short wave magazine

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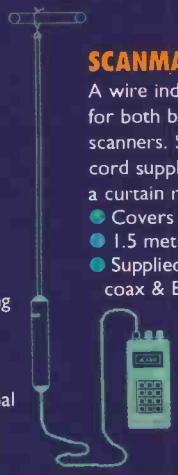

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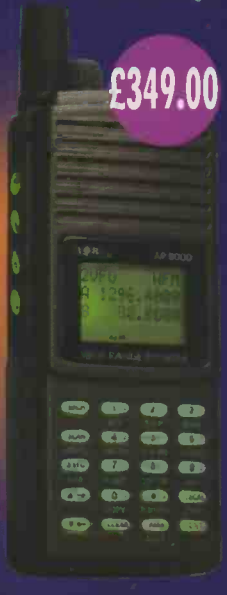

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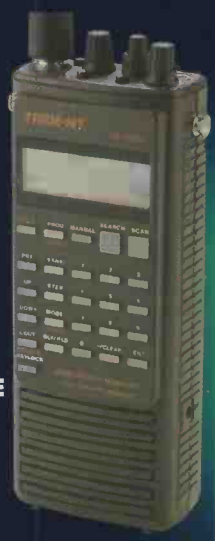

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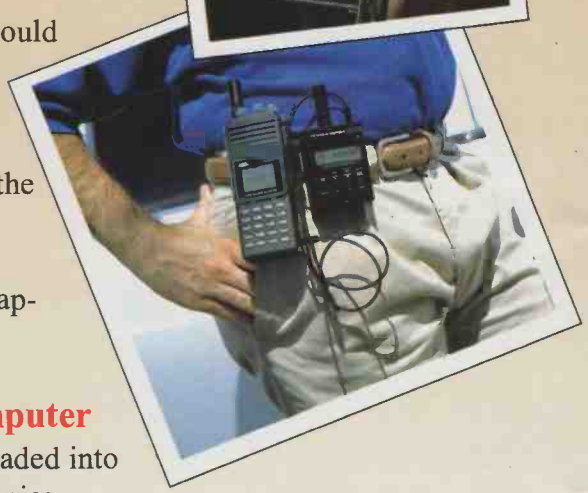

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Win a Roberts R861 Portable World-band Receiver - See page 67 for the first of this two part competition.

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There are easier ways to get your copy of *SWM*!
Photo: John Griffiths

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Good Listening

Communiqué

SEND YOUR NEWS TO KEVIN NICE AT THE EDITORIAL OFFICES

Unlimited Service

High street retailer, **Tandy**, has launched a new service aimed at allowing customers to order unique and hard-to-find items from a catalogue. The initiative forms part of Tandy's pledge to offer the most diverse range of electrical products, parts and accessories throughout its network of 348 stores.

When the Tandy Unlimited catalogues are available, all shoppers have to do is to select the goods they need, fill in a form and the goods will be despatched to their homes immediately. The catalogue covers everything from batteries through to karaoke tapes, mobile 'phone accessories and lots more.

In addition to filling in a form, Tandy Unlimited also allows customers to order direct by post, FAX or, for credit card holders, by telephone. Postage and packing cost £1.50 per item and delivery takes only seven days.

With the Tandy Unlimited range being constantly updated, shoppers can enquire about the availability of parts not currently listed in the catalogue. By filling in details of the item for which the part is needed, customers can order the part, giving their credit card details, while at the same time specifying the maximum amount they are prepared to spend on the item.

Peter Aske, Tandy Marketing Manager, said "We believe that the Tandy Unlimited operation will meet a need from our customers that, for purely logistical reasons, we are not able to fulfil at present. The service aims to enhance our reputation as the most diverse electrical retailer in the UK with an unmatched service, quality and range of products."

New Year Course

John Beaumont G3NGD has made arrangements at the North Trafford College, Stretford, to offers a Radio Amateurs' course starting in the new year, January 1997. This course is very different to the previous courses that John has taught in that it will run for a full 36 weeks and students will sit the Christmas exam in December 1997.

It is also proposed to start another Electronics Servicing for the Radio Amateur course, also starting in January 1997. The day and time will be arranged to meet demand.

Two courses for the Radio Amateur, commencing in January 1997, Stretford, Manchester: Radio Amateurs' Examination - Monday evenings 1800 to 2030. Electronics Servicing for the Radio Amateur (see article published in *PW* May 1996, page 48).

For more details, why not contact John Beaumont G3NGD, **North Trafford College, Talbot Road, Stretford, Manchester M32 0XH** or telephone John on **0161-872 3731**.

New CD ROM

The new Home Education Library CD ROM from the **Public Domain and Shareware Library** (PDSL) is a non-encyclopaedic education CD ROM. It does not contain 'zillions' of files of information, instead it contains 'zillions' of programmes that children, parents and teachers can run to help get them educated.

From simple 'Hangman' that helps with English vocabulary build up and spelling and alphabet learning for infants to programs to teach you Russian, from genealogy to following British Football League activity through the season, designing and making paper airplanes. There are even programmes on conservation, music making and investment strategy.

Teachers will welcome records management and classroom seating charts, lesson plan programes, test and/or quiz generation programs, time line programs for history and even national curriculum records generator programs. There are 1280 programs for Windows and DOS packed onto this CD ROM, which comes with its own 200 page manual of program function descriptions.

Priced at £29 inclusive of VAT, this new CD ROM is available from PDSL, **Winscombe House, Beacon Road, Crowborough, East Sussex TN6 1UL**, telephone on **(01892) 663298**. Credit, debit or switch cards by mail order.

Raising Money For Breakthrough

Sir Ranulph Fiennes is attempting his solo walk across Antarctica, one of the world's last unconquered challenges, in order to raise money for Breakthrough, the charity funding research into breast cancer. His only contact with the outside world is by means of a small customised transceiver, originally designed as an amateur radio kit.

Radio amateurs **Morag** and **Lawrence Howell**, themselves veterans of polar expeditions, are essential members of Sir Ranulph's team, handling the communications and acting as base camp leaders in Antarctica and the UK. It is hoped that Ran's latest expedition, which has HRH The Prince of Wales as Patron and is being sponsored by Dyson Appliances, will raise £3 million for Breakthrough.

The Dyson Antarctic Solo (DAS) expedition is expected to take 100 days and will cover a distance of over 2800km miles. Ran will have to climb to over 3000m and will obviously experience extreme temperatures and high winds. Being a solo expedition, personal and safety communications are paramount.

Ran carries with him a personal satellite location beacon, which can pinpoint his position to the base station in the UK to within a mile or so. His voice communications are on h.f. (short wave) using a purpose built Hands Electronics 2 - 30MHz s.s.b. transceiver. Power efficiency is paramount, as Ran has to pull every gram.

The antenna is a specially designed multi-frequency dipole with plugs and sockets for lengthening and shortening the array for specific channels. It will be supported on ski poles just 1m above the ice. The coaxial feeder cable, specially manufactured by Raychem, stays flexible to below -70°C.

Morag Howell, as Antarctic Base Leader, is living in a tent, with very little electrical power from a solar panel array. She keeps in touch with Ran, and Lawrence's UK base station using two transceivers, together with antennas designed by Lawrence.

Morag's main communication links out of Antarctica will be my Inmarsat. As her base is only 960km from the South Pole, the Inmarsat geostationery Atlantic West satellite appears above the horizon for only a few hours per day. Updates on this expedition can be found at **http://www.rsgb.org**, on the RSGB's Internet site.

New Club For FEBA

An exciting initiative to

encourage support for Christian Radio outreach is launched this month. TransMissioners is FEBA Radio's new club. It's aim is to inspire a new generation of supporters to join together in helping reach thousands of people in Africa, Asia and the Middle East, with the Gospel - by radio.

FEBA's Chief Executive Michael Roemmele says: "FEBA's work is expanding rapidly, with seven new languages due on air in the near future. If the ministry is to keep growing, it's vital to have a new generation of people to help."

Members of TransMissioners are invited to support a different radio programme each month by prayer and giving. A regular flow of information about each programme and about the audience and the listeners will help members be in touch. They will also be kept up-to-date with news about programmes they have previously supported - showing how God is changing lives through TransMissioners.

TransMissioners is similar to a book club where members receive information by post - but here they will also be filling the airwaves with the good news. The emphasis of TransMissioners is on partnership - Christians joining together to spread the good news about Jesus far and wide through radio.

People interested in joining TransMissioners can contact: **TransMissioners, FEBA Radio, Ivy Arch Road, Worthing, West Sussex BN14 8BX** or telephone on **(01903) 237281** (24hrs) or E-mail **reception@febaradio.org.uk**

Radio With Global Perspective

Radio listeners in Oslo and the surrounding area could soon receive a truly global perspective on the day's news if an application for one of the new f.m. radio licences is successful. London based **World Radio Network** (WRN) has applied for permission to broadcast its successful compilation of 25 international public-service radio stations, which are currently transmitted by satellite to listeners in Europe, North America, Africa, the Middle East and Asia and the Pacific.

Programmes from WRN are also heard overnight across the whole of Canada and South Africa on those country's national terrestrial radio stations and are carried 24 hours a day on cable systems in Europe and North America.

World Radio Network programmes come from the world's leading public service broadcasters, including the BBC World Service, Radio Australia, America's Public Radio International, Channel Africa and Radio TV Hong Kong. Listeners from Bombay to Baltimore can hear the world's news, presented by radio stations from Melbournbe to Montreal, and gain a genuine insight into world affairs.

Until the advent of WRN's satellite services, the only way to hear these programmes was via low audio quality short wave radio. Now all these programmes are available for direct to home satellite reception in hi-fi quality, and the granting of an f.m. licence in Oslo will widen the audience, as well as increasing listener choice.

The programmes by WRN play a part in global education and provide a remarkable teaching resource at not cost to educational establishments. Teachers in Europe and North America use WRNs international programmes to illustrate geography, media studies and history lessons, bringing students an up-to-date and real-time window on the world.

Catalogues

Recently landed on the *SWM* Newsdesk are two catalogues, the *Software Reference Guide* by the **Public Domain & Shareware Library** and the *Catalogue Of Technical Books* by **Mauritron Technical Services**. The *Software Reference Guide* has news of new and updated CD ROMs, 100s of new and updated programs along with a program and CD ROM subscription service and CD discounts for members.

The *Catalogue of Technical Books* has details on computer monitor circuits and servicing guides together with vintage valve wireless traders sheets on CD ROM. Contact Mauritron Technical Services at **8 Cherry Tree Road, Chinnor, Oxfordshire OX9 4QY**. (PDSL's address is featured elsewhere in Communiqué).

National Transmitter News

New BBC fm Transmitters

Lyme Regis: A new BBC transmitting station at Lyme Regis now brings good f.m. radio reception, incuding stereo, to an extra 3800 people in the Lyme Regis, Uplyme and the surrounding areas.

Located about 1km north of Lyme Regis, it has now entered service following a period of test transmissions.

Transmission Frequencies

Radio 1	99.3MHz
Radio 2	89.7MHz
Radio 3	91.9MHz
Radia 4	94.1MHz

One same radios, the f.m. band may be marked as v.h.f.

Newbury: A new BBC transmitting station now brings good f.m. reception, inlcuding stereo, to en extra 30000 people in Newbury and Thatcham.

Located about 3km north east of Newbury, it has now entered service following a period af test transmissions.

Transmission Frequencies

Radio 1	97.8MHz
Radio 2	88.2MHz
Radio 3	90.4MHz
Radio 4	92.6MHz

One some radios, the f.m. band may be marked as v.h.f.

Basingstoke: A new BBC transmitting station now brings good f.m. radio reception, including stereo, to an extra 32500 people in Basingstoke and the surrounding areas, inlcuding Brighton Hill, Buckskin, Cliddesden, Daneshill, Kempshott, Oakridge, South Ham, West Ham and Wooton St Lawrence. Located at Swallick Farm, about 5km south east of Basingstoke, it has now entered service following a period of test transmissions.

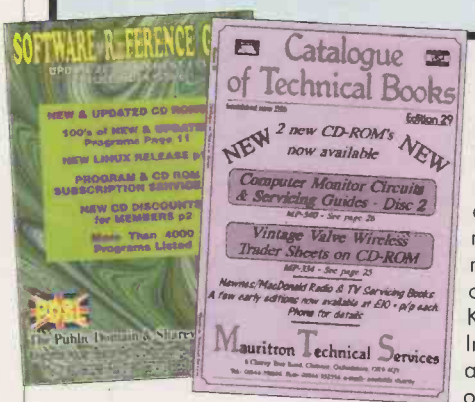
Transmission Frequencies

Radio 1	99.7MHz
Radio 2	90.1MHz
Radio 3	92.3MHz
Radio 4	94.5MHz

One some radios, the f.m. band may be marked as v.h.f.

Saddleworth: A new transmitter for BBC GMR at Saddleworth, located 15km north-east of Manchester, has entered service following a period of test transmissions. The Saddleworth transmitter serves around 36000 people in Saddleworth, Mossley and parts of Stalybridge.

So, listeners in the Saddleworth area should naw tune to 104.6MHz f.m. On some radios, the f.m. band may be marked as v.h.f.



more-so than Ku-band (11GHz) and C-band (4GHz) - signal handling is more difficult and in particular the signal attenuation with clouds, rain and snow which whilst reducing Ku-band signals can completely wipe out Ka.

Intelsat, concerned over the annual April/October solar outages that upset satellite reception during the daytime have established an Internet hotline for advice on minimising outage problems. Dial into their home page on **http:/www.intelsat.int/96falsun/ioclogs.htm.** where you may hear something to your advantage!

The Far Eastern successes of AsiaSat 1 and 2 will be complemented with the planned late '97 launch of AsiaSat-3 at 122° East offering 28 C-Band and 16 Ku-Band transponders intended for TV distribution. C-Band coverage extends into the Middle East, across Asia and

Transponder Update

There's excitement in the 'States right now with satellite players staking claims with the ITU for sections of the next chunk of frequency spectrum to hit the market place - Ka-band that runs from 17.70-20.20GHz. Despite big business exploitation, there are problems with this band

down into Australasia and with high powered spot beams for China and India. And the full bookings on Arabsat 2A at 26° East (allowing Ku-Telecom band reception in the UK) has encouraged the planned slotting of the future launching Arabsat 2c also at 26° East - making for an Arabic Hot Bird slot dedicated to TV.

The mega floating launch 'complex' known as 'Sea Launch' will be based in Long Beach, California, and will be operational mid 1998 and is booked already for a Russian rocket launch. The command ship is being built in Glasgow, the platform in Stavanger and will be towed to the Pacific for an optimum launch position. The project is co-funded between Boeing, US; Norwegian and Russian interests.

New channels being highlighted in the media press include 'African Independent Television' suggesting a late '96 start initially across Africa though Daar Communications claim it's to be a World wide service...the German SAT-1 channel is launching SAT-2 which will comprise mainly repeats and reruns from the Kirch extensive library...Spain's TVE are discussing a Latin American satellite news channel to be transmitted via Hispasat and will be called 'Todo Noticias'...the Iran government has requested 6 satellite slots for their proposed 'ZOREH' satellite at 26°, 34°, 41°, 59° and 61° East though currently Iran prohibits home satellite dishes.

The next main earth station complex may be Gibraltar with American firm GE Americom seeking numerous slots for their future satellite fleet. These will range across the European skies at West 23°, 15°,10° and East 3°, 37.5°, 47°, 51° and over our horizon to East 97°, 100.7°, 105.3°, 108.2°. If these slots are confirmed then a massive uplink and production base will be constructed on the 'Rock'.

D2MAC/Eurocrypt viewers have little to rejoice following another adult content film channel being proscribed by the UK government, thus making it illegal to trade in pirate cards, decoders for same and to insert a pirate card into a D2MAC decoder for said viewing entertainment. It's not illegal to view legitimate 'in the clear' transmissions using the decoder but it is illegal to attempt reception of the banned programmes.

With the ending of hostilities across Bosnia so the UK satellite uplinker 'Uplynx' has been contracted to provide network communication links (digitally compressed MPEG) for the Bosninan TV service pending reconstruction of the system, Uplynx will also provide camera/studio production and video editing expertise.

Rivalry in Spain with both Sogecable/Canal Plus Espagne and telecomms firm Telefonica confirming launching of their own digital satellite TV packages - in January and March '97 respectively.

Happier news for the BBC who were dumped off of the AsiaSat-1 Northern beam April '94 after Chinese government disapproval over the BBC editorial coverage of China's internal matters. Star-TV (News Corporation/Murdoch) was at the time seeking Chinese approval for distribution of Star programming across China. Now BBC World-wide TV is hopeful of selling programming to Chinese terrestrial TV stations with the new wind of media relaxation that blows out of Beijing. BBC can also been seen via PAS-2 in S.E. Asia though currently it's digitally compressed.

Radio and TVDX News

In the 'States, Harris Corporation will be installing for the USA's first terrestrial TV broadcast station - WETA-TV in Washington - a HDTV transmitter. Due to be installed by end '96, it will start transmitting digital TV signals experimentally using the callsign WETA-HD.

The UK's ITC is preparing for TV RSLs - RSLs being 'Restricted Service Licences' which are temporary low powered broadcast transmitters covering a defined area for a specific time period, often 28 days or less. Up to the present only radio RSLs have been in operation at either m.w. or v.h.f. on allocated frequencies (though there is a Silverstone racing circuit u.h.f. TV transmitter for race meetings). TV RSLs will be similar to radio RSLs in terms of low power, limited coverage and defined time periods. The first TV RSLs could be on air by Summer '97.

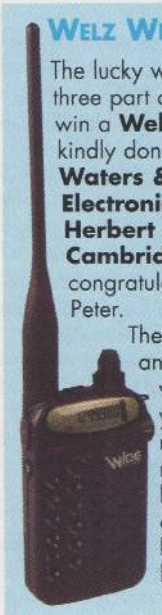
Palestinian TV operates currently at u.h.f. despite a *WRTV Handbook* listing of ch.E4. Should however Band 1 operation take place then be aware that they also transmit certain news bulletins in Hebrew in addition to the present Arabic, French and English versions. Hopefully TVDX will look up!

London's Metropolitan Police has just completed a £15 million project on a revamp of their 'phone system which will provide better security. Last year is was revealed that they'd been hacked by an American who chalked up over £1 million worth of 'phone calls from afar - no suspect was located from US and UK investigation and the case was closed. Over 2/3rds of large UK firms have no anti-hacking 'phone measures in-situ leaving them open to wide scale abuse. A telecomms. paper indicates that managements have no real idea of hacking potential nor how to prevent or reduce it. Telephone hacking (called 'Phreaking') cost US companies over $1.3 billion in 1995!

A note on Portugal's TV service. Currently RTP-1 based in Lisbon has a network split during the mornings with the Northern transmitters opting out of main network and taking the Oporto feed joining the Lisbon national service early afternoon. RTP-2 airs from Lisbon as a national (non-regionalised) service. The outlying island groups of the Azores and Madeira have their own dedicated services in part satellite fed out of Lisbon though Madeira provides daytime programming from 1000 hours. Azores is locally driven from prerecorded cassettes and local news inserts.

Welz Winner

The lucky winner of our three part competition to win a **Welz WS1000E**, kindly donated by **Waters & Stanton Electronics**, is **Peter Herbert** of **Cambridgeshire**. Our congratulations go to Peter.



There is yet another chance to win a radio in your favourite radio read this month. Take a look at page 67, you never know, "it could be you!".

The private channel 'Premiera' in the Czech Republic is closing end December and being replaced with another commercial undertaking. Sweden reckons to open a national terrestrial digital TV network over the next five years and a new German 24 hour local station 'Dresden Fernsehen' is now on the air running 10kw e.r.p. on ch.E59, it opened late May.

Increasing 50MHz (6m) activity in band 1 - Iceland is likely to offer more 50MHz licences now that most TV links are now on cable, Italy is easing restrictions on their 50MHz operators in the 55-51MHz band allowing a power increase from 10 to 300W. Across the water, the Irish authorities are lifting restrictions on 6m operation for one year in cabled TV areas - this for a 12 month trial period.

Yule Tide Yupiteru

Launched just in time for Christmas comes the latest Yupiteru hand-held offering, the MVT-9000.

This dual v.f.o., multi-mode scanner covers from 531kHz to 2.039GHz with step sizes from 50Hz to 125kHz. Weighing in at just 0.41kg including batteries, the MVT-9000 is a palm sized satin finished delight to hold. The set has 1000 channels with 10 priority locations and 500 channels of

search pass memory. The main channels are organised into a convenient 20 banks. The large illuminated liquid crystal display presents the usual vital information such as mode, channel location, v.f.o. frequencies, step size etc. in addition Yupiteru have provided a rudimentary spectrum display.

This new flagship receiver will be reviewed in next month's *SWM*. So watch out for more on this potent hand-held scanner in the February issue.

The MVT-9000 is available from **Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS Tel: (01702) 206835** and **Nevada Communications, 189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (01705) 662145**.

Meteor Showers

Thanks to the British Astronomical Association - Meteor Section we can advise the main 1997 meteor showers, peaking dates, etc.

Name	Overall Period	Peaking
Quadrantids	Jan 1-6	Jan 3 @ 1000
Lyrids	April 19-25	April 22 @ 0800
May Aquarids	Apr 24-May 20	May 4
Cetids	May 7-June 9th	late May
Delta Aquarids	Jul 15-Aug 20	Jul 29 @ 0100 + Aug 6 @ 0200
Perseids	Jul 23-Aug 20	Aug 12 @ 0700 + 1500
Orionids	Oct 16-27	Oct 20-22(wide peak)
Taurids	Oct 20-Nov 30	Nov 3 (wide peak)
Leonids	Nov 15-20	Nov 17 @ 1600
Geminids	Dec 7-16	Dec 13 @ 2200
Ursids	Dec 17-25	Dec 23

Times UTC.

Note: Cetids is a poorly studied shower and the little known Perseids featured a double peak in recent years, now declining but will be active around midday Leonids is due for a high peak possibly 1999 but could offer dramatic increased activity in '97. Thanks to Neil Bone, BAA for offering us this information.

Trip Of A Lifetime

China Radio International is offering the vacation of a lifetime, a free trip to China. That's the grand prize for the knowledge contest of The Relics Cup, sponsored by Shaanxi Province, China Radio International and Air China.

To enter the contest, participants have to answer six questions. All the questions are based on a series of reports that China Radio International broadcast from September 9th to 20th. Reports and questions will be repeated again in November.

The top six winners will get a free trip to Beijing and Shaanxi. Other prizes include a variety of traditional Chinese handicrafts and silk scalves. Answers need to be sent in by the end of February 1997 to: **English Service, China Radio International, Beijing, China 100866**. Good Luck!

To answer these questions listen to the European broadcast daily at 2000 to 2200UTC on 6.950 and 9.920MHz.

1) Where is Shaanxi Province located in China?

1) In the northwest of China
2) In the northeast of China
3) In the southwest of China

2) What are Shaanxi Province's three advantages?

1) Science and technology, destiny of population and culture
2) Science and technology, natural resources and culture
3) Culture, natural resources and climate

3) How many dynasties in Chinese history set up capitals in Shaanxi Province?

1) Twelve dynasties
2) fifteen dynasties
3) thirteen dynasties

4) Which relic site is included on the United Nations Educational, Scientific and Cultural Organisation's World Heritage List?

1) The Qin Terra Cotts Warriors
2) The Famen Temple
3) Forest of Steles Museum

5) On the route of the Yellow River Highlights Tour, there is a splendid waterfall that is the largest along the Yellow River. The waterfall's image is printed on China's 50-yuan RMB currency. What's the name of the waterfall?

1) The Huang Guoshu Waterfall
2) The Hukou Falls
3) The Renzi Waterfall.

6) Shaanxi Province has implemented the new 'four-exchange' policy to attract foreign investment. Please list three of the four-exchanges. For example, to exchange resources for what?

1) To exchange resources for technology; to exchange ownership for capital; to exchange resources for capital
2) To exchange ownership for capital; to exchange existing assets for increased value; to exchange ownership for projects
3) To exchange resources for technology; to exchange ownership for capital; to exchange market for projects

SEND YOUR NEWS TO:
Short Wave Magazine
ARROWSMITH COURT,
STATION APPROACH,
BROADSTONE, DORSET
BH18 8PW.

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

Rallies

January 19: The Oldham ARC Mobile Rally will be held at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. Doors open at 11am (10.30am for disabled visitors). This event will feature all the usual traders and a Bring & Buy stall. Morse tests are available on demand. Talk-in on S22 via GB4ORC, commencing at 7.30am. Mobile contact prize up to 2pm. Refreshments and free parking available. **(01706) 846143** or **0161-652 4164**.

February 2: The 12th South Essex Amateur Radio Society Radio Rally is being held at the Paddocks, Long Road, Canvey Island, Essex. The Paddocks is situated at the end of the A130. Doors open at 10am. Features includes amateur radio, computer and electronic component exhibitors. There will also be a Bring & Buy, RSGB Morse testing on demand (two passport photos required). Home made refreshments, free car parking with space outside main doors for disabled visitors. Admission is £1. Further information from **David G4UVJ** on **(01268) 697978**.

February 2: The Harwell Amateur Radio Society are holding their indoor Radio & Computing Rally at the Harwell Science & Engineering Centre, 1 mile west of the A34 between Oxford and Newbury. Talk-in on S22. Doors open at 10am. There will be trade stands, a Bring & Buy, craft exhibitors, bar and light refreshments. Admission is £1 and children are free. **Arthur G0KOC** on **(01235) 815399** or **http://www.rmplc.co.uk/eduweb/sites/ntaylor/rally.html**

February 16: The 16th Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield - one large hall - just out of town on the Horbury road. Easy access from M1 juncts. 39 & 40 - well signposted and with talk-in on 2m and 70cm. Doors open at 11am (10.30am for disabled visitors and Bring & Buy). Further details from **Peter G0BQB** on **(01924) 379680**, FAX: **(01924) 257445**, E-mail: **rally@waveg.demon.co.uk** Web page: **http://www.waveg.demon.co.uk/rally/**

February 22: The Tyneside Amateur Radio Society will be holding their 11th annual rally at the Temple Park Centre, South Shields. The Temple Park Centre is located on John Reid Road, approached from A194 and with excellent access from all ports. Doors open at 11am with special entry at 10.30am for disabled persons. Admission is £1 on the door. The talk-in station will be provided on S22 from 8am. There is ample parking space for visitors and special arrangements will be made for disabled visitors. There will be a Bring & Buy and all the usual trade stands. More details from **Jack G0DZG** on **0191-265 1718**.

February 22: The 12th Rainham Radio Rally, sponsored by the Bredhurst Receiving and Transmitting Society. This is the 4th year at the new venue, which is, The Rainham School for Girls, Derwent Way, Rainham, Kent ME8 9PP. Talk in on S22 GB4RRR. Doors open 10am, (9.30am for disabled visitors and items for Bring & Buy). Admission is £1.50, under 14s free. There will be the usual mix of trade stands, Bring & Buy, many special interest groups will also be represented, ie. RNARS, RAYNET, KRG, KEPAC, BARTG, etc. There will be plenty of off road parking, a licensed bar, food and refreshments. More details from **Martin M0AAK** on **(01634) 365980** at any reasonable time.

Bandscan EUROPE

Funding continues to be one of the major preoccupations in public service international radio within Europe. Budgets are forever under fire and as a result, broadcasting services are never guaranteed a long life. So it comes as no surprise to learn that Radio Vlaanderen International (RVI), Belgium's foreign broadcaster, is to close its German language service during 1997.

Radio Vlaanderen International broadcasts almost around the clock in Flemish, and has services in Arabic, English, French and Spanish in addition to the threatened German language output. The station currently broadcasts in German twice a day, with the daily evening transmission at 1830UTC carried on short wave and the powerful medium wave channel of 1512kHz.

The rationale behind the planned closure is difficult to work out. Belgium is the heart of Europe, and Germany is one of the most powerful countries in the European Union. So why doesn't Belgium want to provide its own perspective on Europe to listeners in Germany? As I find out more, I'll let you know.

Meanwhile, you might care to look at the Radio Vlaanderen International web site, if you have access to an Internet browser. Log on to **http://www.brtn.be/rvi/** for frequency and programme information about all the station's output.

BBC WORLD SERVICE

The BBC World Service is in a less sticky position than it was, with the announcement in the UK government's autumn budget that £5 million of the station's operating budget is to be reinstated in the financial year from April 1997. The total operating budget of the London-based international broadcaster is £152.4 million. This means that the threats to some language services from Bush House are lifted.

In a statement after the budget announcement, BBC World Service Managing Director, Sam Younger, commented: "Against a background of tight public spending this represents a considerable vote of confidence by the Foreign Secretary in the World Service. The settlement will allow us to move forward confidently, avoiding any further reduction in language services but also making key investments to position ourselves for the next century."

The BBC continues to develop services in Africa. The lifeline broadcasting service to Rwanda, Burundi and Zaire in the local languages of Kinyarwanda and Kirundi was doubled to thirty minutes every weekday from mid-November. Research by the United Nations Commission for Refugees (UNHCR) conducted in the winter of last year showed that despite being on the air for just fifteen minutes Monday to Friday, the BBC World service was the most popular and most listened to radio station in the refugee camps in the region.

The BBC's broadcasts in the two African languages are funded from a variety of outside agencies, including the UNHCR, rather than from the British government's annual grant-in-aid settlement which pays for the rest of the BBC's international radio broadcasting effort.

Also in Africa, BBC World Service is now carried 24 hours-a-day on f.m. in the Ugandan capital, Kampala. Programmes in English and Swahili are now available on 101.3MHz f.m. via a BBC-installed transmitter, which will be maintained by Radio Uganda's local engineers. Programmes including the popular *Focus on Africa* and *Network Africa* will be transmitted, as well as the full range of current affairs, science, music and drama output from Bush House.

LICENSING & REGULATING

Britain's Radio Authority, the body responsible for licensing and regulating the country's independent radio stations, is examining the feasibility of advertising a licence for a national independent radio station using a long wave frequency. The 225kHz channel, a UK frequency assignment previously allocated to the BBC in Scotland, but not used by the Corporation, is now available to the Radio Authority.

The Authority says that, with the use of some additional medium wave 'gap filling' transmitters, satisfactory nation-wide coverage would be guaranteed. If the licence for the long wave service is advertised, it will be the first time that a long wave service is operated in the UK by anyone except the BBC.

STATION NEWS

The privatisation of Voice of America (VoA) Europe, the music and news channel operated from Munich, seems to be going ahead. Reports circulating in the United States say that a radio station group called Clear Channel Communications and the ABC Radio Network (part of

Peter Shore
C/O SWM EDITORIAL OFFICES
BROADSTONE
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BH18 8PW

the commercial ABC TV and radio service) is negotiating to establish a private company called VoA Global. The new organisation would take over VoA Europe which was due to lose US government funding at the end of December 1996.

Keen short wave listeners may have noted that Ireland is now on short wave regularly. West Coast Radio in County Mayo is broadcasting each week via transmitters at the Deutsche Welle's Julich site in Germany. Tune in on Thursdays to the North American transmission at 0100 to 0200UTC on 5.910MHz, or to the European transmission at 1500 on 6.015MHz or the African transmission at 1800UTC on 11.665MHz. You can contact the station at West Coast Radio Ireland, Murneen Post Office, Claremorris, County Mayo, Republic of Ireland.

And finally, frequency news from two east European stations to conclude this quarter's look at broadcasting around the continent...

The Voice of Russia, complete with its new station identification music and an E-mail address for listeners, letters **(letters@vor.ru)**, can be heard in Europe in English: 1700-1800UTC on 9.89, 7.44, 7.18, 6.13, 6.11 5.94, and 4.92MHz; 1800-1900UTC on 9.89, 7.44, 7.18, 6.13MHz and 1143kHz 1900-2100UTC on 9.89, 7.44, 7.18, 6.13, 6.11, 5.94 and 4.92MHz; 2100-2200UTC on 9.89, 7.44, 7.32, 7.18, 7.17, 6.11, 5.94MHz; 2200-2300UTC on 9.89, 7.44, 7.40, 7.36, 7.32 7.205, 7.18, 7.105, 6.11 and 5.94MHz.

Radio Prague has English for Europe: 0800-0827UTC on 9.505 and 7.345MHz; 1000-1030UTC on 21.705 and 17.485MHz; 1130-1157UTC on 9.505 and 7.345MHz; 1400-1430UTC on 17.485 and 13.58MHz; 1700-1727UTC on 9.43 and 5.93MHz; 1800-1827UTC on 9.43 and 5.835MHz and 2100-2127UTC on 7.345 and 5.93MHz.

Grassroots

Club Secretaries:
Send all details of your club's up-and-coming events to:
Lorna Mower, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

AVON

Bristol International RC: Tuesdays, 8pm. The Little Thatch Country Club, 684 Wells Road, Whitchurch, Bristol. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers' can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. January 1 - New Years Greetings, 8th - CW activity evening, 15th - Photographic equipment, 22nd - The 'Matthew' project. For more information ring (01275) 834282 on a Wednesday evening.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 8pm. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). January 8 - Discussion evening, 16th - Annual dinner, 22nd - The 50MHz Experience. Gerry Somers G7VFV on (01296) 432234.

DEVON

Appledore & DARC: 3rd Mondays, 7.30pm. Appledore Football Clubroom. January 20 - Your questions answered by Bob G3GNR and Dennis G0FCL. Dave Brierley G3YGJ. (01237) 476124.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. January 8 - Radio Bygones, 22nd - DC -500kHz. Tommy Main GM4DCL, QTHR on 0131-663 8501 day and evening.

HAMPSHIRE

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. January 7 - Natter night. S. Swain (01705) 472846.

Southampton ARC: Mondays, 7pm. This club is now up-and-running after some years of inactivity. New members welcome. Harold McIntyre on (01703) 737715.

HEREFORD & WORCESTER

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. January 14 - Night on the air. Barry Taylor. (01527) 542266.

Hereford ARS: 1st & 3rd Fridays, 8pm. Many talks and interesting evenings including, January 3 - Informal meeting, 17th - Video evening, DXpedition, etc. Tim G0JWJ, QTHR. Tel: (01432) 279435 or Paul G0DJF on (01432) 353765.

HERTFORDSHIRE

Harpenden ARC: 1st Thursday of the month from September to May, at Aldwickbury School, Harpenden. Morse classes each Monday during term time. January 9 - 1997 G0OMY on the air night. Further details from Peter 2E1BDB on (01727) 860631 or John G4JOV on (01582) 765821.

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. January 16 - First Aid with the Red Cross. Don G3JNJ on 0181-292 3678.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. January 21 - 1997 AGM. A. Messenger G0TLK. 0181-777 0420

Medway AR & TS: Fridays, 7.30pm. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. January 16 - Ken Astronomical Society - an introduction to the space and earth observatory at Riverside, 8.30pm. G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. January 8 - Night on the air, construction QRP and Morse practice, 15th - Wireless, the inside story by Mike G4UUB. Mike G4EOL. (01603) 789792.

NORTH YORKSHIRE

Hambleton ARS: All meetings held at Allertonshire School, Northallerton, 7.30 to 9.30pm. January 9 - Ragchew, January 23 - AGM. More details from John G0VXH on (01845) 537547.

SOMERSET

Wincanton ARC: 1st & 3rd Mondays, 7.30pm. The Community Lounge, King Arthur's Community School, West Hill, Wincanton. January 20 - AGM. Tim Stellar G6RCT on (01963) 31788.

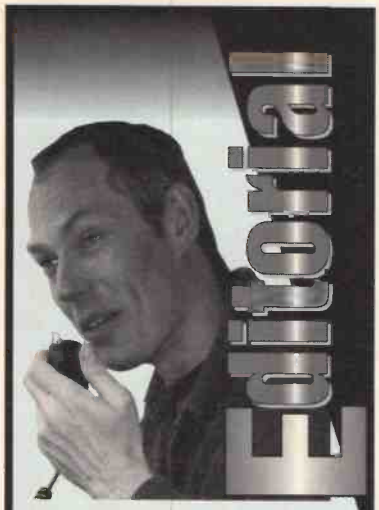
Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. January 2 - Committee meeting and club station on air, 9th - Working stroke portable through Scandinavia by G3KSK, 16th - Surplus equipment sale, 23rd - Microwave communications, Pt. 2 by G3TSK. Cedric White, QTHR. (01258) 473845.

WARWICKSHIRE

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. December 25 - Christmas greetings on the air, January 13 - Annual dinner/social. The Society are again organising a course of instruction for the Radio Amateur Examination of the City & Guilds of London Institute and further details can be obtained by writing to the Chairman of the Society, Mr J. Harris G8HJS, enclosing a stamped addressed envelope. The address to write to is: 57 Evesham Road, Stratford upon Avon, Warks CV31 2PB.

WEST YORKSHIRE

Wakefield & DRS: Tuesdays, 8pm. The Ossett Community Centre, Prospect Road, Ossett. January 7 - On the air, 14th - Tuning co-ax traps without a GDO - G0BQB, 21st - TCP/IP convers., IRC and the Internet/Amateur Radio Connection - 2E1DML. Bob 0113-282 5519 or G3WWF@GB7WRG.



Oh, the problems you run into when trying to be general about specialised subjects.

I was recently involved in a meeting which was brought about by the mis-reporting of the illegal activities of criminals who profit from copying mobile 'phone identities. This is known as 'cloning'. The Cellular industry in this country - and others too - is understandably very concerned about these activities, which result in the loss of millions of pounds of revenue every year.

The general press and even some which should know better have latched on to the name 'scanners' refered to in a bill which is intended to close a loop hole in the law and allow the prosecution of those involved in this illegal activity.

The equipment that has been given the generic name of a 'scanner' is not what we, in the radio hobby know to be a scanner. In the Cellular 'phone fraud context, the term actually refers to a very specialised piece of equipment that intercepts and records very specific information. The press has reported that 'Scanners are to be banned!' this is **not** the case, so don't worry, you won't have to give up your prized receiver at a scanner amnesty. Better still you will be able to buy that radio that you've been saving for - we have a special offer this month to help you spend that Christmas money - see page 45.

In case you're wondering, Dick is well inspite of the crutches, he is currently enjoying a holiday with Peggy in the USA.
That just leaves me to wish you all a prosperous New Year and lots of good DX.

Kevin Nice G7TZC
Assistant Editor

Letters

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

Dear Sir

I am writing to you in the hope that you will allow me to use your letters page to ask your readers for any information they have, no matter how insignificant it may seem, on the wartime German radio broadcaster, William Joyce (Lord Haw Haw). Joyce has always fascinated me, especially his family connections with my home town of Oldham.

The type of information I require, as I have said, is memories, the effect he had on people who listened to him, his speeches, what people remember of them, maybe some of your readers met him, any information regarding this man would be much appreciated.

I would like to point out that I am not an author, I am strictly an amateur in this field. If any of your readers can help me by sending me their memories or stories told by friends or relatives and, would like a print-out of the finished project, please mention it in letter and I will keep a record of names, addresses and send a copy when its finished. I have not set a date to complete this work.

Finally, I am new to the scanning hobby, airband being my main interest. Many thanks to your excellent magazine for the wealth of information available in each issue.

D. Denton
19 Butterworth Street
Chadderton
Oldham
Lancashire OL9 OJL

Dear Sir

I have been in a few radio shops over the past 12 months and on several occasions I have noticed youths of 16 to 20 returning their scanners saying its useless and they can't hear anything and wanting their money back, usually they lose a lot, of course they are correct, the same happened to me, the set seemed dead, so I rang the shop, he gave me five or six frequencies to try and sure enough, I was hooked.

Since then, I haven't stopped listening, its just great and more so now that I've purchased some frequency books. I'd like this letter published please, in the hope anyone buying a scanner for Christmas will also buy a frequency directory. Better still, ask for a full demo and a few frequencies to listen to in the area.

My thanks for a super magazine.

Mr X
Bradford
(Name and Address Supplied)

Dear Sir

I have only recently started buying your magazine, which I found advertised in *Passport To World Band Radio* and have found it entertaining and informative. I am far from being a newcomer to the hobby of DXing, (I have been interested in listening to short wave radio stations for over twenty years), I still find the hobby both informative and very interesting and still have the same radio (a Fidelity) and use a very modest aerial.

I agree with Andrew Ikin about the number of religious stations on short wave from America, which are boring. When I first started DXing, there were only a few religious stations, but now with more stations set-up, mostly funded by religious organisations, I don't have anything against religious stations per say, but wouldn't it be nice to see something original arising from North America?

I look forward to reading your magazines for the years to come and will continue to enjoy this excellent hobby.

D. Fisher
Formby
Liverpool

Dear Sir

I hesitate to criticise such an fine publication as *SWM* but, as a scanner user, I feel I must comment on the lack of coverage this side of the listening hobby is getting in your magazine. I know there are various legal restraints and I applaud the introduction of a Frequency Exchange, but I believe the one regular column you devote to scanning is not really enough to satisfy scanner users.

Also, John Griffiths, the author of this column, seems to have lost his way and it's now become just a military adjunct to Godfrey Manning's Airband section. Perhaps your new dedicated Military Airband column will encourage John to focus a little more on scanning and, I hope, to be a bit more proactive in his approach. He says it's our column and he's there just to collate our letters but I would have thought that he should be actively seeking out and passing on information that is not generally available. There are always new frequencies coming into use, the massive Met. police shake up, for instance, or new scanners in the pipeline - he must of heard the whispers about the AR16. I can't believe readers are his only source of information.

I'm also not happy with the way he used his column in the October issue to chastise Granada for their use of a scanner in the popular soap *Emmerdale*. I enjoy soaps (sad, I know) and I believe the more people who become interested in the hobby, the more likely it is our laws will be seen to be stupid and unenforceable. I didn't object to the national press stories about the listening banker, the 'squidgy' tapes, 'Cammillagate' and so on because they raised the profile of the hobby and increased the number of scanner users in this country. There are those who say that it was better when scanners were used only by enthusiasts, but I don't agree. Our hobby isn't much fun if we stick to the letter of the law and I believe the only way that it will become acceptable is for large numbers of people to become involved.

Introducing scanning into mainstream programmes is the ideal way to do this and I am grateful to Granada for showing millions of viewers a glimpse of our hobby. Okay, they didn't use a very realistic (no pun intended) scanner but, out of approximately 12 million viewers, how many do you think noticed - or cared. I can't see why John feels it was downright disgusting.

He does seem to have taken this very much to heart but I think he has overreacted. The characters in the programme, the Dingles, are pig farmers who are also caricature criminals. They've been brought in as comic relief and their villainy is never taken seriously. Okay, so Zak used a scanner but why did John say,"...the programme has determined that all scanner users are nothing more than ghoulish anoraks...", or "...they have shown the hobby to be populated by members of an 'odd sect'", and "...it portrays scanner - and radio - enthusiasts in general as ghouls".

There was no implication of this in the programme, they just showed Zak and his family using a scanner. There was no mention of any other

scanner users and I don't see how John could have used this to draw the conclusion that all radio enthusiasts have been tarred with this brush. He might just as well have said that the antics of these characters show that all pig farmers are villains.

It's all too easy to become totally engrossed in a hobby to take stuff like this too seriously. It's only a soap opera and it's only a hobby - lighten up.

Meanwhile, I'm looking forward to gleaning lots of interesting frequencies from the 'Frequency Exchange' and my contribution will be winging its way to you as soon as I can collate all the scraps of paper in the pockets of my anorak.

R. Atrium
Chelsea

Dear Sir

I am the scanning editor with Australia's only hobby radio magazine, *Radio and Communications*. I am also a railway enthusiast, which brings me to the reason for writing. I would like to correspond with fellow scanner/rail fans, with a view to exchanging audio tapes.

I am seeking recordings of all British railways actions including mainline, shunting yards as well as private railways. I can provide tapes of police, fire, ambulance, aircraft or whatever takes your fancy. We have no restrictive laws, such as those enacted in the UK.

Australian's are free to listen to whomever we choose, with few restrictions. If any reader of *SWM* is interested, please write to me at the address below.

Russell Bryant
PO Box 344
Springwood NSW 2777
Australia

Dear Sir

I am somewhat puzzled by some of the nomenclature used in 'Active Solution', page 22 of the October issue of *SWM*. For example, in the introductory paragraphs, the "...**electrostatic** field of the radio wave..." is referred to. 'Electrostatic field' is defined as "the field due to a charge or assemblage of charges at **rest**, so therefore the electrostatic **field strength** is constant at any one point.

For a radio wave, however, which is just one example of an electromagnetic wave, the electric field intensity is varying approximately sinusoidally at any one fixed point on the x-axis, assuming for simplicity that the wave front (assumed plane) is moving along the x-axis.

The second point concerns the use of the term "...the Electromagnetic Field". I have never come across a **definition** of this term and I certainly am not aware of any unit in which it can be measured. My experience is that the term **Electromagnetic** Field is used (more and more often), in a purely general and descriptive sense, to cover the situations where both electric and magnetic intensities exist in a particular region.

C. G. Bennett CPhys MInstP
Stockport
Cheshire

Dear Sir

This is my third letter to *SWM* in about four years. Thank you for using the last two!

Originally I wrote after the review of the Yupiteru VT-225 airband receiver was published in 1992 and to cut a long story short, struck up a very good friendship with another subscriber and avid aviation freak! Mike Wynn from Oxford. Well, after many years of correspondence between NZ and UK, we actually met in Fiji in June of this year (complete with VT-225s I might add!). Both his family and mine spent two weeks under the tropical downpours and little sunshine (it was great!).

One of the highlights was a visit to Nadi airport, including the airground centre - see photo. The whole system was installed by NZ in the 70s. It looks a little outdated but still worked very well these days. Oddly enough, Nadi has no radar so there is a lot of talk on v.h.f., (they do use GPS though).

As you can imagine, we had lots to talk about and the time soon passed. We still exchange magazines and tape cassettes, not to mention the numerous phone calls between Oxford and Wellington.

Thank you *SWM* for starting a friendship which is second to none.

Steve Rawdon
New Zealand

To:
Dick@pwpub.demon.co.uk

I've been buying *SWM* now for more than four years.

I bought my first scanner when I was sixteen and was hooked. All I can remember was that it was from the PRO stable and was very heavy considering that it was a hand-held. The day I discovered *SWM* was brilliant, a magazine that dealt with what up until then I had thought of as a clandestine hobby. Some of the articles were a bit over my head because I hadn't even realised that there was life below 30MHz. So for the next couple of years I persevered with my old scanner until I decided to buy new my purchase being the new model from AOR the AR1500 with s.s.b. It was amazing, all the new things I could hear, like the marine calling channels, VOLMET and when I heard a REACH callsign for the first time, you'd have thought I'd won the lottery.

Eventually, I realised that the s.s.b. from my AOR was only a compromise and that if I wanted more from s.s.b. then I would have to part with more cash. So after a bit of thought and wading through all my back issues of *SWM*, I decided to buy the Sony SW55. Along with an a.t.u. and 15m of bell wire I set off discovering the world (well some of it at least).

I often think if I had never found *SWM* on the shelf at my local WH Smith I might have dropped the hobby all together. Everything that I've learned has come from your magazine so I thought I'd let you know how grateful I am.

Darren Bell...via the 'Net

Steve and Mike (seated) at Nadi Airport.

SWM SERVICES

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Subscriptions are available at £25 per annum to UK addresses, £30 in Europe and £32 (Airsaver), £37 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £42 (UK) £47 (Europe) and £51 (rest of world).

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

The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: (0956) 374918 (Mon. - Fri. 9am - 5.30pm).

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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, or whatever 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 are **£2.60** each, photocopies are also **£2.60** per article, plus **£1.00** for subsequent parts of serial articles.

Binders, each taking one volume are available for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

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Technical Help

We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. If you require help with problems relating to topics covered by *SWM*, please write to the Editorial Offices, we will do our best to help and reply by mail.

Lowe Electro

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Following on from our hugely succesful Europa and the more recent HF260, we now present the HF250, Europa...

Our HF250 has proven that performance is a key factor in anyone's choice of receiver but more important than that, today's busy SWL'S need a receiver that is uncomplicated and truly easy to operate. The HF250 EUROPA offers performance through an improved front end with magnetically shielded inductors and low-noise switching diodes. Together with a tighter IF filter bank, this offers a lower- noise level, excellent sensitivity with good strong signal handling and better selectivity, making it the ideal choice for the serious Dxer and the dedicated listener too.

The HF250 Europa includes a synchronous detector with selectable sideband with a deep lock range, offering lower distortion audio for long periods of programme listening that also helps with fading. Users will also like the RC250 remote commander that allows tuning, mode changing, memory selection and programming and a number of other functions.

The bright, clear, backlit liquid crystal display shows frequency to 100Hz resolution, or contents of the 255 memory channels, which store mode filter settings as well as frequency. A bank of LED's keeps you informed as to what mode you are in and a separate moving coil meter tells you the received signal strength. All the information you need for easy operation is there at a glance.

There are two rotary controls for volume and tone plus another for tuning. In addition there are just seven other push-buttons controlling a wide range of functions but keeping the operation very, very simple. Behind this simplicity, we've concealed an impressive array of advanced features for those who need them, including filter selection, clock and timer functions, attenuator, memory store and recall.

The HF250 Europa is superb for audio broadcasts but is also ideally suited to those interested in data communications too. A fixed level output on the rear panel makes connection to external decoders very easy. We haven't forgot those who like to control their receivers from their computers either and the HF250 Europa has a built-in RS232 interface. We supply a lead from the HF250 Europa to 9-way RS232 connector for direct connection to most modern PC's. A free MS-DOS-based control program is also included to get you started but advanced users may want to look at our RCON control software for more advanced features.

If you need more details, we have a brochure describing the HF250 Europa in our shortwave information pack. For those already aware of our legendary skills in design and manufacture plus the excellent reputation we have built up with our previous award-winning quality products and first-class support, you can order right away!

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The launch of our Airmaster ACARS decoding software took the aviation world by storm and the new V3.00 is selling even better.! To access the wealth of aviation data communications, all you need is a reasonable airband receiver tuned to 131.725MHz and at least a 386 IBM compatible PC plus AIRMASTER and you are there! Flight numbers, tail numbers and engineering infomation and other data is there waiting to be looked at!

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AIRUP (upgrade from V2 to V3) £29.95

nics Ltd

With the launch of our HF 150 short wave receiver, we set amazing new standards for performance against price. Despite a couple of price increases over the years, the HF150 still offers this superb value for money. No one has come even close to meeting these standards, which shows why even after five years in the market, it is still the number one selling communications receiver and an ideal choice for those about to buy a new receiver but having to watch the pennies.

Frequency coverage of 30kHz to 30MHz includes all short-wave broadcast, marine aviation and amateur bands, and AM, USB and LSB modes mean that nearly all voice modes are covered. For those who like to listen to radio broadcasts rather than looking for exotic DX stations, the HF150 offers unrivalled audio quality via the selectable sideband synchronous detector and a special hi-fi filter setting. We know a number of customers using the '150 as a tuner in their hi-fi systems and that leads me to another of its qualities - the look. Honestly it will not be out of place in your living room, allowing the whole family to benefit from global transmissions with a rich content of music, culture and current affairs from around the world.

The SSB filter is selective enough to allow reception of utility stations like long-distance marine or Trans-Atlantic aviation and the ssb performance is also ideally suited to data modes like FAX, RTTY, and NAVTEX. Indeed a growing number of boat owners are specifying the HF-150 marine version together with our Modemaster software as an on-board weatherfax monitoring station.

The HF150 on its own will provide years of entertainment with enough performance to satisfy a huge number of listeners - there are nearly nine thousand of you out there already. We do however have a complete range of accessories to add operational convenience, like the KPAD1 keypad which allows dircet frequency entry or selection of one of 60 memory channels. You can also add a backlight to the LCD, or carry case for portable operation and the IF150 interface can add computer control. By the way, it comes complete with a 12V mains power supply and has provision for battery operation too. These can be dry cells or built-in charging circuit can charge Ni-Cads if you wish.

If you want to improve performance at a later date then consider the matching PR150 pre-selector or AP150 audio processor and amplifier for improved selectivity and audio performance. There's even a neat-looking rack system to store all these items together!

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For some this is an ideal short wave receiver - for a lot of others it may be the only short wave receiver they will ever need.

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Lowe HF-250 Europa

Looking for an easy to operate high quality h.f. receiver? Mike Richards looks at the new Lowe HF-250 Europa, which could well fit the bill.

Having reviewed the basic HF-250 and being a proud owner of an HF-150, I noted with great interest the release of the HF-250 Europa. With multi-mode coverage from 30kHz through to 30MHz, the Europa is set to appeal to a very wide range of listeners. The review model was one of the first off the production line and was received hot from the Leicester Rally.

The basic design principle of the HF-250 was to achieve sufficient r.f. performance to cope with today's crowded bands and strong signals, whilst simplifying the operation as much as possible. I'm sure many readers would resonate with this basic principle. This represents a refreshing move away from the mass of receivers that boast a wide range of features that most operators never use. Anyway, on to the review.

Europa Special

You're probably wondering what's so special about the Europa and why the new name. This concept originated with the HF-225 back in 1992 when the DX club of Finland requested a number of modifications to the receiver to meet their specific needs. The co-operation between Lowe and the DX club proved very successful and the Finlandia, as it was known then, won the European DX Council's Best DX Receiver of the Year. Subsequently, Lowe decided to offer the receiver on general release and coined the name Europa. So what's the difference? Most of the work centres around improvements to the receiver's filtering. For a start, the filter bank has been changed to include higher specification filters and a new, 3.5MHz, filter has been added. To make best use of the filter changes, the control software has also been rewritten. The remaining changes are around the filter switching components, where new magnetically shielded chokes have been used along with low capacitance switching diodes and surface mount decoupling capacitors. These latter changes have been designed to minimise leakage around the filters.

First Glance

The styling of the radio is certainly unique and much closer to that used for hi-fi equipment rather than contemporary radio gear. This will doubtless be a big attraction for those listeners that don't have the luxury of a separate room for their listening. The case is made of extruded aluminium with a black anodised wear resistant finish and very solid and robust feel. One particularly novel idea was the way in which the internal speaker had been integrated. Rather than the conventional speaker grille, the HF-250's speaker is mounted inside the case with the sound ducted to emerge from the carrying handle located on the top panel! Yet another example of design innovation.

The Europa's design philosophy has certainly shown through in the front panel layout as there's no mass of buttons and knobs just seven push buttons and three rotary controls. This is a big plus point and makes the receiver far less daunting for the new listener. The simplicity has been achieved by automating as many functions as practical. A good example being the way in which the tuning rates varies depending on how fast you turn the knob. There were very few weak areas, but personally, I didn't like the markings for the secondary functions of the push-buttons. These were sign-written in red print using a small typeface making them very difficult to read. The rest of the panel lettering was easy to read and largely self-explanatory.

Ins & Outs

In order to fully realise its potential as a wide range communications receiver, its important for the HF-250 to have a good range of input and output facilities. As with most of the Lowe range, the receiver is provided with an externally mounted 12V d.c. power supply. This keeps mains voltages well away from the receiver and gives the flexibility to make use of standard external power sources such as can be found onboard a boat or car. The power requirement is 12V d.c at just 400mA so this can easily be supplied from a cigarette lighter socket. Although the internal ducted speaker provides surprisingly good results, there's a standard 6.3mm jack on the front panel for private, higher quality, listening. This was wired so that mono or stereo headphones could be used without problem. There was also the usual 3.5mm external speaker socket on the rear panel that automatically disconnects the internal speaker. For those like me with an interest in data decoding, the HF-250 has a fixed level audio output available from a 3.5mm socket on the rear panel. This provides a healthy 350mV output from a 5kΩ source, so should prove fine for most decoding systems - it was certainly okay with HAMCOMM and JVFAX.

Table 1

Filter Selection (kHz)	Filters Used 2.2	3.5	4.0	7.0	10 (kHz)
2.2	✔	✗	✔	✗	✔
3.5	✗	✔	✔	✗	✔
4.5	✗	✗	✔	✔	✔
7.0	✗	✗	✗	✔	✔

Spring clips were provided for connecting a wire antenna, with a common SO-239 socket used for the whip and 50Ω unbalanced antenna options. Selection of the appropriate antenna being via a simple slider switch next to the antenna connections. If you want to use the HF-250 with a separate transmitter there was a mute connector to silence the receiver during transmission. The idea of using the HF-250 with a low power home-built QRP rig sounds great fun. Last but by no means least, is the 9-pin RS-232 connector. This provides access to the HF-250's comprehensive computer control system - more on this later.

Tune-Up

The frequency selection or tuning system of any h.f. receiver is one of the most important control systems so it's vital that it can cope with the demands of different listeners. This ranges from the fine tuning requirements of s.s.b. and data enthusiasts through to a much faster rate tuning for broadcast use. The main tuning knob on the HF-250E is a good size and very smooth and free spinning. Like all modern receivers, the knob is connected to a digital shaft encoder that feeds positional information to the receiver's microprocessor. As a result, the frequency is changed in discrete steps rather than continuously. However, with fine tuning steps of just 8Hz, it feels very much like continuous tuning. I mentioned the variable tuning rate earlier and this causes the tuning steps to increase by four times when ever the shaft speed exceeds a pre-set threshold. This is an extremely useful facility but it does require a slightly different tuning technique to make the best of it. When you operate the control smoothly the receiver uses the finer tuning steps. However, any sudden movement or rapid tuning causes the fast rate to kick-in.

The default tuning steps for the HF-250 were automatically set according to the selected mode with the following relationship: s.s.b., c.w., a.m.s. the step size is 8Hz; a.m. it's 50Hz and in f.m. you get 125Hz per increment. The preset steps were well chosen and the a.m. option resulted in a movement of about three quarters of a turn between the 9kHz broadcast band channels. To meet the need to change frequency rapidly there are UP and DOWN buttons on the front panel that incremented or decremented the tuning in 1MHz steps. This was supplemented by a FAST tune button to the right of the main tuning knob. When pressed and held this changes the tuning steps to 1kHz. All in all this gave a very flexible range of basic tuning options. The options described so far can also be supplemented by using the remote commander to directly enter the required frequency.

This was fairly straightforward and required the complete frequency in kHz to be entered. The only down side was a lack of any short-cut entry options. To supplement the main tuning options, the HF-250 includes 255 built-in memories. These are somewhat limited in only storing the frequency, but nevertheless handy for checking-out your regular favourites. Programming and recall of the memories can be done either from the front panel or from the keypad.

Modes & Filters

One of the delights of the HF-250 Europa is the excellent filtering that can be applied very easily to any of the modes. All you had to do was press the filter button once to display the current filter, subsequent presses causing the filters to cycle through those available. As I mentioned when describing the Europa philosophy, the filters have been specially trimmed to give the best possible performance. I found the ability to quickly step through 2.2, 3.5, 4.5 and 7kHz filters a real help when trying to pluck out a difficult station. The flexibility meant that you could really optimise the HF-250's performance. Mode selection was equally simple using a similar principle except the current mode was always visible via the front panel l.e.d. array.

The review model was supplied complete with all the demodulation options including f.m. and synchronous a.m. The synchronous demodulator was really great for tidying-up reception from broadcast stations. Once this mode had been selected a lock indicator illuminated to show that you were on frequency. You could then select upper, lower or both sidebands for best performance. If you tune too far off frequency the detector automatically switches back to a.m. until you are in-tune with another station. The audio quality from all the modes was well up to the high standards of other Lowe receivers. The HF-250's tone control used the same principles as the earlier HF-225 and gave a flat response at mid-position with high and low pass filter to either side.

Computer Control

The HF-250 is really strong in this area with a very simple but-none-the-less comprehensive computer control capability. One of the real plus points with this system is the built-in RS-232 port. This means that you can connect directly to any computer with an RS-232 port without having to buy an extra interface unit. In fact, the HF-250 comes with a basic control program for PCs so you can start straight away.

In addition to being able to do the obvious like set and read frequency information, the HF-250 has free access to all the receiver's functions, including reading the time! This open programming approach makes the HF-250 extremely flexible and allows the smart programmer to add a host of new features. For example, it would be very easy to combine the fine frequency steps with the

16▶

Computer control software and interface lead.

▶15

S-meter read-out to produce a detailed spectrum analysis - great for spotting channel occupancy. You can also use the computer control link to download batches of frequencies into the receiver's internal memories.

If you really want to get into computer control it would be well worth taking a look at Lowe's RCON receiver control software. This takes all the features of the HF-250 and links it with the a comprehensive frequency database plus the ability to read commercial lists such as the *Klingenfuss Super Frequency List.*

Under The Hood

Let's now take a quick look at the detail of the HF-250 and why it's achieved such good performance. At the very front-end a set of six switchable band pass filters clean-up the signal before it is applied to the first mixer stage. A notable point here is that the main short wave filters have an additional 1.7MHz high pass filter preceding them to provide maximum rejection of strong medium wave signals. The 45MHz 1st i.f. output is then fed via a PIN a.g.c. attenuator and 15kHz filter to the second mixer to create the final 455kHz i.f. The filtering arrangements used in the HF-250 have been given much thought to ensure maximum performance. The first bank of filters contains switchable 2.2, 7 and 3.5kHz filters. This is followed by a 4kHz filter between the two main amplification stages and a final 10kHz filter before the detector. The various selectable filter setting are achieved using a combination of these filters, shown in **Table 1**. The use of distributed filtering helps strengthen the skirt response and improve the overall shape factor.

The sophisticated filtering combined with well distributed gain stages give the HF-250 its excellent strong signal performance. Lowe receivers have always produced good audio quality and the HF-250 uses a full wave envelope detector for a.m. and a product detector for s.s.b. and c.w. There is also a fully automated noise blanker system that operates on the recovered audio.

The provision of a narrow 200Hz filter for c.w. is done using an 800Hz 'high-Q' peak filter. As you would expect, all the main tuning functions are microprocessor controlled and use the first mixer local oscillator to provide resolution to 1kHz and the second mixer heterodyne oscillator is used for the finer 8Hz steps.

Summary

The HF-250 is certainly one of those receivers that tends to grow on you the more you use it.

The simplistic presentation is backed-up by some clever design and well thought out automation that makes to HF-250 a pleasure to use. The filtering was technically extremely good and has again been made very easy to use. It was a real delight being able to quickly switch through the available filters to find the best fit for any station. A good example was the way you could really improve the quality of h.f. FAX images by selecting the 7kHz filter. The variable rate tuning did take a little getting used to and I would have liked to see a little more resistance in the tuning knob to prevent inadvertent fast tuning. The HF-250 Europa has maintained Lowe Electronics reputation for producing receivers with fine audio and r.f. performance. Although many of the original Europa modifications were based around improving its performance as a broadcast receiver, the end result has also improved its standing as a fine utility receiver. The Europa costs **£799.00** and is supplied complete with the remote commander, Synchronous a.m. demodulator and f.m. module. My thanks to **Lowe Electronics Ltd., Chesterfield Road, Matlock, Derbyshire DE4 5LE, Tel: (01629) 580800**, for the loan of the review model.

Specifications (abbreviated)

Frequency Range:	30kHz to 30MHz	
Stability:	10Hz drift in 1 hour	
Frequency Accuracy:	better than ±50Hz	
Tuning Steps:	8Hz c.w., s.s.b., a.m.s.	
	50Hz a.m.	
	125Hz f.m.	
Filter Bandwidths:	2.2, 3.5, 4.5, 7 and 12kHz	
Audio Filters:	800Hz centre 200Hz wide	
Audio Output:	1.6W into 8Ω, 2W into 4Ω @ 5% t.h.d.	
Headphones:	4V from 200Ω	
Record Output:	350-400mV from 5kΩ	
Frequency Response:	370Hz-2.5kHz s.s.b. 2.2kHz filter	
	40Hz - 1.1kHz a.m. 2.2kHz filter	
	40Hz - 3.1kHz a.m. 4kHz filter	
	40Hz - 4.3kHz a.m. 7kHz filter	
Noise Blanker:	Threshold 12dB above carrier, 500µS blanking	
Sensitivity:	60kHz-2MHz	a.m. better than 1.2µV
		f.m. better than 1µV
		s.s.b. better than 0.5µV
	2-30MHz	a.m. better then 0.8µV
		f.m. better then 0.8µV
		s.s.b. better than 0.3µV
Noise Floor:		-127dBm
i.f. Selectivity:		
2.2kHz	2.3kHz @ -6dB, 3.4kHz @ -60dB, 5.5kHz @ -80dB	
3.5kHz	3.5kHz @ -6dB, 4.8kHz @ -60dB, 7.0kHz @ -80dB	
4.5kHz	5.8kHz @ -6dB, 9.7kHz @ -60dB, 10.6kHz @ -80dB	
7.0kHz	7.0kHz @ -6dB, 12.9kHz @ -60dB, 14.6kHz @ -80dB	
Intermodulation Effects:	50kHz separation	+17dB
	20kHz separation	+16dB
	10kHz separation	+10dB

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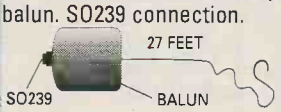

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The Long & Short of It

Building Standard Size, Long and Shortened Dipole Antennas with Joe Carr K4IPV.

The half-wavelength dipole is probably the quickest to build, simplest to tune and easiest to use high frequency short wave antennas. And compared to other antennas, the dipole is cheap! These facts account for the fact that the dipole is probably the most popular antenna for short wave listeners and amateur radio operators. Even people who can afford to install high performance commercial antennas often put up a half-wavelength dipole on one band or another.

And dipoles work really well. Not only are they well behaved (e.g. the work on-the-air the way technical articles say they do), but they offer good performance. Although the beam antenna and its relatives work much better, there is a serious question in my mind over where a cost/benefit decision comes down.

Standard Dipole

The standard dipole antenna is shown in **Fig. 1A**, while its idealised pattern is shown in **Fig. 1B**. The dipole antenna of **Fig. 1A** consists of a half wavelength radiator element ('B'), split in two sections ('A') of quarter wavelength each. In free space (which is almost never even approximated by hobbyist antenna builders), the overall length of the dipole is given by:

$$L_{metres} = \frac{150}{F_{MHz}}$$

Close to the Earth's surface, where real dipoles reside (especially in the low end of the h.f. band), there is a considerable shortening effect due to both the proximity of the Earth and the dielectric qualities of any end insulators used. As a result, there is a 4 to 5% foreshortening of the actual length in order to achieve an electrical half wavelength. The modified equation for practical dipoles is:

$$L_{metres} = \frac{143}{F_{MHz}}$$

Each element length ('A') is one-half the length calculated by this equation. The length calculated is actually an approximation of the real length, although in most cases a close approximation. The actual length required depends somewhat on local installation conditions. It is standard practice to cut the dipole elements ('A') a few inches longer than indicated by Eq.[2], and then tune them to the actual length for the specific installation by one of several methods: a) v.s.w.r. meter, b) noise bridge, or c) an antenna impedance meter. Until recently, when several v.s.w.r. meters with built-in low-power signal generators came on the market, only hams with a license to transmit could effectively use a v.s.w.r. meter to tune an antenna.

The azimuthal pattern for the ideal dipole is shown in **Fig. 1B**; this view is from above. This pattern is more nearly realised in actual practice when a 1:1 BALUN transformer is used at the feedpoint of the dipole (as in **Fig. 1A**). The dipole is a balanced antenna, while coaxial cable is unbalanced. The BALUN makes the transformation, and prevents distortion of the pattern through re-radiation from the feedline.

The pattern of the dipole is called a 'figure-8' pattern for obvious reasons: there are two main lobes in the direction along a line perpendicular to the antenna radiator element. When transmitting, this is the direction of maximum signal strength, and when receiving it is the direction of maximum sensitivity. Orthogonal to the maxima lobes are two nulls that are in line with the antenna element.

On receive, smart operators often do not aim the maxima lobes at the desired station, but use the nulls to attenuate interfering signals on the same or adjacent channels. The maxima are broad enough that a strong signal will still be heard when off-axis, so if you can attenuate the interfering signal more than you lose from the main signal, then the signal-to-noise ratio is considerably improved...and that's what counts in radio reception.

The Long Of It

The dipole is a resonant antenna, i.e. it is cut for a single frequency. Although the pattern changes, it also works well at three times the frequency. As a Novice ham operator in the late 1950s, I used a 66 foot 40 metre dipole on both 40 metres (7MHz) and 15 metres (21MHz). One of the consequences of using a resonant antenna is that it works less well at frequencies away from the design frequency. There are two ways to overcome that problem: 1) for lower frequencies, insert an inductance in each element; and 2) for higher frequencies insert a capacitance in each element. In this section we will take a look at a means for tuning a dipole over a relatively wide range of frequencies centred about its design frequency.

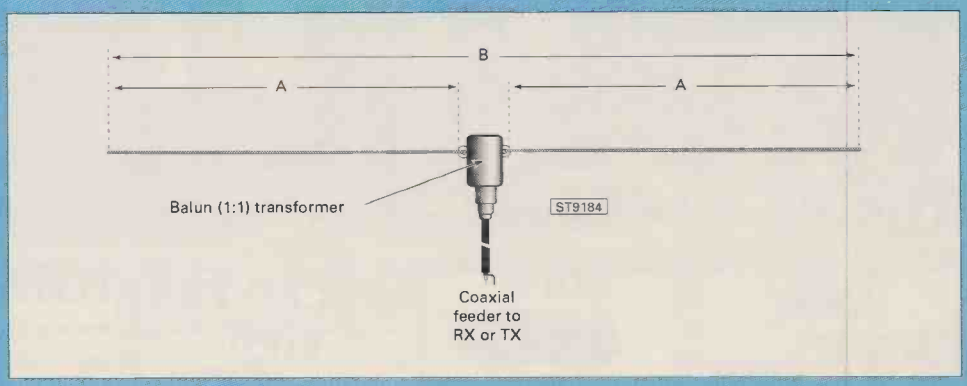
Figure 2 shows the capacitance tuned half wavelength (more or less) dipole antenna. Length 'A' is a bit longer than for normal dipoles, and is found from:

$$L_{metres} = \frac{154}{F_{MHz}}$$

The variable capacitor is a 500pF unit. It can be mounted in a shielded box, as in **Fig. 3**. The unit in **Fig. 3** is a Heathkit model sold several years ago, and is designed to legal-limit amateur

transmitters (note the wide plate spacing). For receive-only antennas, a considerably more modest capacitor can be used. For example, Maplin (PO Box 3, Rayleigh, Essex SS6 2BR) offers a light weight 500pF Dilecon unit (order no. FF51F). It looks as if it would be relatively easy to couple that capacitor to a small, low-speed (1 to 10r.p.m.) d.c. motor, or a stepper motor, and enclosed in a shielded aluminium box. Applying power to the motor would allow one to tune the antenna by varying the capacitance.

Unless the Maplin FF51F has changed in its design since I bought several, it is better for remote use than certain other models because it rotates through 360°, even though the capacitance range is traversed in only 180°. The reason why this is a good feature is that eliminates the need for mechanical stops, sensors at the limits of travel and the direction reversing circuitry that 180° capacitors require.



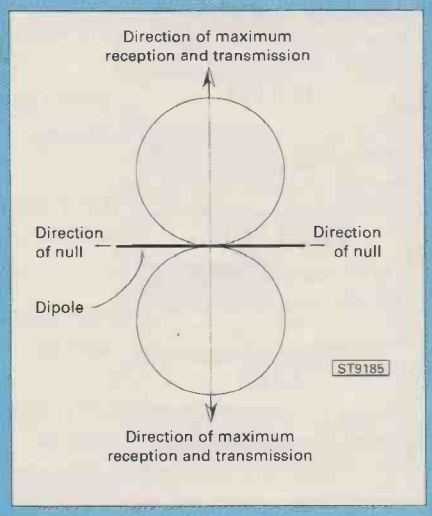
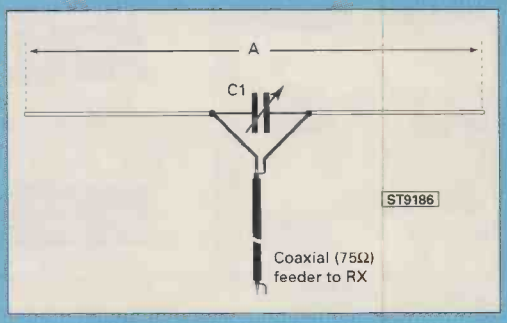


Fig. 1: A) Half-wavelength standard dipole; B) idealised dipole azimuthal (seen from above) pattern.

Fig. 2: Tuneable dipole using a capacitor in series with the antenna element.



The Short Of It

Life always has some little constraints that we must overcome, doesn't it? The constraint that has most affected my short wave and amateur hobbies is the lack of a yard (or is that 'garden') large enough to erect full size antennas. Even in my present QTH, a vertical or something mounted on a tower is the most convenient. In past locations, and in college, I tried a large number of different ways to get on the air in cramped spaces...some successful and others were learning experiences (never 'failures', mind you).

One way to get dipole-like performance in a small space is to use a shortened dipole that is inductively loaded to cancel the capacitance of the short radiator element. It will act as a resonant antenna, although at some narrowing of bandwidth.

Figure 4 shows several ways that short dipoles can be inductively loaded. **Figures 4A, B & C** place the coil at the centre point between the two radiator elements, using different feed mechanisms.

In **Fig. 4A**, the inductor is in the centre of the radiator element, and the coaxial cable is attached at either end. This arrangement works well if the antenna is not too short. For shorter antennas, an arrangement such as **Fig. 4B** might prove better. In this version, the coil is tapped to match the impedance of the coaxial cable. A variant of this antenna is often seen in which the shield of the coax is connected to one end of the coil, while the centre conductor is connected to an impedance matching tap on the coil. Still another variant is shown in **Fig. 4C**. In this antenna, the coil is connected between the elements, as in the previous case, but the feedline is connected through a transformer link. This type of coupling is made real easy for receive antennas by the use of a toroidal or binocular BALIN core to make the coil.

A helically loaded dipole is shown in **Fig. 4D**. This antenna is made from rods of some insulating material wound with approximately half wavelength of copper wire. For receive antennas, the rods can be wooden dowels, usually 2 to 5m in length, and of appropriate diameter to survive in the installation. But for transmitter use, the rods ought to be glass fibre, and can be made from a pair of discarded spreaders intended for quad antennas. Also, for transmitting applications a pair of disc or radial capacity hats will help reduce the corona effect at the ends.

Fig. 3: A dipole tuning capacitor by Heathkit (still occasionally seen on sale at hamfests and rallies).

A linearly loaded shortened dipole is shown in **Fig. 4E**. In this antenna, a matching stub to ground is used, and the coaxial cable attached at a point that matches its characteristic impedance. A pair of crossed-arm stubs is used to provide the loading effects.

Construction details for a home-brew rotatable dipole are shown in **Fig. 5**. For several years I used a 15 metre version of this idea that was published in various *ARRL Radio Amateur Handbooks* and *ARRL Antenna Books*. Although the design seems to have disappeared in recent editions, it's still quite viable. It used 10 foot aluminium tubing sections for the elements, and a 0.14µH inductor between them. The feed method was a little different from those described above: the shield of the coaxial feeder went to one element, while the centre conductor connected to one end of the coil (the other end of the coil attached to the remaining element).

The support for the antenna was a section of 50 x 50mm timber, or a section of (50 x 25mm) timber (as I actually used). For the 15 metre band version, a length of 1.22m was

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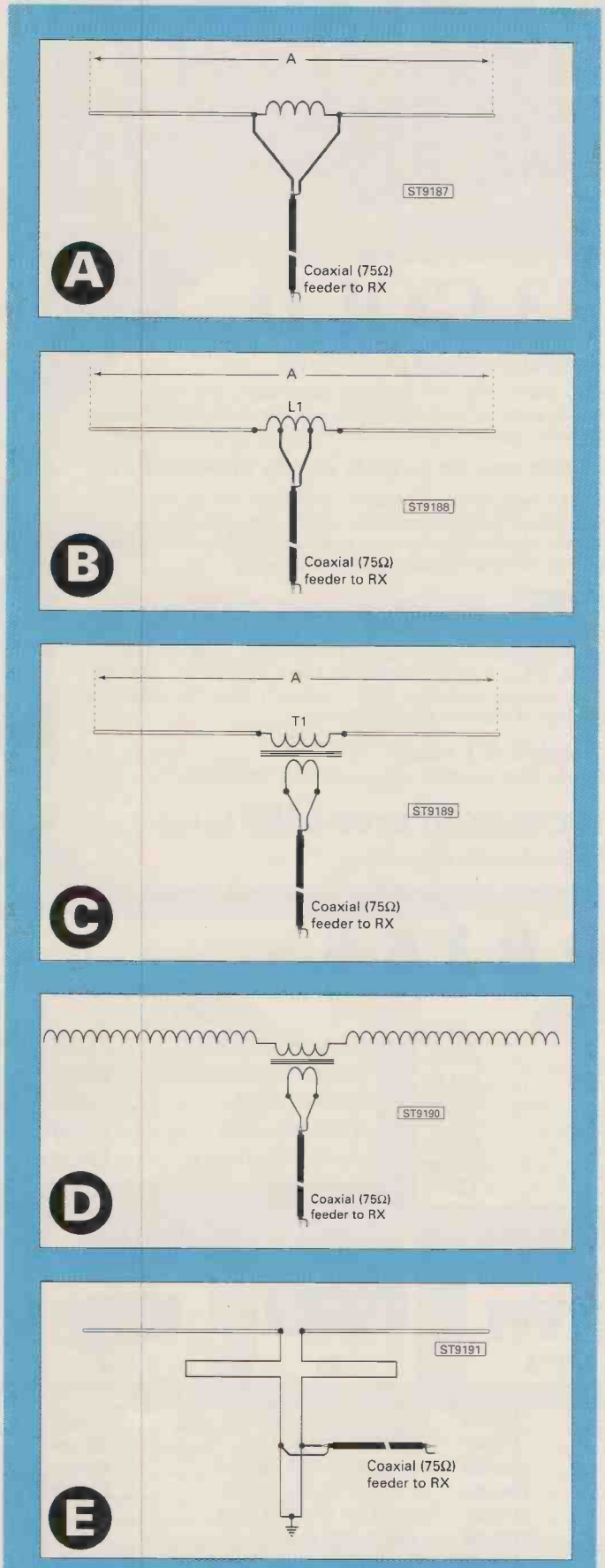

Fig. 4: Several inductively loaded dipoles: A) - C) lumped inductance loaded with different feed configurations; D) helically loaded; E) linearly loaded.

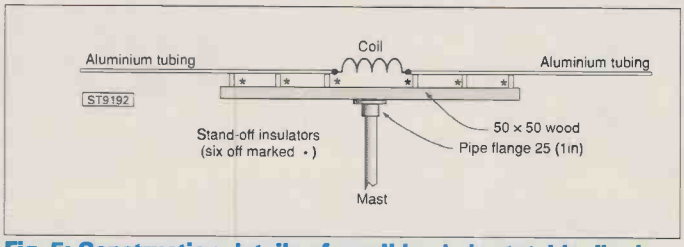

Fig. 5: Construction details of a coil loaded rotatable dipole.

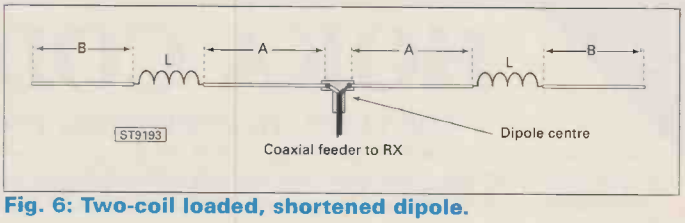

Fig. 6: Two-coil loaded, shortened dipole.

sufficient for the support.

Attached to the bottom end of the wooden support is a right angle plumbing pipe flange. Although one chap I knew used the sort of flange that holds a shower curtain, it looked a bit weak for any serious application in my judgement. The pipe flange can then be fastened to a mast that can be rotated either by hand (as I did), or an electrical rotator motor.

The Two-Coil Loaded, Shortened Dipole

One of the more practical shortened dipole antennas is shown in **Fig. 6**. This antenna uses two coils, one in each element, to make up for the lost length. In a recent trip to an amateur radio distributor in my home town I noted a number of kits on sale, by several different manufacturers, that were of this design. All of the bands from 160 metres through 17 metres were represented. Presumably, antennas for the higher bands are short enough in full size for most people's needs.

The centre feed of the antenna in **Fig. 6** is not a 1:1 BALUN transformer, as used in other dipoles, but rather a simple dipole centre insulator. I've had bad luck with the use of BALUNs in this type of antenna, so cannot recommend it until I figure a way to overcome the problems. The connection to the receiver or transmitter is through either 52 or 75Ω coaxial cable, depending on which gives the better match (even if the match isn't checked, the use of the wrong cable does not present a big problem).

The two sides of the antenna should be symmetrical, i.e. the coils should be at the same points on both halves, and all the dimensions on one side should be the same as the corresponding section on the other side (A = A, B = B).

The siting of the coils can be a matter of some personal choice. If dimension 'A' is zero, then the coils will be right at the dipole centre insulator (this is the "0-percent" location), and the antenna is not materially different from some of those in **Figs. 4A, B & C**. The most usual situation seems to be placing the coils at the 50% point, i.e. where A = B. I've used this method, and found the antenna worked well and wasn't inordinately difficult to get working. Other sites (A/A + B ratios) can also be used.

The equation for the inductive reactance required of the coils is more than a bit daunting. Although the mathematics are basically simple algebra, it's a very large equation with lots of sub-calculations to make. The potential for an error is immense. The graphical solution, available in two or three handbooks, is too limiting, although they can be used as an approximation. Although cut and try is never completely eliminated in practical antenna construction, it can be a bit less tedious if a proper calculation is made in the first place. As a result, I wrote a computer program called *LoadPole* to help you find the inductive reactance and inductance required of the coils (L) in **Fig. 6**.

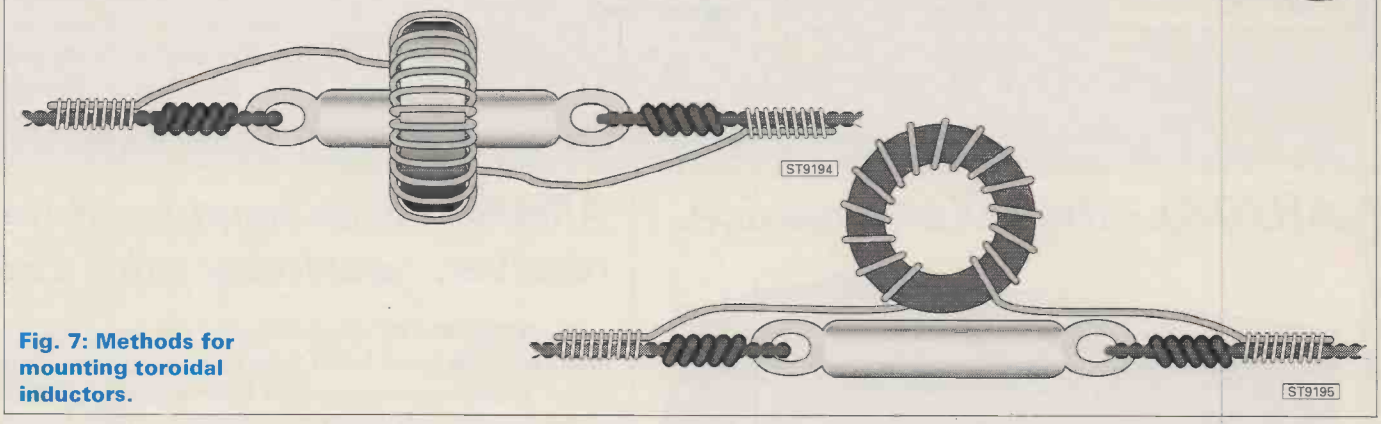

Fig. 7: Methods for mounting toroidal inductors.

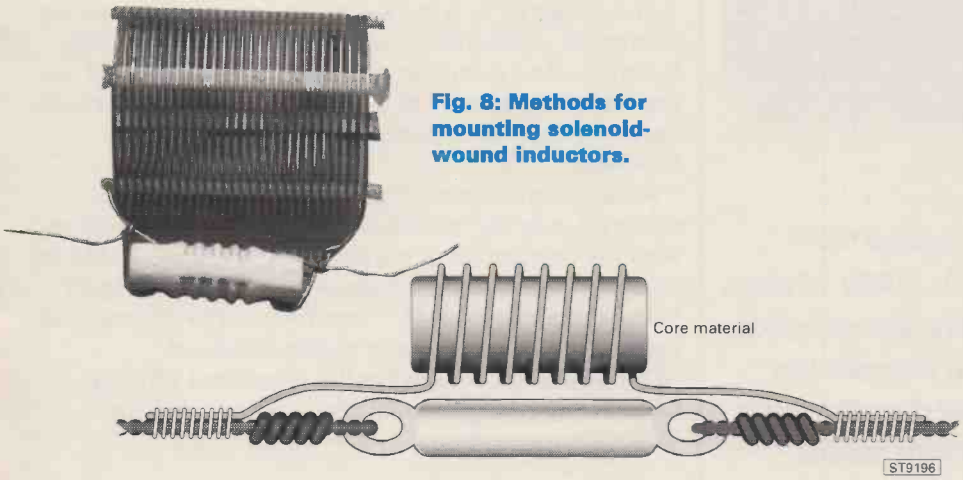

Fig. 8: Methods for mounting solenoid-wound inductors.

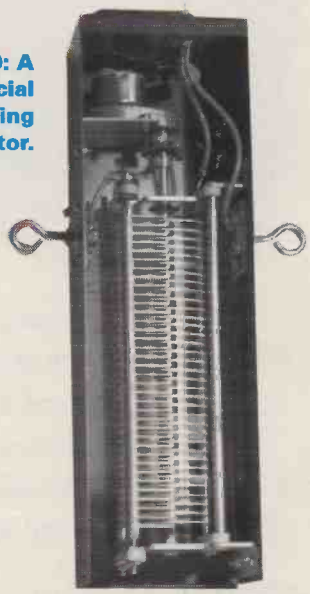

Fig. 9: A commercial loading inductor.

Mounting the Loading Coils

The loading coils cannot simply be soldered to the antenna element wires, and then be expected to stand up to the rigours of the outdoors installation. A better approach is needed. **Figure 7** shows two methods for mounting toroid core coils. An antenna end insulator (ceramic, glass, Nylon, etc.), is used to join the two halves of each element ('A' and 'B') together, and the inductor bridges the two conductors.

In **Fig. 7A**, a large toroidal core is used, so the coil can be slipped over the end insulator body. This arrangement makes it relatively easy to enclose the assembly inside a piece of pvc plumbing. In fact, a dandy coil assembly can be made using a short length of pvc pipe with the appropriate end caps (although don't depend solely on the glue to hold them together...use screw fasteners).

The mounting method in **Fig. 7B** simply bridges the coil across the insulator. It works well if a heavy gauge wire can be used to make the coil, and no strain is placed on the wire ends (let the antenna wire and insulator take all the forces).

A solenoid-wound coil can also be used, and either mounting tactic (as in **Fig. 7**) can be used. In **Figs. 8A & B** a solenoid coil is used with an end insulator. The coil in **Fig. 8B** uses a section of B&W 'mini-ductor' stock to make an antenna for the 75/80 metre amateur radio band. A commercial loading coil is shown in **Fig. 9**. It was salvaged from one of the commercial kit antennas described above.

The LoadPole Software

The calculations for the inductance of the coil in the loaded, shortened dipole are a bit dicey. One major antenna book gives both the equation and a graphical solution. However, I found that the graphical solution was easy to use, but it was basically too rigid. The reactances one obtains from the graph are for only one wire size (#36 to #40 AWG), which is a bit smallish for amateur or s.w.l. antennas. Because the wire diameter is a factor in the equation, it cannot be ignored. Even if the chart were designed around a useful wire size, it wouldn't fit the case where you want to use a different conductor.

The *LoadPole* program allows you to select any of a number of s.w.g. (UK), AWG (USA), or copper/aluminium tubing sizes to make the antenna, and then calculates the required reactance and inductance for the loading coils. Using the program runs under *Windows 3.1*. You use the mouse to drag the pointer of three scroll bars to select the overall length of the proposed antenna (as a percentage of the half-wavelength of a full-size dipole), the position of the coil along the element (0 to 98%), and the operating frequency between 1 and 30MHz. From drop down menus you select the units of measure (feet or metres), and the wire size.

Connections...

Joe Carr K4IPV, can be reached at PO Box 1099, Falls Church, VA, 22041, USA, or via E-mail at **carrjj@aol.com**

If you would like a copy of the Loadpole software, then send two pound coins taped to a piece of card addressed to Short Wave Magazine, LoadPole S/W, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. In return we will send you a PC formatted 3.5in floppy disk containing the installation files. Don't forget to include the return address. Please allow 21 days for delivery.

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PC-MANAGER (versions for DOS and Windows) is an optional utility for memory & search bank management. The software (which works in conjunction with the optional CU8232 interface) permits upload, download, editing, renumbering, saving of data, editing of auto-mode bandplan data (plus a built-in terminal driver for DOS and extra features for Windows including spectrum display and sound recording to disk).

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More from The Captain's Log...

As this Issue is devoted to chapter-and-verse on how the signal gets here, lets see what we can hear when it arrives. One you won't hear is the BBC on 15070. Try around there at dawn and dusk for Aeronautical DX but the Beeb has set up camp at 15575 daytimes. Mail me at bob@aor.co.uk if you can hear a reliable frequency for World Service around midday...

Try your strong-signal handling on 3955 after 1700 in the UK. This AOR user finds it all too reassuring that this BBC TX is strong enough to cause his 7030 to drop the PREAMP function without leaving the armchair.

Wait for night. While the sunspot count is low, try for the BBC in Hong Kong on 3915KHz. If the local QRN allows, try for Ghana on 3366. If you can hear that, Eighty should be a treat. Keen SWM readers know you can check for the MW DX chances by listening for Newfoundland on 930KHz. Those of us already feeling the benefit of the AOR 7030 front-end will hear Moscow Home Service on 171KHz, the choice of filters will keep France Inter's copious sidebands at bay.

Mail me if you can hear VOA. Apart from the skill needed to hear it on a sideband feeder on 10454, this listener catches up on life stateside via AFN Frankfurt on 873. Winter conditions mean this is strong enough for car radio reception in the late evening. Whatever you listen to from wherever in the world it comes, keep in touch with AOR.

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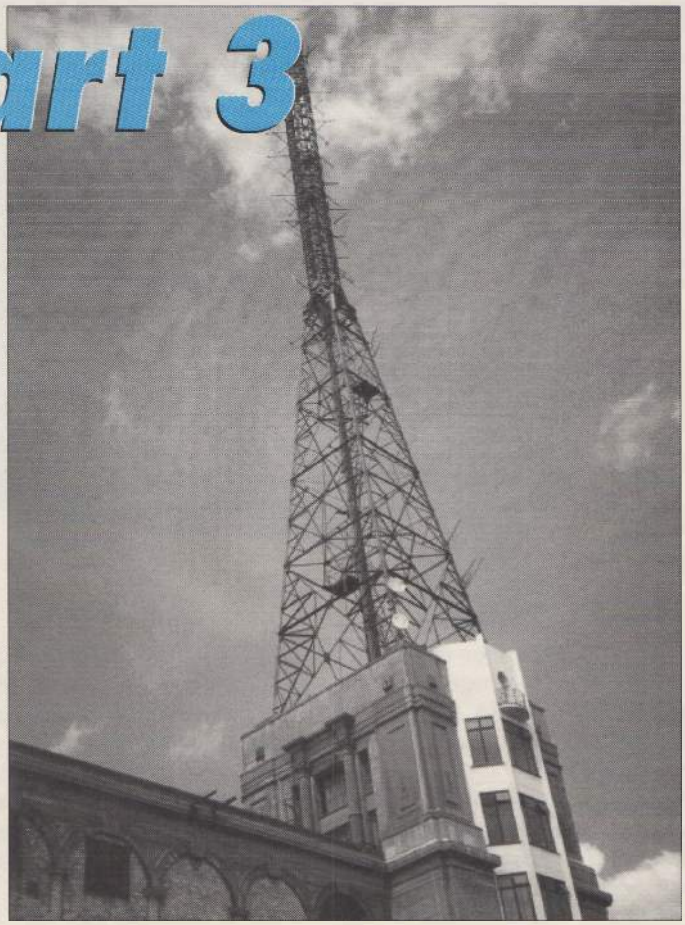
60 years of BBC TELEVISION part 3

Keith Hamer and Garry Smith end their look at the technical achievements made by BBC-TV engineers in the sixty years that have elapsed since the start of the world's first high definition television service.



Transmitting Films

The use of film has always been an important aspect of television programming. Nowadays, feature films are usually transferred onto video tape for ease of transmission. In the Fifties and Sixties, use was made of full-length feature films, especially filmed documentaries, and also filmed inserts into studio programmes.

Transmitting films on television was not a simple matter. The normal film projector as used in the cinema or in the home has an intermittent motion, that is, the film is pulled down frame by frame, and each frame remains stationary behind the projection lens for a fraction of a second. The process takes place rapidly enough for the eye and the brain to be deceived into thinking that the projection process is continuous. Unfortunately, the time during which the film remains stationary in a conventional projector is not sufficient for the television scanning process to be completed and special equipment had to be used to overcome this problem.

A type of projection mechanism was designed using an ingenious system of revolving and tilting mirrors which produced a stationary image from a moving film which allowed the film to run smoothly and continuously. A mechanism of this type (known as the Mechau film projector) was adapted by BBC engineers before the War for television purposes in such a way that the film image was projected directly into a television camera.

The introduction of the 'flying-spot' technique in 1949 made it unnecessary to use a television camera, which resulted in a big improvement to the quality of film transmission and in fact made it equal to the best 'live' pictures provided that the film itself was of first-class quality.

By the early Sixties, four types of film transmission equipment were used by the BBC: Twin-Lens Flying-Spot machines, Vidicon Telecina Channels, the old Mechau mechanism used in conjunction with the new flying-spot technique, and another type of equipment in which the image of the scanning raster was made to appear stationary relative to the film by an optical system which included a rotating glass polygon.

The advantage of the last two systems was that silent films could be run at any speed from zero upwards; this enabled a film insert to be introduced into a 'live' studio programme without the delay which would normally occur while the machine ran up to speed.

Twin-Lens Flying-Spot System

In the twin-lens flying-spot system, the film moved continuously through the film gate which was the size of a normal film frame but the flying-spot raster had an aspect ratio of 4:1.5 instead of the normal 4:3. A double lens system focused two images of the raster, one above the other, on to the film in the gate.

As each film gate passed the first image of the raster the odd-line field was scanned and as the same film frame moved on to the second image, the raster scanned the even-line field. A mechanical shutter blacked out each raster alternately while the other image scanned the film.

This system produced pictures of the highest quality but had the disadvantage that the mechanism had to run up to synchronous speed before the picture could be transmitted. This took some eight seconds.

Vidicon Telecina Channel

The Vidicon Telecina Channel technique used a standard intermittent motion film projector in conjunction with a vidicon camera tube. The relatively long storage time of this type of tube bridged over the time intervals when the optical image was blacked out for the film pull-down period.

Facilities for reproducing sound film from magnetic track, either on the same film or on separate sprocketed film, were also available. This technique offered a higher standard of quality than an optical sound track which usually underwent several dubbings before reaching the final positive film.

Telecina machines were available to handle either 35 or 16mm film. Telecina equipment was installed in London and in each main Regional centre. The apparatus used in making films for television was also provided by the BBC Engineering Division to meet the requirements of the Television Film and News departments. 31

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Telerecording Techniques

It is important to be able to record a television programme, either for subsequent showing in this country or abroad or for the archives. The process can also be used for putting together a number of scenes performed in a studio so as to produce a continuous programme for showing later.

BBC engineers have made some notable advances in this field. In 1949 when telerecordings began to be used regularly, the basic idea was to photograph the picture on a television screen with a film camera. The intermittent motion of the film in a normal film camera presented the same kind of problem as that encountered in the transmission of films and was at first overcome in the same way by using the Mechau mechanism.

The equipment gave reasonable results but the quality of the recorded pictures was not up to BBC standard. Work went on therefore to develop an improved system resulting first in the introduction into service of the 'suppressed-field' system and later of the better system known as 'stored-field'.

Since imperfections in the processing of the film could degrade the quality of the picture when it was reproduced, the developing and printing process was studied stage by stage and, with the co-operation of commercial processing laboratories, considerably improved so that more consistent telerecordings could be obtained.Mention should also be made of another system developed by BBC engineers in co-operation with an outside manufacturer. The system was known as the 'fast pull-down' (or 'rapid pull-down') system and was capable of producing recordings of very good quality.

Suppressed-Field System

In the system known as 'suppressed-field', the picture on the cathode-ray tube was recorded by a normal intermittent type film camera which ran in synchronism with the television field frequency. Since the camera required about half of each field period to complete the film pull-down and the film could not be exposed during the pull-down period, it was necessary to suppress each alternate vertical scan (field) of the picture on the cathode-ray tube. The film pull-down took place during this period of suppression. The recorded picture, therefore, had a nominal 202.5 lines instead of 405 lines. The equipment was designed to use 35mm film.

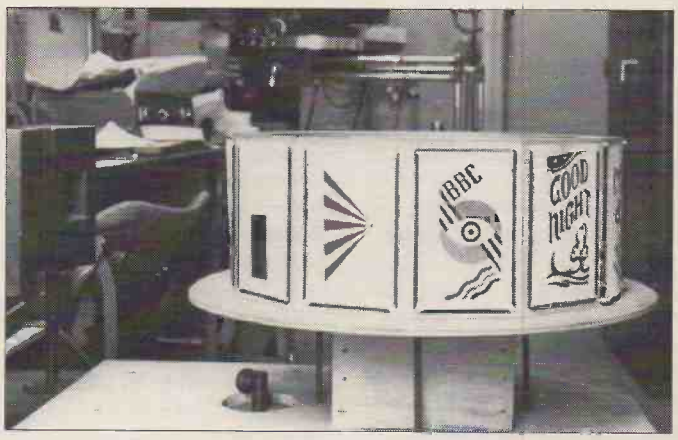
Stored-Field System

In the 'stored-field' system, all the lines were recorded. The alternate vertical scans (taking place during the pull-down period) were not suppressed. The afterglow of the cathode-ray tube was relied upon to store the lines until they were exposed at the same time as the lines which scanned during the exposure period.

It was necessary to provide circuitry which automatically increased the gain of the video amplifier during the scanning of the stored field in order to compensate for the decay during storage and to ensure that the stored and direct fields had equal intensity when they were exposed together. The equipment was designed to use 35mm film and could produce recordings of very satisfactory quality.

Rapid Pull-Down System

With the 'rapid pull-down' system of making telerecordings on film, the film pull-down time was reduced to about five milliseconds. Even this was considerably longer than the television field blanking period of 1.4ms. This problem was overcome in the following way. The camera shutter was arranged to close at the moment when field blanking and film pull-down commenced and remained closed until the film pull-down was completed. The camera therefore remained shuttered during the first few active lines of each field. These few lines were stored by the persistence of the screen of the picture tube until the shutter re-opened and exposure of the film began. Some compensation had to be introduced to ensure that these lines received the same exposure as the remaining lines which were scanned after the shutter had re-opened. This correction was achieved by placing a graded neutral-density filter in front of the picture tube with the minimum density at the top edge of the picture.



Rotating caption stand. BBC 30-line service, 16 Portland Place studio 1934. Note the photocells on the extreme left. Photograph by BBC Engineer, Mark Savage G6SV using his own camera. Photo courtesy of Ray Herbert G2KU.

Video Recording Techniques

All these systems used film as the recording medium, which was expensive and had the disadvantage that a considerable time was required to develop and print it. The BBC therefore devoted a great deal of technical effort to the problem of recording television pictures on magnetic tape by electrical means, with the object of producing a television tape recorder.

This problem was immensely more complex than the recording of sound because something like 200 times as much information had to be recorded, but the problem was largely solved and the resulting equipment was known as VERA (Vision Electronic Recording Apparatus). This equipment was first demonstrated publicly in April 1958 and was subsequently used experimentally for telerecording a number of programmes.

Meanwhile, another system of magnetic recording had been developed in the USA and was by then coming into widespread use. This was the Ampex system and since the equipment was already available it was decided to adopt it within the BBC. The system, known as Videotape, was capable of giving very good picture quality and had the advantage, as in sound recording, of immediate play-back plus the fact that the tape could be used again 32▶

once a recording was no longer required.

Ampex machines were installed at the Television Centre and also in vehicles to provide mobile recording facilities. Similar equipment was also provided at Regional centres. Seventeen machines were in service or on order by August of 1961. Nine of the machines were capable of operating on both 625-lines and 525-lines as well as on 405-lines. One machine was capable of recording programmes in colour.

The Ampex machines used a frequency modulation system with a carrier frequency of 4MHz. Four recording heads were used mounted on the periphery of a rotating drum. The signal was switched from one head to another as each came opposite the magnetic tape. The drum rotated at 15000 r.p.m. and the tape was drawn past it in a helical fashion at approximately 15in per second which gave a relative head to tape speed of 1600 inches per second. There was practically no visible deterioration in first-generation copies.

Colour Television

The BBC's work on Colour Television began in 1946 in the laboratory and experimental transmissions were continued each winter from 1955. By 1961, BBC engineers were ready, if the government so decided (which they didn't!), to start a service of colour television on 405-lines within a year, and on 625-lines at a later stage. The studios at Television Centre had been designed to be suitable for the introduction of colour at any time -it was only the usual amount of government dithering which held things up! The BBC had co-operated in the work of the Television Advisory Committee and BBC engineers carried out much of the practical work and investigations on which the Committee had based its reports. The work by the BBC included a very thorough experimental investigation of the then controversial question of Frequency Modulation versus Amplitude Modulation, which had to be resolved before v.h.f. sound broadcasting could be introduced.

A colour television camera channel was designed by BBC engineers and, later, a 16mm slide and film scanner. With this equipment, colour pictures could be produced and evaluated on a colour monitor constructed for the purpose using a sequential scanning process which provided separate red, green and blue signals. Prior to 1949, it was thought that a practical television system would require the transmission and reception of these three signals, each occupying a bandwidth equal to that of the existing monochrome system (3MHz in the British 405-line system). Such a system would have resulted in an extremely inefficient use of spectrum space, even if the space were available. There would have been an added disadvantage in that the system would not have been compatible, that is to say, it would not enable a satisfactory black-and-white picture to be received on existing monochrome receivers.

In 1953, the National Television System Committee in America (the NTSC) proposed a system in which only two signals needed to be transmitted, one describing the variations in brightness of the scene to be transmitted (the luminance signal) and the other, variations in saturation and hue (the chrominance signal). BBC engineers successfully adapted the NTSC system to the British television standards. Eventually, the PAL colour system was developed.

Standards Converters

A study was conducted into the merits of television standards based on different numbers of lines; a full-scale experiment to compare the relative merits of the British 405-line system and the 625-line system used widely in Europe was carried out and involved the installation of an additional high-power transmitter at Crystal Palace which operated in Band V.

Long-term studies which extended over a period of years were carried out by the BBC to assess the possibilities and problems of television broadcasting in Band IV (470 - 582MHz) and Band V (606 - 854MHz). These included propagation measurements and a detailed survey of the coverage likely to be achieved by stations operating in these bands. In 1957, a high-power Band V transmitter was specially installed at Crystal Palace. This was used for the latter survey in which a number of other organisations co-operated, in the course of which many thousands of measurements were made. The survey was conducted in order to compare the quality of reception of 405-line television signals in Bands I and V and also to compare reception of 405-line television in Band I with reception of 625-line television in Band V.

The trials included field-strength surveys and picture quality assessment in mobile laboratories as well as in selected viewers' homes. The results of these experiments were published by the BBC in 1960 in a document entitled *Television Field Trials Of 405-Line and 625-Line Systems In The UHF and VHF Bands, 1957-1958.*

A further series of 625-line experimental transmissions was undertaken in 1962; some of these were in colour. The Band V transmitter at Crystal Palace was modified for these tests to make it suitable for colour. Additional equipment was ordered for the generation of 625-line colour pictures.

Eurovision

By 1961, the bringing of 'live' television programmes to the United Kingdom from most parts of Europe was an established technique, which could be used whenever programme requirements demanded it. Yet this was pioneered only nine years previously in 1952 by the BBC and the French television service, RTF. The exchange of 'live' programmes was only possible because BBC and RTF engineers had designed standards converters which were used to change the television pictures from the, then, new French 819-line standard to the British 405-line system and to the 441-line standard then still in operation in Paris.

Two years earlier in 1950, the BBC had proved that it was possible to bring television pictures across the English Channel when a complete Outside Broadcast Unit was taken to Calais to beam back pictures to London by a series of temporary radio links. This in itself was a considerable feat, but because BBC equipment was used throughout, the problem of converting from one standard to another did not arise.

Standards conversion between 405, 625 and 819 lines was achieved in 1952. With the advent of video tape recording, the much more difficult problem of converting television signals from European standards to American standards had to be tackled. Tape recordings, unlike films, could not be reproduced in another country where the television

standards were different, so programmes exported to America on tape had to be recorded using the American standards. The main difficulty was that in America each field in the television picture was scanned sixty times per second while in the UK and throughout Europe the picture was scanned fifty times per second. This difference between European and American standards still exists today!

The difference in the number of lines of which the picture was composed presented a problem which had already been solved in converting to the different European standards, but the use of this equipment to convert to American standards resulted in an intolerable flicker in the converted picture. This problem, too, was solved by BBC engineers, who designed equipment which was first used in December 1959 to record on tape, at American standards, pictures from the 'Western Summit' meeting in Paris, which originated using the French 819-line standard. This was quite a difficult operation because the pictures had first to be sent from Paris over the Eurovision circuit to the Post Office terminal of the cross-channel radio link at Tolsford Hill near Folkestone, then by a series of temporary BBC radio links to the research laboratories at Kingswood Warren in Surrey. Here the signals were converted to the US standard, transmitted by more BBC radio links to London Airport and recorded there on video tape. The recordings were then flown to New York ready for immediate playback. A similar large-scale operation was carried out in connection with the Royal Wedding in May 1960, and the first pictures from Moscow (fed into the Eurovision network at Helsinki by direct reception from the station located in Tallin) on April 14th, 1961.

This historic transmission was followed by signals to the UK of the May Day Parade from Moscow and programmes were shortly exchanged between the BBC and TSS (the Russian television service) in both directions.

Satellite Television

In the early Sixties, before the days of *Telstar* and other satellites, it was not possible to go to the Americas or to the Commonwealth countries for 'live' transmissions, but BBC engineers were certainly planning on a link-up with these distant countries either by special cables under the oceans, by radio links, or by future satellites in orbit. Experimental use of earth satellites for television transmissions was set to begin in the mid-Sixties.

Nowadays, television and radio transmissions via satellite are a common, every day occurrence, thanks largely to the dedicated pioneering work by engineers in the BBC Engineering Division.

Calling All Collectors

The authors would be very pleased to hear from anyone who may have photographs or even video recordings of archive BBC-TV graphics, including Test Cards and on-screen Identification Symbols. Also, has anyone collected BBC Test Card music? If so, please write to **Keith Hamer, 7 Epping Close, Mackworth Estate, Derby DE22 4HR. Tel: (01332) 513399**.

Ban Scanners!

Kevin Nice reports on the worrying hype around Cellphone crime and the use of 'scanners'.

Many of our scanner using readers will no doubt be aware of the rumours that currently pervade, about the UK government banning use and ownership of scanners. Recently, the case for this happened to be mentioned in a potentially damaging article in the Trade magazine *Mobile and Cellular*. The article, written by someone who clearly has little engineering knowledge of the topic of radio and communications, Patrick Hook, claims that scanners should be made illegal.

Wrong Terminology

The crux of his argument is that criminals can take a scanner, which he correctly states, has no other purpose other than to "intercept radio signals". Well there's a turn up for the books, what else would anyone do with a radio receiver? Patrick Hook then goes on to explain that said scanner can, "with a little know how, be reprogrammed to obtain vital information" pertaining to the security of analogue cellular 'phones. Well this is certainly **not** the case - yes this information can be obtained with what we in the listening hobby know of as a scanner, but not with a scanner on its own, you need some other sophisticated hardware, some software and a computer in addition.

Mr Head should really research his articles more thoroughly - what he did not mention is that it is possible to buy standard equipment that with no modification will do what he claims is possible with a 'scanner'.

Bill Amendment

The Federation of Communication Services (FCS) are currently working with Ian Bruce MP, on an amendment to the current law (Telecommunications Act 1984) to plug a loophole which allows criminals and others to be in possession the **specialist** equipment required to duplicate analogue cellular 'phone identities. It is this equipment that has caused confusion to the likes of Patrick Hook, because these very equipments have acquired the label of scanners.

The FCS have stated that they, in no way, wish to be involved in damaging the hobbyist use of radio receivers, they are though in their role of the cellular industry regulatory body, very interested in ensuring the law is able to deal effectively with perpetrators of mobile 'phone fraud!

This particular element of criminal activity currently costs the UK cellular industry an estimated £100 million per annum, there is therefore, quite obviously, a great incentive to the industry to reduce this level.

There is not, repeat **not** a will to criminalise the use and ownership of radio listeners scanners - fear not!

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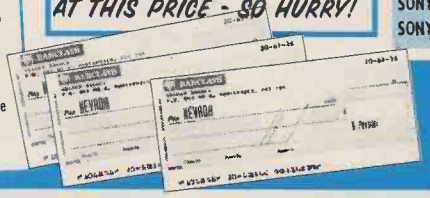

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"More like deep fringe," Kilocycle Ken, the senior radio inspector said.

They were at the river mouth, a scattered settlement of weekend huts, aluminium boat, crayfish pots. A westerly wind from the Tasman Sea moaned across the black marram grass covered sandhills. A solitary fisherman cast into the booming surf. Behind the beach were high hills. This was New Zealand of the 19th century, remote, nikau palms, flax, heavy bush untouched by logging.

And a anachronism, a new large aluminium caravan.

"We won a share of first prize in the Lotto," the young complainant said proudly. A fire in a Shacklog stove wasn't a standard caravan fitting.

"It must have been difficult getting the caravan in over that gravel road," Kilocycle Ken said politely.

Fringe Reception

The TV was a new 33in Philips. The picture was extremely noisy, black shapes behind the noise, almost impossible to watch, despite stacked Yagis on a stayed pipe mast.

"Did the store which sold you the set and the antenna know where you lived and explain about fringe reception? You're too distant from the nearest transmitter. It's taken us hours to get here."

"The store said to ring the radio inspectors, they'd fix it."

Anything to make a sale, but Kilocycle Ken said, "What about the other people who live here?"

"This is the only television set," she said proudly.

Two Maori children on the caravan step looked in, gravely.

"Have you got a television licence?" Kilocycle Ken asked.

"I have, from our old place in town." She fumbled in a drawer amongst receipts, accounts and bitten pencils.

Kilocycle Ken recorded the date of expiry on the Engr. 86 complaint form. "It's expired."

"I'm not going to renew it until I get a picture," she said.

Kilocycle Ken sighed and looked out at the surf caster.

"My husband," she said.

"We can't do anything for you," Kilocycle Ken said.

She nodded, resigned. "Here, have a couple of fish."

Current Licence

Back at the car, Kilocycle Ken said, "People are so kind."

Young Golly said, "I can't remember you asking about a licence before?"

"At one time, it was automatic, but I haven't been asking, now the licensing people have been making a song and dance, saying that if somebody complains about radio or television interference, then the complainant has to have a current licence."

"Why buy a licence, the set operates just as well without it," Young Golly said.

"Not in her case. I should have explained that a TV licence can be equated to a fishing licence, you get the chance to fish, but neither fish nor television reception can be guaranteed."

"Say, that's a good one, I must remember it."

"There were arguments in the early times of low powered TV transmitters because coverage was poor, patchy. Maybe there was sound, maybe there wasn't. People argued that because their picture was bad they shouldn't have to pay a licence fee."

"So they still do."

"There was a thought, once, of abolishing licenses and finding broadcasting from general taxation. Other countries such as Australia did abolish licences, but out minister of finance apparently decided against doing that, saying that a licence was something tangible, showing where tax money was going."

They left the settlement.

... here have a couple of fish...

Unreadable Licences

Kilocycle Ken said, "Before TV, the old radio licenses were written out by tellers at the Money Order Savings Bank position in post offices. Sometimes the carbon paper was very worn and the details on the licences were unreadable, but even if it wasn't, it was hard work checking dealer's returns against the pieces of paper, matching names with

f A Radio Inspector

licences and producing lists of wireless set owners without licences - which was work we had to do in those times. They were put into alphabetical order of surname, date of expiry order and filed in varnished oak cabinets."

"Got the computer now."

"That complainant would have been dropped off, probably gone, no address, but we pursued radio licences relentlessly. Dealers in wireless sets had to advise the Post & Telegraph department when a set was sold, and to whom, and we matched licences and sales. If we couldn't find a licence, we visited to collect the thirty shillings. The trail of used wireless sets through auction rooms and second-hand dealers was followed, auctioneers and dealers had to keep records of sets sold. When I was first in this job, it was part of my work to do random checks on houses to see if there was a wireless licence. I spent days trudging from door to door in various small towns, putting details of the licences in a notebook, lunching on a pie and tea at the local railway refreshment rooms."

"Nothing technical in that," Young Golly said.

"I would ask politely if they had a wireless set or radio receiver. If the answer was yes, where was the licence? Then there would be a hunt. Sometimes the licence was pinned to the wall above the set, sometimes beside it, sometimes it was kept in the set and because of the heat of the valves, it would be browned and brittle.

Suits & Ties

"We all wore suits and ties in those days. And I was once mistaken for a doctor. I had knocked, the door opened and before I could say a word, the woman said, "Oh doctor, please come in."

Young Golly laughed.

"Sometimes I was not invited in. Construction camps housing workers for hydro electric dams were dangerous places. One radio inspector was mauled by a labourer when he asked for the man's licence.

"A woman told me she had a licence, but she didn't have a set, her husband had departed, taking the set with him.

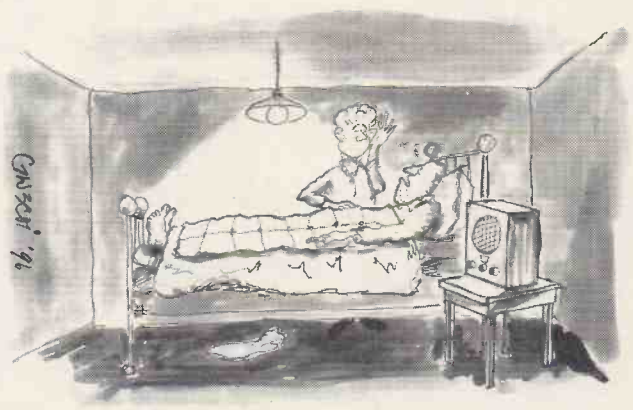
"Then there was the old woman who said that her husband's last words on his death-bed, were, 'Don't forget to pay your radio licence'. I tried to imagine that death-bed scene, without success".

Receiver Type

"Then there was the woman who came back from holiday and found that her wireless set didn't work when she switched it on. She found that her licence had expired, so we went to the local post office to renew it and asked if the P & T would now switch on her set again.

In the beginning, before my time, the receiver type had to be written on the licence, and in the first days, a circuit diagram of the receiver had to be supplied - that was inn times when you made your own receiver, a time of headphones, no loud speakers, and valve sets operated from batteries.

The licence fee was five shillings in 1923 and was thirty shillings for a long time. When television



Don't forget to pay your Radio Licence

"In some houses a wireless licence was a treasured piece of paper, it meant the possessor had a wireless set, and they were expensive luxury goods, but some denied they had a set, even though there was an antenna, or there was a record of sale, but we radio inspectors never had the right of entry.

Of course, there was always the neighbour who would dob one in."

arrived in Auckland in the late 1950s there was an extra four pounds a year for a TV licence and that rose to six pounds ten shillings, or 13 dollars in 1961 as viewing hours increased. The radio and television licences were combined in 1968 to 16 dollars a year and the radio component was abolished, but then the annual fee became twenty dollars and rose through thirty five dollars, sixty six dollars and so on, ever upwards."

"Boring," Young Golly said.

"I'm giving you good background information for your job as a radio inspector," Kilocycle Ken said. "There are many inventive excuses for not having a television licence. One viewer reportedly said, 'There are so many repeats of programmes I thought I could use last year's licence.' Another said, 'I only watch Australian soaps, so I don't need a New Zealand licence.' One, to get the cheaper black and white licence fee, turned down the colour on his set and claimed it was black and white. One man, with a video recorder and a TV, said he only used the recorder as a clock."

Computer System

"Then came the first computer system, back in the 1970s, which made policing the system easier, although the computer was primitive, compared to today's, where the records can be shuffled around to extract a single sheet and print out the addresses where there are licences. If it's thought necessary, then only the houses shown without licenses need to be visited."

"Are you going to force that woman to buy a licence?"

"There's no way she's ever going to get reception there, there will never be a translator installed for so few people."

"So she gets away with having a TV set and no licence."

"I might fry my fish," Kilocycle Ken said. ■

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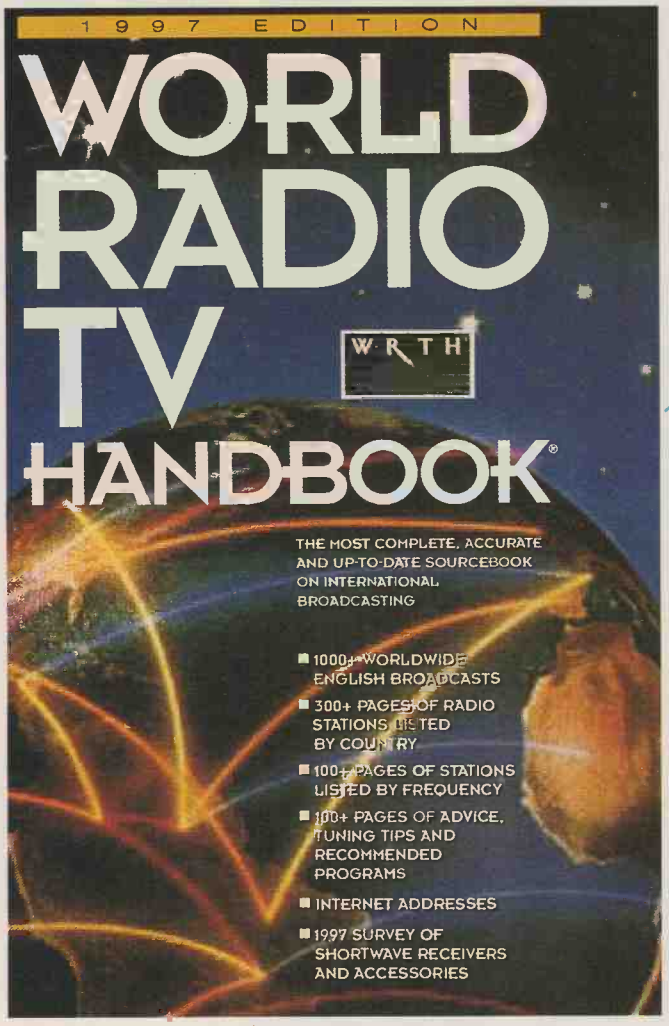

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Sunspots Aren't Everything!

Steve Nichols G0KYA explains why magnetic disturbances are not to be overlooked when considering propagation conditions. Here he presents some of his findings from 1994.

Any short wave radio enthusiast worth his or her salt knows that sunspots are responsible for long range h.f. propagation, but this is just part of the story. Some research that I carried out in January and February shows that more attention should be paid to the Earth's magnetic field and how this can indicate bad conditions.

Disturbed Field

A disturbed geomagnetic field is an indicator of how the sun can wreak havoc on long distance signals, make a mockery of 'predictions', and lead many listeners to think that their receivers have gone kaput.

Yet how many people know just how to interpret an 'A-Index' reading?

The earth's magnetic field has an effect on the free electrons and ions in the upper atmosphere. It can set the free electrons in motion which then has an effect on the behaviour of the radio waves hitting them. Thus, unusual or disturbed magnetic effects can have a marked effect on propagation. This can be witnessed by total radio blackouts and aurora. It also channels charged particles from the sun (usually towards the poles) where the increased ionisation can mean severe absorption of h.f. signals and/or the possibility of the polar region ionosphere being capable of propagating signals at v.h.f. - so called auroral propagation.

The state of the geomagnetic field can be measured using magnetometers and the results are available from many sources including WWV in Boulder, Colorado. For a radio amateur the world-wide radio amateurs' packet radio network carries a daily bulletin, courtesy of G0FAK, and GB2RS, the news service of the Radio Society of Great Britain also carries information.

The A-Index is a single number based on a linear 1-400 scale and based on magnetometer readings around the globe. An 'A' index figure of 1 to 10 is quiet, 11 to 20 is unsettled, 21 to 50 sub-storm, 51 to 80 storm and 80+ severe storm. High levels of geomagnetic disturbance are associated with aurora and poor radio conditions.

Optimum Conditions

The optimum conditions for long distance radio propagation would therefore be a high solar flux and or sunspot number with a very low A-Index. Places to obtain these figures are looked at later.

It was only in 1925 that the ionospheric 'layer' was experimentally verified and tables of heights were published. This 'layer' turned out to be a collection of layers.

The lowest is the **D-layer** (about 60-90km high) which absorbs frequencies of about 0.5-7MHz. The layer disappears at night so enabling the reception of distant low frequency stations. At times of high activity the absorption can reach higher frequencies. This is why, in Summer, when you would expect ionisation and therefore propagation to be at its peak, conditions on the h.f. bands appear worse due to D-layer absorption.

The next is the **E-layer** (100 - 120km) which is responsible for absorbing low frequencies and propagating higher ones over relatively short (1600km) distances.

The **F-region** (300 - 350km) is the highest layer and is responsible for propagation on the 14, 21 and 28MHz amateur bands. It is this region which enables world-wide radio reception. During the day the F region splits into two separate F1 and F2 regions with the lower, and usually weaker, F1 occurring at about 160km. At night the F1 region disappears and the F2 region assumes a lower height.

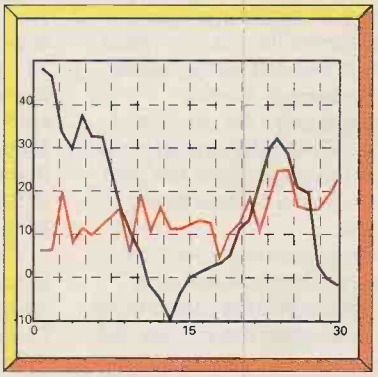
The earth is constantly bombarded from the sun by electromagnetic radiation and charged particles. This creates a mixture of free electrons and positive ions. The electron density is low at high altitudes and greater lower down. But there is absorption of the radiation at lower altitudes so the free electron density is decreased. It is the free electrons and ions which are responsible for the refraction of the radio waves.

Ionisation is therefore dependent on the output from the sun, the time of day at the receiving station and the time of year.

Unfortunately life is a little more complicated! While high levels of solar activity and therefore ionisation are necessary for signals of say, 14MHz, to be propagated. The increased ionisation results in the D-Layer becoming highly ionised too. This results in absorption of the radio waves.

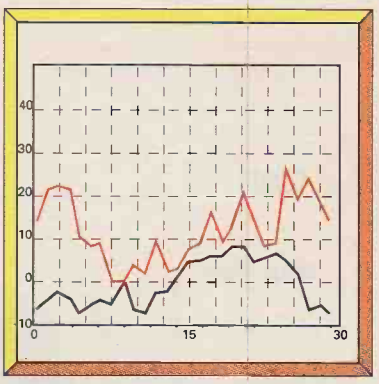
Useful Definitions

Maximum Usable Frequency (MUF) - The maximum frequency that can be reflected and therefore



SK9197

The 14MHz score for January plotted against the 2.8GHz solar flux. The solar flux curve has been equalised with the 14MHz score by deducting 100 from the flux value. There is little correlation except in the last week of the month, but I believe the effects were masked by geomagnetic disturbances.



SK9198

Plot of 14MHz score for February against solar flux. Better correlation but the band conditions were dominated by the unsettled geomagnetic field so this is not a good comparison. Note how the solar flux was very steady in February compared with the fluctuations in January.

14MHz Beacon Details

Call	Location	Lat/Long	ERP (W)	Antenna	Sched.	Operational
CT3B	Funchal	32°45N16°55W	100	Vert.	T+6 min	No
JA2IGY	Ise City	34°27N136°47E	100	Vert.	T+3	Yes
KH6O/B	Honolulu	21°25N157°55W	100	GP	T+2	Yes
LU4AA	Bs. Aires	36°S58°W	100		T+8	Yes
OH2B	Espoo	60°15N25°03E	100	GP	T+5	Yes
W6WX	Stanford	37°25N12°11W	100	Turnstile	T+1	Yes
ZS6DN	Pretoria	25°44S28°12E	100	GP	T+7	Yes
4U1UN	New York	40°45N76°00W	100	GP	T+0	Yes
4X4TU	Tel Aviv	32°41N34°45E	100	GP	T+4	Yes

All the above beacons transmit on 14.100MHz
Schedule: T+6 indicates transmission at 6, 15, 26, 36, 46 and 56 minutes past the hour

used between two stations.

Lowest Usable Frequency (LUF) - The frequency below which total absorption will occur and/or equipment limitations mean the signal will not be heard.

Optimum Traffic Frequency - Usually about 85% of the MUF and the one that therefore gives the best chance of a contact being viable.

Propagation is therefore a delicate balance between having sufficient solar output to propagate the signals, but not too much as to cause absorption.

Obviously, on a long distance path, this balance must be present along the whole path. Thus high frequency paths that cross the night-day terminator are unlikely to be viable as there will be no ionisation.

Also, paths that cross high ionisation areas may not be viable as absorption may kill the signal. And this is where the earth's magnetic field comes into play.

Project

For my project, signals were logged, morning and afternoon, from the world-wide beacon chain on 14.1MHz. These beacons transmit for one minute in each ten minute period from Madeira, Japan, Hawaii, Brazil, Finland, California (USA), South Africa, New York (USA) and Israel.

The total signal strength of each beacon was logged, along with the daily solar flux and the A-Index reading.

The **solar flux** is the strength of the 2.8GHz radio noise as measured coming from the sun. The level rises from about 67 units at sunspot minimum to about 300 units at maximum. Again, the higher the number the better the chance of good radio propagation.

The sun can also lose matter into space through the solar wind. Solar flares, when filaments break off, or coronal holes, when the sun's magnetic field is not strong enough to contain the high energy particles emitted by the sun, cause particles (electrons and protons,) to flow out from the sun and get caught in the earth's magnetic field, causing it to be disturbed.

The daily beacon score, solar flux levels, A-Index, and sunspot numbers were fed into a spreadsheet and graphically plotted.

And this is where the fun started. It was difficult to see much correlation between the received signals and daily solar flux, but what quickly became apparent was that a relatively high A-index reading usually meant poor conditions. Just look at he graphs shown here. You can see that as the A-index goes up, the beacon score goes down.

In January, despite high solar flux levels at the beginning of the month, propagation conditions were not very good. Later in the month, the solar flux stayed high for a few days, but the band conditions declined rapidly. It is interesting to note that on January 27 two South African 28MHz beacons were heard, but no European beacons. The next day no 28MHz beacons were heard.

During this time, the highest recorded 14MHz scores for January were recorded (24 on 25/1 and 26/1), but then band conditions dropped down with 14MHz scores of 16,15 and 15 on subsequent days.

It is interesting to note that the geomagnetic A index rose dramatically after the 25th and this probably explains the poor band conditions.

February was dominated by poor band conditions caused by high levels of solar activity brought about by a coronal hole and a filament that broke away. The particle emissions that impacted upon the earth's magnetic field both affected the A-Index and virtually crippled long distance h.f. communications.

The morning of February 6th started off with very poor conditions being reported on the 3.5MHz amateur band. The 14MHz beacon score was very low in the morning and a scan around the band revealed few stations. By late afternoon the 14MHz band was still very bad, but 28MHz was open to Finland and Norway - even after dark.

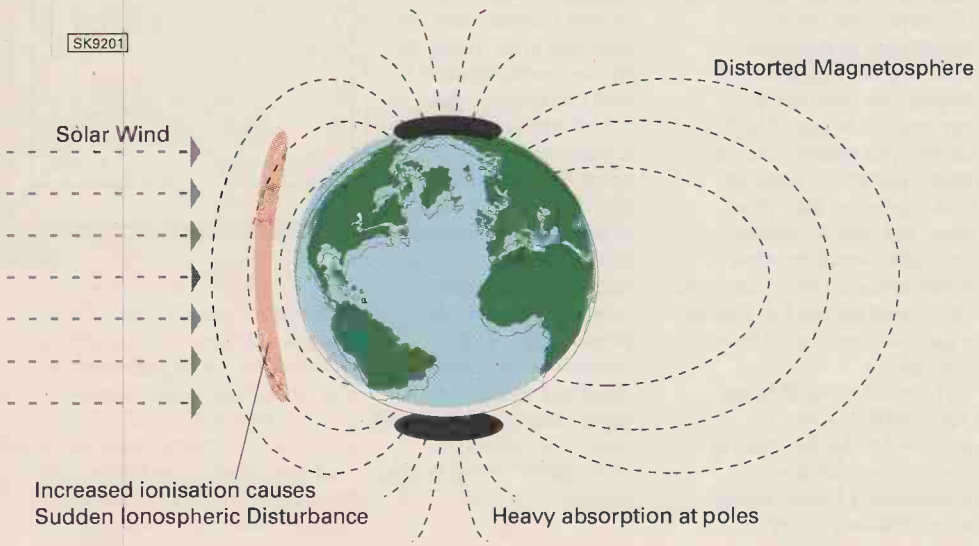
There appeared to be little F-Layer propagation as no signals from outside of Europe were heard on either 14 or 28MHz.

By the 8th of February, reports were coming in of a coronal hole on the sun's surface which was emitting high levels of particles (ions, protons, etc.) and electromagnetic radiation.

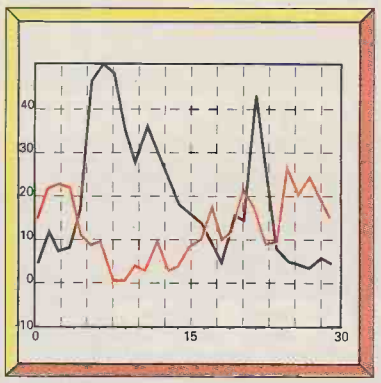
The result was that the 14MHz virtually closed down with a zero beacon score for two consecutive days.

The band conditions were reflected in the high A-Index readings which showed how the earth's magnetic field was being disturbed by the

Magnetosphere distortion due to the sun's ativity.



Plot of the 14MHz score for February against A-Index showing once again what a dramatic effect an unsettled geomagnetic field has on propagation. Absorption and disturbed ionospheric reflection has virtually wiped out the band. But the solar flux curve was much smoother.

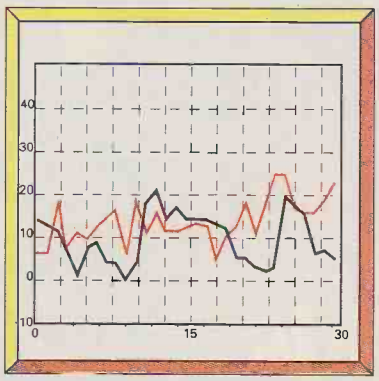


SK9199

KEY

14MHz score

Solar Flux



SK9200

Plot of 14MHz score for January against A-Index. Although the geomagnetic field was more settled than in February you can see that an upturn in the A-Index generally means a decrease in signals heard.

high energy particles arriving from the sun.

These conditions were in evidence for almost a further week or so, witnessed by the poor 14MHz scores and the A-Index values.

There is nothing new in any of this, but I feel that too much emphasis is placed on sunspots and not enough on the sun's geomagnetic effects when it comes to band predictions. If you take your short wave listening seriously, keep an eye on the A-Index readings. Anything more than 2-5 could spell trouble.

Only by taking the geomagnetic effects into account can you truly understand why band conditions seem to vary so much, even when the solar flux appears fairly static. ■

I hope that this brief look at propagation helps you with a better understanding of 'what is going on out there'!

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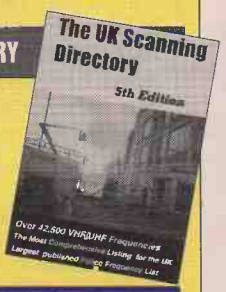

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From the Mists of Time it Came - The T2FD Antenna

I made my first T2FD antenna in 1953, the year our present Queen was crowned, and I remember it (and her) with great affection. I was 15 years old and already pirating on Top Band with home made gear and a venerable old B-21 receiver, which is the one with an Austin Seven door handle to change bands (and break your wrist if you didn't treat it with respect), but at least it was general coverage and allowed me to roam the spectrum and do my body building exercises by lifting it on and off my bench - but I digress.

When I left Lowe Electronics and retired to Devon I was fortunate enough to buy a property which has a few acres surrounded by 150 year old beech trees, most of them about 24m tall (which all sounds very nice until you come home on a windy night and find 24m of beech tree across the drive - two weeks ago). How could I resist stringing wires from these wonderful wooden structures, and what fun I have had with 180m long wires (they also have a tendency to collapse across the drive) - but the memories of my first T2FD and its performance, and the occasional articles which had appeared through the years prompted me to really investigate the facts and the myths which had grown up around this antenna system, and over the last two years I have studied, considered, calculated and tested just about every aspect of the T2FD. Having reached the point when I was happy with my findings, who should resurrect the subject but Kevin Nice of this fine magazine, and he suggested that I write down some of my findings for the benefit of its readers - so here goes.

The first article describing the T2FD was written by G.L. Countryman W3HH, and appeared in 1949. Countryman acknowledged that his source of information was a series of trials conducted by the US Navy and that his own trials of the antenna were at that time incomplete, but he was particularly impressed by the following attributes:-

1) Omnidirectional radiation pattern.
2) Useful operation over a 5 to 1 frequency range (for example 6 to 30MHz).
3) Reasonably flat impedance (s.w.r. of 1.4 to 2.6:1 with an average of 1.7:1) over the full operating range.
4) Single support for one end of the antenna, with the other end close to ground.
5) Moderate gain over a comparable conventional horizontal antenna.

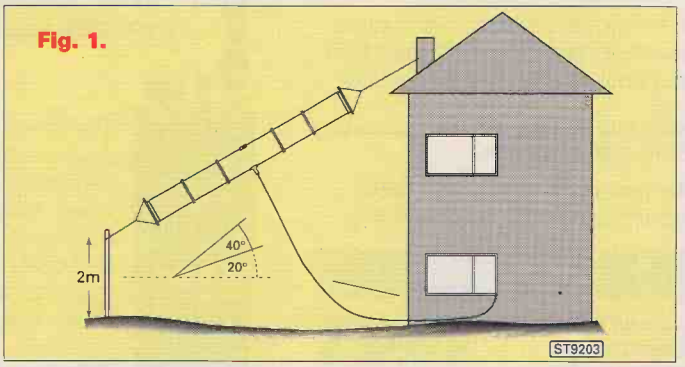
Later articles by Countryman in 1951 and 1953 expanded on his original text and included some results from tests in Japan by the Kyushu Electric Communications Bureau, and I quote his text:- *"Their experiments indicated that the tilted folded dipole was superior to the 'Zepp' and half wave doublet types previously employed. Wide band characteristics were observed and the T2FD resulted in a 4 to 8dB increase in the signal at their various receiving locations."*

As far as I am aware, nothing else was written about the T2FD, apart from reprints of the early articles in *73* magazine, until the 1988 and 1989 issues of *World Radio & TV Handbook* (more on this later), and then an updated survey by Guy Atkins in the 1990 issue of *F.T.S. Proceedings* in which he highlights the other useful characteristic of the T2FD, namely its low noise performance. Now for those of you who might have envied my tree bordered location, I should also mention that I have a 275kV grid line within half a mile to the East, and would you believe it, an older 132kV line a bit closer to the West, so I know all there is to know about noise on lower frequencies, and I'm therefore able to comment with some authority on what constitutes a low noise receiving antenna.

Acronym

T2FD is an acronym for Tilted Terminated Folded Dipole, and this accurately describes its general layout, if not its actual method of operation. Other writers have likened it to a "squashed rhombic", possibly because the T2FD operates with a resistive termination, but it's too short to be considered as a rhombic. In any event, I'm less concerned with the theory than I am with the practical results, and right from the first articles which appeared in 1949, the practical results have been impressive. As can be seen from **Fig. 1**, the antenna is constructed as a folded dipole with one end high and the other low. This is an ideal arrangement for the average house owner because the high end can be up at ridge height or on a chimney stack whilst the lower end can be

Fig. 1.



at the far end of the garden. The dipole is fed half way along one side, with the other side split at the half way point and a non inductive terminating resistor inserted as shown in **Fig. 2**. The performance of the T2FD, in my experience, is very much decided by the method of feeding it and the value of the termination resistor, and they are both critical (see **Fig. 1.**).

The angle of tilt is not critical but 30° from the horizontal is a good design mid point, with anything from 20 to 40° being acceptable. My own tests with various angles of tilt tally quite well with those quoted in Countryman's article of 1951 from which I constructed my own first T2FD. The lower end of the antenna should be about six feet from the ground, but this is largely because the spacing of the wire elements doesn't allow you to come much closer to the ground than this. Increasing the height of the lower end to allow the dog or sprog to pass underneath it without decapitation shouldn't make much difference to the performance, providing that the angle of tilt remains at about 30°.

How big is it? Well, how big is your available space and how high your top support? The calculations given by Countryman are as follows:-

1) Spacing (in metres) between the wire elements = 3/lowest operating frequency in MHz.
2) Span (in metres) from end to end = 100/lowest operating frequency in MHz.

Thus, for a lowest operating frequency of 6MHz the spacing would be 0.5m, and the total span would be 16.67m (54.7 feet). If you know the length of your garden and the height of the top support, you can always use a bit of trig. to work out the maximum length of the antenna you can fit in, or simply draw it to scale on a piece of squared paper and measure just how much wire you can accommodate. Knowing the length of the antenna you can transpose the formula for length to :-

3) Lowest operating frequency in MHz = 100/length in metres.

and thus know just what the frequency coverage will be. Don't forget that the antenna is a folded dipole and you will therefore need twice as much wire as the span of the aerial when you come to construct it. And so to construction - don't worry, I'll get on to the termination and matching a bit later.

After much cajoling and 'encouragement' John Wilson has be persuaded to tell us what he knows of an antenna much mentioned in *SWM* of late.

Don't be a Lightweight

This is a large lump of wire to be hanging in the sky, so although it might be acceptable to make it from lightweight materials as a trial, you should beef it up when you want it to survive a typical English winter. Guy Atkins comments ***"My first attempt at a T2FD self destructed when the antenna was hoisted into the air. I underestimated the strain the wires would be under"***. I agree with Guy's comments and when I came to make my own series of T2FDs (I did make one or two) I took a lot of care in selecting the materials. I recalled having seen some absolutely splendid heavy duty stranded copper cable with a clear insulation which I knew would be strong enough to stay up, but it was sourced in Japan and difficult to obtain so I asked a British cable manufacturer to make some for me. This they did, but there was a minimum order quantity and I eventually had to buy 3000 metres of it (I was sure I could use it or dispose of it in time).

Similarly, when I came to consider a suitable material for the spreaders which keep the wires apart I contacted a British company specialising in plastic materials and took their advice on a particular compound which combined strength, good dielectric properties and resistance to cracking. Surprisingly, my first choice of nylon was unsuitable because it absorbs water...! Once again I had to buy rather more than I needed but it enabled me to carry out a series of tests on different lengths of antenna without worrying about them falling to pieces. I used the time honoured method of securing the antenna wire in the ends of the spreaders by cutting a groove across the end face of the spreader deep enough to hold the wire, then drilled a small hole through the spreader in line with the wire and threaded a short piece of tinned copper through the hole and wrapped it around the antenna wire on each side. I've made hundreds of metres of open wire feeder line by the same method and it's simple and satisfactory.

Resistive Termination

Now to the interesting bit. You will have noticed that the antenna is fed half way along its lower leg, and the corresponding point along the upper leg has a resistive termination in it. In the original articles of 1949 and 1951 describing the T2FD, Countryman showed the terminating resistor to have a value of 600Ω and the antenna fed by 600Ω open wire feeder. In a follow-up article in February 1953, Countryman went into more detail about his observations on feed line and termination impedance, and said that contrary to his earlier articles the termination should be of higher value than the feeder impedance, for example 650Ω for a 600Ω feed line, and that for lower feed line impedances, the value of the terminating resistor was critical to within 5Ω for correct performance. Guy Atkins suggested a feed point impedance of 300Ω with a 390Ω termination resistor, and went on to comment about the *World*

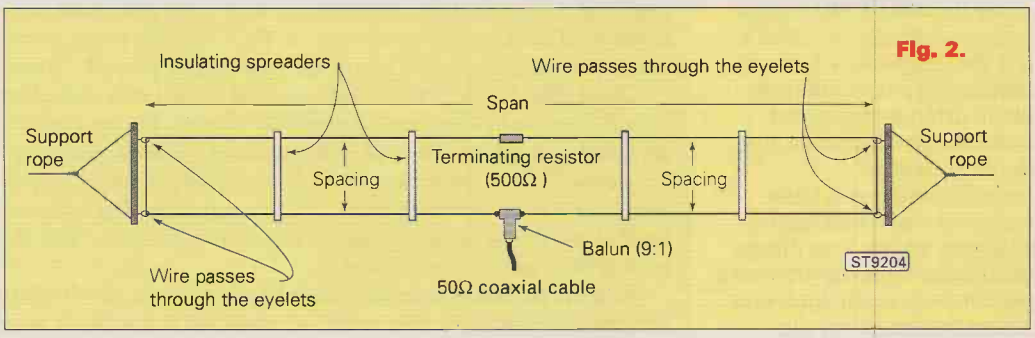


Fig. 2.

Radio & TV Handbook article as follows:-

"The WRTH editions give the erroneous impression that the T2FD antennas REQUIRE a 500 ohm resistor and a 10:1 balun transformer used with 50 ohm coax cable. This is not the case..."

Guy went on to describe how he used a 390Ω termination with a 4:1 balun to convert what he guessed was a 300Ω feed point impedance to 75Ω for coaxial feed. With all these different tales around I decided that this needed detailed investigation which is why I have occupied nearly two years on the subject. As I have said, I made several T2FDs and used them with different wire spacings, terminating resistors and different feed point arrangements. I found that Countryman was correct in how critical the matching became at lower impedances and agreed with Atkins that *WRTH* was wrong in suggesting that only a 500Ω termination with a 10:1 balun to feed 50Ω coax was correct. In fact it's incorrect.

The best results I found were using a 500Ω termination which gave a 450Ω feed point impedance where I used a 9:1 balun to allow the use of 50Ω coaxial cable as a feeder. But that's not the entire story because I researched many different balun arrangements and came to the conclusion that the impedance transformation and balun functions were best kept separate, so my final design used two trifilar transformers (which were made for me in Japan by one of my old friends there), incorporating a fully balanced impedance transformation and a Guanella balun arrangement. All my configurations were checked out using a swept frequency return loss analyser and the two stage 9:1 arrangement was without doubt the best I found both in bench measurement and in actual listening.

Keep It Dry

Since the impedance matching network and balun have to be out there in the pouring rain I sourced some GRP square tubing and potted the whole lot with 4mm sockets for the feeds to the wire ends of the antenna and a BNC socket for feeding the coax. I know that the average short wave antenna uses a PL-259/SO-239 plug and socket but they are not as water resistant as the BNC and don't have the same cable retaining grip as a BNC. In fact the average PL-259 plug will almost certainly allow water to get into the end of the coax cable, and it only takes six months to wreck perfectly good (and expensive) cable by shield corrosion. There's no point in erecting a low noise antenna if you end up with crackling noises being generated in corroded outer braid in the cable. You can sometimes find PL-259 plugs with the same compression cable clamps as the BNC, but be prepared to pay a premium price. I always ask Henry Westlake -**Tel:(01409) 253758** - when I need good connectors, and can recommend his advice on these matters.

The terminating resistor is also out in the rain and needs waterproofing. I used the same potting technique as for the impedance matcher and again used 4mm sockets for the wire connections. I prefer 4mm sockets to terminals because they form a completely waterproof bond with the potting compound and are easy to connect and disconnect. I have found that conventional screwed terminals used outside tend to corrode and seize up, so that when you need to unscrew them they either refuse to turn or shear off, or worse still rotate within the potting compound and tear off the internal connecting wires still buried in the potting. The "push and pull" action of the plug and socket not only removes the seizing up problem but is also self cleaning, particularly if you can find some of the splendid 'O-Z' plugs made by Belling & Lee.

The terminating resistor obviously has to be non-inductive across the operating frequency range of the antenna, and whilst it would be easy to use standard carbon film resistors for the purpose, they probably wouldn't survive the first nearby thunderstorm, so I use a specialist slab resistor which is rated at 5W and has lasted very well so far. Expensive it's true, but better than pulling down the antenna after every storm to replace a burnt out terminator.

How Does It Work?

If you mean the theory behind the T2FD, don't ask me; I'm happy to find that it performs exactly as Countryman and the other users said it would, and I leave the theory to cleverer folk than me. If you mean "How does it work?" in practice, then my reply has to be "extremely well". It certainly exhibits all round coverage (with a slightly favourable gain in the direction of the lower end support), has gain over a long wire, produces less noise at my location than conventional long wires, and has that useful frequency range of 5 or 6:1. I erected my T2FD cut for a lower design frequency of 5MHz and found it worked not only right up to the top of the short wave spectrum but well below 5MHz as well. Although the gain gradually droops below 5MHz, it by no means cuts off, and the 80m amateur band stations come booming in. Guy Atkins also reported that a T2FD designed for the 60m broadcast band still performed well down in the 120m band.

The T2FD is due for a revival, and if you are tempted to erect one and need some tips from me don't be afraid to ask. As you will have gathered from this article I have a surplus of top quality bits and pieces still available and would be pleased to pass them on at reasonable cost. Just contact me via *Short Wave Magazine* and let's see the T2FD recognised for what it is - an interesting and useful antenna for the keen short wave listener. TTFN (for those old enough to remember what it means.)

And so to other things. I'm writing this at the beginning of December 1996 and I know it won't see the printed page until the New Year, so I'll wish you all a very prosperous 1997 and send you my sincere thanks for all the letters I have received as a result of my scribblings. I simply haven't been able to reply to them all, but can assure you that I have appreciated receiving them. My particular thanks to Richard in Pittsburgh, PA, who has been a regular correspondent for many years and keeps me up-to-date with news from the American short wave scene; also to RJP of Northampton who has furnished me with a wealth of information on older equipment and fascinating articles describing the origins of many so-called "new" techniques. To those manufacturers or their representatives who have entrusted me with their latest products for comment, I hope that I have been truthful, if sometimes not complimentary in my findings. My personal award for product of the year goes to AKD for their Target 3 receiver which has successfully brought a good short wave receiver within the financial reach of many enthusiasts, and my "Oh Dear, what a pity" award to the WiNRADiO for being such a well made and attractive product which, for me, completely missed the intended target. ■

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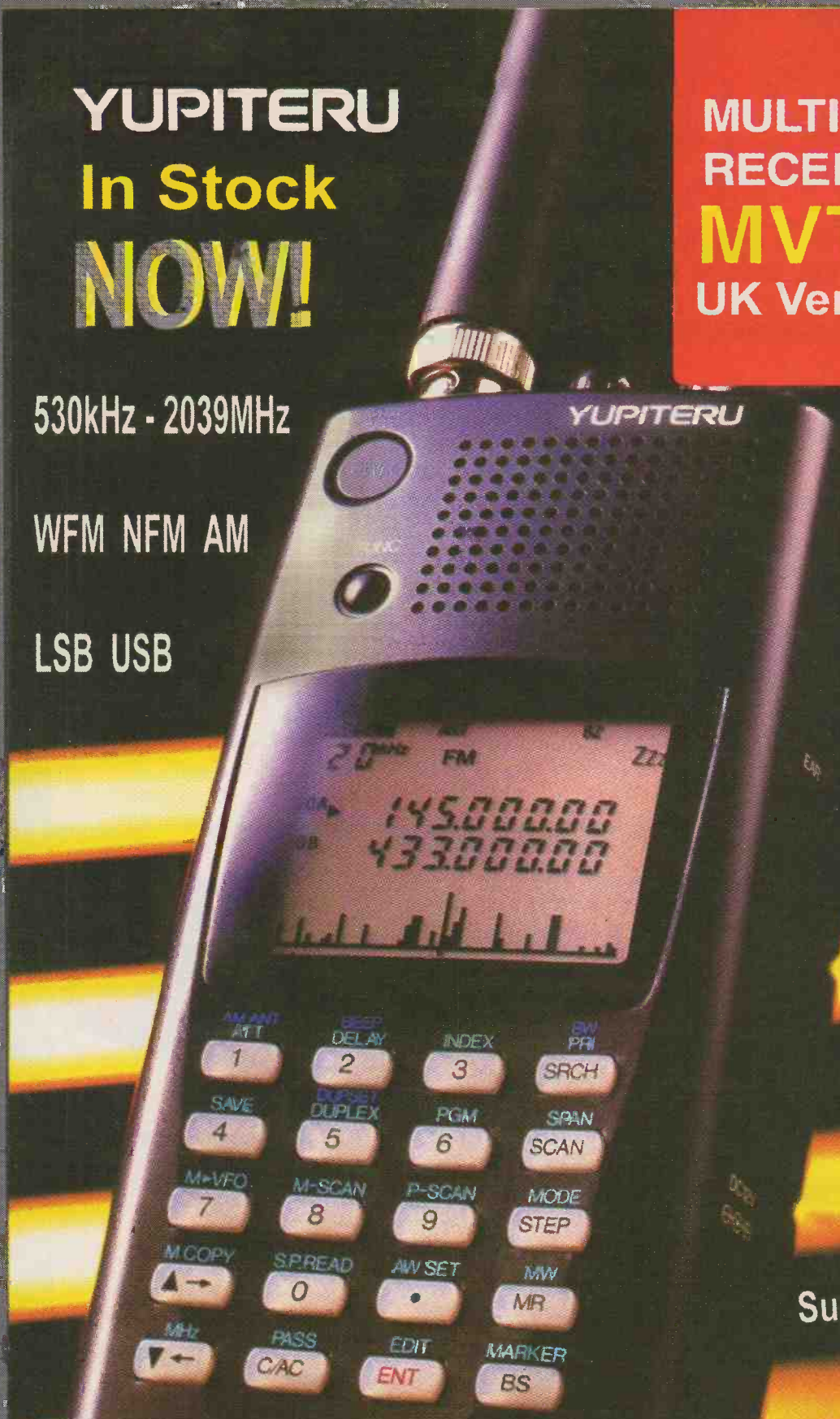

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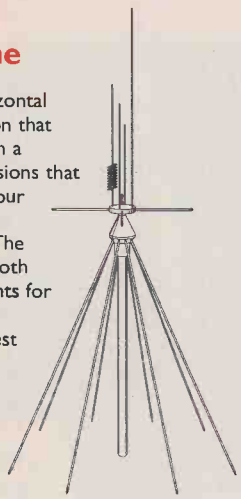

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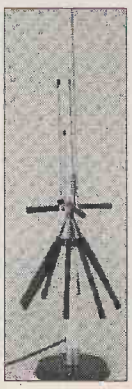

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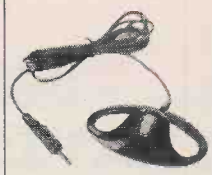

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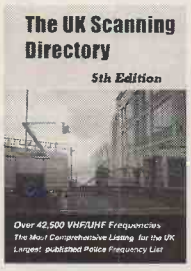

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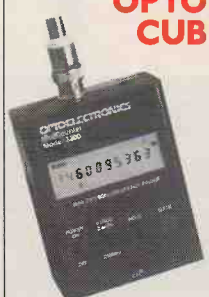

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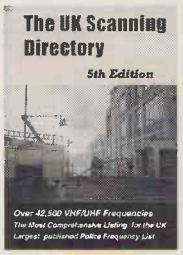

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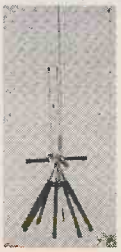

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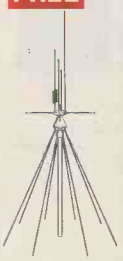


Frequency Coverage

Freq (MHz)	Step	Mode			
25.000-29.995	5.0kHz	AM	137.00-224.995	5.0kHz	FM
30.000-87.495	5.0kHz	FM	225.000-400.000	12.5kHz	AM
87.500-107.995	50kHz	WFM	400.005-520.000	12.5kHz	FM
108.00-136.995	12.5kHz	AM	760.000-1300.000	12.5kHz	FM

QUANTEK FC2000 FREQUENCY COUNTER

This sensitive "nearfield" counter is ideal for on-air frequency checking. Simply hold the counter near to the transmitter to get an accurate frequency reading. Comes complete with nicads, AC charger and aerial. An ideal frequency counter for service engineers or surveillance personnel who need an accurate handheld counter.

SPECIFICATIONS

Frequency range:	1MHz to 2.4GHz
Sensitivity (Typical):	800µV @ 10MHz 500µV @ 30MHz 225µV @ 150MHz 640µV @ 450MHz 1mV @ 850MHz <10mV @ 1.3GHz <200mV @ 2.4GHz
Maximum Input Power:	+15dB (50mW), 1.26V RMS
Input impedance:	50Ohm
Timebase stability:	+/-1ppm 25-35°C
Timebase ageing:	1ppm per year typical
Timebase accuracy:	+/- 1 count in LSD
Gate time:	Fast 0.25 seconds for 1kHz resolution. Slow 2.5 seconds for 100Hz resolution
Power:	Internal nicad batteries 4 x AA, 700mAh or mains adaptor/charger, 240VAC input, 12VDC output, centre positive
Size:	100 x 87 x 28mm

Specifications subject to change without notice

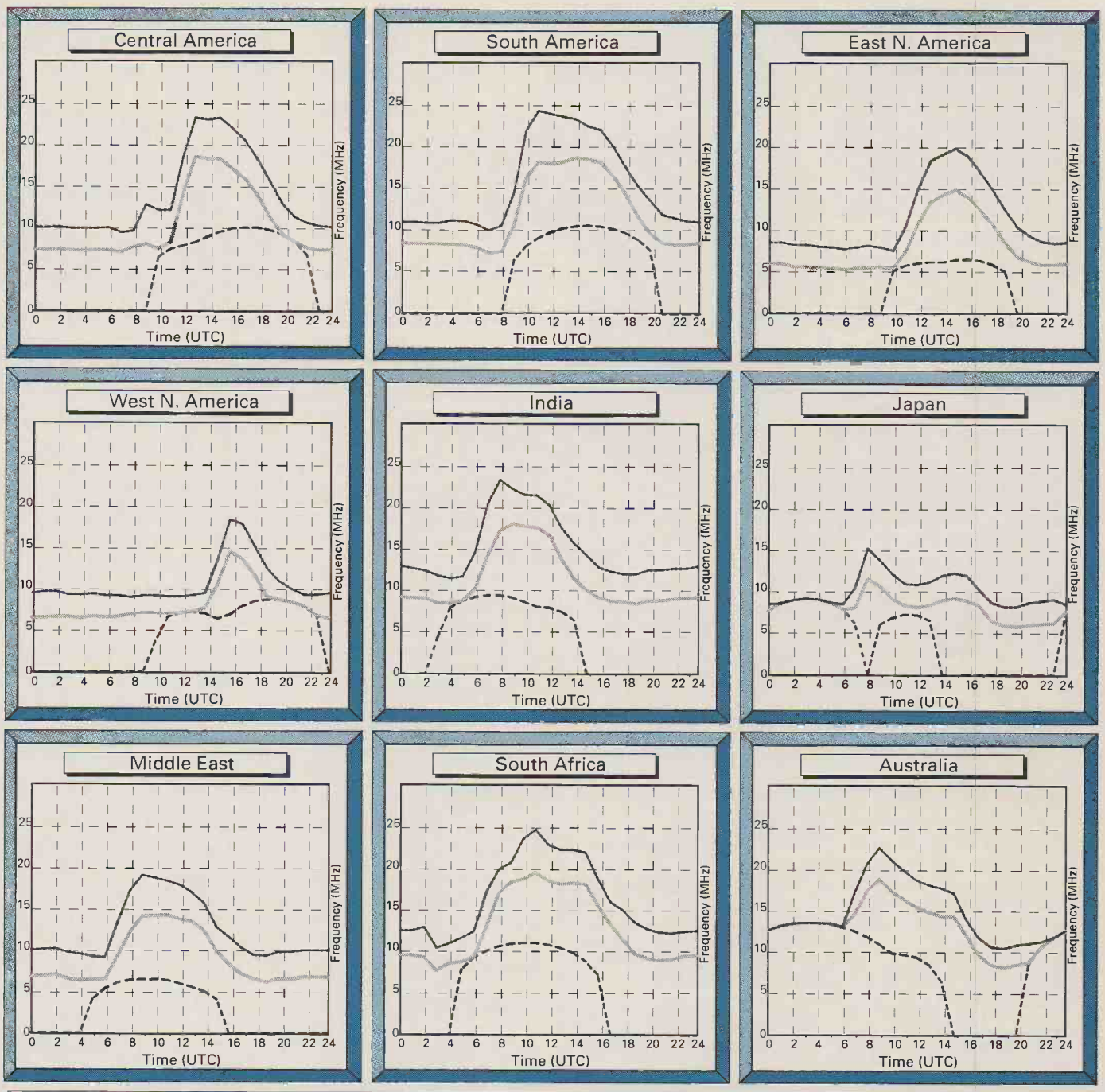
RRP £135.95

SRP PRICE £89.95 £5 P&P

Jacques d'Avignon VE3VIA

World Propagation Forecasts January

Circuits to London



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.

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The best receiver filter in the world - at least that's what users say!

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Watson LWB-1 lets you end-feed your wire aerial with coax cable
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If you are buying a Yupiteru Scanner, make sure it is the latest legal CE version and not old stock! Just check the back and look for the CE label and the "EX" model number.

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530kHz - 1650MHz
SSB - FM - AM - CW

Tthe MVT-7100EX conforms to the Electro Magnetic Compatibility Regulations that became law as from 1st of January, 1996. We can now supply this latest version from stock.

NEW MVT-7200EX

100kHz to 1300MHz

SSB - FM - AM - CW
Narrow SSB filter
AM Ferrite Aerial

Yupiteru's latest model and includes a ferrite aerial for low frequency reception. Also included is a new narrow band SSB filter. AM reception has also been improved by the addition of a new narrower filter and a circuit revision has reduced total battery consumption.

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Xplorer Monitor Special Offer

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Locks onto any frequency in less than a secod! Gives digital readout, decodes audio and reads tone frequencies

Get the complete Xplorer monitor kit at no extra cost.

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WFM-NFM-AM
Maplin Ref CM00

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FRG-100 12V DC	£499.95
KP-100 keypad	£49.95
FM Unit	£33.95
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Icom's super new receiver that goes from 100kHz to 2GHz. This is a fabulous new design that puts all your receiving requirements into one very compact package.

AR-7030

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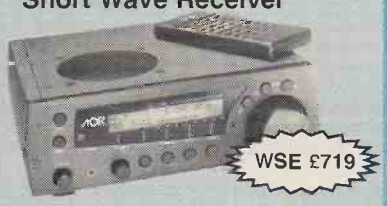

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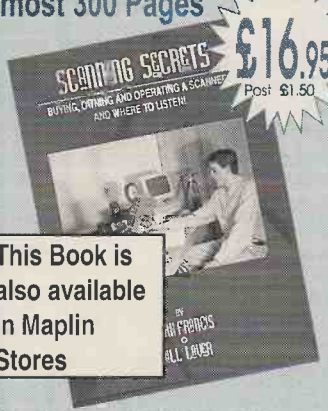

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Features black 400mm wideband whip, latest micro multi-pole magnet, and 2.75m coax fitted BNC plug.
Just place on car roof and hear the improvement! Light and compact with super strong magnet.

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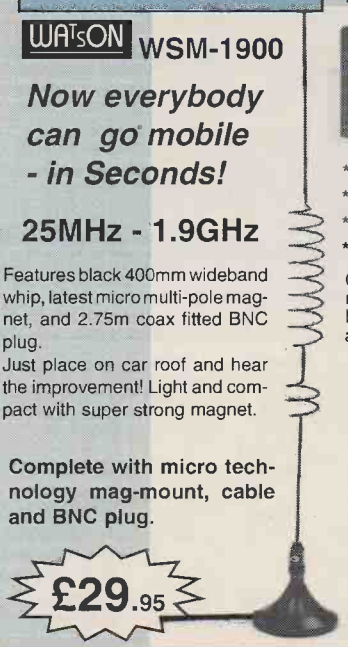

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£885

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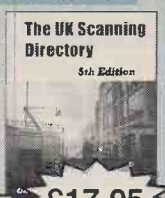
VHF - UHF Frequency Guides

The UK Scanning Directory



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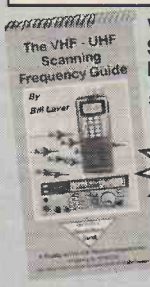

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FREQUENCY EXCHANGE

Kevin Nice G7TZC

Hello again, a good mixture of loggings this months, your input into this feature is very encouraging. If you haven't seen your contributions appear yet don't be disheartened, we can only publish highlights due to the volume of logs receive. You will help us if you can a provide your logs on disk or via E-mail if possible; if not, then you can save lots of editorial time by keeping **exactly** to the format on this page i.e. same sequence and headings. We look forward to this feature growing - it's all down to you.

If you provide logs on disk, please note that we can read PC and Mac format high density 3.5in disks. Preferred, is MS Word for the Mac. We can, however, accept most mainstream wordprocessing formats. If you have an obscure package, then please submit a plain ASCII file.

MHz	Mode	Time	Call	Location	Monitor	Notes
0.101	a.m.	24hrs	-	UNID	fc	Regular pulses, broad-band.
0.133	d.s.b.	24hrs	-	UNID	fc	Pinging.
0.518	NAVTEX	1830	OA60	Portpatrick	je	Oil rig warning & unlit lightbouys.
4.2118	ALIS?	2215	-	Black Sea?	je	WX for Black Sea area.
5.384	Baudot	1630	UNID	?	je	Random letters.
5.439	RTTY	1627	MTI	Plymouth	pt	75/833 Clg 9DL with Test + foxes + "GO ZNI2".
5.8415	PSK	1940	-	UNID	aneu	US-INTEL PSK outlet, D? UNID speed//6.8815MHz, similor to the 108.87Bd/170Hz FSK and u.s.b. voice transmissions, the carrier shows up on the channel long before the actual transmission starts!
6.6855	ARQ	2306	-	Conoil Rig	rb	company message.
6.739	u.s.b.	2038	MAGIC 85	Incirlik	mp	E3 PP CDE: How goes it/There's no concern back at Waddington, we will send him (who) back the detachment, will pay for it and we will investigate further when he gets back home. (on compassionate leave.) '85 signed off saying 'They would sit watching the paint dry'.
6.752	u.s.b.	24hrs	-	UNID	fc	Slow musical tones.
6.794	Baudot	1930	-	Bucharest	je	News EE.
6.865	Piccolo-6	1100	GFH	Hong Kong	ml2	RAF Kai Tak HKG w/foxes & svce msgs to VHC RAN Belconnen (GYU to MUH also logged this freq).
6.9185	FAX 120-576	0200	ECA7	Madrid Met	lc	QWA(I,1?)40 "CHART FOR FL240" rebroadcast Bracknell product. Atlantic / polar. 0215z "27 OCT 96 0149 FROM MET IT OPS BRACKNELL TO 4806 PAGE 001" PGAE06 EGRR NAT FL250 - 630 fixed time prognosis showing sig WX and jetstreams nice chart better than Bracknell from here.
7.5349	u.s.b.	1100	CSM	USA	je	Christian Science Monitor.
7.6473	Baudot	1110	DDH7?	Hamburg	je	Synoptic groups - Homburg Met.
7.6594	Baudot	1115	TANJUG	Belgrade	je	News.
7.675	Baudot	1120	FDY	France	je	50 Baud test French Mil.
8.4377	c.w.	1820	4XZ	Israel	je	Israeli Navy.
8.623	c.w.	1100	PCH41	Netherlands	je	Scheveningen Radio.
8.865	c.w.	1110	IRM	Rome	je	Rome medical.
8.968	u.s.b.	2003	AF RESCUE 212	Thule	mp	HC 130 Patient is on board the Jolly and going to Reykjavk General Hospital, the patient is hypo tensive and has acute hepatitus and possible abdominol infection/global what freqs are you using/2.528,2.828,5.694 (The HC130 poss 66.0212).
8.968	u.s.b.	2010	NAVY PD683	Lavey	mp	P3 VP9 ETA Rota 22052 req. customs and maint for O2 regulator and 13 box lauches for 1700 tomorrow/PP 727.2404 rota metro
9.114	RTTY	1800	MTI	Budapest	je	Hungarian news to Europe & Africa.
10.249	Piccolo-6	2201	GYU	RN Gibraltar	kn	Continuous test tape in the clear "de GYU lololo CIP CIP +test (x12times) qbf + string of lettershifts". Standby at 0530z then marker agn.
11.039	Baudot	1750	DDH47	?	bb	German P/L RYs.// with 14.467MHz.
11.175	u.s.b.	2002	DOOM 19	Croughton	mp	B52 PP 366 5212 (out of service), try Andover on 4.128. Do you have an h.f. freq/Negative/frequency status on tankers/on time contact Keystone CTR on 15.821 upper/nothing heard.
11.244	u.s.b.	2123	BACKPACK	Alternate	mp	Do you have traffic up 4YL/Do you have a better freq. we can stay with nightwatch on 9.391 or 9.390 (not heard on either).
11.494	u.s.b.	1827	RLN9006	Thule	mp	QSYs by Thule for 11.244 PP 202 224 9151 (Washington) gave ETA 7pm local. Then went on to give an interview (Senator?) about his visit to the submarine yard to see them demonstrate them at the white sea.
13.0303	Baudot	2020	FUF	?	bb	RYs.
13.123	u.s.b.	2225	-	?	bb	YL, Radio telephone.
13.483	Baudot	1507	RPTI	?	bb	RPFN de receber DEU.
13.509	Baudot	1845	-	Halifax	bb	Canada Ship synop and FAX poss US Navy.
13.541	Sitor A	1815	CTJ	RR Noase	bb	EE family msgs.
13.588	Baudot	1520	MAP	Morocco	bb	Press - sked/freq list.
13.73L	Baudot	1758	5YD	Nairobi Air	bb	Kenya RYs.
14.467	Baudot	1750	DDH47	?	bb	German P/L RYs. //11.039MHz.
14.653	FEC	1300	SPW	Warsaw	je	Ship tfc list.
14.912	FEC 625	1830	-	?	bb	Serbian NX.
14.9288	c.w.	1045	8BY	-	anee	SDECE Intel SVC text: 8by 8by 8by 487/455/914 vvv vvv, 'til 1100 8BY: SDECE Intel Svc 1345 CW text: 8by 8by 455/914/099/080 (rpts) til 1400.
14.9717	ARQ	0945	-	London	id2	Egyptian Embassy, excerpts from London newspapers translated into Arabic.
15.873	FEC-A	1200	P6Z***	Paris	mc	French MFA, 192bd/400 5LGs to "W3E" (Embassy Islamabad).
15.9465	Twinplex 100	1600	-	Madrid	anee	MFA wkg/embassy Kiev 'til 1630.
16.807	Sitor B	1100	SPA	?	bb	Crypto (2930 on ch 20X).
16.813	ARQ 625	1915	IFQO	?	bb	No tfc to UEYF.
16.839	Sitor A	1920	-	?	bb	EE P/L.
16.926	Baudot	1330	UIW	?	bb	RYs.
17.137	c.w.	0830	LYL	L18IYA	bb	39.7w.p.m.
17.427	ARQ 625	0800	-	Stockholm	bb	EE P/L Crypto.
17.440	Baudot	2135	5YE	Nairobi MET	bb	RYs WX.
18.4935	UNID	1144	-	UNID	mc	FSK 100bd/850 UNID FSK System, sync, cont, ACF=0.

Abbreviations

CG	Coast Guard
DMBC	Doncaster Municipal Borough Council
EE	English language
OB	Outside Broadcast
NN	Norwegian
NX	News
USAF	United States Air Force
USN	United States Navy
WX	Weather

MHz	Mode	Time	Call	Location	Monitor	Notes
18.5293	COQUELET-8	1400	-	Algiers	anee	MFA 26.67bd also 53.3bd circuit tests till 1530.
18.761	Rolu FEC	1245	-	Kenya?	bb	Rumanian P/L.
19.8079	TWINPLEX	1726	LJA30	Oslo	mc	Narwegian MFA, 100bd/400 MSGs in NN to Embassy Addis Ababa.
53.200	n.f.m.	24hrs	-	Swansea	cch	Radio Link With Bursts of music energy 45 secs. (unknown user).
69.900	n.f.m.	1430	-	Swansea	cch	BBC Wales Studio Manager, Camera Control Room, Vetch Field, Swansea AFC.
70.5125	a.m.	various	-	W/Mids	anon	Fire FB
70.8800	a.m.	various	-	Staffs	anon	Fire YG
70.950	a.m.	24hrs	WZ	Swansea	cch	South and West Wales Fire Brigade Control Ops, Morriston, Swansea.
71.1500	a.m.	various	-	W/Mids	anon	Fire F8W
73.3875	n.f.m.	evenings	-	Swansea	cch	Marina and River Tane Boat Ops and Practice.
73.3875	n.f.m.	weekends	-	Swansea	cch	Swansea Sea Cadets.
74.0125	n.f.m.	weekends	-	S. Wales	cch	Also 74.450, 74.5875 & 74.6125MHz. Various Army repeaters of poor quality XMTN, all continously linked, identical tfc c/s DELTA OSCAR + NOVEMBER OSCAR ALPHA.Vorious Army manouvers heard as well as marches & troop movements.
83.350	a.m.	24hrs	-	Swansea	cch	Swansea Council Works Dept. mobile on 71.850MHz.
85.025	n.f.m.	day/night	-	Neath	cch	Boraugh Council Dept.
85.100	a.m.	24hrs	-	Neath	cch	Welsh Water Control Room.
85.1625	a.m.	24hrs	-	Swansea	cch	British Telecom Base, Swansea Ops, mobile on 71.66625MHz.
85.2125	a.m.	24hrs	-	Llanelli	cch	Welsh Water West Wales, Llanelli, mobile on 71.7125MHz.
85.800	n.f.m.	8-1900hrs	-	Swansea	cch	Porcelling delivery Service Co. mobile on 72.300MHz.
86.025	a.m.	weekends	ROMEO	Merthyr	cch	And Sierra - Merthyr Mountain Rescue Teams &Base/Mobile Unit (at scene) mobile on 75.525MHz.
87.0625	n.f.m.	24hrs	BRAVO	Neath Valley	cch	Also c/s MIKE & LIMA. Forrestry Commission. mobile on 77.0625MHz.
141.9125	n.f.m.	1630	OSCAR	-	cch	Sandfields Base.
141.9125	n.f.m.	Sundays	DELTA	Swansea	cch	Territorial Army.
141.9875	n.f.m.	1630	NOVEMBER	-	cch	Sandfields Base.
141.9875	n.f.m.	Sundays	ALPHA	Swansea	cch	Territorial Army.
143.675	a.m.	1448	SPKR 87	UK?	mp	SPKR 89C21's in Air to air chat about who they were picking up and mentioned a leaving party.
146.6600	n.f.m.	various	-	W/Mids	anon	Fire FB/W v.h.f. link
156.3000	n.f.m.	racedays	-	Brownhills	anon	Chasewater Rescue Control Nat Powerboat Championships.
163.1375	n.f.m.	-	-	Wembley Stadium	ca	Contract cleaners.
163.150	n.f.m.	-	-	London	ca	Royal Parks Police CH2 Romeo Zulu, etc.
163.300	n.f.m.	-	-	London	ca	B8 Security.
163.6875	n.f.m.	-	-	Luton?	ca	Possible Vauxhall Motors, (Repeater 159.1875).
163.9875	n.f.m.	-	-	London	ca	Shorrock Security, Oxford St., Plaza Shopping Centre.
164.025	n.f.m.	-	-	London	ca	Chelsea FC Stewards/Management.
164.0490	n.f.m.	various	-	W/Mids	anon	Saint John Ambulance Ch4 Mid Band Fequency No. 2.
164.0625	n.f.m.	-	-	Stevenage	ca	8HS net.
164.0875	n.f.m.	-	-	Stevenage	ca	Multiplex Cinema staff net.
164.575	n.f.m.	-	-	Maidstone	ca	Gillingham also, Scan Electronics, (Repeater 160.075).
164.625	n.f.m.	-	-	Kent	ca	Tunbridge Freight, (Repeater 160.125).
165.0125	n.f.m.	-	-	Kent/London	ca	BOC Oxygen Supplies? (Repeater 169.8125).
165.0625	n.f.m.	-	-	Essex	ca	Warrior skip hire, (duplex 169.8625).
165.4375	n.f.m.	sporadic	ROMEO	S. Wales	cch	Also SIERRA Merthyr Mountain Rescue, Common Base Repeater (various users) CTCSS 114.8Hz mobile on 170.2375MHz.
166.1500	n.f.m.	various	-	Lichfield	anon	Council.
166.4250	n.f.m.	various	-	Birmingham	anon	Central GP Service.
167.7620	n.f.m.	various	-	Birmingham	anon	TOA Taxis Ch1.
167.7870	n.f.m.	various	-	Birmingham	anon	TOA Taxis Ch2
169.0870	n.f.m.	various	-	W/Mids	anon	St. John Ambulance Ch5, also Red Cross national frequency.
169.1370	n.f.m.	various	-	Walsall	anon	Local freq. - Priority - St. John Ambulance Ch7.
169.1690	n.f.m.	various	-	B/Ham & Sutton	anon	St. John Ambulance Ch8, Local Freq - Priority.
169.1690	n.f.m.	various	-	Wolverhampton	anon	St. John Ambulance Ch8, Local Freq - Priority.
169.1870	n.f.m.	various	-	Solihull & Dudley	anon	St. John Ambulance Ch9 Local Freq - Priority -
169.3620	n.f.m.	various	-	W/Mids.	anon	St. John Ambulance Ch10 Brigade national frequency No.1.
169.8120	n.f.m.	various	-	W/Mids.	anon	Aston Villa stewards.
170.1870	n.f.m.	various	-	W/Mids	anon	St. John Ambulance Ch6, West Midlands county frequency.
409.425	n.f.m.	-	-	Menwith Hill	ca	NASA Station.
440.5375	n.f.m.	-	-	Stevenage	ca	British Aerospace security CH3.
442.5875	n.f.m.	-	-	Essex	ca	Integrated Security Group, (Repeater 428.0875).
442.650	n.f.m.	-	-	London	ca	Neptune Museum, (Repeater 428.150).
443.8875	n.f.m.	-	-	Dorset	ca	Boscombe, MOD Police (Repeater 434.3625).
444.050	n.f.m.	-	-	Farnborough	ca	MOD Police.
444.450	n.f.m.	-	-	Farnborough	ca	MOD Police.
446.250	n.f.m.	-	-	London	ca	Oxford St., Virgin Mega Store.
447.825	n.f.m.	-	-	London	ca	N.Soho, Amco Amusements.
453.3500	n.f.m.	various	-	Walsall	anon	Council.
453.5250	n.f.m.	various	-	Sandwel	anon	Council.
454.0250	n.f.m.	various	-	E.Birmingham	anon	Heartlands Hospital voice paging.
454.1000	n.f.m.	various	-	W.hampton	anon	Newcross Hospital voice paging.
454.2000	n.f.m.	various	-	Derby	anon	GP Dept. service.
455.1625	n.f.m.	various	-	W/Mids.	anon	BRMB Radio Flying Eye traffic reports link to studio.
456.0250	n.f.m.	various	-	Solihull	anon	LandRover plant.
462.7750	n.f.m.	various	-	Lichfield	anon	Breakdown service.

Don't delay, post your frequencies to the Editorial Offices or E-mail us on: freq@pwpub.demon.co.uk

OTHER EXCHANGES!

A letter from **RA** who wishes to be kept anonymous is looking for some information. London Transport buses keep squirting out bursts of data at around 193MHz and he's wondering what it is. The suspicion is that it may be something to do with the new fangled bus stops that show how long you have to wait for the next bus(es!). If there's anyone out there who has managed to decode this data perhaps they can write. Our reader says he could wait indoors until he actually know a bus is coming.

An anonymous reader from Staffordshire wishes to appeal through this column for a number of elusive Freqs that keep evading him. These are, any 'PebbleMill' delta frequencies, channel 17 West Midlands Ambulance Service and any u.h.f. Ambulance frequencies. So can anyone help?

Don't forget if a frequency issue is puzzling you, write to me.

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

Amateur Bands Round-up

Listening to the Amateurs

Let's have all your news and comments, sent as usual for the start of the month.

Autumn is in many way the nicest time of the year; from where I write I can look out of my window at the sun over the hills to the southeast and know also that if I go outside I can see other hills most of the way round the compass. The jarring note - there always is one someplace!- comes as I look at the antenna mast and see how hard the guys are working to keep it all upright. If I'm sitting in a meeting in London while a gale rages in Newtown, it is comforting to know I have grossly over-guyed my mast!

Letters

Lots of 'em this time, so let's get stuck in.

First off the **International Listeners Association**, who have their HQ at **1 Jersey Street, Hafod, Swansea SA21 2HF**. Trevor GW4OXB is the guiding light here and covers most of the interests of the short wave listener. Trevor himself has been going through a bad patch just lately, and we offer our sympathy.

Now we turn to **E. Griffiths** of Caernarfon who is debating about adding a dedicated receiver and antenna to look at the amateur bands as well as his present scanner. He sent an s.a.e., so we have written with rather more detail, and incidentally suggested a meeting at the annual Llandudno 'do' which is almost upon us as I write. In essence, reader Griffiths notes that in his neck of the woods, the winds blow wire antennas down; but I have offered some suggestions which may help him.

The winds that blow brought down the 3.5MHz Delta Loop used by **Brian Mortimer** in Whitby, so he has made a change to The Earth Return Antenna discussed by G3BDQ in his book on *Wire Antennas*, with the help of a handily-placed tree and adequate attention to the earthing side of the system. For others using trees as antenna supports it's maybe worth reminding that trees move about in a wind, so the use of a pulley and a weighted cord at one end of the antenna is a trick that allows the antenna to stay up while the tree moves. On 3.5MHz this has paid off to the tune of J79WP, 9K2/YO9HP,J79QA, TI4CF, D44BC, W6RJ, ZL1HY, ZL1BOQ, ZL2JR, 7X5JF, VK6LK, 9M8DB, SU1SK, LU1FA, LU8EEM, LU3CQ, LU1BR, YB6MF, FM5BH, FM5GU, HC1JQ, JA2KIW, VK5PO, JA7NI, JA3CZY, VK5MS, W6CCP, VK3PZM, YV6LIX, ZL3GS, 4X1ARU, J55UAB, FP5CJ, PY6WD, CO3JO, XE1REM, KC5HF, WP4MUO, W5YU, N7JW, AD6C, JA9IKR, JA5AQC, 8R1AK, KG4GG, JA6BJT, ZL1AXQ, VY2ROB, YV3GAH, LU2ANN, ZL4KF, NP4A, A92FZ, VK6APZ, 7X5AB, HJ0SVX, 9G1MR, $49I, PJ9E, TI0C, N6BV, and LR3F. From 3.5MHz a turn to 7MHz produced VK6ACY, 4S7EA, LU4DXU, VU2AUU, XQ1IDM, JL1UJG, CP5NU, J68BK/IK, 8Q7BT, ZL1BO, 5A1A, XX9X, VK2GBG, VK2OE, VK2FLA, LU4FM, VK4MZ, and ZS6EZ, Finally to 14MHz were the following were booked in: VQ9WM, PT7BI, LU6LAZ, ZP5OGL, PP8BU, VA7A, PQ2Q , P40E, ZS5J, KG4GC and W7HRY. I hope I have the calls right - I had trouble deciphering Brian's letter while my specs are under repair.

Dawlish next, and **Dennis Miller** who notes that 21MHz opened up in mid October and helped things along a little. Top Band first, with SP9KRT, TK1A and 3V8BB; on Eighty we see C31SD, CO3JA, D44BC, HC1JOL, SV9ABQ, UA9FQY/Portable 9, W9ARV, 3A/G4MWT, and 7X2LS. On 7MHz the catch included HB0/DL1DRW, LU1CZD, OY3JE, TR8CA, ZL1AXQ, ZP6GCA, and 9K2/SQ5DAK; while 14MHz stumped up with D25L, JT1FBT, JY8XY, T88T(was KC6), V26B, VP2E, XU1U, ZD7CTO, ZD7DP, ZD7HI, and 4J3M. Up to 18MHz and RK9CZA, before cropping 21MHz to the tune of A47JTA, FH5CB, J28JY, LW5DRL, OD5DR, PY0FM (Fernando do Noronha), SO1M, V26B, VQ9IE, VS6WO, YB1AQS, ZD7HI, ZD8Z, ZS6WRS, ZS8IR(Marion Is), 3DA0DX, 4K8DYL, 4L4KL, 5B4AFS, 5H3DS, 5R8EE, 5Z4BS, 6W6JI, 7P8/OE2VEL, 8P9Z, 9G4YR and 9Y4H. Finally at 28MHz EA9IB was booked in plus the usual crop of Europeans from ES to IK. All of course were sideband signals.

John Charles of Louth has recently come back to short wave listening after a long span of years, and now has a Radio Shack DX-394 which is hooked to a balun and some twenty metres of wire strung up N-S at about 4.5m. There is also an a.t.u. available, and an MFJ 784B Digital Signal Processor. On 7MHz John noted 9A3TF, while on 14MHz he noted US1EI in the contest, LY3BA, 4N7DW working K4UFE KC5HRP KC5WHR, MW0AGE working into the Brazilian Net, W2ABM working N6ZO/MM, GB800SM in Stratford-on-Avon, VE3CID, VK3CR, W1LH, VE3OKF, LU7HYK,OEM1KYW commemorating 1000 years of Austria, 9A800S commemorating the name of some city or other and working various W and Eu stations, WD4HRM, K4LSV, TA5C, W1FMA, JA7AKH, Z31ET, W2ONY, VA1BX, VP2E, 4V2A, P49I, VA2MG, P40E, EP5T, PJ9E, VE7RCN/MM on the cruise ship *Splendour of the Seas* in the Adriatic and VP2VF. 18MHz produced paydirt in the form of BV7GA, CN8NM, CU7BA, N8SMB, AE4FJ, 7X5JF, W0ONK, A4LZ, 9H1DE, IT9SVJ, 9K2NG, 9H1AL, AP2JZB, 4Z5GI, KP4IX, and CG1YX. As for 21MHz it gave N8II, ZP5BIB, TA2LZ, 7P8/OE2ELV, ZX5J, P40E, V59T, J3A, K6KKK, plus of course the smaller fry on each band. All, by the way, sideband signals.

In Barnsley we find the home of **Colin Dean**, who looked at Top Band to find EA8ZS, HB0/HB9AON, IG9/IV3TAN, LX1NO, and OH0M. A move to 3.5MHz saw JA5AUC, PJ9E, VP5DX, VK5PO, 4L2M, and 9K2MU. At 7MHz Colin spotted IG9/IT9GSF, J3A, V26B, ZD8Z, ZS6EZ, ZX0F, 3V8BB, and 9Y4VU. 14MHz sheltered A61AM, A61AN, A71FF, A92GD, DU1SAN, D25L, FR5ZQ/T, HS1RU, KG4AN, KL7RO, OI0RJ, P49I, SU1ER, SU1SA, SU1SK, TR8IG, TZ6LL, VP2E, VQ9WM, YB2CPO, YI96BIF, ZD7SM, Z22JE, 3V8BB, 4F4IX(=DU), 4L1UN, 4S7AB, 4S7AW, 5A1A, 5R8EE, DK3LQ/6W1, 9G1YR, 9K2/YO9HP, 9M6BZ, and 9V1ZJ, which left 21MHz to account for CE3/K4ERO, V26B, V44KP, 5N36T, and 9K2HN.

A new computer has been occupying the time of **Andy Bright** of Watford. But he comments with pleasure that the new machine produces little or no hash on the h.f. bands. On the bands Andy has an Icom R71A, which he feeds from a random length wire about ten metres up, or from a 21MHz dipole. On 3.5MHz there were YB1AQS, FR5DX, VK3DZM, CE8EIO, JA6BJT, VK5APZ, JA3MHV, JH1HGC, 8R1Z, J80F, and TG9AOP. At 7MHz VY2RU, 5X1T, ZL1AIZ, VK7GK, V85HG, and ZS8IR, with a twist up to 14MHz for FR5DX again, EK8WB, YB5NOF/8, D2EV, EZ8BD, 4U5VIC, V63AO, KH0CE, JT1FTB, JA4KFA, ZF2WI/M. On 18MHz the score was EK8WB, 5Z4LL, TI5KD, V51CM, 5N0MVE, D52L, V51BG, and on 21MHz YC5VK, VU2PASI, YB1XUR, HS0/G4UAV, JY5IN, ZS6BSF, VO1NC, 5R8EE, ZP5XF, 9G1YR, TA8TAH, and 3B8GD were all noted. Some of these were heard during some 70 hours carp-fishing; the lakeside receiver was a Sony SW100 plus 15m of wire slung over a tree. No wonder Andy didn't get a single bite, though he did get through lots of batteries!

Changing Tack

Mike appeals for us to re-start the HPX Ladder of hallowed memory. The idea was to collect amateur call prefixes, one of each. A minimum of 200 required for a first entry - a reasonable weekend task. Top scores rose quite high, above 2000. Sure we'll run it given there is enough support from the readers, which means ten or more entries if the table is to look something like. Over to all you out there!

Newcastle, Staffs is the home of **Ted Hearn** who has come back to the hobby after a gap of several years with a new receiver - a DX-394 - and a wire from the house to the end of the garden, around 13m. As far as *Short Wave Magazine* goes, Ted is a new reader though - welcome aboard! Eighty first, where Ted logged A92FZ, TI4CS, OY6KM, OH2WI, HB9KNA, and OZ8KR. At 7MHz there were AP2TM, BY3VAM/2, DU2XOX, 9K2RA, TT8AM, ZL1AHZ, ZL2AX, VK4AML, PY2KO, LU2KCD, and LX1EP, while the 14MHz offered 9H4VSG, 7X2LS, ZD7DP, TL8/F5LJK, 9K2MR, ZP5XF, PT7BI, AA1KS, 7X5JF, 9K2MU, V51BO, 5Z4RL, ZP5ALI, JY5IN, PQ8MM, VU2DK, JA6IP, C31SD, 3V8BB, VE7IM, OA4AOH, OD5OZ, OD5PN, WH2UH, VK4COK, 9A4GM, IT9CM and T91EAM. Finally to 21MHz for 5Z4RL, LY1DI, and YB1XUR.

During the contest, **Karl Drage** in Woodford, Northants, was testing out a new logging program and seemingly it bit back! However, even allowing for Karl's own pruning, I've had, alas to axe much more good stuff. Take 3.5MHz sideband, with 3D2RW, 5N3HDM, 7X2BK, 9K2MU, A45ZN, A61AN, AB6ZV, CN8BV, CY0XX, HC1JQ, HL1JV, J80F, JX7DFA, K5NU, K7YTL(Arizona), OH0MAM, P49I, RA0CG, SV2ASP/A, TA2DS, TI4CF, TL8FL, V44KBC, V51CM, an assortment of VKs, X5ACL, XX9X, YK1AO, ZD8s, an assortment of ZLs, ZP5KW. On 7MHz c.w. JAs, and W1AW, with sideband from 4S7SW, 5A1A, 5X1D, 6W1/DK3LQ, 9G1YR, 9K2QQ, A41LZ, A61AN, A71BY, A92FZ, AP2SAR, C31CA, CE8KR, CM8DC, CO8HF, CX3CE, CX8BR, DU9RG, FM5FJ, HB0/DF1JB, HLs, HS1NGR, IL3/IK2JYP/P on Bocasette Is, J38AI, JAs, LUs, PYs, SU1GS, SU1SK, TAs, TI4CF, TRs, TTs, lots of ex-Iron Curtain stations, V47KP, VEs, VKs, VU2PAI, Ws assorted, YBs, YCs, YK1AO, YV5AMC, ZLs, ZSPs, and ZSs. What about Top Band? IG9/IV3TAN was on Lampedusa, SV8CS, UN9IF, ED9EA, T77C, C31LD, HB0/HB9AON, EI5DR, GI3OQR, OY6A, and IS0QDV all on sideband.

Now we turn to **Ted Trowell** in Minster, Isle of Sheppey, who comments that spiders have made webs in his magnetic loop - okay until it rains and then the tuning alters! On Top Band c.w. Ted noted W2JB and UA9FMZ, with PJ8DX on 3.5MHz. For 7MHz the tally of scalps included ZL4DU, JR4PMX/6Y5, LU7KCH, PY7WX, ZL4AU, CO2VG, FM/PA3BBP, ZF8BS, 7X2CR, JA7AGO, OX3EO. 10MHz came next, and EA8BYL, 9H3WM, and VO1HP. Up yet again and 14MHz gave up JY8XY, OD5PL, YV5AAX, YI1ZN, EG9NCE, AA4NC/CY0, VQ9KB, VK7CW, VU2AVG, VQ9IE, E2CJN, VE7EAJ, J28CI, HR2JEP, and JX7DFA. 18MHz produced CN2GA, 5Z4BZ, 9M2TO, 7Q7EH, and 7Z5OO. Ted's final fling was on 21MHz where he connected with ZD8DZ, PU2MHB, 6W6JX, ZS6BE, VU2PAI, LU6BEG, and LU6UO. Everything of course c.w.

QSLs

Ted Trowell mentions VQ9IE to WY8Q; OD5PL to HB9CRV; YI1ZN to PO Box 55072 Baghdad; CN2GA to DL2GGA and EG9NCE to EA8PY.

Finale

The increased number of letters is very heartening....please keep it up!

Finally, to everyone who reads or contributes to this piece, my greetings: a Merry Christmas and a Happy New Year.

That's your lot for now. Letters as usual please by the beginning of the month addresed to me at PO Box 4, Newtown, Powys SY16 1ZZ.

Graham Tanner, 64 Attlee Road, Hayes, Middlesex UB4 9JE. Internet: gmt@delphi.com

SSB Utility Listening

BT Challenge

By the time that you read these words, the second leg of the BT Challenge yacht race will be nearing completion. The second leg started from Rio de Janeiro in Brazil on November 20th. The yachts are racing around Cape Horn at the southern tip of South America, across the South Pacific (the Roaring Forties), to Wellington in New Zealand. This particular leg is about 7000 nautical miles, and the competitors are expected to arrive in Wellington sometime between December 30th and January 4th. The yachts travelled so quickly to Rio that the organisers have added an extra way-point about three-quarters of the way to New Zealand - this is so that the yachts will not arrive too early in Wellington.

Communications on this leg will still be attempted via Portishead, but the yachts will also be in range of Sydney Radio in Australia after they pass Cape Horn. Portishead expect that there will be suitable openings on the 18MHz band around 10.00UTC or the 16MHz band around 16.00UTC, on the following frequencies:
channel, callsign, shore/ship
1602 GKT62 17.245/16.363
1801 GKT18 19.755/18.780
1803 GKU18 19.761/18.786
If these are not successful, the following Sydney Radio frequencies will be used:

Channel	Callsign	Shore/ship
1203	VIS	13.083/12.236
1231		13.167/12.320
1602	VIS	17.245/16.363
1612		17.275/16.393
2203	VIS	22.702/22.006

Also, here is a reminder of the yacht names, with a complete callsign list. Some yachts tended to use their callsigns rather than names during the first leg.

MWSC2 Commercial Union Assurance, MPNX4 Concert, MWSI2 Courtaulds International, MPNU4 Global Teamwork, MPUW3 Group 4 (Leg 1 leader), MWSG2 Heath Insured 2, MWSE2 Motorola, MPUQ3 Nuclear Electric, MPNW4 Ocean Rover, MPXL3 Pause to Remember, MPWB2 Save the Children, MWSF2 Time and Tide, MPXJ3 Toshiba Wave Warrior, MPNV4 3 Com.

Klingenfuss

By the time that you read these words, the 1997 editions of the Klingenfuss guides will be available. Early December sees the publication of three new products - *1997 Shortwave Frequency Guide*; - *1997 Super Frequency List* on CD-ROM; and - *1997 Guide to Utility Radio Stations*.

The new *1997 Shortwave Frequency Guide* is the printed version of the popular *Klingenfuss Super Frequency List* on CD-ROM, including all world-wide clandestine, domestic and international broadcast schedules. The publicity announcement says that this is the very first international publication that combines both world-wide shortwave broadcast and utility radio stations in a single book.

The *1997 Super Frequency List* on CD-ROM is also available, for those of you with the right equipment attached to your computers. Some people might argue that having the information electronically is a waste as it is all available in the book, but with the power of a computer you can perform some impressive searches of the information.

Finally, the *1997 Guide to Utility Radio Stations* (15th edition). This book is the international standard reference book for utility listeners and short wave listeners alike, although is does contain a lot more information on the various data modes than s.s.b. signals.

For detailed descriptions and some sample pages and colour screenshots please refer to **http://ourworld.compuserve.com/homepages/Klingenfuss/**

Letters

Mr Williams writes from North Wales asking about ways to improve his reception of North Atlantic aeronautical traffic. His letter explains that he has a G5RV antenna strung around the inside of his loft, which is fed directly into his Yupiteru MVT-7200 scanner.

Mr Williams (who didn't mention his first name!) says that when he listens to Shanwick on 4 and 6MHz he experiences a lot of background noise, and the controller often sounds like Donald Duck. When he tunes down slightly in frequency, the voice sounds the same and he can never get it just right.

Well, you have just found one of the principal problems with using a scanner for listening to h.f. s.s.b. signals. Many scanners these days seem to offer h.f. reception, but their tuning step-sizes make it difficult to resolve an s.s.b. signal into good audio. What you need is a b.f.o. - a beat frequency oscillator - but these are very rare on scanners - though the MVT-7200 does have one, with switched u.s.b. and l.s.b. modes provided. It seems to be an unwritten law that whatever step-size you choose, you can never get the sound of your chosen s.s.b. signal to be just right. A b.f.o is a control which is completely variable, and does not rely on a step-size for its operation. As ever, the best piece of equipment for listening to h.f. signals is always a proper h.f. receiver, not a scanner.

Mr Williams asks if an a.t.u. (antenna tuning unit) would make a difference to his reception and the quality of the audio. Unfortunately, in this instance, the answer is no. It would go a long way to reducing the background noise when used properly, but noise is something that you will never be completely free from. An a.t.u. would certainly not stop the Shanwick controllers from sounding like Donald Duck either - it could make them sound louder, but they would still be Donald Duck!

Christmas Listening

Well its that time of year again. I hope that you have all got your orders in for that new receiver or station accessory, and are ready for some listening over the holiday period.

For those of you who want a challenge of Christmas Day itself, you may care to listen for the transmission of the results of the CCF (Combined Cadet Force) Winter Wine competition. This will be broadcast of the CCF frequency of 5.328MHz at 12.00UTC. The competition itself takes place at the start of December, and lasts a full 24 hours over a weekend. CCF stations are quite rare, so any opportunity to hear them should not be missed.

For those of you who like to chase special flights on h.f., then once again QANTAS is off to the Antarctic over the holiday period. Flights will commence on the 1st of December and go through to the 16th of February 1997. As of yet I do not have any flight numbers, but here is what I do have: Flight-1, Sunday 1st Dec. 96 From Melbourne Dep. 0830 Return 2000; Flight 2, Tuesday 31st Dec. 96 From Melbourne Dep. 1700 Return 0430 (this is the **New Year** over the ice flight); Flight-3, Sunday 5th Jan 97 From Sydney Dep. 0740 Return 2010; Flight-4, Sunday 12th Jan 97 From Melbourne Dep 0830 Return 2000; Flight-5, Sunday 19th Jan 97 From Perth Dep 0930 Return 2130; Flight-6, Sunday 26th Jan 97 From Melbourne Dep 2030 Return 2000; Flight-7, Sunday 9th Feb 97 From Sydney Dep 7.40am Return 2010; Flight-8, Sunday 16th Feb 96 From Melbourne Dep 0830 Return 2000.

These are all Australian time, so subtract 12 hours to get UTC. There are also flights on December 29th and February 2nd, but I don't know the flight details for these.

All that remains is for me to wish you a good Christmas, and don't eat too many mince pies!

John Griffiths, c/o 22 Ffordd Beibio, Holyhead, Gwynedd, North Wales LL65 2EH.

Scanning

I trust that you've had a good Christmas and that those exclusive presents bought are now up and running? One that came too late for me to have - hi!, as if...is a new base scanner, the Radio Shack PRO-2042. That's a bit later on in, however, I'm certain that you must be a little jaded by scanners by this time!

Anyway, as promised, it's time to begin looking at the hobby and, as I promised, I said I'd start with antennas which, without doubt, make up a lot of my mail bag! Given that it is a technical subject in itself, antennas need not be complex as - with just a bit of knowledge - you can rig up a well sorted system without needing a B.Sc. in Applied Wire and Insulators (Oxon)!

It really need not be frightening and with that in mind I'm going to keep the intro. to the subject simple as I can. There are many books available for the more technical minded on the matter. However, I'm presuming that those of you who need an introduction are novice 'scannerists' or absolute beginners. I apologise if you're not, but remember, we all need to start somewhere.

Firstly, What Sort?

A good premise to adopt with antennas is this 'if they broadcast with it then you can use it for reception'.

What I am saying goes something like this. Ships use vertically polarised antennas - so should you, if this is where your interest lies - go the same way. Same with other services whether they use either verticals or horizontals - so should you. Easy, isn't it?

No, it isn't! In an ideal world we'd be able to follow that, but in practice we have to adopt a compromise in order to get good reception. That's where discones come in. The discone looks like a sweep's brush, know the sort? A bit of a jack-of-all-trades it does an admirable job, but not as well as a dedicated, and by that I mean a tuned antenna. Remember that, and, the word 'broadband'. Keep them very firmly in mind as we progress through this introduction.

So, most antenna systems are a compromise as they have a massive portion of the band to cover Broadband means just that - they cover a broad band. Typical claims made by manufacturers of such antennas are in the region of 150kHz to 1.3GHz, which, when you think about it, is quite a staggering range. Especially when the professionals would have anything up to ten different types In that lot for each specific frequency range!

Narrowband can be found in marine and airband and are generally cut for that frequency portion with a 'tail-off' above and below the intended operating band. A good example is the Air 33 by Haydon Communications which I have used for many years and which has good marine band performance despite being a dedicated airband antenna.

Compare that with my Scanmaster Base, which was very definitely broadband and which offered a poorer performance on airband that was essentially a compromise when placed against the dedicated Air 33.

So, what am I saying? In effect, that you must choose carefully.

If you are a dedicated airbander, don't waste money going for a vertical or a discone offering 150kHz to 2.0GHz coverage when you can get a vertical cut exclusively for civil and military band only. Likewise, if you generally scan through the lot of frequencies on your scanner, don't buy an Air 33 and hope it will do on short wave. It will not! Horses for courses, people, and read the small print also and very important, know what you want! Most serious scanner owners have at least two antennas available at their QTHs. One for general use and others for their specific areas of interest.

Then we go into the technical areas and start talking about things like log periodics, multi-band verticals, etc. What are they? Just know that this type is expert country and pretty specific, coverage wise. In the case of the log periodic, because it's directional, it is usually mounted with a rotator and can then cover the whole horizon around the QTH. Technical stuff - and the price of another scanner - it is the realms of fantasy for most of us on limited budgets!

Choices Choices

So, what choices do you have? Garex offer the Radac, which is a nest of dipoles and that's had good press over the years. I believe that it's well worth the outlay.

Verticals vary, but look for ones which cover a good spread and are of high quality construction. I've seen verticals offered for sale which are no more than glass fibre down pipes or plastics plumbing pipes stuffed with wire and sold as antennas. I kid you not! Go for established suppliers, with well known names and offering guarantees. I will not recommend any particular make but would add that specific antennas in the areas of marine and airbands do exist and would suggest that if these are your areas of interest, then don't bother with a multi-band broadband one but go for a specific antenna.

Right! After that, what improvements can you make? What can I tell you except that I don't use things like filters and pre-amps! I mount my antennas high and clear and always use good quality fittings and coaxial cable as recommended by the manufacturers. Yes, things do exist to enhance the hobby and filters get used when interference is heavy.

I would strongly suggest that more serious info. can be had from the books available from the Book Store in this magazine. There are excellent titles and fair prices and a wealth of information to hand. Again, I'm reluctant to mention any one particular book, but those by the late Peter Rouse are almost bible status - be advised!

Next month I'll look at mounting antennas, a subject, not to be taken lightly and rightly so given the potential dangers involved in access to idea mounting sites. However, I will look at basic securing and leave the technicalities to those better qualified than me! However, the number of antennas I've seen which are not supported properly is mid boggling - why pay all that money out and then live with a grotty mount? First serious wind and, £40 or so down the drain, plus, if you're unlucky, an insurance bill for all sort of resulting damage to property, cars, etc!

I'll also touch on antennas for flat dwellers who are largely forgotten and suffer great hassles - like I do currently, but that's another story!

Column News

Right, into the letters! Thanks to all those who write in regularly, you know who you are. I welcome letters on a wide variety of subjects and, when I can, I write personal replies. It's not always possible, of course, but I do try.

Most answers can be made through the column, so there's no excuse in not writing, or in writing along the lines of a certain gentleman who tells me that we invent the letters. Very nice, ask the nurse to pull the straps tighter after medication, will you?

Ducting

First letter from **KL** of Newby. K tells me that he copies Paris VOLMET on 126.0 as a strong signal but with fading. This is as a result of ducting conditions, and as K says, is usually noticeable when co-channel interference is spotted on the TV. The beauty of v.h.f. ducting is that, when high pressure fronts collapse you can, if you're lucky, get some surprising things through over the air. It's not an exact science and you can, by looking for the tell-tale signs, get well into this. Next time the TV goes ghostly with interference, try the scanner out in

the shack and plot the bands slowly, using a frequency guide to be absolutely sure. You may be quite pleased by what you pick-up.

Another letter from **CCH** of West Glamorgan fills me in on a number of previously unknown frequencies, 168.875 being a DSS simplex. These are liable to be low powered but worthwhile having a listen to if this sort of stuff is your thing.

Other frequencies heard in the W. Glam. area are as follows. As always, it may be worthwhile listening in on these nationwide for evidence of other use: 74.0125/74.450/74.5875/74.6125 - British Army, mostly weekend and in n.f.m. Almost certainly TAVR Units, 164.4375/170.2375 - n.f.m. Brecon Beacons Merthyr Mountain Rescue Team, tones at 114.8 via repeater and c/s ROMEO and 166.3375 - Mountain Rescue Brecon Ambulance Division.

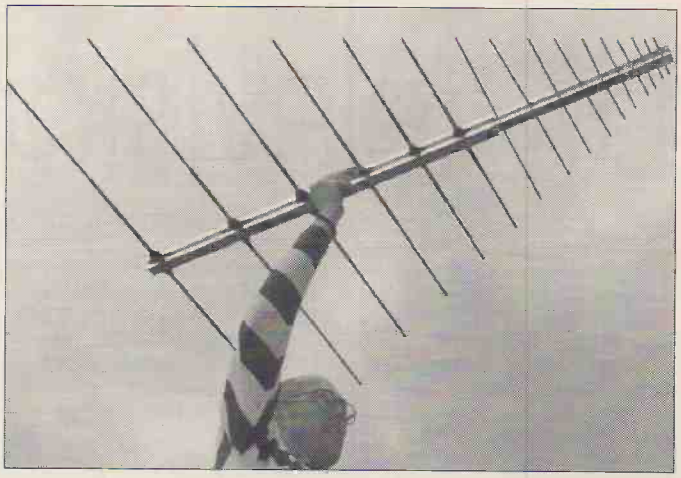
A letter from **P** of Yorks. fills me in on Datatrack - and I'll reproduce that here as two letters from **G. Hall** of Romsey and **DR** of Daventry ask if I have details on this system. It's a radio location system and uses 14 low power, v.h.f. transmitters which provide a location fix - similar to GPS - to some 120 base stations and who receive data from the vehicles. These beacons operate on 133.477 and 146.705MHz and u.h.f. beacons on 462MHz, or thereabouts.

Have Quick

Also, a reader from Southampton asks me whether I know anything about the USAF 'Have Quick' frequencies. Yes I do - but please bear in mind that airband issues should now be routed via Godfrey Manning (Civil) and Peter Bond for Military topics!

Have Quick, very simply, is a frequency hopping system developed for the USAF by Magnavox. It is also used by NATO and is known as FMT-1 and FMT-11. All frequencies are used, with specifics being as follows: FMT-11 - 232.35, 240.4, 246.95, 283.85, 291.25, 306.5, 310.9, 316.55, 328.4, 338.95, 359.35, 372.45, 380.65, 385.15 and 399.45.

FMT-1 is used by the RAF and the 52FW of the USAF with FMT-11 used by 48FW, BAF, RNAF and GAF. Now for the bad news - the frequency hop rate can be chosen from 2, 4 and 8 times per second - are we getting the picture? To catch a complete conversation on FMT-11 as given above, you'd need 15 scanners, one for each channel. Easy, you say. Really? During war or emergency periods,



there's 800 channels allocated!

So, my dear Southampton reader, yes I do know about it and yes I do have some frequencies.....but do you have the scanners for it?!

Right, I'd like to take this opportunity to thanks all those who have supported the column in '96 and have pledged their support for '97. You are a most valuable bunch of folk and I appreciate what you do. If anyone else wants to contribute, please feel free. Anything on scanning does the biz - but airband to the relevant columnist, please!

But, you could go for the ultimate!

Next month we'll continue our brief taster of antenna matters and mountings for all, with an onus on the dilemma of the flat dweller. Until then, good listening and be aware!

Keith Hamer & Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.

DX Television

October was a spectacular month for long-distance TV reception with at least 13 days on which Sporadic-E openings occurred. As a bonus, settled weather conditions formed during the third week of the month creating an intense tropospheric opening with signals from Central Europe and Scandinavia.

Sporadic-E Reports

Peter Barber (Coventry) submitted an excellent Sporadic-E log as usual with details of a sustained opening on the 20th with activity monitored between 0953 and 1330UTC. Initially, Italian RAI UNO signals were encountered on Channels IA and IB but by 1114UTC Croatia on Channel E4 had been identified by its 'HRT' logo. Spanish TVE-1 transmissions appeared during the early afternoon.

An intense opening from Central Europe and the south-east was evident on the 29th between 1123 and 1329UTC. Countries logged included Italy (RAI UNO IA and 'VIDEO', the private station just below channel E2), Serbia (PTCb1 E3), the Czech Republic (NOVA TV R1), Ukraine.(YT-2 R1) and Rumania (TVR-2 R2). The latter was also received on the 14th accompanied by Portuguese and Spanish transmissions.

Tropospheric Reports

Conditions on the 22nd, 23rd and 24th produced excellent-quality colour pictures from many Continental transmitters. Some of these transmissions disrupted BBC and ITV u.h.f. broadcasts throughout many areas of the United Kingdom; even the weather forecasts warned viewers of interference to pictures. Central TV broadcasts on Channel E43 from Sutton Coldfield were wiped off the screen at one point by BRTN-1 programmes from Egem in Belgium. Tuning through Band III revealed many Belgian, Dutch, German and French transmissions. **Chris Howles** (Erdington) commented that the u.h.f. band was filled with Dutch and Belgian signals.

John Woodcock (Basingstoke) comments that the whole of the south of England was suffering from severe co-channel interference on the BBC and ITV broadcasts during the evening of the 22nd. At 2130UTC, John checked Band III and discovered French Canal Plus signals from the Lille transmitter on Channel L5.

Steve Aungier (Dagenham) discovered signals from the Belgian RTBF-1 service on Channel E3 (Liège) on the 22nd. Peter Barber (Coventry) also noted this one, and RTBF-1 from Wavre on Channel E8. Dutch NED-1 programmes were also present on Channel E4 from Lopik. RTBF-1 was also present the following day, accompanied by BRTN-1 (Belgium) from the Channel E10 outlet at Wavre. NED-1 on Channel E4 was again identified by the PM5544 test card at closedown at 2205UTC. RTL broadcasts from Luxembourg on Channel E7 (Dudelange) were also identified.

On the following day, various French Canal Plus outlets were logged; these included Lille on channel L5, Cherbourg L6, Rouen L7 and Brest L10. ARD-1 programmes from the Channel E8 NDR-1 outlet at Hannover in northern Germany were also present.

Alan Taylor (Sheffield) reports several Dutch transmissions on the 22nd and 23rd, the strongest being NED-2 and NED-3 from Lopik on Channels E27 and E30 respectvely. A weak Channel E34 signal had Alan baffled - it seemed to have an Arabic logo. Unfortunately, the reception was less exotic than hoped for. As the signal improved the logo turned out to be the stylised logo of the German MDR network. The transmitter is located at Brocken in central Germany.

Andrew Burfield (Braintree) saw Swiss signals from the La Dôle transmitter on channel E34 which is located in the Lake Geneva area of Switzerland. The station was identified by the white diamond-shaped logo with 'TSI' below, representing the Italian-language service. An on-screen promotion was shown with the letters SF-DRS in the corner. This was an advert for a programme to be shown on the German-language network. Dozens of French, Belgian and German u.h.f. stations were logged during the event which lasted three days. Even the Danish TV-2 transmitter at Odense was received on Channel E22.

A mystery signal on Channel E36 is causing identification problems. The logo resembles a small semi-circle supported by two short stumps. Andrew has noticed this during many openings and thinks it could be a local TV service in Brussels.

Andrew advises that Meridian TV and LWT TV have changed their main identification graphics recently. Channel 4 have also changed theirs at a cost of around £500000. Has anyone noticed the similarity between this and the proposed Channel 5 logo?

Pertti Salonen (Finland) noted tropospheric activity on October 18th with reception of an ORT broadcast from St. Petersberg on Channel R1. Apparently the ORT teletext service known as TELEINF has several pages in English! Pertti has sent information regarding TV in Azerbaidzhan where a new radio and TV station has opened in Baku. It is currently radiating AzTV on Channel R1, Russian TV on R7 and ORT on R12. Channel R22 is still vacant. AzTV-2 and two Turkish channels, TRT-TV1 and GRT, are still broadcast from the old Baku TV tower.

Meteor-Scatter DX

Roger Bunney (Romsey) has submitted the meteor-shower dates for 1997 as supplied by Neil Bone, the director of the Meteor Section of the British Astronomical Association.

Meteor-scatter (or meteor-shower reception) is caused by debris from meteorites burning up on entering the earth's atmosphere. An ionised trail is

SSTV picture received by George Newport (Canterbury), transmitted by a Spanish amateur station.

A Russian clock caption from the Vladivostok Channel R1 transmitter, received in Japan by Hukunaga Mituhiro.

Identification caption as broadcast by 'TSS' in Japan.

Russian RK3AX callsign received by Keith Artherton (Norfolk) on 14.230MHz.

left which can reflect TV and f.m. signals back to earth over distances of several hundred miles. Sadly, signals last only a second or so, which means the DXer needs extremely fast visual reflexes to identify the signal. In the past, many countries could readily be identified if a test card was being shown but with the current trend of round-the-clock programming, identification can

One from the archives! The special BBC-2 Identification Symbol used during Christmas 1980 featured a large revolving glass snowflake.

be difficult, despite most services displaying an on-screen logo.

There are certain days during the year when activity peaks and signals are readily propagated with repeated bursts of reception. The most productive showers are the Quadrantids (peaking at 1000UTC on January 3rd), the Perseids (peaking on August 12th) and the Geminids (peaking December 13th at 2200UTC). On these dates repeated bursts of signal can produce an effect not unlike messy Sporadic-E reception when several stations are fighting for the same channel. Although Band I channels are more productive, Band III reception should not be discounted. Over the years Russia, Italy, Finland, Austria, Czechoslovakia, Poland, Iceland, Sweden, Norway and Denmark have all been identified on various Band III channels.

Some years seem better than others. One theory is that peak meteor-shower activity occurs outside Europe, during the seemingly less active years. Many DXers find that reception from Scandinavian transmitters tends to be more prevalent than from those in Central Europe.

Slow-Scan T V (SSTV)

SSTV differs from conventional fast-scan TV transmissions in the sense that signals are transmitted within a bandwidth of only a few kHz, instead of several MHz. This means that to recreate a recognisable image, the data required to produce a picture has to be sent at a much slower rate thus ruling out images with normal movement. The received data is processed and formed

The WDR TV tower at Langenberg in Germany photographed by Nick Brown (Rugby). Channel E9 signals from this site are regularly received in the UK.

into an image. The amateur bands are used to transmit slow-scan TV pictures.

Two SSTV enthusiasts, **George Newport** (Kent) and **Keith Artherton** (Norfolk) have sent in pictures of their reception achievements at 14.23 and 144.50MHz (see **Figs 3** and **4**). Keith uses a long-wire or discone antenna feeding a Lowe HF-125 receiver. A 486 DX2-66 plus an 8MHz PC with DL4SAW SSTV programme processes the signals which can be stored and pictures later created using a Hewlett Packard 550c printer.

Keep On Writing!

Please send DXTV reception reports, equipment news, off-screen photographs and general information to arrive by the 3rd of the month to:- Garry Smith, 17 Collingham Gardens, Derby DE22 4FS, England.

WIN

a £200 Roberts Radio R861

FIRST OF A *SWM* TWO PART COMPETITION.

So you read Simon Spanswick's review last month* - at least we hope you did. Now, owing to Roberts radio's generosity, you can win your very own Roberts R861 world-band portable. This delightful portable which covers 150kHz to 29.99MHz and 87.7 to 108MHz band II stereo (with headphones) including RDS makes an ideal travel companion.

To enter simply answer the question below this month. Fill in the answer to this month's question on the answer form that we will provide next month with part two of the competition, affix the corner flash from the bottom of this page, answer the second question and send off the completed entry form to the address on the form.

The lucky winner will be drawn from the Editorial hat containing the correct entries.

Question 1: How many AA cells are required to power the R861?

* If you missed the December 1996 issue of *Short Wave Magazine* containing the R861 review don't worry, back issues are available at £2.60 including P&P from the address on page 87. You can also obtain back issues via 'phone on (01202) 659930 by using your credit card.

LOOK OUT FOR NEXT MONTH'S QUESTION

R861 QUESTION 1

Godfrey Manning G4GLM, c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS

Airband

It's that time of year again! This time my Christmas Quiz requires written answers to three questions. I will judge the entries according to accuracy, completeness and clarity (and the final decision rests with me, no correspondence will be entered into).

The prize will be a book or book voucher courtesy of PW Publishing. Entries to arrive no later than the February 17 deadline and results will appear in the April issue. In the event of a tie, random selection will be invoked. If no-one answers all three questions, then any two will be accepted (and so-on if all entrants only manage one question).

Question 1: You are given QNE prior to landing at an aerodrome. Why is this necessary, and what altimeter barometric setting applies? What will the altimeter read when touching down on the runway?

Question 2: You are given QFF when approaching a different aerodrome. What is it and why is it needed? What will the altimeter read when touching down on the runway?

Question 3: A v.h.f. VOLMET broadcast is actually relayed on the same nominal frequency from two transmitters. If you had a really accurate receiver, what actual frequency would each of the two relays be on when compared to the nominal frequency quoted in the *Supplement*?

Flight Ops Dept.

Unfortunately, I couldn't do anything with the disc from **Ken Robinson** (Potters Bar) as I don't have a suitable computer. Ken's aeronautical radio experience goes back to 1950s Fleet Air Arm days, working on Ashbomb 1GHz radar fitted to the Fairey Firefly. I once had a craft of the same name - a sailing dinghy built by Fairey Marine, the construction technique owing something to the company's aviation background.

Ken asks about air traffic control. Radar controllers do alternate with breaks to prevent lapses of concentration, but would usually work for more than 15 minutes at a time. Taking over from each other requires enough time to study the screen and become familiar with the current traffic pattern.

Not all navigation is by radar heading. A controller might tell a pilot to tune in a navigation beacon and then head towards it. Although watching on radar, the controller doesn't tell the pilot the compass heading to steer. Instead, the pilot guides the aircraft by reference to the beacon as indicated on the cockpit's flight instruments.

Example: "Own navigation to Koksy." This means flying towards the KOK (114.5MHz) v.o.r. beacon on the Belgian coast, half-way between Ostend and Calais. It includes a TACAN, so the aircraft's d.m.e. will tell the pilot how far away the beacon is. The v.o.r. part of the beacon, on the other hand, gives directional information. Interestingly, close by is the Koksijde military aerodrome (in Flemish, 'ij' is pronounced like, and even written to look like, 'y').

In common with all radio listeners, Ken, I do hope you plug in an earpiece when out in public so as to avoid disturbing others. I'm sure that all readers understand exactly why this is necessary.

Stampe. *Christine Mlynek.*

Fouga Magister. *Christine Mlynek.*

Have we a new airline? Who owns the callsign "Sovereign" and operates out of Leeds/Bradford? Please tell me for the benefit of **Lee Collins** (Leeds).

Carl Hender (Ipswich) is familiar with the Bulldogs of the University Air Squadron at Cambridge. With the callsign UAG, they often fly out to Wattisham and back. Carl believes Wattisham to have 125.8 as an alternative to 124.925MHz, but so far I've had no official notification of this.

Likewise, I can't find the allocation of 249.6MHz, Carl. If one controller is working both the civil v.h.f. and military u.h.f. allocations for a sector (by 'band-boxing') then calls on one frequency will be relayed on the other. This does NOT mean that civil traffic will start overflowing onto u.h.f. once all v.h.f. channels are occupied. Hardly any civil aircraft are suitably equipped.

The solution will be to interleave two extra channels, 8.33kHz apart, between each existing (25kHz) v.h.f. frequency. As this is such a strong possibility, anyone buying new equipment must ensure that the interleaved channels will be accessible. The airlines have been told this - but complained of the cost.

Are You Insured?

Going back to November, I pleaded with every reader who also drives to make sure that they are insured when visiting aerodromes - even for public displays. I've found out the following. Axa: will NOT provide cover (but I didn't ask if the policy arranged through Saga is different as I'm not yet old enough to qualify); General Accident: really strict, NO cover of any sort; Prudential: should be covered if you have permission to drive there; finally, Royal: acceptable if you drive on routes designated by the airport authority.

This is a guide, you MUST check the actual conditions that apply in your own particular case. You might share my feeling that insurance is boring, but it's also essential. So, end of subject unless anyone has something really important to add.

Follow-Ups and Foul-Ups

Martin Sykala (Irchester) wrote in to the 'Letters' page in November (page 11). I do hope you read my column, Martin. Anyway, TEMPO means TEMPOrary or, more precisely, a short-term change in a weather forecast. The time, in hours UTC (or z, same thing) follows. So TEMPO 2309 means a change expected between 2300 tonight and 0900 the next morning. If the weather will be clear, apart from a cold front with thunderstorms passing through in the night, then this would indicate the time of the variation in weather pattern, ie. when the storms were expected to disrupt the forecast good conditions.

In October, RAF Coltishall's rescue helicopters were mentioned but Carl finds that Rescue 125-127 have moved to Wattisham (Army).

Sorry I wasn't precise when describing OMIMI under Frequency and Operational News - Reporting Points in November. It's NOT on a supersonic route. However, Abeam OMIMI is on a nearby supersonic route and you'll find it on my supersonic chart that's part of *Airband Factsheet*.

Information Sources

And how do you get that, you ask? Send a reply-paid, self-addressed envelope to hold two A4 sheets to the Broadstone Editorial Offices (**not** to me!) and request *Airband Factsheet*. No charge. The document also lists the sources of other basic information such as *En Route Supplements*, both civil and RAF.

I've been sent *Over the Pond* (**Flightdeck, 192 Wilmslow Road, Heald Green, Cheadle, Cheshire SK8 3BH**, Tel: 0161-499 9350) to review. This 60-page paperback contains the

westbound North Atlantic timetable, lists flight numbers and finally Selcalls.

The timetable is in flight number order, showing origin, destination, departure time, oceanic entry point, expected time at that point and aircraft type. When it states 5710 as an entry point, for example, this is shorthand for 57°N 10°W. It would be unwise to depend on this, though, as tracks can change drastically, perhaps twice a day, according to wind conditions.

Flight numbers can be looked up to show origin and destination. Unlike the timetable, this list appears to include eastbounds as well. Finally, given the Selcall code, the aircraft registration, type and operator can be found. It's not for me to tell you what your needs are. Some readers will find this book a convenient summary of a specialist area. I feel the information is also available in other books that you might already have. It's your choice; if you do decide on it, the cost is £6.95 including UK postage (its weight suggests you should add £2.07 extra for overseas airmail).

Frequency and Operational News

Information from *GASIL* (5 of 1996) and *AIP Amendments* courtesy of **Martin Sutton** (all from the CAA). Martin appreciates the summaries that I've been printing here, thanks for the kind comment.

Aerodromes. The new one at Beccles (was previously a heliport) has an ATZ with associated frequency 134.4 (according to *GASIL*, but I had 134.6MHz in my records). Blackpool Approach now 119.95 (was 135.95) but Radar now 135.95 (was 119.95MHz), clarifying previous reports. Coventry now has AFIS on 126.05MHz. Lydd is left with Air/Ground or AFIS on 120.7MHz having lost Approach and Tower. Perth is open again, new management, licenced, ATZ; Air/Ground is 119.8MHz. Silverstone 'becomes a heliport' even though it has a runway suitable for aeroplanes. Tatenhill is a new licenced aerodrome, 124.075MHz. On the deficit side, Dounreay (Thurso), Finningley, Fort William and York (Acaster Malbis) disappear.

Airways: Manchester Sub-centre has 125.95MHz available.

Beacons: New n.d.b. MCH near Woodford, tell me the frequency please, someone!

Oil/gas platforms: Helidecks Esmond and Gordon (operated by Hamilton) removed. Remember that these are summarised in the RAF *En Route Supplement* (see *Airband Factsheet*).

Reporting points: New ones: FENIK between Turnberry beacon and Grice, GARVA between Inverness beacon and ULLAP, finally MIKEL between Isle of Man beacon and BLACA. Name changes: ALCON becomes MOGLI (on UL613 between Barkway beacon and TALLA) and KARIL becomes KETIK (near Jersey on G27). Why the name changes? Do the names sound too similar to other nearby points? If you want the exact lat/long location of any point, write in (quoting the month in which I mentioned it).

Runways: Stronsay has a new one: 10/28 length 404m. Westray now 09/27 (was 10/28).

The next three deadlines (for topical information) are January 20, February 17 and March 17 (note slightly revised dates). Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 21:30 local please).

Abbreviations

AFIS	Aerodrome Flight Information Service
AIP	Aeronautical Information Publication
ATZ	Aerodrome Traffic Zone
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
GASIL	General Aviation Safety Information Leaflet
GHz	gigahertz
kHz	kilohertz
m	metres
MHz	megahertz
n.d.b.	non-directional beacon
TACAN	TACtical Air Navigation
u.h.f.	ultra high frequency
UTC	Universal Co-ordinated Time
v.h.f	very high frequency
VOLMET	VOLume METeorological report
v.o.r.	very high frequency omni-directional radio range
z	Zone time

Peter Bond , c/o Editorial Offices , Broadstone.

Mil - Air

Information

Now that I am starting to receive regular post from readers, I am forming a good picture of the information you want to read about. I am grateful to all those who have written in, please keep the information coming, especially through the quieter winter months. Several people have sent in very detailed logs of aircraft movements and frequencies. Space limitations means that I cannot do the reports justice by including extensive information, so it would be a great help if you could highlight what you feel may be the most interesting items. (It may be different to the information I would choose to include). Please note that I regret that I cannot answer letters personally, when possible all replies will be made through the contents of this column.

Spirit Update

Steve writes in with an update on the visit of the B-2A. In addition to **312.45** (ACC Primary), the aircraft also used the Mildenhall ACC operations backup frequency **249.75** for a 'phone patch to Whiteman Air Force Base. This is a facility that is rarely used on u.h.f. operations frequencies and is more common on h.f. Also noted was **327.6** which was used for Air to Air liaison with the Tankers, (this is a new frequency according to my records). Several readers have commented that they were surprised that the B-2A used several London Control v.h.f. frequencies, rather than exclusively using London Military!

Autumn Exercises 2

As promised, a second look at some of the aircraft movements and frequencies noted during the September exercises. Thanks again to Keith plus two other correspondents for their comprehensive logs.

The airfield at West Freugh was a prime target with airfield attacks from several units including, 1 Squadron Harriers calling Zenith Formation, 54 Squadron Jaguars from Coltishall calling Blackcat Formation plus Attack 31 Flight which were 48 Fighter Squadron F-15Es from Lakenheath. Other formation callsigns in use were: Scimitar 3-4 111 Squadron Tornado F.3s, Scorpion 1-2 which I think is 5 Squadron Tornados, Jackal Formation which is Tornado F.3s from 111 Squadron at Lossiemouth. The old 1/3 FTS callsign Bacardi, was noted in use by Hawks returning to Valley, so I presume with all the recent changes to the training squadrons this callsign has passed to 4 FTS? If anyone has collated a recent list of FTS callsigns since the changes, let me know and I will include it in a future column.

In addition to the frequencies listed last month, the following were noted during the exercise period. London Military: **249.675**. Scottish Military: **134.3**, **134.475**. NATO Low level: **300.8**. Tactical: **233.725**, **251.75**, **282.2**, **309.625**, **310.55** & **383.55**. Also a USAF Boom, (Air refuelling) frequency, **249.775**. My only note of this frequency was in use as Chivenor operations in 1992?

TACAN Routes

A letter from Dave in Kings Lynn. He is relatively new to the airband listening and asks for some information regarding TACAN routes and reporting points. The TACAN routes are a system of military airways used for navigation around UK airspace. The current primary routes are TR1, TR3, TB1, TB2, TB4, TB5, TB6, TB7, TL4, TL6 and TACB3. As an example, one of the regularly used routes is TR1, which tracks from Lands End to Yeovilton, Brize Norton, Mildenhall, Coltishall and then to MC1 in the North Sea. As can be seen from this example, many of the primary reporting points are located at military airfields, others are alpha-numeric such as WD1, MC6 or QM8.

Airband Propagation

High atmospheric pressure during the latter part of October brought some exceptional listening conditions on the airbands. Three readers have written to me with reports of transmissions received over distances that would not normally be possible. Richard in Swindon reports that the Paris Volmet on **125.15** could be heard clearly at his Wiltshire home on the evening of the 22 October. On the same day, Dave in Maidstone heard the Brize Norton ATIS on **254.475** and the following morning Jim in Ebford in Devon (near Exmouth), heard a USAF C-141B call AMC operations at Mildenhall on **312.45** and was amazed when the ground controller could be clearly heard replying to the aircraft. My guess is that must be all of 400km away - it's a shame conditions are not like that all the time!

Frequency Focus

A correspondent in Northern Ireland asks for frequency information regarding Bessbrook heliport. I have asked several sources but no one has a record of any information for this base. My request for information regarding the frequency **245.25**, has prompted several replys. Steve and a reader in Caernarfon have this listed as a rarely used (possibly discrete), London Military North West frequency, whilst Dave in Bristol confirms he has heard it used by aircraft departing Valley. **137.5**, was noted in use as Air to Air by 'Saturn Flight', which by deduction I would guess is 56(R) Sqn. Tornado F.3s. A new USAF Air Refuelling frequency has been reported as **249.775**.

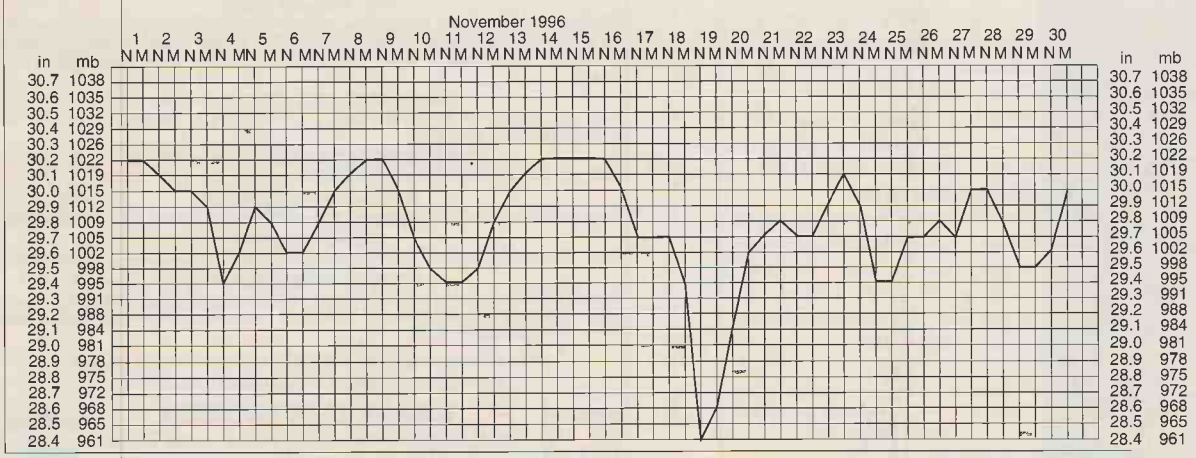
That's it for this month - Best wishes to all of you for the festive season and 1997.

Dick Ganderton, c/o *SWM* Editorial Offices, Broadstone

Propagation Extra

I believe that it is still essential that those readers who have an ongoing interest in propagation still have access to the various pieces of information collated by Ron Ham. I have asked Ron to continue to provide his monthly barometric pressure charts in the same format as before. In the meantime I am trying to arrange for a regular supply of sunspot charts and other similar information. If there are any readers who would be prepared to provide such information **on a regular basis**, please get in touch with me at the Editorial Offices, Broadstone.

Ron's barometric pressure chart for the month of November 1996.



Roger Bunney, 33 Cherville Street, Romsey, Hants SO51 8F8

Satellite TV News

Orbital Sightings.....

Once again a major human tragedy is played out over our TV screens and for those satellite enthusiasts equipped for scanning across the Clarke Belt so the actual raw pictures can be seen daily via the news feeds carried into Europe either in C-Band or at Ku-band via EBU (European) distribution leases on Eutelsat 7 East. The names are familiar - Rwanda, Zaire, Kigali, Goma - their faces display the all too familiar despair. No homes, no food, no hope and where can we go? You'll probably read these lines at (a well fed) Christmas time but just pause and spare a thought for those less fortunate a few thousand miles South of us. There's no Bethlehem star this year over Central Africa...

Reception Results

Comparing reception results with perhaps a year ago clearly shows an alarming trend - there's fewer pictures about with more and more satellite users both programmers and corporates/news/outside broadcasters going digital. The signals are still there, just look at the 'S' meter as you tune through a digital carrier - a walloping large deflection but no signal appears on the screen, just noise!

I'm hopeful that within the year enthusiast 'friendly and flexible' digital receivers will start appearing. In New Zealand a Scientific Atlanta D223 was modified by their regional office and is now able to resolve previously locked out MPEG pictures, more recently Christian Mass has successfully resolved various news feeds and programming using a Strong (Panasat) model 520.

It is possible to change parameters without using a PC and with practice such adjustment is simple. The low take-up on Germany's DF1 Kirch digital package has left many thousands of unwanted 'D-BOX' decoders on the shelf, a few have found their way into enthusiasts' hands and they will work as a flexible digital decoder. With new component technology for digital decoders being released almost weekly it's a wise man that will delay a purchase until the 2nd generation of DVB equipment is available - unless a 1st generation model falls off the back of a lorry!

Fortunately, there are still traditional analogue signals around....after a long delay I noticed the return of APNA TV, this time on Orion 1 Atlantic at 37°W, early November with promotional captions and then opening with programming. Technical quality at times leaves much to be desired, check out 12.670GHz vertical polarity for a very strong signal. They are identifying as 'APNA TV/FMS INTERNATIONAL'. Wonderful to see on November 2nd a very strong and solid PM5534 test card with 'JRTV AMMAN' logo on Eutelsat II F2 @ 10°E (11.172GHz horizontal), this teatime treat wasn't repeated on later days it was merely a news feed rather than regular programming.

Whilst on the topic of Arabic sourced programming, the 'JCS' caption with following programmes now seen on Eutelsat II F3 @ 16°E 10.080GHz horizontal is from Doha City in Qatar, the source being 'Al-Jazeera Satellite'. It's carried in parallel via ArabSat 2A - JCS is may depart 16°E for a 13°E Hot Bird slot late '97.

Bob French (Warks) is awaiting the erection of his 3m C/Ku-band dish at which point his 2.4m dish will be retired! Bob comments that the new ArabSat 2A bird at 26°E provides excellent signal strengths in C-Band whereas signals in Ku are very weak requiring threshold extension for strong locking. C-Band (4GHz) provides Syria, Dubai, Saudi, Yemen, Sudan, Lebanon and Kuwait amongst other European Arabic uplinkers. Exotic signals such as Ethiopian TV and TV India are also well received by Bob from Intelsat 703 @ 57°E, Turksat 2B meanwhile has suffered a complete 'shuffle round' of onboard programmers, the bird itself is packed full of Turkish TV channels all of which can be received strongly over much of the UK.

Several readers have reported news feeds coming out of the Zaire/Rwanda region of Central Africa following the unrest between government and rebel troops. Eutelsat II F4 @ 7°E often carry 'EBU KIGALI SNG GOOO95G' on colour bars, this interrupted with news reports detailing border skirmishes, refugee marches and the general ethnic confusion of a bloody and brutal civil war. The situation is constantly changing within days from both local and international intervention and is likely to continue a troublesome hot spot in the coming years. Uplinks out of Africa are in digital C-Band which are then distributed across Europe in SIS analogue PAL. Check out 10.997GHz vertical for this regular pan-European distribution feed.

As ever the 'Garden Isle' is well represented by Sandown resident **Roy Carmen**. Roy too looks forward to the day of a flexible digital receiver though fears that the first UK offerings will be closely allied to the Rupert Murdoch empire. As an aside, the recent Sky offer of a full dish/receiver/decoder at around £99 is remarkable and you get a lot of technology for your cash. (It is possible to locate a receiver package for £99 without being tied to a Sky subscription!) Roy is now considering modifying his moving dish for inclined orbit satellite tracking which - if fitted - needs careful calculation to take into account the high winds that often flow across the Island.

Sandown lies at the Eastern end of the Arreton Valley and as such allows an improved (clearer) SE through SW tracking arc for satellite reception. Roy can 'see' from East of Turksat 42°E to West of PAS-1 45 West and has sent a very full log of his last months sightings. Hispasat @ 30 West carries many European news and sports feeds in SECAM, PAL and 16:9 PAL PLUS. There's an increasing number of corporate/multi media corporate feeds being carried over the Atlantic during the daytime to correspond with the European working day. This usually means the originating programme source is awake early for rehearsal, I recently noticed an IBM feed via Intelsat K (21°W) ex San Francisco that was rehearsing at 0600hrs their time. Orion-1 Atlantic in Ku-Telecom band is another active source for weekday conferences in analogue PAL though for every feed seen in the clear there must be others lurking in the digital shash!

Again our old friend II F4 @ 7°E was seen to be carrying a 'Test from Helsinki' caption featuring a dish caption at 11.060GHz in SIS (sound in syncs.) during late October mornings - we never found out what they were testing. Finally if you're missing Israel's AMOS-1 Ku-band downlink from 4°W, one guess where it's gone - yes - down digital alley with a 4 channel package! Another analogue transponder still fires up from time to time. AMOS managers are negotiating with possible Arabic transponder customers, so all is not lost!

Caption preceeding a corporate feed via Eutelsat II F2 @ 10°E.

Satellite DX, a news feed from Chile via PAS-3R @ 43°W.

Welcome back APNA-TV on Orion-1 Atlantic @ 37°W.

Another Orion-1 circuit, a VTR clock prior to the Nazim fight.

The human tragedy of Zaire - fed via Eutelsat II F4 @ 7°E using a sound in syncs. decoder to stabilise video and recover audio.

Intelsat K at 21°W with an upcoming corporate feed.

TVE Espagne sends a news offering into BBC White City over 7°E.

Lawrence Harris, 5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB E-mail: lawrenceh@ndirect.co.uk

Info In Orbit

EUMETSAT

Canary Islands from Roger Ray.

The response to November's 'Space Special' was phenomenal; many requests for images and the GOES-8 disks were received. Suggestions for future 'Specials' have been passed on to the Editorial team.

Current WXSATS

How quickly the images from METEOR 3-5 and NOAAs 12 and 14 lose their contrast as the sun's illumination decreases during northern autumn. The October and November north-bound METEOR 3-5 WXSAT (on 137.85MHz) headed into the dark polar regions and switched off earlier by the week. The NOAA WXSATs (on 137.50 and 137.62MHz) responded to the darker landscape by switching even earlier from visible to the second infra-red channel (one infra-red channel is always transmitted).

METEOSAT-5

EUMETSAT announced that the fuel reserve onboard METEOSAT-5 is almost used up so no further adjustment manoeuvres are to be performed (to reduce the slowly increasing inclination of the spacecraft's orbit). EUMETSAT points out that reception systems using large antennas will be the first to see an impact. For the benefit of future mission planning, they ask all users with larger than 3m diameter receive antennas to send a short note giving their antenna diameter and location. METEOSAT-5 de-contamination operations took place between 21 and 25 October. During this process, the infra-red system (which normally runs at a very low temperature to enhance its sensitivity) is allowed to warm-up; this causes an outgassing of the contaminants which have previously accumulated on the cold surfaces.

The layout of the solar panels, radiometer and communications unit within the current generation of METEOSATs is illustrated by **Fig. 2.** METEOSAT-6 is the stand-by satellite, positioned at 10°W. New software has been developed to compensate for the anomaly seen at times in images taken with its sensors. This correction software is currently being tested.

EUMETSAT has operated its METEOSAT satellites from a new purpose-built control centre in Darmstadt since December 1995. This centre is part of a new ground system which includes a primary ground station in Fucino, Italy, and data up-link stations in Bracknell, Toulouse and Rome.

SICH-1 Resurrected

The oceanographic, radar imaging satellite SICH-1 (which occasionally transmits a.p.t. on 137.40MHz) hit problems around 4 November. **Alex Ivanov** of the RD Centre SCAN, reported that SICH-1's side-looking radar appeared to be dead. The control team attempted to "re animate" it, and were apparently successful. Alex issues a transmissions schedule for SICH-1 via the Internet; the schedule is usually available a few days in advance. If any reader would like a copy, please send me a stamped s.a.e. together with secured 20p coin and I shall post the next issue.

NOAA-K Launch Date

NOAA-K is the first of the next generation of WXSATs in NOAA's polar orbiting group - following NOAA-14. NASA has been formally notified that they should press forward for launch on 20 August 1997. This notification is in advance of the normal 150 day 'call-up' and is necessary to permit the US Air Force to co-ordinate launch activities for five Titan launches in 1997, of which NOAA-K will be the fourth. Although NASA has been advised that NOAA requirements could change (due to in-orbit status changes or other considerations), they have been directed to proceed to 20 August, with no further notification required. The WXSAT following NOAA-K is NOAA-L, undergoing thermal vacuum tests from 25 November until 23 December 1996. My thanks to Jim O'Neal, Acting POES Program Manager, for this information.

GOES Launches

GOES-K is scheduled to be air shipped to the Cape on 10 January for a 16 April 1997 launch. The Launch Services contract, the same as that for GOES I-K (which provided Atlas I vehicles) was modified to incorporate the GOES L/M launches. The GOES-L launch is planned for July 2001. GOES-M is scheduled to be launched on an Atlas IIA in August 1999. My thanks to Gerald J. Dittberner, GOES Program Manager, for this information.

Letters & Pictures

Almost all correspondents to 'Info' (correctly) send their letters to me at the address given at the top of this column. Unfortunately, a few have sent mail via the Editorial Offices to *Short Wave Magazine* in Broadstone, which causes delays due to sorting and forwarding. **Please use the Plymouth address at the head of this column.**

A letter from **Mr Fry** of Kent (no other identity was supplied) captured the experience of a first-time entry into the world of satellite monitoring. Using a Scanmaster discone, a PRO-2006 receiver and a copy of 'Info', he quickly logged transmissions from NOAA-12, MIR, Russian Navsats (150.00MHz), NOAA-14, METEOR 3-5 and COSMOS 2142. He also heard (as many of us did) the American John Blaha on MIR. Being keen to confirm his monitoring, he rang up NASA (in Florida) who confirmed that John was onboard MIR - see also 'MIR frequency changes'.

His letter illustrates how one can monitor a large number of satellites with a scanning receiver and discone - see also **Table 1.** The addition of a wide-band pre-amp mounted at the discone, can enhance overall sensitivity of the receiver. This improves the detection of signals, but it is not suitable for decoding the data due to the discone characteristics and the limited i.f. bandwidth of the receiver combination.

Roger Ray sent a number of WXSAT images on disk, including METEOSAT, NOAA and METEOR images, from which I have selected his METEOR picture of the Canary Islands. This was imaged by METEOR 3-5 on 1 May and is one of the clearest of that region that I have seen.

Roger recently visited his daughter's school and saw their WXSAT receiving system which monitors METEOSAT-5. Although some years old, Roger reports that the equipment still works well and is operated by the geography class. During the next couple of years, schools will be connected to the Internet and, in theory, should be able to retrieve images whenever they are wanted. I personally see no comparison between the learning value of a direct reception facility - using an antenna, receiver, decoder and display program - when compared with image retrieval from the Internet by computer. The hardware has so much more to offer the learning process. OK, I shall now step down from my soapbox!

Display Programs

Whatever program is used to decode WXSAT images on a PC, the final image is likely to be in one of the standard formats - GIF, JPG, TIFF, PCX, BMP being the most common. One of the most well-known shareware programs is 'Paint Shop Pro', currently in version 4.10, and occupying nearly 3Mb disk space! This program - and others - may be seen on some cover CDs issued by various computer magazines. A number of smaller image processing programs, of varying complexity, have been written by software writers and I keep a selection of the latest versions obtained from the Internet - amongst other sources. On a smaller scale, I have obtained some display programs issued as 'Freeware' which occupy a few hundred kilobytes of disk space. If anyone wishes to have copies, simply send me a PC disk, return stamped envelope and 50p towards collection costs, and I will provide each program currently available. One program includes a conversion option to change BMP and TIFF files to GIF or JPG, permitting a significant reduction in file size with minimum or no reduction in image quality.

The METEOSAT-5 satellite - courtesy EUMETSAT.

Internet Site Update

Readers having either a direct Internet account at home or work are welcome to drop me an E-mail with discoveries of appropriate

Table 1

Satellites transmitting in the 136-138MHz band

Catalogue	Sat	ID Satellite	Frequency	Notes
965	1964-083D	TRANSIT 5B-5	136.650	modulated f.m. signal.
1430	1965-051A	TIROS 10	136.235	Frequency has increased slightly.
2411	1966-077B	ERS 15	136.440	Some tone shift.
2412	1966-077C	EGRS 7	136.800	typical SECOR signal-see 69-37B.
2768	1967-040D	ERS 20	136.260	ghostly woo-woo
3669	1969-009A	ISIS 1	136.410	c.w. only.
3891	1969-037B	EGRS 13	136.800	typical SECOR type signal.
3951	1969-046B	OV5-6	136.380	characteristic signal.
4256	1969-082B	TIMATION 2	137.380	musical signal.
4237	1969-082E	S69-4	137.410	c.w.
4362	1970-025A	NIMBUS 4	136.500	modulated f.m. signal.
5485	1971-080A	SHINSEI	136.695	c.w. only.
5580	1971-093A	PROSPERO	137.560	nice modulated signal.
5680	1971-110C	DOD	137.080	c.w. only - no official elements.
21263	1991-032A	NOAA 12	137.500	APT.
21263	1991-032A	NOAA 12	136.770	beacon.
21655	1991-056A	METEOR 3-5	137.850	daylight only.
23099	1994-027A	SROSS-C2	137.400	c.w. with fades.
23455	1994-089A	NOAA 14	137.620	APT.
23455	1994-089A	NOAA 14	137.770	beacon.
23545	1995-017A	ORBCOMM FM1	137.710	wideband "noise" with 1 sec pulse.

sites on the web for mention in the column. My own weekend trawls have produced a huge list of many sites where WXSAT information or pictures are available. Some will be featured in future editions.

The Japan Weather Association has a web page at: **http://www.jwa.go.jp/index.html** from which three choices - GMS (HIMAWARI), Japan Spot Weather and World Weather Report - are available. Selecting GMS takes us to a second page: **http://www.jwa.go.jp/gms.html** This contains two images from GMS - a close-up of the area around Japan, and a whole disc view as seen by the satellite. Both images are enhanced with colour and updated three-hourly from 0030, 0330UTC and so on. When a typhoon is in the region, updates are more frequent.

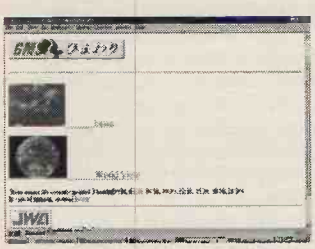
Satellite Tracking Software - Winorb29

Mention has been made in previous editions of a number of satellite tracking programs - commercial, shareware and freeware. WinOrbit is a 'Windows' program for computing artificial Earth-satellite positions and visibility, written by C. D. Gregory K8CG, with the amateur radio satellite operator in mind. It runs on the Microsoft Windows 3.1 operating system (although I run it under Windows-95) and is issued free (not shareware) - the latest version is 2.9. The main feature of the program is a series of tracking windows, one per satellite, which display the current position of the satellite and observer on a simple world map, together with information such as footprint, past ground track, bearing (azimuth), distance, and elevation above the observer's horizon. Sun position and terminator, user-selected DX locations and a second satellite may also be displayed.

Features are many, and include:

* Simultaneous tracking of up to 20 satellites, with sun/moon tracking built in.
* Real-time, pseudo-real-time, and manual calculation modes.
* Satellite 'view from space' map presentation.
* Selectable tracking detail, including doppler shift, free-space path loss, satellite and observer antenna pattern effects for a single satellite.
* Display sun position for eclipse determination, and other observers for mutual visibility.
* "Show DX" for all stations within the satellite footprint, and "what's up" for all satellites visible at observer's QTH.
* Tracking data (Keplerian element sets) read directly from standard bulletins.
* Propagation of pre-launch Kepler sets and other element updates.
* Flexible entry of latitude, longitude, date and time.
* Printing of tables of tracking data (Ephemerides) in several formats.
* Timeline and mutual visibility printouts.
* Extensive on-line help.
* Standard Windows interface for all functions - no commands to memorise. Both mouse and keyboard can be used for most functions.

Winorb29 can be obtained from amateur radio software outlets, or I can provide a copy. Please include a stamped s.a.e., one PC disk and 50p, and I will also include a copy of a DOS tracking program if required. Those requesting software from me can expect to receive the latest versions. The new release of STS-Plus is version 9643 (as at late November!).



Japanese Weather Association web page. Published by kind permission of Shinya Shimoda of the Information System Management Division, Meteorological Data-Processing Department, Japan Weather Association.

Shuttle Launch Schedule

STS-81 is the 5th Shuttle/MIR mission and is scheduled for launch on 12 January 1997. It will carry the 'Spacehab' double-module.

STS-82 is the next Hubble Space Telescope servicing mission, scheduled for 13 February 1997.

A comprehensive listing of all Shuttle flights and payloads, fully up-to-date, together with associated information is available from me as the *Shuttle pack*. Please include a secured £1, and stamped s.a.e. for the A4 booklet.

Chinese Launch Scheduled

An October issue of *Aviation Week & Space Technology* included an article on weather and remote sensing, which mentions that China's third polar orbiting weather satellite is set for launch by about March 1997, on a Long March 4 from the Taiyuan ballistic missile test site south of Beijing. China is also planning development of a more advanced geosynchronous-orbit weather satellite system, as well as more frequent launches of polar-orbit weather spacecraft. I am expecting to shortly provide information about the Chinese WXSAT program direct from the Press Agencies.

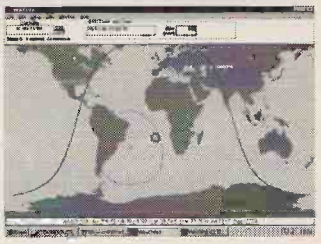
MIR Frequency Changes

The v.h.f. frequency 143.625MHz has been used over many years for communications between MIR and ground stations/tracking ships. Due to budget problems, the fleet of tracking ships has been curtailed. The RSA (Russian Space Agency) and NASA now have a co-operative agreement establishing east and west coast US v.h.f. communications stations to support the MIR program.

MIR is changing its primary amateur radio operations frequency from 145.550 to 145.200MHz. John Blaha (on board MIR) asks for the word to be spread on the ground that MIR is 'sending' on 145.200 and 'receiving' on 145.800MHz.

Christmas With The Satellites

I admit to being fascinated by hearing those satellites which are long past their 'use by' date! Lists of old satellites occasionally heard in the WXSAT band are published periodically and **Table 1** was compiled by **Greg Roberts**, who monitored them from Cape Town, South Africa. Many are well-known, several are rarely heard. Take time off this Christmas to monitor our radio skies and see how many you can identify.



Winorb29 screen display.

Kepler elements - MIR and Shuttle

1 For a print-out of the latest WXSAT elements, MIR, and the Shuttle (if close to launch or in orbit), send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA. I send Kepler elements by return-of-post.

2 I 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.

3 For automatic updating of your tracking software, you can have the data as a computer disk file - one of several containing recent elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest. Please enclose 50p with your PC-formatted disk and stamped return envelope.

Finally, may I wish all 'Info' readers seasonal greetings and a very Happy New Year. I hope to have the pleasure of your letters and company throughout 1997.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz
NOAA-12 transmits a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 (or 2-21) use 137.85MHz
OKEAN-4 and SICH-1 use 137.40MHz
METEOSAT-5 (geostationary) uses 1691 and 1694.5MHz for WEFAX
GOES-8 (western horizon) uses 1691MHz for WEFAX
MIR 145.20 and 143.625MHz.

Mike Richard: G4WNC, PO Box 1863, Ringwood, Hants BH24 3XD. Internet: mike.richards@dial.pipex.com.

Decode

All the Data Modes

Hamcomm - Listeners Configuration

With the introduction of HAMCOMM 3.1 comes a new and much more powerful configuration file. Whilst you don't really need to get involved with the configuration file it can be used to customise HAMCOMM so that it's immediately ready for use when you start the program.

Because HAMCOMM has been primarily designed for radio amateurs, the supplied default settings very much favour this mode of operation. A good example of this is the transmit type-ahead buffer. If you're a listener this buffer is just a waste of screen space and can be disabled via the config file.

Another problem is the selection of 45.5 baud RTTY with a 170Hz shift - the vast majority of commercial stations use 50 baud and 400Hz shift. The configuration file listed in **Fig. 1** starts-up HAMCOMM in RTTY mode with a centre frequency of 1350Hz, 400Hz shift and speed set at 50 baud. The file also removes the transmit portion of the screen, increases the size of the receive buffer and keeps 150 lines of received text available for scrolling on the screen. I've also set the automatic frequency control to on, as well as the weather decoder.

To use this config file, you first need to type it into a file using a standard text editor. If you're using Windows, the Notepad is fine. Once complete, save it a swl.cfg in the same directory as HAMCOMM. You now have two choices for using this file. You can either start HAMCOMM in the normal way and then load the config file from the File menu or you can turn it into the default config file. To do this first find the file hc.cfg in the HAMCOMM directory. Now rename this to old.cfg. Next rename your new file (swl.cfg) to hc.cfg. HAMCOMM will now automatically load this when you start it. I would strongly recommend keeping a copy of the old config file as it is well documented and is very useful if you want to have a go at creating your own specialised config file. If you've already built your own file that you think is better than mine - why not send me a copy?

Fig. 1.

```
# HC31.CFG 19/11/96
#
# HamComm 3.1 Short Wave Listeners Configuration File set confirmexit on
# You may need to change the next line to suit your COM port select port com2
set timercheck off
set timezone UTC
set timediff 0
set mode baudot
set clockcorr 0
set amtoraab on
set extendedbaudot on
set baud 50
set wpm 20
set autowpm on
set afcenter 1360
set afshift 400
set afc on
set autounshift on
set rxblanklines off
# You may have to change the next line to suit your set-up # the options are normal or reverse
set keying normal
set wxdecode on
set scopegrid on
set extconv off
set diddle on
set speaker on
set padelay 0
set txdelay 30
set txwait 1000
set rxbuffersize 512
set txbuffersize 128
set rxwindowlines 150
set txwindowlines 1
set txwindow off
set txlinelength 66
set entrymode word
set insertmode off
set endoftext 0x7f        # control-backspace
set rxlogfile "startup.log" # open logfile startup.log set printer off
exit
```

RTTY Weather Data

One of the most popular and abundant information sources on the h.f. bands is weather reports. These range from a few plain language reports through to comprehensive FAX charts covering land sea and air conditions for just about the whole of the globe. Whilst FAX has its obvious attractions, there is another data source that can provide very much more detailed weather information. This source has become generally known as SYNOP, but in fact covers several different data types. Before I go on to cover this is some detail, why bother at all? Well, other than a general fascination with the complex function of weather forecasting, a good knowledge of weather conditions can help you with your listening. This is particularly true if you have an interest in the v.h.f. bands.

Whenever weather conditions occur that create a layer of warm air above cold air an effect called ducting occurs. This is where radio signals are refracted as they pass through the air and tend to duct over fairly long distances. This can extend v.h.f. propagation to thousands of miles as opposed to the more normal tens or hundreds. Now we have a reason for looking, let's see what's available and how it can be resolved.

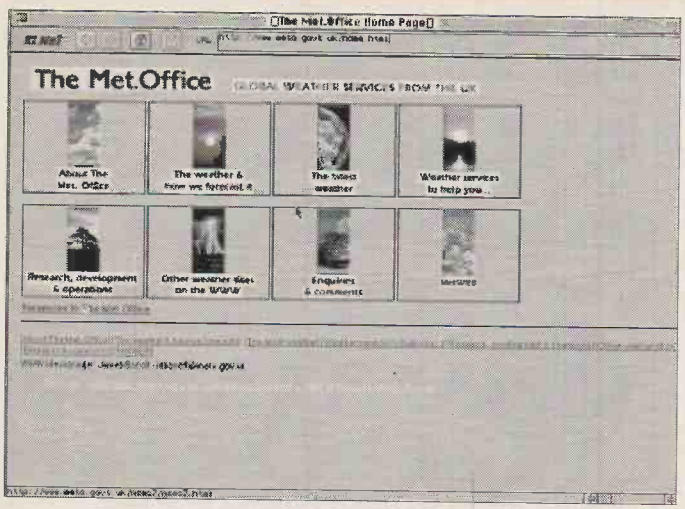
The best source for detailed weather reports is the coded RTTY weather transmissions that abound on the h.f. bands. These can be recognised by their repeated transmission of seemingly endless strings of five figure groups. To the uninitiated these could easily be thought to be spy stations or some other form of indecipherable transmission. In practice the signals can be very easily deciphered using software that's readily available on the amateur market. Before I go into the decoding, lets take a look at the source of the information. The RTTY signals that you can receive are actually part of the World Meteorological Organisation's Global Telecommunication System.

The complex nature of weather forecasting has itself demanded a breakdown of international barriers and the WMO is an excellent example of international co-operation on a global scale. The RTTY transmissions I'm referring to here are actually transmitted by stations that are classified as regional Telecommunications Hubs. These stations take information from the WMO and broadcast it in a number of different formats namely FAX and the RTTY system I'm describing here.

Let's now take a closer look at RTTY based weather information and see just how simple it is to resolve. The basic data format used for these transmissions is very simple indeed and is usually 50 or 75 baud RTTY with a 400Hz shift. This means the data can be received with the simplest of decoding set- ups. If you've not come across this type of data before, why not take a look right now? Set-up your decoder for 75 baud RTTY with a 400Hz shift and tune your receiver to 4.489MHz using upper side band. You will also have to turn off the unshift-on-space facility if you have it. If you don't do this your decoder will keep turning the five digit groups into letters! If all is well, you should now see streams of five figure groups appearing on your decoder's screen.

Let's now take a look at how the seemingly meaningless numbers can be converted into detailed weather information. Like most things there's an easy way and a hard way - we'll start with the hard way!

Other than your data decoder, all you need to convert the data is a reference book and some patience. However, before we can start making some sense of the data we need to be able to break it into sections and work out where the various elements of the message start and finish. This is quite easy to do thanks to the use of a couple of standard patterns, these are ZCZC and NNNN. Whilst ZCZC is used to indicate the very



Met. Office Weather Site.

start of the message, NNNN is used to show the end. Here's a typical extract from a message to illustrate how these codes are used.

```
ZCZC 987
SMUK73 EGRR 031200
AAXX 03114
00318 34522 67354 65743
43528 84635 76635 76843
67532 87652 58452 74523
72538
NNNN
```

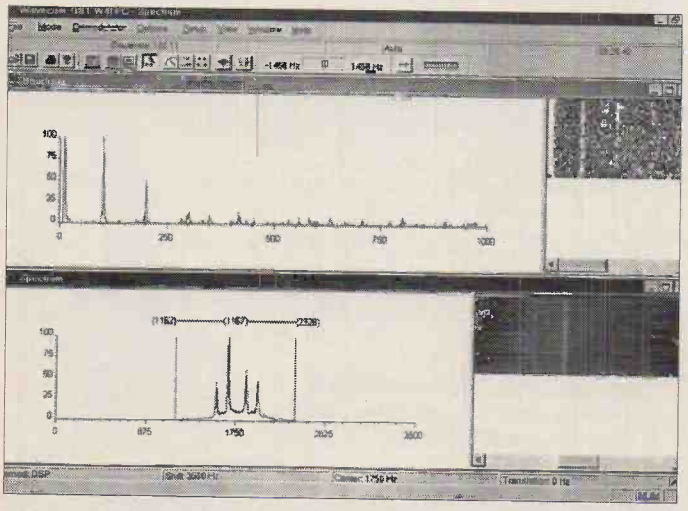
As you can see the ZCZC/NNNN sequence very clearly separates-out the message. Using this message as an example lets now look at the data in the second line. The first two letters are used to indicate the type of data about to be sent, in this case SM shows that the data is synoptic data for the main hour. The next two letters show the country of origin - UK in this case. The two numbers at the end are mainly used to separate-out any bulletins that come from the same station. The next four letter group is the location indicator for the station supplying the data. Here the letters EGRR refer to Bracknell. The final five digit group of this line shows the day of the month and the time in hours and minutes, e.g. 3rd 1200hrs. These first two lines are primarily header information that sets-up the rest of the data. The third line reports the type of data report (AAXX = SYNOP), the date and hour of the actual observation plus a digit signifying the type of wind speed measurement used at that station. In this case the number 4 indicates an anemometer with a read-out in knots. Phew!

Now that's done we can get down to the individual weather reports. The very next line starts with the international index number of the station taking the readings, in the example I have used Blackpool Airport. By now you should have picked-up the basic idea of how to take-apart the groups of numbers and turn them into usable data. You will also be wondering where to find the reference information to decode the numbers.

There are several sources, the most readily available of which is the *Klingenfuss Radio Data Code Manual* that's available from the *SWM* Book Store. Another high quality reference is the *Admiralty List of Radio Signals* (ALRS). This extensive publication comprises many volumes, but those of particular interest are: Volume 3 parts 1 and 2 plus Volume 4. Although very comprehensive, the down-side is that these three books will cost you a total of around £55 before post and packing. There are a number of sources for this, but I've used Kelvin Hughes successfully in the past.

Now you can relax as what I've just described was the hard way to decode these RTTY weather reports. For an easy solution you need look no further than HAMCOMM as this program has its own built-in SYNOP decoder that can be found under the TEXT menu. All you have to do is turn weather decoding on and sit and wait for the decoded text to appear before your very eyes! Yes, it really is that simple - but first a few tips.

Hamcomm does need to see the very start of the message to decode the data accurately and weak signals can cause havoc. You really do need a good steady signal if you are to receive a consistent set of weather reports. Another book well worth considering if you have a general interest in these transmissions is *FAX and RTTY Weather Reports* by Philip Mitchell. The *SWM* Book Store carry this title, of course. If you have access to the Internet here are a couple of sites that provide some interesting background. The World Meteorological Organisation can be found at **www.wmo.ch/** and the UK Met Office are at **www.meteo.govt.uk/home.html**



Wavecom W41PC Screen Shot - see last month's column.

DSP Hardware

Those of you with a particular interest in the construction of DSP projects may well be interested to hear of Kane Computing based in Northwich, Cheshire. They offer a wide range of DSP products including the range of TMS320 development and evaluation boards from Texas Instruments. They have comprehensive contact points including a Web site at **www.azure.com/kanecomputing**, E-mail to **sales@kanecomputing.com** or plain old 'phone on (01606) 351006.

FGR-100 Receiver Control

Do you have an FRG-100 receiver and want to control it with your PC? If so, why not take a look at Thor Andersen's program that can be found on the Demon Internet site' In its compressed form it's called frgcntrl.zip and can be found in directory msdos/hamradio/ of any of the SimTel mirror sites.

The spur for mentioning the program came from a request from Thor. He is busy finishing a new version of the program and is looking for beta testers. If you've not come across the term before, a beta tester is just someone who agrees to test, what is thought to be the final release of the software, and provide detailed reports back to the developer. The main purpose of the Beta test is to ensure the software will work successfully on a wide range of systems. If you'd like to participate you can contact Thor via E-mail at **thora@online.no**

More T2FD!!

A note from Pat O'Shea pointed out the Nordic Shortwave Centre are currently running a feature on the T2FD antenna I mentioned the other month. Their feature has been put together by Guy Atkins and contains some very good constructional details. (*Look out for constructional details on this excellent antenna in a feature by John Wilson, in this issue of* SWM, *page 48- **KN.**)* You can go straight to the article on the Internet at: www.sds.se/org/swl/antenn/t2fd.html. If you know of any other hot sites please E-mail me and let me know.

Readers Special Offers

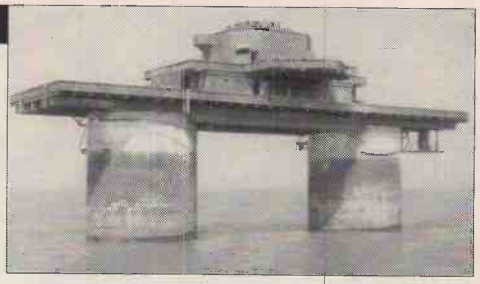
The bad news for this month is that I've had to temporarily withdraw my offer to supply *FactPacks* and frequency lists. Quite simply, the demand has outstripped my ability to supply and I'm incurring heavy delays with the inevitable complaints. So my apologies to all who have waited patiently, but enough is enough.

Once I've caught-up with the backlog, I will hopefully be able to re-introduce an improved service for some of the items. Looking on the bright side, I do still have the 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 so you don't even have to write a letter.

So in future please direct all requests for 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 7.0, HAMCOMM 3.1 and WXFAX 3.2 Disk B - DSP Starter plus Texas device selection software. Disk C - NuMorse 1.3 Disk D - UltraPak 4.0 Disk E - Mscan 1.3 and 2.0.

Andy Cadier, 28 Romney Avenue, Folkstone, Kent CT20 3QJ

Off the Record



With the festive season upon us, or perhaps as you read this its just passed, we can expect the usual increase in pirate radio activity. The shorter daylight hours mean many stations are using lower frequencies.

The 3.9MHz (76 metre) band is becoming quite crowded most weekends. Live Wire Radio using a 1kW transmitter has received reports from Massachusetts and New Jersey in the USA, possibly the first European pirate to make the trip to the States on 76 metres. Other English language stations are set to use the extended m.w. frequencies of 1611-1650kHz, which up to now has been used almost exclusively by Dutch pirates.

Tape Exchange

I frequently receive letters asking if I collect or exchange tape recordings of offshore or pirate radio stations. The answer is no, but I do appreciate that many readers of this page are collectors of this kind of material. I do publish readers names but their home address and private 'phone numbers are treated with utmost confidentiality.

A possible solution could be for persons wishing to swap tapes to place a small advertisement in *SWM*'s 'Trading Post' under the heading Exchange. There is a small fee, which could be a very worthwhile investment should you manage to obtain the valued item you are seeking. In response to your letters, I have started to include items about pirates of the 1960s, much of which is taken from my personal experiences.

Pirate Topics

Steve Gilbert from Birmingham asks if I can provide a list of addresses of other Free Radio information magazines. I am happy to do this as I cannot possibly cover anything and everything about pirate radio in this quarterly page. Please, when writing, do include a stamped addressed envelope, you would be surprised at the quantity of mail this page generates.

A photograph of Radio Caroline's ship, the *Ross Revenge*, is featured on the latest cover of *Family Matters* the newsletter of the Conservative Family Campaign, together with an article by Adrian Hogg. He points out the discrimination that has kept Radio Caroline and other religious broadcasters from obtaining licences to operate in Britain. I wonder if the politicians will take note.

Adrian also informs me that with the forthcoming privatisation of BBC short wave transmitter sites, their services may in the future become accessible other British broadcasters, providing their contractual obligations to the BBC were met. At present, only foreign stations are relayed by the BBC on short wave.

The Irish government are reported to be taking a second look at their broadcasting legislation, loopholes in the present law has allowed pirates to continue unabated. There is also speculation on whether Ireland may build its own s.w. broadcasting facilities.

In recent months they have purchased air time on British and German facilities for the transmission of sporting events and a St. Patrick's Day special. American, Alan Weiner is in the news again. He was behind Radio New York International which broadcast from a ship called the *MV Sarah* from 23 July 1987 until it was raided by FCC officials five days later on the 28th July.

Another similar project involved a ship called the Fury. This had been equipped with machinery from the *Sarah*. The FFC claimed they had detected test broadcasts while the ship was near Charleston harbour. They used a rented barge and a crane to confiscate the broadcasting equipment on 19 January 1994. This latest venture features an old tug renamed *Electra*, a medium wave and two short wave transmitters and a seemingly unnecessary blaze of publicity.

Radio Essex

This was certainly one of the smallest of all the offshore stations of the 60s, it had a staff of about 12 and broadcast 24 hours a day. Everyone on this station did more than one job, the teamwork involved would probably have impressed the military that had been the forts original occupier.

The tower had originally been an offshore gun emplacement and radar installation, but had been abandoned by the War Department during the middle 50s. Transmissions commenced from Radio Essex on 27 October 1965 on 222m, 1349kHz, with a middle of the road format during the day and pop music at night.

The supplies came during favourable weather conditions aboard a small fishing boat called *Kestrel*. All supplies and even individuals were unceremoniously hauled aboard at the end of a badly frayed rope. The original ladders had been removed by Radio Essex personnel to reduce the possibility of uninvited guests getting aboard the platform.

The forts original diesel generators had been fully restored by senior DJ/Fort Captain Richard Palmer, the diesel for which arrived in dozens of five gallon containers. These had to be hauled aboard and painstakingly poured into a former aircraft fuel tank situated on the main deck, where a plastic tube took the diesel to the generator room below.

The staff canteen and recreational area had originally been the officers mess and a store room became the stations studio. This contained two Garrard 401 turntables with Decca pick-ups, one Collaro turntable, a Vortexion tape recorder and a Reslo ribbon microphone.

The mixer was built by station engineers which fed a 50W RSC audio amplifier which was linked to the transmitter in the room next door. The transmitter was probably capable of 500W, however, due to the end fed long wire antenna and the rising and falling of the tide, which had the effect of moving the ground plane, the e.r.p. was probably only 200W.

Staff worked about three weeks on and one week off, the station was run by Roy Bates and his family from their home in Southend-on-Sea. Towards the end of 1966, Radio Essex relaunched as BBMS 'Britain's Better Music Station' in effort to attract advertising from Kent as well as Essex. This was Britain's first local radio station and unbelievably, was the first British station to go 24 hours a day.

It was very popular with night shift workers and had a clear frequency after midnight when co-channel stations closed down. The fort also had its own ghost or poltergeist. At one point, the entire structure was searched as the DJs were convinced an unknown person was aboard, nobody was found!

On 30 November 1966 BBMS was charged with contravening Section One the Wireless Telegraphy Act of 1949, making unlicensed broadcasts. The station was found guilty and fined £100, but continued broadcasting. It finally closed at Christmas, when similar court action was being taken against the other fort based stations.

The legacy of Radio Essex still exists in a minor way, all BBC local Stations identify themselves as BBC Radio whatever, except one....BBC Essex, where the word Radio is still excluded.

It seems inconceivable that pirate radio stations could openly operate from the sea forts, some for a period of almost two years. Yet neither the armed forces, Home Office, the police nor H.M. Coastguard knew, even roughly, where British territorial waters commenced. The Post Office's prosecution involved measuring the territorial limit from any coastal sandbank that became visible at low tide.

Radio Lighthouse

Both pirate radio and vintage radio enthusiasts may be interested in the National Vintage Wireless and Television Museum, at the high lighthouse at Harwich in Essex. Exhibits trace the history of broadcasting from the early days of the crystal set to the present day.

One floor is entirely dedicated to the history of Offshore Radio, several stations of which were supplied from Harwich docks during the 60s. The museum is not open every day during the winter, so do ring **Tony** on **(01206) 322606** for details.

Licence Evasion

Under the British Government's new Crime Bill persons failing to pay for their TV licences will no longer face imprisonment. Previously persons not paying licence fees were fined, if the fine were unpaid a short jail sentence was ultimately the only alternative available to the court. In future, Community Service, or a curfew involving electronic tagging will be imposed on those that fail to pay, what is in effect their subscription to the BBC.

Short Wave Pirates

Station	Monitors
ABC Dublin	A, B
Airplay USA (Milan relay)	C
Armadillo	A
Benelux	A
Blackbeard	A, D, E
Boomerang	A, D
Border Hunter	A
Britain	A, B, D, E
Caroline (France)	A, B, D, E
Crazy Wave	A, E
Doctor Tim	A, B
Drilland	A
Easy International	B, E
European Music	A
Free London (mention of this page!)	A, B, D, E
Holland FRS	A, B, C, D, E
Horizon	A, B, D
International Music	A, B
Jolly Roger	A, B, C, D, E
Korak International	B, D
Laser Hot Hits	A, B, C, D
Marabu	A, B, E
Moonlight	B, D, E
New World (test b/cast)	A
Nova (new station?)	A, B, D
Orion	A, E
Ozone	A, B, C
Packman	A
Pamala (see QSL card)	A, B, E
Pandora	A, D, E
Perfect	A
Reflections Europe	A, B, C, E
Rockit USA (7125kHz via Milan relay)	A, E
Rose Panther Amsterdam	A
Southern Music	A
Subterranean Sounds	A, D, E
Titanic	D
Torenvalk	A, B, C, D
Transatlantic	A, B, C, E
UK Radio	A, B, C, D
United Christian	A
Weekend Music	A, C, E
Zodiac	B, D

(A) Free Radio Monitoring, East Midlands.
(B) Bob Marsh, Bexleyheath, Kent.
(C) Glynn Harding, Crewe, Cheshire.
(D) Andrew Cooper, North Walsham, Norfolk.
(E) Jack Diamond, Folkestone, Kent.

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

LM&S

Long, Medium and Short Waves

If the next sunspot cycle is now underway then propagation in the higher frequency short wave bands should soon begin to improve. As we progress through 1997 the data in LM&S will reflect the improvements because it is based on reports of actual reception. They are always welcome here - please send them to me at the end of each month. Happy New Year!

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. Listeners who monitor 189kHz after dark for the weak sky waves from the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanisseta, Italy may be interested in the technique used by **Tony Stickells** in Thornton Heath. Firstly, he tunes his receiver to the RAI 540kW medium wave outlet in Rome on 846kHz, which carries the same programme (RAI R-2) as Caltanisseta. This is then entered into the receiver memory. Next, he tunes to 189kHz and enters it into the memory. When music is being played on 846kHz he switches between the two frequencies. If the transmission from Caltanisseta is present it is easy to recognise. On October 2 he logged it as SINPO 33212 at 1959UTC. On the 30th **Fred Pallant** (Storrington) logged it as 13332 at 2130.

Medium Wave Reports

During several nights in October the propagation conditions enabled the broadcasts from quite a few m.w. stations in E.Canada, E.USA and S.America to reach the UK - see chart. Some were heard before midnight. On the 4th **David Sayles** (Doncaster) logged CJYQ on 930kHz as SIO343 at 2243UTC. On the 5th, WLPZ on 1440 was SIO343 at 2302 and WQEW 1560 was SIO243 at 2330. At 0734 on the 12th, VOCM on 590 rated SIO232 and was still audible at 0800UTC!

Favourable conditions were noted after 0100 by David on the 3rd and 6th, also on the 4th by **Robert Connolly** in Kilkeel. The early hours of the 6th proved to be the best for Tony Stickells when nine stations were positively identified and another seven were heard. On the 21st he logged CJYQ at 2157, which is the earliest he has ever heard a State-side m.w. station, but the conditions deteriorated at 2230 and did not improve until 0200.

The broadcasts from CJYQ were heard at 2200 on the 17th & 18th by **John Slater** in Scalloway, Shetland. A search for some early DX was also made by **David Edwardson** in Wallsend but nothing was heard until the 18th, when VOCM on 590 was 24542 at 2227. He also listened around 0500 on the 10th and heard six stations but he was unable to identify them.

Up in Troon, **Paul Crankshaw** compiled an interesting log during the first two and a half weeks of October but he found the conditions exceptionally poor from the 18th until the end of the month. Before dawn on the 12th he logged two stations in Venezuela, namely R.2000 in Cumana on 1500 (22222 at 0605) and R.Vibracion in Carupano on 1470 (33333 at 0610); also RCN in Bogata, Colombia on 770 (22222 at 0640). On the 14th R.Nova Eldorado AM, Sao Paulo, Brazil on 700 was heard at 0630 peaking 22222.

The broadcasts from some m.w. stations in the Middle East and N.Africa also reached the UK after dark - see chart. Those from the JRTV 2000kW outlet at Ajlun, Jordan on 801 were received for the first time by **George Millmore** (Wootton, IoW) at 2030 on October 22 and rated SIO333. In the late afternoon **Paul Bowery** (Burnham-on-Crouch) has logged many European stations before dusk - see chart.

Up in Galashiels **Ross Lockley** has been hearing test transmissions from the new ILR station in South Wales on 1116 during the daytime. He says "The on-air identification at the moment is Valleys Radio and the launch date is given as 5th November. I first heard it on 23rd October with a positive ident." For up to two hours after dawn he has been receiving some of the south coast local radio stations including BBC Southern Counties Radio on 1368 & 1485; BBC Devon 1458 and BBC R.Solent on 1359.

In the reverse direction **Brian Keyte** (Bookham) logged BBC R.Solway on 585 during its 10 minute 'slot' from 0750-0800. He also heard BBC R.Tay on 1584 during the morning and also in the late afternoon. Down in Somerset, **Nicola Hutchings** (Wellington) has received ILR South Coast Radio via their new 0.75kW outlet at Bexhill on 945kHz. Reception was noted as 'Good' at 0803.

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	J*
153	Donebach DLF	Germany	500	A,B,C*,D,F,G,H,I,J
162	Allouis	France	2000	A,B,C*,D,E,F,G,H,I,J
162	Agri	Turkey	1000	H*
171	Nador Medi-1	Morocco	2000	H*,J*
171	B'shakovo etc	Russia	1200	A,B,D*,E,F,G,H,J
177	Oranienburg	Germany	750	A,B,C*,D,F*,G,H,I*,J
183	Saarlouis	Germany	2000	A,B,C*,F,G,H,I,J,K*
189	Caltanissetta	Italy	10	H*,J*
198	Droitwich BBC	UK	500	A,B,C*,D,F,G,I,J,K*
207	Munich DLF	Germany	500	A,B,F,D*,G,H*,I,J
207	Azilal	Morocco	800	H*,J*
216	Roumoules RMC	S.France	1400	A,B,D*,F,G,H,I,J,K*
225	Raszyn Resv	Poland	?	A,B,C*,D*,F*,G,H*,J,K*
234	Beidweiler	Luxembourg	2000	A,B,C*,E,F,G,H,I*,J,K*
243	Kalundborg	Denmark	300	A,B,C*,D,E,F*,G,H,J,K*
252	Tipaza	Algeria	1500	D*,G*,H*,J*
252	Atlantic 252	S.Ireland	500	A,B,C*,D,F,G,H,I,J,K*
261	Burg(R.Ropa)	Germany	200	A,C*,G,H*,J,K*
261	Taldom Moscow	Russia	2500	F*,H*,J
270	Topolna	Czech Rep	1500	A,C*,D*,E,F,G,H,I*,J,K*
279	Minsk	Belarus	500	A,D*,F*,G*,H*,I*,J,K*

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

Listeners:-
(A) Paul Bowery, Burnham-on-Crouch.
(B) Martin Dale, Stockport.
(C) Ted Harris, Manchester.
(D) Sheila Hughes, Morden.
(E) Rhoderick Illman, Oxted.
(F) Eddie McKeown, Newry.
(G) George Millmore, Wootton, IoW.
(H) Fred Pallant, Storrington.
(I) Tom Smyth, Co.Fermanagh.
(J) Tony Stickells, Thornton Heath.
(K) Norman Thompson, Oadby.

Short Wave Reports

It seems unlikely that international broadcasters will use the **25MHz (11m)** band in 1997.

Propagation in the **21MHz (13m)** band varies daily but it is being used by some broadcasters to reach listeners in chosen target areas. During favourable conditions R.Australia's transmission to Asia via Darwin on 21.725 (Eng 0630-1100) may reach the UK. It was rated 45434 at 0840 by **Tony Hall** in Freshwater Bay, IoW; 44343 at 0942 by **Eddie McKeown** in Newry; 35433 at 1015 by **Roderick Illman** in Oxted.

Broadcasts in this band also reach the UK from R.Prague via Litomysl 21.705 (Eng to S.Asia, W.Africa 1000-1030) 34333 at 1010 by **Sheila Hughes** in Morden; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to S.E.Asia 0900-1200) 25343 at 1020 in Storrington; UAER, Dubai 21.605 (Eng to Eur 1030-1055) 54433 at 1045 by **Stan Evans** in Herstmonceux; HCJB Quito, Ecuador 21.455 (Eng [u.s.b. + p.c.]) 32121 at 1130 by **Norman Thompson** in Oadby; DW via Julich 21.560 (Ger to Asia 1000-1355) 34333 at 1243 by **John Eaton** in Woking; RFI via Issoudun 21.620 (Fr to E.Africa 0800-1330?) 55444 at 1316 in Scalloway; UAER, Dubai 21.605 (Eng to Eur 1330-1355) 45444 at 1335 by **Michael Griffin** in Ross-on-Wye; RAI Rome 21.535 (Tt [Home service relay to Lat Amer] Sun only 1330-1700) 25542 at 1342 in Wallsend; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 34333 at 1547 in Burnham-on-Crouch; WYFR via Okeechobee, USA 21.525 (Eng, Fr, Ger, Port to W.Africa 1600-2045) 24222 at 1640 by **Thomas Williams** in Truro.

Daily variations in conditions also occur in the **17MHz (16m)** band. Noted during the morning were R.Pyongyang, Korea 17.765 (Eng to S.E.Asia 0700-0750) 35553 at 0700 by **John Parry** in Larnaca, Cyprus; R.Pakistan via Karachi 17.900 (Eng to Eur 0800-0845) 54444 at 0810 by **Tom Winzor** in Plymouth; R.Australia via Darwin 17.715 (Eng to Asia, Pacific 0200-0858) 35243 at 0811 in Newry; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-1000?, 1200-2000?) 23332 at 0836 by **Ron Damp** in E.Worthing; R.Slovakia Int 17.485 (Eng to Australia 0830-0857) 44333 at 0845 in Scalloway; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) 34443 at 0945 in Kilkeel; V of Russia 17.860 (Eng [WS] to Asia 0900?-1400) SIO222 at 1000 by **Tom Smyth** in Co.Fermanagh; AIR via Bangalore 17.387 (Eng to Pacific areas 1000-1100) 22111 at 1006 in Truro; BBC via Cyprus 17.705 (Eng to Eur 0900-1230?) 45434 at 1030 in Freshwater Bay; R.Pakistan, Islamabad 17.900 (Eng to Eur 1100-1120) 45444 at 1103 in Ross-on-Wye.

After mid-day RAI via 17.780 (It [R.Uno] to America 1330?-1630? Sun) 25542 at 1342 in Wallsend; BBC via Antigua, W.Indies 17.840 (Eng to N/C.America 1400-1700?) 34433 at 1405 by **Eric Shaw** in Chester; BBC via Woofferton, UK 17.640 (Eng to Eur 0800-1500) 44444 at 1450 by **Martin Cowin** in Kirkby Stephen; Monitor R via WSHB? 18.930 (Eng to Eur? 1600?-1800?) 44333 at 1606 in Oxted; REE via Costa Rica? 17.755 (Sp to Americas 1800?-0000?) 35433 at 1844 by **Darren Beasley** in Bridgwater; R.Nederlands via Bonaire 17.605 (Eng to S/E/W.Africa 1830-2025) 25232 at 1850 in Burnham-on-Crouch; WYFR via Okeechobee, USA 17.555 (Eng to Eur 1600?-1900?) 33333 at 1655 by **Bernard Curtis** in Stalbridge.

Received in the **15MHz (19m)** band during the morning were

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Hurzburg (BR)	Germany	0.2	C*,H*,M*
531	Ain Beida	Algeria	600/300	I*,M*
531	Torshavn	Faeroe Is.	100	A*
531	Leipzig	Germany	100	B,H*,I,M*
531	RNE5 via ?	Spain	?	H*,I*,M*
531	Beromunster	Switzerland	500	A*,M
540	Wavre	Belgium	150/50	A,B,H*,I,M,N*
540	Solt	Hungary	2000	A,M
540	Sidi Bennour	Morocco	600	B*,H*,I*,M*
549	Les Trembles	Algeria	600	B*,H*,I*,M*
549	Thurnau (DLF)	Germany	200	A,B,C*,H*,I,M
558	Espoo	Finland	100	B*,H*,I,N*
558	RNE5 via ?	Spain	?	B*,H*,I*
567	Tullamore(RTE1)	Ireland (S)	500	A,B,C*,G,I,L,M*
567	Bologna	Italy	20	M*
576	Muhlacker(SDR)	Germany	500	A,B,C,H*,M
576	Riga	Latvia	500	H*,I*
576	Barcelona(RNE5)	Spain	50	B*,I*,M*
585	Paris(FIP)	France	8	B,I,M
585	Riyadh	Saudi Arabia	1200	M*
585	Madrid(RNE1)	Spain	200	A,B*,H*,I*,M,N*
585	Dumfries(BBCScot)	UK	2	B*,D*,G,M
594	Frankfurt(HR)	Germany	1000/400	A,B,C*,H*,I*,M
594	Oujda-1	Morocco	100	I*,M*
594	Muge	Portugal	100	B*,H*,I*,M*,N*
603	Lyon	France	300	M
603	Sevilla(RNE5)	Spain	50	H*,I*,L*
603	Newcastle(BBC)	UK	2	B,G,M*
612	Athlone(RTE2)	Ireland (S)	100	B,C*,D*,G,I,M,N*
612	Vilnius/Klaipeda	Lithuania	?	A
612	Sebaa Aioun	Morocco	300	I*
612	RNE1 via ?	Spain	10	M*
621	Wavre	Belgium	80	A,B,C*,H*,I,M
621	RNE1 via ?	Spain	10	M*
621	Barcelona(OCR)	Spain	50	H*
630	Dannenberg(NDR)	Germany	100	B*
630	Vigra	Norway	100	B,H*,M*
630	Tunis-Djedeida	Tunisia	600	A,B*,H*,I*,M*,N*
639	Praha(Liblice)	Czech	1500	A,B,H*,I*,M,N*
639	RNE1 via ?	Spain	?	B*,H*,I*,M
648	RNE1 via ?	Spain	10	B*,H*,M*
648	Orfordness(BBC)	UK	500	A,B*,C*,D,I,M
657	Neubrandenburg(NDR)	Germany	250	A,H*,M*,N*
657	Napoli	Italy	120	A,I*,M*
657	Madrid(RNE5)	Spain	20	H*,I*,M*
657	Wrexham(BBCWales)	UK	2	B,H*,M
666	MesskirchRohrd(SWF)	Germany	150	B*,C*,H*,M*
666	Sitkunai(R.Vilnius)	Lithuania	500	A,H*
666	Lisboa	Portugal	135	H*,I*
666	Barcelona(COPE)	Spain	10	M*
675	Marseille	France	600	H*,I*,M*,N*
675	Lopic(R10 Gold)	Holland	120	A,B,C*,H*,I,M
684	Sevilla(RNE1)	Spain	500	B*,H*,I*,M
684	Avala(Beograd-1)	Yugoslavia	2000	B*,I*,M,N*
693	Tortosa(RNE1)	Spain	2	H*,M*
693	Droitwich(BBC5)	UK	150	A,B,C*,I*,L,M,N*
702	Flensburg(NDR)	Germany	5	A,H*,M*
702	Monte Carlo	Monaco	40	H*,I*
702	TWR via Monte Carlo	Monaco	300	A,C*,M
702	Slovensko 1 via ?	Slovak Rep.	?	M
702	Zamora(RNE1)	Spain	10	B*,I*
711	Rennes 1	France	300	A,B,H*,I,M
711	Heidelberg	Germany	5	M*
711	Laayoune	Morocco	600	D*,I*
711	Murcia(COPE)	Spain	5	M*
720	Lisnagarvey(BBC4)	Ireland (N)	10	B,C*,I*
720	Norte	Portugal	100	H*,I*,N*
720	Lots Rd,Ldn(BBC4)	UK	0.5	A,I*,L,M
729	Cork(RTE1)	Ireland (S)	10	G,H*,M*,N*
729	RNE1 via ?	Spain	?	H*,I*,M*
738	Paris	France	4	D,I
738	Poznan	Poland	300	A,H*,I*,M,N*
738	Barcelona(RNE1)	Spain	500	B*,H*,I*,M*
747	Flevo(Hilv2)	Holland	400	A,B,C*,H*,I,M,N*
756	Braunschweig(DLF)	Germany	800/200	A,B*,C*,H*,I*,M*,N*
756	Bilbao(E1)	Spain	5	M*
756	Redruth(BBC)	UK	2	G,I,L
765	Sottens	Switzerland	500	A*,B,H*,I*,M*,N*
774	Abis	Egypt	500	M*
774	Enniskillen(BBC)	Ireland (N)	1	H*
774	RNE1 via ?	Spain	?	B*,H*,I*,M*
783	Burg	Germany	1000	A,B,C*,H*,I*,M*,N*
783	Dammam	Saudi Arabia	100	I*
792	Limoges	France	300	A,B*,I,M,N*
792	Lingen(NDR)	Germany	5	H*,I*,M*
792	Sevilla(SER)	Spain	20	B*,I*,M*
792	Londonderry(BBC)	UK	1	L
801	Munchen-Ismaning	Germany	300	A,B,H*,M*
801	Ajlun	Jordan	2000	I*,M*
801	RNE1 via ?	Spain	?	B*,H*,I*,M*
810	Madrid(SER)	Spain	20	B*,H*,M*
810	Westerglen(BBCScot)	UK	100	A,B,C*,D*,E*,F*,G,I*,L*,M*,N*
819	Batra	Egypt	450	I*,M,N*
819	Toulouse	France	50	H*,M*
819	Trieste	Italy	25	M
819	Rabat	Morocco	25	M*
819	Warsaw	Poland	300	A,B,H*,I*,M*
828	Hannover(NDR)	Germany	100/5	B,L*,M*,N*
828	Rotterdam	Holland	20	A,H*,M
837	Nancy	France	200	A,H*,I,L*,M
837	COPE via ?	Spain	?	B*,D*,H*,I*,M*
846	Rome	Italy	540	A,B*,F*,I*,K*,M
855	Berlin	Germany	100	B*,H*
855	R.Bucharest	Roumania	750	N*
855	RNE1 via ?	Spain	?	B*,H*,I*,M*
864	Santah	Egypt	500	I*,M*
864	Paris	France	300	A,B*,I,L,M
864	Socuellamos(RNE1)	Spain	2	I*,M*
873	Frankfurt(AFN)	Germany	150	A,B,C*,D*,G,H*,I*,M,N*
873	Zaragoza(SER)	Spain	20	B*,I*,M*
882	COPE via ?	Spain	?	H*,M*
882	Washford(BBCWales)	UK	100	A,B,C*,D,G,I,M
891	Algiers	Algeria	600/300	B*,D*,H*,I*,M*
891	Huisberg	Netherlands	20	A,F,H*,I*,M*
900	Brno(CRo2)	Czech Rep	25	H*,I*
900	Milan	Italy	600	A,H*,M*
909	B'mans Pk(BBC5)	UK	140	A,C*,I,L,M
918	Plesivec(Sloven'nR)	Slovenia	600/100	A,D*,I*,I*,M*
918	Madrid(R.Int)	Spain	20	B*,M*
927	Wolvertem	Belgium	300	A,B,H*,I,M
936	Bremen	Germany	100	A,B,D*,H*,L*,M*
936	Venezia	Italy	20	I*,M*
936	RNE5 via ?	Spain	?	D*,H*,I*,M*
945	Toulouse	France	300	B,H*,M
954	Brno (CRo2)	Czech Rep.	200	B,M*
954	Madrid(CI)	Spain	20	B*,H*,I*,M*
963	Pori	Finland	600	B,H*,I*,N*
963	Tir Chonaill	Ireland (S)	10	B*,I*,L
972	Hamburg(NDR)	Germany	300	B,H*,I*,M*
972	RNE1 via ?	Spain	?	H*,I*,M*
981	Alger	Algeria	600/300	B*,D*,I*,M*
981	Coimbra	Portugal	10	M*
990	Berlin	Germany	300	B,H*,I*,M*
990	R.Bilbao(SER)	Spain	10	M*
990	Redmoss(BBC)	UK	1	H*
990	Tywyn(BBC)	UK	1	G,L
999	Schwerin (RIAS)	Germany	20	H*
999	Torino	Italy	20	M*
999	Madrid(COPE)	Spain	50	B*,D*,H*,K*,M*
1008	SER via ?	Canaries/Spain	?	M*
1008	Flevo(Hilv-5)	Holland	400	A,B,H*,I,M
1017	Rheinsender(SWF)	Germany	600	B,C*,D*,H*,I*,M*
1017	RNE5 via ?	Spain	?	H*,I*
1026	SER via ?	Spain	?	H*,I*,M*
1035	Lisbon(Prog3)	Portugal	120	B*
1044	Dresden(MDR)	Germany	250	B,H*,I*,M*
1044	SER via ?	Spain	?	B*,I*,M*
1053	Zarogoza(COPE)	Spain	10	B*,M*
1053	Talk R.UK via ?	UK	?	B,C*,I,L,M
1062	Kalundborg	Denmark	250	A,B,C*,H*,I*,M*
1062	R.Uno via ?	Italy	?	H*,M*
1071	R.France via ?	France	?	B*,H*,L,M
1071	Brest	France	20	I*
1071	Lille	France	40	A
1071	Riga	Latvia	50	I*
1071	Bilbao(E1)	Spain	5	M
1071	Talk Radio UK via ?	UK	?	M*
1080	Katowice	Poland	1500	B*,H*,I*,M*
1080	SER via ?	Spain	?	I*,M*
1089	Krasnodar	Russia	300	H*
1089	Talk Radio UK via ?	UK	?	B,C*,I,L,M
1098	Nitra(Jarok)	Slovakia	1500	B,H*,I*,M*
1098	RNE5 via ?	Spain	?	M*
1107	AFN via ?	Germany	10	G,H*,M*
1107	RNE5 via ?	Spain	?	M*
1107	Talk R.UK via ?	UK	?	B,C*,I,M,N*
1116	Bari	Italy	150	K*,M*
1116	Pontevedra(SER)	Spain	5	M*
1125	La Louviere	Belgium	20	A,D,H*,I*,M
1125	Deanovec	Croatia	100	M*
1125	RNE5 via ?	Spain	?	D,H*,I*,M*
1125	Llandrindod Wells	UK	1	D,G
1134	COPE via ?	Spain	2	B*,I*,M*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	B,H*,I*,M*
1143	AFN via ?	Germany	1	D*,G,H*,I*,M*
1143	COPE via ?	Spain	2	D*,H*,I*,M*
1152	RNE5 via ?	Spain	10	M*
1161	Strasbourg(Flnt)	France	200	B*,H*,I*,M*
1161	S.Sebastian(E1)	Spain	50	M*
1179	SER via ?	Spain	?	H*,M*
1179	Solvesborg	Sweden	600	B,F,H*,I*,M*
1188	Kuume	Belgium	5	A,B*,H*,I*,M*
1188	Reichenbach(MDR)	Germany	5	B*,H*,M*
1188	Szolnok	Hungary	135	I*,M*
1197	Munich(VOA)	Germany	300	B,H*,M*
1197	Virgin via ?	UK	?	B,I,L,M
1206	Bordeaux	France	100	A,M
1206	Wroclaw	Poland	200	H*,M*
1215	Virgin via ?	UK	?	B,C*,I,L,M
1224	Vidin	Bulgaria	500	M*
1224	Lelystad	Holland	50	A,H*,M
1233	Liege	Belgium	5	H*,M*
1233	Virgin via ?	UK	?	B,M
1242	Marseille	France	150	H*,M
1242	Virgin via ?	UK	?	B,M*
1251	Marcali	Hungary	500	H*,M*
1251	Huisberg	Netherlands	10	B,H,M*
1251	R.Renascenca via ?	Portugal	10	F,M*
1260	SER via ?	Spain	?	H*,I*,M
1260	Guildford (V)	UK	0.5	M
1269	Neumunster(DLF)	Germany	600	A,B,C*,H*,I*,M*,N*
1269	COPE via ?	Spain	?	I*,M*
1278	Strasbourg	France	300	A*,M
1278	Dublin/Cork(RTE2)	Ireland (S)	10	A*,B,G,I*,L,M
1287	RFE via ?	Czech Rep.	400	H*,I*,M*
1287	Lerida(SER)	Spain	10	M*
1296	Kardzali	Bulgaria	150	I*
1296	Valencia(COPE)	Spain	10	H*,M*
1296	Orfordness(BBC)	UK	500	A,G,L,M*
1305	Rzeszow	Poland	100	I*,L*
1305	RNE5 via ?	Spain	?	H*,I*
1314	Kvitsoy	Norway	1200	A,B,H*,I*,M*
1323	Zyyi(BBC)	Cyprus	200	M*
1323	W'brunn (V.Russia)	Germany	1000/150	A,B,H*,M*
1332	Rome	Italy	300	H*,I*,M*
1341	Lakihegy	Hungary	300	M*
1341	Lisnagarvey(BBC)	Ireland (N)	100	A,B,D*,E*,F,G,I*,L,M*
1341	Tarrasa(SER)	Spain	2	M*
1350	Nancy/Nice	France	100	A,B*,C*,H*,I*,M*
1359	Arganda (RNE-FS)	Spain	600	A*,H*,I*,M*,N*
1368	Foxdale(Manx R)	I.O.M.	20	A*,B,D*,G,H*,I*,J,L,M*,N*
1377	Lille	France	300	A,B*,H*,I*,M
1386	Ahwaz	Iran	400	M*
1386	Bolshakovo	Russia	2500	A*,H*,I*,M*
1395	Lushnje(Tirana)	Albania	1000	B*,C*,I*,N*
1395	TWR via Lushnje	Albania	500	H*,M*
1395	Lopic	Netherlands	120/40	A,H*,I*,M,N*
1404	Brest	France	20	A,B,H*,I*,L*,M*
1413	RNE5 via ?	Spain	?	H*,I*,M*
1422	Heusweiler(DLF)	Germany	1200/600	A*,B,C*,H*,I*,L*,M*
1422	Valmiera	Latvia	50	H*
1431	Kopani	Ukraine	500	H*
1440	Marnach(RTL)	Luxembourg	1200	A,B,H*,I,M*
1440	Damman	Saudi Arabia	1600	M*,N*
1449	Squinzano	Italy	50	A*,M*
1449	Redmoss(BBC)	UK	2	G,H*,L*,M*
1467	Monte Carlo(TWR)	Monaco	1000/400	A*,B*,H*,I*,M
1485	SER via ?	Spain	?	M*
1494	Clermont-Ferrand	France	20	A,H*,I*,M*
1494	St.Petersburg	Russia	1000	A*,M*
1503	Stargard	Poland	300	B*
1503	RNE5 via ?	Spain	?	I*,M*
1503	Beograd	Yugoslavia	10	A*
1512	Wolvertem	Belgium	600	A,B,D,H*,I,M
1512	Jeddah	Saudi Arabia	1000	M*
1521	Kosice(Cizatice)	Slovakia	600	B*,H*,I*
1521	Duba	Saudi Arabia	2000	M*,N*
1530	Vatican R	Italy	150/450	D*,H*,I*,L*,M*,N*
1539	SER via ?	Spain	?	M*
1557	Nice	France	300	L*,M,N*
1566	Samen	Switzerland	300	A,D*,I*
1566	Sfax	Tunisia	1200	M*,N*
1575	Genova	Italy	50	H*,I*,M*
1575	SER via ?	Spain	5	I*,M*
1584	SER via ?	Spain	2	H*,I*,M*
1593	Holzkirchen(VOA)	Germany	150	I*,M*,N*
1602	SER via ?	Spain	?	I*,M*
1602	Vitoria(E1)	Spain	10	H*,I*,M*
1611	Vatican R	Italy	15	C*

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

Listeners:-
(A) Paul Bowery, Burnham-on-Crouch.
(B) Martin Dale, Stockport.
(C) Ted Harris, Manchester.
(D) Sheila Hughes, Morden.
(E) Nicola Hutchings, Wellington.
(F) Rhoderick Illman, Oxted.
(G) Brian Keyte, Bockham.
(H) Eddie McKeown, Newry.
(I) George Millmore, Wootton IoW.
(J) Chris Ridley, Cranmore, Co.Sligo, Eire.
(K) David Sayles, Doncaster.
(L) Tom Smyth, Co.Fermanagh
(M) Tony Stickells, Thornton Heath.
(N) Norman Thompson, Oadby.

R.Pakistan, Islamabad 15.470 (Eng to Eur 0800-0848), rated 44444 at 0841 in E.Worthing; AIR via ? 15.050 (Ind to Indonesia 0845-0945) 33333 at 0930 in Stalbridge; Voice of Malaysia, Kajang 15.295 (Mal to S.Asia 0830-1025) 22232 at 0945 in Scalloway; VOIRI via Kamalabad 15.084 (Pers to Iran, Eur) 34434 at 1010 in Oxted; VOIRI via Zahedan 15.365 (Pers to M.East) 24332 at 1010 in Oxted; BBC via Rampisham, UK 15.575 (Eng to Eur, M.East, W.Asia 0400-1615) 44444 at 1030 in Morden; BBC via Antigua, W.Indies 15.220 (Eng to C/S.America 1100-1400) 34343 at 1150 in Woking; R.Denmark via RNI 15.270 (Eng to Eur, N.America 1130-1155) 34433 at 1150 in Bridgwater.

During the afternoon RFI via Issoudun 15.115 (Eng to E.Eur 1200-1300) was 43433 at 1220 in Herstmonceux; R.Finland via Pori 15.400 (Eng to N.America 1230-1300) 44444 at 1245 in Storrington; R.Romania 15.390 (Eng to Eur 1300-1356) 54444 at 1307 in Ross-on-Wye; R.Nederlands via Madagascar 15.585 (Eng to S.Asia, M.East 1330-1525) 24322 at 1330 in Newry; Voice of Greece, Athens 15.630 (Gr, Eng to N.America 1300-1350) 44544 at 1335 in Galashiels; Voice of Russia 15.460 (Eng [WS]) 54444 at 1357 in Freshwater Bay; WWCR Nashville, USA 15.685 (Eng to Eur 1100-0000) 25332 at 1420 in Chester; RCI via Sines, Portugal 15.325 (Eng to Eur, M.East, Africa 1430-1600) 54444 at 1431 in Ross-on-Wye; RRI Jakarta 15.150 (Ind [Progama Nasional relay]) SIO333 at 1436 in Doncaster; WEWN Vandiver, USA 15.665 (Eng to Eur 1200?-1656?) SIO433 at 1511 by **Philip Rambaut** in Macclesfield; WYFR via Okeechobee 15.695 (Eng to Eur, Africa 1600-1900) 54444 at 1611 in Plymouth; Channel Africa 15.240 (Eng to Africa) 35343 at 1618 in Newry.

In the evening KTBN Salt Lake City, USA 15.590 (Eng to N.America 1600-0000) was 24222 at 1755 by **Vera Brindley** in Woodhall Spa; VOA via Selebi-Phikwe, Botswana 15.445 (Eng to Africa 1630-1800 [Sat/Sun add 1600-1630]) 44454 in Larnaca, Cyprus; VOA via Greenville 15.580 (Eng to Africa 1800-2200) SIO433 at 1800 in Co.Fermanagh; BBC via Ascension Is 15.400 (Eng to Africa 1430?-2100?) 45444 at 1812 in Burnham-on-Crouch; RNB Brazil 15.265 (Port, Eng, Ger to Eur 1630-2020) 22222 at 1912 in

Local Radio Chart

Freq (kHz)	Station	ILR	BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I		0.80	A,C,H,K,O,P*
585	R.Solway		B	2.00	B,H
603	Cheltenham R.	I		0.10	B,C,F,H,K,O,P*
603	InvictaSG,Litt'brne	I		0.10	A,E*,H,K,O
630	R.Bedfordshire(3CR)		B	0.20	A,B,C,E,F,H,K,O
630	R.Cornwall		B	2.00	B,H,K
657	R.Clwyd		B	2.00	B,H,K
657	R.Cornwall		B	0.50	B,H,K
666	Gemini AM, Exeter	I		0.34	H,K,O
666	R.York		B	0.80	B,C,H,I,P*
729	BBC Essex		B	0.20	A,C,H,K,O
738	Hereford/Worcester		B	0.037	B,C,D,E,H,K,O
756	R.Cumbria		B	1.00	B,H,I,J
756	R.Maldwyn, Powys	I		0.63	B,C,H,K,N
765	BBC Essex		B	0.50	A,B,C,D,E*,H,K,O
774	R.Kent		B	0.70	A,H,K,O
774	R.Leeds		B	0.50	B,C,H,I
774	3 Counties SG, Glos	I		0.14	B,F,K
792	Chiltern SG,Bedford	I		0.27	A,C,H,K,O,P*
792	R.Foyle		B	1.00	B
801	R.Devon & Dorset		B	2.00	C,H,K
828	Chiltern SG, Luton	I		0.20	A,H,O
828	Magic 828, Leeds	I		0.12	C
828	R.WM		B	0.20	C
828	2CR CG, Bournemouth	I		0.27	F,K
837	R.Cumbria/Furness		B	1.50	B,I,J*
837	R.Leicester		B	0.45	A,C,E*,H,K,O,P*
855	R.Devon & Dorset		B	1.00	H,K,N
855	R.Lancashire		B	1.50	B,C,I,J*
855	R.Norfolk		B	1.50	A,G,H,I,O
855	Sunshine 855,Ludlow	I		0.15	C,F,H
873	R.Norfolk		B	0.30	A,C,G,H,K,O,P*
936	Brunel CG, W.Wilts	I		0.18	C,O,F,H,K,O,P*
945	S.Coast R. Bexhill	I		0.75	E*,F,H,I*,K,O
945	Derby (Gem AM)	I		0.20	A,B,C,F,I,P*
954	Gemini AM, Torquay	I		0.32	B,F,K
954	Wyvern AM, Hereford	I		0.16	C,D,H,I,O
963	Asian Sd,Manchester	I		?	B,C,N
963	Viva, Southall	I		1.00	A,F,H,K,O,P*
990	R.Devon & Dorset		B	1.00	B,H,K,L
990	Gt.Yks G, Doncaster	I		0.25	C
990	WABC, Wolverhampton	I		0.09	C,H,P*
999	Gem AM, Nottingham	I		0.25	A,C
999	Red Rose G, Preston	I		0.80	B,C,H,I*,L
999	R.Solent		B	1.00	A,F,H,K,M*,O
1017	WABC, Shrewsbury	I		0.70	B,C,E*,F,H,I,L
1026	R.Cambridgeshire		B	0.50	A,C,H,I,J*,O,P*
1026	Downtown, Belfast	I		1.70	B,F*,L,N
1026	R.Jersey		B	1.00	F,H,K,M*
1035	RTL Country 1035	I		1.00	A,B,F,H,I*,K,O
1035	R.Sheffield		B	1.00	C
1035	N.Sound, Aberdeen	I		0.78	B,I
1107	Moray Fth,Inverness	I		1.50	I,J
1116	R.Derby		B	1.20	B,C,F*,H,I,N,O*
1116	R.Guernsey		B	0.50	A,F,G,H,K,O
1116	Valleys R.	I		?	I
1152	Amber, Norwich	I		0.83	A,C*,F,I*
1152	Clyde 2, Glasgow	I		3.06	I
1152	GNR, Newcastle	I		1.80	I
1152	LBC 1152	I		23.50	A,F*,H,J*,K,O
1152	Pic'ly 1152,Manch'r	I		1.50	B,C
1152	Xtra-AM, Birmingham	I		3.00	F*,P*
1161	R.Bedfordshire(3CR)		B	0.10	A,H,O
1161	Brunel CG, Swindon	I		0.16	B,F,H,K,O
1161	Gt.Yks, Hull	I		0.35	C,F*,I
1161	Southern Counties R		B	1.00	A,H,K,O
1161	Tay AM, Dundee	I		1.40	B,I
1170	Amber SGR, Ipswich	I		0.28	A,I*,P*
1170	GNR, Stockton	I		0.32	F*,I
1170	SCR, Portsmouth	I		0.50	G,H,K
1170	Signal G,Stoke-on-T	I		0.20	C,I*
1170	Swansea Snd,Swansea	I		0.58	B,F
1170	1170AM,High Wycombe	I		0.25	H,O,P*
1242	InvictaSG,Maidstone	I		0.32	A,H,O
1242	IoW Radio, Wootton	I		0.50	K,L*
1251	Amber SGR,Bury StEd	I		0.76	A,B,G,H,I*,J*,L*,O
1260	Brunel CG, Bristol	I		1.60	F,I,N
1260	Marcher G, Wrexham	I		0.64	C,F*,I
1260	SabrasSnd,Leicester	I		0.29	F*,I,P*
1260	R.York		B	0.50	B
1278	Gt.Yks G, Bradford	I		0.43	I,J*
1296	Radio XL,Birmingham	I		5.00	B,C,F,H,I,K,L*,O,P*
1305	Gt.Yks G, Barnsley	I		0.15	B,C,I
1305	Premier via ?	I		0.50	A,G,H,I,K,O
1305	Touch AM, Newport	I		0.20	B,F,I,K
1323	S.Coast R,Southwick	I		0.50	A,H,K,O
1332	Premier, Battersea	I		1.00	A,B,G,H,I,K,O
1332	CGd 1332, Peterbr'	I		0.60	B,F*,I
1332	Wiltshire Sound		B	0.30	H,J*,K
1359	BreezeAM,Chelmsford	I		0.28	A,H,I,O
1359	CGd 1359, Coventry	I		0.27	C,H
1359	R.Solent		B	0.85	G,H,I,K
1359	Touch AM, Cardiff	I		0.20	F*,I
1368	R.Lincolnshire		B	2.00	H,P*
1368	Southern Counties R		B	0.50	A,E*,H,I,K,O
1368	Wiltshire Sound		B	0.10	K
1377	Asian Sound, Manch'	I		?	C,F*,I
1413	Premier via ?	I		0.50	A,F,G,H,I,K,O
1431	Breeze AM, Southend	I		0.35	A,C,D*,F*,H,I,K,O
1431	CGd 1431, Reading	I		0.14	C,H,I,K,O
1449	R.Peterboro/Cambs		B	0.15	A,B,O
1458	R.Cumbria		B	0.50	B,H,I
1458	R.Devon & Dorset		B	2.00	F,H,I,K
1458	1458 Lite AM Manch'	I		5.00	C,H,I,J*,L*,N
1458	Sunrise, London	I		50.00	A,C,F,H,I,K,O
1458	Radio WM		B	5.00	P*
1476	CountySnd, Guildford	I		0.50	A,E,F*,H,I*,K,O
1485	R.Humberside (Hull)		B	1.00	I,J*,P*
1485	R.Merseyside		B	1.20	B,C,I,J*,N
1485	Southern Counties R		B	1.00	A,H,I,K,O
1503	R.Stoke-on-Trent		B	1.00	B,C,F*,G,H,I,J*,K,O
1521	R.1521 Craigavon,NI	I		0.50	B,F*,I,N
1521	Fame 1521, Reigate	I		0.64	A,C,E,F*,G,H,I*,K,O
1530	R.Essex		B	0.15	A,H,K,O
1530	Gt.Yks G,Huddersf'd	I		0.74	B,C,F*,I,L,N
1530	Wyvern, Worcester	I		0.52	F,I,K,L,O,P*
1548	R.Bristol		B	5.00	K,L
1548	Capital G, London	I		97.50	A,H,K,L,O,P*
1548	City G, Liverpool	I		4.40	B,C,J*,L
1548	Gt.Yks G, Sheffield	I		0.74	H*
1548	Max AM, Edinburgh	I		2.20	F*,I
1557	R.Lancashire		B	0.25	B,C,F*,I
1557	Mellow, Clacton	I		0.8	A,H,I*,O
1557	Northants CG	I		0.76	C,F*,I,J*,L,O,P*
1557	S.Coast R, So'ton	I		0.50	F*,H,K,L
1584	KCBC, Kettering	I		0.04	F*,P*
1584	London Turkish R	I		?	A,F*,H,K,O
1584	R.Nottingham		B	1.00	C,F,G,172,I,L
1584	R.Shropshire		B	0.50	B,H
1584	Tay, Perth	I		0.21	F*,H,I
1602	R.Kent		B	0.25	A,B,H,I,K,O

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

Listeners:-
(A) Paul Bowery, Burnham-on-Crouch.
(B) Robert Connolly, Kilkeel.
(C) Martin Dale, Stockport.
(D) Francis Hearne, N.Bristol.
(E) Sheila Hughes, Morden
(F) Nicola Hutchings, Wellington.
(G) Rhoderick Illman, Oxted.
(H) Brian Keyte, Bookham.
(I) Ross Lockley, Galashiels.
(J) Eddie McKeown, Newry.
(K) George Millmore, Wootton, IoW.
(L) Chris Ridley, Co.Sligo, Eire.
(M) David Sayles, Doncaster.
(N) Tom Smyth, Co.Fermanagh.
(O) Tony Stickells, Thornton Heath.
(P) Norman Thompson, Oadby.

Truro; RAE Buenos Aires, Argentina 15.345 (Eng, Fr, Ger, It, Sp to Eur, N.Africa 1900-2300) 24542 at 2040 in Wallsend.

The occupants of the **13MHz (22m)** band during the morning include SRI via Sottens? 13.685 (It, Eng, Fr, Ger, Port to Australasia 0830-1100), noted as 44444 at 0820 in Kilkeel; R.Nederlands via Irkutsk 13.700 (Eng to Pacific, E.Asia 0830-0925) 34322 at 0830 in Newry; Monitor R, via KHBI Saipan, N.Mariana Is 13.840 (Eng to Asia, Pacific 0900?-1058) 34333 at 0900 in Scalloway; UAER, Dubai 13.675 (Eng to Eur 1030-1055) 35434 at 1045 in Freshwater Bay; SRI via Sottens? 13.635 (Eng, Fr, Ger, It to Far East 1100-1245) 33333 at 1100 in Truro; R.Australia via Darwin 13.605 (Eng, Chin to Asia 0900-1200) SIO433 at 1130 in Macclesfield.

Noted after mid-day were UAER, Dubai 13.675 (Eng to Eur 1330-1355), rated 53433 at 1335 in Herstmonceux; WYFR via Okeechobee 13.695 (Eng to N.America 1300-1400) 24222 at 1345 in Woodhall Spa; WWCR Nashville, USA 13.845 (Eng to E.USA 1400-0100) 34323 at 1511 in Woking; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eur 0400-1800) 44544 at 1535 in Bridgwater; VOA via Selebi-Phikwe, Botswana 13.710 (Eng to Africa 1600-2030?) 43333 at 1645 in Stalbridge; WHRI South Bend, USA 13.760 (Eng to E.USA, Eur 1500-2200) 24342 at 1800 in Chester.

Better reception from some areas has been noted in the **11MHz (25m)** band. During the daytime SRI via ? 12.075 (It, Eng, Fr, Ger, Port to Australasia 0830-1100) was 24222 at 0902 in Newry; FEBC Bocaue, Philippines 11.635 (Eng to Asia 0930-1100) 23222 at 0945 in Morden; R.Sweden via Horby? 11.650 (Eng to N.America 1230-1300) 33333 at 1230 in Truro; RCI via Sackville 11.855 (Eng to USA, Caribbean 1300-1400) 43334 at 1300 by Gerald Guest in Dudley; R.Romania Int, Bucharest 11.940 (Eng to Eur 1300-1400) 33333 at 1313 by Martin Dale in Stockport; BBC via Woofferton, UK 12.095 (Eng to Eur, N/W.Africa 1000-2230) 54554 at 1430 in Kirkby Stephen; RCI via Skelton, UK 11.935 (Eng, Fr to Eur, M.East, Africa 1430-1530) 43333 at 1437 in Ross-on-Wye; RCI via Sines, Portugal 11.915 (Eng, Fr to Eur, M.East, Africa 1430-1530) 45444 at 1454 in Storrington.

Later, R.Kuwait via Kabd 11.990 (Eng to Eur, N.America 1800-2100) was SIO444 at 1800 in Co.Fermanagh; R.Nederlands via Meyerton, S.Africa 11.655 (Eng to Africa 1730-2025) SIO322 at 1934 in Woking; RCI via Sackville 11.945 (Fr, Eng to Eur, M.East, Africa 2000?-2230) 43333 at 2015 in Stalbridge; R.Damascus via Adra 12.085 (Eng to Eur 2005-2105) 22222 at 2023 in Plymouth; WWCR Nashville, USA 12.160 (Eng to Eur? 1500-2300) 35444 at 2140 in Chester; SRI via Montsinery, Fr.Guiana 11.650 (Eng, Ger, It, Sp to S.America 2215-0000) 44444 at 2220 in Kilkeel.

Radio New Zealand has been reaching the UK in the **9MHz (31m)** band! Their 100kW transmission from Rangitaki on 9.700 (Eng to Pacific areas 0717?-1206?) was rated 22222 at 0920 in Stalbridge. R.Australia has been heard on 9.580 from Shepparton (Eng to Pacific areas 1430-2058) 43334 at 1535 in Truro; and 9.615 from Darwin (Eng to Asia 1100-1755), 33342 at 1600 in Oxted.

Other broadcasters using this band include SRI via Fr.Guiana 9.885 (It, Eng, Fr, Ger, Port to Australasia 0830-1100), logged as 34333 at 0953 in Woking; BBC via Skelton, UK 9.410 (Eng to Eur, N/C.Africa 0300-2300) 43333 at 1200 in Dudley; RCI via Sackville 9.640 (Eng to USA, Caribbean 1300-1400) 22242 at 1300 in Storrington; BBC via Kranji, Singapore 9.740 (Eng to S.E.Asia 0500-2200) 34343 at 1314 in Burnham-on-Crouch; RCI via Skelton, UK 9.555 (Eng, Fr to Eur, M.East, Africa 1430-1530) 22332 at 1440 in Ross-on-Wye; WYFR via VOFC Taiwan 9.280 (Chin to China 1102-1605) 33333 at 1505 in Scalloway; SRI via Schwarzenburg? 9.885 (Eng, Ger, It, Fr to E.Africa 1700-1845) SIO444 at 1730 in Macclesfield; AIR via Delhi? 9.950 (Eng to W/N.Africa, M.East 1745-1945) SIO444 at 1900 in Co.Fermanagh; R.Nederlands via Madagascar 9.605 (Eng to S/E/W.Africa 1730-2025) 33333 at 1922 in Newry; Voice of Indonesia, Jakarta 9.525 (Eng to Eur 2000-2030) 44444 at 2004 in Wallsend; Yemen R, Sana'a 9.780 (Ar to M.East 0255-2130) 54333 at 2030 in Oadby; R.Portugal via Sines? 9.815 (Eng, Fr to Eur, Africa 2000-2100 Mon-Fri) 32222 at 2035 in Plymouth; WVHA via Scotts Corner, USA 9.930 (Eng to Eur, Africa 1900?-2200?) 54444 at 2050 in Chester; VOA via Gloria, Portugal 9.760 (Eng to M.East 1700?-2200) 54444 at 2115 in Stockport; RCI via Sackville? 9.805 (Eng to Eur, M.East, Africa? 2100?-2230?) 34443 at 2125 in Storrington; VOFC Taiwan via WYFR USA 9.985 (Eng to Eur 2200-2300) 34322 at 2244 in Bridgwater.

Some of the broadcasts in the **7MHz (41m)** band come from RFPI Costa Rica 7.385 (Eng 24hrs), rated 22222 at 0634 in Plymouth; WEWN Birmingham, USA 7.465 (Eng to Eur 1000-1200) 43333 at 1018 in Ross-on-Wye; Sudwestfunk via Rohrdorf 7.265 (Ger to Eur 24hrs) 44343 at 1040 in Oadby; R.Norway Int, Oslo 7.295 (Norw to Eur, N.America 1100-1129) SIO333 at 1111 in Macclesfield; R.Denmark via RNI 7.295 (Da [Eng 1st Sun] to Eur, N.America 1130-1200) 33333 at 1138 in Truro; R.Nederlands via Nauen 7.190 (Eng to Eur 1130-1325) 45333 at 1130 in Newry; R.Romania Int, Bucharest 7.195 (Eng to Eur 1900-1956) 34434 at 1920 in Woodhall Spa; RAI Rome 7.235 (Eng to Eur 1935-1955) 43343 at 1944 in Oxted; VOIRI Tehran 7.260 (Eng to Eur, M.East 1930-2027) 52432 at 2025 in Chester; Voice of Mediterranean via Russia? 7.390 (Eng to Eur? ?-2100) 44343 at 2044 in Bridgwater; R.Bulgaria via Plovdiv 7.330 (Eng to Eur 2000-2100) 43333 at 2050 in Storrington; Voice of Russia 7.400 (Eng [WS] to Eur) 43333 at 2105 in Stalbridge; WJCR Upton, USA 7.490 (Eng to E.USA 24hrs) 23222 at 2205 in Kilkeel; RCI via Skelton, UK 7.235 (Eng to Eur, M.East, Africa 2100-2230) 22342 at 2207 in Storrington; VOA via Selebi-Phikwe, Botswana 7.415 (Eng to Africa 1900-2230) 44444 at 2227 in E.Worthing; Monitor R.Int, via WSHB 7.510 (Eng to Eur, Africa 2200-0000?) SIO444 at 2242 by **Francis Hearne** in N.Bristol; Vatican R, Italy 7.305 (Eng to N.America 0300-0315) 43344 at 0310 in Scalloway.

In the **6MHz (49m)** band HCJB Quito 5.860 (Eng to Eur) was 54444 at 0750 in Ross-on-Wye; R.Nederlands via Julich 6.045 (Eng to Eur 1130-1325) 45344 at 1208 in

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2047	D,H,J
2.325	ABC Tennant Creel	Australia	2047	H
2.485	ABC Katherine	Australia	2048	H
2.850	KCBS Pyongyang	N.Korea	1540	N
3.223	AIR Simla	India	1610	I,K
3.230	SABC Meyerton	S.Africa	2049	B,H,I,K
3.240	TWR Shona	Swaziland	1757	K
3.245	AIR Lucknow	India	1725	D,H,N,I,K
3.255	BBC via Maseru	Lesotho	2025	H,K,M
3.270	SWABC 1, Namibia	S.W.Afrca	2050	B,H,K
3.290	Namibian BC,Windhoek	S.W.Africa	2210	B,H,K
3.306	ZBC Prog 2	Zimbabwe	0327	D,H,K
3.315	AIR Bhopal	India	1532	B,D,H,I,K,N
3.316	SLBS Goderich	Sierra Leone	2051	H,K
3.320	SABC Meyerton	S.Africa	2109	B,H,K,M
3.325	FRCN Lagos	Nigeria	2051	H
3.330	Christian Voice	Zambia	2049	H
3.335	CBS Taipei	Taiwan	1750	H,I,K,N
3.340	R.Uganda, Kampala	Uganda	1928	H
3.345	AIR Jaipur	India	0025	B
3.345	AIR Jammu	India	1731	H,I,K,N
3.356	R.Botswana	Gabarone	2053	H,I,K
3.365	GBC R-2	Ghana	2245	B,C,H,J,K
3.365	AIR Delhi	India	1532	A,D,H,I,K,N
3.375	R.Nacional S.Gabriel	Brazil	0012	K
3.377	R.Nacional, Mulenvos	Angola	1856	H
3.390	AIR Gangtok	India	1530	N
3.395	ZBC Gweru	Zimbabwe	0327	K
3.915	BBC via Kranji	Singapore	1654	A,C,H
3.945	AIR Gorakhpur	India	1615	K
3.945	Vatican Radio	Italy	0045	B
3.950	Qinghai PBS, Xining	China	1733	B,K,M
3.955	BBC via Skelton	England	0800	L
3.965	RFI Paris	France	2235	B,C,F,M
3.970	R.Korea via Skelton	England	2046	N
3.975	R.Budapest	Hungary	2110	F
3.985	R.France Int	France	2035	N
3.985	Nexus, Milan	Italy	0650	F,G
3.995	DW via Julich	Germany	2044	B,M,N
4.000	RRI-Kendari	Indonesia	1640	K
4.005	Vatican R.	Italy	0040	B
4.035	Xizang PBS, Lhasa	Tibet	0002	F,I
4.130	V of the Strait 1	China	2305	M
4.330	Xinjiang BS, Urumqi	China	1613	K
4.460	CPBS 1, Beijing	China	1605	K,N
4.500	Xinjiang BS, Urumqi	China	1600	A,K,N
4.735	Xinjiang, Urumqi	China	1555	A,B,K,N
4.750	Xizang BS, Lhasa	Tibet	0010	B,K
4.755	R.Educ CP Grande	Brazil	0040	B
4.760	Yunnan PBS,Kunming	China	2107	B,K
4.760	AIR Port Blair	India	1616	K,N
4.760	TWR Manzini	Swaziland	0330	K
4.765	R.Integracao	Brazil	0035	B
4.770	Centinela del Sur	Ecuador	2233	B,C
4.770	FRCN Kaduna	Nigeria	2046	F,H,K,M
4.775	AIR Imphal	India	1707	B,H,K,N
4.777	R.Gabon, Libreville	Gabon	1947	F,H,K,N
4.783	RTM Bamako	Mali	2001	B,C,H,K
4.790	Azad Kashmir R.	Pakistan	1625	B,K
4.790	R.Atlantida	Peru	2225	K
4.800	AIR Hyderabad	India	1628	B,K
4.800	LNBS Lesotho	Maseru	1941	H,N
4.805	R.Nac.Amazonas	Brazil	0005	B,K
4.815	R.Difusora, Londrina	Brazil	0040	B
4.815	R.diff TV Burkina	Ouagadougou	2248	B,C,H,K
4.820	AIR Calcutta	India	1709	B,H
4.828	ZBC R-4	Zimbabwe	2114	H,K
4.830	R.Botswana, Gaborone	Botswana	2219	C
4.830	China Huayi BC	China	1440	K
4.830	R.Bangkok	Thailand	1620	K
4.830	R.Tachira	Venezuela	2335	A,B,D,K
4.832	R.Reloj	Costa Rica	2312	M
4.835	R.Tezulutlan, Coban	Guatemala	0050	B
4.835	RTM Bamako	Mali	1955	B,C,F,H,K
4.840	AIR Bombay	India	1650	A,B,K,N
4.845	RTM Kuala Lumpur	Malaysia	1645	K
4.845	ORTM Nouakchott	Mauritania	2040	B,H,K,N
4.855	R.Mozambique	Mozambique	1655	N
4.860	AIR Delhi	India	0110	B,145
4.860	AIR Kingway (Feeder)	India	1644	K
4.865	PBS Lanzhou	China	2305	A,D,K
4.870	R.Cotonou	Benin	1957	H,K
4.870	Voz del Upano	Ecuador	0050	B
4.875	R.Roraima, Boa Vista	Brazil	0305	K
4.879	R.Bangladesh	Bangladesh	0021	A,K
4.880	R. Difusora Acreana	Brazil	2220	K
4.880	AIR Lucknow	India	0115	B
4.885	R.Clube do Para	Brazil	0055	A,B,K
4.885	R.Difusora Acreana	Brazil	2345	B
4.885	KBC East Sce Nairobi	Kenya	1800	H
4.890	R.Port Moresby	New Guinea	1950	H
4.890	ORTS Dakar	Senegal	0505	K
4.895	Voz del Rio Arauca	Colombia	0040	B
4.895	AIR Kurseong	India	1720	A,K
4.900	Haixia 2	China	1430	K
4.900	SLBC Colombo	Sri Lanka	0100	B
4.905	Anhanguera	Brazil	2206	M
4.905	R.Nat.N'djamena	Chad	2057	A,E,H,K
4.910	RTG Conakry	Guinea	2340	B
4.910	R.Zambia, Lusaka	Zambia	2037	D,H,K
4.914	R.Cora del Paru,Lima	Peru	0400	E
4.915	GBC-1, Accra	Ghana	2146	A,B,H,K,M
4.915	KBC Cent Sce Nairobi	Kenya	1953	H
4.920	R.Quito, Quito	Ecuador	0315	D,E,K
4.931	R.Internacional	Honduras	0425	E
4.935	R.Capixaba, Vitoria	Brazil	0500	K
4.940	Haixia 1	China	2315	K
4.940	AIR Guwahati	India	1640	A,K
4.940	SLBC (Eng.Comm.Svce)	Sri Lanka	0110	B
4.950	R.Nacional, Mulvenos	Angola	2026	A,H,K
4.950	AIR Jammu	India	0100	B,I,K
4.950	R.Madre de Dios	Peru	2317	B,M
4.950	VOA via Sao Tome	Sao Tome	2044	F,H
4.955	R.Nac. de Colombia	Colombia	2350	B,K
4.960	Hanoi 2	Vietnam	1450	K
4.970	PBS Xinjiang	China	1620	K
4.970	AIR Shillong	India	0050	B
4.975	Fujian 1, Fuzhou	China	1400	K
4.980	PBS Xinjiang, Urumqi	China	1600	B,K
4.980	Ecos del Torbes	Venezuela	0020	B,C,D,F,K
4.985	R.Brazil Central	Brazil	0050	B,K
4.990	FRCN Lagos	Nigeria	2029	H
5.005	R.Nacional, Bata	Eq.Guinea	2002	A,H,K,N
5.005	R.Nepal, Kathmandu	Nepal	1627	A,I,K
5.010	AIR Thiru'puram	India	0055	B
5.015	R.Brazil Tropical	Brazil	0100	B
5.020	PBS-Jiangxi Nanchang	China	1545	B,K
5.020	La V du Sahel,Niamey	Niger	2026	A,H,K
5.020	SLBC Tamil Home Sce.	Sri-Lanka	1759	K
5.025	R.Parakou	Benin	2037	A,H,J,K
5.025	R.Rebelde, Habana	Cuba	0310	B,K
5.025	R.Uganda, Kampala	Uganda	2038	H
5.030	AWR Latin America	Costa Rica	0125	B
5.035	R.Bangui	C.Africa	2030	A,H
5.040	Voz del Upano, Macas	Ecuador	0100	B
5.045	R.Cultura do Para	Brazil	0105	B
5.047	R.Togo, Lome	Togo	2032	A,B,C,H,J,K
5.050	Guangxi FBS, Nanning	China	1620	K
5.050	Haixia 1	China	1502	A
5.050	AIR Aizawl	India	0110	B
5.050	R.Tanzania	Tanzania	1900	E,H
5.055	RFO Cayenne(Matoury)	French Guiana	2345	B,K

DXers:-
(A) Paul Bowery, Burnham-on-Crouch.
(B) Robert Connolly, Kilkeel.
(C) John Eaton, Woking.
(D) David Edwardson, Wallsend.
(E) Bill Griffith, S.W.London.
(F) Sheila Hughes, Morden.
(G) Rhoderick Illman, Oxted.
(H) Fred Pallant, Storrington.
(I) John Parry, Larnaca, Cyprus.
(J) David Sayles, Doncaster.
(K) John Slater, Scalloway.
(L) Tom Smyth, Co.Fermanagh.
(M) Norman Thompson, Oadby
(N) Mahendra Vaghjee, Rose Hill, Mauritius.

QUARTERLY LIST OF EQUIPMENT USED

LM&S for $November, #December'96, *January'97

$Tim Allison, Middlesborough: Lowe HF-225 + r.w.
S#*Darren Beasley, Bridgwater: Yaesu FRG-100 + a.t.u. + 15m wire.
S#*Paul Bowery, Burnham-on-Crouch: Sangean ATS803A + 30m wire.
S#*Vera Brindley, Woodhall Spa: Sony CRF-320 or Sangean ATS803A + r.w.
S#*Robert Connolly, Kilkeel: JRC NRD-525 + Datong AD370.
S*Martin Cowin, Kirkby Stephen: Hitachi TRK-5854E + built-in whip.
#*Paul Crankshaw, Troon: Lowe HF-225 + Mag Balun + 30m wire or loop.
S#*Bernard Curtis, Stalbridge: Tatung TMR7602 + rod antenna.
*Martin Dale, Stockport: Grundig Satellit 3000 or Sangean ATS803A + a.t.u. + 23m wire or Capco loop.
#*Ron Damp, Worthing: JRC NRD-525 + Mag Balun + 14m wire.
S#*John Eaton, Woking: Lowe HF-225 + Datong AD270 or a.t.u. + r.w.
S#*David Edwardson, Wallsend: Trio R-600 + Balun + invert V trap dipole or loop.
S#*Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
SPeter Gordon-Smith, Kingston, Moray: Icom R72 + a.t.u. + inverted V dipole.
*Michael Griffin, Ross-on-Wye: Lowe HF-225 + a.t.u. + 45m wire.
#*Bill Griffith, W.London: JRC NRD-535 + 20m wire.
SBill Griffith, while in Vancouver: Sony ICF-2002 + AN-1.
#*Gerald Guest, Dudley: Roberts RC818 + r.w.
S*Tony Hall, Freshwater Bay, IoW: Yaesu FRG-7 + r.w. or RF845
S#*Ted Harris, Manchester: Roberts RC818 (Roberts R101 in Germany).
#Gerry Haynes, Bushey Heath: Kenwood R-5000 + Mag Balun + 40m wire.
#Gerry Haynes, while in Talgarth: Kenwood R-5000 + Kiwa loop.
S#*Francis Hearne, N.Bristol: Sharp WQT370 or Selena Vega B210 + r.w.
S#*Sheila Hughes, Morden: Sony ICF-7600DS or Panasonic DR48 + 15m invert L.
#*Nicola Hutchings, Wellington: Sony Walkman.
S#*Rhoderick Illman, Oxted: Kenwood R-5000 + r.w. or Spny AN-1.
#Stephen Jones, Oswestry: Sanyo DCX W7 Hi-fi + r.w.
S#*Brian Keyte, Bookham: Panasonic Tuner ST-2600L + loop or Grundig Party Boy 700.
SJohan Leidekker, Deal: Lowe HF-225 + 20m wire.
S#*Ross Lockley, Galashiels: Realistic DX-300 + a.t.u. + 40m wire or Sangean ATS803A.
S#*Eddie McKeown, Newry: Tatung TMR 7602.
S#*George Millmore, Wootton, I.o.W: Sangean ATS803A or Racal RA17L + v.l.f. converter + loop.
S#*Fred Pallant, Storrington: Trio R2000 + Howes CTU8 a.t.u. + r.w.
#*John Parry, Larnaca, Cyprus: Realistic DX-400 + r.w.
#Roy Patrick, Derby: Lowe HF-125 + 22m wire.
S#*Clair Pinder, while in Appleby: JRC NRD-525 + a.t.u. + r.w.
SPeter Pollard, Rugby: Sony ICF-2001D + r.w.
S#*Philip Rambaut, Macclesfield: Int.Marine Radio R.700M + r.w.
SRichard Reynolds, Guildford: Sangean ATS803A + a.t.u. + 10m 'T'.
S#Harry Richards, Barton-on-Humber: Grundig Satellit 700 + AD270 or r.w.
#*Chris Ridley, Co.Sligo, Eire; Morphy Richards R-124 + home built loop.
S#*David Sayles, Doncaster: RX not stated + Timewave DSP599ZX processor.
S#*Eric Shaw, Chester: Lowe HF-225 + 7m wire.
#Chris Shorten, Norwich: Matsui MR 4099 + 10m wire.
S#*John Slater, Scalloway, Shetland: Lowe HF-150 + a.t.u. + 20m wire.
S#*Tom Smyth, Co.Fermanagh: Sangean ATS803A or Morphy Richards R191.
S#*Tony Stickells, Thornton Heath: Yaesu FRG-7700 + 20m wire or loop.
#Tony Stickells, while in Loire Valley: Yaesu FRG7700 + r.w.
S#*Norman Thompson, Oadby: Matsui MR 4099 + 20m wire in loft.
#Phil Townsend, London: Lowe HF-225 + preselector + r.w.
*Mahendra Vaghjee, Rose Hill, Mauritius: Not stated
S#Ted Walden-Vincent, Gt.Yarmouth: Sangean ATS803A.
S#*Thomas Williams, Truro: Sharp 5454 or Grundig Yacht Boy 206.
S#*Tom Winzor, Plymouth: Kenwood R-1000 or Eddystone 840C + Miller ant.
#*Julian Wood, Elgin: Kenwood R-2000 + Yaesu FRT-7700 a.t.u. + 5m wire or Philips D2935.

Newry; DW via Sines 6.075 (Ger to Eur) 55545 at 1231 in Kirkby Stephen; R.Australia via Shepparton 6.090 (Eng to Asia 1600-2058) 22332 at 1600 in Oxted; SRI via Lenk? 5.850 (Eng, Ger, It, Fr to E.Africa 1700-1845) 22111 at 1700 in Truro; R.Austria Int via Moosbrunn 6.155 (Ger, Eng, Fr, Sp to Eur 0400-2300) 44444 at 1733 in Woodhall Spa; R.Norway Int, Oslo 5.960 (Norw to Eur 1900-1929) SIO444 at 1900 in Co.Fermanagh; SRI via Lenk 6.165 (Eng to Eur 2000-2030) 55555 at 2015 in Oadby; China R.Int 6.950 (Eng to Eur 2000-2157) heard at 2031 in Plymouth; RCI via Skelton, UK 5.995 (Eng to Eur, M.East, Africa? 2100?-2230?) SIO222 at 2118 by **Julian Wood** in Elgin; Monitor R.Int, via WSHB 5.850 (Eng to USA, Eur 2000?-2200) 33333 at 2120 in Stalbridge; RCI via Sackville 5.925 (Fr, Eng to Eur, Africa 2000-2200) 43553 at 2151 in Bridgwater; WHRI South Bend, USA 5.745 (Eng to Eur 2200-0400) 44344 at 2227 in Woking; CKZN St.John's, Newfoundland 6.160 (Eng [Rly CBN] 0930-0500) 32332 at 0015 in Kilkeel; Croatian R. via Deanovec 5.895 (Cr [News in Eng hourly 2300-0400]) SIO444 at 0102 in N.Bristol.

Transatlantic DX Chart

Freq (kHz)	Station	Location	Time (UTC)	DXer
USA				
770	WABC	New York, NY	2320	B
850	WEEI	Boston, MA	0600	B,D
880	WCBS	New York, NY	2314	B
1010	WINS	New York, NY	0142	B,F
1130	WBBR	New York	0117	B,D,F
1440	WLPZ	Portland, MA	2326	B,D
1470	WZOU	Lewiston, ME	2352	B
1500	WTOP	Washington, D.C.	0006	B,D,F
1510	WNRB	Boston, MA	0126	B,F
1520	WWKB	Buffalo, NY	0750	B
1560	WQEW	New York	2330	B,D
1590	WARV	Warwick, RI	2243	B
1660	WJDM	Elizabeth, NJ	0745	B
CANADA				
560	CHVO	Carbonear, NF	2252	B
580	CJFX	Antigonish, NS	0622	B,D
590	VOCM	St.John's, NF	2307	A,B,C,D
620	CKCM	Grand Falls, NF	2314	B
700	CHSJ	St.John, NB	0801	B
710	CKVO	Clarenville, NF	0115	A
740	CHCM	Marystown, NF	0112	B,D
780	CFDR	Dartmouth, NS	0604	B
820	CHAM	Hamilton, ON	0150	A
920	CJCH	Halifax, NS	0207	B,F
930	CJYQ	St.John's, NF	2243	B,D,E,F
940	CBM	Montreal, PQ	0055	F
950	CHER	Sydney, NS	0105	B,F
1010	CFRB	Toronto, ON	0112	F
1140	CBI	Sydney, NS	0651	B
1380	CKPC	Brantford, ON	0121	F
1400	CBG	Gander,NF	2248	B
SOUTH AMERICA				
700	R.Nova Eldorado	Sao Paulo, Brazil	0633	B
770	RCN	Bogata, Colombia	0640	B
1470	R.Vibracion	Carupano, Venezuela	0610	B
1500	R.2000	Cumana, Venezuela	0605	B

DXers:-
(A) Robert Connolly, Kilkeel.
(B) Paul Crankshaw, Troon
(C) David Edwardson, Wallsend.
(D) David Sayles, Doncaster.
(E) John Slater, Scalloway.
(F) Tony Stickells, Thornton Heath.

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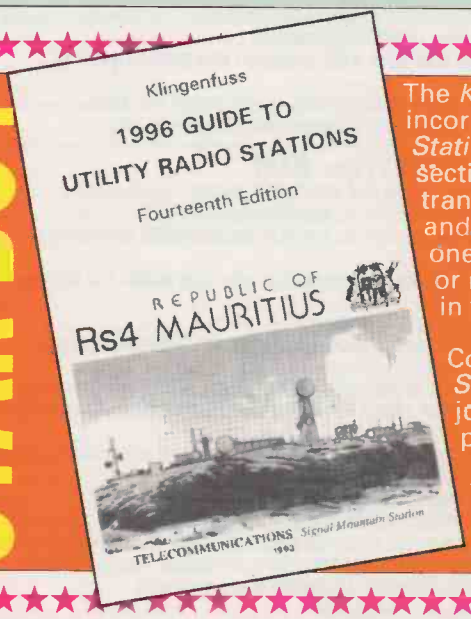

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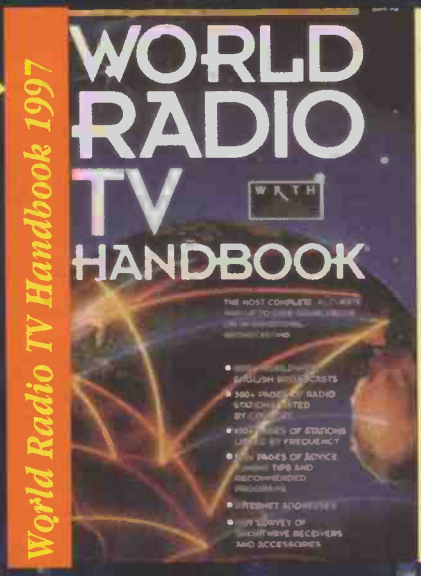
All the best for '97, 73 Michael

Fireside Reading

What can you read while you're all wrapped up warm and sat in front of the fire while outside it's just started to snow? Well, have a look at the five book profiles this month, make your choice, curl up and start that reading!

Profiles 1



JUST IN! NEW

As always, the *World Radio TV Handbook* provides the most up-to-date schedules and information including: a directory of hobby clubs for international listeners, Internet addresses of international broadcasters, listings in frequency order for medium wave and short wave broadcasts, independent reviews of short wave receivers and accessories and much, much more!

With its new design, this book is now claimed to be better than ever. It's a must have resource for radio novices and enthusiasts alike. The re-design, introduced in last year's edition, makes the book very attractive and accessible for first time users.

World Radio TV Handbook costs **£17.95** plus £1 P&P UK, order yours from the *SWM* Book Store (and **save £2 on normal retail price!**). Available now!

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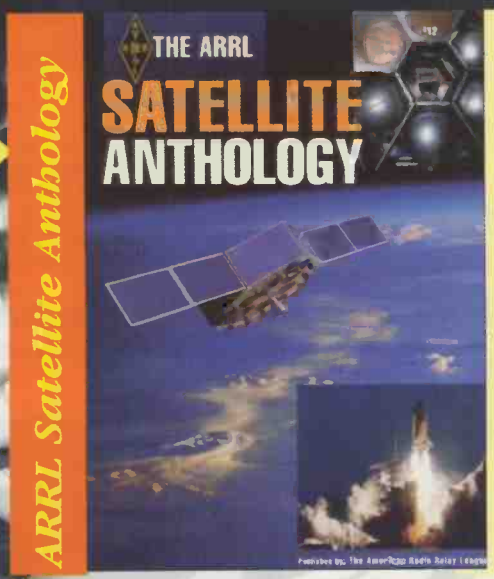

Whether you are an experienced space communicator or want to set-up your first satellite station, this book will get you where you want to be. With chapters covering the history of amateur space communications, a satellite glossary/modes and frequencies, British UoSATs, future satellites and amateur satellite communications, this book is a definite must!

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Profiles

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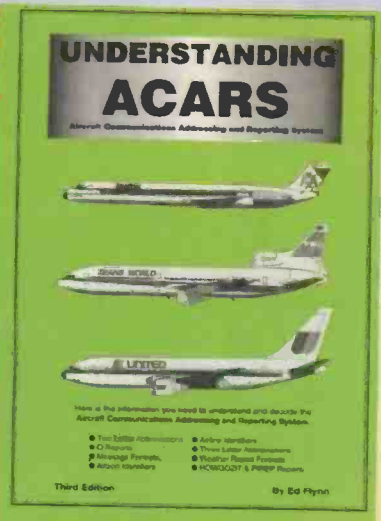

This is the third edition of understanding ACARS, (Aircraft Communications Addressing and Reporting System). Radio enthusiasts who enjoy aeronautical listening will find that ACARS monitoring provides an interesting new insight into aircraft communications. This book provides the information you need to interpret and understand these messages.

Message types and formats are clearly defined and abbreviations are fully explained. There are also useful tables of airline and airport identifiers contained within the 92 pages.

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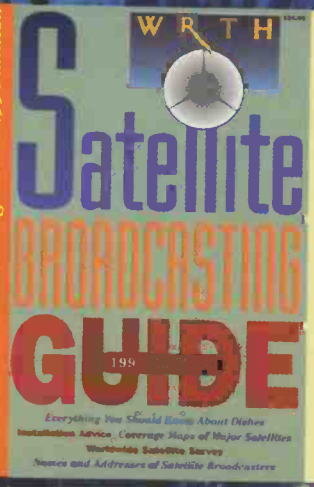
4 WRTH Satellite Broadcasting Guide - 1996 Edition

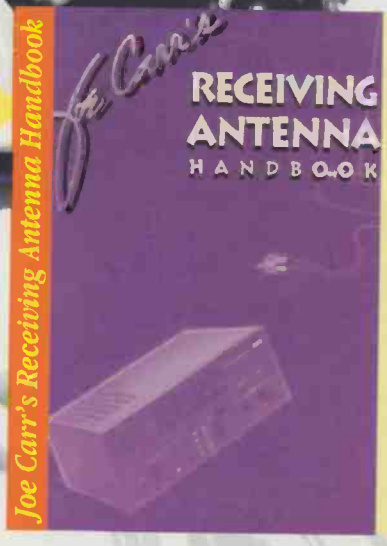


This third edition, written by experts from the respected *World Radio TV Handbook*, will be of great help to everyone interested in the world of satellite radio and television. With over 300 pictures and graphics, this book gives you everything you need to know about installing your own satellite system.

With information on satellite dishes and other components, more than 190 coverage maps world-wide, satellite transponder loading survey in alphabetical and satellite order, names and address of major satellite operators and programmes - all this and more in this book.

At only **£17.95**, it surely deserves a place on your bookshelf.

5 Joe Carr's Receiving Antenna Handbook



This book is a complete guide to high performance receiving antennas for longwave, all the way to the upper end of the short wave spectrum. This is a comprehensive examination of antennas intended specifically for receiving purposes.

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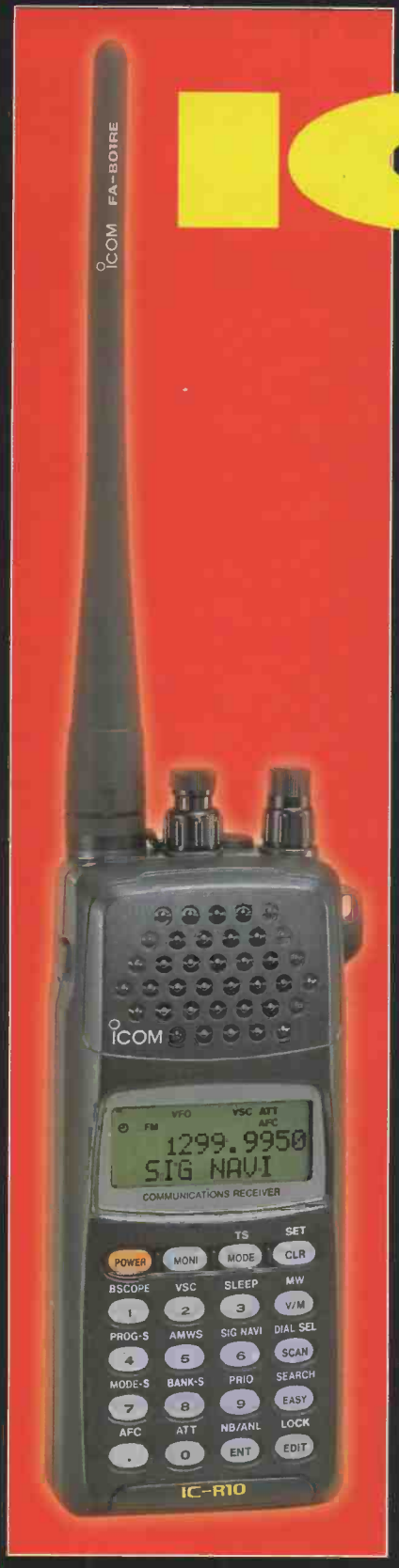

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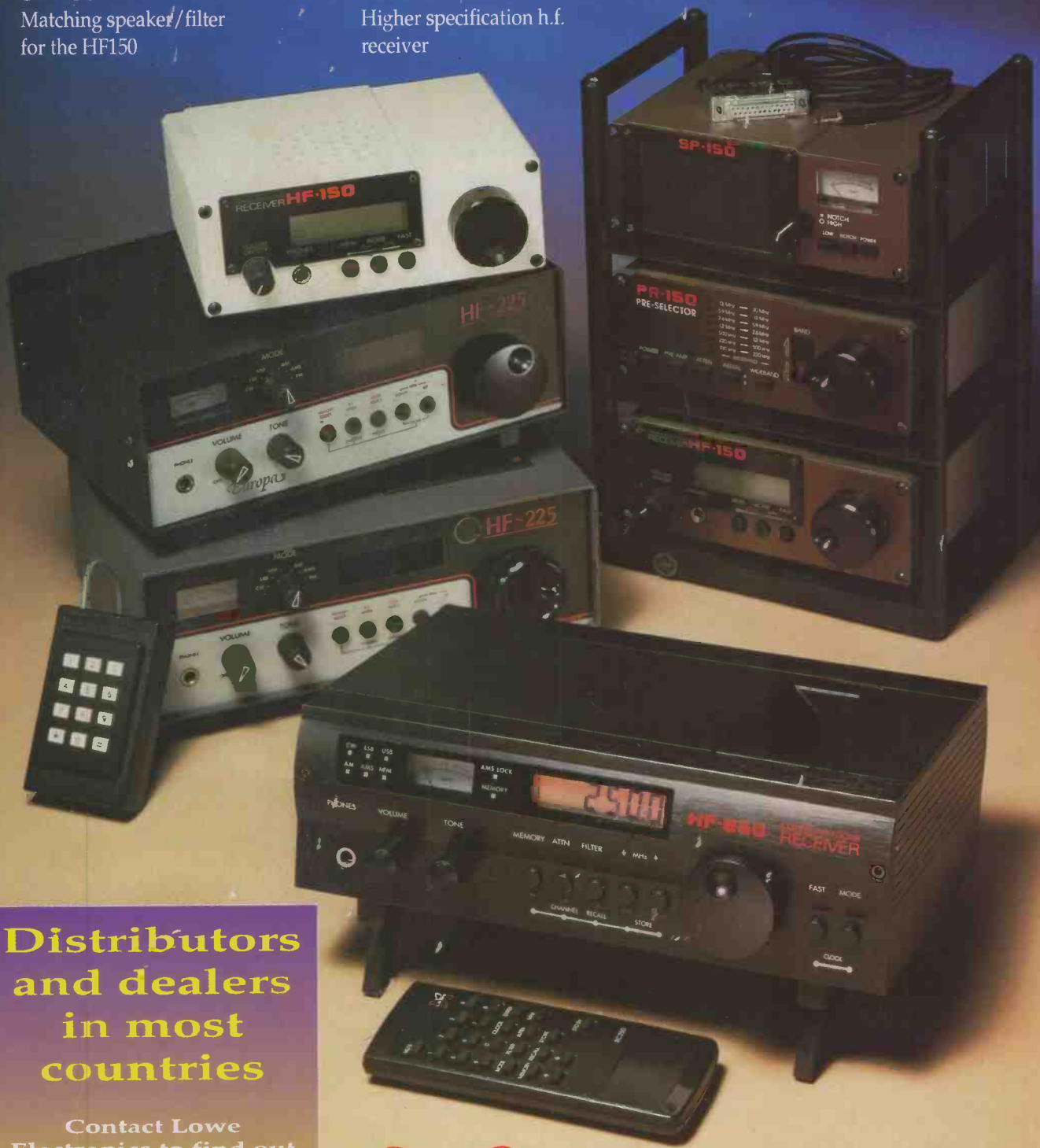

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