LUTON TO DUSSELDORF
ON THE FLIGHT DECK OF BRITANNIA AIRWAYS FLIGHT BY940

SPECIAL OFFER
SANDPIPER MOBILE SCANNEER ANTENNA
TANDY PRO-2021 SCANNER REVIEW

For The Radio Listener
ICOM introduces the IC-R7000, advanced technology, continuous coverage communications receiver. With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz.

The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto-M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-colour fluorescent display. Other features include dial-lock, noise blanker, attenuator, display dimmer and S-meter and optional RC-12 infra-red remote controller, voice synthesizer and HP 1 headphones.

ICOM, General coverage receiver.

The ICOM IC-R71E 100KHz to 30MHz general coverage receiver features keyboard frequency entry and infra-red remote controller (optional) with 32 programmable memory channels, SSB, AM, RTTY, CW and optional VFO’s scanning, selectable AGC, noise blanker, pass band tuning and a deep notch filter. With a direct entry keyboard frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency is altered without changing the main tuning control. Options include FM, voice synthesizer, RC-11 infra-red controller, CK70 DC adaptor for 12 volt operation, mobile mounting bracket, CW filters and a high stability crystal filter.

Helpline: Telephone us free-of-charge on 0800 521 145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.

Datapost: Dispatch on same day whenever possible.

Access & Barclaycard: Telephone orders taken by our mail order dept, instant credit & interest-free H.P.

ICOM (UK) Ltd.
Dept SW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.
Luton to Dusseldorf

Cover: Take a flight with Malcolm Wayland as he navigates one of Britannia's Boeing 737s from Luton Airport to Dusseldorf.

Part 2 of T. J. Wright's article on restoring an Eddystone 340 receiver has been held over.

EDXC Conference Report
Three-Band SSB Receiver
Part 2
SWM Review
Tandy PRO-2021 Scanner
SWM Review
Sandpiper Model 7 Antenna
Mobile Scanner Antenna

Luton to Dusseldorf
Introduction to DX-TV
Part 11

First Word
A Word in Edgeways
What's New
Grassroots
Listen Out For
Rallies
Bookcase
Airband
Scanning
Bandscan
Services
Starting Out
What Scanner?
Book Service
Trading Post

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I receive a lot of letters from readers asking for explanations of the various abbreviations used throughout the magazine. It is a fact of life that with any technical subject, and listening falls into that category whether you like it or not, there are many terms that occur frequently and lend themselves to abbreviating. As long as the abbreviations used are consistent throughout it makes sense to use them.

However, if you are a complete beginner or non-technically minded there is no reason why you should not be able to enjoy your favourite hobby. For you I have started to add a list of all the abbreviations used at the end of each article. Although the lists will not give you full-blown technical explanations, they should enable you to make more sense of the articles and point you in the right direction. If you already know what the abbreviations stand for you can ignore them.

In Short Wave Magazine I have stuck to the British Standards, e.g. single side band is abbreviated to SSB. I am also firmly of the opinion that in circuit diagrams resistors should be indicated by the old-fashioned "zig-zag" symbol, not the useless modern "rectangle". Rectangular boxes should be reserved for unusual components.

I also like to see the supply rails drawn horizontally with the lowest voltage rail at the bottom of the drawing and the highest at the top. You should be able to "read" a circuit diagram easily without having to trace connections half-way round the world to find out where they go. Zig-zag resistors are likely to appear in SWM for a long time yet!

Last month I mentioned letters and the length of time taken to answer them. Thinking about the problems and how best to overcome them I noticed that a lot of letters cover multiple topics. It is not uncommon to receive a letter ordering articles from back issues, a couple of books and posing several technical questions.

Imagine what happens to this letter. Kathy needs it to fulfill the order for the books and back issues but has to ask someone on the technical staff which issues contained the articles requested. Then Alan in Accounts needs the information regarding the orders so that he can bank the money. Finally the letter arrives back on my desk for the technical queries to be answered. As this usually involves some research into several different disciplines, and possibly help from other members of the editorial staff, the letter could well sit in the "pending" tray until the time is available.

To help overcome some of these problems please ensure that you only ask questions on one topic in each letter and keep orders separate. You can, of course, put several letters in the same envelope to reduce postal charges and delays — but remember that FREEPOST is only available if you are ordering, and don’t forget the s.a.e.

For a number of reasons, Part 2 of Tim Wright's short series on the Edystone 940 receiver will appear in the September issue.

DICK GANDERTON

Sir

I feel I must reply to the letters that have appeared in the June and July issues of your excellent magazine.

Firstly: "operating standards" (my term) covering such basic etiquette as "please" and "thankyou" and polite acknowledgement of any newcomer are certainly thin on the ground. Or should I say thin in the air?

Considering the abysmal level of education of recent years I suppose this is to be expected, as this is reflected not only in amateur radio but all walks of life these days! Maybe on the occasion Mr...

- A WORD IN EDDGWAYS

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

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to other magazines.

Word "scanned the bands" the scene was, to him, in order. Should he spend many hours diligently endeavouring to listen and understand a particular QSO, however, I'm sure he would agree "things are not what they used to be".

CW in all forms-automatic coded numeric, commercial RTTY and amateur, is the bane of most s.w.c. and I am pleased to learn the Editor agrees with me! Only recently I heard a chap boasting of his maxim, namely: "Tune up and blast through on c.w. regardless of where on the band c.w. always gets through". Apparently the "listen before you transmit" rule is just another one to be flagrantly broken!

In conclusion is, in my opinion, the huge commercial potential of Amateur Radio being ruthlessly exploited that is responsible for what I maintain is the degradation of our hobby. Seeing affluent youngsters running around with expensive hand-held-talkers to someone 500 yards (sorry metres), away has to be seen to be believed. No thank you, the licence holds no charisma for me. . .

DAVID GOMMO
CREWKERNE SOMERSET

Sir

On reading the letter from K. Gardiner in the June edition of Short Wave Magazine, re: the problem of batteries for the Matsui MR-4099, may I add my comments.

I purchased my receiver from the Truro branch of Curnow in October 87, this was the last receiver that they had in stock, possibly the demonstration model as it was fitted with Duracell batteries. The sale was completed and as the batteries were deemed to be part used, were not charged

to me, for which I was pleased.

I used the radio for about 3 months before the batteries dropped below a usable voltage. In the meantime, I purchased a Maplin YMB85G Adaptor for home use and, also discovered that the receiver will run happily on a 6V lantern battery Ever Ready 931 type. One of my Christmas presents was a Halfords voucher which I used to purchase six Gold Seal U2 type batteries, which fit and work 100%, no problems at all.

My friend Clyde GBXNH in Newquay did experience the same problem as K. Gardiner with the "look-a-like" he tried from Comet. The six NiCads he had would not fit, nor would six of an unknown type he purchased cheaply in a local Sunday market.

My thoughts on this problem are that perhaps on the early batch of receivers the case was that bit larger in size. The later batch, perhaps being smaller, will not allow the batteries to fit. It is a bit like today's modern car, when one needs a minor part replaced, one finds there are about half-a-dozen variations.

Conclusions: It is obvious to me that MR-4099, and its variants, does have an internal battery problem, but in my opinion this does not detract from the "value for money" impression of the receiver. One can, if the normal cells do not fit, make up a battery to fit in the left jacket pocket, sling the receiver on the right shoulder, and tramp across the moors with the world in your ear.

DES CARNE PAR CORNWALL
SIR

Due to what seems the lack of success of the EDXC Conference in Antwerp, ie only 60 DXers turning up and the West German clubs boycotting it, is it not time to have smaller meetings of clubs in each country? The EDXC Conference seems now to be a meeting place for all DX programme presenters in the world to get together and interview each other to fill in space on their respective DX programmes, and for manufacturers to show off their high priced wares.

Do the EDXC Committee not realise that £300-£400 for a weekend is far beyond the means of 99% of s.w.i.s? Or are they like the manufacturers of radio equipment and think we have a never ending supply of money?

The European Broadcasters at the Conference said nobody in Europe was listening to short wave anymore does anybody wonder why?

J. S. DEIGHTON
SWINTON
MANCHESTER

Oblast Guide

Geoff Watts, well-known for his "DXNS" DXCC Countries Guide and "DXNS" Radio Amateur Prefix-Country-Zone List has just sent me a copy of his latest venture, the "DXNS" USSR Oblast Guide.

If you are into the Russian Oblast collecting side of the hobby then you cannot afford to be without this valuable work. Thirteen foolscap sides of solid information on the Oblast system, of which seven sides are useful maps showing all 184 Oblasts, will cost you just £1.00 if you are in the UK or $3.00 in other countries.

Geoff Watts
62 Belmore Road
Norwich
NR7 0PU

The NR-108F1 Receiver

Nevada Communications are importing the NR-108F1 and have just sent us details. It covers 150kHz to 520MHz and 850 to 910MHz with twenty menus and a scan facility.

The tuning steps are:

<table>
<thead>
<tr>
<th>a.m.</th>
<th>6kHz</th>
<th>s.s.b. &amp; c.w.</th>
<th>4kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>f.m. N1 - 15kHz</td>
<td>f.m. N2 - 6kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.m. W</td>
<td>150kHz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tuning is either by rotary dial or direct entry using the keypad. It also has a clock with timer and sleep timer.

The radio runs from the mains using an external power pack or batteries. The dimensions are 350 x 200 x 90mm and it weighs just 2kg. The price is £396 inc.

Nevada Communications
189 London Road
North End
Portsmouth
Hampshire PO2 9AE
Tel: 0705 662145

Autoranging DMM

The DM71 is a portable, pen-type, autoranging DMM that has 17 ranges or functions. It measures d.c. and a.c. voltage, resistance and includes a continuity and diode test function.

The 3½ digit l.c.d. indicates value, polarity, measurement unit, over-range, data hold and low battery. The d.c. voltages are measured in five ranges between 200mV and 250V with accuracies between ±0.7% plus 4 digits and ±2% plus four digits dependent on range. The four a.c. voltage ranges are between 2V and 250V and have an accuracy of ±2.3% plus four digits.

Resistance has six ranges with 20MΩ the maximum, an accuracy of ±2% plus 4 digits on all but the highest range and an open circuit voltage of <0.45V. The continuity/diode test has a threshold level of 1.5kΩ at 1.58 battery level. Input impedance is >100MΩ on the 200mV range, approximately 12MΩ on the 2V range and approximately 11MΩ on all other ranges.

The DM71 is supplied complete with batteries, test leads, operators manual and nign rigid plastic carry case.

Beckman Industries Ltd
Temple House
43-48 New Street
Birmingham B2 4LJ
Tel: 021-643 8899
News from Radio Sweden

In their Bulletin No. 1992, we found some interesting snippets.

ALASKA. KNLS has been observed with weak signals in English at 1600 on 7.355MHz.

BHUTAN. The Bhutan Broadcasting Service in Thimpu has been planning to use 9.615MHz instead of 6.035, which is still in use. Their transmitter is equipped with crystals for 3.395, 6.035 and 9.615MHz. There is now a small 10 watt f.m. transmitter on 101MHz to cover the Thimpu area. The BBS has changed their address to: Box 101, Thimpu, Bhutan. The construction of the transmitter building, antennas and studios is now complete and the station is now scheduled to operate with 50kW from February 1989.

COLOMBIA. The situation on the Colombian short wave scene is rather sad, as a couple of stations have disappeared during the last few years. Now we can report on a new station — La Voz del Rio Arauca, in Arauca. It has been heard from around 0110 until 0300 on 4.898MHz. According to the station identification, the power is 10kW. Other Colombian stations active at present include Ondas del Orteguaza on 4.975MHz a Radio Macarena on 5.975MHz.

HONDURAS. La Voz Evangelica de la Republica has been heard 0249-0303 on 4.910MHz. The station broadcasts in Spanish and the Mosquito Indian language.

PHILIPPINES. Radio Veritas can be heard in Bengali 1430-1500 and in English 1500-1530 on 11.820MHz. This replaces 9.770MHz. The FEBC can be heard in Russian, Ukrainian, Polish and German for the USSR 1600-1930 on 9.8MHz.

RWANDA. Radio Diffusion de la Republique Rwandaise (or Radio Rwanda) has been heard 0316-0330 and from 1750 on 3.33MHz.

USA. WYFR, Family Radio, is now on the air 0600-1700 on 9.852MHz, 1100-1200 on 7.355MHz, 1200-1300 on 7.355, 9.565 and 15.215MHz, and 1600-1600 on 15.566, 21.615 and 21.525MHz.

Media Network Plans for August

Thursday August 4. Sealand and other Dreams. Jonathan Marks talks to Hans Knot about some of the more mysterious offshore broadcasting ventures, they'll be tracing the fate of the Mebo II and looking at the numerous plans that have been announced and never materialised on top of a concrete platform in the North Sea. Media News from the pacific is also scheduled.

Thursday August 11. News Round-Up. This all-news edition will examine projects planned to go on the air in the period, including new high power short wave broadcasts from Jordan.

Thursday August 18. Holiday Radio. The programme looks at some of the short lived programmes aimed at tourists in different parts of Europe. Some have to be heard to be believed. There will also be news from the editorial office of the WRTH in Amsterdam.

Thursday August 25. Crisis Radio. They look at the 20th anniversary since the invasion of Czechoslovakia and recall the strange situation surrounding Free Radio Prague. The programme includes a lot of historical audio material from the period.

WHAT'S NEW

Analogue Multimeters

A range of four new Iska analogue multimeters are now available from Universal Instruments. All four models measure both a.c. and d.c. voltages to 1000V, alternating and direct current and resistance. They have large, clear displays and are robust too.

The model 42 has twenty measuring ranges which include decibels from 15 to +50dB, current from 20μA to 3A and resistance to 50MΩ. Accuracy is 2.5% for all voltage and current ranges, with a d.c. voltage sensitivity of 50μV/volt and a.c. at 5μV/volt.

Models 43 and 46 are similar to Model 42 but with sensitivities of 20μV/volt for d.c.

and 3μV/volt for a.c.

Model 45 has 27 measuring and test ranges. These include a d.c. voltage accuracy of 1.5% alternating and direct current to 30A and an integral audible short circuit indicator. The prices for these meters are (excluding VAT): Model 42 — £28.14, Model 43 — £24.78, Model 45 — £34.33 and Model 46 — £19.50.

Universal Instrument Services Ltd
Unit 62
GEC Site
Cambridge Road
Whetstone
Leicester LE8 3LH

Only the Name Has Been Changed

As from May 1, the Earlstown branch of ARE Communications Ltd., separated from their parent company and is now known as Amateur Radio Communications Ltd. The address is 38 Bridge Street, Earlstown, Newton-Le-Wilows, Merseyside, telephone 09252 28881.

The only thing had has altered is the name. The shop will be carrying on with the same policies as before. Peter Roberts G4KKN is now the owner and Frank and Elaine will still be there to help you with your enquiries. The shop is open Tuesdays to Saturdays, 10am to 5pm.

IBA Re-engineer Mendip Transmitter

The Engineering Division of the IBA has completed the installation of replacement u.h.f. high power transmission equipment at the Mendip transmitter, near Wells in Somerset. This is the first station to be re-equipped in a major modernisation programme involving the replacement of the original ITV u.h.f. colour transmission equipment over the next ten years. Transmission using the new equipment started with TV-am on June 8.

The new equipment at Mendip was commissioned after installation work over a period of about six months, and without disruption to viewers. It replaces transmitters which have been in use for more than 18 years. The new transmitting equipment employs pulsed Klystron techniques to give high electrical efficiency and low maintenance requirements. It will also be capable of providing high quality NICAM digital stereo sound when regular transmissions on the full ITV and Fourth Channel networks begin in 1990. Stereo sound will be available in London and parts of the Yorkshire region from August 1989.

Two-hundred Year Calendar Clock

Maplin Electronics have introduced the 200 year calendar clock. It features an i.c.d. digital alarm clock and calendar with a permanent display of the time, year, month, day and calendar for the current month.

The time may be set to display in the 12 or 24 hour format. The date and calendar displays can be moved forward or back in one month steps to any month between the years 1901 and 2099.

The case which houses the 73 x 40mm display is in gold anodised alloy with dark brown end pieces. The price for the clock is £14.95 inc VAT.

Maplin Electronics
PO Box 3
Rayleigh
Essex SS6 8LR
Hand-held Battery Tester

Alpha Electronics have announced the availability of a small hand-held tester for both 6 volt and 12 volt batteries. No batteries are required for the device itself as it takes its power from the device you are testing. It can measure voltages to within 20mV on a bright red i.e.d. display. The device is protected against polarity reversal, so it should be difficult to damage. It weighs less than 142g and the case is completely sealed.

The BQ 200A costs £26 excluding VAT, and more details can be obtained from: Alpha Electronics Ltd Unit 5 Linstock Trading Est Wigan Road Atherton Manchester M29 0QA

IARU ATV (International): September 10/11. 1800 Saturday to 1200 Sunday (UTC), f.s.t.v. all bands.

Slow Scan TV Autumn Vision Combined: November 13. 0001 to 2359 local time. Slow scan, f.s.t.v. all bands.

Winter ATV Joint European: December 10/11. Saturday 1800 to Sunday 1200 (UTC), f.s.t.v. all bands.

There are some changes in the contests planned for next year (1989) due to an agreement reached with neighbouring societies in Europe. It has been agreed that there will be four joint contests through the year. One of these contests will be the International, which from now on will be an official IARU contest. This contest will be run each year by a different member country. The BATC will be organising the 1989 contest on behalf of the RSGB.

The advantage of running contests at the same time is that, conditions permitting, contacts into Europe may take place as everyone will be QRV at the same time. For more details on the British Amateur Television Club contests, contact: Mike Wooding 5 Ware Orchard Barby Nr Rugby Warks CV23 8UF

Ontario DX Association

The Ontario DX Association is a club for shortwave listeners and DX enthusiasts who live in the province of Ontario, but members are invited to see further details. The subscription rates are £7.00 for the UK, £8.00 for Europe and £10 for elsewhere in the world.

Arthur Ward
17 Motspur Drive Northampton NN2 6LY.

WHAT'S NEW

WACRAL

This stands for the World Association of Christian Radio Amateurs and Listeners. A copy of their April newsletter landed in the office.

Apparently the group was formerly known as WAMRAC and was founded in 1957 by a Methodist Minister, the late Rev Arthur Shepherd G3NGF. The group is affiliated to the RSGB and are the proud owners of G3NJB.

In issue No. 148 there are items on technical topics, news from around the world, humorous items and lists of the new members names and addresses. An interesting idea they have is "Meet the Member" where members introduce themselves. In this issue it was Member No. 499 from Scotland.

If you would like to know more about the group and their subscription rates, send an s.a.e. to:

WACRAL HQ
13 Ferry Road Wawne
Nr Hull HU7 5XU.

World DX Club

This British based, leading European DX Club is celebrating its 20th Anniversary this year. To mark the occasion, the club’s monthly bulletin, Contact, was extended to 64 pages for the May issue.

World DX Club membership is spread throughout most parts of the English speaking world, with near to 30 per cent of the total membership residing outside of the UK. The membership in North America is now so great they have their own membership secretary.

The club operates a limited membership policy to keep the overall numbers to a figure which can be dealt with by the volunteer work force. The service this work force provides is good enough to keep many members for the twenty years the club has been going. One quarter of the membership holds pre-1976 membership numbers.

Contact works to a first of the month editorial deadline, with publication over the second weekend of the month. This allows all members to provide follow-up and feedback to points raised in time for the subsequent issue, thus keeping a running dialogue. All main sections you could expect to find in a DX Club newsletter can be found in Contact: logbooks for short wave, medium wave, v.h.f. f.m. and DX TV, QSL report and DX news. There is also a broadcasting review section which looks at what has been heard, a Future Waves section which looks at what you might hear and a radio nostalgia section which looks back into the history of radio. That’s just some of what you find in Contact!

As resignations are not plentiful, vacancies likewise are not in abundance, but in this anniversary year, anyone who is interested in broadcast band listening is invited to seek further details. The subscription rates are £7.00 for the UK, £8.00 for Europe and £10 for elsewhere in the world.

Contact!
Tuesdays. August 3 is a Visit to Station and a Family Barbecue on Tennis Club, Holland Avenue, Cheam. Natter Nights are 1st on Sale 1837.

A 8.10pm start 17th a Visit to Dover Coast Guard Station, Nettleton, Emsworth. Rick G4BLT on Wakefield 255515.

South Manchester RC has a Club Quiz on July 29, a Visit to Safe Fire Station on August 5, a Constrictional Night on the 12th and Beginners’ d. f. 8.10pm start on the 19th. Fridays, 8pm in Sale Moor Community Centre, Norris Road, Sale. David Holland G3WFT on Sale 1837.

Maltsby ARS meet Fridays, 7.30pm at the Community Hall, Clifford Road, Hellaby, nr Rotherham. July 29 is a Treasure Hunt, August 5 a Kite Nite, the 12th an Activity night v.h.f. and the 19th TV and Video. Keith G1POW on Rotherham 814136.

Sutton & Cheam RS meet 3rd Fridays, 7.30pm in Downs Lawn Tennis Club, Holland Avenue, Cheam. Natter Nights are 1st Mondays in the Downs Bar. August 2 is a Committee Meeting. John Puttick G0BWW at 53 Alexandra Avenue, Sutton.

South East Kent (YMCA) ARC meet Wednesdays with Morse or RAE Coaching on Mondays and Tuesdays. August 3 is a Visit to the Folley – the QTH of Ian, the 10th is a 144MHz Fox Hunt, the 17th a Visit to Dover Coast Guard Station and a Family Barbecue on the 24th. John Dobson on Dover 211638.

Wolverhampton ARS meet Tuesdays, 8pm at The Wolverhampton Electricity Sports & Social Club, St. Marks Road, Chapel Ash. August 2 is a Committee Meeting, the 9th Home Construction, the 16th is Night on the Air and the 23rd the Club Project. Keith Jenkinson G101L on Wolverhampton 24870.

Braintree & District ARS have a Construction Evening on August 1 and 2MT Writtle by G6GUX on the 15th. 1st & 3rd Mondays, 7.30pm at The Braintree Community Association Centre, Victoria Street. Norma Willicombe G0FPW on Braintree 45058.

Pontefract & District ARS have HF Lines and Valves on August 4, a Committee Meeting on the 11th, Prep for SSB Field Day on the 18th and On the Air on the 25th. Tuesdays, 8pm at Carleton Community Centre, Carleton Road. Eddie Grayson G6OJX on Knottingley 83792.

Wyre ARS have Morse Classes on August 10 and 24. 2nd & 4th Wednesdays, 8pm in the Breck Sports & Social Club. Dave Westby G4UHI on Lancashire 864748.

Todmorden & District ARS meet 1st & 3rd Sundays, 8pm in the Queen Hotel, August 8 and 22 are Natter Nights. Val Mitchell G1GZB on Todmorden 7572.

Midland ARS have their Summer Outing on August 16. Tuesdays, 7.30pm with classes from 7pm in Unit 16, 60 Regent Place, B’ham. Wednesdays is Morse, Thursdays a Night on the Air. Tom Brady G8GAZ on 021-357 1924.

Homdean & District ARC meet 1st Thursdays, 7.30pm in Merchiston Hall. August 4 is EMC & the Politics by G4RLE. Dan Bernard G4RLE on Portsmouth 755274.

Felixstowe & District ARS have a DF Hunt & Barbecue on August 8 and a Social on the 22nd. Meet in the Scout Hut, Bath Road at 8pm, with Socials in the Grovener Hotel. Paul Whiting G4YGC on Ipswich 642595.

Wimbledon & District ARS meet 2nd Thursdays, 7.30pm in St. Andrews Church Hall, Herbert Road. July 29 is the Annual Camp Organisation Meeting, July 30/August 7 is the Annual Camp, Barwell Estate, Cheshill and the 12th is Air Band Radio by G8HRX. David Love G4RQB on 07373 51559.

Mid-Warwicks ARS have an outing to Castle Inn, Edge Hill on August 9 and a Natter Night on the 23rd. 2nd 4th Tuesdays, 8pm in St. John Ambulance HQ, 61 Emprete Road. P. Brown G0HHT on Market 632370.

Cheshunt & District ARC meet Wednesdays, 8pm in the Church Room, Church Lane, Wormley. August 3 and 17 are Natter Nights. Peter Davies G1KOA at Lee Valley 764930.

Exeter ARS meet 2nd Mondays, 7.30pm in the Community Centre, Davids Hill. August 8 is Free & Easy Out & About Evening. Ray Donno G3Y8K on Exeter 78710.

Coventry ARS meet Fridays, 8pm at Baden Powell Horse, 121 St. Nicholas Street, Radford. August 5 is a Social at the Morse & Jockey and the 19th is a Night Out Operating Portable. All other meetings are Nights on the Air with Morse Tuition. Jonathan Ward G4GHT on Coventry 610408.

The East Kent RS have a Barbecue from 6.30pm £1pp on July 30, Phase Locked Loops and Frequency Synthesis on GB8NH on August 4 and a Video Show on the 18th. 1st & 3rd Thursdays. 7.30pm at Parkside Lodge, Kings Road, Herne Bay. Brian G0DIN on Whitstable 262042.

Lorna Mower

Port Talbot ARC meet Thursdays, 7pm with Morse from 6.30pm in the BSC Sports and Leisure Club, Margam. S. Hillat 31 Ynys Lee, Cwmavon SA12 9AQ.

Southgate ARC meet 2nd & 4th Thursdays, 7.45pm in Holy Trinity Church Hall (Upper), Winchmore Hill. July 28 is a Demo of the “Dr DX” Computer Programme. Brian Sheldon on Winchmore Hill 2453. Verulam ARC on Thursdays, 7.30pm at the RAF Association HQ, New Kent Road, St. Albans. August 9 is an Activity Evening, the 23rd a Bring & Buy Sale. Hilary G4JKS on St. Albans 59318.

On August 2, Workop ARS have a Quiz, the 9th and 23rd are Natter Nights and the 16th a Barbecue. Details of their meeting place and time from Mrs. C. S. Gee G4ZUN on Workshop 486614.

Derby & District ARS meet Wednesdays, 7.30pm at 119 Green Lane, August 3 is a Bank Holiday. The 10th is Rally Preparation at Lower Bemrose School, the 14th is the Derby Rally and the 24th G4DJV talks about The Joys of GRP. Kevin Jones G4RFP on Derby 669187.

York ARS will be signing G8BTS at Toferton Show on August 13. Fridays, 7.30pm in the Clubroom, United Services Club, 61 Micklegate. Keith Cass G3WVO at 4 Heworth Village, York.

Dunstable Downs RC meet Fridays, 8pm in Room 3, Chews House, High Street South. July 29 & August 12 are Natter Nights, August 5 is the Wolfsburg Arrangements and 15th – 22nd is the Wolfsburg Trip. Tony Kelsey-Stead G0COQ on Luton 508259.

Hastings Electronics & RC have a talk on the Practicalities of Satellite TV on August 17. 1st & 3rd Wednesdays, 7.30pm (1st a committee meeting in Ashdown Farm Community Centre, 3rd a main meeting in West Hill Community Centre). Fridays are Chat Nights in Ashdown Farm Community Centre. Tim Anderson G0TGF on Hastings 437513.

Southgate ARC meet 2nd & 4th Thursdays, 7.45pm in Holy Trinity Church Hall (Upper), Winchmore Hill. July 28 is a Demo of the “Dr DX” Computer Programme. Brian Sheldon on Winchmore Hill 2453. Verulam ARC meet Tuesdays, 7.30pm at the RAF Association HQ, New Kent Road, St. Albans. August 9 is an Activity Evening, the 23rd a Bring & Buy Sale. Hilary G4JKS on St. Albans 59318.

Port Talbot ARC meet Thursdays, 7pm with Morse from 6.30pm in the BSC Sports and Leisure Club, Margam. S. Hillat 31 Ynys Lee, Cwmavon SA12 9AQ.

On August 2, Workop ARS have a Quiz, the 9th and 23rd are Natter Nights and the 16th a Barbecue. Details of their meeting place and time from Mrs. C. S. Gee G4ZUN on Workshop 486614.

Derby & District ARS meet Wednesdays, 7.30pm at 119 Green Lane, August 3 is a Bank Holiday. The 10th is Rally Preparation at Lower Bemrose School, the 14th is the Derby Rally and the 24th G4DJV talks about The Joys of GRP. Kevin Jones G4RFP on Derby 669187.

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**LISTEN OUT FOR**

Have you Got a Special Event Station we should know about? If so, write and tell us

GB2RLN: On July 28 – 31, a special event station will be run for the benefit of the Royal National Lifeboat Institution. They will be on the air from the headquarters in Poole (in the depot complex) to coincide with the RNLI open days which are the 29th and 30th. On those two days the HQ will be open from 10am to 6pm to the public. A QSL card will be produced for this event, but can only be supplied on receipt of an s.a.e. or for overseas amateurs the requisite number of IRCs. Don’t forget the RNLi is dependant upon donations so costs must be kept to a minimum.

The frequencies they will be using are: 3.750, 7.050, 14.250, 21.250 & 28.500MHz (phone). 3.550, 7.025, 14.075, 21.075 & 28.075MHz (c.w.). Of course, that’s ± QRM.

Send your envelopes for QSL cards to:

GB2RLN
Malcolm A Williamson G0EGA
21 King Alfred Avenue
Bellingham
London SE6 3HT

GB75IBH: Between July 23 and 31, the Wigan-Douglas Valley ARS will be operating a special event station to celebrate a week long international Scout Camp at Bispham Hall Scout Estate, Billinge, near Wigan. Approximately 1500 Scouts from around the world will be participating and they hope to make many contacts on most bands including 50MHz.

Colin G6AHF
Tel: 0942 715851

**RALLIES**

July 30: The Hilderstone Radio Society are holding their mobile rally and convention at Hilderstone College, St Peters Road, Broadstairs, Kent. There will be trade stands, a bring and buy, talk-in station, a special event station, raffle, refreshments and a lecture programme.

Alan
Tel: 0843 593072

*July 31: the Scarborough ARS Rally will be held at The Spa, Scarborough. Doors open at 11am. Talk-in will be on S22 and SUB as well as GB3NY. More details from:

Ian Hunter G4UQP
Tel: 0723 376847

August 14: The 1988 Derby Mobile Rally will take place at the usual venue of Lower Bemrose School, St Albans Road, Derby. Doors open at 11am. More details from:

G3KQT
QTHR

*August 14: The Flight Refuelling ARS and the Bournemough RAIBC Rally will be held at the FRARS Sports & Social Club, Merley, Nr Wimborne, Dorset. All the usual attractions will be there for all the family. Entrance is 50p (children free). Gates open from 10am to 5pm.

GB2NTS: This is to commemorate the 200th anniversary of the death of Prince Charles Edward Stuart, thecallsign stands for National Trust Scotland, They will be on the air on August 20 and 21 from Culzean Castle, 19km south of Ayr.

Paddy GM3MTH, QTHR

GB75TV: The Rugby TV Repeater Group is planning a special event station over the August Bank Holiday weekend (August 27/28). The station will be operating ATV on at least 430 and 1296MHz from Sheenington, near Banbury in Oxfordshire. The hours will be from 12 noon to 8pm on the Saturday, and from 7am to 12 noon on the Sunday.

G6IQM
QTHR

GB2WVR: This is for the World Veteran Rowing Championships, Stratthclyde Country Park, Motherwell between September 5 and 11.

Brian G0OEI, QTHR or
Paddy GM3MTH, QTHR

GB1FLD: Two members of Radio Link — Derby Hospital Broadcasting will be operating the special event station from the outside broadcast caravan at the City Hospital, Derby. They will be using 144MHz v.h.f. on September 17 and 18 from 1000 to 1600.

John Huddleston G1UJX
Tel: Derby 676822
SCANNING RECEIVERS are our speciality (and all that goes with them).

The AR2002 is without doubt the best known and best performing VHF/UHF monitor receiver on the market. Encompassing every frequency of interest, whether it be VHF airband, UHF airband, radio amateur, mobile radio, FM broadcasts, TV sound, the AR2002 also gives the user top performance. Frequency selection can be directly by key-

board entry, but there is a good old tuning knob as well, for whizzing up and down the bands. Properly styled and engineered for use in fixed station, mobile or portable, the AR2002 comes complete with a mains power supply and extended whip aerial. Covering 25-550 and 800-1300MHz, the AR2002 has high sensitivity and selectivity for professional performance. In use by government departments and Big Brother, as well as thousands of users everywhere.

For the airband enthusiast, the WIN-108 is the answer to a maiden's prayer. This compact handheld airband receiver is fully synthesised and covers the entire VHF airband from 108 to 136 MHz. With direct key-

board frequency entry you can be on channel faster than a Concorde captain, and the clear frequency readout tells you where you are. 20 memory channels are included, and you can scan these automatically. Not only that, you can tell the WIN-108 to search any given frequency range within the air band so as to find new frequencies of interest. Forget the AIR-7, the WIN-108 does it all and more. The WIN-108 comes complete with a correctly matched helical aerial and is eager to go.

For those who demand the best, the airband receivers from Signal Communications are a must. The company is totally dedicated to producing the best airband radios around, and the latest R-535 is in such demand that we are having to keep a waiting list of eager enthusiasts. Why? Simply because the R-535 gives ultimate performance not only on the VHF airband, but also on UHF as well. Designed for simple programming and high speed scanning and searching, the R-535 has no less than 60 memory channels to store your most used frequencies. VHF and UHF channels can be mixed in any order. A full list of accessories is available, including power supplies, aerials, rechargeable battery packs, and so on, making the R-535 the complete system for the advanced airband enthusiast.

As you may guess, we stock, sell, and take care of almost everything connected with the hobby of listening, from Long wave to UHF. If you need any advice or assistance, we are here to help, and information is available at all times on any of our product range. In addition to the "Listener's Guide", we also publish the "Airband Guide", so if you send us £1 for postage, and ask for both these guides, we will be happy to send them off. Happy listening.
This annual event provides a unique forum on the European continent for the discussion of every facet of international broadcasting. The 1988 Conference was held in the ancient Belgian city of Antwerp for four days beginning on Friday May 20.

More than one hundred and twenty delegates from nearly twenty countries gathered at the Crest Hotel in Antwerp for the twenty-second annual Conference of the European DX Council.

This year’s meeting was combined with a new venture called “International Radio Days”, an initiative designed to promote short wave radio listening to the public. Extensive publicity was given to the event in the media in Benelux and on BBC 648. The public were invited to visit the Conference exhibition where equipment and publicity material was on display. DXers and short wave listeners from places as far afield as Austria, Spain, Italy, North America, Great Britain and Finland, for example, and broadcasters from Norway, Sweden, East and West Germany, South Africa, the United States, Switzerland, Hungary and many other countries assembled on Friday.

Following registration they travelled to the Provincial House in the centre of Antwerp, home of the local government for the Province of Antwerp. There were two dynamic audio-visual presentations introducing the city and port (one of the largest in the world) and the whole Province. Then at 1900 local time (1700 UTC), silence fell in the auditorium as Radio Sweden was tuned in on the new Sony ICF-SW1 pocket receiver. After the opening identifications and programme promotions, George Wood gave a short presentation to listeners throughout the world, explaining that 1988 was the 40th anniversary of Radio Sweden's media programme, Sweden Calling DXers, also telling them about the 1988 EDXC Conference.

He then declared the Conference open, through the very medium which was of interest to the event! This was a new departure and proved highly popular with the delegates and George Wood, present at the Conference representing Radio Sweden, was congratulated on this new idea. After this novel opening to the convention, delegates were given the opportunity to get to know each other informally, or to renew old acquaintanceships over a glass of locally brewed Jupiter beer. Circulating amongst the crowd, it was possible to pick up threads of conversation in many different languages — French, German, Spanish, English, Dutch, Italian — which goes to show just how international this event is.

Lectures

On Saturday morning, the delegates assembled in the main Conference room at the hotel, adjacent to the Exhibition Hall. After some initial words of welcome, the

Each year, the European DX Council organises a meeting for short wave listeners, broadcasters and station engineers, SWM was sent this report by Simon Spanswick, Assistant Secretary General of the EDXC.

Pat Fraser, Head of Technical Operations RSA, talks to Tom Walters, Editor of BBC World Service “Waveguide” programme.

first lecture was given by Dr Jean-Claude Jodogne on the relationship between the sun and the ionosphere and its consequences for the radio spectrum. Dr Jodogne is Director of the Department of Geophysics at the Royal Meteorological Institute in Brussels and has spent many years working in the field.

As all short wave listeners know, the ionosphere is the natural basis for all international radio listening as the layer around the earth which reflects short wave signals back to the earth. The speaker discussed the non-chemical physics of the ionosphere, and looked at its behaviour with regard to the propagation of radio waves and the prediction of propagation. Dr Jodogne explained that the study of radio propagation is an inexact science, with many variables and potential different interpretations of the data collected. The sunspot count is clearly an integral part of work in this field and bears a direct relation on propagation. Yet, differences of opinion opinion were becoming apparent as to the precise length of the solar cycle, previously thought at as eleven years. Perhaps the cycle was more than that, eighteen years, or possibly cycles overlapped, leading to misinterpretation in the past.

Dr Jodogne explained in some detail about the effect of ionisation and absorption, about the nature of the E, F1 and F2 layers in the ionosphere, and the need for broadcasters to calculate with some accuracy the angle for transmission of signal to beam effectively to the target area. The use of ionograms in measuring solar activity was explained. It is this information provided by organisations such as the Royal Meteorological Institute, that is essential to broadcasters to calculate circuits which would work effectively, but of course, was only a very small segment of the work of such bodies. Because of the nature of the ionosphere, propagation prediction is extremely difficult and until now, only a statistical relation has been predictable. Yet, with changing interpretations of the data and new research, it should, said Dr Jodogne, be possible within the next decade to predict day-to-day variations in the ionosphere. This should open up some very exciting prospects for international radio listening, providing that the information can be disseminated effectively.

The second paper of the morning was presented by Karel Cristijin on Antwerp Coastal Radio. As a busy international seaport specialising in general goods and handling thousands of tonnes every year, the role of the coastal radio station is most important, assuring communications with

| Distress — Antwerp | Channel 16 or 24 |
| Distress — Ostend | Channel 16 or 27 |
| Channel — upstream from Kruisschans downsteam from Kruisschans Fleeunge Radio | |
| Locks | Channel 14 |
| Bridges | Channel 12 |
| Port Services — Antwerp | Channel 14 |
| Port Services — Gent | Channel 11, 13 |
| 18, 20, 22 | |
| Pilot services | Channel 11, 13 |
| Ship-to-ship comms | Channel 18 |
| 10, 13, 70, 73 | |
| Private communications | Channel 5, 6, 11 |
| Channel 8, 9 | |
| Channel 6, 8 | |
| Channel 77 | |

Short Wave Magazine August 1988
Sights Seeing Tour

After a most impressive buffet lunch, delegates were able to travel on a sights seeing tour of Antwerp, or to visit Antwerp Coastal Radio. Meanwhile, members of the public continued to visit the exhibition and to learn about the wonders of short wave radio.

In the late afternoon, when delegates had reassembled at the Crest, Jonathan Marks gave a brief audio-visual presentation about his recent visit to the Dayton Hamfest in the United States. This is one of the largest amateur radio events in North America, and more than 30,000 people visited the show. The amount of equipment on display was staggering, and well-known Grove Enterprises of North Carolina took the opportunity to launch details of a new wide-band communications receiver to be known as the SR-1000. With a predicted launch date of autumn this year, the SR-1000 will cover 10kHz to 100MHz continuously, with narrow band f.m. available in addition to a.m. and u.s.b. and l.s.b. The most novel feature will be a spectrum analyser, which will provide the user with a 10kHz, 1MHz or 10MHz spread of the spectrum being tuned. The price of the new set, reported Jonathon, will be something under US$2000. The EDXC's sister organisation, the Association of North American Radio Clubs (ANARC) were out in force at Dayton, with a large stand to tell the public about short wave radio.

After this presentation, George Wood took the floor to talk briefly about Radio Sweden's entry into satellites. Following a lead from Radio Netherlands, the Radio Sweden schedule is now available on Sky Channel and SkyNet service, and it is planned to include extracts from Sweden Calling DXers in the near future.

Later that evening, George hooked his portable computer to the telephone and called up the CompuServe network in the United States and proceeded to exchange messages on the HamNet system. That was until his computer screen went blank when, as it transpired, the hotel fuses blew. Clearly they could not cope with all the extra demands placed by communications specialists at work! However, George's demonstration did allow delegates to see just how easy computer communication around the world actually is — and that, in theory, the cracks and whistles which amateur radio operators experience do not exist on computer lines.

The evening was then free and Antwerp benefited from a parade of international radio enthusiasts descending into the city centre for refreshment and sustenance. This writer, having been tied up at the exhibition during the organised sights seeing tour, travelled into the city to see the cathedral and old town, in the company of colleagues from the BBC and Radio Norway — international relations certainly boom at the EDXC Conference.

Eurovision

Sunday morning dawned brightly. Back at the Crest Hotel, Brian Flowers, Head of the Eurovision Control Centre in Brussels, talked to the Conference on the work of Eurovision and the distribution of television programmes around Europe. Established in 1965 (in Torquay), Eurovision has grown into an immensely complex and increasingly important organisation, with 37 broadcasting members from 31 countries, as well as a large number of associate members in other areas of the world.

From the Eurovision Control Centre in Brussels, the network of satellite and s.h.f. terrestrial links are supervised, distributing hundreds of hours of programmes each week around the continent, and collecting and distributing input from outside Europe to the member broadcasters. There is an average 15 per cent increase in traffic each year, and despite leasing channels on trans-Atlantic satellites, there is a need, when covering major events, such as the Washington Reagan-Gorbachev summit last year, to lease additional transponders.

A regular feed from Asia (Kuala Lumpur and Japan) takes place each day, but it is intended to lease a transponder on an Indian Ocean satellite for expanded facilities. Fifteen earth stations make up the Eurovision network, and it is common
for more than one earth station to receive feeds of major events. In the instance of the Washington Summit, pictures of NTSC standard were converted in the Eurovision bureau on the East Coast, and fed in PAL or SECAM to Europe, thus alleviating the need to have conversion equipment at each of the three earth stations used.

Eurovision also co-ordinates the deployment of equipment and logistical arrangements for major coverage, and Brian was to fly out to Moscow the day after his talk at the EDXC Conference to oversee arrangements for the Moscow summit.

Following the European start to the Sunday morning of the Conference, we went further afield and received greetings from Melbourne, home of Radio Australia, and the presenter of that station’s Communicator programme, Roger Broadbent.

Radio Data System

Then it was back to Europe to hear about Radio Data Systems from Herman van Velthoven of Pioneer Electronic Europe. RDS is a concept which was explained in Short Wave Magazine, December 1987, but it is now about to be launched with vigour in many European countries, including the UK.

Receivers are now available including models made by Pioneer, Blaupunkt and Panasonic, with varying degrees of sophistication. Herman enlarged on the possibilities of this very flexible enhancement to f.m. broadcasting, and the varying type and amount of information which could be transmitted to the listener. Perhaps one day, he speculated, there could be RDS on a.m. broadcasting, although the problems with propagation and deterioration of signal quality and strength need to be overcome first.

Glasnost and Perestroika arrived at the 1988 European DX Council Conference just before Sunday lunch, when Yuri Kharlanov, Brussels correspondent for Pravda addressed delegates about the changes taking place inside the Soviet Union, and the impact these were having on mass communications including sound and vision broadcasting.

The reporting of important news stories was being speeded up, and more analysis provided of events at home and abroad. The jamming of overseas broadcasts were also on the decrease.

At the Banquet, in speaking in French, with Frans Vosken of the BRT translating, then went on to answer questions from the floor most candidly, even responding to a question from the Head of Audience Research at Deutsche Welle asking why DW’s Russian Service was still jammed. Mr Kharlanov said that he was unaware that this was the case, and could not really comment, since he was not a specialist in broadcasting, but could only assume that this was because of a perceived interference in Soviet internal affairs by the station.

It must be said that Mr Kharlanov’s appearance at the Conference did cause some dissatisfaction amongst two of the delegates who protested that the Conference was becoming unnecessarily political. It was pointed out, however, that this was not the intention in inviting the Pravda correspondent, and that just a couple of years ago, this sort of presentation would have been unthinkable.

The majority of delegates, it should be noted, were most impressed with this particular aspect of the Conference.

After lunch, we crossed to North America, firstly with a video presentation from Kim Elliot, of the Voice of America, taking about the station and importance which it places on audience research. Then by telephone link with Kim, who answered questions on VOA, audience research and the future for short wave broadcasting from the assembled delegates. Then another video presentation, this time from Prof. Dr Ron Brown of the University of Minnesota on Local Radio, and whether it is going in the Italian direction of a free-for-all. Once again, a telephone link provided a question and answer session on this and related topics for the delegates.

WRTH Quiz

After a brief break, another first for the 1988 EDXC Conference — the WRTH Quiz. A regular feature at ANARC Conventions, this light-hearted quiz featured two teams of three — Europe versus North America — and was recorded for future broadcast on “Media Network”.

All the team members demonstrated their wide ranging knowledge of international broadcasting from frequencies to word and wonderful station aids and names. The prizes at the end were copies of the WRTH, and the winners suggested that theirs should be sent by WRTH to Third World DX clubs.

To the Banquet

At 1830, the delegates climbed aboard coaches for transportation to the mystery venue for the traditional EDXC Conference Banquet, and by 1900, had discovered that the setting was Antwerp Zoo. After a stroll past flamingoes and other exotic animals, an apéritif was served in the extremely humid Winter Garden. Then it was into the sumptuous Marble Hall for the Banquet.

A Raffle provided a little light entertainment with winners of station memorabilia from all over the world, then David Monson demonstrated an unexpected talent as musician, playing some haunting melodies on the piano. A most pleasant evening.

Back at the Crest on Monday morning, George Wood opened the International Broadcasting Symposium, with representatives from most of the stations, east and west, answering questions and commenting on the international broadcasting scene.

Delegates learnt of the possibility of a second BBC World Service, the re-opening of Deutsche Welle’s Sinhalese relay station, the thoughts of different stations on QSL cards and much more besides. The Symposium proved highly successful and listeners were presented with a rare opportunity to discuss matters of importance with programme makers.

In all, a successful Conference, I think, judging by the comments of delegates leaving Antwerp, and with International Radio Days forming an integral part of the event, an important step forward has been taken in publicising short wave radio to a much wider audience.

The venue for the 1989 Conference is still under discussion, but could well be in Central Europe; Short Wave Magazine will bring you full information in the coming months.

Tom Walters again.

Abbreviations:

| a.m. | ANARC | amplitude modulation | Association of North American Radio Clubs |
| f.m. | EDXC | frequency modulation | European DX Council |
| kHz | MHz | kilohertz | National Television |
| I.s.b. | NTSC | lower sideband | Sequential Colour And Matrixing (TV System) |
| s.h.f. | PAL | super high frequency | Phase Alternate Line (TV System) |
| u.s.b. | RDS | upper sideband | radio data system |
| UTC | SECAM | Co-ordinated Universal Time (GMT) | Sequential Colour And Matrixing (TV System) |
| WRTH | WRTH | World Radio TV Handbook | World Radio TV Handbook |
UK LISTENERS CONFIDENTIAL FREQUENCY LIST 5th edition
compiled by Bill Laver
Published by Spa Publishing Ltd
Available from the SWM Book Service
210 x 296mm, 147 pages. Price £6.95 plus 75p P&P
ISBN 0 9512729 3 4
This book provides the reader with a comprehensive list of h.f. frequencies between 2 and 30MHz. It includes details of aviation, marine, broadcast, etc. users along with their location/station and mode/callsign/times wherever known.

The main objective is to quickly direct the listener to the frequency, or band of frequencies, most likely to provide the type of stations required. The short wave bands are full of surprises and even the most experienced listener is often rewarded with a new station not heard before – especially when you know where to start looking.

The entries in the book are placed under block headings. These frequency headings are all based in the international frequency allocations adopted by most countries in the world. However, not all countries subscribe exactly to these international agreements and there are numerous examples of radio transmissions appearing in unexpected places. So it’s best to regard this list as a starting point from which to build up your own bigger and more specialised listings.

W1FB’S ANTENNA NOTEBOOK
by Doug DeMaw W1FB
Published by the American Amateur Relay League
Available from the SWM Book Service
208 x 276mm, 123 pages. Price £4.95 plus 75p P&P
The book was written for enthusiasts rather than engineers, so readers don’t have to have lots of previous knowledge before the book is useful.

It’s mainly simple wire and tubing antennas that have been detailed as these can provide very satisfactory performances for a host of operating objectives. There is no high level mathematics in the book, only simple equations are used to either explain something or to calculate the length of an antenna element. Detailed drawings are used to help clarify constructional methods.

There are chapters on such types of antennas as dipoles, single-wire antennas, simple verticals, high performance wire antennas, limited space and “invisible” antennas and special receiving antennae. Other topics covered are matching techniques and simple antenna measurements.

One thing you notice about the book is the size of the print, much larger than usual and very easy to read. All the drawings are also well laid-out and very clear.

PASSPORT TO WORLD BAND RADIO
Published by Radio Database International
Available from the SWM Book Service
177 x 253mm, 399 pages.
Price £10.95 plus 75p P&P
ISBN 0 914841 15 0
There are stations from more than 160 different countries on the air transmitting programmes on music, nature, tourism, culture and politics – trouble is you need to know where to look for them. This book gives a list, by frequency, of the hours and languages broadcast by international broadcast stations.

As well as that there are receiver reviews and advice about which receiver suits which needs. There are also features about some of the international broadcasters.

QUESTIONS AND ANSWERS RADIO
by Eugene Trundle
Published by Newnes Technical Books
Available from the SWM Book Service
110 x 164mm, 110 pages. Price £3.95 plus 75p P&P
ISBN 0 408 01550 0
When people start out along the radio hobby road, there are usually loads of questions they would like to ask if only they knew who could give the answers. This book may well provide those answers.

Questions like: What is a mixer? What is electricity? What are f.e.t.s? Do I need a licence to transmit? How is this achieved? are all answered in a simple and concise manner.

No previous knowledge is assumed, just an interest in the world of radio. This book attempts to guide the reader up the first few rungs of the technical ladders. It starts at ground level and graduates to a useful working knowledge of the main aspects of radio.
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. . . WHEN YOU ONLY NEED TO SPEND £995.00?

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No boring waffle, just "realistic" prices.

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Listen to HF Broadcasts as they were always intended to be heard with LINIPLEX Radio Systems

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- The nearest thing to Hi-Fi on short wave.
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- No distortion and minimum fading.
- Near ideal LSB/DSB/USB modes derived by a unique tracking filter to minimise adjacent channel interference.
- Rebroadcast quality for both speech and music in all modes.
- Highest RF performance.

LINIPLEX F2 Broadcast Receiver tuned by the low noise LINIPLEX OSC-1 frequency synthesiser, 2-22 MHz.

Complete system with matching loudspeaker . . . £1399 including VAT.

PHASE TRACK LTD., 16 Britten Road, Reading, RG2 0AU, England.
Tel: 0734 752666 Tlx: 848888 Tadlex G.
John Waite reviews the Realistic PRO-2021 scanner — a v.h.f./u.h.f. base station receiver.

The PRO-2021 is a very comprehensive scanner covering most of the interesting bands between 68 and 512MHz. In addition to the wide frequency range there are some 200 memories in which to store all those special frequencies for instant recall. The usual scanning facilities are complimented by a search feature which makes the discovery of new stations simple itself.

Controls

On the front panel there are two rotary controls on the left-hand side and twenty-four push buttons on the right-hand side.

The rotary controls are the combined volume and on/off switch and a conventional squelch control. Both controls are graduated from 0 to 10.

The twenty-four push buttons are divided into two groups, operation and program. As you would expect, the operation buttons allow the selection of the different modes available. The program buttons are for numerical entry of frequencies and memories.

The operations available on the PRO-2021 are fairly standard, although I don’t mean that they are unnoteworthy. It’s just that the PRO-2021 provides the standard functions of the v.h.f./u.h.f. scanner and doesn’t call any of the buttons by unusual or odd names.

The various options are:

- **Scan:** This mode scans the frequencies already stored in memory. You can scan any or all the available channels, as required.
- **Limit:** This is used in the search mode, where the operator decides the limits of the band, or part of the band, they wish to look through.
- **Speed:** Obviously, this button determines the speed at which the scanner looks through frequencies. You can either have eight or four frequencies/steps per second.
- **Manual:** This allows the user to manually select any one of the two hundred memory channels. It’s also used in the programming of these channels.

**A:** To search up from the lower frequency limit to the higher frequency limit requires the operator to use this button.

**V:** The opposite applies to this key!

**Priority:** If you have a favourite frequency you like to monitor then that can be stored as the priority channel. Then, the scanner will check for activity on that frequency every two seconds, whilst it carries on any other function, apart from searching.

**Lock Out:** Pressing this key causes the selected memory channel frequency to be locked out for (or ignored) during scanning.

**Clear:** Very useful for those clumsy fingers when you get something wrong!

**Delay:** Normally the scanner carries on scanning as soon as the received signals stops, this button delays that move for two seconds.

**Monitor:** Any interesting frequency

The Manual

The multi-lingual manual covers the operation of the PRO-2021 in English, French, Dutch and German. The first few pages of the manual deal with the installation of the PRO-2021 and some good advice is given both for base-station and mobile use. The mobile environment is, fairly obviously, less than ideal for operating a scanner but nevertheless the manual contains several useful suggestions for reducing any interference you may suffer.

The manual was generally well written with extensive use of diagrams and simple, step-by-step instructions to cover the more complicated aspects of operation.

In addition to the basic operation of the scanner, there was a very useful chart to help you eliminate operator error in the event of the scanner failing to perform as expected.

Getting Started

Before operation can begin, the power source needs to be sorted out. There are two options, either 240V mains power via the supplied 1.5m cord and moulded two-pin plug or 13.8V d.c. external power source, e.g. a car battery. The back-up power for the memories is supplied by a 9V 6F22 (PP3) battery. If you try to operate the receiver without this battery the display will flash up the message BATT and emit a short beep every few seconds. I can assure you it can’t be ignored!

The next thing to organise is an antenna. Those of you who are as impatient as I am will be pleased to hear that there is a 62mm telescopic whip supplied screwed into a hole in the top panel of the PRO-2021. Although this will get you started I would strongly recommend that you use a good external antenna in order to get the best from the scanner. The external antenna connection is via a car radio type antenna socket on the rear panel. Sadly this is not a very good choice of socket for a receiver covering 68 to 512MHz and is likely to introduce significant losses at the higher frequencies.

Assuming that everything is in order the PRO-2021 starts in “scan” mode, automatically searching all the 200 channels except for any that were locked-out during the previous operating session.

Memories

The heart of the PRO-2021, along with most other scanners, is the memory system. The first operation is to program some frequencies into the memories. Fortunately, this is very easy and means selecting the required channel, pressing PROGRAM, entering the frequency and then pressing ENTER. This takes about ten seconds or so. The scanner will put in the trailing zeros in any frequency for you, just by pressing ENTER.

With some two hundred memories to play with, it can be fairly easy to lose track of what frequency is in which memory. To simplify this task, the memories are arranged in ten banks of twenty. This means that you can store like frequencies in one bank, e.g. air band, marine band and amateur band frequencies.

Another feature of the memory banks is that you don’t have to scan all two hundred channels. There is the option to exclude any bank(s) up to a maximum of nine, i.e. there must always be one active. You can also exclude individual frequencies at will.

There is an eleventh memory bank, not mentioned so far. This is used for the temporary storage of frequencies in when in the “search” mode. Despite its temporary nature, any frequency stored in this bank can be transferred to the main memories very easily. This is just like having a notebook handy when you’re searching for new and interesting frequencies.
The PRO-2021 was quite an easy receiver to "drive", although the handbook was necessary to achieve anything more than the most basic receiving function.

This scanner unfortunately falls into the category of having my pet hate. That's a "beep" on just about every key press that can't be controlled by the volume switch. I sometimes wonder if the scanner manufacturers run part-time businesses manufacturing headache pills! It also doesn't help those trying to operate quietly, late at night, without disturbing the rest of the family. I always want to find the offending wire and cut it.

The PRO-2021 looks a very smart rig if you use a corner of the living room as your shack. Although it hasn't got a dedicated headphone socket on the rear panel, you could use the 3.5mm external speaker socket to drive phones. Once again the "beep" could cause problems as it will be a fixed volume in the headphones. Not everyone can put up with the noise. Also there is 1.5W available on this socket, so some attenuation would be wise to protect the ears from extreme and sudden bursts of noise.

There is the provision of a phone socket so that you can tape directly from the scanner, which is often popular with scanner users.

Other than the infuriating "beeping", the noise the scanner makes, it is very difficult to criticise the operation of the rig. Although I dislike jargon, to use a well-worn phrase, it was quite "user friendly". All the controls were easy to use and basically self-explanatory. Obviously some knowledge of scanning receivers in general always helps, which is why books like Scanners and Scanners 2 are useful for the beginner. (5SWM Book Service Page 54)

Operation

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The Display

The display of the PRO-2021 is a pleasant turquoise colour, with the filtering and numbering being a dark blue. All the legends on the panel are made up of liquid crystal segments, the choice of colour making it very easy to read.

Four of the functions (manual, scan, lock-out and delay) appear on the left hand side, priority and program appear on the right. Along the top are the numbers 1 to 10, these represent the different memory banks. A thick, liquid crystal bar appears under any of the banks that are in operation at that time.

The only other things displayed are the frequency (in MHz) and the channel number. These are in digits about 7.5mm high, hence making them easy to read.

Performance

The PRO-2021 turned in quite a good performance as can be seen from my measured results. The sensitivity was consistent and exceeded the manufacturers specification at all frequencies. The selectivity was also well controlled with the measured performance being slightly wider at the -6dB point and narrower at the -50dB point. I was pleasantly surprised by the audio quality which was very crisp and clear. The a.m. performance, which is so poor in many scanners, was actually very good. Another good feature of the audio section was the healthy 1.5 watts output which should prove adequate for all but the noisiest of cars when used in a mobile environment.

Summary

The PRO-2021 is a very capable scanner equipped with a good range of facilities, its strong points being the well organised 200 memories and the good audio quality. If you can stand the incessant "beeping" then I think it is a good buy!

The PRO-2021 costs £219.95 and is available from your local branch of Tandy. My thanks to Tandy UK for the loan of the review model.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>68-88MHz (5kHz steps)</td>
</tr>
<tr>
<td>Coverage</td>
<td>108-136MHz (25kHz steps)</td>
</tr>
<tr>
<td></td>
<td>136-174MHz (5kHz steps)</td>
</tr>
<tr>
<td></td>
<td>380-512MHz (12.5kHz steps)</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>for 20dB signal to noise</td>
</tr>
<tr>
<td></td>
<td>±68-88MHz (0.4µV)</td>
</tr>
<tr>
<td></td>
<td>±108-136MHz (2.9µV)</td>
</tr>
<tr>
<td></td>
<td>±136-174MHz (1.9µV)</td>
</tr>
<tr>
<td></td>
<td>±380-512MHz (1.9µV)</td>
</tr>
<tr>
<td>Selectivity</td>
<td>±9kHz ±10Hz</td>
</tr>
<tr>
<td></td>
<td>±15kHz ±50dB</td>
</tr>
<tr>
<td></td>
<td>±13.75kHz</td>
</tr>
<tr>
<td>i.f. Rejection</td>
<td>60dB ± 154MHz (65.9kHz)</td>
</tr>
<tr>
<td>Scanning Rate</td>
<td>Fast: 8 channels/step per second</td>
</tr>
<tr>
<td></td>
<td>Slow: 4 channels/step per second</td>
</tr>
<tr>
<td>Frequencies</td>
<td>10.7MHz (first i.f.)</td>
</tr>
<tr>
<td></td>
<td>455kHz (second i.f.)</td>
</tr>
<tr>
<td>Squelch Sensitivity</td>
<td>Less than 1.5V (0.34µV)</td>
</tr>
<tr>
<td>Audio Power</td>
<td>1.5 watts max.</td>
</tr>
<tr>
<td></td>
<td>(1.6 watts at 10% t.h.d.)</td>
</tr>
<tr>
<td>Power</td>
<td>220-240 volts a.c. 17 VA</td>
</tr>
<tr>
<td>Requirements</td>
<td>13.8 volts d.c. 8 watts</td>
</tr>
<tr>
<td></td>
<td>9 volt battery for memory</td>
</tr>
<tr>
<td>Dimensions</td>
<td>80mm high 200mm wide 200mm deep</td>
</tr>
<tr>
<td>Weight</td>
<td>2.0kg</td>
</tr>
</tbody>
</table>

Abbreviations:

- a.c. alternating current
- dB decibel
- d.c. direct current
- i.f. intermediate frequency
- kHz kilohertz
- m metre
- MHz megahertz
- mm millimetre
- t.h.d. total harmonic distortion
- u.h.f. ultra high frequency
- µV microvolts
- V volts
- VA volt amperes (w)
- v.h.f. very high frequency
- W watts

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BUILDING 109, PRESTWICK AIRPORT, KA9 2RT.
Did you go to the Popular Flying Association event at Cranfield at the beginning of July? It's annual, so if you can make it next year, you'll be rewarded. One devotee of this fly-in is Hugh G3XSE (Birchanger, Essex) who is a private pilot. One year he flew to the event in a 4-seater Grumman Tiger and on his return journey he loaded the aircraft down so heavily with purchases of sundry aeronautical bargains that he was right on the weight and balance limit. "Landing back at base afterwards was definitely exciting; the far edge came up at an awe-inspiring rate despite determined braking!" This does emphasise a safety point; many smaller aircraft will be outside their weight limits if all seats are occupied, tanks are full and maximum baggage stowed: there has to be a compromise. See the Civil Aviation Authority (CAA) leaflet General Aviation Safety Sense 9: Weight and Balance. So far there are 10 leaflets in the series which can be obtained free from CAA Printing and Publication Services, Greville House, 37 Gratton Road, Cheltenham, Gloucestershire GL50 2BN, but do include £0.50 (£1.30 overseas) for postage. I'm sure that readers would like your thoughts on taking the R/T exam as you suggest, Hugh.

Frequencies and Updates
On the subject of Cranfield, its v.o.r. is back on the air 24 hours a day (CFD: dah-di-dah-dit, di-di-dah-dit, dah-di-dit, 116.50MHz). This is the only news since last month from the CAA General Aviation Safety Information Leaflet 5/88: Pilots please check your NOTAMs for details; these NOTIfications to Air Men are the official way in which a country promulgates important changes or makes temporary alterations of this sort.

London (City) departures initially fly outside controlled airspace (once clear of the special rules zone) and the likely routes are detailed in CAA Aeronautical Information Circular (AIC) 52/1988. Route A follows the Lambourne 173° radial until airway A47 is intercepted at reporting point HARDY on route to Paris (Charles de Gaulle). Route B is towards the Detling v.o.r. hence following the 128° radial away from the beacon towards the HASTY reporting point. Route C goes over the Detling and Dover beacons to join airway B3.

Changes are afoot in the Newcastle special rules airspace. The latest Aeronautical Chart from Aerad Customer Services, Building 254, PO Box 10, Heathrow Airport (London), Hounslow, Middlesex TW6 2JA (Tel: 01-562 0795) then ask for the free information pack at the same time. This contains a catalogue plus examples of recently out-of-date charts. Thanks to Keiron Carroll (Coventry, West Midlands) for pointing this out.

Alternatively, if you like Keith Finlay (Chester-le-Street, County Durham) you favour Jeppesen radio-navigation charts then these are sold by The Airport Shop, Oxford Airport, Kidlington, Oxford OX5 7RA. Keith plotted his Newcastle to Malta trip via airways UA25E, UA1, UG32, UA1, DW2, UA18/A18. Does anyone know the meaning of the D in DW2? If any reader can provide the flight plan for Keith's forthcoming trip to the USA (CARPE to Orlando section) he'd be grateful and I'll try to include it in a future "Airband" column.

Bryan Yates G4TVN (Garstang, Lancashire) would like a list of SelCal codes. On long-haul flights the crew need not monitor the radio for calls addressed to them; the automatic selective calling activates their receiver when the controller sends the appropriate tone-encoded four-letter signal. Try High in the Sky by Ken Barker of The Aviation Society, 44 Laburnum Park, Bradshaw, Bolton BL2 3BU. The Midland Counties Aviation Society sometimes publishes updates to this book in their Air-Strip monthly newsletter; contact R. Queenborough, 17 Leylan Croft, Birmingham B13 0BD.

Yet another book that lists beacons is pointed out by Tony Bernascone (Middlesbrough); HF Radio Signals (Volume 2) provides updates on coastal shipping beacons.

I'm all for a bit of fun, just like Chris Durkin (Romsirk, Lancashire) who found a tape in a local shop: What Goes Up Might Come Down - The High Flying Humour of David Gunston (Big Ben Tapes No. B8MC12). David is an air traffic controller at Birmingham.

Your Experiences
Dave Edwards (Boksburg, S. Africa) notes that, of course when you hear your own sonic boom coming back to you over the radio (if a ground station picks it up on its microphone) there is a delay before you receive it. Proves something about the speed of sound in air! Thanks to Dave for his various amusing experiences that I've printed recently; any more readers' anecdotes would also be welcome.

Lucky M. C. P. Bennett lives right by the Heathrow 09L outer marker in Datchet, Berkshire. He remembers Heathrow opening. Then, aeronautical h.f. communications used amplitude modulation (a.m.) rather than the present-day upper sideband (u.s.b.).

Help!
"Is your Museum open to the public?" Asks Les Crowther (Wrexham, Clwyd). Visitors are welcome in groups of up to 4 by prior arrangement; 'phone me on 01-568 5113 weekday evenings. How do you decide how good an antenna is? By using it? Strictly it should resonate on the band in question and not be too bad a match to the impedance of the feeder and receiver, but for receive-only purposes it is surprising how much you can get away with. If a friend offers you something, ask to try it before you decide. In the specific case of a CB dipole (I assume this is for 27MHz) and the v.h.f. airband 108-136MHz then clearly the antenna is going to be electrically very long. But the airband is different to terrestrial radio, aeronautical
signals arrive from high angles, something which for most other purposes antennas try to avoid! Groundplanes, on the other hand, seem to work quite well and are often seen in use by the controller at airfields. Sorry that I can’t end up giving a recommendation; it’s a matter of experiment.

If anyone out there has any Vulcan instruments or manuals please let me know; I am trying to complete a museum display. Vulcan XH558 has been a regular at displays this year, despite needing emergency repairs to cracked engine intakes whilst at Hurn. You can support its activities by joining the Vulcan Association: send £7.50 to Peter Quicke, 207 Weoley Castle Road, Weoley Castle, Birmingham B29 5OW.

Another item I am regularly asked for is aneroid altimeters, like the one Ron Ham described in his Band ll DX column (April SWM page 40). B. Surtees (West Auckland, County Durham) would like one of these and also a world globe showing air routes. Any ideas? Apparently the previously-mentioned device from Time Co. is no longer available. What about increasing scan speed on the Tandy 2004? I’m not in a position to try this but altering the clock speed of part of any digital circuit could have knock-on effects elsewhere which would require intimate knowledge of the equipment to predict.

The signal R517 can be modified, according to Hugh Tyson (Shipham, Somerset). The batteries are replaced by a single PP3 thus making room for 6 extra crystals and a selector switch; the new channels are brought in to operation by connecting this additional assembly in place of one of the existing crystals. Second-image problems can be removed using a filter between antenna and receiver. In fact two trap arrangements are placed in series, each trap is a 3-30pF trimmer in parallel with a coil of 4 turns of 18s.w.g. enameled wire. The input is one joint between the coil and capacitor; the other joint is the output terminal.

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Signature: □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
The first section of the receiver to be described is the audio amplifier which is built on a section of miniature group board or tag board. This comes with two rows of 18 double tags along each of its sides and you will need to carefully cut it into two pieces, one having seven tags along each side, the other having eleven. Cutting can be achieved either with a small hacksaw or by deeply scoring both sides of the board with a Stanley knife and carefully snapping the board in two.

For the audio amplifier you need the piece having eleven tags per side. The other piece will be used for the variable frequency oscillator (v.f.o.) board. Start by fitting the connecting wires between tags as shown in Fig. 2.2, wrapping the ends of the wires through the holes in the tags with a small pair of pliers but leaving the soldering until later. Next fit the resistors as shown. The value of each resistor is shown by the coloured bands around the body of the resistor. This system is known as the Colour Code and, although simple, does take some practice to read. If you do not already know the Colour Code then there are several cards and selector discs available.

The capacitors can be added next, wrapping the leads round the tags in the same manner as the resistors. Note that the electrolytic types have their polarity marked — you must fit these the correct way round.

It is worth saying something here about components and capacitors in particular. Capacitors come in all shapes and sizes with a variety of methods of indicating their value. The electrolytic types may well have slightly different values and working voltages marked on them from those specified. The working voltage can be higher than that specified but must not be lower than the supply voltage, 9V in this case. The other capacitors can be of any type so long as the values are as shown in the component list.

The last components to be fitted are the three transistors. These are all fitted to the board with the small tab on the base of the can pointing in the same direction, taking care to solder the three leads of each transistor to the correct tags. When soldering the transistor leads you should ensure that the soldering iron bit is clean, hot and properly tinned so that the joint can be made in the shortest possible time.

Try to get each component neatly positioned with the identification marks visible. This will help later on if you have any problems that require sorting out.

**Inspection and Testing**

The external leads can now be fitted and the amplifier tested — if you have the means. Inspect your work carefully and methodically to confirm that you have got the right value components in the right places, that the transistors and electrolytic capacitors are correctly orientated and all...
YOU WILL NEED

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistors</td>
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<td></td>
</tr>
<tr>
<td>1/4 W 5% Carbon film</td>
<td>220Ω</td>
<td>R10</td>
</tr>
<tr>
<td>1kΩ</td>
<td>6.8kΩ</td>
<td>R5</td>
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<tr>
<td>10kΩ</td>
<td>47kΩ</td>
<td>R6,8</td>
</tr>
<tr>
<td>1MΩ</td>
<td></td>
<td>R9</td>
</tr>
<tr>
<td>Potentiometers</td>
<td></td>
<td>R4</td>
</tr>
<tr>
<td>1/4 inch spindle carbon track with switch</td>
<td>10kΩ log</td>
<td>R7 + S3</td>
</tr>
<tr>
<td>Capacitors</td>
<td></td>
<td></td>
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<tr>
<td>Electrolytic, axial lead</td>
<td>5µF 63V</td>
<td>C10,12,14</td>
</tr>
<tr>
<td>10µF 16V</td>
<td>2 C9,16</td>
<td></td>
</tr>
<tr>
<td>47µF 16V</td>
<td>1 C18</td>
<td></td>
</tr>
<tr>
<td>Audio Amplifier Board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100µF 16V</td>
<td>1 C29</td>
<td></td>
</tr>
<tr>
<td>Polyester, axial lead</td>
<td>10nF</td>
<td>C13,15</td>
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<tr>
<td>0.1µF</td>
<td>1 C17</td>
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<tr>
<td>Disc Ceramic</td>
<td>1nF</td>
<td>C11</td>
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<tr>
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<tr>
<td>Transistors</td>
<td>BC107</td>
<td>Tr4</td>
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<tr>
<td>BC108</td>
<td>2 Tr2,3</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/4 inch mono jack socket</td>
<td>D.p.t. toggle switch</td>
<td>C18</td>
</tr>
<tr>
<td>4mm mono jack socket</td>
<td>9v battery</td>
<td>C29</td>
</tr>
<tr>
<td>10kΩ log</td>
<td>47kΩ</td>
<td>R6,8</td>
</tr>
<tr>
<td>1MΩ</td>
<td></td>
<td>R9</td>
</tr>
<tr>
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<td>10kΩ log</td>
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<td>R6,8</td>
</tr>
<tr>
<td>1MΩ</td>
<td></td>
<td>R9</td>
</tr>
</tbody>
</table>

the wire links are in place. Ensure that there are no leads touching other leads, tags or components. To test it you will need a power supply, multimeter and a source of audio frequency. A 9 volt battery will do for the power supply while you could use the earpiece output of a cassette tape recorder or radio to provide some audio but you will need to keep the volume control set very low! If you have got it all together you should hear an amplified version of the input signal in your headphones. If you are unlucky and nothing happens you should inspect your work again. Fault finding will be covered in more detail at the end of the project.

In Part 3 we will look at the construction of the v.f.o. which will give you some experience of coil winding.

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The C.M. HOWES communications section of the Short Wave Magazine August 1988.
The first is an updated version of the Black Jaguar MKIII BJ200 handheld scanner. This has had a number of design changes made since the original Mk 1 version and is now manufactured by a different company. It covers the bands 26-29.955MHz, 60-88MHz, 115-178MHz in 5kHz steps and 210-260MHz, 410-520MHz in 10 or 12kHz steps. Sensitivity is reasonable for a handheld scanner at 0.5-0.7µV for 12dB SINAD on n.b.f.m. and 1.0-1.5µV for 10dB s/n on n.m. a.m./f.m. is switchable on all bands.

The inclusion of the 210-260MHz band is unusual in a scanner of this type and should appeal to u.h.f. aircraft band fans. One interesting feature is the ability to enter frequencies outside the specified frequency ranges. The microprocessor control circuits don’t seem to object to this and providing the r.f. circuits don’t mind either it is possible to listen quite a long way outside the preset limits. The actual coverage depends on the individual model and its alignment. An interesting receiver I believe, especially at £235. A selection of additional accessories are also available. Contact the distributor: Nevada, 189, Portsmouth Road, North End, Portsmouth, Hants, PO2 9AE. Tel: 07059 662145 for further details. The company also stocks a selection of 934MHz scanning and amateur equipment, so try and get hold of a copy of their catalogue if you can.

Another new receiver aimed at the Airband enthusiast is the Fairmate HP82 handheld scanner. This has 20 memory channels and covers 118-174MHz, 220-380MHz and as a bonus 930-950MHz. The price?, around £220. For more information contact Johnathan Clough at Javiatron, Carlton Works, Carlton Street, Bradford. West Yorkshire. Tel: (0274) 732146.

My spies have been busy and I am now able to give me more information on the proposed follow-up to the Icom R-7000 receiver. The main feature will be its extended frequency coverage, ranging from 100kHz to 2GHz combining the facilities you would expect from current top of the range short wave general coverage receivers and v.h.f./u.h.f. scanners. Two versions may be available, the standard amateur version and a commercial version with built in Panoramic display. The amateur version is likely to be called the ICR-9000 and is anticipated to cost around £1500. So start saving now as the first samples are likely to arrive around October/November.

934MHz Update

Times are changing on the higher u.h.f. bands with the DTI stopping the sale and importation of equipment for the present 934MHz CB allocation after December this year. This is in order to make way for the proposed Short Range Radio service which will operate in the 933-935MHz band. The full specification for the new service is still being drawn up but the UK has reached agreement with some of the Scandinavian countries on the frequency and channel allocations to be used. This should be a good guide as to the final system whose main features are expected to include digital signalling, automatic channel selection and selective calling. Each set will have its own electronic “callsign” built in. The thought behind some of these ideas seems to have originated from major communication equipment manufacturers who believe that the 934MHz allocation will have a much wider appeal if equipment is more sophisticated and user-friendly. It is thought that these changes will provide a much higher grade of service than at present and so open a new market to users who are currently discouraged by the CB label attached to the band. One interesting aspect of the allocation is the exclusive use of four channels for data signalling. This differs from a similar system currently operating in Japan termed Personal Radio Service in which only one channel is set aside for signalling purposes. Perhaps the designers of the new system have learnt from the Japanese system or maybe the intention is to be more sophisticated. The channels are arranged at regular 25kHz intervals and will interleave with the existing 40 CB channels from 934-936MHz. Don’t rush out and sell your 934MHz gear yet, as it is expected that current equipment will still be usable for at least another 5 years, perhaps even longer before interference between the two systems starts to cause problems. A lot depends upon the level of usage in particular areas.

Converting TV Tuners

Following on from last months notes on the use of convertors Keith Micklewright

![Icom IC-R7000 Image]
of Market Drayton has written to me with the suggestion that it is possible to use a u.h.f. TV tuner as a converter. This would extend the coverage of any scanner which can receive 39.5MHz – the tuner i.f. output. In use the scanner is left set on 39.5MHz, the tuning being achieved by adjustment of the TV tuner. Using this method it is possible to extend the coverage of the scanner to u.h.f. TV Bands IV & V. Keith used a simple tuner in his experiments and found that the frequency stability was good once the tuner was set on a station, as the free running local oscillator stage has a tendency to Injection Lock to the incoming signal. The tuner Keith tried was a Thorn “T20” type, this used AF 139/239 transistors as the active devices, but better results may be obtained with some of the more modern Varicap type tuners which are readily available from advertisers in magazines such as Television. These usually require a stabilised 12V supply to operate, as well as a tuning voltage adjustable over the range 0-33V. One further adjustable supply may be required for the automatic gain control (a.g.c.) input on the tuner but this can normally be fed from a variable resistor connected across the 12V supply rail.

If you shop around a little you can obtain tuners which cover v.h.f. bands as well as the normal u.h.f. bands. These are intended for use in European TV sets where v.h.f. is still used for TV transmission or cable distribution. This would then give coverage of the bands 41-70MHz and 175-225MHz – very handy if you want to listen out for European TV or East European f.m. broadcast stations.

Readers Pat Evans and Alistair Matthews have found another use for these wide coverage TV tuners, they are using them as the basis of a home built spectrum analyser. The idea behind such a device, sometimes known as a Panoramic receiver or Pan-adaptor, is that it permits the examination of a wide range of frequencies on an oscilloscope type display. It is rather like looking at a horizontal tuning scale on a receiver, with all the signals being received shown as vertical “Blips” along the scale, the height of each blip being dependent on the received strength of each signal.

This is very useful if you want to quickly check on activity over a certain frequency range, the v.h.f. aircraft band for instance. You can see which frequencies are used the most, and from the displayed signal strength which signals are the most local to you. The printout shown in Fig 1 is an example of the type of display you could expect, although this particular one came from a very nice Marconi spectrum analyser that you would need a second mortgage on the house to be able to buy. The vertical axis is calibrated in 1μV divisions and the horizontal axis 10kHz divisions. The centre of the display is at

128.6MHz and you can clearly see the signal from London VOLMET south being displayed with its peak at around the 3μV level. Two divisions to the left and 200kHz lower in frequency a very strong signal can be seen peaking just below the 10μV line. With a conventional receiver you could be monitoring 128.6MHz and be completely unaware of the more local signal on 128.4MHz. Other traces are also present at 128.275, 128.550, 128.850, 129.000 and 129.050MHz showing how much activity there is in just one small portion of the v.h.f. aircraft band.

Commercial Spectrum Analysers cost several thousands of pounds and have facilities which permit very rapid measurement and analysis of the displayed signals. If you are willing to accept reduced performance then it is possible to build such an instrument at a fraction of the cost.

The basic elements required are a Varicap TV tuner and an oscilloscope. The idea is that a sample of the horizontal sweep voltage is taken from the oscilloscope and is used to feed the Varicap diodes in the TV tuner. The i.f. output of the tuner is fed to a diode detector and then the vertical deflection amplifier of the oscilloscope (see Fig 2). Obviously this is quite a simple system, but it is capable of good results and is an ideal basis for experimentation. Improved performance can be achieved by the addition of extra sections such as i.f. amplifiers, i.f. filters, Logarithmic i.f. stages, etc. The basic circuit Pat & Alistair used was published in the Aug 83 and Feb 85 issues of Wireless World, but other more complex designs have appeared at various times in several publications. The great advantage of the Wireless World design is its ease of construction, with a working circuit being quickly obtainable. Have any other readers experimented with designs like this? Drop me a line and let me know your findings.

Icom R-7000 TV Reception

I have now built the 700MHz amplifier stage I outlined in last month’s column and have added it in line with the i.f. output I took from the receiver. The results have been very worthwhile with signals now detectable when the signal strength meter is only just lifting off the zero position. It has also solved the problem of the pictures becoming noisy when the a.g.c. starts to operate.

One slight problem which has now come to light is that the i.f. output is frequency inverted. Signals which are higher in frequency than the vision carrier such as the sound carrier and colour sub-carrier appear on the low frequency side (like a mirror image) at the i.f. output. This is an unfortunate side effect of this method of frequency conversion. However in practice it has little effect on the end result, a lot depends on the i.f. response of the TV receiver used to view the i.f. output. Using the present system I can now see weak signals on most days just using a 50MHz slit polarised dipole mounted in the loft.

Revco RS3000

Nigel Alford of Erith has recently obtained a Revco RS3000 scanning receiver which he is very pleased with. He wonders if any readers have performed modifications to the set, particularly the provision of a S-meter. I will pass on any details I receive. As usual all letters to PO Box 1000, Eastleigh, Hants, S0554B. Please enclose an s.a.e. if you require items returning. Until next month — Good listening.

**Abbreviations:**

- a.g.c.: automatic gain control
- a.m.: amplitude modulation
- Band IV: 471.25 – 607.25MHz
- Band V: 615.25 – 855.25MHz
- CB: Citizens Band
- dB: decibels
- DTI: Department of Trade & Industry
- f.m.: frequency modulation
- i.f.: intermediate frequency
- kHz: kilohertz
- MHz: megahertz
- n.b.f.m.: narrow band frequency modulation
- PO: Post Office
- r.f.: radio frequency
- s.a.e.: stamped addressed envelope
- SINAD: ratio of signal to noise and distortion
- s/n: signal to noise
- TV: television
- u.h.f.: ultra high frequency
- UK: United Kingdom
- μV: microvolts
- V: volts
- v.h.f.: very high frequency
PMX PRESELECTOR-CALIBRATOR

The PMX preselector-calibrator is an H.F. antenna tuner covering 1.7 to 34MHz, a three stage preamplifier, a 15dB attenuator, a calibrator having 1MHz, 100kHz and 10kHz outputs, plus a mains power supply all in a single metal case. There’s more: the power supply has an outlet to power other transistor projects as well, giving 12 volts at 30mA stabilized. As well as antenna matching, reduction of superhet image is greatly improved, only the band being used is amplified and everything else is attenuated. The receiver RF gain can be turned well down and in the majority of cases a very significant improvement in reception is noticed. The calibrator will give harmonics throughout the MW/HF spectrum and is extremely useful as an accurate and stable signal source whether a digital dial is in use or not.

There are four pages of free information available on the PMX, one devoted to eight unusual antenna experiments using the PMX, non-technical and well illustrated. The PMX can be supplied unpowered (you provide 12V DC) or mains powered.

- Unpowered PMX: £68.00
- Mains powered PMX: £78.00
- Mains powered PMX with calibrator: £87.00

All prices include postage and packing. Despatch normally same day first class.

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S A E for full details and prices of other ‘separates’

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- 2 watt audio output stage having a low quiescent current.
- Size: 153 x 33mm Requires 10-14V DC supply.

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- Stock Versions: (fully assembled, aligned & tested boards) 6m, 4m, 2m & Weather Sat.
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- Complete cased versions & special options: details & prices on request.
- Crystal can be supplied if required; most popular 2 metre frequencies and the currently active Weather satellites are readily available. Crystal prices on request.
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- U s e S 5 / 4 (0.7dB NF at 200MHz)
- Input & output impedance 50 ohms
- 1dB compression: + 10dBm
- Saturated output: + 15dBm
- Supply voltage 8-17V DC at 5-10mA
- Stock Versions: (fully assembled, aligned & tested boards) 6m, 4m, 2m & Weather Sat.
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- Other versions: Prices & details on request.
- **NEW ** HIGH PERFORMANCE 2 metre PRE-AMPLIFIER
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25th Anniversary Year 1963-1988
Most mobile scanner users adopt a simple whip which is usually cut to give a quarter wave at about 100MHz and then hope for the best. One recent variation on this theme has been to include a simple broadband amplifier in line to boost those signals which are well off the resonant frequency. Other scanner owners, myself included, have adopted the use of u.h.f. collinaires which are resonant on at least two, if not three centre frequencies. The Sandpiper antenna works on this principle and although such antennas have been on the market for some years, to the best of my knowledge Sandpiper are the first manufacturers to actually promote the product for mobile multi-band operation; in this case 50, 144 and 435MHz.

A full description of how such an antenna works is rather complicated and beyond the scope of a review but in simple terms the basic unit consists of two λ/4 sections over a λ/4 section at u.h.f. These elements are coupled by contra-wound λ/4 coils to provide the 50Ωm match to the feeder. The combination of elements and phasing sections also provides resonance at other frequencies where, in some instances, the coils become electrically transparent or act to a small extent as loading coils. The result in this instance is a three band antenna with far more gain at u.h.f. than can be obtained with the previously mentioned all-purpose whip.

Sandpiper Model 7

The Sandpiper antenna supplied for review came in knocked-down form comprising the base and quarter wave section, two phasing coil assemblies and two whip sections and an Allen key. The mounting is via a 3/8in UNF stud (PL259) is available but whatever base is chosen has to be bought separately although, of course, as the stud is the type also favoured for CB antennas there is a wide choice.

Assembly takes a few minutes and each of the phasing sections allows for a degree of adjustment for final tuning. On the test sample, the set was tuned for a minimum v.s.w.r. on the 430MHz amateur band and checks were made at 50 and 144MHz to see if the v.s.w.r. was acceptable. The worse case was at 52MHz where the v.s.w.r. was a fraction under 2:1 and any attempt to improve this resulted in the two remaining bands being off-tune. However, these tests were really academic because the objective was to see how effective the antenna was for scanner use and in that context tests were carried out in two ways. First of all I used a jig that is established at home OTH for the very purpose of comparing performance using known transmitters in a variety of bands. Measurements are taken using the S-Meter of an Icom R-7000 and compared with a table of previous tests using a discine as a reference. The results of this test were that u.h.f. performance was excellent and performance between 130 and 170MHz were as good as a quarter wave whip cut to the centre of that band. Performance between 66 and 88MHz and 110 and 130MHz was reasonable and marginally better than the 100MHz quarter wave whip.

The next test was to use the antenna on the vehicle and this was done using the AOR 2002. Impressions were obviously subjective but appeared to bear out the jig tests. The performance on u.h.f., 144MHz and the marine band was very good and v.h.f. low band and airband certainly no worse than the familiar 100MHz quarter wave.

Overall Impressions

For anyone who has only used a simple whip for scanner use, the performance of the Sandpiper collinear will come as a revelation. Usually the most critical band is u.h.f. and the 15dB gain offered by this antenna is far superior to a v.h.f. whip. At this point I have a small but relevant confession to make. For over a year I have been developing a commercial design for mobile scanner use and had arrived at almost exactly the same formula used for the Sandpiper Antenna. However, my own design was to be manufactured using wire elements encased in fibreglass so that it would look like an ordinary car radio antenna. Sadly, the fishing rod manufacturer who was going to produce these antennas has gone out of business so my efforts have come to an end. I mention this because although the Sandpiper antenna performs well it is both ugly and heavy (it is well engineered though with solid, stainless steel elements and well-machined parts). It also stands out like a sore thumb on any car and advertises the fact that some sort of special equipment is fitted. Unless you want to inform every villain in the area that expensive goodies are installed then the obvious answer is to use a magnetic mounting base and remove the antenna after use and indeed, this method was used during the tests for this review.

The Sandpiper antenna probably performs as well as any mobile scanner antenna ever will and it is good to see a product filling a long-standing gap in the market. However, although I am not renowned for giving away the results of my labours, I would suggest to Sandpiper or any other manufacturer that my own market research has shown that a less obvious antenna with similar performance would probably find an even wider market.

One final point concerns scanner owners who cannot install a discine (flat dwellers in particular). During the jig tests it became apparent that this antenna could easily be used as a base antenna merely by including some sort of ground plane, even a few wires strung out from the base. In fact the u.h.f. performance was far better than that of the reference discine and in the marine bands it was just as good. Anyone with limited space should find it a far better solution than simply using the telescopic whip supplied with most scanners and if it can be installed on a balcony or window box so much the better.

I am indebted to Links Communications of Guernsey for loan of the review sample. The Model 7 antenna is available from Sandpiper Communications, Pentwyn House, Penyward, Llwydcoed, Aberdare, Mid-Glamorgan CF44 0TU (Tel: 0685 870425). Cost (not including VAT) is £17.80 which includes postage, packing and VAT.

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>CB</td>
<td>Citizens Band</td>
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<tr>
<td>dB</td>
<td>decibel</td>
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<td>in</td>
<td>inch</td>
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<td>λ</td>
<td>wave length</td>
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<tr>
<td>MHz</td>
<td>megahertz</td>
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<tr>
<td>u.h.f.</td>
<td>ultra high frequency</td>
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<tr>
<td>UNF</td>
<td>Unified National Fine (thread)</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
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<tr>
<td>v.s.w.r.</td>
<td>voltage standing wave ratio</td>
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Sandpiper Mobile Scanner Antenna & Mag-mount

Save £3.00 on the normal price of £24.50

Have you thought of using your scanner while mobile in the car? If so, what do you use as an antenna? Are you like a lot of scanning enthusiasts and put up with a simple whip cut to be a quarter wavelength at about 100MHz, hoping for the best — or are you looking for something better?

Then look no further — our Special Offer this month is the Sandpiper Model 7 collinear mobile scanning antenna and mag-mount ready to cling, limpet-like, to the roof of your car.

This antenna is also the subject of the review by Peter Rouse in this issue, so you can find out all about it by turning to page 26.

The antenna will screw directly onto any mount having a 3/8in UNF stud fixing and you have the options of buying the antenna alone or complete with a powerful 130mm diameter mag-mount.

**HOW TO ORDER**

Complete both coupons in ink, giving your name and address clearly in block capitals. Coupon (2) will be used as the address label to despatch your antenna to you.

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No postage stamp is needed. If you wish to pay by credit card (Access, Mastercard, Eurocard or Visa only), please fill in your card number and sign the coupon where indicated.

Available to readers of *SWM* in England, Scotland, Wales, N. Ireland, the Channel Isles and the Isle of Man. Orders are normally despatched within 28 days, but please allow time for carriage. The closing date for this offer is 15 October 1988.

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| **To:** Short Wave Magazine Antenna Offer (2), Freepost, Enefco House, The Quay, Poole, Dorset BH15 1PP  
Please send me:  
Model 7 antennas @ £15.50 inc. VAT & P&P  
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Signature  
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If you do not wish to cut your copy of *SWM* you must send the corner flash with full details and remittance, PW Publishing Ltd., Poole, Dorset (Reg. No. 1980539, England).
We started both engines on aircraft G-AXNB, a Boeing 737-200, at 1525 local time on August 18 and then taxied out to begin Britannia Flight BY940 to Dusseldorf. This was the second flight of the day for the crew as we had already been to Hannover and back beforehand.

For this sector, the captain Ian McAreavey, was the "handling pilot." My duties, amongst others, were to monitor the navigation, to select and identify the navigation aids required and to operate the radio-telephone (R/T).

Prior to engine start both transceivers had been tested. The nav-aids had been selected for the Standard Instrument Departure (S.I.D.) we anticipated receiving from Air Traffic Control.

We obtained permission to start engines and to taxi with the Luton Ground Controller on 121.75MHz. Then, as we went toward Runway 26 he passed our airways clearance. As expected, we were cleared to Düsseldorf on a Clacton Bravo s.i.d. squawking 5255 on the transponder. We were to call London Control on frequency 125.8 when advised after take off.

As we approached the holding point for Runway 26 we were instructed to call Luton Tower on 120.20, and after receiving clearance to do so, we entered the runway. We checked again that the correct nav-aids were selected for the s.i.d. we had to follow - we had Bovingdon v.o.r./d.m.e. (113.75) on both nav receivers and Brookmans Park n.d.b. (328kHz) on both a.d.f.s. On the altitude alert system we had entered 3000 as this was the altitude we had to maintain until passing "the Park". Once lined up in the direction of take off and all the checks completed, we received permission to take off and were told to contact Luton radar on 128.75 once airborne.

We took off at 1543BST, and as we passed 500ft the v.o.r. receivers showed we were on the 037 radial from Bovingdon. We turned left, tracking the runway toward the v.o.r. until the d.m.e. showed a range of 7nm. We then turned left again toward Brookmans Park which we now selected on both nav sets and tracked inbound on the 286 radial. We spoke to Luton Radar briefly as we became airborne, and as there were no other aircraft in the Luton Zone to affect us, they handed us over to London Control as we were passing 2000ft.

I dialled 125.8 into the frequency selector and called London, "London, good afternoon, Britannia 940 with you reaching 3000 feet". Back came the reply, "Good afternoon, Britannia 940. Squawk 2410, continue the climb to 6000 feet, and cancel speed control." (Normally there is a maximum of 250 knots below FL100 in the London terminal manoeuvring area (TMA)).

As we crossed Brookmans Park the next beacon, Clacton (114.55), was tuned on both nav sets. We tracked 027° on airway Red One North towards Clacton.
reached ODINO we turned right, tracking 169° inbound to the n.d.b. As we approached FL100 and began reducing our speed to 250 knots (mandatory maximum i.a.s. below FL100 in German airspace) we were handed over to the next Dusseldorf sector controller on 120.05 MHz. He cleared us to FL80, gave us a radar heading to steer of 180°, and transferred us to the Approach controller on 119.40.

On first contact with Approach, I passed our radar heading and also confirmed that we had received the latest ATIS information. We were then cleared to descend to 3000 ft on the QNH altimeter setting, instructed to turn right onto 180°, and cleared to intercept the i.l.s. localiser. We were also instructed to reduce speed to 170 knots, in order to fit into the flow of other aircraft ahead and behind us. As it was happening the nav-aid indicators were quickly re-selected and identified. First of all the i.l.s. was dialed in on Nav 1, and the "Lima India" n.d.b. selected on both a.d.f.s, Dusseldorf v.o.r./d.m.e. was retained on Nav 2 to provide distance information so that we could confirm the correct altitude/distance relationships as required on the i.l.s. approach plate. At the first movement of the "beam bar" the aircraft was turned so that we tracked the localiser inbound. I reported we were "established" to the controller.

We were then cleared for the i.l.s. approach and to descend with the Glide Slope, and told to contact the Tower on 118.30. The Tower told us to continue the approach, advised us that there was one aircraft ahead of us to land first. They passed the O.F.E. altimeter setting which the Captain selected on his altimeter.

At a range of 10.5 nautical miles the Glide Slope was intercepted from below, and the aircraft was then descended as we tracked both the localiser and the glide slope. A further check of the glide slope/range relationship was made at 9.0 d.m.e., following which the i.l.s. was also selected on Nav 2. We crossed the "L.I." n.d.b., and then the outer marker, which was our final check that the glide slope was accurate.

By now the approach lights and the runway were visible ahead, and the final part of the approach was conducted visually using the VASI lights in conjunction with the i.l.s. indications. The aircraft gently touched down at 1530 BST, with Captain McAraeevev performing yet another perfect landing! As we slowed down to taxi speed and turned off the runway, we made our final communication frequency change to the Ground controller on 121.90. This controller cleared us to our parking stand, and confirmed that he had received our flight plan for the return flight back to Luton.

Thirty minutes after our arrival on stand, refuelled, cleaned and with 130 different passengers, the whole thing began again in reverse! For those who might be interested, the principal plates and charts used during this flight were the Jeppesen E (Loc) 1 and 2, E (Hil) 3 and 4, Luton 10-3, and Dusseldorf plates 10-2 and 11-1.

N.B. Please note that since this article was written the IATA code for Britannia (BY) has changed to "BAL" and airway Red One renamed Romeo One.

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<th>F/L</th>
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Abbreviations
- a.d.f.: automatic direction finding
- ATIS: automatic terminal information service
- BST: British Summer Time
- d.m.e.: distance measuring equipment
- FL: flight level
- i.a.s.: indicated airspeed
- IATA: International Air Transport Association
- i.l.s.: instrument landing system
- MHz: megahertz
- nav: navigational
- n.d.b.: non-directional beacon
- nm: nautical mile
- R/T: radio telephone
- s.i.d.: standard instrument departure
- s.t.a.r.: standard terminal arrival route
- t.m.a.: terminal manoeuvring area
- VOLMET: Volume METeological report
- v.o.r.: very high frequency omni-directional radio range
After taking a "holiday" last month, that involved dropping-by several European radio stations, here's a bumper bundle of developments.

Back in the Future

After a rather sad close-down ceremony towards the end of last year, it looks as though the Australian time signal station, VNG, could return on at least two of its three traditional frequencies.

The closure of the 10kW facility was certainly felt by many scientists. Although short wave may sound "old fashioned" when compared to satellite methods of obtaining precise time to within one second in 100,000 years, it doesn't require expensive receiving equipment.

In mid-July, the VNG transmitter at Lyndhurst in Victoria was loaded onto a truck and taken to the new location of Penrith, near Sydney. By the time this issue of Short Wave Magazine hits the newsagents, VNG should be back on the air.

The old transmission schedule was 4.5MHz between 0945 - 2130UTC, 7.5MHz from 2245 - 2330UTC and 12MHz between 2145 - 0930UTC. A voice identification was given every 15 minutes, although the programming on time signal stations may be somewhat repetitive (1), they are quite useful for checking receiver calibration and propagation conditions between Europe and Australia. I found VNG a useful check when listening for Indonesian stations on 60m, and I'm sure that others will welcome the station's return.

Over the Wall

In West Berlin, a legal private radio station has decided to do a form of international broadcasting giving East German dissidents a chance to air their views. But "Radio Glasnost" on 100MHz has listeners and critics on both sides of the wall that divides the city. Some say that the tapes of East German writers and scientists are providing a useful service.

The coverage is limited because the 50W station only operates on f.m., and therefore only a relatively small part of the East German capital is covered. Critics point to the fact that the German Democratic Republic has started taking action to stop the show by jamming it with a 10kHz tone. Such a trend might cause interference problems to other private stations in the border areas who are not interested in the East.

ITU Flop

What were you doing on May 17? Of course you recall that it was World Telecommunication Day. No? The International Telecommunication Union in Geneva spent a lot of money sending out both a video and audio tape to many stations around the world for broadcast on that day.

Although the summer season is traditionally the time when international radio listening takes a dip, before picking up again in September, the last eight weeks or so have been busier than usual.

Across the Atlantic

The recent Moscow summit seems to have benefited the Voice of America. Charles Wick, Head of the Parent Organisation US Information Agency, recently told reporters that he expects VOA to open a news bureau in the Soviet capital shortly.

At the same time financial constraints have stopped VOA's broadcasts in Thai, and put the VOA Dixon transmitter site in California into mothballs. No sooner had Dixon gone off the air than Alabama entrepreneur Dixon Norman was issuing press releases again. Norman has been telling the world about his forthcoming NDXE Global Radio station since 1985. This 500kW radio station would broadcast in stereo on short wave, he claimed. Despite starting an NDXE "listeners' club", so far the members have nothing to listen to. Their 30 US dollars subscription brings a 4-page newsletter once in a while. The latest NDXE release said they had petitioned the US government to hire the Dixon short wave site. This would finally put NDXE on the air, and VOA would get a cut of the profits in return. We rang VOA to check the story. A spokesman for the engineering department said that they regard any business proposal as confidential. However, since VOA Dixon was only off the air for budgetary reasons, they had no plans to dispose of the facility just yet, nor change its current status as a VOA station. So don't raise your hopes too high that NDXE will materialise.

The FCC in Washington has just opened an investigation into NDXE's activities. A few short wave listeners have been surprised to find that NDXE has charged their credit card for goods they never ordered or received. If you have suffered a similar problem, drop a line to Bandscan, and we'll investigate further.

Finally, don't write to Voice of America at 7616 in Washington DC (the box number recently mentioned in several advertisements and on their 1988 calendar). Evidently the VOA hasn't renewed the subscription with the post office. As a result, some mail to the box is being returned marked "Gone Away".

Peter Laughton

"Appearance-conscious" music lovers arise, you have nothing to lose but your wires. Those not-so-aesthetic wires linking headphones with cassette players may be about to go the way of the vacuum tube. The Japanese Sony Corporation has developed a Wireless Walkman. The cassette player has a transmitter that sends signals to the headphones, a company spokesman told us. The system is now on sale in Japan at a price of 260 US dollars, but the manufacturer didn't elaborate as to just what kind of transmitter is installed in the cassette player. Cordless headphones that use a beam of infra-red light to carry the sound from an amplifier to the user have been around for years, but the headphones have to have a line of sight path between the infra-red transmitter and receiver. The fact that the headphone can receive music within a 1.5m of the player, even if the player is in a bag or briefcase, suggests that Sony are using a low-power radio transmitter. Just what frequency range is used wasn't announced. Sony says that the headphones pick up the signal of the nearest cassette player if two are within range.

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"We'll have to do some further research in Tokyo though, because Sony has no immediate plans to market the product abroad. In view of radio interference problems, maybe that's a good thing.
That would be a gigantic removal contract! VOA's correct address is simply Voice of America, Washington DC 20547 USA.

Relay Stories

At the start of August, Deutsche Welle, the Voice of Germany, resumed transmission from the “Trincomalee” transmitter site on the island of Sri Lanka. Actually the transmitting complex is further north than that, being located between two lagoons at the town of Perlaka. Ironically, the building was used by the British to listen out for German submarines during the Second World War, since Trincomalee is one of the largest natural harbours in the world.

Whilst the site is a fine example of German precision engineering, the position in the north-east part of the island has proved somewhat of a problem. Violence between Tamil and Singhala communities made it impossible to hire local personnel, or get oil up from Columbo to run the diesel generators. But now it appears the situation has calmed down a bit, and operations can resume. This means that Deutsche Welle will probably stop hiring airtime from the Catholic radio station, Rádio Veritas, in the Philippines. This was a temporary measure to cover for Trincomalee.

Two other stations are talking about relays. Spanish Foreign Radio in Madrid says that progress on their transmitter site in Costa Rica is proceeding rather slowly. It should start testing towards the end of next year. The site will not only put out programmes relayed from Madrid, but we should hear programmes produced by the government authorities in Costa Rica too.

Radio Netherlands has just completed a £10,000 survey of the Asian broadcasting scene. The station’s signal strength in East Asia is poor, and there have been plans to improve this for years. The study concludes that only Thailand, Brunei or the Philippines would be possible transmitter sites. The plan has now been sent on to the Dutch minister of Culture to see what can be done about the finance. The survey gives no automatic guarantee that the station will get an Asian relay station.

BBC on Stream

In the next few weeks we can expect the BBCs East African relay station to start testing. No frequencies have yet been announced — we should have them in this column next month. The two 250kW transmitters on the Seychelles will be used for English programmes, as well as vernacular services such as Somali. If all goes well, the transmitter will come into full operation on Sunday September 25.

Short Wave on Satellite

The momentum to improve distribution of international radio programmes seems to be in full swing. Radio Canada International announced in June that it’s early morning Caribbean programme was being distributed on the the C-SPAN cable system in the Washington DC area. C-SPAN simply listen to the Intelsat feed that is uplinked from the RCI Montreal studios. If successful, C-SPAN have plans to make the service available to 33 million homes in the US. If that’s the case, other international broadcasters will join in.

Already Radio France International, Voice of Free China, Deutsche Welle and Radio Netherlands are being heard on the C-SPAN cable network too, although these audio feeds are taken off short wave.

On the European continent, the BBC is scoring further successes with the satellite feeds on Eutelsat. The French service news bulletins are now rebroadcast by a number of private stations in France, and three local stations in Finland are relaying the BBC’s Finnish service.

AUSSAT

In Holland, the cable systems are switching to satellite feed of the BBC World Service. The quality is improved and the channel doesn’t keep trying to speak three languages at once as witnessed on the BBC 648 service. The BBC is also said to be investigating the possibility of distributing its programmes in Australia through the AUSSAT satellite service.

More satellite feeds may be on the way. Radio Moscow fed a special 60 minute English language programme to the USSR during the Moscow summit, and some US stations did take extracts. It will be some time before Radio Moscow will be able to persuade stations to relay them on a 70.m. or medium wave on a permanent basis. Surprisingly, the quality of the satellite feed seems to be similar to a telephone — there was more fidelity on short wave in fact. Radio Moscow is also announcing a new answerline number for listeners. However, only some countries can dial Moscow 2336595 direct.

Teletext Services

If you live in a city such as Swindon with SKY channel on the cable system, the number of short wave stations that offer schedule information on the Teletext system has just doubled — to two! Radio Sweden has its complete schedule listed on 496, Radio Netherlands Dutch language transmissions have been on page 306 since April. The World Radio TV Handbook operate a media news page on 307. George Wood of Sweden’s DX programme says they are planning to put extracts of Sweden Calling DXers on the SKY channel pages too.
The majority of Sporadic-E reception will be confined to the TV channels allocated within the Band I spectrum, mainly because of the limiting factor imposed by the m.u.f. Some openings are better than others and a careful check through the f.m. broadcast band may reveal the presence of continental f.m. stations. In some cases, transmissions will be noted only at the lower end of the f.m. radio band, depending upon the m.u.f. At other times, transmissions will be present on the higher frequencies around 100MHz and occasionally the reception of amateur signals on the 144MHz (2m) band is possible. On rare occasions, TV signals in Band III are encountered on frequencies higher than 175MHz.

Many such openings will allow the reception of a special group of TV channels used exclusively in Russia and certain Eastern-bloc countries, provided the necessary equipment is at hand to cover these frequencies.

When skip distance reduces substantially on lower frequencies to below 500km, the m.u.f. refracted by the ionised Sporadic-E clouds is, in fact, increasing. Thus the likelihood of reception occurring on frequencies above Band I can be predicted to some degree. Unfortunately, a decreasing skip distance may not be very obvious to the newcomer, or even the experienced DXer, especially during an intense opening when signals seem to be coming in simultaneously from all over Europe!

**Band I Reception**

In most Western European countries, v.h.f. television transmissions occur in Band I between 45 and 70MHz and in Band III between 175 and 230MHz, f.m. radio broadcasting takes place between 88 and 100MHz. In Russia and the Eastern-bloc countries, the situation is a little different. Band I and III are still used for TV broadcasting, but a further group of channels exist between 75 and 100MHz which is usually referred to by enthusiasts as Band II (see Fig. 1). The f.m. band used by Russia and some Eastern-bloc countries is located towards the upper end of Band I between 62 and 73MHz. This situation Fig. 1: Distribution and Band II channels in relation to Band I.

**Most newcomers to the hobby of long-distance television will be content with Sporadic-E reception in Band I. This is the easiest band to receive, but sometimes an intense opening produces impressive signals on higher frequencies.**

**Countries Using Band II**

Most of the transmission found in Band II will originate from countries already operational in Band I. There are two exceptions, Albania and Bulgaria, although the latter occupied Channels R1 and 2 until the late sixties. Channel R5 listings have been included for the benefit of those lucky enough to live far away from local f.m. transmitters.

**OIRT Channels (Russia and certain Eastern-bloc countries)**

- **R3** USSR, Poland, Romania and Bulgaria. The latter has a transmitter listed at 50W. Despite its low power it has been received in the Netherlands.
- **R4** USSR, Poland, Romania, Hungary and Czechoslovakia.
- **R5** USSR, Poland, Romania, Czechoslovakia and Bulgaria.

**CCIR Channel (Italy and Albania)**

- **IC** Italy (RAI from Torino) and a few low-power private stations, Albania with a 100kW outlet.

**Notes:**

1. (1) On OIRT Channels R3, R4 and R5, System D with SECAM colour is used except Romania which uses PAL.
2. (2) On CCIR Channel IC, PAL colour is used by both Italy and Albania.

**Equipment**

For some reason the Band II part of the v.h.f. spectrum is ignored by many enthusiasts. This is a pity because it does have a lot of potential. There are many high-power TV transmitters operating on channels within this band.

Perhaps one reason why Band II is less popular for DXing is the apparent lack of availability or receiving equipment and antennas suitable for this particular band. Most multi-band TV receivers which were originally destined for the Western European market will only provide coverage throughout Bands I and III. In Band I this will include Western European (CCIR) Channels E2 – E4 and Russian/Eastern European (OIRT) Channels R1 and R2. Band III will include CCIR Channels E5 – E12 and OIRT Channels R6 – R12.

Fortunately, there is a trend nowadays from some of the more upmarket television receivers to cater for these extra channels in Band II, particularly the ones boasting satellite and cable channel facilities. The once popular mini-colour portable, the JVC CX610GB, provided coverage of Band II channels and was calibrated accordingly. The “de luxe” version of the D-100 DXTV Converter System covers these special channels as standard. Gone are the days when enthusiasts had to patiently rewind the coils of clip-in “biscuits” fitted to the old valued v.h.f. turret tuners!

For the constructor, an increasing selection of Varicap tuner units is available with coverage into Band II. For instance, the Mullard ELC2000 series of tuner will cover Band II channels although not all tuners will guarantee a coverage of Channel R5 which is unfortunately located right in the middle of the f.m. radio band with a vision carrier frequency of 93.25MHz.

Some Varicap tuners allow virtually an uninterrupted coverage between 45 and 240MHz, or much higher in some cases. Generally there is a certain amount of overlap where the band-switching point occurs, which is typically 100MHz. The Mullard UV411 and UV412 Varicap tuners will tune from 44 up to 88MHz only in Bands I and II whereas the UV415 and UV416 versions provide coverage from 47 up to 111MHz.

**Interference Sources**

In Western Europe, the f.m. radio band completely envelops Channel R5. This means that reception of this channel will be extremely difficult unless you happen to live in a very quiet part of the United Kingdom with few f.m. transmitters receivable. Even when using equipment with a reduced i.f. bandwidth it is virtually impossible to cut down the f.m. splatter sufficiently to resolve the vision carrier of Channel R5. The JVC CX610GB receiver,
referred to earlier, will tune as high as Channel R5 but difficulty with f.m. radio splatter begins to show as far back as Channel IC.

The use of pre-amplifiers will only exaggerate the problem unless one is prepared to experiment with filtering prior to the input of the amplifier to reduce the strength of the f.m. transmissions. Also, a few p.m.r. channels exist in this part of the band which can cause intermittent problems. In most cases it may be best to concentrate DXing efforts on the lower channels in Band II such as R3 and IC (and Channels R4 if local conditions permit).

Stable Pictures

Sporadic-E signals in Band II are normally very stable with gradual fading. In fact, they resemble signals received during a tropospheric lift. Colour reception is possible, especially on Channel R3 but interference from the f.m. radio band and various other band users may prevent it from being resolved on the higher channels. The same applies to the sound channel. It is interesting to note that because the sound frequencies of channels R4 and R5 fall within the f.m. band it is possible to monitor them directly using an ordinary f.m. radio receiver.

Antennas for Band II

A frequent temptation is to use the existing Band I array for Band II reception. Although the frequencies we are dealing with are not much higher, the use of such an antenna cut for lower channels will give poor and unpredictable results. On the other hand it may be considered an uneconomical use of mast space to fit a separate multi-element array for relatively infrequent reception over a limited range of channels. As we said earlier, Band II will only become active during intense Sporadic-E openings when the m.u.f. rises high enough. Although this band is affected by tropospheric enhancement, it is doubtful whether transmissions would be received in the UK because of the distances involved. Fortunately, other modes of propagation, such as meteor shower, do occur in this band but reception is not as frequent as in Band I.

One satisfactory solution to the problem of mast space is to mount a dipole on the same boom as the Band I array cut to the higher frequency end of Band II. Each rod should be approximately 840mm (33in) in length and the dipole should be situated some 760mm (30in) in front of the last Band I director. This will, in effect, provide a 2-element Band II array because the Band I director acts as a reflector for the Band II antenna. The original boom can be extended by using a sleeve of alloy tubing to attach the second boom, provided that sufficient boom end is available, (see Fig. 2a). Alternatively, the second boom could be made to overlap the

Fig. 2a: Using an alloy sleeve.

Galvanised bolts & wing nuts

Fig. 2b: Overlapping booms.

first by a few inches (see Fig. 2b). In both cases the tubing should be secured using the appropriate hardware such as galvanised bolts and wing nuts.

Sporadic-E Reception in Band III

There are rare instances of TV signals being received well into the Band III spectrum between 175 and 230MHz via Sporadic-E propagation. Excluding the Moroccan channels (which commence at 163.25MHz but are usually hidden beneath a deluge of radio communication channels in the UK), the lowest Band II channel common to most countries is E5/R6 with a vision carrier frequency at 175.25MHz. It is advisable to periodically check this channel during an opening, especially if the skip distance on the Band I channel seems to be decreasing. Better still, continuously monitor this channel if Fig. 3: Dimension details for wideband and semi-wideband 3-element arrays covering television channels in Band II.

The arrays can be constructed of 0.5mm dia. alloy tubing for the rod and 1mm dia. for the boom.

Amplifiers

In the previous article when we have discussed signal amplification, most of the emphasis has been placed on amplifiers suitable for u.h.f. reception. What about TV reception in Bands I, II and III? Most manufacturers produce wideband masthead amplifiers covering all v.h.f. frequencies throughout the range 40 to 230MHz.

Band I

The use of an amplifier for Band I frequencies is questionable because overloading due to high field strengths can be a constant problem, especially throughout the summer months. The last thing the DXer needs is cross-modulation or signals appearing on incorrect channels!
INTRODUCTION TO DX-TV

When the CB radio craze reached its peak a few years ago, many enthusiasts who had previously used mast-head amplifiers for Band I soon abandoned them. It wasn't only the illegal CB operators that drove mast-head amplifiers into severe overload through the use of linear amplifiers and multi-elements arrays in an attempt to increase their transmitting power. Transmissions from rigs conforming to the legal requirements caused just as many problems. Operating a mast-head amplifier in the vicinity of several watts of r.f. power created immense problems and in many cases the whole of Band I was severely obliterated. Also, the length of a dipole cut to the centre channels of Band I (54-55MHz) is harmonically related to the CB band and this made matters considerably worse.

One of the authors found that fitting a high-pass filter to the input of the amplifier eased interference considerably but its use at mast-head was still considered risky. Re-siting the amplifier indoors offered easy access to the filtering arrangement, despite a slightly poorer signal-to-noise ratio. The arrangement is shown in Fig. 4.

With the rampant use of illicit cordless telephone systems around 49MHz and the growth in the 50MHz (6m) amateur band, it is suggested that an amplifier at mast-head should be avoided for Band I reception. Similar remarks apply to television reception in Band II where problems from the f.m. band might be encountered.

**Band III**
When using a wideband v.h.f. amplifier but it seems a small price to pay for freedom from interference.

During the preparation of this article, a mast-head amplifier specifically intended for Band III use is undergoing evaluation. Its frequency response is 175 to 230MHz and so far no problems have been encountered with f.m. breakthrough. Additional filtering has not been found necessary.

Combining the Signals
In the system used by one of the authors, the outputs of the mast-mounted Band I and III systems are delivered into a combiner/bandfilter unit prior to feeding a common distribution amplifier. The output from the u.h.f. and Band II systems feed individual distribution amplifiers (see Fig. 4). This was considered necessary to avoid cross-modulation occurring within the Band I and III distribution amplifier caused by strong local signals in the f.m. and u.h.f. bands.

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**Abbreviations**

| CB  | Citizens Band |
| f.m. | frequency modulation |
| i.f. | intermediate frequency |
| m.u.f. | maximum usable frequency |
| PAL | Phase Alternate Line |
| p.m.r. | private mobile radio |
| r.f. | radio frequency |
| SECAM | System En Couleurs A |
| TV | television |
| u.h.f. | ultra high frequency |
| v.h.f. | very high frequency |

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**SERVICES**

Subscriptions
Subscriptions are available at £17 per annum to UK addresses and £19.00 overseas by Accelerated Surface Post outside Europe. For further details see the announcement on page 19 of this issue. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both Short Wave Magazine and Practical Wireless are available at £27.00 (UK) and £30.00 (overseas). Three-year subscriptions are also available for SWM at £45.00 (UK), £50.00 (overseas).

Queries
We will always try to help readers having difficulties with a Short Wave Magazine project, but please observe the following simple rules:

1. We cannot give advice on commercial radio, TV or electronic equipment, nor on modifications to our designs.
2. We cannot deal with technical queries over the telephone.
3. All letters asking for advice must be accompanied by a stamped, self-addressed envelope (or envelope plus International Reply Coupons for overseas readers).

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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 board for the SWM Audio Filter, July '87 issue, is available price £2.75. The printed circuit board for the SWM Active Weather Satellite Antenna, June '88 issue, is available price £4.20.

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Short Wave Magazine August 1988

35
The basic principles of a.m. have already been outlined in this series (SWM, December '87), but let us now consider some aspects of them in a little more detail.

**Sidebands**

A complex mathematical analysis of the modulation process reveals that amplitude modulation is essentially a form of mixing. The modulating audio signal (fm) mixes, or heterodynes, with the carrier (fc) and produces additional sum and difference frequencies (fc + fm) and (fc - fm) called side frequencies – see Fig. 1a.

Modulating the carrier with several audio frequencies results in two bands of side frequencies; they are known as the upper and lower sidebands.

The effect of modulating a carrier (fc) with three ascending audio tones (fm1), (fm2) and (fm3) is depicted in Fig. 1b. The highest tone (fm3) results in the two equally spaced side frequencies being furthest away from the carrier, whereas the side frequencies produced by the lowest audio tone (fm1) are nearest to the carrier. A change in the amplitude of one of the modulating audio tones will result in a corresponding change in the amplitude of its associated upper and lower side frequencies. Note that the information contained in each sideband relative to the carrier is identical, so they may be considered as “mirror images” of each other.

**The Carrier**

Surprising as it may seem, the analysis shows that the amplitude and frequency of the carrier (fc) remains constant during the modulation process – it simply acts as a reference for the sideband information and actually “carries” nothing! It is this information that leads to the conclusion that the carrier could be eliminated at the transmitter and replaced by a locally generated reference signal at the receiving point so as to enable the sideband information, devoid of its original carrier, to be demodulated.

**Composite Signal**

The modulated r.f. output from an a.m. transmitter is a composite signal contained in a modulation envelope, being the resultant of the carrier and sidebands. The peak r.f. signal voltage of the modulation envelope varies in sympathy with the waveform of the modulating audio. When the level of the audio applied to the modulator causes the peak r.f. voltage to vary from zero to twice the unmodulated value the transmission is said to be fully modulated.

**Radiated Power**

When the transmission is fully modulated the peak r.f. power in the envelope, known as the peak envelope power (p.e.p.), will vary from zero to four times the unmodulated value, since power varies as the square of the voltage; however, the average power radiated will depend upon the nature of the modulating waveform. Complex waveforms such as speech, which often have spiky peaks but a low average content, result in a relatively low average power being radiated when the peaks reach 100 per cent. In contrast, if the carrier is fully modulated by a single sinusoidal tone the average power in the modulated signal will be 1.5 times the power in the unmodulated carrier – in other words the power output increases by 50 per cent.

The additional power is supplied by the modulator and goes entirely into the sidebands since the carrier remains constant at all times. If one considers this in terms of a broadcast transmitter with an unmodulated carrier power of 100kW the additional power required from the modulator for full modulation with a sine wave tone will be 50kW – no small amount. The power distribution within the carrier and sidebands under these conditions is shown in Fig. 1c. It is interesting to note that two-thirds of the radiated power is in the carrier itself, since it will be remembered that it carries no useful information and simply acts as a reference for the sidebands. Obviously a great saving in transmitter power will be obtained if the carrier is eliminated at the transmitter.

---

**Starting Out**

Brian Oddy G3FEX

One of the most frequently used methods of sending information to a distant location by radio consists of superimposing an audio frequency onto an r.f. carrier at the transmitter by a process known as amplitude modulation (a.m.), but it is possible to transmit information by radio without sending a carrier!
Carrier Suppression

It is, in fact, a relatively simple matter to remove the carrier from the sideband information at the transmitter. Instead of carrying out the modulation process at high power levels in the final stages of an a.m. transmitter, the audio signal (f_m) and the carrier (f_c) are applied at very low power to a special circuit called a balanced modulator in the initial stages of a suppressed carrier transmitter.

The audio signal (f_m) and the carrier (f_c) have to be applied to the modulator in such a way that the sum and difference frequencies (f_c + f_m) and (f_c - f_m) appear at the output, but the carrier (f_c) is balanced out or suppressed. The resulting output is called a double sideband suppressed carrier (d.s.b.s.) signal — see Fig. 1a. In signal, since only one frequency can appear at the output, the carrier is entirely suppressed, but a suppression of 70dB or more may be achieved. Whereas an a.m. transmitter radiates a "plain" carrier when the modulating signal (f_m) is absent, virtually nothing will be radiated by a suppressed carrier transmitter if the audio signal (f_m) is removed from the input to the balanced modulator.

There are a number of different balanced modulator designs in general use, but one type that provides good carrier suppression at low cost is known as a diode bridge modulator — see Fig. 2. An outline of the operation of this circuit is given later — see appendix.

Since the modulation process is carried out at very low power levels the d.s.b.s. signal has to be amplified to raise the power output to the desired level. It is important that the waveform is not distorted during amplification, so linear r.f. amplifiers are required.

Single Sideband

The sidebands of a d.s.b.s. signal contain identical information, so there is really no need to send both of them to a distant receiving point — in fact there are a number of advantages to be gained if only one of the sidebands is eliminated at the transmitter. Apart from the additional saving in transmitter power, another important aspect is the significant saving in r.f. spectrum space required by the signal, since only half the bandwidth required by its d.s.b.s. counterpart will be needed. There are a number of other less obvious advantages in sending one sideband — some of them will be outlined in a subsequent article concerned with the reception of these signals.

Appendix

The circuit of a diode bridge modulator is shown in Fig. 2. The modulating audio (f_m) is applied to the four diodes via transformer T1 and the carrier (f_c) is introduced via the centre tap on L3. L3/C1 is broadly tuned to the sideband frequencies (f_c + f_m) and (f_c - f_m). The d.s.b.s. output appears across L4. The amplitude of (f_c) is made about 10 times that of (f_m) so that it controls the switching action of the diodes.

Assume initially that (f_m) is absent. During the instant when the waveform of (f_c) at point (A) is positive with respect to (B), the series diodes D1/D2 will be forward biased and conduct, thus causing equal currents I1/I2 to flow in L3, resulting in no r.f. output at L4. During the next half cycle of (f_c) point (A) will be negative with respect to (B), so the shunt diodes D3/D4 will be forward biased and conduct, whereas D1/D2 will be reversed biased. Since equal currents will flow in L2 there will be no r.f. output at L4.

If (f_m) is applied while D1/D2 are conducting it will not affect the switching; however, during one half cycle of the audio waveform the r.f. current of D1 will be more positive than that of D2, causing I1 to be greater than I2. During the next half cycle of audio the opposite applies and I2 will be greater than I1. These current unbalances result in a d.s.b.s. output at L4.
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As I outlined last month, this is the last column from The Short Wave Log. It has been my turn to write the column for over a decade, turning white and the time has now come to hand over the monthly work to someone else. I successfully lobbied for the arm, (he'll be in plaster for weeks) so that someone else will be Paul Essery GW3KFE. Old timer readers of Offshore Wave Magazine will recall him as the Editor between 1977-87. Current readers of our magazine Practice Wireless will be aware of his monthly DX column. Paul has been professionally involved in the electronics industry for many years, in the development of secondary radar, naval communications systems. In earlier years he was involved in the design of antennas control systems for nuclear power stations and guided missile electronics. He was a station commander at a TS-830V, VPQ-290 and R. 21002Z line, either into a TA32, an indoor beam, or a Best Bent Wire for the i.f. bands. At v.f he is occasionally to be heard on 144MHz or 432MHz, either from home or out of home. He has had some longish discussions on the format of the column, and I decided that the HPX Ladder is getting a little long in the tooth; after all it has been running successfully twice a month! So, this is the last time the tables will appear, but fear not, Paul and I thought up a new format. We persuaded Dick G8V FH (the Editor) to foot the bill for the award which will be back for those with interesting prefixes. I'll let Paul explain all the rules next month as the starting date is 1 September 1988. This gives all readers, whether old hands or as a w.i.o. or not, the chance to shine.

Obviously I shall be sad to give the column, that can be said for both you by saying by reading over Paul’s shoulder from time to time. It will also give me the chance to do some of those "special things" I have been promising myself for many years.

Don't forget to send your reports to the address at the top by: August 16, September 20 and October 19

All Time Post War HPX Ladder

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<tr>
<th>Name</th>
<th>Prefixes</th>
<th>Phone</th>
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CW only

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DX only

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Annual HPX Ladder Starting date January 1, 1988

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<td>S. Myers (Liverpool)</td>
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<tr>
<td>D. Gilbert (Farnham)</td>
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<td>223</td>
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</table>

200 Prefixes to have been heard since January 1, 1988 for an entry to be made in accordance with HPX Rules. At score points, the All-Time list is automatic. Note, the Annual Table is a Phone only listing.

Most in 1988

<table>
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<td>E. M. Guacci (Malt)</td>
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Rules as for the Annual List. An entry for this listing must be in addition to any claim for the All Time Post War listings.
noise like an old steam train chuffing along

I've been spending some time this month catching up with my post bag, so hopefully some of your questions will have been answered.

Readers' Letters

My first letter is from Victor Spiteri in Gibraltar. Victor has been a short wave listener for many years with his main interests being RTTY, cw, SSTV and AMTOR. The equipment comprises a Sony ICF-2001D receiver and a Commodore 64 computer. In order to eliminate the need for a terminal unit, Victor uses the RX-4 and TX-3 programs from Technical Software. The computer is also used for log keeping by utilising a Microlog SWL cartridge.

Like many of you, Victor has been frustrated by the many different types of signal on the bands these days and is looking to expand his system to cater for more modes. One of the main problems for anyone attempting to receive new modes is recognising the signal so that the appropriate mode can be selected. Those of you with a generous budget will find a solution by using the automatic decoders e.g. the Pcomor range. The rest will need to learn from experience.

Victor has suggested that a cassette tape with a selection of different types of signal would help to overcome some of these problems. I agree with Victor and I hope that a voice commentary and perhaps a print-out of the content of each message would be particularly useful for listeners setting up new equipment. Would any readers be interested in such a tape?

The content of each message would be e.g. the Pocom range. The rest will need to learn from experience.

Readers' Letters

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

Peter Thompson has been spending some time checking out the unidentified frequencies that I printed in the April issue. It would seem that he has been able to confirm at least three frequencies which is good news. Peter uses a Yaesu FRG-7 with modified filters and an Alpha-Delta DX-SWL Sniper antenna. The occasion was achieved using a Kantronics KAM intelligent terminal unit, though he used to run the Technical Software program. As he has yet to get the KAM working on FAX, he is still using his Spectrum with the G4DVE FAX program for this mode.

Chris Norfolk has supplied some very comprehensive signal reports which make interesting reading. Rather than just sending me the date, time, frequency, etc., he has sent a sample print out of each station with a local QSL report and general information on the signal quality, etc. One example is ADN Berlin on 13 876 kHz using 50 baud normal shift. This station was received at 1300UTC and the weather was bright and sunny. Another report points out that he was having trouble with QRM from an aircraft approaching the garage next door! All these reports are very useful and add some interesting background information.

Now for a plea for help! Mr P. Dunn has an Atari 800XL computer and is trying to obtain a copy of the user's manual. Can anyone help? He has removed the original manual down to a line and I will put you in contact with Mr Dunn.

Regular readers will recall the letter from Mr Roberts of the Halesowen Climatological Centre. He was having problems with interference from his printer whilst receiving FAX charts.

We'll have found the solution and to prove it he has sent me some rather
good charts which with luck should be displayed in this column.

Dave Brightman has sent in a useful letter, apparently using his Brother M1109 printer and 25-year old Ex-WD RTTY paper. He runs a very comprehensive version of the program, and an amazing selection of receivers as follows: NRD-525, HRO, BC-348, HQ-147, RA-17 with IF and RS-32 adapters, Edysonner 888A, Collins 51J3 and a Yaesu FR-101D1! Having owned some of those receivers myself, he must have heard them all.

My thanks to you all for your letters and I look forward to even more in the future.

Your Views

In the June issue I asked for your comments regarding the development of the column and I have received a very good response. Norman Hartford sent in a very interesting letter which summarised most of the views expressed. First of all it would seem that I need twice the space in order to present all the information! Seriously though, the first point to appear was that the column should concentrate on commercial stations and ignore amateur stations, unless they are exceptional in some way.

It is also clear that there are lots of listeners who have new to the data modes and would like to see some simple tutorials covering the various modes. I would envisage these running along the lines of perhaps some historical background followed by a detailed list of what they work and why they are needed.

Another idea was a 'What Decoder' feature which could be printed occasionally. This is a new and good idea and one that I had already thought about. I think it would have to be split into two sections: a simple terminal units and intelligent terminal units. In order to get hands-on reports, I would like to see short articles from writers with their comments on the programs they use.

But, last not least, it seems that you want a larger frequency list. This presents something of a problem as frequency lists tend to take up quite a lot of room in the column. One solution I am considering is to consolidate all readers reports into my own database and make copies of this database available to readers. I'm not intending to set-up in competition with the likes of Kingen fuss, but more to provide a list of up-to-date loggings.

I would expect the list to cover about three months which should be adequate. As to the development, to begin with I would think that an a.s.e. would be enough — that is unless the list gets too big then we'll have to think again. So if you have any loggings you think should go into the list, send them along and I can add them into the database. Anyone wanting this list be sure to send a little note along saying sending off your s.a.s. though, haven't finished entering all the data yet.

Amstrad CPC Support

If you are the proud owner of an Amstrad CPC computer and would like to use it to aid your short wave listening, help is at hand! Jim G4RSA has written kindly offering a library of four disks of public domain software for this computer. Included in this package is a RTTY program that operates over the range 45 to 100 bauds, which proved very useful. All the programs are complete with documentation on the disk, there is even a print facility for those of you who don't have a wordprocessor.

To get your hands on this attractive offer you should send four disks and return postage to Jim at the address shown at the end of the column. If you are a regular user then you should write first. Scrob users will also find help from Jim's direction. He can supply a program to allow you to dump OSO files to disk, if you are interested then drop a line to Jim. Don't forget that this is a kind offer from an enthusiast so be sure to receive yours for delivery and your must include an s.a.e. My thanks to Jim for his letter.

Commercial QSLS

The practice of sending QSLS is common in the amateur world, but not so common amongst short wave listeners. I suspect that this is simply because listeners don't tend to confess to having heard a station or delivering reports they may not be licenced to receive. You may be surprised to hear that a lot of stations, particularly foreign ones, send signal reports as it gives them confirmation of the stations coverage. Norman Hartford recently sent a signal report to

RWN-72 which is a TASS station operating on 15.63MHz. You can imagine his surprise when he received a letter from the Ministry of Posts and Telecommunications thanking him for his report! He has given me permission to print the reply here:

'The USSR Administration has received your message in respect of reception of our radio station.

We wish to express our gratitude and we wish you further progress in your passion for the amateur broadcasting.

As you can see it is well worth sending reports to some stations. The only problem is deciding which stations to contact and their addresses.

As a general rule the Russians and Americans are a pretty safe bet, but if you have heard from any other countries then please drop me a line with the details. As to addresses, the only source that I am aware of is the Kingenfuss Guide To Utility Stations (from SWM Book Service). The book contains a very comprehensive station address list along with a wealth of other useful information.'

Frequency List

The reports listed are a compilation of information received from readers this month. The usual format of frequency, mode, speed, shift and callsign has been used. Any stations in bold print have not been positively identified and any additional information would be most welcome.

<table>
<thead>
<tr>
<th>Frequency</th>
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<th>Mode</th>
<th>Speed</th>
<th>Shift</th>
</tr>
</thead>
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<td>ARQ 100/170</td>
<td>OST</td>
<td>100/170</td>
<td>OST</td>
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<tr>
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</table>

AMSAT-OSCAR-13

The good news for the month is that a completely successful launch of the AMSAT-12 satellite, by the first Ariane-IV ESA launch vehicle from French Guiana, finally took place. First it put Meteosat, then OSCAR 13 in its 5/60a constant, and then Panaramiss into perfect parking orbits.

A few further holdups preceded the launch, the original date having been postponed for a few more days to overcome an interface problem on the Ariane flight computer. The ESA engineers team worked over the week-end of June 11 to get things right. They hoped that the problem was minor and that a further postponement to July would not be necessary. A Flight Readiness Review held on the previous Saturday, reported by the AMSAT-DL team over FQSYM (the launch site club station on 21.280MHz), stated that all systems were ready to go and the Ariane-IV tanks were filled ready for firing up on Wednesday June 15. That was one day before OSCAR-10's fifth birthday.

The AMSAT Launch Information Network broadcast the countdown, firing and satellite ejection on many frequencies all round the world. It was estimated over a quarter of a million listeners followed the event. It was also put out on live TV from the Galaxy-3 (transponder 241 satellite, in geostationary orbit at 33.5 degrees west), Ariane Spacecast broadcast the launch via Spacecast-1, transponder 1, and OSCAR 10 used the space facility to broadcast the launch via the OSCAR-10 satellite on 145.968MHz.

As might be expected, propagation on 14 and 21MHz, which had been excellent prior to the launch day, dropped to poor conditions. Even the live coverage from G6RLW of AMSAT-UK, as G8OUK was not perfect copy over the entire UK at the critical time.

415MHz, 4.605MHz and 5.457MHz have now been confirmed, thanks Peter Thompson.

Thank you for all your contributions and keep those reports coming either to the address at the head of the column or to my Prestel Mailbox: 425470071.

(1) 5 Queens Road, Wellington, Somerset TA2 1AW.

SEEN & HEARD

RWN-72 which is a TASS station operating on 15.63MHz. You can imagine his surprise when he received a letter from the Ministry of Posts and Telecommunications thanking him for his report! He has given me permission to print the reply here:

'The USSR Administration has received your message in respect of reception of our radio station.

We wish to express our gratitude and we wish you further progress in your passion for the amateur broadcasting.

As you can see it is well worth sending reports to some stations. The only problem is deciding which stations to contact and their addresses.

As a general rule the Russians and Americans are a pretty safe bet, but if you have heard from any other countries then please drop me a line with the details. As to addresses, the only source that I am aware of is the Kingenfuss Guide To Utility Stations (from SWM Book Service). The book contains a very comprehensive station address list along with a wealth of other useful information.'

The next three deadlines are: August 16, September 20 and October 19.

INFO IN ORBIT

Pat Gowen G3IOR
17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6XD

Received 14.6.88 at 1745UTC

4.605MHz ARQ 100/170 OST
4.487MHz RTTY 50/425 LZF9 Sophia
6.333MHz RTTY 100/R 72JL
Spanish Navy
6.8115MHz ARQ 100/170 7 Italian
9.169MHz ARQ 100/170 7 Italian
9.231MHz RTTY 50/N 9TKT7 Kuwait
11.0615MHz RTTY 50/425 7 Code
13.58MHz RTTY 50/425 HV4F36
Kyoungong Korea
13.48MHz RTTY 50/B50 El Dajaa'ir Algeria
13.05MHz RTTY 76/170 EBA
Spanish Navy
13.199MHz RTTY 50/N CA17E
Easter Island
13.185MHz RTTY 425/170 RED2
Moscow
16.043MHz RTTY 50/425 Y2V57
Berlin News
17.57MHz RTTY 50/425 RBX42
TASS News
17.588MHz FMX 120/567 AOK USA
18.86MHz RTTY 50/100 ZAT
Albanian News Agency
18.725MHz RTTY 100/25RF 7 News
20.837MHz ARQ 100/170
Regular readers may like to note that 2.716MHz, 4.605MHz and 5.457MHz have now been confirmed, thanks Peter Thompson.

Thank you for all your contributions and keep those reports coming either to the address at the head of the column or to my Prestel Mailbox: 425470071.

41
to charge the battery and good earth pointing of the antennas was necessary. Both were not always possible! This can be seen in Figs. 1 and 2. The first shows that when the satellite is magnetically steered for optimum sun on the side solar panels, it is still pointing with optimum earth pointing signals from the end of the arm beams. When the sun is seen from a different angle, as at the points marked 128 and 192 in Fig. 2, then the orientation of the satellite required means that a minimal signal is heard from and beamed to earth. That is unless the power source is sacrificed and this would mean no signals. The numbers show the mean anomaly, i.e., that part of the eclipse of the orbit in terms of 256, where 0 and 256 is perigee (the closest point to earth) and 128 is apogee, the furthest point.

**Malfunction**

The first attempt at this, Phase II-a, suffered a launch malfunction and finished up in the deep water of the South Atlantic. It nearly put AMSAT into deep water too, as all the funds were locked into that satellite with none left over to insure. Supporters worldwide re-funded AMSAT, and Phase III-b was placed into orbit. Murphy's law struck again, as the Ariane third stage, in jetting off its excess oxygen, collided with the satellite it had just launched, damaging the antenna system, and knocking OSCAR-10 into the very worst possible sun-angle. This meant the solar panels were at 80 degrees to the sun, hence no battery charge was possible. Therefore the commanded magneto torquers could not be deployed to steer the satellite in earth fields to the correct sun angle. At first, all appeared to be lost, but as the sun-angle slowly changed, a little life came back into the batteries, so command and telemetry were possible.

The next problem came when the apogee kick motor was fired to lift the perigee, later intended to take the satellite to a higher inclination. Instead of firing for the period intended, it used all the fuel in one big burst. The result was that OSCAR-10 finished up with an inclination of 28 degrees and with the perigee at some 3000km. This was the worst possible place for ionising damage to the solid state circuitry of the housekeeping onboard computer. It meant that the computer failed due to hard radiation from the inner Van-Allen belt. As the inclination of the satellite drifted between 26 degrees north and 26 degrees south, the time that it spent close to the equator where the belt is thicker were the worst of all. It also meant that, with this drift, a compromise between a good sun-angle to charge the battery and good earth pointing of the antennas was necessary. Both were not always possible! This can be seen in Figs. 1 and 2. The first shows that when the satellite is magnetically steered for optimum sun on the side solar panels, it is still pointing with optimum earth pointing signals from the end of the arm beams. When the sun is seen from a different angle, as at the points marked 128 and 192 in Fig. 2, then the orientation of the satellite required means that a minimal signal is heard from and beamed to earth. That is unless the power source is sacrificed and this would mean no signals. The numbers show the mean anomaly, i.e., that part of the eclipse of the orbit in terms of 256, where 0 and 256 is perigee (the closest point to earth) and 128 is apogee, the furthest point.

**Perfection**

Third time lucky they say, despite it being the thirteenth OSCAR satellite. The launch was quite perfect. It placed OSCAR-13, still in its insulated container, into the exact orbit intended at launch plus 20 minutes. It had the correct spin rate and was at just the altitude needed to give the minimum battery charge from the solar illuminated panels when it was popped out at 80 minutes after launch. It was then below the European horizon. Ian Ashley ZL1AOD, who had the satellite in view, reported the first 145.821 MHz telemetry signals when it came on. Many thousands of receivers were tuned to that frequency when it came above the users horizons later, all anxious to hear their first signals from what promises to be the best amateur radio satellite yet. The general beacon format plan, unless a special manoeuvre is in progress, is to have a short eight w.p.m. Morse code bulletin at the hour and half hour, a short 50 baud RTTY bulletin at the 15 and 45 minutes points after the hour and the rest of the time a B-Phase Shift Keying transmission that can be read with a suitable demodulator. From time to time the engineering beacon will come on at 145.985 MHz. Later, we shall be hearing the Mode "L" beacons on 435.651 and 435.677 MHz. Despite the limitations of the omi-directional antenna in use and low power, the signals can readily be heard by a station with simple receiving antennas, especially at an inclination.

At this time, OSCAR-13 is in an orbit which takes it up to an apogee of 35000 kilometres, and down to only 222 kilometres at perigee. This means, especially with our expanding earth atmosphere due to the now rapidly increasing solar flux, each perigee pass imparts a little braking to the satellite velocity, bringing it down a little and losing vital forward motion. For this reason, the first job of the command stations at AMSAT-DL is to gently manoeuvre the spacecraft to a carefully calculated pointing position. They must spin up the revolution rate to some 40 r.p.m. by pulsing current to the end of the arm coils in earth field, an analogy like that of the coils of an electric motor working in a permanent magnetic field. The spacecraft then gets sufficiently gyro-stabilised to the point at which to give a short firing of the onboard controllable rocket motor at apogee, which will both raise the perigee up out of most of the drag and bring the inclination to 26 degrees to the equator. This should have been accomplished by the time you are reading this column.

The satellite will then be serially de-spin, re-oriented, spun up again and further kick-motor firings effected. This will eventually bring the spacecraft to a perigee of 1500 metres and an apogee of 35000 kilometres of at least to 58 degrees inclination to the equator.

As for through-satellite communications, it is hoped to have the transponders on for two-way QSOs by August, after all manoeuvres, tests, etc., have been completed to satisfaction. Not only will we be able to see the satellite high points in our own hemisphere, but those on the opposite side of earth also. The result is that it will be possible to hear DX in all continents on a daily basis for up to some 14 hours a day at least. This will be quite independent of the normal propagational conditions that can adversely effect communications.

The full details of the frequencies, powers, sensitivities, antennas required, etc., will be found in the pages of the last few issues of Practical Wireless in the "Amateur Satellites" column. An artists impression of OSCAR-13 in orbit is shown in Fig. 3A, in a full colour version. Since 144, wall poster for your shack is available for $5.50 plus postage from AMSAT, Post Office Box 27, Washington DC 20044, USA.

**Weathersats**

Lawrence Harris of Plymouth, who in his findings on the Meteor, NOAA and Cosmos weathersats last month provided Fig. 4 where the antenna used for both the V.H.F. weather satellites and for the UoSAT pair can be seen. In Fig. 5, you can see his home-made wooden framed dish that captures his Meteosat pictures. A query has come in from John Webb who lives at an open site, without any apparent source of electrical or radio interference, close to Horsham in West Sussex. John has been getting black spots on his Meteosat pictures taken after sundown. He describes them as, \"an attack of measles on earth\". He uses a converter to take the 1700MHz signal to 137MHz for his system, and is unable to explain the cause of the problem. \"It started in mid March\", says John, \"and the random spots appeared on the picture then at around 7.30pm, soon after sunset.\" Whilst we are all familiar with the increasing sunspots, earthspots are in a completely different category, and it is asked if any other readers have experienced a similar phenomena. In other words, is it local or general?
In the June issue, I referred to receiver design and "the change from the use of thermonic valves to a wide variety of semiconductors". However, I never expected to find them "growing" when Joan and I visited Wisley Gardens in May with Storrington's Horticultural Society (Fig. 11). It's not easy to get away from radio propagation, is it.

DXers Dream Conditions

"The stations were coming from everywhere. I've never heard anything like it... there were so many stations doubling up on Band I from outside, and I'm a Ken Lancaster from Rotherham, Ken, who uses a Quad FM4 tuner with outside antenna, also remarked, "it sorted them out like magic".

During this period, there have been both tropospheric and sporadic-E openings. Like other DXers, Ken logged signals from Belgium, Germany, Holland and Italy, and a host of others that he could not always understand, via sporadic-E. Ken's jack pot came between June 3 and 5, when he heard a station on 106.1 MHz giving an identity as Tel Aviv Radio or Radio Tel Aviv.

"On Sunday June 5 some quite amazing signals included a strong one from Band I in Austria, I listened above 98 MHz and found the band covered in Spanish stations", reports David Edwards (Wallingford). David has a Toshiba RF11-L with a rod antenna and identified Radio Nacional de Espana and a Spanish football comment.

In Wales, Simon Hemer's DX bag included BBC Radios Guernsey and Jersey; Italian and Aerobic; Scottish, Solway and Tweed; Foyle and Ulster; plus Belgium (BRT-1/2, Studio Brussels and BTB-1); Denmark (North Jutland); France (Culte, Frequence Nord and Inter); Germany (AFN, BFBs, Deutschlandfunk, HR-1/2/3, NDR-1/2/3); Radio Bremen and Hamburg and WDR-1/2/3; Holland (Nederland-1/2/3/4); Isle of Man (Manx Radio); Ireland (IRTF-EFM1/2/3, Cork and Millennium BB) and Luxembourg, via tropo, on May 16.

I follow that I thought and he did. Outbreaks of sporadic-E enabled him to log stations from Norway (NRK-1/2/3) and Sweden (Programme-3) on the 23rd, Denmark (Borsholm, Copenhagen and Naestved); Iceland (FM-1) and Faroe Is. on the 27th; as well as Finland (YLE P2) and Vatican Radio on the 28th and 29th.

Simon's prize came on June 5 when he heard some Arabic stations and also heard programmes from Hungary (Radio Danubius — for German tourists); Gibraltor (BFBS-1/2 and BBC); Greece (ERT in portuguese and in Spain (APRTS)).

At 1815 on the 4th and 1330 on the 7th there were foreign voices, some from a newly Italian, on no. 15 spots in Band II. I left my receiver tuned to 87.6 MHz and noted that as one station faded another came up on the same or a nearby frequency. On the 7th, some were exceptionally strong.

Gerry Smith (Derby) identified Romanian television (TVR) on Ch. R5 by listening to their sound signal on 99.75 MHz.

During the early evening of June 3, David Glenday (Ayr) heard Italian and Spanish stations fighting for predominance around 99.4 MHz, a German language station on 99.5 MHz and "crystal clear" stereo from Radio Zagreb on 99.7 MHz. He also added Italy, June 4, 7.4 MHz at 11.45; 20 Spanish/Portuguese in stereo, plus many in mono, between 87 and 106 MHz at 1620 on the 9th.

Below Band II

While tuning my ex-military R216 v.h.f. communications receiver, fed from a Reventon antenna, between 66 and 73 MHz I logged 15 very strong f.m. stations from eastern Europe at 1800 on May 22. Five such stations were audible at 1835 on the 23rd and over 20 during the early morning of June 5 and 7, the afternoons of May 25 and 26 and the evenings of June 3 and 4. Around 0435 on the 7th, I heard a stereo on 91.3 MHz. "The name of some Spanish football teams were mentioned, the Charitas of Fire theme music played and then the signal faded", said David.

As the atmospheric pressure declined from 30.3 in (1026 mb) during the evening of the 22nd, I found French and Dutch stations on various spots throughout the Band and, I think, Ireland's Radio Na Gaitschtach on 30.4 and 31.5. I was also picking up "voices and many inter-station "warbles" while a similar lift was in progress between 1945 and 2115 on the 27th and predominantly French at midnight on the 28th.

We parked on Cairn O' Mounth on May 23, George Garden (Edinburgh) heard BBC Radio Cleveland from Birstall and the two Tyneside IBA locals, Radio Times and Metro Radio on his car set.

A multitude of French stations appeared throughout the band as the weather changed during the evening of June 10, the morning of the 11th and the afternoons of the 15th and 17th. On the subject of weather, Dave Coggins has installed a rain gauge and a maximum/minimum thermometer at his home in Knutsford and is currently building a Stevenson Screen to house the thermometer.

Those First Steps

"I have purchased a JVC3050UK, which I found in a second-hand shop in Newquay," wrote Stephen Moore (GOGTV, Newquay) on June 6. Stephen began TVDXing with this set and a wire dipole, cut to 55 MHz, right at the start of the 1986 Sporadic-E season. Within a couple of weeks, from May 22, he had seen pictures in Band I from Austria (ORF4/5), in Czechoslovakia (CST-Bratislava and RS-KH), Hungary (MTV), Iceland (Icluv Island, Italy (RA-I), Norway (regions Gamlem, Melhus and Stiogn), Poland, Sweden (Kanal-1 Sverige and TV2) and the USSR (BPMPR).

"I experienced the thrill of receiving my first European signals from Spain and Yugoslavia," said Maurice Peill (High Wycombe) This was after installing an icv receiver and was a fix on Band I/II antenna. He logged Czechoslovakia, Hungary and Italy in Band III on the 28th, June 4/5; Austria on 91.9 MHz; Germany, Iceland, Norway, Sweden and the USSR on the 6th as well as Holland, Switzerland (PTT-SRG1 and Switzerland (PTT-SRG1) later on.

Having seen Continental television on his Sony 9-90 receiver during tropospheric openings, Paul Field (St Albans) decided to investigate Bands I and III. So, he added a D-100 converter, disccone antenna and wide-band preamplifier to his system. He logged his first Band I signals from Sweden and Italy on May 23 and the USSR on May 24. Paul also watched the news from Austria, Czechoslovakia; Finland (YLE TV1); Hungary; Italy; Norwegian regions; Poland; TVP; Portugal; (RTD Portugal); Spain (TVE Barcelona, Eserande and Valencia); Sweden; news captions from the USSR (BPMPR, CCCP, CNOPT, HOB30CTN and TACCI and Yugoslavia (JRT RTV LNAJ).

Owen also saw the CCCP clock, 3 hours ahead of our time on May 23, the captions Telezite Novina, Trednik 2, Safern Stavenose and Jugo Solveni on the
the 26th; as well as Sabado on the 27th. Any ideas readers?

"June 6 was a good day for a big bag of stations," said Owen. At Laurencekirk on May 23, George Garden (Edinburgh) was using his JVC610 with its own rod antenna. He found a football match from an unidentified station on Ch. E4, (62.25 MHz).

John Raleigh (Bedford) received pictures from Czechoslovakia on May 27 and June 6; Finland on May 24; Iceland on June 6; Italy on May 15, 27, 28, June 2 and 5; Scandinavia on May 24, 26, 26; and 6 and 7; Spain (this time using an indoor rod antenna) at 1700 on May 15 and the USSR on May 15, 22, 23, 26, 27 and June 6. At 1540 on the 8th he watched their news with the TACC (Tall) logo.

Boi Nicks (Great Sutton) had a good Band I haul which included an Arabic station at 1747 on June 3; Czechoslovakia, (DDK3); ARD/ZDF, NDR and WDR captions from West Germany; test cards from Hungary (Budapest), Jordan (JTV); Norway (Bagn, Brenmanger, Gamlem, Hadsel, Hanna, Methus and Steigen); Yugoslavia (Belgrade, Ljubljana and Zagreb); and, at 1800, a clock logo from the USSR Indicating five hours ahead of UK time — all on June 6.

Edwina and Tony Mancini (Belgium) had a busy month prior to June 13. In addition to seeing most of the countries already mentioned, they logged test cards from an Arabic station at 0645 on May 24; Belgium (RTBF1-Liege 3); Czechoslovakia; Germany (ARD—Grune, Ochenkopf, SWF-Badn and RGB); Holland (PTT-NED 1); Norway (Kongsvig); programmes from Czechoslovakia (ČST-1); France (Antenne 2); Finland (YLE-TV1 with MTV Logo); Spain (Teleporte and Porta Manana) and Yugoslavia (Teokin).

"We notice that Finland is using the MTV logo more often this year especially before ads. It can be misleading for newcomers who might think they have Hungary on Ch. R2," said Edwina. I received pictures with cursive captions on Ch. R3 (77.25 MHz) Using a Revcone antenna, D100 converter and Panasonic NV-430 video recorder. I heard the sound on my R216 v.h.f. communications receiver tuned to 8.75 MHz. The narrow filters on the D100 helped me identify the Polish news caption from the jumble of signals on Ch. R1 (49.75 MHz) at 1830 on the 26th.

In New Radnor, Simon Hamer logged pictures on Ch. R3 from Poland on May 27, June 3 and 9; Hungary on June 6; Romania (TVR) and the USSR on May 22, 23, 27, June 3 and 5. He found Czechoslovakia on Ch. R4 (85.25 MHz) and the USSR on Chs. R4 and R5 (93.25 MHz) on June 3 and 5. Also on the 5th, he received Iceland on Chs. E5 and 6 in Band III.

During these intense openings, Simon added Albania (RTSH) Arabic news at 1920 on June 3; France (ITDF-Canal +), Greece (EPT) and possibly Nigeria on Ch. E3 on May 23; Syria (Ortas Damasi) and Switzerland (PTT—SRG1 and SSR) to his Band I score. He also saw the following news programmes, Zeit in Bibi (Austria), News (Belgium), Zpravy (Czechoslovakia), TV-Avisen (Denmark), Dnieset (Finland), Aktuelle Kamara (East Germany), Heute and Tagesschau (West Germany), Nos-Journal (Holland), Hirado (Hungary), Telejournalale (Italy), Deputy (Austria), Kvfijnytt (Norway), dt (Poland), Telejournalale (Portugal), Telejurnal (Romania), Telejurnal (Spain) and Jurnal (Sweden).

Although parked under trees at Polden Lacey, Surrey, at 1400 on the 27th, I checked for Sporadic-E with my Pliustron TVR5D. Using its own rod antenna I received the Norge Gamlem test card on Ch. E2 (48.25 MHz) and strong pictures that I could not identify on Chs. E3 (55.25 MHz) and 4 (62.25 MHz). At 1540 on June 2, I logged a Swedish test card. Before leaving Michelham Priory, East Sussex, at 1724 on June 3, I saw tennis on Ch. E2 and a Portuguese test card (RTP—LISB) on Ch. E3. On arriving home, I found a glorious mixture of stations throughout Band I. A similar mix-up occurred between 1730 and 2000 on the 4th. By 1010 on the 5th, I had test cards from Denmark (DR Denmark) and Iceland and weak pictures and sound on Ch. R3. Sporadic-E was about for most of the 6th and, at 1541, I logged a strong test card from Sweden on Ch. E3 with the Plustron on the back seat of my car in Chichester. From home, at 1804, Iceland's test card was up and around 1930 and a film, with foreign sub-titles, occupied Chs. E2, 3 and 4. Around 0835 on the 7th, I received test cards from USSR Chs. R2 (59.25 MHz), 3 and 4 and Sweden on Ch. E4.

Gary Smith (Derby) told me that Keith Hamer saw Arabic news programmes, possibly from Egypt or Syria, between 1855 and 1910 on Ch. E3 on June 2 and again on Ch. E4 at 1840 on the 3rd. "There was also an Arabic signal on Ch. E3 at 1840 on the 8th," said Gary. He reports that, while these super conditions were in progress, several Arabic stations appeared up in Band III during the early afternoon. "At 1300, E5 came up with programmes, followed by E7 (very strong) which was different. This must have been Algeria because I then saw the Tunisian (RTT) FuBK test card on E6! The E5 was probably Morocco because it was also present on a channel between E5 and 6 (MB). Kevin Jackson thinks it was Algeria but the 'in between' channel is a mystery. One clue is the news. It was covering the arrival of the Syrian President and the captions were all in Arabic." Among the DX that romped toward David Glenday's Yoko receiver in Arbroath between June 4 and 6 was Austria; Czechoslovakia Fig. 1; Finland; programme and sport listings from Hungary, Figs. 2 and 3; Italy; Portugal; Scandinavia; a national lottery advert and programme caption from Spain Figs. 4 and 5; and a sport logo and test card from the USSR Figs. 6 and 7. David's photographs are a good example of the consistency and strength of the signals on those days.
FULLY AUTOMATIC AERIAL ROTATOR FROM AERIAL TECHNIQUES.

The AR300XL is a new improved model which we have added to our range. The Rotator head has been redesigned, with sevenisers streamlined casing and sturdy internal bearings for longer life. The sturdy designed Central Control box is equipped at home for ‘off’ shock’ and domestic surroundings. The moving parts on the control box, give instant reaction to the aerial head, allowing you to know the aerial’s position at any time. The system is ideal for most 12v and domestic cars. The 12v 1220gms of the full motor rotator accommodates all types of VHF, TV and FM aerials both large and small, with 190 Cable 1220gms of motor range. The system comprises two main components, the fully automatic central control box and the rotator head unit which has a vertical carrying capacity of 45kg (99lbs). The head unit may be mounted on a mast with a size of up to 7” (175mm) in diameter – the stabilisation mast is made up of 1/8” (3mm) in diameter. If required, larger "V" boxes can be supplied to allow a 2" (50mm) mast to be fitted (please ask for details). For heavier head applications, an Amplified/Support bearing may be fitted above the rotator tip to these aerial arrays may be suspended, depending on site.

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AR300XL Automatic Antenna Rotator and Control Console comes 3/4m clad cable...

£39.95
The peak of the holiday season is now with us. Many holiday locations provide an ideal opportunity to explore the bands with complete freedom from the high levels of electrical noise associated with many cities, towns and industrial areas. So, if you are packing your bags just now, be sure to include a portable radio as a pair of headphones.

Long Wave DX

Note: I.w. = medium wave transmission in kHz, s.w. = in MHz, Time in UTC (+ GMT).

A most interesting first report from Jurgen Thiél in Morais, Spain which have not been mentioned before by other DXers. One of them is a 1000kW transmission via Becjar, Algeria, on 153 which it rates as S1NPD 44444 during daylight, but by 2100 their signal deteriorates to 13431. The other transmission is via Ouargla, C. Algeria, on 198 which also rates as 44444 during daylight. Their 1500kW transmission via Tiquiza on 254, which has been logged by many UK DXers, is the strongest i.w. signal at this time being S9/S8 at any time.

For quite some time, Jurgen has been monitoring BBC Radio 4 via Droitwich. He says he was able to hear the broadcasts quite well on 200 kHz until Ouargla commenced operations on that frequency in May '87 – it then became impossible to hear Droitwich. When the new band plan came into effect in February '88 Ouargla remained on 200, but both signals were then audible, but a potent 2kHz heterodyne whistle arose. A home-made notch filter enabled the whistle to be eliminated and the reception of Droitwich was then acceptable.

On the 16 April '88 Ouargla complied with the new I.w. plan and moved to 191! The two signals could not be separated by using a 0.3m square loop in conjunction with his S9/S8 Senatena 215 portable, so Jurgen decided to do a little experimenting. He tried using a loop with a loop amplifier and he also tested a 50m long, 10m high, inverted "L" antenna tuned by an a.t.u., but he could not separate the signals. With the loop coupled to the receiver via the loop amplifier he discovered that he could suppress the strong signal from Ouargla and hear Droitwich by keeping the loop still attached to the 50m antenna, inside the loop in a certain position – turning the a.t.u. through 90°, he brought in Ouargla and suppressed Droitwich.

Many direction finding antennas employ a "sense" antenna to modify the loop directivity pattern from a figure of eight to a cardioid or heart shaped response so as to enable the true direction of a signal to be ascertained. So, the underlying principle is not new, but adapting the system in this way for DXing is certainly a novel approach and may well prove to be beneficial for some DXers! Now Droitwich usually rates as 44444 between 0700 and 1600, but after 2100 it improves to 54454.

Writing from Stoke-on-Trent, Daniel Masterson says he was very surprised to find that he could hear BBC Radio 4 via Droitwich 18 late at night while at his holiday location in Torremolinos, Spain. He also picked up the broadcasts from Morocco via Aitazl on 209 – they have still not complied with the new band plan, consequently their transmission causes a 2kHz heterodyne whistle when it beats with the

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

Long Medium & Short

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

From his holiday home in Deal, Les Jenkins received pictures from France (A2, FR3 and TF1), Holland (NED-1/2/3) and West Germany (NDR-Hamburg) in the middle of May. As the pressure fell during the afternoons of June 6th and 7th, I received strong negative pictures from France (Canal+) and Band III while portable, near Goodwood House and at Wakehurst Gardens respectively.

While the barometer was falling on June 8, George Garden, in Edinburgh, using an outside rotatable antenna, logged a weak picture from France (NED-4) on Ch. 54. After peaking the signal with his horizontally mounted beam, plus some detective work with charts and tables, he thinks it came from the vertically polarised satellite transponder at Innerleithen on the Scottish border.

Several u.h.f. channels suffered from co-channel interference for most of the evenings and the early hours of June 10 and 11.

John Raleigh received Band III pictures from Belgium (RTBF) on May 22 and 29 and June 10 and Holland around noon, on 14 of the days between May 16 and June 13. The extensive logs from Bob Brooks, Simon Hamer and the Macniversary emphasised that, between these times, signals were received in their areas of the UK from stations in Belgium (VRT TV1/2, RTBF 1 and Teletex); Channel Islands (ITV Channel News); Denmark (DR); France (TFD-Canal+); East Germany (DFP-1); West Germany (ARD, HR-1, NDR-1/3, WDR-1/3 and ZDF); Holland (PITT-NED-1/2/3); Ireland (RTÉ-1/2); Luxembourg (RTL-Plus) and Sweden (SVT-Kanal-1) in Bands III, IV and V.

The Macniversary's best Band III catch was Czechoslavakia, Ch. R6 (175.25MHz) on June 10. For Simon, that signal from the Channel is means that he has all TV regions in his book. That's all for this month, keep your reports coming.

SEEN & HEARD

Fig. 10: Germany

"I was able to put the de-luxe D-100 through its paces on American and Canadian DX late on the 6th," said GD. "First up was A2, 3 and 4 (5.55, 6.25 and 67.25MHz) came up about 2245. Quite a few DXers saw it and it was still on at 0100. The A4 was best and I identified it as CJCN-TV, Newfoundland, from an address given over the adverts and noting the nix logo. Keith heard CBS mentioned on A3 and Mark Dent heard a CBS callsign in Virgil Chris Howies logged 3 A2 stations!

"525-line rolling frames visible on Chs. A2, 3 and 4," said Simon Hamer.

Tropospheric

David Glennay described May 15 as, "a real catch, being explained. Around middy I flicked through the presests of my Philips and as it was a clear day I went up to Charton, which I did, with all four stations (TTT, Ch. 4 and BBC 1 and 2 on Chs. 49, 42, 39 and 45 respectively) coming through loud and clear and Teletext fully resolvable. However, I was a little short of a test card. . . but I was aware that none of the other British stations were transmitting test cards at that time." As a result, David operated the scan facility on his set and found Dutch transmissions (PIT-TED-2 or 31 on Chs. 27, 30, 36, 38, 42, 44 and 47. During the afternoon he enjoyed the Monaco Grand Prix on BBC 2 and on Nederland 3 in a programme called Studio Sport. But the best was still to come, because, during the good tropospheric conditions between June 10 and 14, David saw Denmarks test card in Band III and pictures from Belgium, Denmark, Holland, Germany and Iceland, mainly during many spots in the hi band. His log includes Teletext from Germany and Holland, Figs 8 and 9; many German regions like Hamburg, Fig 10 and test cards from Holland and Sweden, Figs 11 and 12.

Note: I.w. = frequencies in kHz; s.w. = in MHz, Time in UTC (+ GMT).

A most interesting first report from Jurgen Thiél in Morais, Spain which have not been mentioned before by other DXers. One of them is a 1000kW transmission via Bechar, Algeria, on 153 which he rates as S1NPD 44444 during daylight, but by 2100 their signal deteriorates to 13431. The other transmission is via Ouargla, C. Algeria, on 198 which also rates as 44444 during daylight. Their 1500kW transmission via Tiquiza on 254, which has been logged by many UK DXers, is the strongest i.w. signal at this time being S9/S8 at any time.

For quite some time, Jurgen has been monitoring BBC Radio 4 via Droitwich. He says he was able to hear the broadcasts quite well on 200 kHz until Ouargla commenced operations on that frequency in May '87 – it then became impossible to hear Droitwich. When the new band plan came into effect in February '88 Ouargla remained on 200, but both signals were then audible, but a potent 2kHz heterodyne whistle arose. A home-made notch filter enabled the whistle to be eliminated and the reception of Droitwich was then acceptable.

On the 16 April '88 Ouargla complied with the new i.w. plan and moved to 191! The two signals could not be separated by using a 0.3m square loop in conjunction with his S9/S8 Senatena 215 portable, so Jurgen decided to do a little experimenting. He tried using a loop with a loop amplifier and he also tested a 50m long, 10m high, inverted "L" antenna tuned by an a.t.u., but he could not separate the signals. With the loop coupled to the receiver via the loop amplifier he discovered that he could suppress the strong signal from Ouargla and hear Droitwich by keeping the loop still attached to the 50m antenna, inside the loop in a certain position - turning the a.t.u. through 90°, he brought in Ouargla and suppressed Droitwich.

Many direction finding antennas employ a "sense" antenna to modify the loop directivity pattern from a figure of eight to a cardioid or heart shaped response so as to enable the true direction of a signal to be ascertained. So, the underlying principle is not new, but adapting the system in this way for DXing is certainly a novel approach and may well prove to be beneficial for some DXers! Now Droitwich usually rates as 44444 between 0700 and 1600, but after 2100 it improves to 54454.

Writing from Stoke-on-Trent, Daniel Masterson says he was very surprised to find that he could hear BBC Radio 4 via Droitwich 18 late at night while at his holiday location in Torremolinos, Spain. He also picked up the broadcasts from Morocco via Aitazl on 209 – they have still not complied with the new band plan, consequently their transmission causes a 2kHz heterodyne whistle when it beats with the

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

Dxers:
A: Colin Diffell, Cosham.
B: David Edwardson, Welland.
C: Daniel Masterson, Torremolinos.
D: Philip Rabaut, Macclesfield.
E: Tim Shirley, Bristol.
F: Jurgen Thiél, Morais, Spain.
H: Neil Wheately, Newcastle-on-Tyne.
broadcasts on 207 from DLF Munich, W. Germany. A noticeable difference in the signals that can be heard at certain times of the day may be observed. Opaque DX was observed in Coram. During the early afternoon he can hear Allou, France 162; Sarlous, W. Germany 183; BBC Dublin 216; and Junglinster, Luxembourg 234, but about an hour before dusk four airborne signals are audible, Kaldungur, Denmark 245; Tipaza, Algeria 254; Moscow, UUSR 263 and Topolino, Czechoslovakia 272.

In Zurich, George Efstatiades' DX predicated on the signal reaching a level of DXing activity just now! The report from Tim Shirley indicated that his WWVNs in New York 1010 have reached our shores as early as 2230 on one or two occasions, but that his signal usually became audible around 0100. He has also heard WCAU in Philadelphia, PA 1210 at 0030, but Tim says that he has been too busy for best conditions for this signal to be heard. It is interesting to note that he has been hearing CQYQ St. John’s, NF 1080 on the WWVNs and the Caribbean Beacon, Anguilla 1610 as late as 0630.

Following the arrival of a QSL card and 40th Anniversary sticker from WXT in New Orleans, LA, Tim has picked up their signals again on 690 - this time on 0200 and 0300. Apparently they are no longer restricted to daytime only operation. Most all of the transatlantic signals received in Grimby by Jim Willett were logged after 0100 - there were only two exceptions, our regular pointer to broadcast on the WWVNs on 930 and the Caribbean Beacon, Anguilla 1610, which were heard at 0030. Although most of the broadcasts which reached him from the USA were from the New York area, Jim also heard a station in New Orleans, LA. WWL 870.

In contrast, the majority of the signals heard in New Radiors by Simon Hamer stemmed from Newfoundland and New Brunswick. He commenced his listening period at 0230 and by 0400 he had logged three stations from the USA and the Caribbean area - which just goes to show that there are plenty of interesting signals to be dug provided one can stay awake!

The latest report from Leo Geske in Randburg, S. Africa provided an interesting insight into the DXing scene in that area. Although many of the callsigns or station names noted in his log have also been heard recently in the UK, there is one distinct difference, the almost complete absence of Canadian signals in Randburg. This season however, the number of broadcasts from the east coast of the USA reached him around 0430 and were all rated as "fair" in his report.

The broadcasts from the Caribbean Beacon, Anguilla 1610 are frequently heard in the UK at night with a relatively good strength and it seems that they also reach Randburg well too. Leo noted that the Allo 1010, although heard but the signals from Nassau, Bahamas 1540 and the Atlantic Beacon, Turks and Caicos Islands 1590 were "good" at that time. Another "good" signal noted by Leo stemmed from Radio Globo in Rio, Brazil 1220 - this station was heard during this time, although their broadcasts via Sao Paulo, Brazil at 1100 were logged by Jim Willett at 0310.

Other DXW M Transatlantic DX

The long hours of darkness in S. Africa just now have now enabled Leo Geske to hear a number of DX signals from several continents, including VOA by Bangkok, Thailand 1575 as "weak" at 1541; AIR Naga, India 1566 - noted as "fair/good" at 1553; ABC 400D in Emarald, Australia 1548 (50kW) - rated as "weak" at 1600; Mayoore, Comoros Island (Mozambique Channel) 1458 - logged at 1610. Much to the delight of Nice, France 1350, noting their 100kW signal as "fair" at 0356. The broadcasts from WWZD in Queensland, Australia on 1548 were also logged by Dick Moon in George, S. Africa - he picked them up at 1535. Dick started listening at 1745 and in less than two hours he heard five more Australian stations! Three of them stemmed from stations in Western Australia. 6WIF Perth 720, 6NO in Narragansett 96K and 6K in Perth 1206. SAU in Port Augusta, S. Australia was heard at 1242 and 12E in Bengar, S. N. Wales 765 completed his remarkable list!

Reporting from Premantura, W. Austria, Raul Mosca noted the interesting variety of the stations there operate 24 hours a day, but he managed to hear three broadcasts from other countries tuning to the high frequency end of the band. It is interesting to note that two of his log entries were also heard by Leo Geske - VOA via Bankok, Thailand 1575 and AIR Nagpur, India 1566; Davy rated both signals as SIO 434 at 1415. Listening during the evening he picked up KUMU in Hawaii on 1500, rating their signal as 333 at 2100 - according to all known information this is a 5kW station in Honolulu.

Some UK broadcast stations are achieving the accretion of overseas listeners and they have quoted some interesting SINPO ratings. It is worth remembering that in some cases a particular station may be heard from a number of different locations using transmitters which share the same frequency, so the listener may refer to the combined signal received.

Some ideas of the kind of signals to be expected on the Costa Blanca, Spain may be found from the studies undertaken by quoted by Jurgen Thiel: all were logged after 1800 with a Vega Seeline 21 portable and a 0.3m square loop. BBC Radio 1 1088 (shared) - 32422; BBC Radio 2 909 (shared) - 22322;
Robert Taylor says he spent some time trying to "null-out" the broadcasts from Kutsuyo, Northway and 11W with his "Super Loop" in an attempt to hear the Red Dragon in Cardiff on 1335, but the Norwegian signal was too powerful. John Evans has been putting his "Super Loop" and Lone SRX30 receiver to good use in Shawforth during daylight - see chart.

The extensive log sent along by Bill Eyre contains several stations which he has heard before in Shawforth, the most notable being Northants 990, which was heard early one Sunday morning before Radio Lancaster came on the air.

Writing from Brighton, John Nash says he has now received all outside OSLS from BBC local radio stations, but ILR Radio 210 Reading, GW Radio Swindon and Saxo Sound don't seem to want to know. He sent two detailed reports to each of them and included postage stamps - without result.

Short Wave DY

The sunspot count has shown a marked increase recently - many countries which we hadn't been predicted, but there is still no sign of broadcasters making test transmissions or regular broadcasts in the 25MHz (11m) band. Although the conditions on the next band up, the 212MHz (10m) amateur band, are generally unstable, many contacts are being made between amateurs in the UK and others in other countries. A general improvement in the reception conditions prevailing on the higher frequency bands is being noted as we reach the steep slope leading to the predicted peak of the present solar sunspot cycle in 1991/92. As the level of solar activity increases, the number of sudden ionicospheric disturbances (s.i.d.s) can be expected - they may show slight disruption to reception for a few minutes or even a few hours.

Some broadcasters to Europe on the 21MHz (13m) are direct transmissions from the country of origin, others are relayed from unexpected locations! The early morning broadcasts from Radio Japan are relayed via Mozai, Gabon on 21.695 (500K). Commencing at 0700, their programmes in English and Japanese close down at 0800. Reception is now a good deal more reliable than earlier in the year. Using a Trio R600 receiver in WallSEND, David Elstone rated their signal as SINPO 5543.

Radio Japan also broadcast to Europe in English and Japanese via Gabon from 1500 until 1700, however this transmission is on 2170. Edward Broadbent has a good signal on both their broadcasts in Worcester and he has found reception to be generally good.

One or two comments recently he has observed a prolonged breakdown in the service - this appears to be due to a fault on the satellite link between Japan and Gabon.

The direct transmissions to Europe from Radio RSA in Johannesburg, S. Africa 21701500 usually reach the UK at remarkable strength - 55444 being the rating noted by David Whitaker from Camberley. 1430 A variety of topics are covered in their daily broadcasts in English, their Mail Bag programme is a regular favourite with many listeners.

The direct broadcasts to Europe from UAE Radio Dubai 21605 are also being very well received here - Philip Rambaut quoted SIO 555 at 1112 in his report from Macclesfield. Their programmes in English, Culture Arab History and Culture and may be heard at 1030 and 1330. They discuss points raised in letters from listeners, mention the station's listeners and play short clips of their received and answer questions in a Mail Bag programme which is broadcast every week on Saturdays and Sundays.

---

Robert Taylor has been at the forefront of the search for foreign signals. During the mid-1980s, he became interested in the monitoring of solar activity and its effect on radio reception. His expertise in this field is evident in his detailed logs and reports, which have provided valuable insights into the reception of distant radio broadcasts.

Robert's dedication to the hobby has earned him recognition from fellow enthusiasts and radio stations alike. His contributions to the field of short wave radio have significantly advanced our understanding of solar activity's impact on radio reception.

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**Note:** Entries marked **_** were logged during daylight. All other entries were logged during darkness.
The reception conditions prevailing on the 15 MHz (19m) band have been disturbed from time to time by solar events. Listening in Sheffield at 0645, Cyril Kellam heard Radio Australia via Stepphan, S.E. Australia 15.240 (English to S. Asia). Simon Hamner picked up their broadcasts to E. Asia via Centurion, W. Africa at 15.295 (Eng, Fr, Chin) at 0600. Kenneth Reece heard Radio Japan, Tokyo 15.235 (Eng, Jap to Australia) as 23433 at 0630. John Perry heard the BBC Ascension Island relay 15.400 (Ilish at Afocal) on 0910, noting their signal as 35344.

Using a Philips D 1835 with just the whip antenna in Moolepole, Botswana, Ron Peare picked up WCBN-Africa at 15.615 (Heb to E. Europe) as SIO 444 at 0940. The signal peaks 44444, but there is severe adjacent channel interference at 1225 from Radio Netherlands via Talata Volon, Madagascar at 15.330. He also has been enjoying RSP via San Gabriel, Portugal 15.250 (Eng, Fr at Africa) at 1915— their signal is often 55344. During the afternoon, Simon Hamner heard Radio Denmark 15.165 (Dan to N. America) at 1300. Robert Taylor logged the Voice of Israel, Jerusalem, 15.240 (Heb to Europe) as 44444 at 1530; also Radio Sophie, Bulgaria 15.310 (Eng, Port, Fr at Africa) as 4434 at 1500. John Shirley heard the Voice of Sweden, Stockholm 15.345 (Eng, Swe, Fr at N. America) as 444 at 1415; Radio Korea Seoul, S. Korea 15.575 (Ar, Fr, Sp at Europe) as 35333 at 1700.

Listening in Cambridge at 1800, Christian Pinchard heard RBB Brasil, Brazil 15.265 (Eng, GER to Europe)— their signal was 43333. George Milmore logged the Voice of Vietnam, Hanoi 15.010 (Eng) as 43333 at 1900 during his two valve receiver. Ron Peare picked up WCSSN in Mains, USA 15.390 (Eng to Europe at 2005. During the afternoon, Tony Shirley picked up 2222 as Alajuta, Costa Rica 15.460 (Eng, Sp at C. America) at 1500; Ron Peare heard Sweden, Stockholm 15.345 (Eng, Swe, Fr at N. America) as 444 at 1415; Radio Korea Seoul, S. Korea 15.575 (Ar, Fr, Sp at Europe) as 35333 at 1700.

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heard Radio Bucharest, Rumania 11.940 (Eng to Europe) at 1300 — rated as SIO 434; Sheila Hughes listened to Vatican Radio, Rome 11.740 (Eng to Europe) at 1335 — SINPO 4444; Robert Taylor noted Finland, Helsinki 11.755 (Eng as SIO 444 at 1415; P. Guruprasad heard Radio Japan, Tokyo 11.815 (Jpn, Eng to S.E. Asia) at 1500, noting their signal as 44444. David Watten logged United Arab Emirates Radio Dubai 11.730 (Eng, Ar to Europe) as S44444 at 1630.

The evening broadcasts stemmed from RAI Radio, Italy 11.800 (Eng to Europe) — logged as 43334 at 1948 by John Nash; AIR via Aligarh, India 11.800 (Eng to Europe) — rated as 44444 as 2000 by Jean-Yves Camus in Creteil, France; BBC via Ascension Island 12.820 (Eng to Africa) — noted as 454442 at 2002 by Paul Hegarty; Radio Kuwait, State of Kuwait 11.665 (Eng to Europe) — logged as 44444 as 2012 by Daarr Tapin; Radio Damascus, Syria 12.085 (Eng) — noted as “noisy” by Leo Barr, Radio Beijing, China 11.500 (Eng) — rated as 444434 at 2015 by David Edwardson; Radio Australia via Darwin 11.730 (Eng, Chn) — logged by Neil Dove as 444443 at 2100. Later, the voice of Israel, Jerusalem 12.080 (Eng) was logged as SIO 222 at 2153 by Julian Wood in Buckie. Two broadcasts from S. America were received by Christian Pitchard — RAE Buenos Aires, Argentina 11.710 (Sp, Port to N. America), rated as 444442 at 2232, at 2240, also by Brasilia, Brazil 11.745 (Sp, Eng to N. America), noted as 433334 at 0200. At 0400 Simon Hamer heard Radio New Zealand, Wellington 11.455 (Eng to Europe), broadcasting a sports report in English.

The 9MHz (31m) band is used by Radio Australia to broadcast in Europe from 0700 broadcasting via Shepparton 9 655. A marked deterioration in their signal was observed during the last few weeks; the 33333 rating noted at 0800 by Keith Wallin in Hull is just now. George Hewlett has been monitoring their transmissions — heard 9.580 to the central Pacific area as SIO 433 at 0800; falling to 322 and 9.770 to S.E. Asia as 433 at best to 1000.

Other broadcasts included Radio Jordan, Amman 9.530 (Ar to Middle East) — logged by Jean-Yves Camus at 1700, REE via Madrid, Spain 9.765 (Sp, Eng to Europe) — heard by Cyril Kellam at 1900; RNI via Kitoyso, Norway 9.590 (Norw, Eng to Sp) — received at 1910 by Colin Diffell; VORR Tehran, Iran 9.022 (Tur, Eng to Europe) — logged by David Edwardson at 2010; Radio Sofia, Bulgaria 9.700 (Eng, Lt to Europe) — noted by Julian Wood at 2130; Radio Cairo, Egypt 9.900 (Eng to Europe) — heard by Ian Newton at 2145; AIR via Australia, India 9.535 (Eng to S.E. Asia) — logged by George Ellisbrotides at 2300.

The 7MHz (41M) band is used by Radio Australia to reach their listeners in Europe via Camarvon, W. Australia 7.205 during the afternoon; Townsend rated their signal as SIO 322 at 1700. There are a number of broadcasts to Europe during the evening including Radio Prague, Czechoslovakia 7.345 (Eng, Sp, Pol) — logged by John Nash as 444434 at 1900; Vatican Radio, Italy 7.250 (Pol, Ger, Eng, It, Esp) — heard by Colin Diffell at 1920; RAI Rome, Italy 7.275 (Eng) — noted as SIO 433 at 1935 by Evers Radio Korea, Seoul, S. Korea 7.550 (Ar, Ger, Eng) — logged by Dick Moon at 2115; AIR Delhi, India 7.410 (Eng) — rated as 33333 at 2044 by Ian Curry; Radio Tirana, Albania 7.215 (Eng) — received by Leo Barr at 2135; Radio Polonia Warsaw, Poland 7.720 (Eng, Ger) — rated as 55454 at 2200 by David Watten; RFI via Costa Rica 7.735 (Eng) — logged by Tim Shirley at 0130, WHR South Bend, Indiana 7.400 (Eng) — noted as 444333 at 0130 by Christian Pitchard.

Some of the many 6MHz (49m) broadcasts to Europe during the day include RIAS Berlin, 6.015 (Ger) — logged as 333444 by Stuart Stone; by Kenneth Reece; Radio Nederlands via Flevoland 5.955 (Eng) — noted as SIO 444 at 1440 by Edward Taylor; RFI via Brussels, Belgium 5.910 (Eng) — received at 2100 by John Nash; RFI via Ukraine 5.410 (Eng, Fr, Ger) — heard by Sheila Hughes as 444444 at 2230.

**Station Addresses**

BBC Radio Foyle, PO Box 927, 8 Northland Road, Londonderry, BT4 2JD

IRL Two Counties Radio (2CR), 5-7 Southcourt Road, Bournemout, BH3 2LR

Radio Polonia, Box 46, Pl-00-950 Warszawa, Poland

Radio For Peace International, P.O. Box 88, Santa Ana, Costa Rica, 11851

Radio Comoro, External Service, P.B.250, Moroni, Grand Comoro, Comoros


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**Dxers:**

A: Leo Barr, Sunderland

B: Ian Baxter, Blackbum

C: Alan Curry, Stockton-on-Tees

D: Neil Dowsett, Barnstaple

E: David Edwardson, Walsend

F: John Evans, Shrewsbury

G: David Hughes, Hamilton, W. Australia

I: Cyril Kellam, Sheffield

F: Malcolm, Stanmore

I: Christian Pitchard, Cambridg

J: Kenneth Reece, Preston

K: Tim Shirley, Bristol

L: Darran Tapin, Tundridge Wells

M: Keith Wallin, Hull

N: Jim Willerton, Glenroyst

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**Abbrev. Language**

<table>
<thead>
<tr>
<th>Chn</th>
<th>Chinese</th>
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<tr>
<td>Cz</td>
<td>Czechoslovakian</td>
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<td>Dan</td>
<td>Danish</td>
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<td>Eng</td>
<td>English</td>
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<tr>
<td>Ger</td>
<td>German</td>
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<td>It</td>
<td>Italian</td>
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ADVERTISERS INDEX

Aerial Techniques ........................................ 45
AJH Electronics ........................................ 35
ARE Communications ................................... 13
Bredhurst .................................................. 35
Colomor .................................................... 38
Component Centre ...................................... 14
Corrigan Radio .......................................... 17
Datong ...................................................... 17
Dressler Communications .............................. 14
Elliott Electronics ....................................... 38
ERA .......................................................... 35
Flightdeck .................................................. 17
Garex Electronics ....................................... 25
Hamgear .................................................... 25
Howes C M Communications .......................... 22
Icom (UK) .................................................. Cover ii

Javiation ..................................................... 38
Johnsons Shortwave Radio ............................. 51
Lowe Electronics ......................................... 8
Phase Track ............................................... 13
Practical Wireless ....................................... 21
Raycom Communications Systems ................. 17
Rylands F.G. .............................................. 38
Sandpiper ............................................... 38
SEM ....................................................... 35
South Midlands Communications .................. Cover iv
Spacetech .................................................. 25
Stephens James ......................................... 45
Technical Software ..................................... 14
Theasby .................................................... 17
Uppington Tele-Radio (Bristol) ...................... 45
Ward, Reg & Co. ........................................ 22
Waters & Stanton ......................................... Cover iii

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- **Selectivity**: 100 kHz.
- **Resolution**: 5 kHz.
- **Image rejection**: At 145 MHz = 39 dB.
- **IF stage**
- **Audio output**: 1 W into 8Ω.
- **Scan rate**
- **Search rate**
- **Memories**: 100
- **Features**: 6 MHz whip antenna, mobile mounting bracket, wire stand, 1.8 m d.c. power cord.
- **Reviewed**
- **Price**: £525

### Realistic PRO-32
- **Programmable Handheld Scanner**
- **Coverage**: 68 to 996 MHz, 106 to 1369 MHz (a.m.), 138 to 174 MHz, 380 to 512 MHz.
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- **Sensitivity**: f.m. = 20 dB signal to noise at 60% modulation.
- **Selectivity**: 60 dB at 6 kHz.
- **Resolution**: 5 kHz.
- **Image rejection**: At 145 MHz = 39 dB.
- **IF stage**
- **Audio output**: 300 mW.
- **Scan rate**: 4 and 8 channels per second.
- **Search rate**: 4 and 8 channels per second.
- **Memories**: 200
- **Reviewed**
- **Price**: £299.95

### Realistic PRO-38
- **Handheld Scanner**
- **Coverage**: 88 to 138, 140 to 512 MHz.
- **Modes**: f.m.
- **Sensitivity**: f.m. = 20 dB signal to noise at 60% modulation.
- **Selectivity**: At 156 MHz = 60 dB.
- **Resolution**: 5 kHz.
- **Image rejection**: 6 dB at 39 MHz.
- **IF stage**
- **Audio output**: 300 mW.
- **Scan rate**: 10 channels per second.
- **Search rate**
- **Memories**: 10
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- **Reviewed**
- **Price**: £179.95

### Uniden Bearcat 70XL
- **Handheld Scanner**
- **Coverage**: 29 to 54, 135 to 174, 406 to 512 MHz.
- **Modes**: f.m.
- **Sensitivity**: 0.4 µV at 12 dB SINAD; 136 - 174 MHz = 0.4 µV, 406 - 512 MHz = 0.3 µV.
- **Selectivity**: 650 kHz at ±25 kHz.
- **Image rejection**: 50 dB.
- **IF stage**: 10 MHz.
- **Audio output**: 140 mV at 10% t.h.d. into 8Ω.
- **Scan rate**: 15 channels per second.
- **Search rate**: 15 channels per second.
- **Memories**: 10
- **Features**
- **Reviewed**
- **Price**: £199.95

### Uniden Bearcat 50XL
- **Handheld Scanner**
- **Coverage**: 29 to 54, 135 to 174, 406 to 512 MHz.
- **Modes**: f.m.
- **Sensitivity**: 0.4 µV at 12 dB SINAD; 136 - 174 MHz = 0.4 µV, 406 - 512 MHz = 0.3 µV.
- **Selectivity**: 650 kHz at ±25 kHz.
- **Image rejection**: 50 dB.
- **IF stage**: 10 MHz.
- **Audio output**: 140 mV at 10% t.h.d. into 8Ω.
- **Scan rate**: 15 channels per second.
- **Search rate**: 15 channels per second.
- **Memories**: 10
- **Features**
- **Reviewed**
- **Price**: £199.95

### Uniden Bearcat 100XL
- **Handheld Scanner**
- **Coverage**: 88 to 138, 140 to 512 MHz.
- **Modes**: f.m.
- **Sensitivity**: f.m. = 20 dB signal to noise at 60% modulation.
- **Selectivity**: 100 MHz.
- **Resolution**: 5 kHz.
- **Image rejection**: 60 dB at 139 MHz.
- **IF stage**
- **Audio output**: 300 mW.
- **Scan rate**: 10 channels per second.
- **Search rate**
- **Memories**: 10
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- **Reviewed**
- **Price**: £180.99

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*Short Wave Magazine August 1988*
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