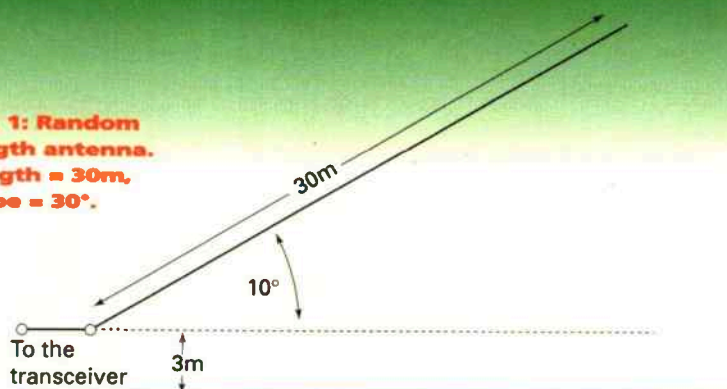
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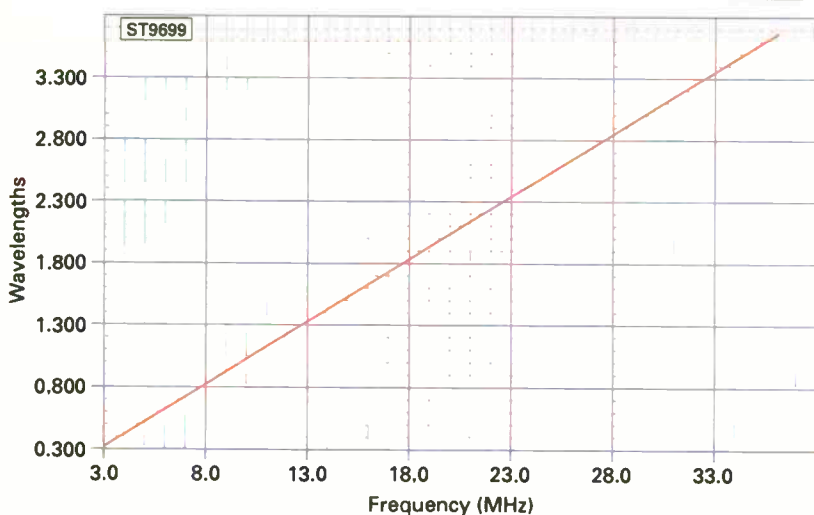
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...continued  
from page 45

**Fig. 1: Random length antenna.**  
Length = 30m,  
slope = 30°.



ST9698



**Fig. 2: Length in wavelengths as a function of frequency.**

the same range, it will be higher. The patterns for this frequency are shown in **Fig. 3**. The azimuth pattern (**Fig. 3a**). It tries to be both a vertical and a horizontal antenna, so has elements of both patterns. The 'figure-8' pattern one would expect of a horizontal antenna is apparent, but the nulls are filled in off the ends. I believe this is the antenna also trying to act like a vertical.

The elevation pattern at 3MHz is shown in **Fig. 3b**. Note that this pattern is similar to what might be expected of the vertical, except that the deep null is canted at an angle of 60° (which is the angle opposite the 30°), rather than 0° (straight up). Signals arriving at your site at this angle, which is not an unreasonable angle, will be severely attenuated.

When the frequency increases to 5MHz, the wavelength is a bit more than half wavelength. The patterns remain similar, as shown in **Fig. 4a** and **Fig. 4b**.

If the frequency is increased to 7MHz, which is the 40m amateur radio band, something happens to the azimuth pattern (**Fig. 5a**), although the elevation pattern (**Fig. 5b**) remains similar to the lower frequency cases. The azimuth pattern fills out a little at 0° and 180°, but pulls in a bit around 110° and 250°, creating a 'butterfly shaped' pattern.

When the frequency gets to 9MHz, the bottom end of the 31m band, the length of the antenna is 0.938λ, and the pattern forms up to a species of 'figure-8' (**Fig. 6a**). This bi-directional pattern is not unlike that expected of a half wavelength horizontal dipole.

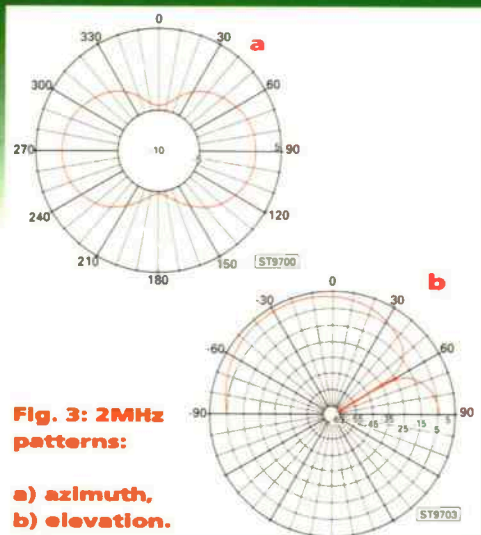
The elevation pattern also changes at this frequency. There is still a deep but narrow null at +60°, but there is also a new null at -30°. This reciprocal null is not as deep as the main null. At 11MHz both patterns are similar to the 9MHz patterns, although the reciprocal null is deeper (**Fig. 7a** and **Fig. 7b**).

The patterns blossom out when the frequency reaches 15MHz. The 'figure-8' azimuthal pattern (**Fig. 8a**) develops two minor lobes at right angles to the direction of the main lobes. It also increases the number of null-no signal-directions to four. At this frequency, however, the azimuthal coverage of the 30m random wire is quite decent for reception all around. While it is not omnidirectional, it none the less gives good coverage.

The elevation pattern at

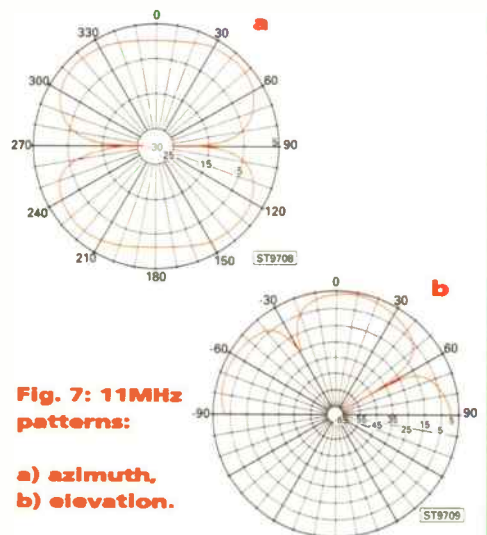
15MHz is shown in **Fig. 8b**. It retains some of the features of the lower frequency patterns, but has nulls, not simple along the wire axis (60°), but also at -10° and -50°.

The patterns for the 21MHz, 15m amateur band are shown in **Fig. 9a** and **Fig. 9b**. The azimuthal pattern (**Fig. 9a**) is similar to the 15MHz pattern, but the two minor lobes have split into two even smaller lobes. There are now six nulls, with the minor lobes centered about the 90-270° line. The elevation pattern has also split, and now has several lobes, with nulls at 60°, 0° (directly overhead), -30° and -60°. The scalloping of the pattern lobes and nulls continues at frequencies of 27MHz (around the 11m Citizen's 8and and 10m amateur bands).



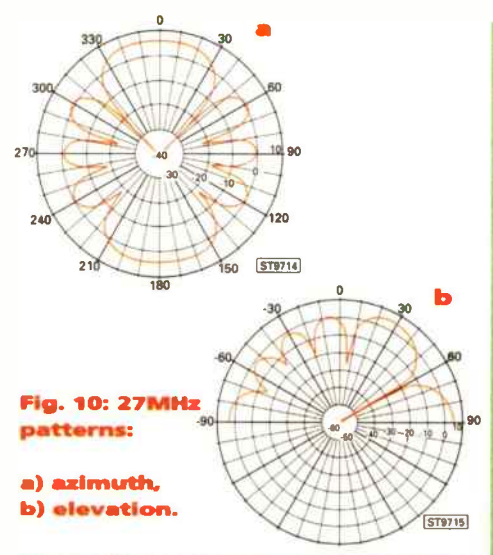
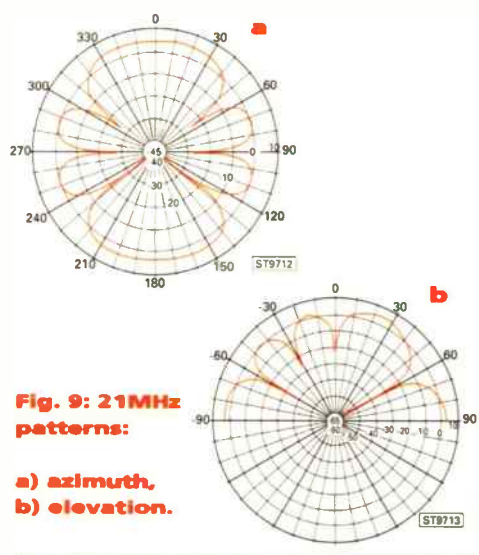
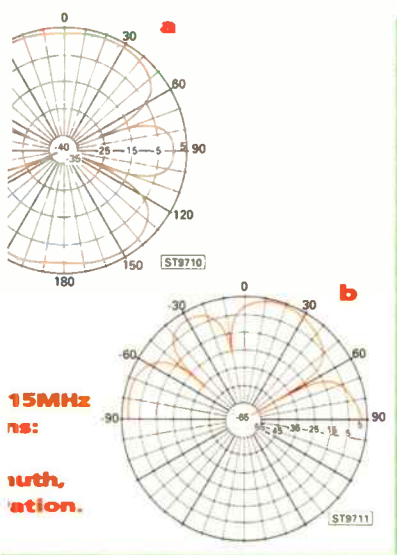
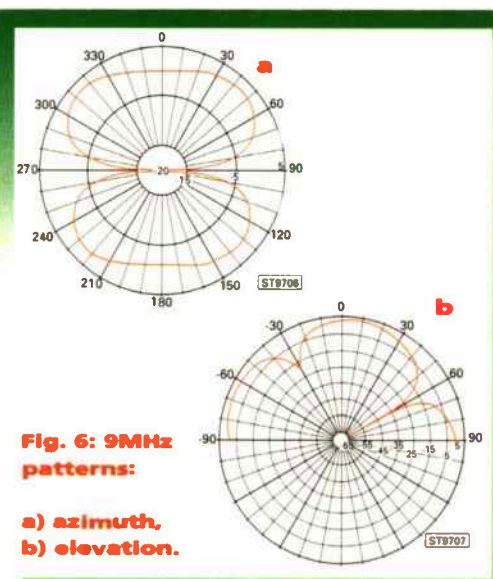
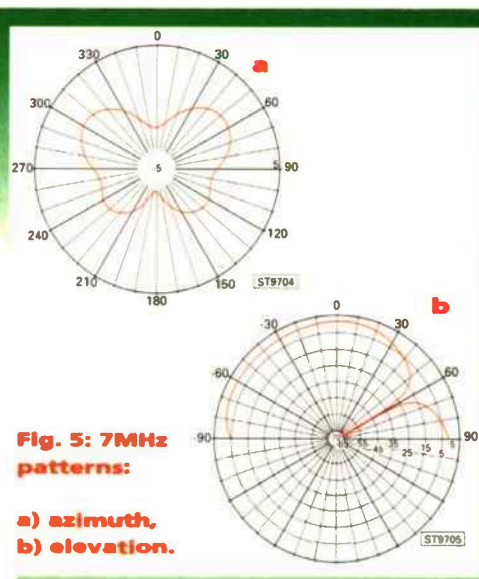
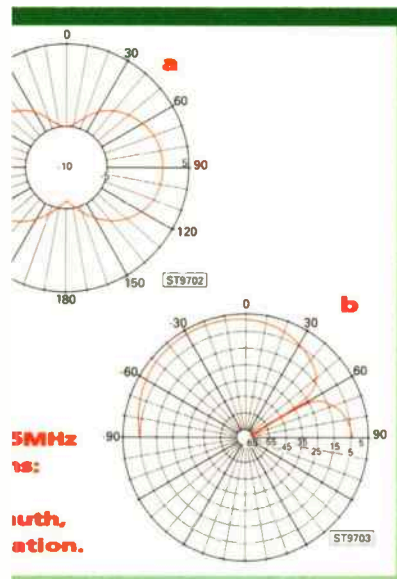
**Fig. 3: 2MHz patterns:**

a) azimuth,  
b) elevation.



**Fig. 7: 11MHz patterns:**

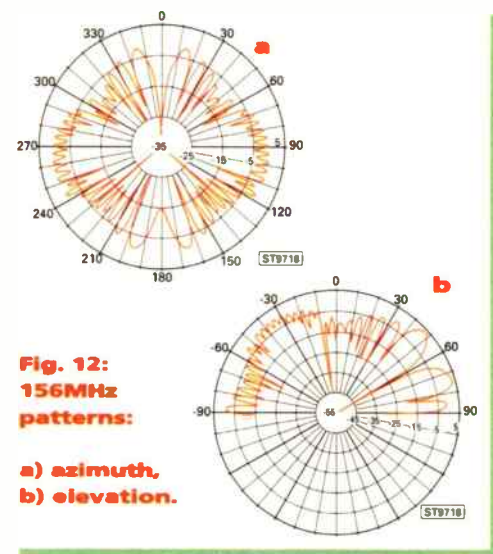
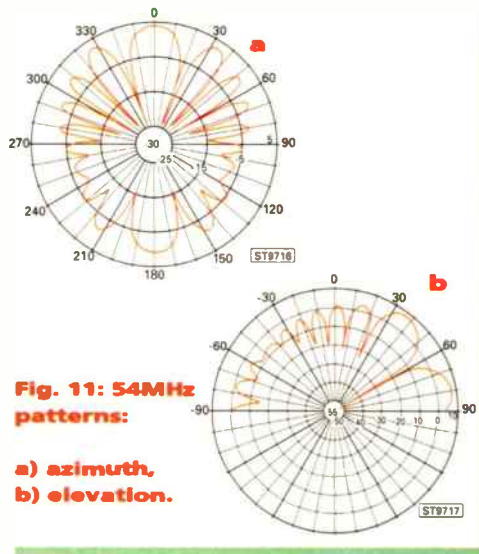
a) azimuth,  
b) elevation.



### Patterns At VHF

The random length antenna is normally thought to be an h.f. only antenna. But it can also act like a long wire antenna at v.h.f. antenna. Keep in mind that a long wire is an end fed affair that is more than two wavelengths ( $2\lambda$ ) long. Some are terminated in a resistor ('traveling wave' antennas) others are not ('standing wave' antennas). The 30m long random length wire that we consider here essentially works like a messy long wire at v.h.f. The 54MHz azimuth and elevation patterns are Fig. 11a and Fig. 11b respectively, while the 156MHz patterns are shown in Fig. 12a and Fig. 12b.

When I was running some of the simulations used as the basis for this article, a friend of mine - a local antenna guru by his own lights - called on



the telephone. When I told him what I was doing, he made some insulting noise about me being a 'real Bubba' for even considering such a terrible antenna. A 'Bubba' is

a good ol' southern boy who'd dearly like to shoot straight, but being about as dumb as a box of rocks, somehow just can't seem to find the trigger. **SWM**

You can download the **Mini-NEC** software used for the generation of the characteristic plots in this article from the **SWM Web Site**. See [www.pwpublishing.ltd.uk/swm](http://www.pwpublishing.ltd.uk/swm)

# An Effective LF Receiving System

How low can you go?

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Marris

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alternative for

l.f. reception.

The long neglected spectrum below 500kHz is again arousing increasing interest in the amateur radio field, by the news of the allocation of new European and UK amateur experimental bands below 150kHz and the increasing use of standard frequency and time stations for such things as standard accuracy radio clocks and time inputs into computer networks, etc.

In early 1998, the 136kHz amateur band was introduced in the UK to ultimately replace the limited 73kHz band (UK only). The 136kHz band has swiftly proliferated throughout most European countries, and there is every indication that it will be adopted more or less worldwide. The prospect of the USA getting this band would provoke a hectic race for the first transatlantic QSL between the USA and Europe.

Of course, for many years, there has been a USA 1750m (160-190kHz) low power experimental band, which, though not an amateur band, appears to be largely inhabited by North American licensed amateurs. Unfortunately, in Europe, the US 1750m band is usually obliterated by high power a.m. broadcast stations located in Europe, N. Africa and parts of Asia.

Below 500kHz, in addition to the LW BC stations, you can find a multitude of marine and aircraft beacons, navigational stations and systems, RTTY weather information stations and ship to shore transmissions, etc. To be added must be the world-wide standard frequency and time stations, such as MSF Rugby on 60kHz; DCF77 on 77.5kHz in Germany and the 60kHz WWVB in Colorado, USA.

It is probable that no other 500kHz wide segment, of the radio spectrum, contains such a wide variety of activity. You can find c.w., a.m., s.s.b., RTTY, f.m., Pulse and some very weird signals, which are difficult to identify.

## Receiving Equipment Needed

A good sensitive communications receiver to cover all, or part, of the band from about 10 and 500kHz. The few communications receivers which cover these frequencies are quite costly. However, it is an excellent opportunity to use semi-conductor or older valve communications receivers covering 3.500-4.000MHz,

with a l.f./v.l.f. converter.

The basics of a receiving system are shown in Fig. 1. It consists of a Palomar VLF-A crystal controlled converter (see Fig. 2), covering 10-500kHz, feeding a 3.500-4.000MHz output into an amateur bands communications receiver, though a digital general coverage receiver is quite satisfactory. An alternative mode, the VLF-S, uses a 4.000MHz crystal with an output of 4.000-4.500MHz.

Investigation indicated that the reasonably priced well proved

Palomar VLF-A converter was probably the best available, with a performance only equalled by an earlier home designed/constructed all-valve converter. The receivers normally used with the VLF-A by me are a small digital communications receiver,

which is especially useful when away on holiday, and a mint all-valve Heathkit RA1 valve amateur band communications receiver, which has a wide illuminated tuning scale, a 100kHz crystal calibrator and all other necessary facilities. It has been carefully realigned on the 3.500-4.000MHz band, with a careful selection of r.f. and i.f. valves. A simple audio cassette recorder, at the receiver output, can be used to record any unidentifiable signals for replay and later investigation.

The Palomar VLF-A converter block diagram, shown in Fig. 2, has 50Ω impedance input and output impedances. A 1496 i.c. mixer is used with a MPF102 3.500MHz crystal controlled local oscillator, providing a usable output into the receiver 'i.f.'. The 3.5MHz crystal oscillator can be heard in the receiver and provides a useful crystal marker.

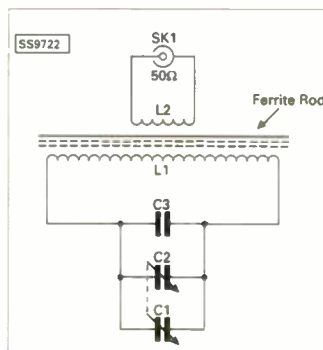
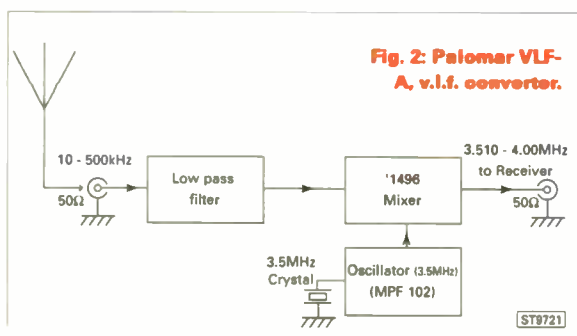
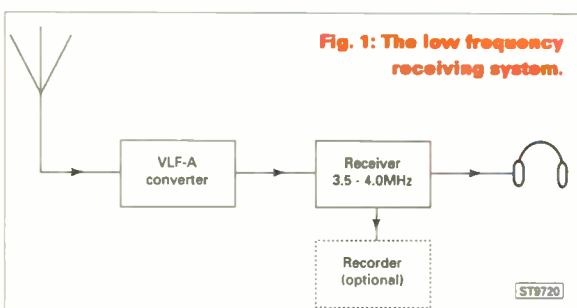
The specification of the VLF-A is quoted as:

<b>Input:</b>	10-500kHz
<b>Output:</b>	3.510-4.000MHz
<b>Power:</b>	9V d.c. at 12mA (a PP4 battery is clipped to the rear of the VLF-A)
<b>Controls:</b>	On/Off - bypass switch
<b>Connections:</b>	SO-239
<b>Filter rejection:</b>	50dB at 1000kHz
<b>IF Rejection:</b>	85dB
<b>Size:</b>	50 x 110 x 130mm
<b>Weight:</b>	300g

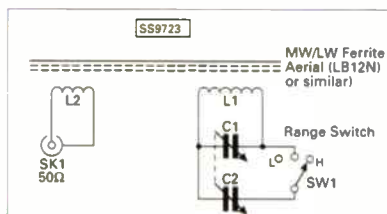
In operation, the actual frequency being received is read off by subtracting the 3.5MHz crystal frequency (l.o.) directly from the receiver 3.510-4.000MHz tuning scale, e.g. 3.550-3.500MHz = 50kHz; 3.700-3.500 = 200kHz and 4.000-3.500MHz gives 500kHz.

## Antennas

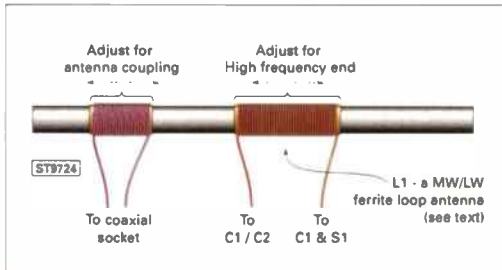
The antenna used at this l.f. band is most important, and much depends as to whether you live in an urban environment or where the noise level is much higher



**Fig. 3: 25 to 80kHz loop antenna.**



**Fig. 4: 75 to 500kHz loop antenna.**



**Fig. 5: Winding layout for the 75 to 500kHz loop.**

than in a rural environment. A resonant dipole, at these frequencies, is a physical impossibility, due to the length involved, though maybe there is someone somewhere who has sufficient real estate and the noise level input would probably make worthwhile reception unworkable.

Noise can be divided into man made and atmospheric. Man made noise covers electrical appliances, wiring and power lines, TVs, computers, light dimmer switches and thermostats and the like. Fortunately, much of this can be eliminated, or greatly reduced, by using a directional loop antenna. Atmospheric noises are due to a wide variety of sources, but the most prominent are electric storms with lightning, and once again a directional loop antenna can be most useful.

Some enthusiasts use an active antenna, but personally, in this urban area, the noise level has been found to be higher than with a good loop. However, in a more rural area, it would be well worth trying.

At the time of writing, I use two carefully designed ferrite loops to cover the required range in two steps - (1) 25-80kHz, see Figs. 3, 6, and 7c and (2) 75-500kHz, see Figs. 4, 5 and 7b. Both loops have been found to be most effective, with directional properties which greatly reduce the noise level and an excellent signal.

I have abandoned a 1.2m dia. spiral loop as being too cumbersome, in the available space, and is noisier than the ferrite loops. However, I intend looking further into redesigned both active antennas and frame loops, using some new ideas.

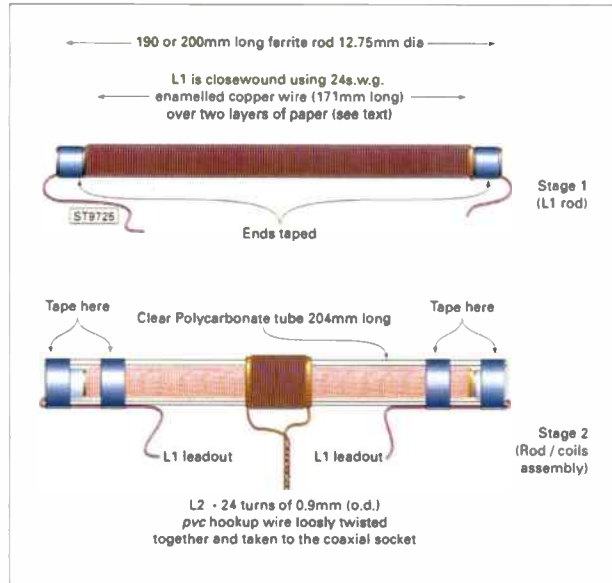
### Antenna Construction

I have utilised a common chassis/box assembly for both antennas - see Fig. 7a. It consists of a PX3 ABS plastic box (90 x 149.5 x 52.5mm) with a 2-gang 500 + 500pF airspaced variable capacitor mounted at one end (with an insulated extension shaft and knob). A coaxial output socket is fitted at the opposite end. This arrangement ensures that the two items are in line with the null of the loop. In both units, the ferrite rod antennas are fitted at the top of the box.

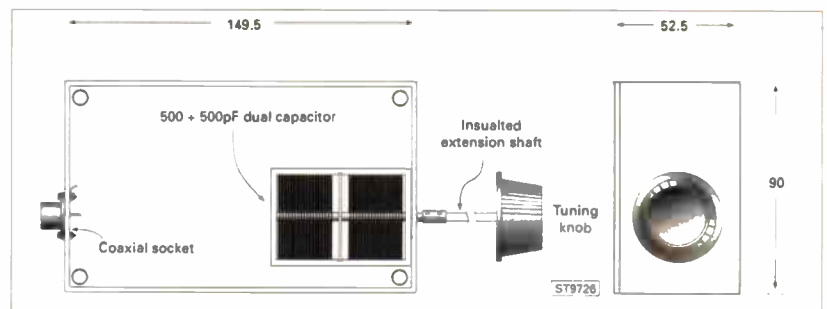
### The 25-80kHz Loop

The schematic in Fig. 3 shows a tuned ferrite rod coil, L1, resonated by a 2-gang 500 + 500pF receiver type variable capacitor, with both sections C1C2 wired in parallel, plus a 1nF ceramic disc, also in parallel. The ferrite rod can be either 7.5in long x 0.5in diameter: Manganese Zinc 33 material ( $\mu = 850$ ) or an 8in x 0.5in diameter rod, fabricated from two 4in rods adhered end to end, with superglue, after cleaning the ends with fine glass paper. Onto the rod are wound two layers of self-adhesive address labels. This, in effect, separates the wire from the rod.

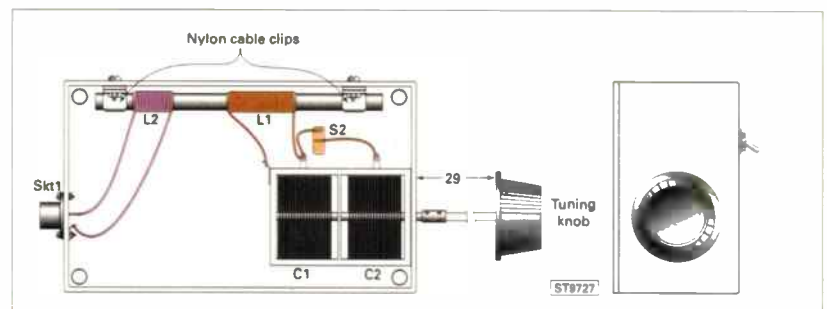
L1 consists of 171mm wide closewound turns of



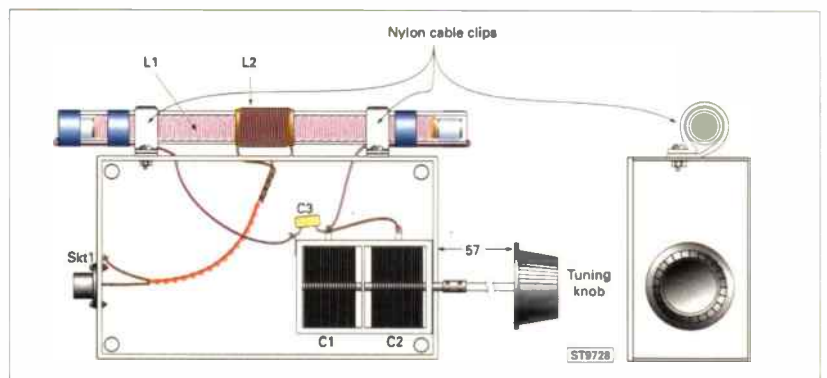
**Fig. 6: Winding layout for the 25 to 80kHz loop.**



**Fig. 7a: Enclosure, ABS plastic box assembly (PX3).**



**Fig. 7b: 75 to 500kHz loop - final assembly.**



**Fig. 7c: 25 to 80kHz loop - final assembly.**

24s.w.g. enamel copper wire - see Fig. 6. L1 is then inserted into an 200mm length of 5/8in o.d. clear polycarbonate tubing obtained from a tropical fish

**Continued on page 54...**



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# An Effective LF Receiving System

...continued  
from page 51

emporium. The antenna coupling winding L2 is 24 closewound turns of 0.9mm o.d. PVC 'hookup' wire wound over the centre of this tubing. The ends of L2 are

loosely twisted together to go to the coaxial socket.

The L1/L2 assembly is mounted on top of the plastic box, Fig. 7c, using two nylon 'P' cable clips. The ends of L1 and the twisted ends of L2 are taken through small holes drilled in the box top and wired as schematic Fig. 3 and assembly Fig. 7c.

s.w. signals can be heard breaking through, re-check the coaxial interconnections between the loop - VLF-A and receiver.

As an initial frequency and efficiency check, the standard frequency and times station's MSF Rugby should appear at 60kHz (3.560MHz displayed) and the German DCF77 should appear at 77.5kHz (3.5775MHz displayed). The latter should certainly be receivable at night and often during daylight. In the USA listen for WWVB on 60kHz. In all cases, the ferrite loop should be rotated for maximum signal/minimum noise.

The directivity can be quite sharp, see Fig. 8. Once satisfied that all is well, the plastic lid should be screwed onto the box to keep out dust.

The 75-500kHz loop testing should proceed in a similar manner to the above. However, it is necessary to adjust the position of L1 for frequency range and L2 for coupling. L2 should be moved to the extreme left of the rod and L1 to the extreme right. The position of L1 should then be adjusted until the loop resonates at about 520kHz, i.e. just h.f. of 500kHz and then held in position with adhesive tape.

The coupling coil L2 is then adjusted for maximum signal strength at 500kHz and temporarily fixed in position and L1 slightly readjusted if necessary. It will be found that if the antenna coupling coil L2 is adjusted to maximum signal strength at 500kHz, this will be satisfactory at the lower frequencies.

Assuming that the receiver calibrations are accurate, the antenna should now cover 75-500kHz, but this should be cross checked with BBC R4 on 198kHz and French Allouis on 162kHz. Receiver dial readings of 3.698 and 3.662MHz respectively. Also, once again, the German Time and Frequency Station DCF77 (77.5kHz) should appear just inside the l.f. end on receiver dial reading 3.5775MHz.

## Post Script

The lower limit end of the 25-80kHz antenna can be reduced by switching in an extra capacitor across C1, C2 and C3.

I have found that a pre-amplifier between the ferrite loops and VLF-A have been found to be unnecessary. It would amplify the signal and the noise and could override the low pass filter in VLF-A.

The l.f. receiving system described in this article is an economical and very effective way of receiving the new European and UK experimental bands.

And finally, anyone still contemplating a dipole or other full size wire antenna might reflect on the following: A wavelength at 250kHz is about 1200m, 170kHz is 1764m and at 10kHz a wavelength is 30km.

SWM

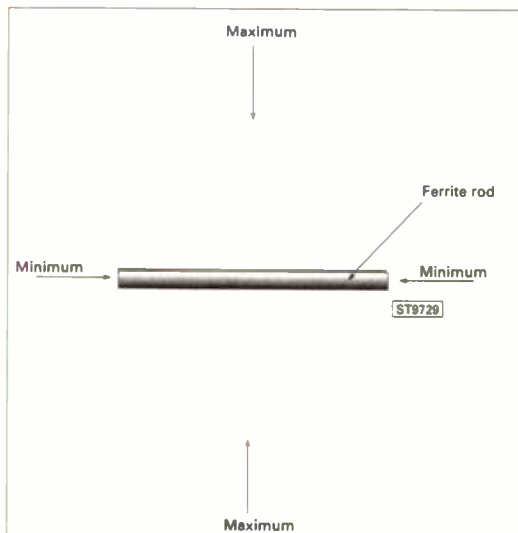


Fig. 8: The antenna's typical polar diagram.

defunct old radio. On such a l.w./m.w. ferrite antenna the nominal inductance would be about 4.1mH for the l.w. coil and 370µH for the m.w. coil.

The actual inductances will depend on the position of the coils on the rod, e.g. the highest inductance is when the coil is at the centre of the rod and the lowest at the end. This feature is used to adjust the correct top end frequency of antenna coupling. The l.w. winding is used for L1 and the m.w. winding for L2, see Fig. 5.

The rod/coil assembly is mounted inside the box top with two nylon 'P' clips, see Fig. 7b. A miniature toggle switch (SW1) is fitted in the back of the box (Fig. 7b) to switch C2 in parallel with C1 to give two ranges, High - 520 to 130kHz and Low - 490-75kHz, which effectively moves the frequency range down from 130-75kHz.

## Adjusting, Testing & Operating

The 25-80kHz loop is quite straightforward and should be connected to VLF-A converter with a RG-58 coaxial cable. With the receiver and VLF-A switched on, the 3.500MHz crystal in the VLF-A should be heard on the receiver with its tuning dial at 3.500MHz. If

## You Will Need

### Qty Item

- 2 ABS box, 90 x 149.5 x 52.5mm - PX3.
- 2 500 + 500pF, receiver type airspace 2-gang variable capacitor - Jackson 'type O', or similar.
- 1 1nF capacitor, ceramic disc or silver mica.
- 1 Switch, miniature s.p.s.t. toggle.
- 2 Coaxial sockets, panel mounting.
- 4 Nylon cable 'P' clips 1/2 x 1/4in \*\*
- 1 Ferrite rod antenna, m.w./l.w. - Maplin type LB12N or similar.
- 1 Manganese Zinc (grade 33) ferrite rod, 7.5in long x 1/2in dia., type R33-075-1200 from Amidon.\*\* or 2off ferrite rods, 4in x 1/2in dia. (grade 33) from Palomar or Amidon\*\*; 200mm length clear polycarbonate tubing, 5/8in o.d. from fish tank accessory supplier.\*\*

## Miscellaneous

Enamelled copper wire 24s.w.g.; pvc insulated 'hookup' wire 0.9mm o.d.; coaxial plugs; RG58 coaxial cable; 2off knobs and insulated extension shafts for 2-gang variable capacitor.

## VLF-A Converter - From Palomar

At the time of writing, comparatively low cost suitable 8in x 1/2in type 43 ( $\mu = 850$ ) ferrite rods are available from Surplus Sales of Nebraska, 1502 James Street, Omaha NE 68102 USA. Apparently, substantial stocks exist.\*\*

**Note: Items marked \*\* are quoted and supplied in inches - not metric.**

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# The Voltage-Probe Antenna

Peter Buchan, inspired by some old and dusty state-side magazines which presented some theory and research, went to work on developing an antenna idea he found within those pages.

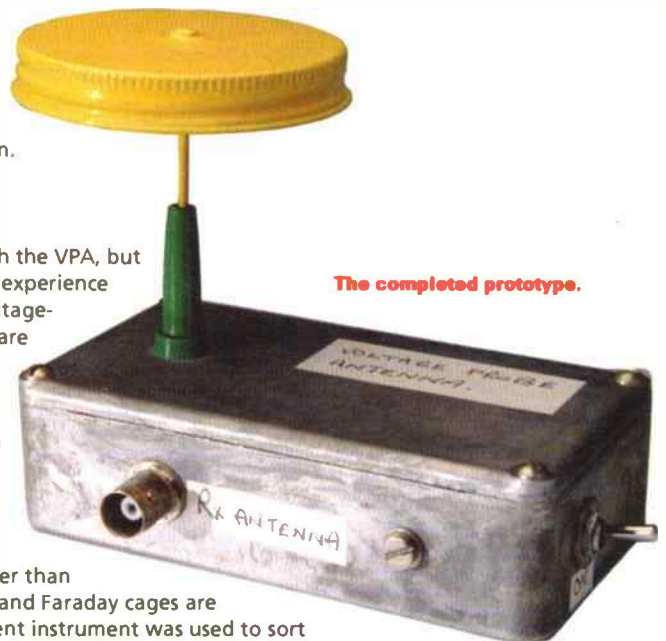
**B**rowsing through old radio magazines is a fascinating and sometimes rewarding pastime. Recently, whilst looking at a few copies of the American magazine *Ham Radio*, all nearly 30 years old, I came across the interesting article titled 'Voltage-Probe Antennas'. [1]. This article described some research [2] on a very small active antenna which claimed to out-perform the common one metre whip antennas supplied with table-top short wave receivers, and also a ground mounted five metre vertical. The active circuit made use of discrete components, making

particular use of a Field Effect Transistor (f.e.t.), but no detailed information was given.

## In The Field

I was not familiar with the VPA, but I've had considerable experience making and using Voltage-Probes (VP'). The VP' are instruments used to search out electric fields and interference when conducting research on insect nervous systems. Glass electrode impedance's greater than  $1G\Omega$  are common and Faraday cages are required. A different instrument was used to sort out magnetic fields. Early VP' used discrete components but later ones made use of the then innovative op-amp, and a little later of course the f.e.t. input op-amp.

Bearing in mind the 1MHz Bandwidth; it took but 30 minutes or so to knock up a VP using the ubiquitous 741 Op-Amp. Instead of the normal search probe a very small antenna was constructed as per the photograph in the old *Ham Radio* article; connecting the battery supply and the probe output, through a coaxial cable to a Ten-Tec 585 antenna socket, a search of the lower frequencies commenced. The results were quite extraordinary. The VPA was also tested using an Icom 745 with similar results. The VPA

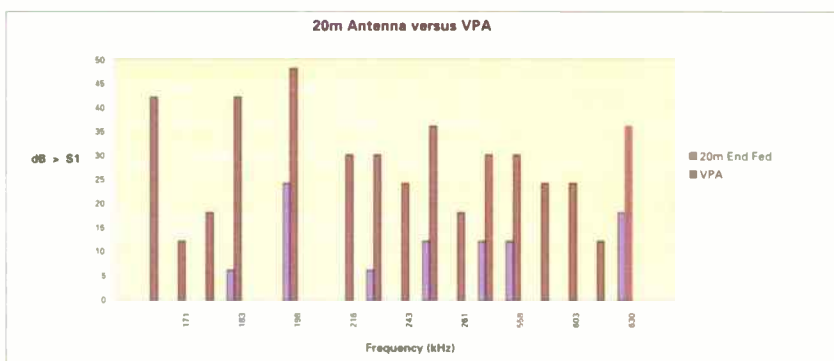


The completed prototype.

Fig 1a

Frequency (kHz)	Wire (dB)	VPA (dB)	Station
162		42	Allouis, France
171		12	?
177		18	Oranienburg, Germany
183	6	42	Saarlouis, Germany
189			
198	24	48	BBC R4, UK
207			
216		30	Munich, Germany
234	6	30	Beidweiler, Luxemburg
243		24	Kalundborg, Denmark
252	12	36	Atlantic 252, Ireland
261		18	Burg (R.Ropa), Germany
540	12	30	?
558	12	30	?
567		24	Tullamore RTE1, Eire
603		24	Newcastle, UK
612		12	Athlone RTE2, Eire
630	18	36	Luton, UK

Fig. 1: The increase in dB above S1 of signals received on the VPA against those received on the 20m end-fed wire.



Continued on page 58...



Batteries and amplifier board.



# MULTICOMM 2000

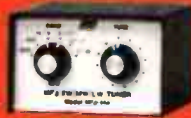


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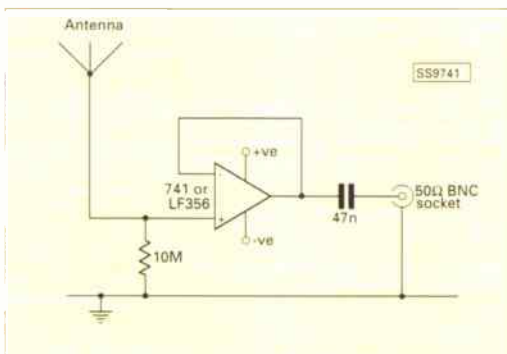
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# The Voltage-Probe Antenna



**Fig. 2: Theoretical circuit of the VPA. Note that the op-amp is connected as a voltage follower. The same circuit is used for either a 741 or LF356 amplifier.**

**...continued from page 55**

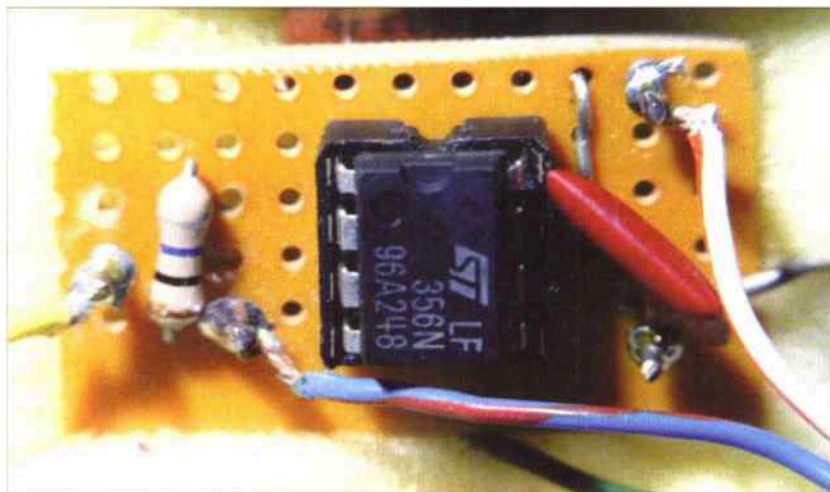
out-performed a 20m end-fed antenna from 100kHz up to 1MHz, increasing the strength of signals at the lower end by as much as 40dB, see Fig. 1. Here was evidence that a very useful active antenna could be constructed from just a few components.

Further work showed that the VP **must** be contained in a screened enclosure and positioned at least 2m from any type of metal work. This includes the receiver itself, and such

devices as filing cabinets, water piping, and electrical conduit or wiring. To avoid overloading, the VPA should be used remotely from a large antenna. An improvement in performance is realised by changing the 741 op-amp for an SGS LF356; nevertheless the 741 does work very well.

The impedance characteristics of a very short antenna, one that is very much less than a quarter wave, show the antenna to be overwhelmingly reactive. The resistance is of the order of milliohms in series with a capacitive reactance of about 1MΩ. Connecting this across the 50Ω input of a communication receiver leaves only a minute percentage of the signal voltage for amplification, the remainder being

reflected. The VPA however, with the Op-Amp connected as a Voltage Follower, presents a very high input impedance, especially so the LF356 with its input resistance claimed as being one Tera ohm, that's  $10^{12}\Omega$ . The op-amp is not acting exactly as a matching device but nevertheless allows the signal to be presented to the receiver at an impedance of about 50Ω. The output impedance of both the 741 and LF356 devices is about 50Ω.



**The op-amp assembled on perforated board.**

## You Will Need

Die-Cast Box	1	DCM 5003/13
4mm plug	1	JB24B
4mm chassis socket	1	HF69A
Socket, 8-pin d.i.l.	1	BL17T
Op-amp, LF356N, SGS AV51F	1	
BNC socket, 50Ω	1	HH18U
Switch d.p.d.t.	1	
Battery clips (PP3)	2	HF28F

Part numbers relate to Maplin Electronics items.

## Construction

Construction of the VPA is quite straightforward. The VPA shown in the photograph was made up into a small Eddystone die-cast box with the addition of an on/off switch, a BNC coaxial socket, a 4mm plug and socket (banana plug) plus an 8-pin d.i.l. socket a small piece of 0.1in pitch matrix board and of course a 741 or LF356 op-amp.

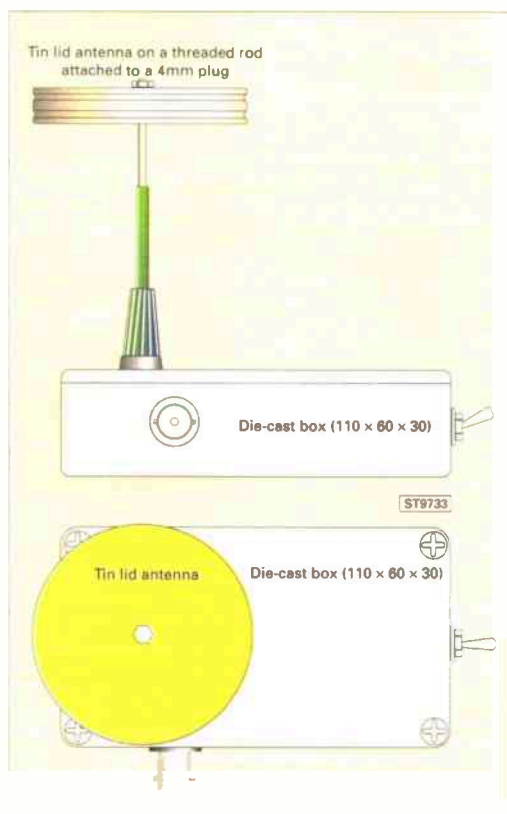
The antenna was constructed by soldering 50mm of 6BA threaded rod into the 4mm plug, on top of the rod was fixed a discarded tin lid 60mm diameter, by first drilling a 6BA clearance hole into the centre of the lid, securing the lid with a 6BA nut on both sides and then soldering the nuts to the lid. A coat of paint was added later. The circuit of the VPA is shown in Fig. 2. and the enclosure in Fig. 3.

## Results

Further tests were carried out using an AKD HF3 receiver which tunes from 30kHz, using the same 20m antenna. The AKD out-performed the Ten-Tec and other receivers, below 1MHz by a fair margin but with the addition of the VPA the low frequency performance was considerably enhanced, especially below 100kHz. **SWM**

## References

1. *Ham Radio*, October 1970. Page 20.
2. *Voltage probe Antenna* Robert Fischer, Kollmorgen Corp. Report ER 848.1. 29 January 1968.



**Fig. 3: Plan and side views of the VPA, see text.**

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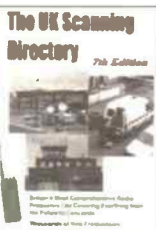
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# Propagation Forecasts

## How to use the Propagation Charts

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

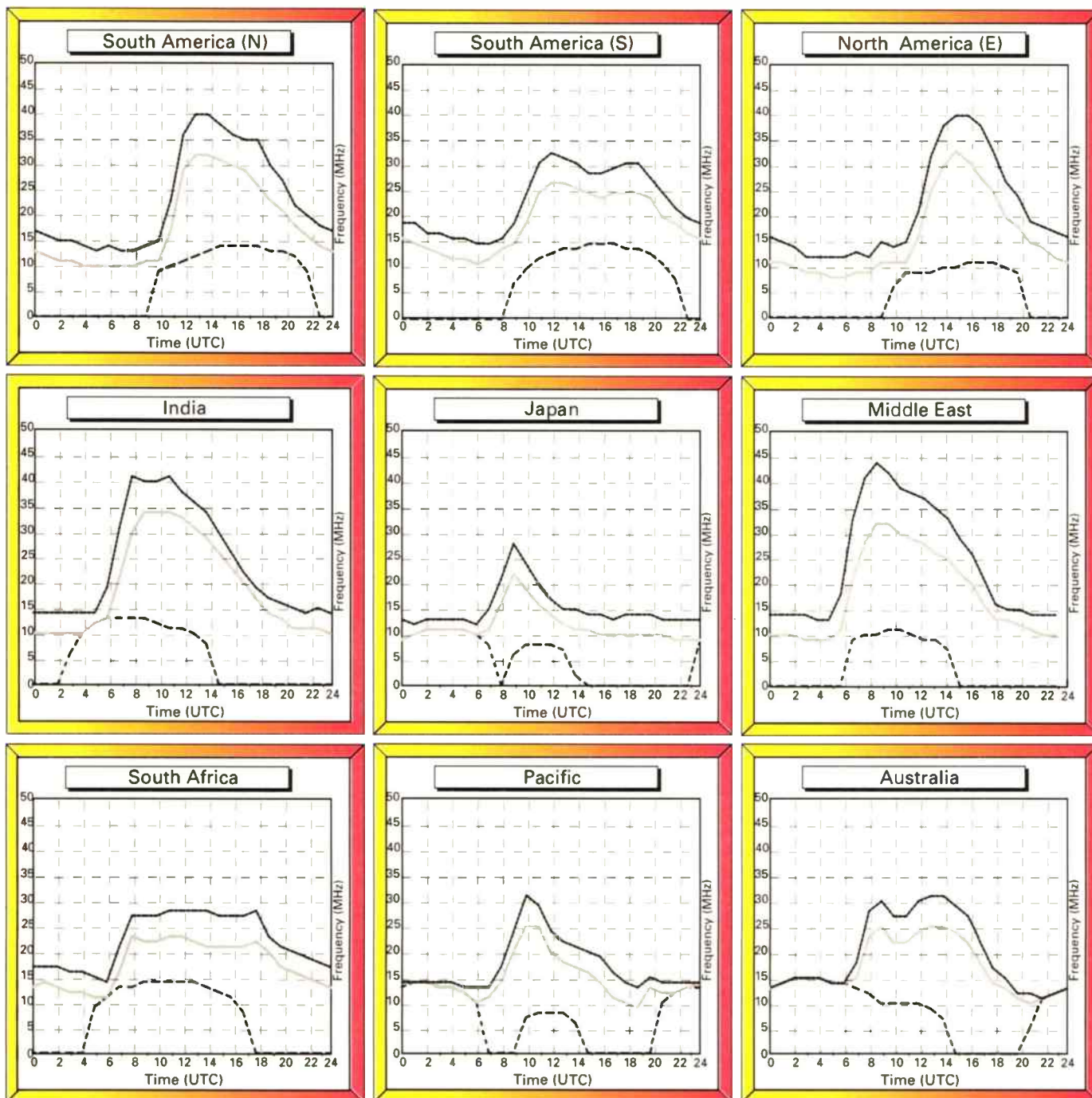
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

probability of success for the path and time.

To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

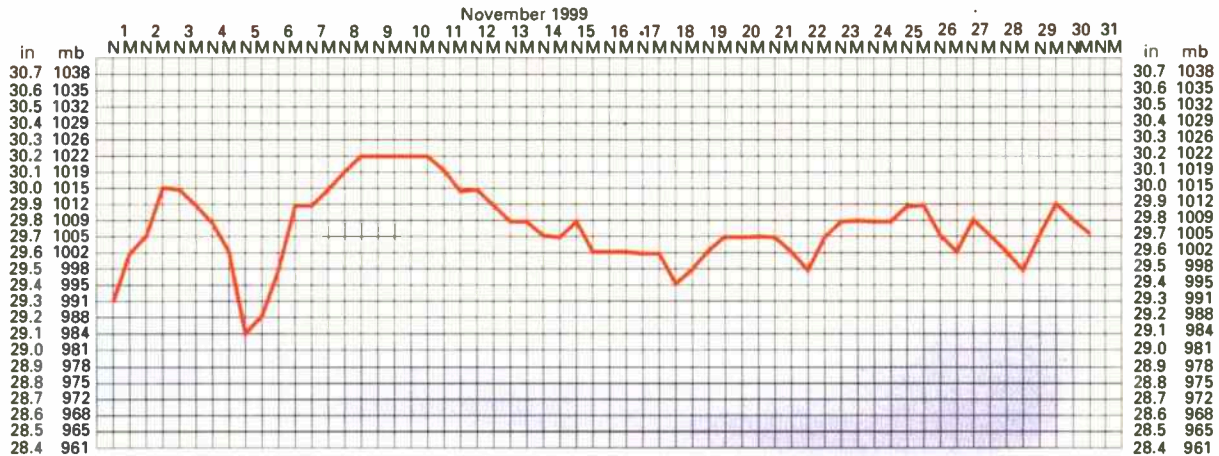
January 2000  
Circuits to London



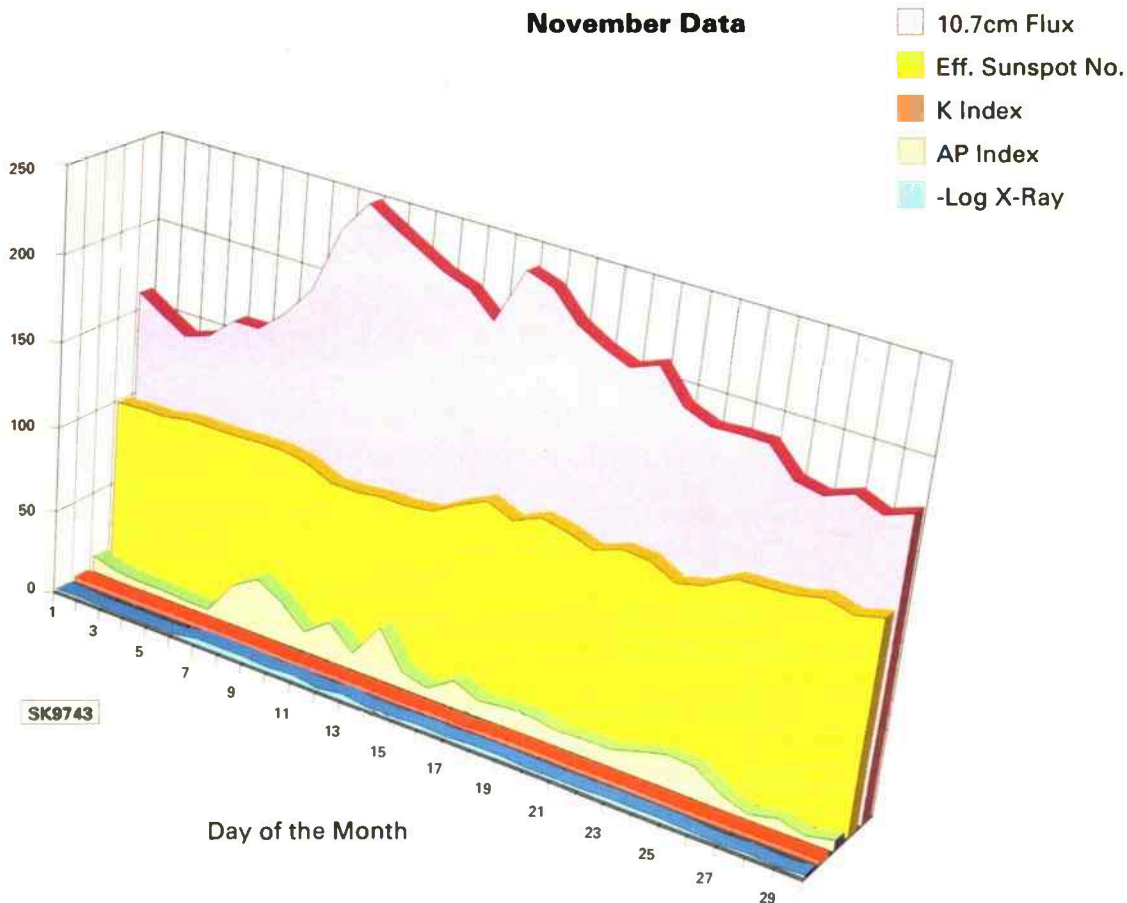
SK9742

# Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, November 1999.



## November Data



## guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed).

K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

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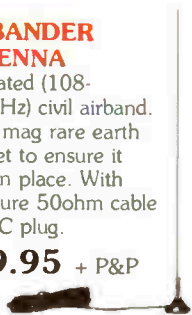


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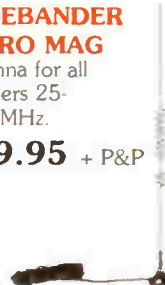
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**Earphone socket** allow you to plug in  
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undisturbed listening

**Scan speed** high speed scan up to 40  
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steps per second

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**Rear panel**

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**Tape-out** connect your tape recorder

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optional extension speaker

**DC 13.V** connect your vehicles cigar  
lighter socket with optional DC cigar  
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**Reset** reset the scanner back to factory  
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**Dimensions** 232 x 210 x 90mm (WDH)  
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# Airband

## Abbreviations

AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
a.m.	amplitude modulation
CAA	Civil Aviation Authority
CD-ROM	Compact Disc - Read Only Memory
GPS	Global Positioning System
kHz	kilohertz
MHz	megahertz
nm	nautical miles
STAR	Standard Terminal Arrival Route
UIR	Upper Information Region
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range

I have pleasure in presenting my annual Christmas Quiz. It's a written question this year. What are the classes of aeroplane that are designed to be capable of taking off from water? You need to demonstrate your understanding of the subject by writing a description of each class. Also, tell me to which class the Super Catalina belongs. In last April's issue I had the unfortunate duty of describing what happened to one when something went wrong during takeoff.

Rules are, that my decision is final and no correspondence can be entered into. The clearest, most comprehensive, written submission (no pictures allowed!) will be the winner. Entries must arrive at my Museum address (see above) by the end of January for the results to appear in the April issue. The kindly Editor will be sending the winner a prize.

## Information Sources

To tie up flight numbers with routes, try *Airport Timetables from Airtime Publishing Ltd., 7 Steven Close, Toton, Nottingham NG9 6JX*. There are two volumes, sold separately: *UK* (out twice a year, the Winter 1999/2000 issue now being available) and *Heathrow & Gatwick* (three issues a year, November's now available with further releases in April and July). You could send them a pre-paid reply envelope for their latest prices.

Last month **Andrew Green** (Barnsley) asked about the allocation of certain frequencies. The *AIP* on CD-ROM is easy to access for this information. The 'Enroute, ENR-3, Upper ATS Routes' section appears on your screen courtesy of the Adobe Acrobat reader. At the top of the screen is an icon that looks like a pair of binoculars. Click on this and you have the facility to look up text.

When I entered 118.475 (MHz frequencies) as asked about by Andrew, the text jumped to UB29 Lambourne to UIR boundary. Likewise, 126.775 and 128.125 = UB1 Ottringham to BLUFA; 127.1 = UA2 Trent to abeam Brookmans Park and 135.575 = UB1 LIFFY to Wallasey.

What else can the *AIP* on CD-ROM do for you? Section 'ENR 4.3' would tell **Pete Jarmolinski** (Doncaster) that SKINA is a reporting point on Birmingham STARs about 15nm north of the Trent v.o.r. beacon and that TARAN, just south of Gatwick, is for the Gatwick and Heathrow STARs.

A trial version of the CD-ROM is on sale. Send a cheque or postal order for £5, payable to National Air Traffic Services Ltd., to **AIS Publications (CD-ROM), Room 160, Control Tower Building, London Heathrow Airport, Hounslow, Middlesex TW6 1JJ**. You will only receive the

current copy, no updates are included when the information changes in future. I'm not sure for how much longer this offer is open, let me know if you are refused a copy and I'll announce the fact here. If you haven't a computer, the paper version is expensive, but a local aerodrome or flying club might let you look at theirs if you ask nicely.

Pete wants to know about reporting points for the North Atlantic Organised Track System. Twice a day, the routes are determined according to the most favourable wind directions. On the tracks, positions are referred to simply by latitude and longitude. These are easily plotted on a chart such as NAT-1 from Raca/Aerad which also shows fixed entry/exit points. You can buy these, by mail order, from the address given on my *Airband Factsheet*. This in turn is available from the Broadstone Editorial Offices (**not** from me!) on provision of a pre-paid reply envelope to hold two A4 sheets. It's also on the website ([www.pwpublishing.ltd.uk](http://www.pwpublishing.ltd.uk) text only, no supersonic routes chart).

## 8.33kHz Update

The new, closely-spaced 8.33kHz channels in the v.h.f. communications airband are starting to be assigned. **Mike Wynn** (Isle of Wight) tells me that Brest Control (France) is now on 133.475 (133.480), 129.000 (129.005) and 131.175 (131.180)MHz. The UK will not make use of such extra channels until 2002.

Why two frequencies for each channel? I've quoted the actual frequencies that you would have to select on a typical scanning receiver. Now, to keep things tidy, these are not stated by the controller. Instead, the frequencies are rounded to the nearest convenient number in a fixed way. For example, the controller says (and the pilot selects) 131.18 which is fine on the dedicated radio in the aircraft. In reality, the radio actually tunes itself to precisely 131.175 which is also the frequency to which a scanner would need to be set to remain on channel.

Confused? Think how the rest of the aeronautical community feels! You, dear readers, have an advantage though. On the website (see above) you will find the complete list of frequencies that I have prepared for you. Now, if a controller says a 'nearest' frequency, you can look up the real setting! The list will also be on the next cover CD-ROM that *SWM* carries.

The list is too long to print. If you haven't Internet access and want to know the details of a specific frequency, write in and I'll answer in this column. Alternatively, I am considering copying the list on to a floppy. If you would take up this idea, write in but **don't** send a floppy until you read about it here, I need to see if I'm going to be overwhelmed! The file will be readable with a web browser, available on most recent computers (or the *AIP* on CD-ROM, see above) even if you haven't an Internet connection.

One difficulty is that pilots must not transmit on the 'old' frequencies with 25kHz equipment. The bandwidth of the transmission would be too wide and hence spread across to (and interfere with) the new interleaved frequencies. That's why the controller doesn't say 129.0 but instead 129.005. Only the new sets will display this peculiar-sounding frequency on their tuning dials, the old ones won't. In reality, they both transmit exactly on 129.0, but the new sets put out a narrow bandwidth signal.

## Receiver Hardware

With these new allocations, what receivers are best? I can only offer a personal choice with which you have every right to disagree. That's why it's hard to advise **G. Sims** (Wiltshire) who asked me directly for advice in the letter on page 5 of the November issue.



Dassault Falcon 50.  
Christine Mlynek.



**Blackburn 1912.**  
Christine Mlynek.

For commercial and airborne purposes, type-approved equipment is mandatory. For general monitoring, a hand-held scanner might do. Certainly, Mike Wynn reckons a non-8.33 set such as the Yupiteru MVT-7100 will tune close to the new channel centres when set to 1kHz steps. However, it's not just about tuning. As we've seen, these are narrow, tightly-packed channels and a correspondingly narrow filter is needed in a receiver to prevent interference from adjacent transmissions.

The only scanner that I know of that is currently on sale and is designed for 8.33kHz steps (inclusive of a narrow a.m. receiving mode) is the AR8200 from AOR. It's not perfect, disadvantages include the fact that it's expensive for a hand-held. The money buys you complex functions and a big instruction book but, if most clever facilities aren't needed, then it makes it tiresome learning to operate the set. Being very wide coverage, interference from nearby strong signals is noticeable. Yet it doesn't quite resolve 198kHz with enough sensitivity, so I won't be able to take one on holiday for Chris to listen to the news over breakfast while in France!

I say that I know of no other set specifically equipped for 8.33kHz channels. I'm surprised that no other manufacturer has met the challenge (with a blaze of publicity). Some previously proposed receivers don't seem to be available. So, if you're a vendor choking with indignation that I haven't mentioned your offering, do something about it and send me your specification and price list!

## Frequency & Operational News

From January, larger aircraft must carry the Airborne Collision Avoidance System, ACAS II, when in UK airspace. This works by detecting the secondary radar returns from surrounding aircraft. If one appears to suggest a collision course, the pilot receives a warning on an instrument in the cockpit of either a Traffic Advisory (an alert not yet sufficiently serious to require action) or a Resolution Advisory.

In the latter case, the pilot must act immediately, the instruction always being a vertical change (never a directional one). Hopefully, both aircraft involved simultaneously receive mutually deconflicting instructions. Pilots inform the controller once the avoidance action has been initiated and the immediate danger is over.

In October (page 50) I warned of a GPS jamming trial. This has been extended by A/C 121/1999 from the CAA. The trial could take place at any time up to the end of February, centred on a point between Stonehenge and Danger Area 124. If you experience the jamming, let me know!

Some new Danger Areas were in the AIP amendments sent by **Martin Sutton** (CAA). They are: D213 (along with a small arms range) at Kineton (isn't that the ammunition dump in Warwickshire?), D215 North Luffenham (near Peterborough) and D216 Credenhill (near Hereford).

Sorry to hold over letters from **Martin** (Clapham) again and **Jonathan Clough**, **Quentin Cruse** and **C. Robinson**. All other letters received up to November 11 have been answered.

The next three deadlines (for topical information) are January 10, February 7 and March 6. Replies always appear in this column and it is regretted that no direct correspondence is possible.

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\*Because of a packed January 2000 issue the fourth & final part of the 'Get Going On Microwaves' series by **David Butler G4ASR** had to be held over to the February issue. Catch it and discover where to obtain components, kits and surplus equipment for the Microwave bands.

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## Leonids

Every year the planet Earth passes through the trails of the comet *Tempel-Tuttle*. This comet was discovered by Ernst Tempel and Horace Tuttle in 1861, and its full name is *55P/Tempel-Tuttle*. The passage of the Earth through the comet debris causes a large increase in the sightings of meteors, as the dust and debris from the tail of the comet enters the earth's atmosphere and burn-up, causing a tell-tale shooting star. The peak for this meteor shower falls between November 13th and 20th each year. When viewed from earth, the meteors appear to come from the constellation of Leo, so the shower is known as the *Leonids*.

Every 33 years there is a large increase in the number of shooting stars entering the atmosphere. This is due to the orbit of Earth passing close to the orbit of comet *Tempel-Tuttle*. 1999 was the last peak of the millennium, and NASA mounted a complex mission to track the shooting stars and to perform experiments upon them. The peak of the meteor shower in 1999 was spread over three days - November 17th to 19th.

NASA sent two aircraft to Europe to provide a viewing platform for the experiments and to provide a real-time video down-link of the night sky. The results of the down-link were viewable via NASA's cable-TV service, and also via a live Internet link.

The two aircraft sent to Europe are normally based at Edwards AFB in California with the 452nd Flight Test Squadron. NASA sent a NKC-135E FISTA (Flying Infrared Signature Technology Aircraft) and an EC-18B ARIA (Advanced Ranging and Instrumentation Aircraft).

The NKC-135E is a heavily modified KC-135 tanker aircraft equipped with 20 upward-looking windows to allow maximum coverage of the sky. The EC-18B is a military variant of the Boeing 707 airliner, equipped with a huge telemetry dish inside an extended nose cone. The telemetry dish was used to communicate with a TDRSS satellite and to pass the real-time video-feed back to NASA HQ.

The airborne experiments makes it possible to avoid poor November weather by flying above the clouds to avoid the scattering of light by dust particles in the air and to rise above the low-altitude haze and water-vapour which would block measurements.

For this series of experiments, the aircraft flew from Edwards AFB to the eastern USA (13th Nov.) where they refueled before crossing the Atlantic that night. They were heard working Shanwick ATC on 5.616MHz during the early hours of the morning of the 14th. Their callsigns were Agar 35 and Agar 92 respectively. They arrived at RAF Mildenhall early that morning, where they rested until the 17th. They departed RAF Mildenhall late on the 17th for a flight to Tel Aviv in Israel, using the same callsigns as before. They were heard soon after departure talking to Thule GHFS on 8.992MHz, to report their on-time departure, and to advise their ground party in Tel Aviv that they were on their way. The route from the UK took them south over France, and into Spanish airspace at the western end of the Mediterranean, before they turned east and flew the entire length of the Mediterranean Sea.

That night (17th), the aircraft flew across Europe to Tel Aviv, watching the meteor storm, making experimental measurements, and relaying the pictures back to the USA. The two aircraft flew along a parallel track about 96km apart so they could provide a stereoscopic view of the meteor shower, which will allow later triangulation of the shooting stars, their trajectories, and their orbits.

Both aircraft departed Tel Aviv at about midnight

on the 18th for a westbound flight along the Mediterranean Sea, out into the Atlantic Ocean, and to land at Lajes AB in the Azores. This allowed a second night monitoring the meteor shower.

Once again, the aircraft were heard using the same callsigns working Thule GHFS on 8.992MHz. This time, they were getting weather forecasts for Lajes AB, and one of the aircraft (Agar 35) stated they were "overhead Madrid". During this flight, the aircraft were also heard working Cape Radio on 10.780MHz, where they revealed that they would be using the same frequencies tonight that we used last night. ARIA aircraft will transmit on 7.833, and ARIA aircraft will use 9.043 to receive. Both aircraft and Cape Radio were heard doing radio checks on 7.833 and 9.043MHz. Later in the night, they changed frequency, and were heard using 14.432MHz (ARIA transmit) and 13.878MHz (ARIA receive).

On the night of 19th November (actually, about 0330 on 20th November), the aircraft departed Lajes AB for the transatlantic flight back to Patrick AFB in Florida. This last leg of the mission is the final chance to examine the *Leonid* meteor shower for many years. They were heard working Santa Maria ATC on 5.598MHz soon after they departed Lajes AB.

## JMC

By the start of October 1999, the Ministry of Defence (MoD) had released the dates for the first JMC (Joint Maritime Conference) exercise of 2000. The information came from quite a surprising source. The MoD web-site includes some pages of information relating to low-flying in and around the UK, and this revealed that the dates for JMC 1/00 are from 25th February 2000 until 13th March 2000.

During the early months of each year, I get several requests for me to provide advance information concerning this series of exercise (and several others also), so it quite gratifying to be able to present these dates for you prior to the event actually taking place. However, I can report that this information originates from the Internet - the MoD site (see details elsewhere on this page) includes some

interesting information about their policy on low-flying and military exercises.

Now that you know when, and can find out where it will take place from the CAA website listed a few months ago, you are all set to listen-in to the exercise. The article by Keith Elgin in the December 1999 issue ('JMC Low Down', pages 44-48) will give you an idea of the frequencies to listen to, and how to find more frequencies.

## Millennium

This issue of *Short Wave Magazine* should reach most of you around about the Christmas period, so now is the ideal opportunity to send out seasons greetings to friends and contributors to this column, and to thank them for all their help and assistance over the past year.

I will be listening to h.f. at various times of the Christmas period - you never know what you will hear. Last year, there was all the drama of the Australian yacht race, who knows what will happen on the airwaves this year.



MoD Low-Flying notices - <http://www.mod.uk/policy/lowflying/index.htm>

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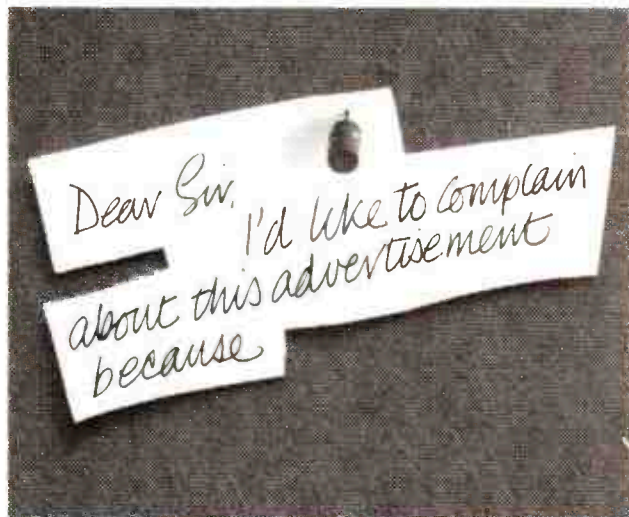
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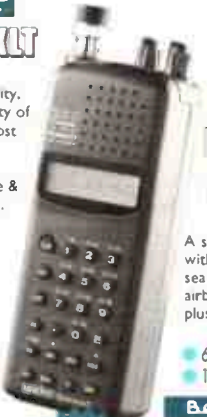


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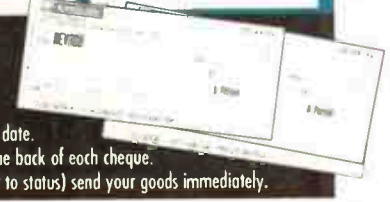


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# Satellite TV News

Just before Christmas, a quarter century ago, I opened a letter from **Steve Birkhill** (now well known in the satellite field) and was completely amazed at the contents. Steve detailed a 1.5m diameter dish system that he had constructed and was receiving satellite transmitted TV signals at u.h.f. - 860MHz - from the *ATS-6* bird slotted above our horizon at 35°E.

Photographs clearly showed pictures of Indian TV and in one moment our modest terrestrial TVDXing horizons (perhaps a noisy Jordan ch.E3 as the exotic ultimate reception) had expanded to perfect pictures from Asia with the antenna sat on the lawn in the back garden. My enthusiasm and excitement was fired and coupled with a three week absence from work (mumps!), later in spring 1976, a rough dish made from chicken wire stretched across a rusty garden lounger, a Jaybeam Group C/D slot Parabeam TV antenna + Wolsey masthead amplifier and noisy signals appeared on my unmodified TV.

I didn't have a clear view of the satellite being through many trees coming into leaf, and as improvements were made, the leaves thickened, and by May, the signal had disappeared! Twenty five years on we have domestic satellite TV, digital and finding a satellite TV live news feed from the USA, or even from a Middle Eastern battlefield, is now a normal way of life on but a 1m dish.

And today, as we enter a new century and a new millennium, the pace of digital evolution accelerates rapidly. We need to take the new technology, adapt and also move forward. May you all enjoy many happy, successful and healthy years in this new age.

## Orbital Sightings

Last month a rail disaster, this month an aircraft disaster. In the early hours of the last day in October, Egyptian flight 990, a passenger Boeing 767 departed JFK airport for Cairo. Within an hour it fell from the sky and disappeared beneath the waves.

The American media is well rehearsed at presenting disasters to the viewing public and observation of the Reuters 11.566GHz-V lease on *NSS-K* @ 21.5°W (SR 5632; FEC 3/4) will aptly confirm this observation. During the afternoon, a series of press meetings, the US Coastguard at their Cape Cod HQ, the air safety folk, President Clinton and live reports into Europe from a series of news presenters all told the unfolding story of yet another 'plane loss in that area. Remember the SwissAir Jumbo, then the passenger jet that speculation suggested had been shot down by a bird missile, and even more recently with the John Kennedy jr 'plane loss, all around the same spot of ocean and all very odd.

Even odder was the final flight of golfing personality Paine Stewart, October 25, and he boarded a Learjet in Florida on route for Dallas, Texas. Hundreds of miles later and over Dakota, USAF pilots noted the windows were frosted over and the jet's excessive height, the aircraft crashed in Dakota killing all humanity on board though mercifully unconscious from a suspected pressure leak and lack of oxygen. The story unfolded on the 'BT WASHINGTON' digital lease @ 21.5°W lease, 11.492GHz-H, SR 5632; FEC 3/4.

It's not often that a news story breaks actually 'on-air', but **John Locker** (Wirral) was monitoring the Armenian digital lease on 36°E (listed as a *Eutelsat II F3* widebeam) on October 28. Proceedings in their parliament were televised when a group of gunmen burst into the building and took out the PM, Vazgen Sarkisyan and several other political figureheads - and in front of the TV cameras. Armenian TV-1 transmits digital at 12.520GHz-H, SR 4340; FEC 1/2.

Programming was obviously changed in view of the drama unfolding, and although John alerted 'yours truly', I

**NBC fed out Stateside using SISLink facilities but using 525-lines NTSC on 36°E.**



**A recent news feed ex Miami reference the latest hurricane, *NSS-K* @ 21.5°W digital.**

just couldn't lock up the signal. It registered on my receiver at about 25% FSD, but despite the claimed Eutelsat 45dBW footprint across the South UK, I failed. My 1.2m dish is smaller than John's equipment, but a 45dBW would normally lock up OK. Very odd.

More live drama on November 3 at 1945 when I was checking out the several usually active frequencies on *NSS-K* digital. The Reuters 11.566GHz-V channel with its on-screen caption was abruptly cut to be followed with aerial shots (from a police helicopter) showing a dockside office building at Northlake, Seattle. Suddenly several police cars screamed off and the chopper followed them through various streets into a residential area where the heavily armed SWAT team surrounded a small house brandishing rapid fire weapons.

Two officers carefully approach the front door...and then the picture cut to the 'Reuters Financial TV caption' - typical! It was later discovered that the hunted criminal, already having shot two people, wasn't in the house.

In preparation for the Lennox-Holyfield fight, November 13, the Maxat lease on the same bird (11.625GHz-V 9SR 5632; FEC 3/4) was feeding live trails into Sky Sports from the car park outside the Las Vegas venue evening (our time) of the 11th - here dark, cold wind and rain - there blue skies and reporters being mopped to keep cool!

Sky Sports late October were taking live PGA golf from 'The Tour Championships' and were spotted in analogue, PAS-3R/6 @ 43°W (12.728GHz-V; audio 6.20MHz), meanwhile Sky were also taking an alternative feed via *NSS-K* digital on a Globecast lease (11.590GHz-V, SR 20145; FEC 3/4). Sky use many ways of bringing their signals home, even to terrestrial fibre optic across the Atlantic at times.

Good to hear that **Cyril Willis** (Kings Lynn) is making good progress from his operation some weeks ago. He is participating in an experimental injected (preventive) chemotherapy and we wish him a successful outcome to the pioneering tests. He comments on an interesting corporate on 21.5°W, November 11. IBM apparently have a quarterly report to staff world-wide to advise and update on the good (and not so good) news within their company.

The 1999 *Employee World Wide Broadcast* was transmitted into the UK late afternoon and included live hookups with other parts of their employee world. J'burg featured heavily as there's a new office centre open, live input from that centre was included. The chairman spoke to



**The Paddington rail disaster, October 5. The SISLink SNG truck ident alternated between 'Rail Disaster' and...**



**the 'SIS-35 UKI-495 ITN' pattern. This on 36°East digital.**



**Live insert standby at 2200 from Paddington crash scene for the network UK news.**



the gathered audience and the 'IBM World' inviting questions. Once the transmission ended, the satellite remained 'up' and the whole presentation - as a VTR recording - was replayed out for those that missed it the first time round. Good to see that IBM use reliable analogue video @ 11.616GHz-V, audio @ 6.60MHz.

The *Amos-1* satellite at 4°W is a craft that I can't resolve easily, but a report received advises that the Yugoslavian TV service 'RTS-Sat' has been taken off the air on that satellite. Apparently the US government was opposed to RTS airing in breach of a political embargo following on from the recent conflict and the US requested the Israel government to switch them off.

I liked a catch by **Roy Carman** (Dorking) in a recent letter, mid October, on Kopernikus (DFS)-2 @ 28.5°E and in glorious analogue, the band of the Devon and Dorset Regiment performing at a military tattoo in the Stadion Sport Halle, Hannover, Germany. Roy awards 5/5 to the NDR channel for the excellent pictures and sound, uplinked via 'NDR Sat Ka 3'. An odd sighting, Roy, on October 22, noted a Sky Box Office boxing match of Naseen v. Soto ex Banbury, Detroit, but the transmission was in the clear and carried on *Eutelsat W2* @ 16°E (11.105GHz; SR 5632; FEC 3/4).

Why this bird and to whom - and non-encrypted - is a mystery indeed! I have noticed that *Intelsat 605* @ 27.5°W has been carrying films in the clear on a Canal Plus channel (11.476GHz-H, SR 17981; FEC 3/4) - a bit too good to last, they've just gone into scrambling!

An important tip from Roy Carman - and he speaks from experience - if you're thinking of buying a Nokia for general 'enthusiast' reception, avoid their new 9800, it doesn't have auto search. It's OK if you want to load down all the programmes on *Astra* or the *Hot Bird*, but offer it a news feed and it gives up. Certain of the 9600 receivers do have auto search.

To check, you need to peer through the heat grill and check the tuner number, the latest tuners are made in Latvia and have a number - 'DF1ST 1173 Art no. 55-500075-01' - this is a **non auto search** and avoid it! If it's a 'made in EU tuner' then it has 'NDT 1006 A art. no. 567009002' or similar then this receiver has auto search and is the one to go for. Our old friend **Hugh Cocks** (Algarve) also confirms the unsuitability of the latest Nokia for 'enthusiast' use.

Just a couple of reception notes. TV Chile that went into scrambling a couple of months ago has now gone back into the clear on *Sirius* @ 5°E. Tap out 12.380GHz-H on the unusual SR 18051; FEC 3/4. Bulgarian TV has dropped analogue and is now Hot Birding in MPEG only - 12.539GHz-H; SR 27500; FEC 3/4 - last two news items from Internet - **owner-sat-stefan@komtron.com** - 'Transponder News' bulletin originated by **Stefan Hagadorn**, Germany, who welcomes sightings, etc. via E-mail on **sat-stefan@ngmedien.de**

## Orbital News

Following the privatisation of several Intelsat satellites last year and the formation of New Skies Satellite (NSS) based in Amsterdam, the first moves of privatising Intelsat itself are now under discussion. The new structuring format should be ready for discussion by July 1, 2000 and will be reviewed Winter 2000.

Providing all is deemed OK, the privatised 'New Intelsat' should be established by April 2001. In the new world, the rejigged Intelsat will ensure that nations dependent on the organisation for its communications and commercial viability will maintain all present facilities and not be disadvantaged.

British Telecom will soon be providing ISDN capability via the Immarsat 'Satelan' service as part of the latter's Global Area Network. The new ISDN capability will offer access to 64Kbit/sec using a compact briefcase size unit which will interface to a laptop or telephone handset and able to deliver broadcast quality programming and short video segments. The briefcase size hardware will cost £10,000 at inception and charges are typically \$2 for voice rising to \$8 for the full 64kbit/sec connection.

SES Astra in Luxembourg are ramping up for the launch of their new *Astra 1K* bird that will launch year 2000 offering a mega payload of 52 high power Ku-band transponders ample to replace most of the current analogue capacity now

transmitting at 19°East. *Astra 1K* will provide for two main beams, one for the UK/Eire (24 transponders) and a European beam reaching across from the Canaries into Russia with similar Ku-band capacity.

The delayed *Astra 2B* launch - not reckoned spring 2000 - is the knock-on effects following solar array problems on other satellites. The problem is within the glass covering of the solar cells and the German makers are now upgrading the panels - that's why *Sirius* and *Astra 1D* are in service at the 28.2°E slot.

Noting the problems above with RTS-SAT, nearby broadcaster RTV Crna Gora has opted into clear MPEG over their *Hot Bird* 13°E slot. And West German regional TV stations NRW-1 (Nordrhein-Westfalen) and Privat TV will go onto satellite during 2000 having just received a 10 year licence to transmit a 24-hour programme format.

Russia has lost another Proton-K rocket during the launch of their Express-A1 end October and launches have once more come to a halt pending investigation into the cause - thought to be rockets in the 2nd stage. This will delay numerous Russian satellite launches and also the Eutelsat's SESAT launch planned late November '99. It will also mean Russian communications must still rely on their aged Gorizont satellite work horses, yesterday's technology and into inclined orbit movement!

There's a new idea for insurance cover in space. A company called 'Assuresat' will soon have launched two Loral 1300 satellites that carry both C and Ku-band transponders (24 for each band simultaneously) or either C and Ku-band (36 transponders for single band working). The satellites will have both comprehensive switching to create the frequency downlinking pattern for the target area and carry a larger than normal fuel payload. This will give sufficient long term fuel for numerous changes in operating slots.

The scheme is that an actively transmitting satellite operator signs and pays a fee for Assuresat backup. Should the satellite operator lose one of his satellites, service can be resumed by transferring one of the Assuresat fleet to the problem slot. At that time, the concerned operator pays a monthly leasing fee to Assuresat for use of the reserve satellite and until a replacement satellite can be launched or 'found'.

Assuresat will not accept business from other satellite operators not signed into the club that suddenly find they are 'satellite-less'. Loral reckon the first Assuresat will launch around September 2001.

## LONDON END OF FEED CHECK TAPE

At the end of several timetabled news feeds ex Latin America this caption appears, the 'Check Tape' flashes, another *NSS-K*.



The South African Motorcycle Grand Prix on *Eutelsat II F4* @ 10°E, note the start of sparklies caused by solar outage



October 31st and a news report into Sky ex Fox News, NY, the presenter closely studies the script concerning the loss of Flight 990 of Egyptair, via *NSS-K* digital.



Press briefing concerning the Flight 990 Boeing 767.

■ LAWRENCE HARRIS, 5 BURNHAM PARK ROAD, PEVERELL, PLYMOUTH, DEVON PL3 5QB

■ E-MAIL: info.orbit@pwpublishing.ltd.uk ■ WEB SITE: http://www.ichycoo-park.freemove.co.uk

# Info in Orbit

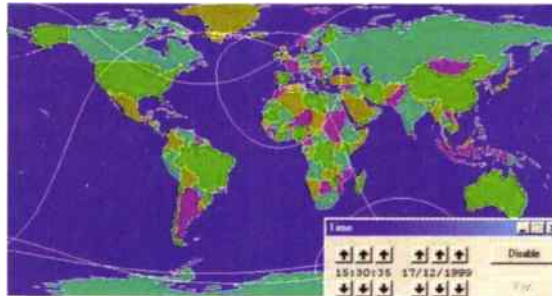
With just a few days left before the year's end, and that of the entire century, December sees the ultimate nostalgia experience. At the start of this century, there were no artificial satellites and the idea of

weather forecasting was probably limited to folklore and seaweed studies.

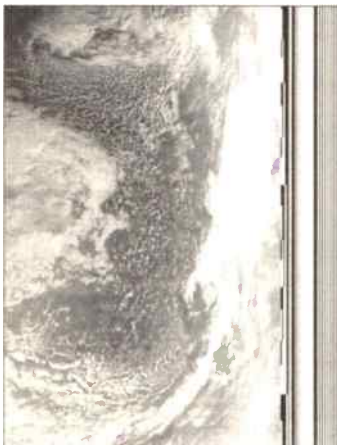
Now I look into my yard and see an antenna farm, a large dish pointing at *METEOSAT-7*, a small dish doing the same thing, a steerable antenna for tuning into some of the Direct Broadcasting Satellites and a set of Yagis to tune

to other satellites and to help monitor meteor reflections!

As I write this, the computer on my left is displaying an image from America's *GOES-10* WXSAT showing almost the whole of the Pacific ocean. Whilst looking at the weather systems over the American east coast, and the clouds over the central Pacific ocean, I was suddenly brought back to European reality when an encrypted image was received!



**Fig. 1: METEOR 3-5 footprint for 17 December 1530UTC.**



**Fig. 2: METEOR 3-5 pass 2 November 0957UTC.**



**Fig. 3: NOAA-1412 November 1421UTC dual image (visible and infra-red).**

## Current WXSATs

Before or after mid-December, *METEOR 3-5* should be operating once more. The WXSAT's orbital plane is not sun-synchronous, so every few months it crosses the region of low solar illumination. This apparently causes some power budget problems so the a.p.t. transmitter (137.30MHz) is switched off for a few weeks.

The interesting feature of December's passes will be the sudden switching on during south-bound passes when the satellite emerges from the northern polar night into winter sun - see **Fig. 1**. *METEOR 3-5* will be several degrees above the northern horizon before switch-on, so scanners should instantly lock the moment transmissions start.

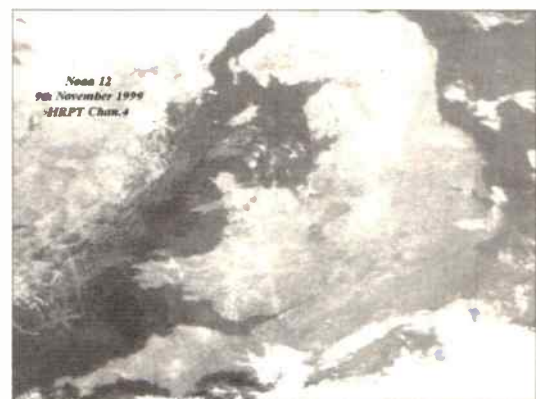
Picture quality from *METEOR 3-5* has been variable. I have received a few images of very good quality, yet on other passes, evidence of line jitter is present.

The last pass that I obtained was on 3 November, though **Fig. 2** shows a longer one from the previous day - the north-bound morning pass over the Atlantic ocean. This shows Iceland near top-right; North Africa and Spain can be seen outlined behind the cloud in this enhanced image. The

image gathering aperture indicator bars can be seen along the right-hand side of the picture - showing the gradual change of binary numbers as they reduce to 'all open'. A more detailed description of this indicator has been given in



**Fig. 4: NOAA-14 10 November h.r.p.t. channel 2 from Roger Ray.**



**Fig. 5: NOAA-12 9th November h.r.p.t. image of Britain from Roger Ray.**

previous editions of this column.

The system used in my room to obtain this image starts with Paul Hayes' QFH antenna up on the roof, feeding a PROscan a.p.t. receiver. The signal is analysed by my computer's sound-card and recorded as a 'wav' file using Christian Bock's *wxsat* program. The 'wav' file was then decoded using David Taylor's *SatSignal* program. The sequence of image collection and processing changes from day-to-day as I try new variations.

The signal from *METEOR 3-5*, as received at my QTH, is stronger than the NOAAs and this usually results in my obtaining better quality images. I still have to investigate the problems causing lower quality a.p.t. images from the NOAA WXSATs.

Only two NOAA WXSATs (*NOAA-14* and *NOAA-15*) are currently transmitting a.p.t., though h.r.p.t. (high resolution) image users remain spoilt for choice! **Figure 3** shows my latest dual-channel image from *NOAA-14*, in which we can see the visible-channel is nearly 'washed-out'. I have slightly enhanced it to show that there is some detail available!

**Roger Ray** provided me with **Fig. 4** and **Fig. 5**, showing the high resolution equivalent from *NOAA-14* and *NOAA-12*. The latter WXSAT is currently only transmitting h.r.p.t. imagery because its footprint is now overlapping that of *NOAA-15* - the primary WXSAT - see **Fig. 6**. The vast majority of a.p.t. users have low gain antennas - such as crossed dipoles - and would otherwise receive signals on 137.50MHz from both satellites simultaneously.

## OKEAN Satellites Monitored

Several reports have been received concerning transmissions on 137.40MHz from *OKEAN-4* (a.k.a. 1-7), *SICH-1* and *OKEAN-O*. Despite much monitoring, I have heard these transmissions quite infrequently, and the limited



**Fig. 6: NOAA-12 and NOAA-15 footprints over UK.**

number of images received have been very short.

Others have reported, and sometimes sent me, good pictures. One such example is that received from **David Ball** on 29 October. After checking the reported time, I concluded that it was probably a transmission from **OKEAN-4** at 0835UTC.

The image shows Norway and Sweden as seen by three different spectral frequencies - the right-hand image being visible-light. The radar image sees straight through the cloud. Although the reproduced image may be too small, the time component - the incrementing number before the grey scale - shows the satellite was south-bound, and matches the ground track.

## Superb Imagery

Although reports concerning the failure of the Chinese geostationary WXSAT **FENGYUN-2** were received in October, the problems were apparently fixed before the end of the month. The official Chinese web site includes a page where 'real-time' **FY-2** images are usually available. As on 14 November, the latest image (after 'refresh!') was still dated 11 November, but I suspect that many more will follow.

Meanwhile, the Chinese polar satellite **FENGYUN-1C** continues to provide staggeringly high quality high resolution images - as seen in **Fig. 9** from **Edward Murashie**. This colour image shows California and inland Arizona. Looking at a 'zoom' into this image leaves me quite dazzled. Imagine receiving **FY-1C** several times a day - if you have a suitably adjusted h.r.p.t receiving system.

It is perhaps worth mentioning that not every h.r.p.t. system is capable of receiving the transmissions from **FY-1C**. If you are seriously considering upgrading to h.r.p.t. - which is probably the most expensive, yet still feasible, satellite imaging system - do check carefully that the unit can either already receive **FY-1C**, or can be modified inexpensively to do so.

## Software Updates

### wxsat Upgrade

Two or three programs have recently had substantial upgrades and can now be obtained without difficulty. Christian Bock's **wxsat** program takes the a.p.t. or WEFAX signal from the appropriate receiver and samples it fast enough to produce a 'wav' file that can be either decoded in real-time (using **wxsat** itself), or later using a separate program.

The latest version is 2.5 revision 7 and includes several modifications, including increasing the bmp (image) format to 256 colours and new signal processing techniques to eliminate the distortions caused by asynchronous sampling. Numerous other improvements have been added. The program can be downloaded from Marius Rensen's site <http://ourworld.compuserve.com/homepages/HFFAX> or by sending me a disk with return self addressed stamped envelope.

### SatSignal & WXTRACK Upgraded

David Taylor's satellite programs have received near-continuous upgrading, the latest version becoming

registerable for full access to the facilities. **SatSignal** processes the wav files that can be produced by **wxsat**, or similar sound recording program. The main requirement is an adequate sampling rate of the incoming a.p.t. signal to ensure quality.

I have reviewed **SatSignal** in a previous edition, so I will just add that the improvements include **OKEAN**-type telemetry processing that uses equalisation to enhance the dark frames often transmitted within the image. The new version can decode NOAA bmp image formats and - in the registered version - displays temperature, as obtained from the infra-red component.

Decoded **RESURS** and **METEOR** images show perfectly straight edges. NOAA processing produces four full-length spectral images and optional maximum resolution format images.

### WXTRACK

This is currently version 2.0.0.74 from 24 October, an earlier version of which I described in a previous edition. It carries a database that reads any Kepler file(s) and stores all data. Any reasonable number of satellites can be displayed on the tracking map and those with good Internet access can optionally download a very large (6Mb) topographic file to improve the country details. The program can read in some actual satellite images for comparison with the predicted ground track.

When I originally described David's program, my only concern was its availability - it required downloading from the Internet. I based this on my perception of the file sizes. Discussion with **Les Hamilton** (who operates the software base for the Remote Imaging Group) indicated that the files could be highly compressed by zipping.

Consequently, for those not able to collect files directly from the Internet, thanks to Les's help and David's advice and approval, I can provide the suite on two floppy disks. Files required include the compressed program files, together with numerous Intel library files and patches.

I have tested this (compressed) version on two older computers without problems. Those interested in using this service should forward either a stamped, return-addressed envelope with secure £1, or enclose two disks with 50p coin and return envelope.

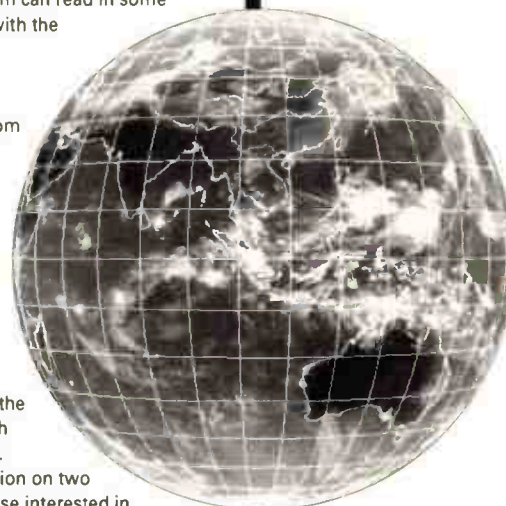
## Emergency Beacons To Be Phased Out

Those of us who monitor the a.p.t. and/or h.r.p.t. telemetry from the WXSATs are aware that imaging is just one aspect of the huge payload carried by both American and Russian WXSATs. The International COSPAS-SARSAT Program uses these satellites to relay distress alerts to search and rescue authorities, and they have just announced they will terminate satellite processing of distress signals from 121.5/243MHz emergency beacons during the next generations of satellites. Mariners, aviators and individuals using emergency beacons will need to switch to those operating at 406MHz if they want to be detected by satellites.

Termination of the current 121.5/243MHz processing will happen over a period of time. It is expected to take place far enough into the future to avoid a crisis for those currently



**Fig. 7: OKEAN-4 image received from Dave Ball.**



**Fig. 8: FY-2 (geostationary) infra-red image 11 November 0702UTC courtesy Chinese Meteorological Agency <http://202.106.103.181/y2.htm> China Meteorological Agency web site for FY-1C and FY-2 images and information.**

*Continued on page 74.*



**Fig. 9: FY-1C high resolution image from Ed Murashie 16 October**

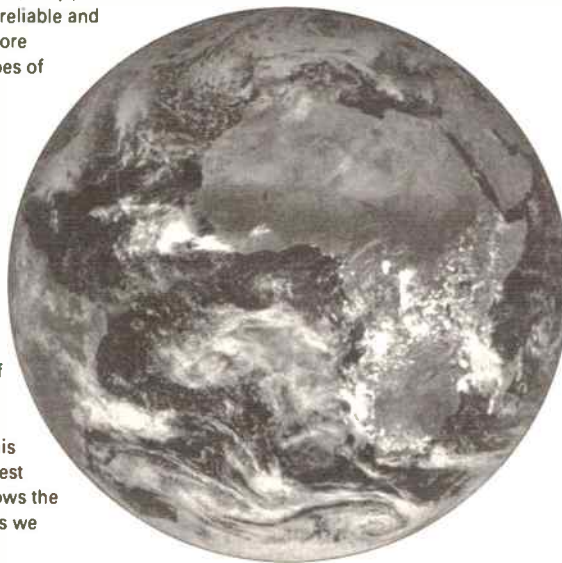
using these beacons. The COSPAS-SARSAT Program is working on the details of the transition, including the time frame. Although no actual date has been set, the Program has decided that the next generation of satellites - starting in 2006 for Russian satellites and 2009 for U.S. satellites (operated by the Commerce Department's National Oceanic and Atmospheric Administration) - will move to 406MHz beacons.

Although the new beacons cost more, they provide search and rescue agencies with more reliable and complete information to do their job more efficiently and effectively. The three types of beacons in use are: emergency locator transmitters (ELTs), used on airplanes; emergency position-indicating radio beacons (EPIRBs), used on boats and personal locator beacons (PLBs) used by land-based persons such as hikers.

### Primary Data Images From METEOSAT

Recent columns have included some of the best of the high resolution imagery transmitted by METEOSAT-7, the European geostationary WXSAT. For this Christmas edition I have chosen the latest mid-day (14 November) image that shows the darkness of the northern hemisphere as we approach winter.

The image can be zoomed to show much higher resolution than indicated by a quick glance at this image. Nearly all Atlantic weather systems can be monitored, and even the river Amazon in South America can be seen near lower left. If only EUMETSAT's New Year resolution was to abandon encryption!



**Fig. 10: METEOSAT-7 1202UTC full disc visible-light image 14 November**

### Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz.

NOAA-15 transmits a.p.t. on 137.50MHz.

NOAAs transmit beacon data on 137.77 or 136.77MHz.

METEOR 3-5 uses 137.30MHz.

OKEAN-4 and SICH-1 use 137.40MHz for brief transmissions.

RESURS 01#4 transmits a.p.t. on 137.85MHz.

METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.

GOES-8 (western horizon) uses 1691MHz for WEFAX.

### Shuttle Launch Schedule

MISSION: STS-99 - Shuttle Radar Topography Mission (SRTM); *Endeavour*/OV-105 scheduled launch 13 January 2000 at 1217UTC for an 11 day mission. Orbital inclination 57° (includes UK). During November, wiring inspections, repair and protection installation continued. Tests on the auxiliary power unit wiring were in progress, as were Shuttle main engine controller verifications. Work on *Endeavour's* nose and main landing gear continued.

NASA now confirms the Space Shuttle that will carry the initial Amateur Radio gear into space for the International Space Station - can launch no earlier than 10 February 2000. The flight will be aboard shuttle *Atlantis*, on mission STS-101, and will carry only the transceivers, not any external Amateur Radio antenna hardware. The ARISS team reports that a suitable commercial external antenna on the service module will be made available so that the crew can start using the ISS amateur set-up immediately on 2m.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me, at the address at the head of the column, as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.

### Reflections & Crystal Ball Gazing

What inventions and discoveries will arrive during the next century? I am certain that well before people pop the corks at the end of the year 2099, they will be enjoying complete weather control. I don't believe that there will be such things as hurricanes or floods.

New hobbies will arrive with new technology. We are likely to still have satellites and despite the world-wide weather control system that I believe will rule the day, anomalies will undoubtedly occur. Meanwhile, after reflection on the achievements or otherwise of the last year of this decade, let us think positively about the year 2000. I hope you will continue to join me in WXSAT monitoring during the years to come.

### Kepler Elements - WXSATs, MIR and Shuttle

- 1 If you want a computer disk file containing recent elements for the WXSATs, AMSATs and others of general interest, together with a large file holding elements for thousands of satellites please enclose 50p with a PC-formatted disk and stamped envelope. A print-out is included that identifies NASA catalogue numbers for the WXSATs. The disk file is ideal for automatic updating of tracking software.
- 2 I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions. Transmission frequencies are given for the operating satellites. This data originates from NASA.

# Timestep



PROsat for Windows is used by most leading weather satellite enthusiasts. They have grown up using Timestep products and now rely on the superior image quality and ease of use provided by PROsat for Windows. Features such as real time reception, auto-scheduling, temperature readout, totally automatic reception of all NOAA's and Soviet satellites and automatic animation have made PROsat the preferred package. Satellite profiles allow individual adjustment of synchronisation and input levels, giving unrivalled automatic or manual reception of even "difficult" satellites. Geostationary satellites are well covered and include METEOSAT, GOES, GOMS, GMS and even INSAT. All images can be in colour and because this is a full 32 bit Windows application it will work perfectly on Windows 95-98-NT4.

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## NASA HF-4E Receiver 30kHz - 30MHz

**£199**



Computer Compatible FREE Software Disk. This new receiver covers 30kHz to 30MHz and is designed for SSB, CW and AM reception. A much improved version of the Target HF-3. It is fitted with 2.6kHz SSB filter, advanced mixer design, backlit display, active antenna facility, and computer output. Included in the package is a software disk and 12V AC mains adaptor. **Optional self-powered active antenna £59.95.**

## ICOM IC-R75 Receiver 30kHz - 60MHz

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The IC-R75 has received rave reviews in the Amateur Radio Press. It's a very serious short wave receiver with coverage right up to the exciting 6m Ham Band. Features include USB, LSB, CW, AM, FM \* 101 Memories \* Super High Dynamic Range \* Synchronous AM detection \* Twin Pass band Tuning \* Digital Signal Processing \* Automatic Notch Filter \* 101 Alphanumeric Memories \* RF Gain Squelch \* Clock \* Numeric keypad \* Attenuator \* 2-level Pre-Amp \* Scanning.

## YAESU FRG-100 Receiver 50kHz - 30MHz

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The FRG-100 has stood the test of time. It offers full coverage of the short wave bands plus long wave and medium wave. It features: \* USB, LSB, AM, CW \* 50 memories \* 2 stage attenuator \* Noise Blanker \* Band Scanning \* Memory Scanning \* Dual Speed AGC \* High and low impedance antenna inputs \* Programmable steps from 10Hz - 1kHz \* Optional Narrow Filters, PSU and FM board \* BFO reverse for CW \* Twin Clocks. Ask for leaflet.

## AOR-7030 Receiver 0kHz - 32MHz

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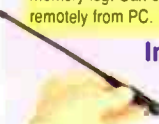


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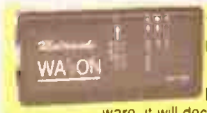
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# Off The Record

Well, if you get your copy of *SWM* by subscription, it will most likely still be 1999 when you read this, however, it is probably not too early, or too late, to wish you all a Happy New Century as you thumb your way through this first issue of the millennium.

Last October's *SWM* included a special broadcast feature including a splendid article by Daniel Burke relating how he became involved in radio piracy during the middle 1960s and how he and his friends eventually (and I mean eventually) won a local radio licence. This certainly evoked nostalgic memories for me and possibly all those that were similarly engaged in, or supported, the many clandestine activities that took place at the time.

## Digital Radio

This digital revolution is gaining pace, there is a lot of attention in the media being paid to the future of television, but not a lot on digital radio. The economic stumbling block has been the price of receivers, initial suggestions were that digital receivers would cost the best part of £1000 each, now prices are dropping to around £200. Clearly when the microchips and other components are mass produced and the development costs have been covered, prices should fall to the point where they are much the same as old analogue radios.

What will they be like? Very simple is the reply, and no manual tuner or other knobs to play around with. Switch on, the names of receivable stations will appear on the built-in screen, select the station and there it is.

The screen will give similar information that the f.m. RDS system does, with potential to do quite a lot more. As yet, I do not fully understand what DX potential may exist if you took your set to very high ground - there are two reasons.

First of all, most channels may be occupied by local multiplex transmitters and secondly, domestic receivers will be unlikely to respond to weak signals that cannot be decoded properly.

What is evident though is that digital radio and the way it is transmitted will favour the BBC and the larger commercial stations. The stations that remain on f.m. will probably be just small scale stations that are now springing up all over the place and the numerous f.m. pirates.

Another possibility is that some TV stations showing pop videos and quiz games may simulcast their sound output on radio channels creating Tele/Radio stations.

## Pirates In 2000

A frequently asked question is will pirate stations be able to go digital? As technology stands today, probably not. However, as components become more readily available, the likelihood will increase. As it is some pirate stations are already using digital technology to store MP3 compressed audio on CDs giving them 12 hours of programming on just one CD.

However, a computer is required to decode the audio and to feed the transmitter with superb studio quality sound. Another advantage is that a whole days programming can take place without anyone having to change the tape. Some stations use loop tapes so you hear the programmes repeated every few hours.

I think I can say quite confidently that there will be lots of s.w. pirate activity over Christmas, as usual, and possibly even more during the first few days of the New Year. One station, that I have been requested not to name, have ambitious plans to run four separate services on different frequencies over the holiday, so listeners should be in for quite a bonanza.

I will post a resumé of stations heard on the *SWM* Readers' E-mail list, so if you subscribe to this free service, you will not only receive this information, but you can also contribute if you wish. To join, all you do is send an E-mail to [swm\\_readers-on@pwpublishing.ltd.uk](mailto:swm_readers-on@pwpublishing.ltd.uk) (there is no need to include a message). Shortly after this, you receive details

of how to send postings. At present, subscribers receive several messages a day on all sorts of radio related topics.

## Readers' Logs

**Steve Black** writes from Hoddesdon in Hertfordshire, asking if I could pass on some of his pirate radio reception reports. He has been receiving Marabu from Germany on 6.210MHz, Laser Hot Hits on 3.910 and Groove FM on 6.299 (apparently 99.7MHz in the Midlands). He has also received Fresh Air 2000 on 6.243 with a show he describes as hilarious stuff and also a test broadcast from Boarder Hunter on 6.270, now identifying as Boarder Hunter Broadcasting Corporation. (Nothing like a bit of self styled grandeur).

Finally, Steve says that thanks to *SWM* and, after a suggestion I made, he is now able to delve much deeper into his hobby of pirate radio monitoring and would I like to receive further reports? Yes Steve, all information is welcome, particularly pirate QSL cards.

## The Great 208

I have just been reading on the Radio Caroline web site about a proposed return of an English service at Radio Luxembourg. Eric Wiltcher, previously with Merlin Communications, appears to be behind this venture with Radio Caroline playing a part. This new service is all set to commence during the middle of November, which is after my deadline for this page. So by the time you read this, the 1440kHz English service should be back on air during the late evenings and most of the night, also 24-hours a day on satellite.

## The Wonderful Isle Of Man

On the subject of new stations, Music Mann 279, the proposed 500kW l.w. station from the Isle of Man, are constructing fully computerised studios on the top floor of a Ramsey hotel. So far I have no precise technical information, except they will be transmitting on 279kHz using 500kW during daylight and 100kW at night.

Paul Rustling has advertised for engineering staff to work on a generating plant containing three generators, Harris transmitters and a crossed-field antenna. These antennas are relatively new and in some respects slightly controversial. They look like a giant wine glass, but made of metal. The base is the ground plane, the stem is a giant capacitor (this is an over simplification) and at the top are the radiators. The big advantage is height, m.w. versions already in use in Egypt, the home country of its co-inventor, stand just over 6.1m tall and are reputed to work more efficiently than the quarter wave verticals that had been in use previously.

So for l.w., the antenna would only need to be about 30m tall, considerably less than the size of the traditional vertical masts for long wave. This will be the first station to operate a crossed-field antenna at a power in excess of 100kW, but if the efficiency figures and circumstances are correct, this single transmitter should produce an acceptable signal strength over the entire British Isles.

The station expects to be on air sometime during the summer, their postal address is, **PO Box 279, Ramsey, Isle of Man IM99 4HT.**

## Radio Northsea International

East Anglia Productions have produced their latest catalogue of pirate radio related material. It also includes films, CDs and posters of the RNI recreation of 1999 and also the Radio London ones of 1997 and '98. Paul Graham has produced souvenir books for both the RNI and Radio London RSL's, each featuring over 130 photographs. For further information, telephone **(01255) 676252** or visit their web site at: [www.eastangliaproductions.co.uk](http://www.eastangliaproductions.co.uk)



## Recent Logs

UK Radio have been very active, as have Borderhunter and Korak. A station from the past has suddenly popped up again, that's Live Wire Radio, have been heard on 75m with test broadcasts. BBMS has been literally crashing in on Sunday mornings on 6.200MHz or thereabouts. Radio Free London have been reaching the south east coast with their 819kHz transmissions, where I appear to be referred to on air as "The old geeser in Folkestone".

Another London m.w. pirate, Pipeline Radio, has been brought to my attention. I don't have their frequency and have not managed to receive them here, I wonder if any readers have logged this one?

As I write this, there are unconfirmed reports relating to the future of the Irish legal l.w. station Atlantic 252 that suggests their licence is to cease at the end of 1999. Their web site has no information other than the caption "Under de-Construction" (sic). This has certainly aroused some curiosity.





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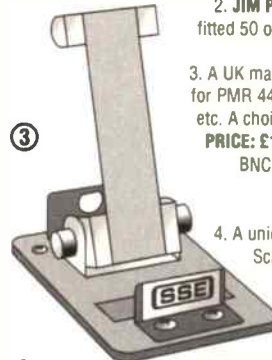


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# ShackWare

Hello and a warm welcome to 'ShackWare'. Recently, I had the good fortune to visit the Amberley Museum near Arundel in West Sussex and see its amateur station **GB2CPM** in operation. I've visited the museum on several occasions because it has all the stuff I love such as a rebuilt bus garage with working buses, museum of electricity, narrow gauge steam engine, beautiful little telephone exchange, a printing works and much more, all manned by enthusiasts, but had never been lucky enough to be there when the radio station was operating.

This time - the last open day of the season - the station was in operation and I had a good old natter with the chaps there, and was even invited to help occasionally - heaven! Thanks guys, my little skill quotient and large Land Rover are at your disposal.

And now on to the mail bag.

## Your Letters

Chris Smolinski's *Mac Multimode* continues ever popular with formatted disks, s.a.e.s and requests for the software simply pouring in - well - four in the past three weeks, anyway! One such comes from **Fred Wilmhurst** of Harpole, Northants, who writes "I was delighted to read details of (*Mac Multimode*) radio software for Macintosh users in November's *SWM*."

"I have a Macintosh LC and an Icom IC-R70 as my receiver and hope to start decoding RTTY, etc. some 50 years after first getting involved with the mode while serving in the Royal Signals in the Far East, working RTTY back to the War Office in London." No problem, Fred, I just hope *Mac Multimode* is worth the half-century wait!

**James Mackenzie** of Leigh, Lancs, is also a Mac owner previously out in the cold radio-wise. "I have a Mac IISI with Connectix *RAM Doubler* and a Frog 330 external hard drive, Power CD drive and StyleWriter printer. Radiowise, I have a Lowe HF-150 and an AOR AR8200. My main interest is airband."

*Mac Multimode* also goes to **Denis Lyle** of Southampton and **Patrick McGilliver** of Whitehaven in Cumbria.

And now more on the Atari 8-bit front (which regular readers will recognise as my all-time favourite machine). **Bryn Thomas** E-mailed recently to say "I have recently brought a scanner and have become more and more interested in radio. But the thing that caught my eye was the name '800XL' in the September 'ShackWare'. A bit amazed, I read further because I had no idea there was software for decoding on the 8-bit.

"I too am a big fan of the Atari, and used mine only up until about four years ago. A lot of my degree work was done on it. I have recently moved and plan to rebuild my systems in our garage now I have room. I had quite a few (all second-hand, apart from my original 800XL and 1010 from Christmas 1984) including two 800XLs, one 130XE, one 65XE, a couple of 1050 disk drives (one with a Happy chip upgrade) and various other bits and pieces and software. Odd ones I can remember, IDC parallel port for printer, the Covox voice master and some Princeton scientific interfaces for measuring light and temperature."

Having recently taken up the sublime art of listening, Bryn is keen to use his beloved Atari machines in his new hobby - a marriage I can say from experience, made in heaven.

"I have a Yupiteru MVT-7100 and an old Netsat PRO-44. Please send a copy of the interface plans for the Atari. I would very much like to see my 8-bit do some decoding. I have a demodulator for my PC and am trying out some software (with no great results), and also have a TU1000 module from Maplin, but I haven't got around to using that yet."

As I said in September's *SWM*, the Atari is very definitely second best when compared with even the lowest-spec PC, but the machine will do some competent decoding and there really is a lot of pleasure to be had in pushing older hard and software to the limit. Interfaces are easy and cheap to build and all parts are available from Maplin. I've sent Bryn the software and build instructions and I'll do the same for anyone else who writes with an s.a.e. and suitably-formatted media (i.e. a 5.25in disk formatted with DOS 2/2.5).

The Atari 8-bit had two great rivals during its heyday in the early and middle 80s: the Sinclair Spectrum and the Commodore 64.

Sinclair's machine enjoyed phenomenal support in the UK from games writers and 'serious' applications and utilities programmers alike (the best radio-oriented stuff was from the now defunct Technical Software - truly excellent!). The Commodore also enjoyed a massive following, though with perhaps slightly less serious software originating here in the UK (though there was a small planet's worth of games available).

Like it's American peer, the C64 sported a proper keyboard, a full compliment of proprietary interfaces, printers and a disk drive, though this latter was notorious for being slower than the cassette drives of some other computers. There was even a portable version (well, 'luggable') with a clip-on keyboard and a built in 5in screen and disk drive. I saw one of these exceedingly rare beasts at a boot sale about two years ago and the owner wanted £15 for it. I lusted after it, but my wife was with me, which more or less put the kibosh on its acquisition. Ah, what might have been...

## Back To The Plot

But returning to the plot, the rise of the 16-bit computers such as the ST and Amiga spelled the end for the little Commodore and it survived only in the hands of a hard-core band of supporters.

**Neil Jenkinson** of north Devon E-mailed me to ask "Having used a PC for decoding, I was interested to read about using 8-bit computers, having long since passed on my Commodore 64."

"Full of enthusiasm for some real hard core decoding, I recently acquired another Commodore 64 from a boot sale, only with tape drive sadly, but despite browsing the Web at length, I have been unable to find any reference to decoding software - though there are plenty of games and utilities. I wonder if you can suggest a source of such software and a circuit or pin-out connections for an interface? I am quite happy to build the interface if I had a circuit from which to work."

The awful thing is, Neil, I can't! Over the years, I've located software for many obscure (forgive me!) computers. I've even read of APT software for the Oric 8-bits in Lawrence's 'Info in Orbit' column (though I haven't yet managed to track down the author and acquire it) but I've never yet found anything to support the C64 - a remarkable situation, and one which I'm sure can be rectified.

The C64 was hugely popular in the United States and I believe it must have circulated widely among Hams and listeners. There must also have been some commercial radio-oriented software and eventually, I'll find it, but no luck yet. When I do of course, you'll read about it here.

Meantime, anyone with a PC and an interest in older computers (or a hankering to relive the days of their youth) can acquire one of several excellent C64 emulators from various locations on the Internet - try <http://home.paclink.com/users/netrunnr/>

And the Net also features lots of serious software including - incredibly - a working Unix variant called *Linux* (Little Unix), which offers multi-tasking via processes and remote log-ins. The software is free for download from the *Linux* homepage at <http://hd.c64.org/poldi/linux/linux.html> The site features screen grabs of a sample *Linux* session.

## Mac Stuff

And now, let's finish with some more Mac-oriented stuff. **Tom Davies** of Grahamstown, South Africa, uses an Icom R-70 with *RadioRaft*, *MScan* and a ZSRX Vertical, and passed on an E-mail he received from the Macnet mailing list, an Internet mailing list devoted to Mac users who are also radio enthusiasts. The original author is **John Seney WD1V** of Manchester, NH (I'm assuming that's New Hampshire, USA?). Take it away John:

"I've released version 1 of a new program for the Mac, called *Elmer*. This creates sample tests to help you prepare for your ham radio written examination. It contains all FCC question pools for each of the five written exams: Novice, Technician, General, Advanced and Extra Class. *Elmer* will grade your sample test, showing you which questions were answered incorrectly. It will also indicate if you passed the exam. *Elmer* is shareware and requires a Mac with a colour display. A demo copy may be downloaded from <http://www.blackcatsystems.com/software/elmer.html>

"Also available is Macnet Roster, a virtual 'Who's Who' HyperCard stack with more than 880 entries giving the names, addresses and 'phone numbers of radio operators all over the world that are using Macs. Check out their projects and their passions and put a design on your Mac Radio future when you see what neat things are being done! You can find it at <http://people.ne.mediaone.net/wd1v>"

John goes on to mention his 'Ham Radio.FAQ', "...compiled on a Mac with a lot of links to great Mac FTP sites for radio, electronic engineering, and similar data. Superb for new hams or folks studying for a license. Find it at <http://people.ne.mediaone.net/wd1v>" Thanks both to Tom and John for that one.

## Web Watch

- Acquire one of several excellent C64 emulators from various locations on the Internet - try <http://home.paclink.com/users/netrunnr/>
- Check out the *Linux* homepage at <http://hd.c64.org/poldi/linux/linux.html>
- A demo copy of *Elmer* may be downloaded from <http://www.blackcatsystems.com/software/elmer.html>
- You can find Macnet Roster at <http://people.ne.mediaone.net/wd1v>
- Find Ham Radio.FAQ at <http://people.ne.mediaone.net/wd1v>

## And Finally...

I would like to wish all *SWM* readers a very merry Christmas. Thanks for your continued support for 'ShackWare' - keep it coming!

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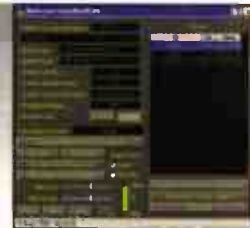
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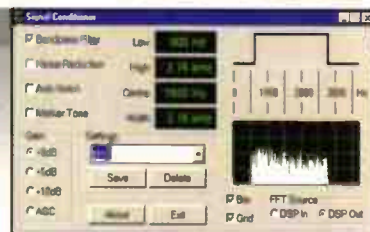
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### Construction of internals

### Construction of externals

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### Modes

### Tuning step size

### IF bandwidths

### Receiver type

### Scanning speed

### Audio output on card

### Max on one motherboard

### Dynamic range

### IF shift (passband tuning)

### DSP in hardware

### IRQ required

### Spectrum Scope

### Virtutone

### Published software API

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no

no - use optional DS software

no

yes

yes

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8 cards

65 dB

±2 kHz

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yes

yes

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# MilAir

## All Quiet

Was it just me or did other 'MilAir' readers notice a dramatic lull in aircraft activity for two weeks at the end of October. In the fortnight from the 23rd October to the 7th November the Military Airwaves in comparison to normal seemed to be very quiet. Then in the next week, starting Monday 8th, everything returned to normal, in fact, it actually appeared busier than usual on some days.

On one day whilst I was out working on a job in quite an elevated position and therefore a good monitoring location, I had the radio on for about five hours and in that time I heard just one Jetstream and a pair of Lakenheath F-15's, some of the other days were almost as quiet. It may just be co-incidence, but it was though a large percentage of the country had a 'down' period, perhaps it was a concentrated effort to save on budgets after the massive expenditure during the Kosovo crisis?

## Falling Stars

On the night of the 17th/18th November, the Earth passed through the tail of the comet *Tempel-Tuttle*. This event caused a meteor shower in the Earth's atmosphere called the *Leonids*, with debris entering at over 72kms<sup>-1</sup>.

After the visit of 'BIG CROW', NKC-135A in September, Mildenhall once again hosted two special aircraft who were in Europe to record this astronomical event. Arriving on Sunday 14th November were two aircraft from the 412 Test Wing, EC-18B/10892, calling AGAR 92 and (N)KC-135E/53135, calling AGAR 35.

The aircraft deployed to the Mediterranean on the 16th ready for their mission the next day. Both aircraft are equipped with highly sophisticated camera and monitoring equipment, and working as a team they parallel each other approximately 160km apart to give as complete camera coverage of the Meteor Shower as possible.

Their route to record the event was from the eastern Mediterranean westbound to Lajes in the Azores. The night before was crystal clear and a few meteors were noted and so I looked forward to the main event.

Needless to say, it clouded over during the afternoon, and by the time darkness came, there was 8 octas of cloud cover. I checked the sky regularly up to midnight, but the cloud cover was total. Typical, I hope the USAF achieved better results than I did!

## London Mil

Following on from my comments in the past couple of 'MilAir' columns, it seems that a mini change round has taken place within the frequencies used by London Military. As already reported, **278.075** has taken over from 277.125, which is now reduced to standby status. This is now one of the South and West primary frequencies and can be a very busy on a good day.

The second new frequency is **245.175**, according to regular sources this **appears** to have replaced 257.225, (can anyone confirm that?). Two other new frequencies have also been confirmed as London Military, they are **247.275** and **257.275**. Both were heard in early November, but at present it is uncertain

if they have replaced an existing frequency. I have heard and confirmed both of them, but in each case I have heard them only once, which perhaps indicates that they have a standby status?

Readers comments as to the area of coverage of these frequencies would be appreciated. Initial reports indicate that 245.175 and 247.275 are used from the central midlands, west across central Wales as they can be heard clearly from the Clee Hill Transmitter. Thanks to **Steve F** and Photavia Press for the information.

## Emmantina

As a follow up to my comments in October's 'MilAir' with reference to the Emmantina Hotel, Costas - who lives in Athens - has kindly added the following information. If you are thinking of heading for the Emmantina you should do so in the next 18 months or so as the new Athens airport will be opening in 2001. This new airport is located at Spata, which is apparently some miles East of Athens.

Also, I should have pointed out that due to its proximity to the airport, the Hotel is not the quietest of places for a peaceful holiday, although when I was last there they had fitted some fairly effective double glazing.

## Cottesmore

My thanks go to Steve F, **Andy L** and **Martin** who all sent in similar information regarding the frequencies in use at Cottesmore since the arrival of 3 and 4 squadrons, (see *SWM* August 1999). In addition to the previously reported frequencies, **277.45** has also been noted in use by two correspondents. This was an old TTTE Air to Air frequency but is now being used by the resident Harrier squadrons, apparently as an Operations frequency.

At a different location, Steve also reports that the AMCC facility at Prestwick is using **336.55** as an Operations frequency, the identification callsign being 'Kingfisher Echo'.

## Lota F

Following up on QC's letter, (*SWM* Sept '99), there seems to be some confusion regarding the frequency for Low Level Area F, (LOTA F). The primary frequency **279.25**, (TAD 069), was heard by me on three occasions during my visit to St. Mawgan during exercise Northern Lights, so as far as I am concerned, it is still the primary frequency. **Mark T** has written to say that **340.3** is possibly the new frequency, but as yet I have not heard this frequency in use. Any thoughts anyone?

**QC** also asks a couple more questions. (1) You ask if the book *Airwaves 99* will give you the airband information you want, the quick answer is yes. It is a very comprehensive publication which covers all aspects of MilAir listening and I feel it would quickly answer most if not all of your questions. (2) 277.125 is a London Military south/west ATC frequency. (3) Military airband spacing is currently 25kHz.



**Big Crow** visiting Mildenhall.

Photo courtesy of Andrew C

## Runway Changes

Lastly, one item I forgot to mention earlier in the year - due to the fractional eastward movement of magnetic North, the following two runways have been re-designated this year.

**Edinburgh** - Runway 07/25 becomes 06/24 and 13/31 becomes 12/30. **Lyneham** - Runway 07/25 is re-designated 06/24. Thanks for the E-mail **Richard**.

## Big Crow - The Photo

My thanks go to **Andrew C** who kindly supplied this month's photograph. Seen visiting Mildenhall for the Northern Lights exercise, (see *SWM* November 99), is 'BIG CROW', NKC-135A/55-3132. Note the vast electronics array/canoe on the top of the fuselage - this can be used to simulate the electronic signature of many different modern military aircraft.

**BIG CROW** is probably the most devastatingly efficient Electronic Counter Measures aircraft in the world, with the capability of jamming a vast range of electronic devices, across an area the size of the UK! My thanks too go to **Mike R** who also supplied a photo.

# Book Profiles

See below for our comprehensive book listing or visit [www.pwpublishing.ltd.uk/books/](http://www.pwpublishing.ltd.uk/books/) for lots more information on radio-related books. Internet users can order on-line.

You'll be bound to find something of interest this month in our Book Profiles. And as a special offer, two books are knocked down in price. Remember, you can order your books by 'phone, FAX, E-mail or post.

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the world of radio collecting. In the past year, according to Marty and Sue Bunis, authors of this book, as more and more people discover the fun, excitement and nostalgia of collecting transistor radios, its popularity has grown at a fantastic rate.



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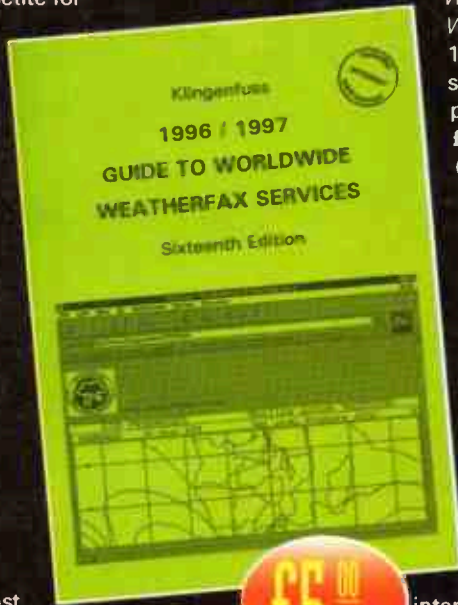
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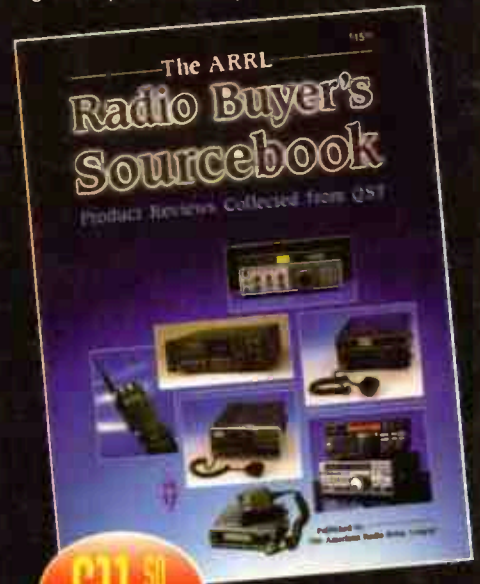
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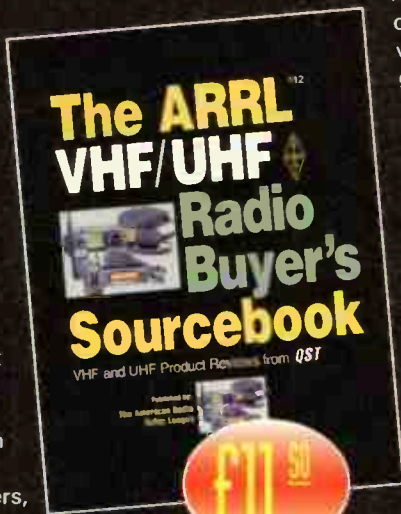
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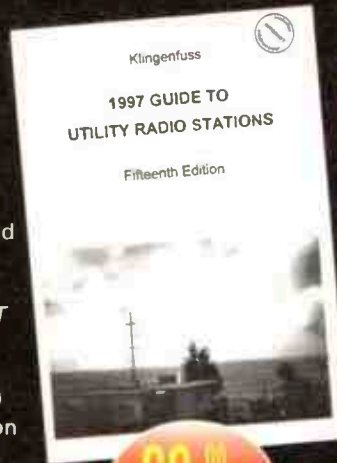
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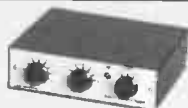
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# Decode

## Digging-out Those Signals!

Analysis tools are the secret to this side of the decoding hobby and I've been digging around to find some more tools. This search was inspired by **John** from Australia (didn't leave a full name). John had written asking for help finding the Signal Analysis Toolkit that I had featured a few columns ago. The usual Internet searches steered me towards He Lingsong's excellent Web site which is packed with some excellent analysis tools. The program that sparked the original enquiry SAT32 is to be found here and is a very powerful package with a very wide range of analysis options for the advanced user.

I've shown a screenshot or two so you can see what it looks like. If you're looking for real-time analysis through a soundcard, it might be worth taking a look at *Visual Sound Instrument* from the same site. This program provides yet more analysis tools that can be used on-air to help understand the workings of data signals.

If you want to try either of these programs, take a visit to He Lingsong's site at:

<http://www.userworld.com/users/hlingso/> To download SAT32 from the site directly, just add sat32.zip to the address. The same goes for *Visual Sound Instrument*, except

you need to add vsi.zip. Installation of both programs is really simple. All you have to do is unzip them to a new directory and run them. As both programs are less than 1Mb, the download times are also very reasonable.

Whilst searching around I came across a couple more programs that may prove useful. The first is *Audiotester* by W. Mueller which is a surprisingly sophisticated measurement program. Whilst it was originally designed to provide detailed analysis of audio equipment, it can be used very effectively with data signals.

There are three main analysis modes: Spectrum Analysis, Signal Generator and Oscilloscope. The spectrum analyser comes with a wide range of FFT windows and has the added benefit of being able to adjust the sensitivity and frequency scale whilst you're monitoring the signal. This is a real bonus and makes real-time signal

analysis much quicker as you can get the best display very quickly. The Web address for this is:

<http://www.sumuller.de/audiotester>

Final analysis program for this month is *WinSpec32* which provides a very neat real-time spectrum analyser and oscilloscope for analysing any signal via a PC soundcard. There's no option to analyse .WAV files so you can only use it in real-time. Nevertheless it's a very useful program that's really easy to operate.

## Why Analyse?

Some of you who are maybe new to the hobby may be wondering why people want to use the analysis tools I've just described. Whilst it's true you really don't need these tools to monitor the common signals, there are times when you want to try and understand more about a signal your decoder can't resolve. It's at this point you can start to make good use of these tools.

If the signal you want to examine has a straightforward two-tone warbling sound then you can use a spectrum analyser display to accurately measure the frequency difference or shift between the two tones. Very often this information alone can be used to provide a very strong indication of the signal type.

If this doesn't solve the problem, then the next step is to look at the baud rate of the signal. To do this you need to be running a spectrograph display such as that provided by *Spectrogram*. Once set-up for the signal in question, this program will let you see each shift between the two tones.

You then just have to use the cursor to measure the time interval of the smallest shift and this, in seconds, divided into 1 gives you the baud rate. I've shown an example of a basic RTTY signal analysis in the column. In this case, the time interval of the smallest change was 20ms or 0.02 seconds which, when divided into 1, gives a speed of 50 baud. So you can see, this analysis game can be quite straightforward.

Whilst *Spectrogram* can provide some very useful tools, the programs I described earlier provide the sort of detailed information you will need if you want to examine some of the more complex multi-tone systems. However, the analysis basics still apply you should be aiming to identify the baud rate of the signal and then measure the shift of the various components. Once you have this fundamental data, you should find that you can complete the analysis with the aid of some good reference books.

If you want to try the excellent *Spectrogram* analyser it can be found at: <http://www.monumental.com/rshorne/> If you've used some of these software tools to identify signal, why not drop me a line with the details. I'd be particularly interested to hear which programs you used, how you used them and how you set about identifying the signal. I'm sure listeners just venturing into this area would appreciate some further insight.

## Bug Fix

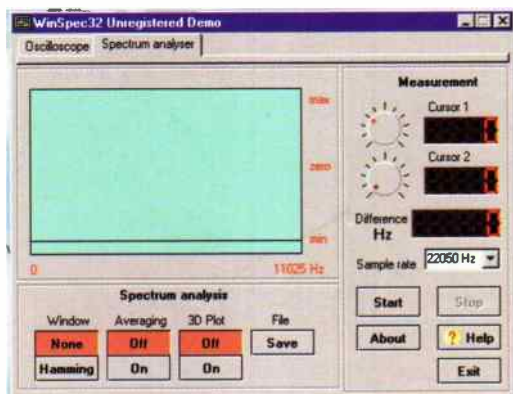
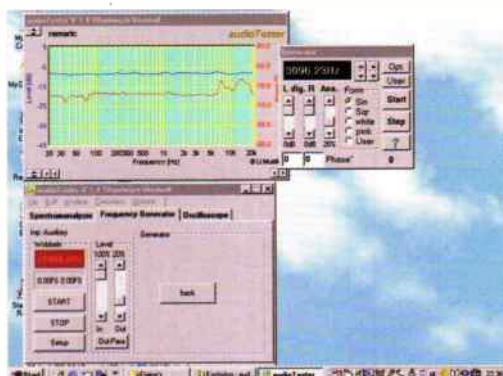
You're probably all sick to death of the millennium bug, but I've just got one more piece of info to add, thanks to an E-mail from **Len** of Bude! I'm sure many people are continuing to use equipment that is not millennium compliant such as video recorders, radios and some stand-alone decoders that include clocks.

Now, although these will probably be working OK, you may have a problem with the year information. When the time comes, you may find that the year reverts to some obscure date in the 1970s. Whilst you can't necessarily fix the problem, there is a simple trick you can use to make the equipment serviceable.

All you have to do is set the year to one that has the same daily sequence as the year 2000 - the answer is 1972. Once you set your equipment to this date you can then rely on the clock to provide the correct day and date information - you just ignore the year! As far as I'm aware, the sequence runs true from 1972 through at least until 1986 (2014). Thanks for the tip Len.



### Screenshot of the AudioTester real-time analyser.



### WinSpec simple analyser.

## Laptops & FAX Software

**Alistair Dunlop** has written with a possible solution to the FAX problem I mentioned in the November issue. Just as a reminder, this was where Steve Greenhough was suffering an unexplained slippage in received FAX pictures. Alistair reports that he had an identical problem and eventually traced it to the power saving utility. With this turned-on (standard for most laptops) a check of the battery voltage is made every 30 seconds or so. When this happens it seems to steal some processor time and mess-up the timing.

As a result of this, *JVFAX* will effectively stop receiving for a very short period which will cause the picture to shift across the screen slightly. The problem with this type of shift is that it's not easily corrected. The only way I can think of is to import the final, distorted picture into a drawing package and shift bits around!

The solution is to make sure the power saving feature is turned off. Whilst this may sound simple enough, Alistair found that he had to turn it off in both the BIOS set-up and in *Windows*. To do this in *Windows* you select 'Settings' then 'Control Panel' from the start button and open-up Power Management. You then need to make sure that the power scheme is set to always on.

Checking the BIOS is a little more complicated and can normally only be done as part of the start-up sequence. If you're not sure about this, I would suggest you find someone with the knowledge to help you. Even if you have a desktop PC, it might be worth running through this check if you're suffering unexplained picture slips.

## Ice Charts

Always keen to come-up with new information, **George**, in Norfolk, has sent me details of where you can find regular ice charts produced by the Danish Meteorological Office. There are four frequencies and various times to monitor as follows:

Frequency (MHz)	Time UTC
5.850	0028, 0943
9.360	0003, 1008, 1153, 1243, 1828
13.855	1218, 1308, 1803
17.510	1333

If you've found some good quality or interesting FAX frequencies please drop me a line with the details and maybe a sample image or two. If E-mailing the image, please keep the file size under 1Mb or my mailbox gets clogged!

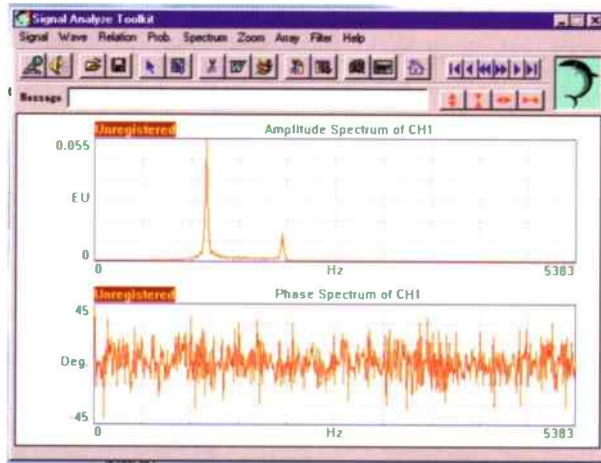
## Mscan Meteo

Latest news from **Mike Versteeg** is that he's just released the latest update to *Mscan Meteo*. This brings it to version 1.04b (beta version). He has also released the 3.112beta of *Mscan*. In case you're wondering, beta versions of programs are the final prototype release for testing by a number of users.

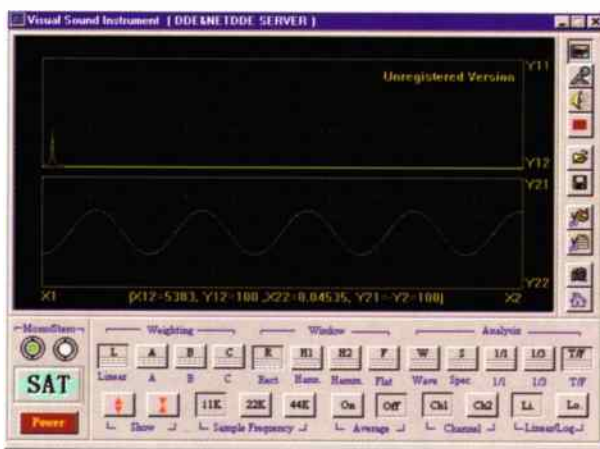
However, due to being inundated with requests, Mike has decided to open-up his beta test program to anyone who wants to join-in. Whilst this may mean a risk that the program may not be as bug free as previous versions, it does give us all an early opportunity to try the latest software.

One of the main changes in these latest releases is the addition of soundcard support. This means that you no longer have to use a special interface, but you can simply feed the receiver's audio straight into the computer soundcard.

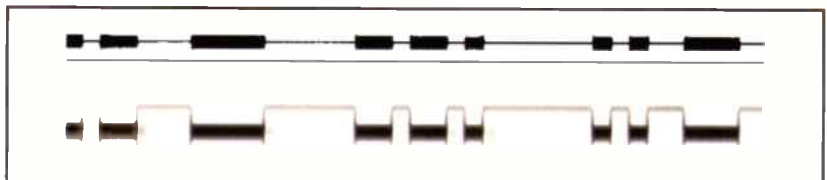
Great idea and particularly attractive for those new to the hobby who want to try their hand without committing too much cash. It will be interesting to see how the results from the soundcard option compare with the use of one of Mike's dedicated interfaces. If you've any comparison's of your own, please write and let me know.



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If you'd like a copy of *Hamcomm/JVFAX*, etc. I've arranged a very special offer with the Public Domain and Shareware Library (PDSL). They have put together a library set of all five disks for just 12.00, all inclusive. Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by phone - you don't even have to write a letter.

Please direct all orders and enquiries about this disk set to **PDSL Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (01892) 663298** and request library volume: H008739abcde. IBM PC Software (1.44Mb disks):

- Disk A - *JVFAX 7.1, HAMCOMM 3.1 and WXFAX 3.2.*
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- Disk C - *NuMorse 1.3.*
- Disk D - *UltraPak 4.0.*
- Disk E - *Mscan 1.3 and 2.0.*

## Web Watch

- He Lingsong's site can be found at: <http://www.userworld.com/users/hlingso/>
- W. Mueller's web site is <http://www.sumuller.de/audiotester>
- If you want to try the excellent Spectrogram analyser it can be found at: <http://www.monumental.com/rsborne/>

■ PAUL ESSERY GW3KFE, PO BOX 4, NEWTOWN, POWYS SY16 1ZZ

# Amateur Bands

My receiver 'gave up' recently, and I found to my horror that my ageing eyes were unable to pick out the detail I needed. So, I went to Castle Electronics at their base at Halfpenny Green airfield. On the A458 Stourbridge way, find Six Ashes and the sign-post for Bobbington. Head for Bobbington and come to a sign on the right "To the Airfield". Turn into the airfield. There are five flying schools, plus helicopter schools, so plenty of interest. Castle are in the building ahead.

Castle Electronics did a very fine job indeed. The workshop has many thousands of pounds worth of first class test gear - we amateurs get the benefit of their other line, maintaining aircraft electronics. There is also a very pleasant restaurant in the Control Tower. All considered, I thought the price charged was very fair, the more so as I now know that my rig is 'up to spec' in all areas. I stress that Castle knew nothing of my connection with SWM or the RSGB.

## Improvisation

What to do meanwhile? I have a 'trannie' with a short wave band. I switched it on, found 'Twenty' by locating the c.w. at the lower end. Going a bit higher, I found some 'Donald Duck' noises. Next I took another trannie (No. 2) and tuned it until its local oscillator was beating with Donald Duck; very careful tuning turned D.D. into an East Coast W. Adjusting the spacing and/or orientation of No. 2 gives you optimum injection - too close and desensing occurs, too far and you lack injection. What matters is that the method works! I put all continents into my s.w.l. log.

## Coming Up

December 31 sees the opening of M2000A by Lord Rix G2DQU. It will operate through the first 24 hours of the new millennium, and then remain active until the end of February, from the Rangers House, Blackheath, on the Greenwich Meridian Line. More details from [www.qsl.net/m2000a](http://www.qsl.net/m2000a)

JD1BKR returns to Iwo-Jima on November 4, for a period of around six months.

Clipperton, FO0 activity is scheduled for February 25 - March 16 next year. P29PB will sign P2000K in December and January from New Britain Is, OC-008 for IOTA.

Reports of CE0Z Juan Fernandez activity, January 6-16 in the 59(9) DX Report - amused by the reference to it as 'The Robin Caruso Island'!

The Malay Peninsula South East Group will be activated in March 2000 from a new one; the Radio Amateur Society of Thailand are organising it.

9G100 and 9G1AA are on 14.140 or 21.160MHz at 1600UTC on Sundays - the cards for both go to PA3ERA. J28FF in Djibouti is there for a year or more, and his cards go F6ITD. Finally, ZL3PX is on Scott Base, Ross Island, Antarctica and his QSLs go to ZL3PX.

## Busted Flush

Alas the proposal for Malpelo, HK0 activity went down the pan due to economic situation in Colombia and the consequent lack of sponsorship.

The East Timor question now. It used to be CR8 of course, for DXCC purposes it needs to become a UN member, be assigned an ITU callsign block or have a national society membership of IARU. I guess the word on this one is **patience!**

## History

The Annobon, 3C0R group made 23000 contacts, hand logged due to computer problems.

## Letters

Harry Richards in Barton on Humber notes two conflicting reports in the *Daily Telegraph* on the Search for Extra-Terrestrial Intelligence (SETI). One relatively accurate report suggests that the work has been going on for two decades at Arecibo - which ignores all the other places involved for rather longer. The other one was a report that NASA are to meet UFO enthusiasts from ISSO who claim that much of modern technology is derived from the remains of UFOs. Dottedness Rules OK!

The next letter came from David Jones in Nelson, Caerphilly. David wants to get into amateur radio so I wrote to him direct. However, for other readers, the first step is a receiver and a log. Secondly, find a club and join it - members will be able to point you in the direction of a Radio Amateurs

course and exam.

However, it is hoped that City & Guilds will soon announce procedures for 'examinations on demand', doubtless details will appear on GB2RS and in our news column. Once you have the pass-slip, plus, if desired, the Morse pass-slip, then you go to SSL at Bristol, pay up and receive a callsign. Once you get on the air, the fact that you were a listener sticks out, because you 'know the form.'

Ted Trowell's favourite mode is c.w., but he can't listen and paint things! VR2GY (1500z) was noted on 14MHz, with (1000z) C56HP, HL2AQN, (1500z) 9K2MU and VQ9QM on 21MHz. PY2NHK (1000) plus (1500) 9K2MU and VQ9HM again on 24MHz! 1000 wasn't so successful on 28MHz with just VK6ZH; but around 1500 LU4FC, YV1NX, A71EZ, HS0/G3NOM, LU1DOP, W0ZR (Minnesota), 5A1A, 5B4AGC, 3B8CF and KP4TF.

Our next stop is Barnsley, where Colin Dean reports loggings sideband from A41LZ, BV2RS, C33BD, DS2KBP, EK3GM, HL3/JA5AUC, JW5NM, RA0SA, TK/DJ5MX, UN8GF, UN0N, VU2AJQ, ZA/IK0EIM, 4F4IX, 4L1BW, 4L1DA, 4S7BRG and 9K2RA. The 18MHz log: AP2JZB, JO1DZA, J28FF, VK1TX, VU2GTE, YB1AQU, 4S7AB, 9G1MR and 9V1CR.

21MHz yielded A92GJ, CM6YI, DU67HBC, EK8WY, ET3AA, HC6HR, HL3GDB, HS1GUW, JT1BV, KL7HLF, OD5IU, OH0JTU, PZ5JR, P43A, VK1MJ, VR2IG, V51AE, XE1CRO, XE1YKK, XX9SC, YD4GAV/MM off YB, ZL2AX, Z28JL, 4L1UN, 5A1A, 6W1HM, 7K1WLE, 7Q7RM, 9K2/SQ5DAK, 9M2TD, 9V1BG and 9V1JA.

Finally on 28MHz we see A41KJ, A41LZ, A61AD, C08LY, CP1CI, D3SAF, EK6TA, EX8MDA, HS0/IK4MRH, JW5NM, JY4NE, J68AZ, OD5/3A2MT, PZ5RA, TA4/DH6MBW, TI4MF, TOODX(=FP), VK4AJK, YC4WIO, 5N29NAS, 7Q7CE and 9K2HS.

## Late Entry

A late entry came in from Rod Johnston GW7RDV (Whitford, Holywell), who uses an FRG-9600 scanner and AKD converter fed with 4m of indoor wire, a combo lacking selectivity. Nonetheless, between August 28 and the end of October, (with nothing in September), Rod was able to find all the continents. Most of his listening seems to have been in the middle of the day, with just four loggings around the 2030 (local) mark.

I was interested to note that Rod's listening and logging aims at preparing himself for the h.f. bands when the time comes. Two reasons: first, an ex-s.w.l. new licensee who 'knows the score' is so obvious. Secondly, the enormous advantage when your contact is in QRM - you can say R5, when others will say 'no copy'.

Paul and Peter Goodhall (Oxford, Holywell) have been a mite less active, while they write a history of Oxford and DARS. (Anyone with useful info, please contact Paul) Against that, they've been learning to decode weather satellites and SSTV, the latter using software downloaded from <http://www.siliconpixels.com> which they say works well with a scanner and a helix antenna. Equipment used: Icom R71E, MFJ antenna tuner, G5RV antenna, plus dipoles for 21 and 28MHz and also a sigma vertical for 28MHz.

On 14MHz they were on early for the long-path VK/ZLs, and three hours later VK and JA by short-path. A notable catch was ZL4IR/ZL7 (IOTA OC-038). In the evenings of course there was much more European QRM, but still they winkled enough out to be satisfied.

## Anonymous Correspondent

Finally, our anonymous correspondent. She's on an RAE course, and questions what is meant by 'tolerances'. Nothing can be measured exactly.

Fifty years ago, a carbon resistor would be selected to be within  $\pm 20\%$  of the nominal value - but by the time it was installed, it might already have wandered further and went on wandering through life.

Today's equivalent usually stays within its selection tolerance. Design of a circuit means that the worst combination of tolerances won't take the overall design out of limits.

For a test meter, there is a tolerance on the movement of so much of the full scale, another tolerance on your ability to read the scale, the tolerance of the high-precision multiplying resistors. Tolerances may all add, or all subtract, or (hopefully!) partly cancel. Thus we may have overall  $\pm 3\%$  of full scale on d.c. ranges or 4% on a.c.

An equivalent digital meter's tolerance will be given differently. So for 100V, we would use the range where 100V is full scale when a true 100V might register anywhere between 97 and 103. Drop the meter or misuse it, and it won't remain in spec. Hence it is checked ('calibrated') regularly against known standards.

Letters, as usual to me by the first of the month, addressed to PO Box 4, Newtown SY16 1ZZ. News as well as lists!



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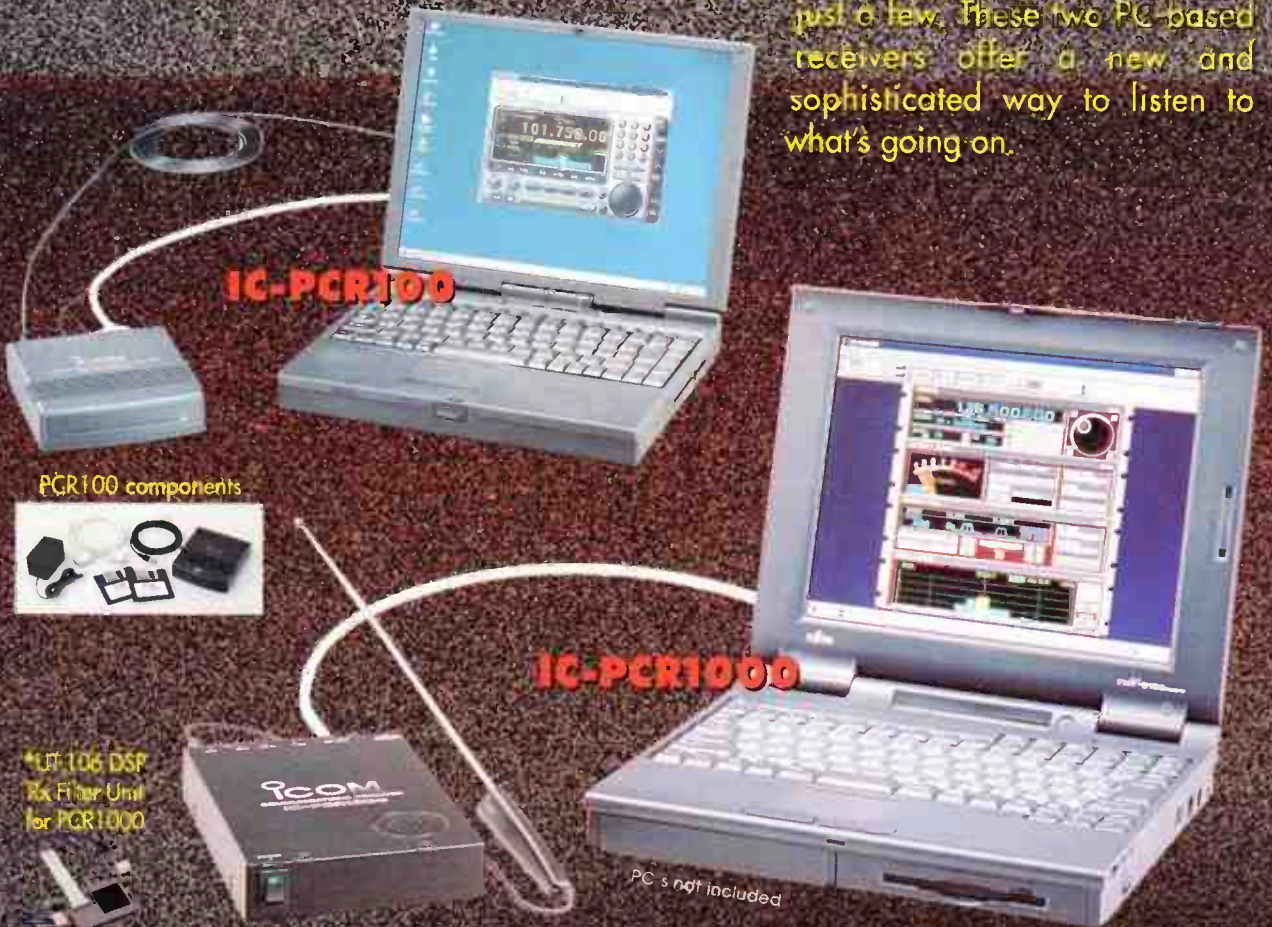
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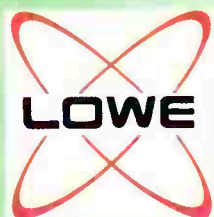
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