

ICOM

Count on us!

IC-R7000, 25-2000 MHz, Commercial quality scanning receiver



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.

IC-R71E, 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 521145. 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: Despatch 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.



[28] 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 940 receiver has been held over.

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FIRST WORD

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 s.s.b. (not 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 fulfil 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 Eddystone 940 receiver will appear in the September issue.

DICK GANDERTON

A WORD IN EDGEWAYS

Sir

I feel I must reply to the letters that have appeared in the May 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

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.l.s 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 it 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 helds-talking 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 Currys 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 YM85G Adaptor for home use and, also discovered that the receiver will run happily on a 6V lantern battery Ever Ready 991 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 G8XNH 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

A WORD IN EDGEWAYS

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.l.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

Sir

I read with interest the letter in SWM for July 1988 from Mr Alwyn Saul.

No doubt you will receive many suggestions about the origins of the "photographs" you have received. My feeling is that they are pictures transmitted and received by the "Fultograph" system which was used experimentally by the BBC at about the dates quoted. They

may be photographs of the images displayed by a Baird scanning-disc TV — but I doubt it.

The "Fultograph" system was capable of transmitting "still" pictures using medium frequency broadcast channels, but taking rather a long time to complete the operation! I seem to remember that weather maps were also transmitted at times.

Essentially, the receiving equipment consisted of a revolving drum to which was affixed a piece of sensitised paper. The paper was scanned by a "pen" which carried electrical impulses which, in turn, caused the paper to become darker in varying degrees, according to the picture being transmitted.

As a matter of interest, I myself, together with some

other radio amateurs in the North West of England, where I lived at the time, transmitted and received some silhouette-type pictures using a modified "Fultograph" system, in the early 1930s. We used the 160 metre band — probably illegal!!
RUSSELL LEE
IFFLEY
OXFORD

WHAT'S NEW

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 (6 IRCs) for airmail if you live overseas.

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 memories and a scan facility.

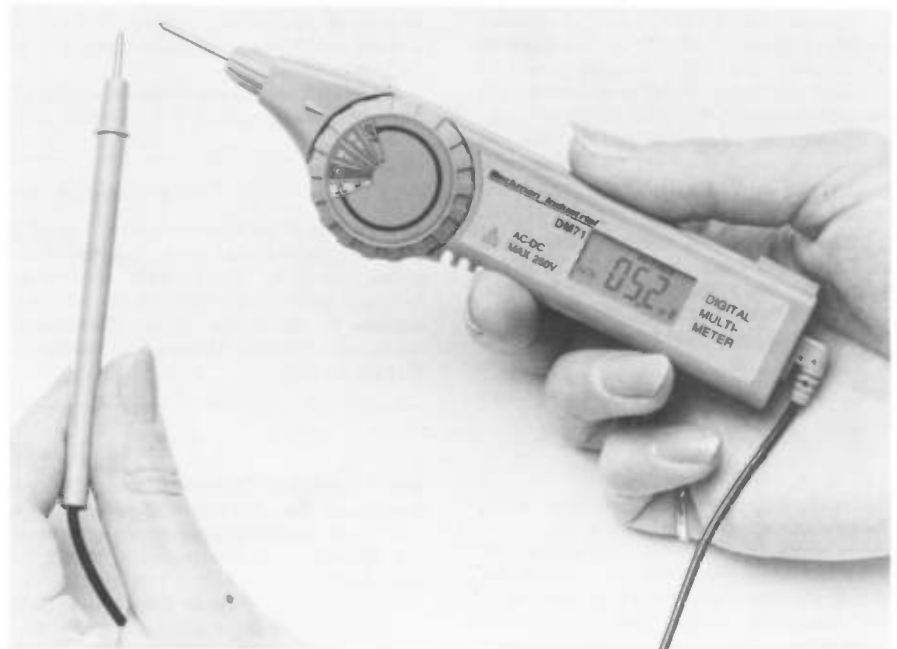
The tuning steps are:

a.m. — 6kHz s.s.b. & c.w. — 4kHz
f.m. N1 — 15kHz f.m. N2 — 6kHz
f.m. W — 150kHz

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 1.5B 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 a rigid plastics carrying 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 4.895MHz. According to the station identification the power is 10kW. Other Colombian stations active at present include Ondas del Ortegua on 4.975MHz a Radio Macarena on 5.975MHz.

HONDURAS. La Voz Evangelica de la Mosquitia has been heard 0249-0303 on 4.910MHz. The station broadcasts in Spanish and the Moskito 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. Radiodiffusion de la Republique Rwandaise (or Radio Rwanda) has been heard 0315-0330 and from 1750 on 3.33MHz.

USA. WYFR, Family Radio, is now on the air 0600-1700 on 9.8525MHz, 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 off-shore 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.



Analogue Multimeters

A range of four new Iskra 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 20 μ A to 3A and resistance to 50M Ω . Accuracy is 2.5% for all voltage and current ranges, with a d.c. voltage sensitivity of 50k Ω /volt and a.c. at 5k Ω /volt.

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

and 3k Ω /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-Willows, Merseyside, telephone 09252 29881.

The only thing that 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 l.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

WHAT'S NEW



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 l.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

BATC Contests

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 from the New Members list in their magazine, people from all over the world join.

The monthly newsletter they produce is very impressive, A5 with about 80 pages of information. It contains features on receiver previews, an antenna project, a QSL album and various surveys telling you what's where and when.

The callsign VE3SRE, standing for Short wave Radio Enthusiast, is run by Stephen Canney as often as he can get on the air to promote the hobby.

Membership costs \$25 for residents of the province of Ontario, but residents of other states or even other countries are welcome to become Associate Members. Canadian and US associate members pay \$25, those in other countries \$30 (Canadian dollars).

For more information (please include IRCs), contact:

The Ontario DX Association
PO Box 232 Stn. Z
Toronto
Ontario M5N 2Z4
Canada

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
Micasa
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-1975 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 DXTV, 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.

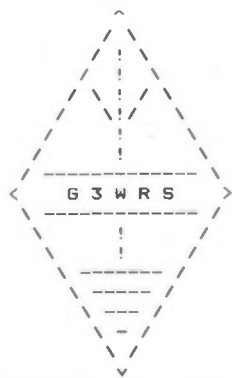
Arthur Ward
17 Motpur Drive
Northampton
NN2 6LY.

GRASSROOTS

Lorna Mower

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 G1OIA 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.



Wakefield & District RS meet Tuesdays, 8pm in Ossett Community Centre, Prospect Road. August 2 is a Car Treasure Hunt, the 9th a Practical Evening, the 16th is Using an Oscilloscope demo by G3WWF and the 23rd on the Air. Rick G4BLT on Wakefield 255515.

South Manchester RC have a Club Quiz on July 29, a Visit to Sale Fire Station on August 5, a Constructional 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.

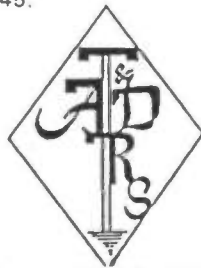
Maltby ARS meet Fridays, 7.30pm at the Community Hall, Clifford Road, Hellaby, nr Rotherham. July 29 is a Treasure Hunt, August 5 a Kite Nite, the 12th an Activity night v.h.f. and the 19th TV and Video. Keith G1PQW on Rotherham 814135.

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 Puttock G0BWV 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.

Pontefract & District ARS have HF Linears 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. Thursdays, 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 854745.



Todmorden & District ARS meet 1st & 3rd Mondays, 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.

Hordean & District ARC meet 1st Thursdays, 7.30pm in Merchistoun 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 7 and a Social on the 22nd. Meet in the Scout Hut, Bath Road at 8pm, with Socials in the Grosvenor Hotel. Paul Whiting G4YQC on Ipswich 642595.

Wimbledon & District ARS meet 2nd & last Fridays, 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, Chessington and the 12th is Air Band Radio by G6HXR. David Love G4RBQ on 07373 51559.

Mid-Warwickshire 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 Emscote Road. P. Brown G0HHI on Marton 632370.

Cheshunt & District ARC meet Wednesdays, 8pm in the Church Room, Church Lane, Wormley. August 3 and 17 are Natter Nights. Peter Davies G1KQA on Lea Valley 764930.

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

Ray Donno G3YBK on Exeter 78710.

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121 St. Nicholas Street, Radford. August 5 is a Social at the Horse & Jockey and the 19th is a Night Out Operating Portable. All other meetings are Nights on the Air with Morse Tuition. Jonathan Ward G4HHT on Coventry 610408.

The East Kent RS have a Barbecue from 6.30pm £1pp on July 30, Phase Locked Loops and Frequency Synthesizers by G8NVH on August 4 and a Video Show on the 18th. 1st & 3rd Thursdays, 7.30pm at Parkside Lodge, Kings Road, Herne Bay. Brian Didmon G4RIS on Whitstable 262042.

KARS

Keighley ARS have an Informal on August 9. 2nd & 4th Tuesdays, 8pm in the Club Room, rear of Victoria Hall, Victoria Park. Kathy G1IGH on Bradford 496222.

Rugby ATS meet Tuesdays, 7.30pm at the Cricket Pavilion, outside Rugby Radio Station. An Activity Night on August 2, 10pin Bowling (Forum Bowling Coventry) on the 9th, 144MHz d.f. on the 16th and a talk by the Crime Prevention Officer Pc Wright on the 23rd. Kevin Marriott G8TWH on Rugby 77986.

Stevenage & District ARS meet 1st & 3rd Tuesdays, 8pm at SITEC Ltd, Ridgemoor Park, Telford Avenue. July 29/30 is AMSAT Colloquim. Peter G0GTE on Stevenage 724991.

Lincoln SW Club have On Air/Activities on August 3 & 17th, Home Movie Night G1WVO & others on the 10th and a Construction Contest on the 24th. Meet Wednesdays in the City Engineers Club, Central Depot, Waterside. Pam Rose G4STO at address shown above.

Acton, Brentford & Chiswick ARC have Starting with Oscillators on August 16. 3rd Tuesdays, 7.30pm in Chiswick Town Hall, High Road, W. G. Dyer G3GEH on Acton 3778.

Chelmsford ARS meet 1st Tuesdays, 7.30pm in Marconi College, Arbour Lane. August 2 is RSGB Liaison G4TUO and The Nostalgia Night. Roy Martyr G3PMX on Chelmsford 353221, Ext. 3815.

Yeovil ARC have JFET Voltage Amplifiers part 1 on August 11, part 2 on the 18th and a Natter Night on the 25th. Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. David Bailey G1NMN at 7 Thatchem Close, Yeovil BA21 3BS.

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 Shelton on Winchmore Hill 2453.

Verulam ARC meet 2nd & 4th 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. Hill at 31 Ynys Lee, Cwmavon SA12 9AQ.



On August 2, **Workshop 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 Junk Sale, the 10th is Rally Preparation at Lower Bemrose School, the 14th is the Derby Rally and the 24th G4DVV talks about The Joys of QRP. Kevin Jones G4FPY on Derby 669157.

York ARS will be signing GB2TS at Tollerton 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 Communication 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 G0GTF on Hastings 437513.

LISTEN OUT FOR

GB2RNL: 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:

GB2RNL

Malcolm A Williamson GOEGA
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

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

GB1 WIT: this station will be run from the Witan 88 Student Scout & Guide Camp, near Christchurch, Dorset. They will be operating between July 25 and August 5.

David Heale G6HGE

Tel: 0705 264137

GB2CPC: The Dragon ARC in association with Penrhyn Castle, Bangor, Gwynedd will be holding their special event station from August 19 to 21. An amateur TV station will be set up and operated as well as an exhibition of vintage radios and equipment.



Dewi Roberts GW0ABL

Tel: 0248 713647

GB2NTS: This is to commemorate the 200th anniversary of the death of Prince Charles Edward Stuart, the callsign 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, Strathclyde Country Park, Motherwell between September 5 and 11.

Brian GM0EGI, QTHR or

Paddy GM3MTH, QTHR

GB1RLD: 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 Huddlestone G1UJX

Tel: Derby 676822

RALLIES

*SWM in attendance

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 SU8 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 Bournemouth RAIBC Rally will be held at the FRARS Sports & Social Club, Merley, Nr Wimbourne, Dorset. All the usual attractions will be there for all the family. Entrance is 50p (children free). Gates open from 10am to 5pm.

One of the new arena events taking place at Hamfest '88 (at The Flight Refuelling Sports & Social Ground, near Wimborne, Dorset) will be a team antenna mast erection contest.

Teams of up to five people may enter and the winning team (those who put up the mast quickest and straightest) will be presented with the FRARS Hamfest Trophy. Dr. Julian Ganawat G3YGF, Executive Vice-President of the RSGB, has agreed to present the trophy.

The mast and the guy sets will be provided on the day, together with hard hats and a teach-in before hand. Entry forms and further details on Hamfest '88, on August 14, can be obtained from:

John Fell GOAPI

Tel: 0202 691649

August 21: The Newbury & District ARS will be holding a radio car boot sale at The Acland Hall and Recreation Ground, Cold Ash, Newbury. It open at 10am. Pitches are £5 or £4 if pre-booked and there is a limited supply of inside tables at £10. Please contact:

Mike Fereday G3VOW

Tel: 0635 43048

August 28: The Annual Rally of the British Amateur Radio Teleprinter Group (BARTG) will again take place at Sandown Park Racecourse, Portsmouth Road, Esher. More details from:

Peter Nicol G8VXY

Tel: 021 453 2676

August 28: The Galashiels & District ARS are holding their Open Day at the Focus Centre, Livingstone Place, Galashiels. There will be trade stands, a bring and buy as well as catering facilities. More from:

John Campbell GMOAMB

Tel: 0835 22686

September 20: The annual Amateur Radio Auction and Barbecue will again take place at the Cricket Pavillion "B" Building Entrance, BTI Radio Station, A5 Trunk Road, Hillmorton, Rugby. It's organised by the Rugby ATS.

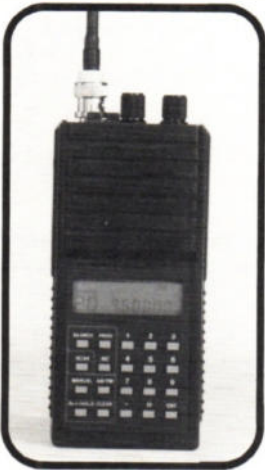
The admission charge is only 20p per person and the large car park is free. Anyone may place an item in the auction, with or without a reserve price, free of charge. However, the Rugby ATS will retain 10% (£10 maximum) on all items sold.

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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 by direct keyboard 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.

AR2002.....£487 inc. vat. Carr. extra.



In the realms of hand held scanners, it would be hard to beat the new AR800E. This compact package (only 60 x 50 x 135mm) contains an AM/FM scanning monitor covering the frequency ranges 75-105, 118-174, 406-495, and that most requested band 830-950 MHz. Channel spacing can be programmed from the keyboard for 5, 10, 12.5, and 25 kHz according to band, so all frequencies are correctly selected. AM and FM modes are available, and there are 20 memory channels to store the most used frequencies. You can also tell the set to search auto-

matically between frequency limits set by the user, and transfer any frequency of interest directly into an unused memory. To cap all this performance, the AR800E comes complete with rechargeable batteries and mains charger, and at an attractive price.

AR800E.....£199 inc. vat. Carr. extra.

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 keyboard 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.



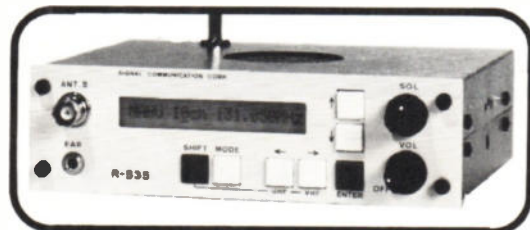
WIN-108.....£175 inc. vat. Carr. extra.

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.

R-535.....£249 inc. vat. Carr. extra

The radio to end all radios. The new RZ-1 from Kenwood may look like a high quality in-car wireless, but in fact is a mobile monitoring receiver covering 500kHz to over 900MHz. . . . Just read that again . . . 500kHz to over 900MHz. Modes available are AM, FM (communications), FM (broadcast and TV), and channel spacings are included to meet all requirements. Consider the fact that with this one package you can listen to almost everything, from Medium wave broadcast, Shortwave stations, high quality FM and TV broadcasts, all communications channels including VHF and UHF airband, right up beyond 900MHz. (Although the spec says 905MHz, all RZ-1 receivers supplied by us have the upper frequency extended to 950MHz at no charge). The excellence doesn't end there; the display can be programmed by you to show a readout of the station title e.g. "Radio 2" or "Lon. Twr.", in any of the 100 (yes, 100) memory channels, Kenwood engineering quality and ease of use are combined to make the RZ-1 a must.

RZ-1.....£465 inc. vat. Carr. extra.



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1988 EDXC Conference, Antwerp

Simon Spanswick

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 (1700UTC), 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 Jupiler 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

Antwerp Coastal Radio — u.h.f. channels

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

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 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 effectually to the target area. The use of ioposons and 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 Cristijn 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

1988 EDXC Conference, Antwerp

ships at sea or on the inland waterways in Belgium. Antwerp Coastal Radio offers radio telegram communications, either by telephone or by Telex, for the public. The installation of transmitters and receivers on board ships is available under a licence and radio operators on board ship must have a suitable certificate.

Satellites

From Coastal Radio it was on to satellites. Andrew Popperwell, Studio Resources Manager at Bush House, talked about the development of BBC satellite broadcasting development. Andrew explained about the switch from h.f. to satellite feeds for all of the BBC's overseas transmitting stations, with Lesotho in southern Africa being the last to go over to this form of pick up, and the far better quality which resulted.

Satellite distribution was now also becoming important to rebroadcasters; many domestic radio stations in different parts of the world relay some of the World Service news bulletins. They were now able to benefit from this new technology. One of the first stations to start using the satellite feed was Radio 74 in Geneva and, whereas before the signal was received on short wave and then rebroadcast with all the associated crackles and pops, a clean and noise-free service was now being provided. BBC External Services have two services on the Eutelsat ECS-F1 satellite at 13 degrees east, using Transponder 12 a centre frequency of 11.674GHz, and subcarrier frequencies of 7.38MHz for World Service and 7.56MHz for the language programmes.

Whilst primarily designed for rebroadcasters (cable networks, local stations *et al*), anybody with a Ku-band receiver could pick up the service as it is not scrambled, although a Wegener Demodulator is required to benefit from the full studio quality available. Andrew stressed that satellite was in no way going to supplant h.f. broadcasting in the immediate future, but in order to stay in front the BBC had to examine all potential areas for expansion. Rebroadcasting of BBC programmes by other broadcasters was, despite the potential problems with final editorial control, an important avenue and an area in which the BBC was making considerable investment.

Sightseeing Tour

After a most impressive buffet lunch, delegates were able to travel on a sightseeing 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, Jonathon 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 100kHz to 1000MHz 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 100kHz, 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's *Skytext* 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 crackles and whistles which amateur radio operators experience do not exist on

computer lines.

The evening was then free and Antwerp benefited from parties 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 sight-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 1950 (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

A general view of some of the exhibits at the Conference.



1988 EDXC Conference, Antwerp

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.

Mr Kharlanov, speaking in French, with Frans Vossen 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, talking 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 weird 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 aperitif 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 Sri Lanka 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.	amplitude modulation
ANARC	Association of North American Radio Clubs
BBC	British Broadcasting Corporation
EDXC	European DX Council
f.m.	frequency modulation
GHZ	gigahertz
KHZ	kilohertz
l.s.b.	lower sideband
MHZ	megahertz
NTSC	National Television Standards Committee (TV System)
PAL	Phase Alternate Line (TV System)
RDS	radio data system
SECAM	Sequential Colour And Matrixing (TV System)
s.h.f.	super high frequency
u.s.b.	upper sideband
UTC	Co-ordinated Universal Time (GMT)
WRTH	World Radio TV Handbook

2MT WRITTLE — The Birth of British Broadcasting

by Tim Wander

Published by Capella Publications

Available from 44 Homefield Way, Earles Colne, Essex CO6 2SP.

179 pages, 155 x 220mm. Price £12.95

ISBN 0 946443 10 6

2MT was the callsign allocated in 1922 by the then Postmaster-General when issuing the first ever licence to the Marconi Company to operate a radio-telephony broadcasting service. The transmitter was sited as Writtle, near Chelmsford, Essex, and for eleven months it sent out a half-hour-per-week programme of speech and music.

Tim Wander's book is more, in fact, than a history of 2MT itself and covers the many earlier attempts, successful and otherwise, to broadcast entertainment material. The author's research has evidently been very thorough, producing an unexpectedly long list of experimenters and stations, from not long after the turn of the century.

We have, in fact, to wait rather a long time to reach Writtle itself, but having got there we are given some extremely interesting information on the design and construction of the station and of the highly inventive material provided by the technical staff plus various professional performers.

Thanks to the author's vivid descriptions of various broadcasts, we are able to imagine something of the excitement that they must have generated amongst those early radio



listeners 66 years ago. Anyone interested in radio history is bound to find much that is informative and stimulating in Tim Wander's book, and those pioneer listeners who actually heard 2MT will undoubtedly have memories evoked.

A number of appendices give information on very early radio experimenters and on other aspects of broadcasting. The book is illustrated with over 50 photographs, many of which are unfamiliar and noteworthy.

Chas E. Miller.

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

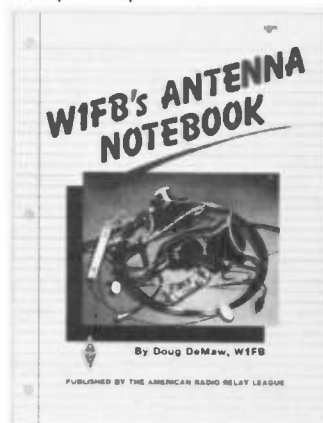
Available from the SWM Book Service

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 antennas. 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 914941 15 1

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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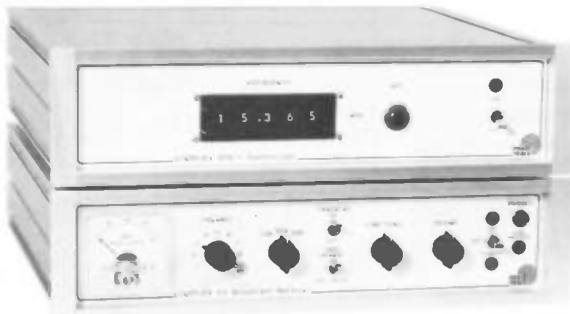
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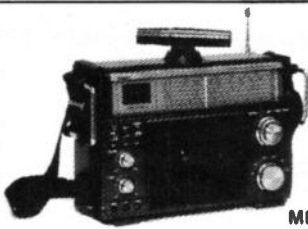
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REALISTIC PRO-201 SCANNER

John Waite

The PRO-201 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 simplicity itself.

John Waite reviews the Realistic PRO-201 scanner — a v.h.f./u.h.f. base station receiver.



The Manual

The multi-lingual manual covers the operation of the PRO-201 in English, French, Dutch and German. The first few pages of the manual deal with the installation of the PRO-201 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-201. 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-201 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-201, 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 what 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 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.

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-201 are fairly standard, although I don't mean that they are unnoteworthy. It's just that the PRO-201 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.

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

▼: 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 (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

REALISTIC PRO-2021 SCANNER

found, whilst in search mode, can be transferred to the "notebook" facility by pressing this button.

The Display

The display of the PRO-2021 is a pleasant turquoise colour, with the lettering 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.

Operation

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 phono socket so that you can tape directly from the scanner, which is often popular with scanner users.

Other than the infuriating "beeping" 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. (SWM Book Service Page 54)

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!

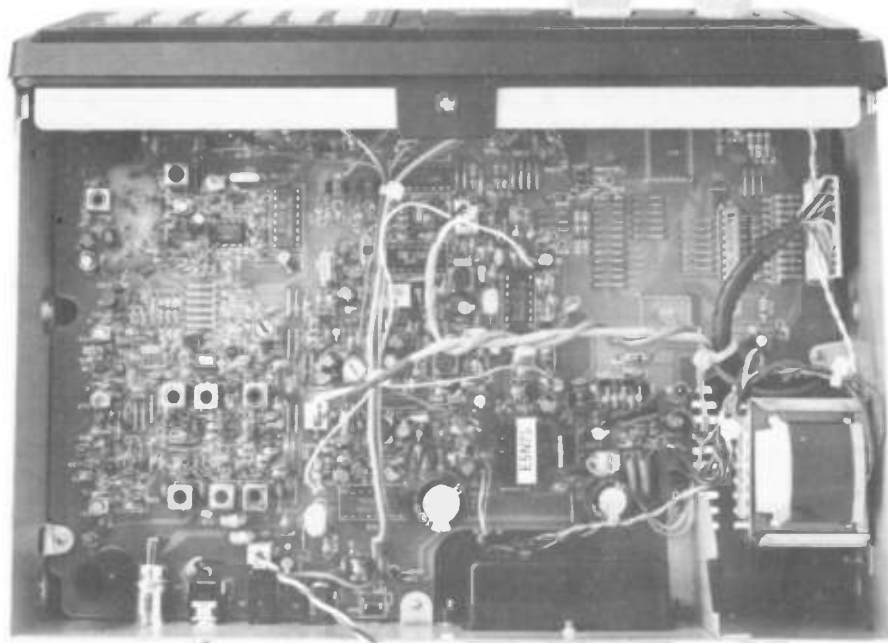
The PRO-2021 costs £219.95 and is available from your local branch of Tandy. My thanks to Tandy UK for the loan of the review model. □

SPECIFICATION

Frequency Coverage:	68-88MHz (5kHz steps) 108-136MHz (25kHz steps) 136-174MHz (5kHz steps) 380-512MHz (12.5kHz steps)
Sensitivity:	for 20dB signal to noise 68-88MHz 0.5µV (0.2µV) 108-136MHz 2.0µV (0.8µV) 136-174MHz 1.0µV (0.4µV) 380-512MHz 1.0µV (0.4µV)
Selectivity:	± 9kHz-6dB (± 10kHz) ± 15kHz-50dB (± 13.75kHz)
i.f. Rejection:	60dB at 154MHz (65.9dB)
Scanning Rate:	Fast: 8 chans/steps per second Slow: 4 chans/steps per second
i.f. Frequencies:	10.7MHz (first i.f.) 455kHz (second i.f.)
Squelch Sensitivity:	Less than 1.0µV (0.34µV).
Audio Power:	1.5 watts max. (1.6 watts at 10% t.h.d.)
Power Requirements:	220-240 volts a.c. 17 VA 13.8 volts d.c. 8 watts 9 volt battery for memory
Dimensions:	80mm high 260mm wide 200mm deep
Weight:	2.0kg.

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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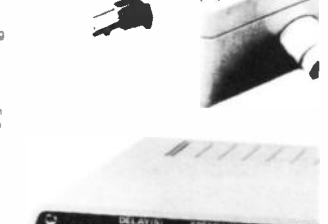


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AIRBAND

Godfrey Manning G4GLM

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 NOTAMs 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 en route to Paris (Charles de Gaulle). Route B is towards the Detling v.o.r. thence following the 188° 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 ICAO 1:500 000 Sheet 2171AB Northern England and Northern Ireland Edition 11* correctly shows how the controlled airspace now extends over the coast. This airspace requires radio contact for its penetration; aircraft using the coastline for navigational reference under visual flight rules (v.f.r.) are at a disadvantage if non-radio-equipped. Under v.f.r. the "rules of the road" state that aircraft must remain to the right of any line

This month's column is mainly taken up with answering reader's questions as well as the usual updates on information.



feature being followed (such as a coastline). This is the flying equivalent of always driving on the left side of a single-carriage-way road, in order to prevent collisions with oncoming traffic. The trouble at Newcastle is that southbound aircraft (flying on the inland side of the east coast) now cross the edge of controlled airspace. See CAA *AIC 61/1988*.

The recent Display at Croydon used 122.55MHz as a temporary frequency for the event; the Air-Britain Fly-In at Wroughton used 130.7MHz and there was a temporary visual arrivals corridor from the M4 motorway Junction 15 direct to the airfield which allowed penetration of the Lyneham zone.

Information Sources

If you choose to buy your 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 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 0DB.

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** (Ormskirk, Lancashire) who found a tape in a local shop: *What Goes Up Might Come Down — The High Flying Humour of David Gunson* (Big Ben Tapes No. BBMC12). 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 01-958 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

AIRBAND

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 5QW.

Another item I am regularly asked for is aneroid altimeters, like the one Ron Ham described in his Band II 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. enamelled wire. The input is one joint between the coil and capacitor; the other joint is the output terminal.

Abbreviations:

AIC	Aeronautical Information Circular
a.m.	amplitude modulation
CAA	Civil Aviation Authority
CB	Citizens Band
h.f.	high frequency
ICAO	International Civil Aircraft Organisation
MHz	megahertz
mm	millimetre
nm	nautical mile
NOTAM	NOTifications to Air Men
pF	picofarad
PO	Post Office
RAF	Royal Air Force
R/T	radio telephony
s.w.g.	standard wire gauge
u.s.b.	upper sideband
v.f.r.	visual flight rules
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range

The drawing in last month's column had the wrong scale marked on it. The true scale should have been 5.2mm = 1nm.

Thanks for all your letters; if you're going on holiday by air or near an airport this summer, don't forget to write!

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THREE-BAND SSB RECEIVER

C. M. Lindars

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

In this part we get on with the actual construction of the receiver starting with the audio amplifier section.

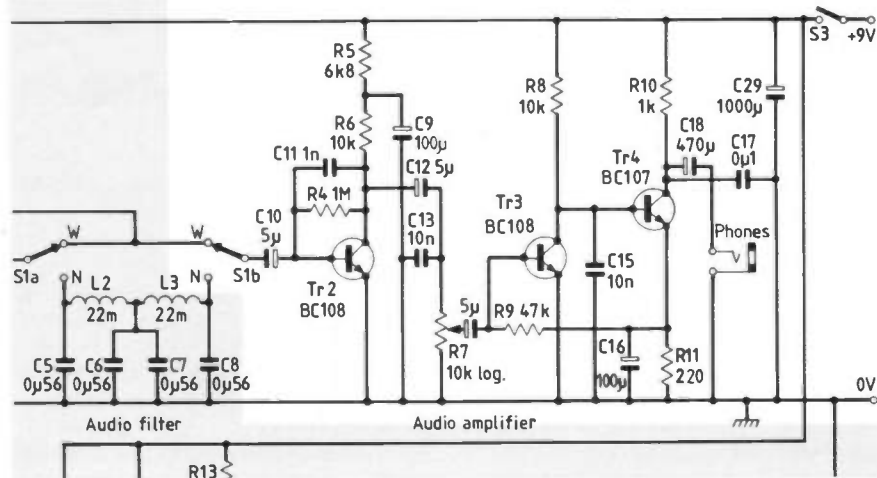


Fig. 2.1: Circuit diagram of the audio amplifier.

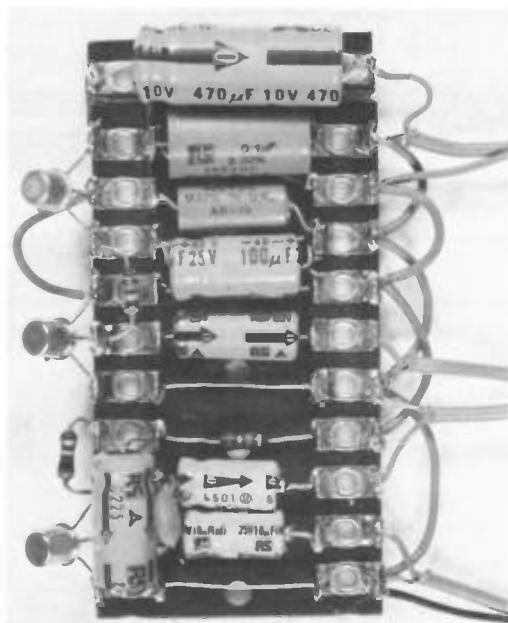
specified. The working voltage can be higher than that specified but must not be lower than the supply voltage, 9V in this case. The other capacitors can be of any type so long as the values are as shown in the component list.

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



Completed audio amplifier module.

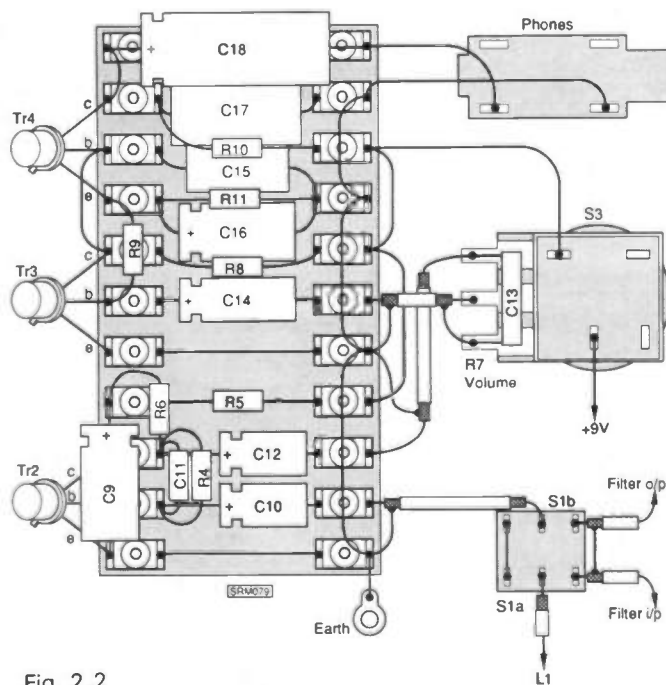


Fig. 2.2

THREE-BAND SSB RECEIVER

Part 2

YOU WILL NEED

		Audio Amplifier Board			
Resistors					
¼ W 5% Carbon film		1000µF 16V	1	C29	
220Ω	1	Polyester, axial lead			
1kΩ	1	10nF	2	C13,15	
6.8kΩ	1	0.1µF	1	C17	
10kΩ	2	Disc Ceramic			
47kΩ	1	1nF	1	C11	
1MΩ	1	R4			
Potentiometers		Semiconductors			
¼ inch spindle carbon track with switch		Transistors			
10kΩ log	1	R7 + S3			
Capacitors					
Electrolytic, axial lead		BC107			
5µF 63V	3	C10,12,14		1	Tr4
100µF 16V	2	C9,16		2	Tr2,3
470µF 16V	1	C18			
		Miscellaneous			
		¼ inch mono jack socket; Miniature d.p.d.t. toggle switch; Miniature group panel (tag board); Single screened cable.			

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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AR2002 £487.30



The frequency range is from 25 to 550 and from 800 to 1300MHz. Modes of operation are wide band FM, narrow band FM and AM. The receiver has 20 memories, memory scan and a search mode which checks frequencies between user designated limits and a push button keypad for easy frequency entry and operation. A front panel knob allows the listener to quickly step up or down in either 5, 12.5 or 25kHz steps from the frequency initially chosen.

A socket for the optional RS232 interface (IRC PACK) is provided on the rear panel.

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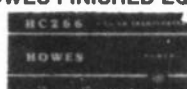
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SCANNING

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 26-29.995MHz, 60-88MHz, 115-178MHz in 5kHz steps and 210-260MHz, 410-520 MHz in 10 or 12.5kHz 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 a.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: (0705) 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, 220-380 MHz and as a bonus 830-950MHz. The price?, around £220. For more information contact Johnathan Clough at Javiation, 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

This month's column begins with information on several new products of interest to the scanning enthusiast.

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 934-935MHz. 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 useage in particular areas.

Converting TV Tuners

Following on from last months notes on the use of converters **Keith Micklewright**

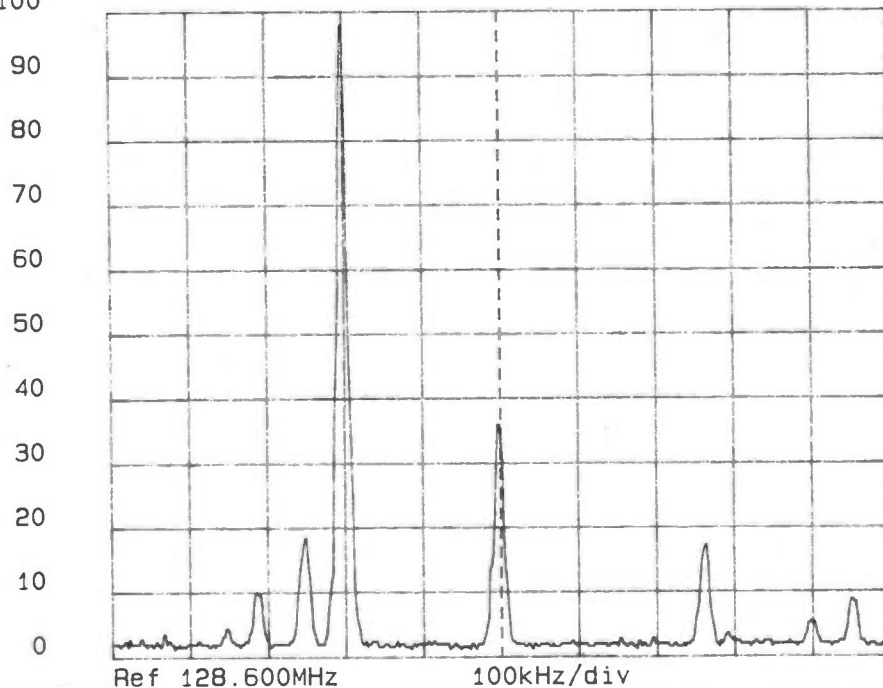


Fig. 1 ▼

▲ Icom IC-R7000

µVolts VHF AIRBAND 128.1-129.1MHZ

100



of Market Drayton has written to me with the suggestion that it is possible to use a u.h.f. TV tuner as a convertor. 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 10 μ V divisions and the horizontal axis 100kHz divisions. The centre of the display is at

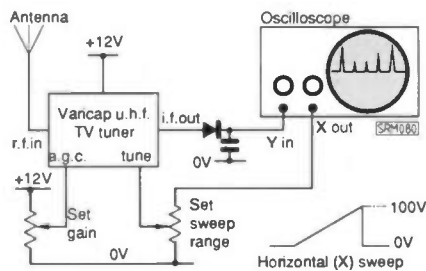


Fig. 2

128.6MHz and you can clearly see the signal from London VOLMET south being displayed with its peak at around the 35 μ V level. Two divisions to the left and 200kHz lower in frequency a very strong signal can be seen peaking just below the 100 μ V 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 r.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 slant 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 an S-meter. I will pass on any details I receive.

As usual all letters to PO Box 1000, Eastleigh, Hants, SO55HB. Please enclose an s.a.e. if you require items returning. Until next month — Good listening.

Abbreviations:

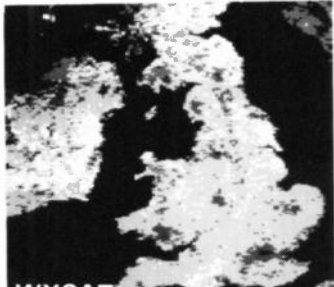
a.g.c.	automatic gain control
a.m.	amplitude modulation
Band IV	471.25 — 607.25MHz
Band V	615.25 — 855.25MHz
CB	Citizens Band
dB	decibels
DTI	Department of Trade & Industry
f.m.	frequency modulation
i.f.	intermediate frequency
kHz	kilohertz
MHz	megahertz
n.b.f.m.	narrow band frequency modulation
PO	Post 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
μ V	microvolts
V	volts
v.h.f.	very high frequency

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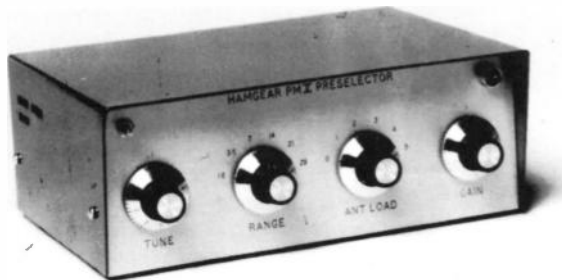
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SANDPIPER MOBILE SCANNER ANTENNA

Peter Rouse GU1DKD

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. collinears 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 manufacture 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 $\lambda/8$ sections over a $\lambda/4$ section at u.h.f. These elements are coupled by contra-wound $\lambda/4$ coils to provide the 50ohm 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 only 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 my home QTH 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 discone as a reference. The

A broadband mobile antenna for scanners, with similar performance to the familiar discone, has yet to be invented and unless scientists have somehow overlooked some of the laws of physics, it probably never will be. However, as Peter Rouse explains, Sandpiper appear to have found a reasonable compromise — a multi-band antenna for mobile use.



results of this test were that u.h.f. performance was excellent and performance between 130 and 170 MHz 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 free 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 discone (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 discone 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, Penyard, Llwydcoed, Aberdare, Mid-Glamorgan CF44 0TU (Tel: 0685 870425). Cost (not including base) is £17.95 which includes postage, packing and VAT.

Abbreviations

CB	Citizens Band
dB	decibel
in	inch
λ	wave length
MHz	megahertz
u.h.f.	ultra high frequency
UNF	Unified National Fine (thread)
v.h.f.	very high frequency
v.s.w.r.	voltage standing wave ratio

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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.

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LUTON TO DUSSELDORF

Malcolm Wayland

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 Mc-Areavey, 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 Dusseldorf on a Clacton 1 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 1534BST, and as we passed 500ft the v.o.r. receivers showed we were on the 037 radial from Bovingdon. We turned left, tracking the radial 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 288 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 ident, 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 (t.m.a.)).

As we crossed Brookmans Park the next beacon, Clacton (114.55), was tuned on both nav sets. We tracked 087° on airway Red One North towards Clacton

How does it feel to be in the cockpit and fly between airports? After reading this article you should have some idea.



v.o.r./d.m.e. Then we received further climb clearance to Flight Level 120, and were told to call London on 133.45. After "checking in" on the new frequency giving our call-sign and the flight level we were passing, we obtained clearance to climb to FL290, our selected cruise altitude. We passed overhead the v.o.r. at 1547, some 13 minutes and 66 nautical miles since becoming airborne, and continued along Upper Airway Red One North as we tracked the 076 radial away from Clacton.

About 50 miles beyond Clacton we were told to contact Amsterdam Radar on 125.75. After being identified, we were cleared from our present position direct to the Pampus v.o.r./d.m.e. (117.80MHz).

Ian then said "Tune in Brussels VOLMET on box one, Malcolm, and get some weather please." I dialled Brussels VOLMET (127.8) on box one, and listened to the recording. This included the weather reports for both Dusseldorf and Cologne, which was our selected alternate should Dusseldorf become unavailable for any reason.

By the time we reached Pampus, Ian had already briefed me for the descent and approach, and had selected the "Top of Descent" point as being 30nm beyond Pampus. The "STAR" (Standard Terminal Arrival Route) we expected was a "Two Delta Lima", to be followed by radar onto the instrument landing system for Runway 24. We crossed Pampus at 1606BST, and were instructed to contact Amsterdam Radar on 124.87MHz for clearance to descend. This we did, and were cleared down initially to FL240.

By now we were tracking the 114 radial away from Pampus toward ARKON, a point in space defined as being on the 114 Radial Pampus at a range of 62nm. We were told to contact Dusseldorf radar on frequency 129.17, and upon doing so were further cleared down to FL100. We briefly tuned one of the nav receivers onto Dusseldorf v.o.r./d.m.e. (on 115.15), to get the latest ATIS weather information, and also to obtain the d.m.e. reading to give us an idea of the distance to touch down.

As we reached ARKON, we selected Dortmund v.o.r./d.m.e. (112.70) on the nav receivers and continued to track inbound on the 294 radial until the d.m.e. indicated a range of 27nm, this being the position "ODINO". We had also previously selected Bottrop n.d.b. (406.5kHz) on the a.d.f.s and as we

```
BRITANNIA AIRWAYS 737 FLT. PLN. LOC FR: EGGW LUTON
Flt. Date: 18/08/87 Capt: M. AGENCY N51526 W000221
Flt. Num.: BY 940 F/O: Wayland To: EDDL DUSSELDORF
On Checks: 12.35 Landed: 15.30 N51159 E006455
Off Checks: 14.25 Airborne: 14.30 Avg Tr 100(T)
Block: 1.10 Flight: 0.52 Sched: 1420:1525 (1:05)
Clearance: A/C Reg: G-AXNB
A 26 1014 CW 28 5255 125.8 Con. Alt. EDDK
```

Alternates	MTR	Dis	FL	W/C Nil	W/C -20	W/C -40
EDDK COLOGNE	150	035	060	13/630	13/640	14/655
EDVV HANNOVER	070	173	250	34/1560	36/1610	37/1670

CRD	120.75	MSA	FL	A/Way	Mtr	Waypoint	Dist	CS	Time	ETA	ATO	ETO	DTG	FOB
TLR	120.20	03.6	ATC	CLD	BPK		16		6					311
RDR	128.75	03.6	URIN	088	CLN	N51449 W000661	47		7	40				264
LOW	125.80	03.6	URIN	076	CAB	N51519 E011890	36		6	47	47	49		228
LOW	133.45	03.4	URIN	076	REDFA	N52020 E002137	16		2	53	53	53		212
AMS	125.75	03.3	URIN	077	TULIP	N52069 E012293	58		5	55				154
AMS	124.97	02.9	URIN	099	PAM	N52238 E004807	40		7	02				114
		03.4	UB15	114	ARKON	N52242 E005856	62		6	08	02	02		114
		04.6	UB1	170	BOT	N51574 E006388	18		8	16	14	14		52
DRDR	124.17	04.6	2DL	115	ODINO	N51528 E016550	11		2	19		16		41
DRDR	120.05	04.6	2DL	170	EDDL	N51352 E007815	23		4	22	21	20		23
APP	119.40	03.5	2DL	CLD	EDDL	N51169 E006455	327		7	29		28		
TLR	113.30	03.5	2DL	CLD	EDDL	N51169 E006455	327		7	29		28		
121.90	6WB													
Totals														327
														08.57 A/B-ETA 1529 CONE 2.841
														0.55 1434

Ref. 325 FL 290 Dated 21JUL87 based on standard SUMMER & WINTER Plan

FLIGHT LEVEL RESTRICTION ON ALL URIN TRAFFIC FROM LONDON TMA TO DESTINATIONS IN DUSSELDORF FIR-NORMALLY NOT ABOVE FL290.

LUTON TO DUSSELDORF

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 120.05MHz. 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 we had received the latest ATIS information. We were then cleared to descend to 3000ft on the QNH altimeter setting, instructed to turn right onto 190°, 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 this was happening the nav-aids were quickly being re-selected and identified. First of all the i.l.s. was dialled 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 QFE 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 8.0 d.m.e., following which the i.l.s. was also selected on Nav 2. We crossed the "LI" 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 1530BST, with captain McAreavey 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 (Lo) 1 and 2, E (Hi) 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.

B.737 TIME/BURN OFF - KGS

F/L ENG	ECONOMY CRUISE 15A			LANDING WEIGHT		42000KGS		DIST		325NMLS	

	-100	-80	-60	-40	-20	-0	+20	+40	+60		
250	1.09	1.06	1.03	1.00	0.58	0.56	0.54	0.52	0.50		
-9 /M.70	3125	2960	2850	2735	2625	2535	2450	2370	2295		
-15/M.71	3215	3065	2935	2810	2705	2610	2525	2440	2365		
270	1.09	1.06	1.03	1.00	0.58	0.56	0.54	0.52	0.50		
-9 /M.70	3060	2920	2800	2690	2590	2500	2425	2345	2275		
-15/M.72	3150	3005	2885	2770	2670	2580	2500	2420	2350		
290	1.08	1.05	1.02	1.00	0.58	0.56	0.54	0.52	0.50		
-9 /M.72	3020	2895	2780	2670	2580	2495	2420	2345	2280		
-15/M.73	3085	2950	2830	2720	2620	2535	2455	2385	2310		
310	1.08	1.05	1.03	1.00	0.58	0.56	0.54	0.52	0.51		
-9 /M.72	2990	2870	2760	2655	2570	2490	2420	2350	2285		
-15/M.73	3050	2925	2810	2710	2615	2530	2455	2390	2320		
330	1.08	1.05	1.02	1.00	0.58	0.56	0.54	0.52	0.51		
-9 /M.72	2960	2845	2735	2640	2560	2480	2415	2350	2290		
-15/M.73	3025	2905	2795	2690	2605	2525	2455	2395	2325		
350	1.08	1.05	1.02	1.00	0.58	0.56	0.54	0.52	0.51		
-9 /M.72	2950	2830	2730	2630	2550	2480	2410	2345	2290		
-15/M.73	2990	2875	2770	2670	2590	2515	2445	2385	2320		

TIME ASSESSMENT FOR LONG ROUTES WHEN REQUIRED				B.737 FUEL CALCULATIONS			
TIME TO	TRK(T)	G/S	DIST	TIME	A. Fuel to dest. (from above)	TIME	
INC CLIMB		S/AIR			-15A Corr. Minus 5%	24	20
SPOTWIND		-40 Kts			B. 4%/hr. landing wt. Corr.†		X
					C. Corrected Fuel to Dest.	24	20
					D. Approach	2	5
					E. Anti-Eng 2kg per min Ice Wings-Eng 3kg per min.		X
USING TOTAL TIME INTERPOLATE FOR FUEL REQ. FROM ABOVE TABLE.				TOTAL TIME	F. Burn Off	26	70
					G. Contingency for C ††	1	20
					H. HOLDING	1	20
					I. Fuel to Alternate	6	30
					J. 5% of 'I'	3	0
					K. Test (10 min).	2	0
					L. Ramp requirement	4	85
					Excess (@ 2100 kgs/Hr.)	1	150
					Total on board/End.	6	09

STATION WEATHER REPORTS										
Station	GMT	W/V	Vis.	WX	Cloud	Cloud	T	QP	QNH	Trend
DUS	1420	250/08	8k		3/2000 4/3000		22	18	1017	NS
CGN	1420	300/10	10+		1/2000 4/3000 6/8000		21	18		NS

Ref: Distance 325

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 beacons
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 METeorological report
v.o.r.	very high frequency omnidirectional radio range

Peter Laughton

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 100000 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 - 2230UTC and 12MHz between 2145 - 0930UTC. A voice identification was given every 15 minutes, although the programming on time signal stations may be somewhat repetitive (!), 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 1000Hz 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

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.



stations around the world for broadcast on that day.

Spanish Foreign Radio seems to have been the only station to broadcast the speech by ITU Secretary General Richard Butler. They let us hear it in full. Mr Butler may be an excellent administrator, but his presentation of the future of the communications industry sounded like a rather weary Les Patterson! Communications, we're told, is the world's fastest growing industry. The ITU seriously needs to rethink its public relations strategy if it wants to persuade governments to give communications a greater priority.

Wireless Walkman Interference

"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 headset 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.

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.

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.

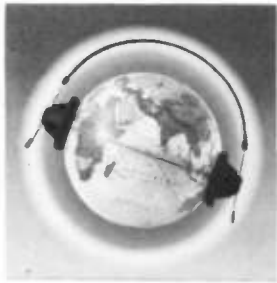
At the same time financial constraints have stopped VOA's broadcasts in Thai, and put the VOA Dixon transmitter site in California into mothballs. No sooner had Dixon gone off the air than Alabama entrepreneur Dixon Norman was issuing press releases again. Norman has been telling the world about his 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".

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 Perka. 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 Sinhala communities made it impossible to hire local personnel, or get oil up from Colombo 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, Radio 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 £10000 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 BBC's 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 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 US 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 f.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. □



Abbreviations

f.m.	frequency modulation
Hz	hertz
ITU	International Telecommunications Union
kHz	kilohertz
kW	kilowatt
m	metres
MHz	megahertz
UTC	Co-ordinated Universal Time (= GMT)
W	watts

INTRODUCTION TO DX-TV

Keith Hamer and Garry Smith

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 II 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. Bands 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.

may change in the future and some countries are already introducing f.m. broadcasts into the more familiar 88 to 100MHz part of the v.h.f. spectrum.

Albania and Italy also have a channel assigned in Band II although its future use by the Italian TV services is uncertain.

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 Torina) and a few low-power private stations; Albania with a 100kW outlet.

Notes:

(1) On OIRT Channels R3, R4 and R5, System D with SECAM colour is used except Romania which uses PAL.

(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.

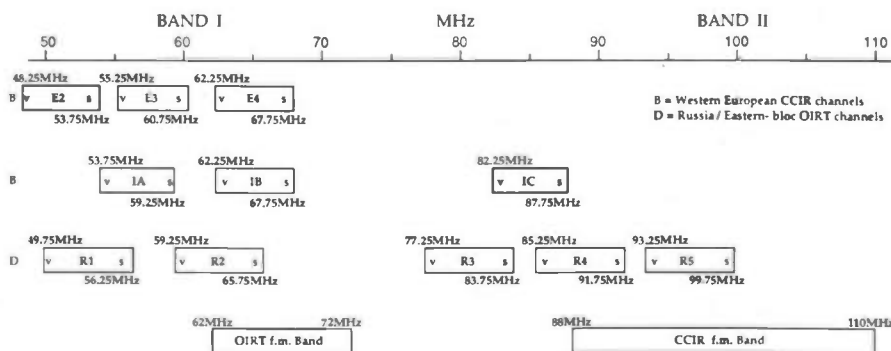
Fortunately, there is a trend nowadays from some of the more upmarket television receivers to cater for these extra channels in Band II, particularly the ones boasting satellite and cable channel facilities. The once popular mini-colour portable, the JVC CX610GB, provided coverage of Band II channels 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 valved 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 ELC2000/2060 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 UV 416 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,



INTRODUCTION TO DX-TV

Part 11

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

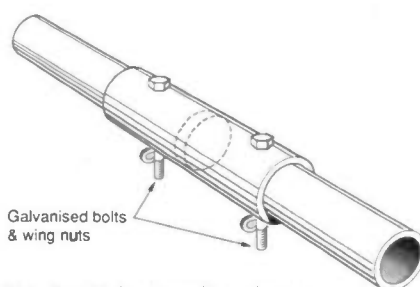


Fig. 2a: Using an alloy sleeve.

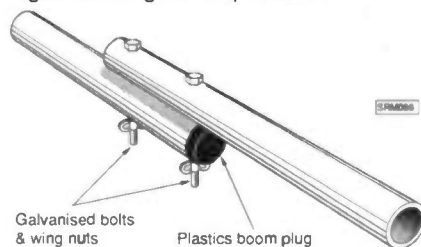


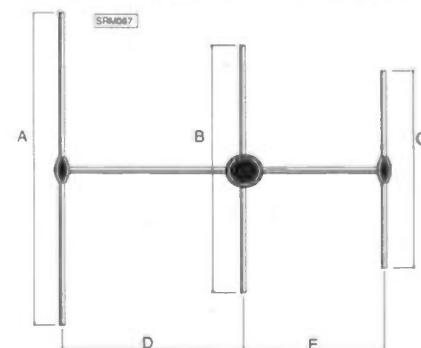
Fig. 2b: Overlapping booms.

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 175.25 MHz. 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.



	Wideband (70-100MHz) Channels R3, IC, R4 & R5	Semi-wideband (72-88MHz) Channels R3, IC & R4
A	2030mm	1980mm
B	1730mm	1740mm
C	1400mm	1620mm
D	740mm	710mm
E	430mm	480mm

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

you happen to have a spare receiver. Also, the higher Band III channels should be thoroughly checked at regular intervals during periods of high or increasing m.u.f.

A classic example of Band III Sporadic-E reception occurred one afternoon in early June 1981 when virtually every Russian channel was logged in the UK and the Netherlands. Reception in Band III may not seem very significant to the budding enthusiast but some countries, especially those in North Africa, have very little, if any, Band I coverage. Over the years, countries which have been positively identified in Band III via Sporadic-E include Russia, Italy, Spain, Morocco and Algeria.

Antennas for Band III

Signals received at Band III frequencies via Sporadic-E propagation tend to be stable like those in Band II. Signals strengths encountered may vary from extremely weak to strong.

Although antenna height is not of great importance due to signals arriving at a slight angle, the same antenna would also be used for tropospheric DX reception and should therefore be mounted as high as possible.

Most Band III designs are based on the Yagi principle in which passive elements are positioned at a certain distance in front of, and behind, a half-wave dipole. Band III arrays usually have a minimum of two-elements, known as directors, positioned in front of the dipole assembly. Some commercially available arrays have as many as ten directors in order to promote a high forward gain with minimum signals pick-up from the rear and sides of the antenna. The reflector can comprise a single passive element or a composite assembly consisting of two. The latter arrangement is designed to improve the front-to-back ratio of the array, thus reducing the possibility of interference from co-channel transmitters which may be located to the rear. Band III arrays are available in channelised, semi-wideband and wideband versions.

Amplifiers

In the previous articles 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 mast-head 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 band-pass or high-pass filter prior 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

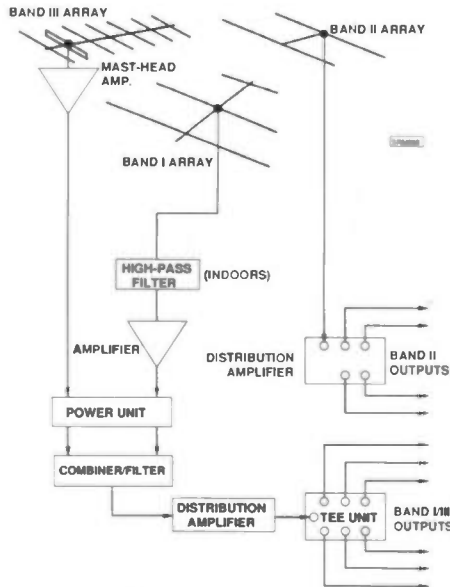


Fig. 4: Distributing the signals at v.h.f.

(covering 40-230MHz) for Band III reception, experience has shown that f.m. radio breakthrough can create problems throughout the lower channels E5, E6 and E7. These channels correspond to twice the f.m. radio band frequencies and the problem is not uncommon even at a distance of 30-40km from the f.m. transmitter. The remedy is to fit a high-pass filter at the input of the amplifier to attenuate unwanted transmissions which may be present below Band III. Over the years, both authors have successfully employed the Band III section of a Band I and III diplexer to remove the offending f.m. interference from their installations. This does introduce a slight insertion loss

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. □

Abbreviations

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

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STARTING OUT

Brian Oddy G3FEX

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 (f_m) mixes, or heterodynes, with the carrier (f_c) and produces additional sum and difference frequencies ($f_c + f_m$) and ($f_c - f_m$) called **side frequencies** — see Fig. 1a.

One of the most frequently used methods of sending information to a distant location by radio consists of superimposing an audio signal 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!

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 spikey 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!

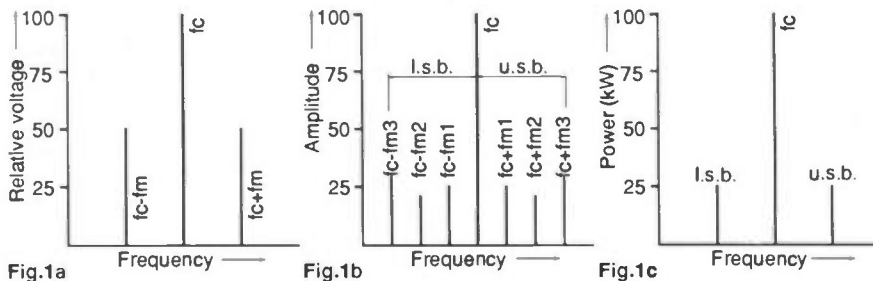


Fig.1a

Fig.1b

Fig.1c

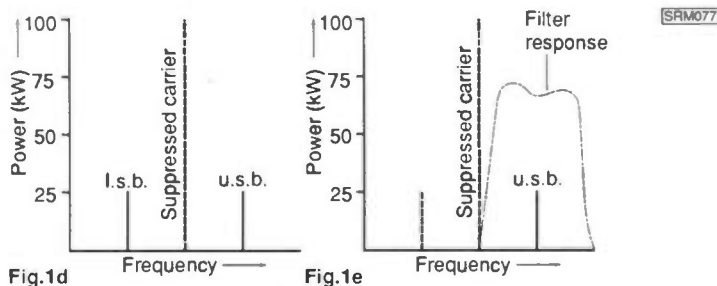


Fig.1d

Fig.1e

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 (f_c) with three ascending audio tones (f_{m1}), (f_{m2}) and (f_{m3}) is depicted in Fig. 1b. The highest tone (f_3) results in the two equally spaced side frequencies being furthest away from the carrier, whereas the side frequencies produced by the lowest audio tone (f_{m1}) 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.

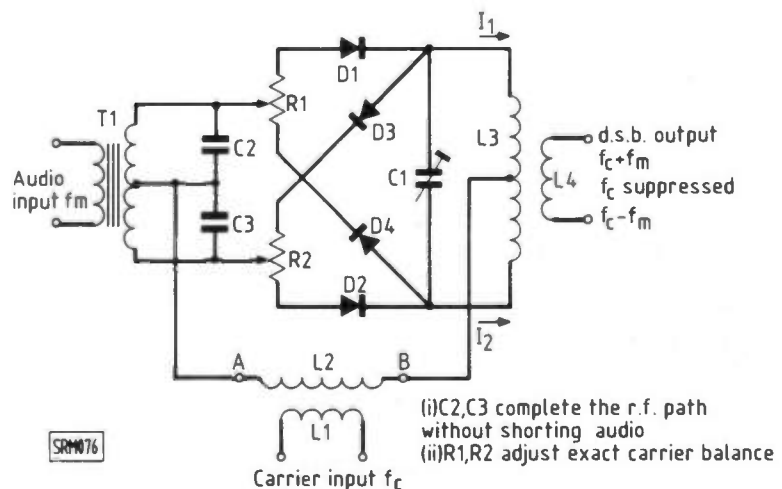
The Carrier

Surprising as it may seem, the analysis shows that the amplitude and frequency of the carrier (f_c) 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**,



SRM076

Fig. 2

(i) C2, C3 complete the r.f. path without shorting audio
(ii) R1, R2 adjust exact carrier balance

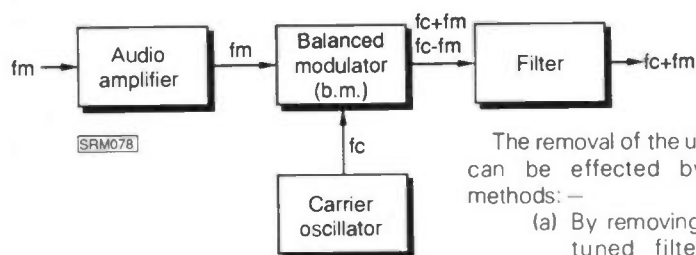


Fig. 3

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 ($f_c + f_m$), ($f_c - f_m$) 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.)** signal — see Fig. 1d. In practice it may not be possible to eliminate the carrier entirely, 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. 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. 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 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. 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.

The removal of the unwanted sideband can be effected by one of three methods: —

- By removing it with a sharply tuned filter — the **Filter System**.
- By phasing it out — the **Phasing System**.
- By a special means of generating the signal, called the **Third Method Generation**.

With the advent of excellent modern quartz crystal filter designs, methods (b) and (c) have, in general, fallen by the wayside.

The initial stages of a single sideband (s.s.b.) suppressed carrier transmitter are shown in fig. 3. The output from the carrier oscillator (f_c) and the modulating audio (f_m) are applied to the balanced modulator (b.m.) and sum and difference frequencies are produced, but the carrier is suppressed. The d.s.b. signal is then coupled into the filter (FL) which has a steep-sided band-pass response, with a bandwidth just adequate to pass only one of the sidebands — the upper sideband (u.s.b.) is shown as having passed through the filter in Fig. 1e. The required filter response may be obtained by connecting a number of quartz crystals in a lattice format, but at low frequencies a mechanical filter may be used.

The processing needed after the filter will depend upon the frequency at which the basic s.s.b. signal is generated. Many commercial transmitters generate the s.s.b. signal at a relatively low frequency (100-500kHz), since this technique enables excellent sideband suppression to be obtained by using a mechanical or quartz crystal filter. The low frequency s.s.b. signal (f_{sb}) then has to be converted to the final frequency of transmission by mixing it with the output from a high frequency oscillator (f_o).

Since the output from a simple mixer would contain the injection frequency (f_o) as well as the sum and difference frequencies ($f_o + f_{sb}$) and ($f_o - f_{sb}$), it is usual practice to employ another balanced modulator as the mixer, so that the (f_o) component is suppressed. The unwanted mixing product ($f_o - f_{sb}$) can be removed by adding a simple tuned filter after this balanced modulator. Linear amplifiers are then used to raise the signal power to the desired level.

In many of the more compact and portable transmitter designs the basic s.s.b. signal is generated at higher frequencies (1 – 10MHz), since this approach enables fewer stages to be used to reach the final transmitted frequency. High frequency quartz crystal filters are, however, more difficult and costly to produce and tend to be less effective than

their low frequency counterparts. Since the output stages of any s.s.b. transmitter are subjected to only short duty periods at high peak power, the power supplies used can be made both physically and electrically small.

Independent Sideband

It is possible to modulate a carrier with two entirely different audio signals so that the upper and lower sidebands contain completely different information! This concept, known as **independent sideband working (i.s.b.)** is used on many of the commercial h.f. links to distant places since it saves both power and bandwidth.

The initial stages of an i.s.b. transmitter contain two balanced modulators, each coupled to a common carrier oscillator. Each audio signal is applied to a modulator input, consequently the d.s.b. output from each modulator is entirely different although derived from the same carrier which is suppressed. After removing the lower sideband from one d.s.b. output and the upper sideband from the other by means of filters, the remaining upper and lower sidebands are combined with a low-level signal from the carrier oscillator, called a **pilot carrier**, in a circuit called a **hybrid bridge** to form an i.s.b. signal. The pilot carrier is required by the receiver — as will be explained next month.

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. 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 anode 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. signal appearing at L4. □

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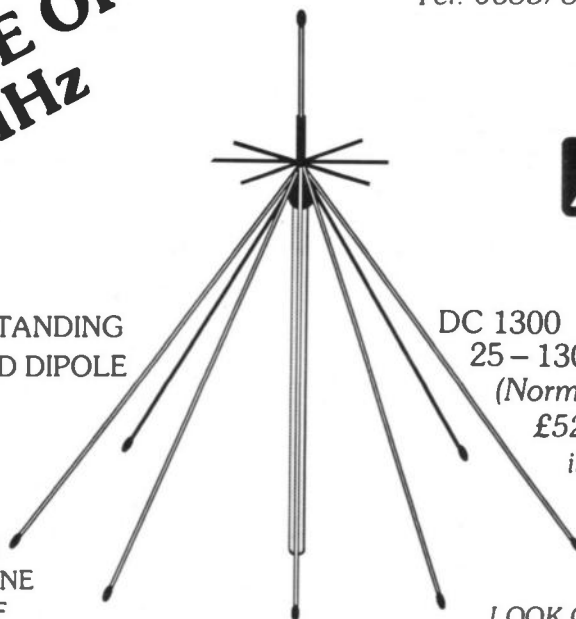
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SEEN & HEARD

AMATEUR BANDS ROUND-UP

Justin Cooper

PO Box 4, Newtown SY16 1ZZ

As I outlined last month, this is the last column from me. The grey beard has, over the decades, turned white and the time has now come to hand over the monthly work to someone else.

I successfully twisted his arm, (he'll be in plaster for weeks!) and so that someone else will be Paul Essery GW3KFE. Old-time readers of *Short Wave Magazine* will recall him as the Editor between 1977-87. Current readers of our sister magazine *Practical 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 runs a station comprising a TS-830S, VFO-230 and FL-2100Z linear, into either a TA32, an indoor beam, or a Best Bent Wire for the I.f. bands. At v.h.f. he is occasionally to be heard on 144MHz or 432MHz, either from home or out /M.

We have 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 since the early sixties! So, this is the last time the tables will appear, but fear not, Paul and I thought up a new challenge for readers. We persuaded Dick G8VFN (the Editor) to foot the bill for the award which will be available for logging various 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 at being an s.w.l. or not, the chance to shine.

Obviously I shall be sad to give the column up, but I can keep up with all you are 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.

By the way, to save confusion (and in a truly generous manner!) I have donated my PO Box number to Paul so you can still write to the same address.

Your Letters

J. Mowat (Luton) starts; Jim has a short list simply because his receiver had to go back to the dealer for service; a leaking rectifier diode. He enquires about the status of a station signing, for example G3SWM/P, as compared with another portable such as W6AM/P/7. No difference really, the /7 merely indicates that the location of W6AM/P is in W7-land. In other countries not divided into call areas, such as UK, there is no need for this, so it counts only as a G3/P. In fact, we hear that the Yanks are going over to the new standard and putting the "suffix of location" up front, so that G3SWM in the USA would sign W6/G3SWM rather than the previous G3SWM/W6. The deadline for this change is to be around July 18 — after this has left me and before it reaches you.

Turning to B. Woodcock (Leeds 17), the QSL from JY1 has arrived and he now awaits the arrival of the Polar Bridge Award, from the Canadian/Russian Ski-Trek expedition. The expedition has now been completed, from Cape Artichski in the USSR to Cape Columbia via the North Pole.

S. Burgess (Stockport) is very much of a 21MHz addict, perhaps the pick of the crop was 4F1DMD for a special prefix from the Philippines.

E. W. Robinson (Felixstowe) has picked some interesting prefixes; TQ6JUN was a "special" heard on June 3 for a reminder of D Day, from Utah Beach in Normandy. QSL this one to F5AM. VO7FG was a special too: this one was to celebrate the 100th anniversary of the formation of the Newfoundland government. The prefix was, in fact, used there pre-WWII and in the forties before Newfoundland

became a part of Canada. Yet another brace of specials included I88ITU, QSL to I8MPO, and Y88SKF from Neschwitz for a festival — this one asked for cards via his home call of YB4WL.

D. B. Glover (Newton-le-Willows) has been operating with the old ICF2001 and doing quite well thank you. He says he feels much sympathy for the poor old operator of a rare DX station who is badgered every moment he is on the air by impatient callers, when he is himself looking for DX . . . True, but sympathy can only be extended to those resident in such rare spots. Those who go on DXpeditions know exactly what they are letting themselves in for (or should do) and can handle it well.

D. Peat (Mansfield) has ventured on to 21MHz and to his surprise found the receiver's whip antenna serving better than the G5RV. This sounds like a good reason either to build an a.t.u., or to check out the G5RV thoroughly.

One of the problems with this particular antenna is that the open-wire or twin-feeder stretch running down from the centre of the flat-top to the a.t.u. or to low-impedance feeder is very much inclined to "work" in the breezes, so that it breaks a connection. One must always remember that ordinary solder does NOT have much mechanical strength. Hence, it is important that the junction between flat-top and feeder, and between the open-wire line and the low-impedance feed, is mechanically supported so that soldered joints cannot move. Normally one would use a tee-shaped piece of some material such as ceramic at the top, to which one can solidly fix the feeder and the connections. Most people forget to do the same service for the joint between open wire feeder and low-impedance feeder. I used to have a chunk of Perspex here with five holes: two for 6BA nuts and bolts, each having solder tags under to which open wire and low-impedance line ends could be soldered. Two more provided strain-relief for the open-wire line, while the fifth was used for the low-impedance stuff. The addition of tape and adhesive made it quite certain that no matter how wildly the wind swung this skywire about, the soldered joints would feel NO

stress and NO movement. That G5RV lasted very well — until the tree fell down!

Back to prefixes and David mentions a special, VA1AGF from the Apple Blossom Festival in Nova Scotia. Another was K4AF, from the Pentagon, on Armed Forces Day.

L. Marquardt (Hereford) has moved QTH since last time and some listening was achieved, adding JA1, JK1, EM7, UQO, HG5A and VP1ST to the logs.

R. E. Webb (Ashford, Kent) says he has been having a super time; the Lowe SRX30 has been put aside in favour of a B40C, used along with an old set of SG Brown high-impedance headphones. Listening has, in the main been in the early mornings and this has bumped up the totals too. The KH6 took some winking out and the first Chinese signals were heard, from BY1ZH. CIBICR was on Baffin Island at Pond Inlet, D44BC Cape Verde Is, TU2IQ and UA0FF (Sakhalin) also helped to swell the totals.

Perhaps the pick of the crop for R. Shilvock (Halesowen) was VR6ID. Talking of VR6 stations, while most people think of VR6TC, VR6AY was probably the first from that distant spot. Andrew Young VR6AY, sad to say, died recently at the age of 88. In an obituary I was surprised to note that Pitcairn Island has perhaps the highest proportion of radio amateurs to population in the world. VR6AY got his start in an unusual way; he learned the code in order to be able to contact passing ships by light more than fifty years ago, before going on to an amateur radio call sign. Andrew Young will be much missed by the VR6s.

M. Ribton (Gillingham) has been burning the midnight oil, partly listening and partly in repairing old radio sets picked up at car boot sales for a pound. As he wrote his letter (O100, June 16) he was listening to a WBO telling a GWO how hot it was at 2000 local time over there, a W3 working a VK6 all on 14MHz. Whilst there was some stuff on 7MHz, there were no s.s.b. signals whatsoever on 3.5MHz! For 28MHz, Mike has knocked up a VK2ABQ which he has been comparing with a ground-plane; unfortunately, there is something to his SE which is making a

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

Name	Phone Only	Prefixes	Name	Prefixes
E. M. Gauci (Sliema, Malta)		3417	S. Hill (Port Talbot)	562
B. Hughes (Harvington)		3379	P. McAllen (Southampton)	528
E. W. Robinson (Felixstowe)		2767	J. Mowat (Luton)	523
M. Ribton (Gillingham)		2257		
M. Rodgers (Bolton)		1828	Name	Prefixes
R. Shilvock (Halesowen)		1891		
N. Henbrey (Northiam)		1731	CW Only	
B. Woodcock (Leeds 17)		1434	H. Scott (Rievaulx)	1396
B. Patchett (Sheffield)		1366	N. Melville (Edmonton)	1312
C. R. Eve (Jersey)		1165	P. J. Barnes (Blackpool)	589
D. McGlone (Limerick)		1056	M. Rodgers (Bolton)	388
A. Woodcock (Denmark)		1027	C. R. Eve (Jersey, C.I.)	342
D. Hedges (Prestwick)		987		
S. Burgess (Stockport)		928	Name	Prefixes
R. G. Williams (Borehamwood)		908		
A. P. Lincoln (Aldershot)		898	RTTY Only	
R. E. Webb (Ashford, Kent)		678	W. J. Prior (Lochcarron)	578
D. McGlone (Limerick)		656	A. P. Lincoln (Aldershot)	551
L. Marquardt (Hereford)		651	C. R. Eve (Jersey, C.I.)	500
N. K. Yule (Bengeo)		650	D. R. Tanswell (Iver)	360
D. R. Tanswell (Iver)		628	N. Henbrey (Northiam)	345
R. Gawan (Preston)		569	M. Rodgers (Harwood)	275

Starting score, 500 for Phone, 200 for CW or RTTY. Entries in accordance with HPX Rules.

Annual HPX Ladder
Starting date January 1, 1988

Name	Prefixes
D. Peat (Mansfield)	472
C. R. Eve (Jersey)	361
D. Peat (Mansfield)	360
D. B. Glover (Newton-le-Willows)	276
S. Myers (Liverpool 9)	275
D. Gilbert (Farnham)	223

200 Prefixes to have been heard since January 1, 1988 for an entry to be made in accordance with HPX Rules. At score 500, transfer to the All-Time list is automatic. Note, the Annual Table is a Phone only listing.

Most in 1988

E. M. Gauci (Malta) 785

Rules as for the Annual Listing. An entry for this listing must be in addition to any claim for the All Time Post War listing.

noise like an old steam train chuffing along!

Fish were the reason that just the one new prefix was offered by W. J. Prior (Lochcarron). Apparently, salmon and sea-trout are on their way up the river Carron, so Bill drops everything else to go after them. Work always was the curse of the fishing classes!

Another list-only effort is a first list from D. Hedges (Prestwick) who said at the end of the list "must go to work now - letter next time"! However, some 427 without a dud one among them is a fine substitute for a letter. The rig is a Sony ICF-2001D plus a wire antenna some ten metres long.

B. Patchett (Sheffield) adds some 61 to his previous score and quite a few of the interesting ones were in fact collected from the /M installation.

G. Johnson (Nuneaton) says his pick of the month catches were 9M2AR, YC5NST, TF3BM, YB4ES and V188BBC. Incidentally, he uses a Panasonic DR49 and its inbuilt whip.

Turning to N. Melville (Edmonton) we find that Neil has a fine collection of c.w. prefixes, headed by CR8CN. Does anyone know whether this one was Slim again, or some variety of Spanish "special"? Personally, I would have laid long odds on it's being Madrid Slim. One definitely OK special was OG1AB reported by most readers, while RS3ARS was probably Russian.

Sunspot Cycle

This one really has been quite a steep rise; from counts of zero in mid 1986,

we have roared up, until, in the early part of June, the daily figure, rose, on occasion, to over 200, with of course an accompanying effect on the DX workable. I hear that this is the steepest rise noted over the past fourteen cycles. That might mean we are going to see one of the steepest peaks ever, or it might imply a shorter-than-eleven-year go-around this time. On t'other hand, it might mean nothing!

That band liveliness of course has not pleased GW3KFE who was on holiday - visiting, photographing and operating on v.h.f. from some islands, notably Lindisfame (Holy Is), Lundy, St. Michael's Mount and Caldey. Apparently he was sorely tempted to try for a v.h.f. QSO from the paddle-steamer *Waverley* as well, but remembered in time that he hadn't a /MM ticket!

New License Proposal

As this is my last column I shall steal the thunder from GW3KFE to tell you the latest news. The RSGB held a meeting on Saturday June 25, at which almost all the Regional Liaison Officers of the UK were present. (RLOs from GI, GD, GW, the north of GM and the far south-west spoke). Statistics were produced to prove that recruitment of the young into amateur radio has all but stopped in the past few years. There are less than 200 Associate members at the time of writing. If the present trend goes on there will be a downward trend overall ere long. In the long term that's "finis" to Amateur Radio. Those who are coming in are in the age range 40

upwards. Of the few youngsters, almost all are the offspring of existing amateurs. The RSGB made a presentation of some two hours, followed by some two hours discussion - EVERYONE present on the floor of the meeting had a say. In essence the proposal is to invent a new licence class (I shall call it a "Z" class licence to avoid upsetting people).

This would call up a "hands-on" approach... what does s.s.b. taken on the wrong sideband sound like? How do I connect the Avo to get a useful reading in this circuit, given the bits are physically in front of me? Can I show a selection of QSLs to demonstrate I know how to listen, to send a report and to keep a log? There will be a selection of "bomb-proof" kits - has the candidate built some of these and used them? The training syllabus is envisaged at 30 hours, PLUS the "homework" of short wave listening and a requirement for a Morse test at, say, 5 w.p.m.

As for bands, a slice at, say Top Band, at 10MHz, 21/28MHz aligned with the USA novice area, then maybe a bit at 432MHz, 1.2GHz, for practical work with datacomms. No allocations in the overcrowded areas of for example 14MHz, or 144MHz. Power level, measured as d.c. input, four watts or maybe lower. Licence to run for a period "X" and then the licensee would be expected to drop out or to transfer to A or B licence categories via normal RAE and Morse test route.

The problem of where that leaves existing "B" licensees has to be

considered - a suggestion was that a "B" licensee passing the 5 w.p.m. Morse test would be allowed same I.f. privileges as the "Z" licensee. Older people, or disabled, taking up a "Z" licence need to be considered to ensure they are not forced out if they are unable to go on to an "A" or "B" licence. EVERYONE went to the meeting doubting the acceptability of the proposals, apparently at the end, EVERYONE agreed the negotiations should proceed.

As for the DTI, they have let it be known that they like the general idea. Right now, RLOs throughout the country are stumping around the clubs, explaining the ideas in more detail. GO and LISTEN, then give your comments to the RLO, preferably in writing. He will feed them back to RSGB in a lump.

The aim is to bring in new, mainly young blood, and to ensure that entrants by this route come in well able to operate properly, to use an iron or a testmeter, to build the station gear, to keep a log, and so on; these are things which the existing RAE course completely fails to address.

As far as I can see, it's not perfect, but nothing ever is. It's certainly the best idea so far and we need young people to take over where "old uns" like me leave off.

Well, that's the lot from me, I'll let Paul have the odd report from time to time so you'll know I'm still around. I hope to give him as much help and as many reports as you have given me over the years. Let's hope the column goes from strength to strength. Good DX!

DECODE

Mike Richards G4WNC

200 Christchurch Road, Ringwood, Hants BH24 3AS

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, c.w., 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 one of the automatic decoders e.g. the Pocomtor 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 would add 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?

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 Sloper antenna. The decoding is achieved using a Kantronics KAM intelligent terminal unit, though he used to run the Technical Software RX-4 program. As he has yet to get the KAM working on FAX, he is still using his Spectrum with the G4IDE FAX program for this mode.

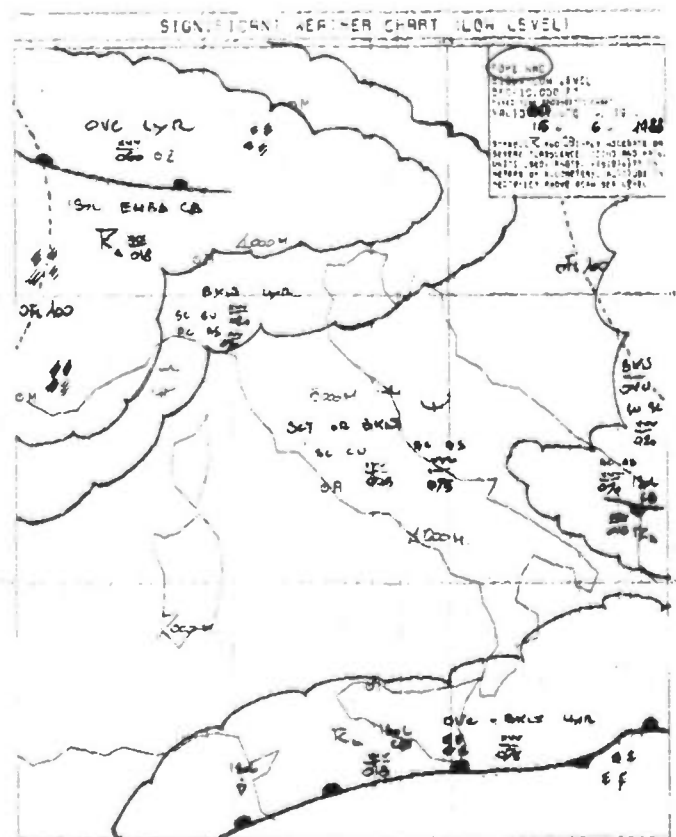
Chris Norfolk has supplied some very comprehensive signal reports which make interesting reading. Rather than just sending me the date, time, frequency, etc., he has sent a sample print out of each station with a local weather report and general comments on the signal quality, etc. One example is ADN Berlin on 13.876MHz 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 arc welder in the garage next door! All these reports are very useful and add some interesting background information.

Now for a plea for help! Mr M. Dunn has an Atari 800XL computer and is trying to obtain a copy of the user's manual. Can anyone help? If so drop me 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.

Well, he has found the solution and to prove it he has sent me some rather



SEEN & HEARD

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 station using the Pocomtor 2010 automatic decoder and an amazing selection of receivers as follows: NRD-525, HRO, 8C-348, HQ-170, Racal RA-17 with i.f. and s.s.b. adaptors, Eddystone 888A, Collins 51J3 and a Yaesu FR-101DDI Having owned some of those receivers myself, he must also have a very large shack!

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 me 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 are 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 description of how they work and why they are needed.

Another idea was a "What Decoder" feature which could be printed occasionally. This is a very good idea and one that I had already thought about. I think it would have to be split into sections for software, simple terminal units and intelligent terminal units. In order to get hands-on reports, I would ask readers to write to me with their comments on the programs they use.

Last, but 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 Klengenfuss, 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 distribution, to begin with I would think that an s.a.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 should wait a little longer before sending off your s.a.e.s though, I haven't finished entering all the data yet!

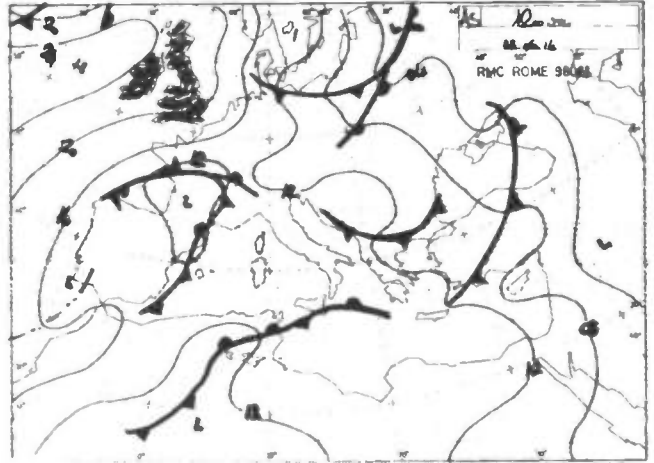
Amstrad CPC Support

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 G4RGA 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 should prove 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 tape user then you should write first. Scarab system users will also find help from Jim's direction. He can supply a program to allow you to dump QSO 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 leave a reasonable time for delivery and you 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 radio field but not so common amongst short wave listeners. I suspect that this is simply because listeners don't want to confess to having heard a station they may not be licenced to receive. You may be surprised to hear that a lot of stations, particularly foreign ones, welcome signal reports as it gives them confirmation of the stations coverage. Norman Hartford recently sent a signal report to



Received 14.6.88 at 1745UTC

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 you 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 biggest 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 Klengenfuss *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 welcome.

2.716MHz ARQ 100/170 OST Ostende Radio

4.605MHz ARQ 100/170 OST Ostende Radio
5.457MHz RTTY 50/425 LZF9 Sophia Bulgaria

6.333MHz RTTY 100/R 72JKL Spanish Navy

6.8115MHz ARQ 100/170 ? Italian
9.169MHz ARQ 100/170 ? Swiss

9.231MHz RTTY 50/N 9KT27 Kuwait
11.0615MHz RTTY 50/425 ? Code

13.58MHz RTTY 50/425 HMF36 Pyongyang Korea

15.48MHz RTTY 50/850 El Djaza'ir Algeria

13.059MHz RTTY 75/170 E8A Spanish Navy

13.1998MHz RTTY 50/N CAI7E Easter Isle Air

15.95MHz FAX 120/576 R8I77 Moscow WX

16.403MHz RTTY 50/425 Y2V57 Berlin News

17.57MHz RTTY 50/425 R8X42 TASS News

17.585MHz FAX 120/576 AOK US Navy

18.358MHz RTTY 50/425R RRQ20 TASS News

18.86MHz RTTY 50/170 ZAT Albanian News Agency

19.725MHz RTTY 100/425R ? News
20.8378MHz 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.

(1) 5 Queens Road, Wellington, Somerset TA21 9AW.

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

AMSAT-OSCAR-13

The good news for the month is that a completely successful launch of the AMSAT Phase III-c satellite, by the first Ariane-IV ESA launch vehicle from French Guiana, finally took place. First it put Meteosat, then OSCAR-13 in its Sylva container and then Panamsat into perfect parking orbits.

A few further hold-ups 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

engineering 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 FYOEK (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 that over a quarter of a million listeners followed the event. It was also put out on live TV from the Galaxy-3 (transponder 24) satellite, in geostationary orbit at 93.5 degrees west. Arianespace broadcast the launch via Spacenet-1, transponder 1, and AMSAT too used the space facility to broadcast the launch via the OSCAR-10 satellite on 145.958MHz.

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 G3RWL of AMSAT-UK as G80AUK was not perfect copy over the entire UK at the critical time. OSCAR-10, however, being independent of solar anomalies, came up trumps and gave a superb signal covering all of North America and Europe.

As the launch window of 1113UTC approached, a further hold in the

Fig. 1

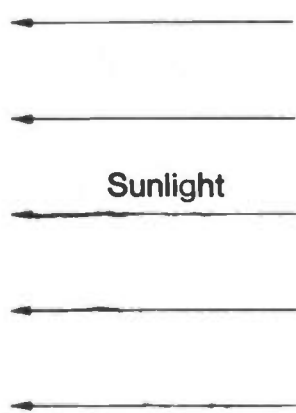
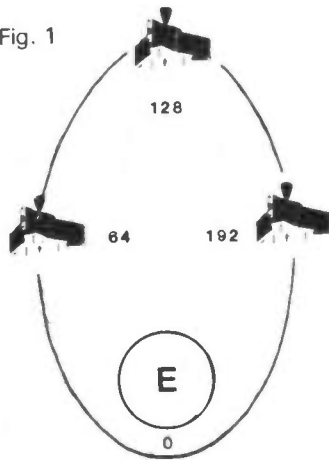


Fig. 2

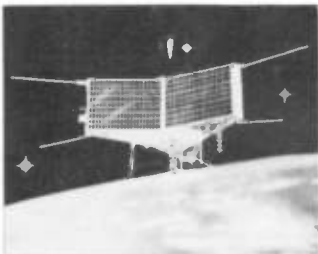
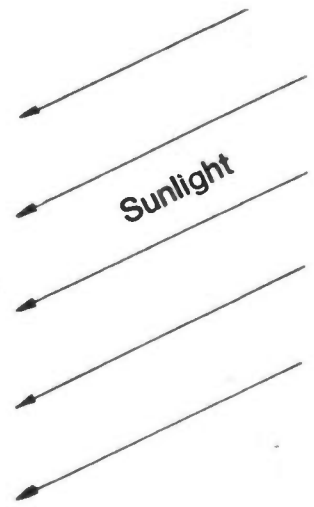
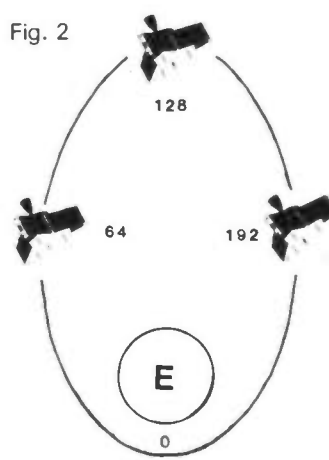


Fig. 3

countdown occurred, but of only six minutes. At 1119 and 4.33 seconds, the long awaited mission carrying our satellite left earth to produce, what looks like being, the very first perfect elliptical orbit DX amateur satellite.

Malfunction

The first attempt at this, Phase III-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 jettisoning 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 90 degrees to the sun, hence no battery charge was possible. Therefore the commanded magno-torquers could not be deployed to steer the satellite in earth's field 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 thrust. The result was that OSCAR-10 finished up with an inclination of 26 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 earth 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 re-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 ellipse 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 angle needed to give optimum 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 ZL1AOX, who had the satellite in view, reported the first 145.812MHz 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 the 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 Bi-Phase Shift Keying transmission that can be read with a suitable demodulator. From time to time the engineering beacon will come on at 145.985MHz. Later, we shall be hearing the Mode "L" beacons on 435.651 and 435.677MHz. Despite the limitations of the omni-directional antenna in use and low power, the signals can readily be heard by a station with simple receiving antennas, especially at around perigee.

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. Then 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's field, an analogy like that of the coils of an electric motor working in a permanent magnet 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-spun, re-oriented again and further kick-motor firings effected. This will eventually bring the spacecraft to a perigee of 1500 kilometres 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 1, 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 abnormal propagational conditions that can adversely effect h.f. 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. 3. A full colour version, measuring 11 x 14in, wall poster for your shack is available for \$7-50 plus postage from AMSAT, Post Office Box 27, Washington DC 20044, USA.

Weathersats

Lawrence Harris of Plymouth, who sent in his findings on the Meteor, NOAA and Cosmos weathersats last month provides 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



Fig. 4



Fig. 5

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 1970MHz 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 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?

SEEN & HEARD

BAND II DX

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

In the June issue, I referred to receiver design and "the change from the use of thermionic valves to a wide variety of semi-conductors". However, I never expected to find them "growing" when Joan and I visited Wisley Gardens in May with Storrington's Horticultural Society (Fig. 1). It's not easy to get away from radio propagation, hi!

DXers Dream Conditions

"The stations were coming from everywhere, I've never heard anything like it... there were so many stations doubling up on frequencies", wrote 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, France, Germany, Holland and Ireland by tropo and Italy and Spain 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 106.1MHz giving an ident as Tel Aviv Radio or Radio Tel Aviv.

"On Sunday June 5 some quite amazing DX came through. I listened above 98MHz and found the band covered in Spanish stations", reports David Edwardson (Wallsend). David has a Toshiba RPF11-L with a rod antenna and identified Radio Nacional de Espana and a Spanish football commentary.

In Wales, Simon Hamer's DX bag included BBC Radios Guernsey and Jersey; Derby; Aberdeen; Scotland; Solway and Tweed; Foyle and Ulster; plus Belgium (BRT-1/2, Studio Brussel and RTBF-1); Denmark (North Jutland); France (Cultur, Frequence Nord and Inter); Germany (AFN, BFBS, Deutschlandfunk, HR-1/2/3, NDR-1/2/3, Radios Bremen and Hamburg and WDR-1/2/3); Holland (Nederland-1/2/3/4); Isle of Man (Manx Radio); Ireland (RTE-FM/1/2/3, Cork and Millenium 88) and Luxembourg, via tropo, on May 16.

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 (Radios Bornhoj, 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 identified programmes from Hungary (Radio Danbius - for German tourists); Gibraltar (BFBS-1/2 and GBC); Greece (ERT-1); Portugal in stereo and Spain (AFRTS).

At 1815 on the 4th and 1330 on the 7th there were foreign voices, predominantly Italian, on at least 15 spots in Band II. I left my receiver tuned to 87.6MHz and noted that as one station faded another came up on the same or a nearby frequency. On the 7th, some were exceptionally strong.

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

During the early evening of June 3, David Glenday (Arbrough) heard Italian and Spanish stations fighting for predominance around 99.4MHz, a German language station on 99MHz and "crystal clear" stereo from Radio Zagreb on 99.7MHz. He also added Italians on 99.4MHz at 1140 and over 20 Spanish/Portuguese in stereo, plus many in mono, between 87 and 106MHz at 1620 on the 5th.

Below Band II

While tuning my ex-military R216 v.h.f. communications receiver, fed from a Revcone antenna, between 66 and 73MHz I logged 15 very strong f.m. broadcast signals from eastern-Europe at 1800 on May 22. Five such stations were audible at 1835 on the 23rd and over 20 during the early mornings of June 5 and 7, the afternoons of May 25 and 26 and the evenings of June 3 and 4. Around 0845 on the 7th, I heard the buzzing of picture pulses on the TV channels R3 (77.25MHz) and R4 (85.25MHz) and the R4 sound on 91.75MHz. My DXTV gear, running alongside, proved that these pulses were in fact test cards from the USSR.



Fig. 1: It's amazing what you find in gardens

Tropospheric

During the opening on May 16/17, Ken Lancaster logged stations from Belgium (BRT-2), France, Germany, Ireland (RTE-2) and the locals Radio Broadland and Chiltern Radio. "Radio 1 was the best I've ever heard it on 104.8MHz and Radio Broadland was coming in so powerful on 102.4MHz that it was blocking out the signal of Pennine Radio on 102.5MHz", said Ken. At 1700 on the 17th, Ken phoned the DJ, on air, at Broadland Radio and told me that he was "taken aback" when Ken gave his location as South Yorkshire. "the barometer here was 1025mb (30.25in) and falling", added Ken. He noted that the event beginning about 2030 on the 16th, lasted 19 hours.

Around 1900 on May 15, David Glenday, using a Sansui TU-D33XL stereo tuner and amplifier with a 3-element beam pointing west toward Forfar, heard a strong foreign station on 99.7MHz. "The names of some Spanish football teams were mentioned, the *Chariots of Fire* theme music played and then the signal faded, said David.

As the atmospheric pressure declined from 30.3in (1026mb) 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 Gaeltachta on 90.4 and 91.9MHz. I also heard continental voices and many inter-station "warbles" while a similar lift was in progress between 1945 and 2115 on the 27th and predominantly French at midday on the 28th.

While parked on Cairn O' Mounth on May 23, George Garden (Edinburgh) heard BBC Radio Cleveland from Bilsdale and the two Tyneside IBA locals, Radio Tees 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.

Don't forget, send in your reports for Band II DX by the following deadlines August 16, September 20 and October 19

TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

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 55MHz, right at the start of the 1988 Sporadic-E season. Within a couple of weeks, from May 22, he had seen pictures in Band I from Austria (ORF-FS1), Czechoslovakia (CST-Bratislava and RS-KH), Hungary (MTV), Iceland (RUV Island), Italy (RAI-1), Norway (regionals Gamlem, Melhus and Steigen), Poland, Sweden (Kanal-1 Sverige and TV2) and the USSR (BPEMR).

"I experienced the thrill of receiving my first European signals from Spain and Yugoslavia," said Maurice Peall (High Wycombe) This was after installing a Yoko receiver and a fixed Band I/III antenna. He logged Czechoslovakia, Hungary and Italy in Band I on June 4/5; Austria, Finland, Germany, Iceland, Norway, Sweden and the USSR on the 6th as well as Holland (PTT-NED-1) 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,

discone antenna and wide-band pre-amplifier 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 the USSR on Chs. R1 (49.75 MHz) and R2 (59.25MHz) and then heard their sound on 56.25MHz and 65.75MHz using his scanning receiver. He added Spain (TVE) at 1800 on May 31, then Italy and the USSR on June 4 and 5.

In Dublin on the 3rd Paul Hegarty using a Reynolds BT-352 receiver and 50MHz wire dipole received pictures from Belgium, Czechoslovakia and the USSR. Well done to you all on a good start.

Band I

Between May 6 and June 9, Owen Jones (Blurton), received test cards or programmes from Austria; Czechoslovakia; Finland (YLE TV1); Hungary; Italy; Norwegian regionals; Poland (TVP); Portugal (RTP-Porto); Spain (TVE Barcelona, Eserande and Valencia); Sweden; news captions from the USSR (BPEMR, CCCP, CNOPT, HOBOCTN and TACC) and Yugoslavia (JRT-RTV LJNA).

Owen also saw the CCCP clock, 3 hours ahead of our time on May 23; the captions Televiz Novina, Tednik 2, Safon Stavernost and Jugo Solveni on

SEEN & HEARD

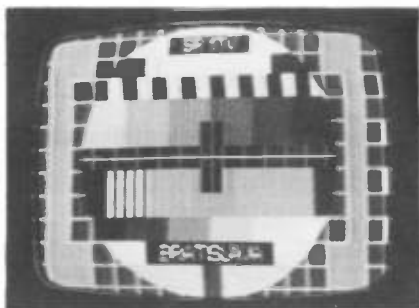


Fig. 1: Czechoslovakia



Fig. 2: Hungary



Fig. 3: Hungary



Fig. 4: Spain



Fig. 5: Spain

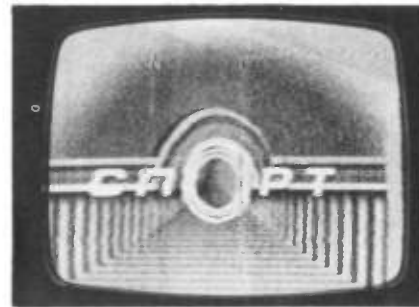


Fig. 6: USSR

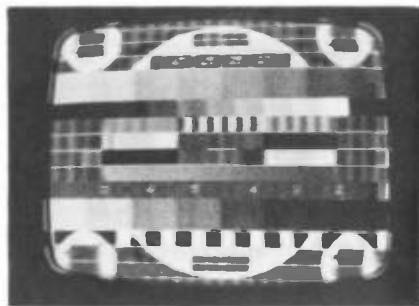


Fig. 7: USSR



Fig. 8: Germany



Fig. 9: Holland

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, (62.25MHz).

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, June 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 (Tass) logo.

Bob Brooks (Great Sutton) had a good Band I haul which included an Arabic station at 1747 on June 3; Czechoslovakia, (DDK-3), ARD/ZDF, NDR and WDR captions from West Germany, test cards from Hungary (Budapest), Jordan (JTY), Norway (Bagn, Bremanger, Gamlem, Hadsel, Hemnes, Melhus 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 (Belper) 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—Grunten, Ochsenkopf, SWF-Badn and RGB); Holland (PTT-NED-1); Norway (Kongsberg); programmes from Czechoslovakia (CST-1 Intervention); France (Antenne 2); Finland (YLE-TV1 with MTV Logo); Spain (Tele Porte and Porla Manana) and Yugoslavia (Teonik).

"We notice that Finland is using the MTV logo more often this year especially before adverts. It can be misleading for newcomers who might think they have Hungary on Ch. R2," said Edwina.

I received pictures with Cyrillic captions on Ch. R3 (77.25MHz) 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 83.75MHz. The narrow filters on the D100 helped me identify the Polish news caption from the jumble of signals on Ch. R1 (49.75MHz) at 1830 on the 26th.

In New Radnor, Simon Hamer logged pictures on Ch. R3 from Poland on May 27, June 3 and 5; Hungary on June 3; Romania (TVR) and the USSR on May 22, 23, 27, June 3 and 5. He found Czechoslovakia on Ch. R4 (85.25MHz) and the USSR on Chs. R4 and R5 (93.25MHz) 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 (TDF-Canal +), Greece (EPT) and possibly Nigeria on Ch. E3 on May 23; Syria (Ortas Damas) and Switzerland

(+PTT—SRG1 and SSR) to his Band I score. He also saw the following news programmes, *Zeit im Bild* (Austria); *News* (Belgium), *Zpravdy* (Czechoslovakia), *TV-Avisen* (Denmark), *Uutiset* (Finland), *Akuelle Kamera* (East Germany), *Heute* and *Tagesschau* (West Germany), *Nos-Journal* (Holland), *Hirado* (Hungary), *Telegionale* (Italy), *Dagsrevyen* and *Kveldnytt* (Norway), *dt* (Poland), *Telegiornale* (Portugal), *Telegiornale* (Romania), *Teledario* (Spain) and *Journalen* (Sweden).

Although parked under trees at Polden Lacey, Surrey, at 1400 on the 27th, I checked for Sporadic-E with my Plustron TVR5D. Using its own rod antenna I received the Norge Gamlem test card on Ch. E2 (48.25MHz) and strong pictures that I could not identify on Chs. E3 (55.25MHz) and 4 (62.25MHz). 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—1) 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,

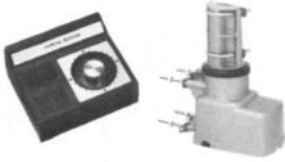
occupied Chs. E2, 3 and 4. Around 0835 on the 7th, I received test cards from USSR Chs. R2 (59.25MHz), 3 and 4 and Sweden on Ch. E4.

Garry 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 6th," said Garry. 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 (M6). 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.

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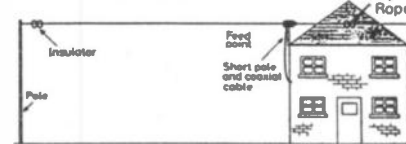
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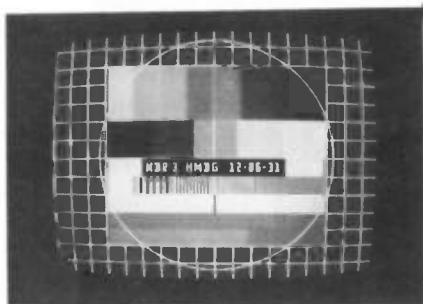


Fig. 10: Germany

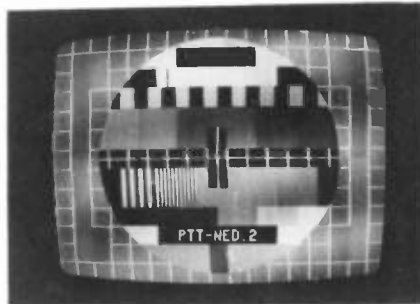


Fig. 11: Holland

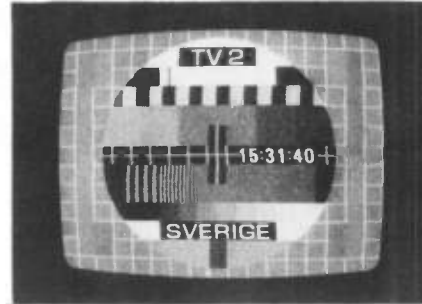


Fig. 12: Sweden

"I was able to put the *de-luxe* D-100 through its paces on American and Canadian DX late on the 6th," said Garry Smith. He continued, "Channels A2, 3 and 4 (55.25, 61.25 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 CJC-N-TV, Newfoundland, from an address given over the adverts and noting the ntv logo. Keith heard CBS mentioned on A3 and Mark Dent heard a CBS call sign in Virginia! Chris Howles logged 3 A2 stations!

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

Tropospheric

David Glenday described May 15 as, "a real cracker", and explained, "Around midday I flicked through the presets of my Philips and as it was a clear day with blue skies I expected to find at least Chatton, 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, imposed on the BBC 1 picture was the faint trace of a test card... 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 (PTT-NED-2 or 3) on Chs. 27, 30, 35, 39, 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 Denmark's test card in Band III and pictures from Belgium, Denmark, Holland, Germany and Sweden on many spots in the u.h.f. band. His log includes Teletext from Germany and Holland, Figs 8 and 9; many German regionals like Hamburg, Fig. 10 and test cards from Holland and Sweden, Figs. 11 and 12.

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 17th, 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 9, George Garden, in Edinburgh, using an outside rotatable antenna, logged a weak picture from a Channel 4 programme 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 transmitter 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 Mancinis emphasised that, between them, signals were received in their areas of the UK from stations in Belgium (BRT TV1/2, RTBF1 and Teletext); Channel Islands (ITV *Channel News*); Denmark (DR); France (TDF-Canal +); East Germany (DFF-1); West Germany (ARD, HR-1, NDR-1/3, WDR-1/3 and ZDF); Holland (PTT-NED-1/2/3); Ireland (RTE-1/2); Luxembourg (RTL-Plus) and Sweden (SVT-Kanal-1) in Bands III, IV and V.

The Mancinis' best Band III catch was Czechoslovakia, Ch. R6 (175.25MHz), on June 10. For Simon, that signal from the Channel Is. means that he has all ITV regions in his book.

That's all for this month, keep your reports coming.

LONG MEDIUM & SHORT

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Long Wave DX

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (= GMT).

A most interesting first report from Jurgen Thiel in Moraira, Spain included two l.w. broadcasts from Radio Algeria 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 SINPO 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 Tipaza on 254, which has been logged by many UK DXers, is the strongest l.w. signal at his location, being 55555 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 200kHz 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, so 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 l.w. plan and moved to 19B! The two signals could not be separated by using a 0.3m square loop in conjunction with his Vega Selena 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 placing the a.t.u., still attached to the 50m antenna, inside the loop in a certain position — turning the a.t.u. through 180 degrees 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 idea 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 44454 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

Freq kHz	Station	Country	Power (kW)	DXer
153	Bechar	Algeria	1000	F
153	Brasov	Romania	1200	D*,E,F
153	DLF Donebach	W. Germany	500	D*,E,F*,G
162	Allouis	France	2000	A,B,D*,E,F,G*,H*
171	Kalinograd	USSR	1000	D*,G
171	Medi 1-Nador	Morocco	1200	D*,F
177	Oranienburg	E. Germany	750	A,D*,G*
183	Saarlouis	W. Germany	2000	A,B,D*,F,G,H*
189	Caltanissetta	Italy	?	F
189	Motala	Sweden	300	B,D*,E,H*
198	BBC Droitwich	UK	400	A,B,C*,D*,F,G,H*
198	Leningrad	USSR	150	D*,E*
198	Quargla Algeria	?	F	
207	DLF Munich	W. Germany	500	D*,F,H*
209	Azilal	Morocco	800	C*,D*,F
216	Oslo	Norway	200	A,B,D*
216	Roumoules	Monaco	1400	B,D*,F,G,H*
225	Konstantinow	Poland	2000	D*,F,H*
234	Junglinster	Luxembourg	2000	A,B,D*,F,G
234	Kishinev	USSR	1000	E*
245	Kalundborg	Denmark	300	A,B,D*,F,G,H*
254	Tipaza	Algeria	1500	A,D*,F,G,H*
254	Lahti	Finland	200	D*,E
263	Burg	E. Germany	200	D*,G
263	Moscow	USSR	2000	A,D*
272	Topolna	Czechoslovakia	1500	A,D*,E*,F*,G,H*
281	Minsk	USSR	500	D*

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

via Droitwich 19B late at night while at his holiday location in Torremolinos, S. Spain. He also picked up the broadcasts from Morocco via Azilal 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

DXers:

- A: Colin Diffell, Gorsham.
- B: David Edwardson, Wallsend.
- C: Daniel Masterson, Torremolinos.
- D: Philip Rambaut, Macclesfield.
- E: Tim Shirley, Bristol.
- F: Jurgen Thiel, Moraira, Spain.
- G: Phil Townsend, London.
- H: Neil Wheatley, Newcastle-on-Tyne.

SEEN & HEARD

broadcasts on 207 from DLF Munich, W. Germany.

A noticeable difference in the signals that can be heard at certain times of the day has been observed by Colin Diffell in Corsham. During the early afternoon he can hear Allouis, France 162; Saarlouis, W. Germany 183; BBC Droitwich, UK 198; Oslo, Norway 216 and Junglinster, Luxembourg 234, but about an hour before dusk four additional signals become audible, Kalundborg, Denmark 245; Tipaza, Algeria 254; Moscow, USSR 263 and Topolna, Czechoslovakia 272.

Topolna, Czechoslovakia 272 was logged for the first time by Tim Shirley in Bristol at 2300. He has received an attractive QSL card from Allouis, France which confirms his reception of their broadcasts on 162. It is worth remembering that most l.w. broadcasters welcome detailed reception reports and confirm them with a variety of interesting QSL cards.

MW Transatlantic DX

Although the longest day has now passed, the long hours of daylight are still preventing most of the signals from bridging the Atlantic until well after midnight. No doubt this is one of the factors which is restricting the level of DXing activity just now!

The report from Tim Shirley indicated that the broadcasts from WINS in New York 1010 have reached our shores as early as 2230 on one or two occasions, but he found that their signal usually became clearly audible around 0130. He has also heard WCAU in Philadelphia, PA 1210 at 0030, but Tim says the best time to listen for their signal is at 0200. It is interesting to note that he has been hearing CJYQ St. Johns, Newfoundland 930 at 0600 and the Caribbean Beacon, Anguilla 1610 as late as 0630.

Following the arrival of a QSL card and 40th Anniversary sticker from WTIK in New Orleans, LA, Tim has picked up their signals again on 690 — this time at 0200. A lack of space prevents the publication of four QSL letters which Tim has sent along, but they confirm his reception of CHOO Ajax, Ontario 1390 (logged 12/2/88); WOAY Oak Hill, W. Virginia 860 (a daytime only station, logged at 2130 3/3/88); KUYO Casper, Wyoming 830 (logged 16/4/88); WFGW Black Mountain, N. Carolina 1010 (logged 14/5/88). Tim has also received a letter from WBIX in Jacksonville Beach, FL 1010 which confirms his reception of their broadcasts at 0330 — apparently they are no longer restricted to daytime only operation.

Almost all of the transatlantic signals received in Grimby by Jim Willett were logged after 0100 — there were only two exceptions, our regular pointer to band conditions CJYQ in St. Johns on 930 and the Caribbean Beacon, Anguilla 1610, which were heard at 0030. Although the majority 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 on 870, noted at 0415.

In contrast, the majority of the signals heard in New Radnor by Simon Hamer stemmed from Newfoundland and Nova Scotia — see chart. He commenced his listening period at 0230 and by 0400 he had logged thirteen Canadian stations, six in the USA and eight in the Caribbean area — which just goes to show that there are plenty of interesting signals to log provided one can stay awake!

The latest report from Leo Gieske in

Randburg, S. Africa provided an interesting insight into the transatlantic DXing scene in that area. Although many of the call signs 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 seems odd, as a number of the broadcasts from the east coast of the USA reached him around 0430 and all were rated as "fair" in his report.

The broadcasts from the Caribbean Beacon, Anguilla 1610 are frequently audible in the UK at night, often at relatively good strength and it seems that they also reach Randburg well too! Leo noted them as "good" at 0420, but the signals from Nassau, Bahamas 1540 and the Atlantic Beacon, Turks and Caicos Islands 1570 were only "fair" at that time. Another "good" signal noted by Leo stemmed from Radio Globo in Rio, Brazil 1220 — this station was not mentioned by UK DXers this time, although their broadcasts via Sao Paulo, Brazil on 1100 were logged by Jim Willett at 0310.

Other MW DX

The long hours of darkness in S. Africa just now have enabled Leo Gieske to hear a number of DX signals from several continents, including VOA via Bangkok, Thailand 1575 — rated as "weak" at 1541; AIR Nagpur, India 1566 — noted as "fair/good" at 1553; ABC 4QD in Emerald, Queensland, Australia 1548 (50kW) — rated as "weak" at 1600; Mayotte, Comoro Island (Mozambique Channel) 1458 — logged at 1610. Much later he heard Nice, France 1350, noting their 100kW signal as "fair" at 0356.

The broadcasts from 4QD in Queensland, Australia on 1548 were also logged by Dick Moon in George, S. Africa — he picked them up at 1855. Dick started listening at 1745 and in less than two hours he heard five more Australian signals! Three of them stemmed from stations in W. Australia, 6WF in Perth 720, 6NA in Narrogin 918 and 6KY in Perth 1206. 5AU in Port Augusta, S. Australia was heard on 1242 and 2EC in Bega, N. S. Wales 765 completed his remarkable list!

Reporting from Fremantle, W. Australia Davy Hossack says that many of the stations there operate 24 hours a day, but he managed to hear three broadcasts from other countries by 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 Gieske — 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 my information this is a 5kW station in Honolulu!

Some UK broadcasts have been attracting the attention of overseas listeners and they have quoted some interesting SINPO ratings. It is worth remembering that in some cases a particular programme may be radiated from a number of different locations using transmitters which share the same frequency, so the ratings may refer to the combined signal received.

Some idea of the kind of signals to be expected on the Costa Blanca, Spain may be ascertained from the ratings quoted by Jurgen Thiel — all were logged after 1800 with a Vega Selena 215 portable and a 0.3m square loop. BBC Radio 1 1089 (shared) — 32422; BBC Radio 2 909 (shared) — 22322;

Freq MHz	Station	Location	Time (UTC)	DXer
USA				
690	WTIX	New Orleans, LA	0200	C
870	WWL	New Orleans, LA	0415	D
880	WCBS	New York, NY	0300	B,C
990	WZZD	Philadelphia ME	0300	B
1010	WINS	New York, NY	0130	B,C,D
1020	KDKA	Pittsburg, PA	0030	C
1030	WBZ	Boston, MA	0315	C,D
1050	WFAN	New York, NY	0120	B,D
1090	WBAL	Baltimore, MD	0300	B
1130	WNEW	New York, NY	0230	D
1210	WCAU	Philadelphia, PA	0200	B,C
1220	WGAR	Cleveland, OH	0250	D
1500	WTOP	Washington, DC	0430	C
1530	WCKY	Cincinnati, OH	0425	A
1540	WPTR	Albany, NY	0310	A,D
1560	WOXR	New York, NY	0430	A
Canada				
580	CFRA	Ottawa, ON	0250	D
590	VOCM	St. John's, NF	0300	B,C,D
620	CKCM	Grand Falls, NF	0300	B
670	CHYO	Musgraveon, NF	0150	B,D
710	CKVO	Clarenceville, NF	0300	B
750	CBGY	Bonavista Bay, NF	0300	B
930	CFBC	St. John's, NF	0300	B
930	CJYQ	St. John's, NF	0030	B,C,D
940	CBM	Montreal, PQ	0300	B
950	CHER	Sydney, NS	0300	B
1110	CBD	St. John, NB	0300	B
1140	CBI	Sydney, NS	0300	B
1150	CKOC	Hamilton, ON	0300	B
1220	KKCW	Moncton, NB	0100	D
1390	CHOO	Ajax, ON	0600	C
1570	CKLM	Lavel, PQ	0300	B
1580	CBJ	Chicoutimi, PQ	0230	A,D
C. America & Caribbean				
555	ZIZ	Bisetteer, St. Kitts	0300	B
705	Kingston	St. Vincent	0300	B
770	R. Jamaica	Spur Tree, Jamaica	0300	B
825	R. Paradise	St. Kitts	0300	B
1470	XEBBC	Tijuana, Mexico	0300	B
1540	Nassau	Bahamas	0425	A
1570	Atlantic Beacon	Turks & Caicos IIs	0120	A,B,D
1580	VOA	Antigua	0300	B
1610	Caribbean Beacon	Anguilla	0030	A,B,C,D
S. America				
760	R. Manchete	Brazil	0345	C
950	R. Vision	Caracas, Venezuela	0230	D
1100	R. Globo	Sao Paulo, Brazil	0310	D
1220	R. Globo	Rio, Brazil	0130	A,C
1350	R. Buenos Aires	Argentina	0300	D

BBC Radio 3 1275 (shared) — 33433; BBC Radio London 1458 (50kW) — 33423; ILR LBC 1152 (23.5kW) — 22422; ILR Capital Radio 1548 (97.5kW) — 43433.

Listening in Thessaloniki, Greece George Efstratiades rated the BBC broadcasts via Orfordness 648 (500kW) as "very weak" at 2215. He uses a Philips D-2225 portable with built-in antenna. In contrast he logged the signal from Solvesborg, Sweden 1179 (600kW) as "fair" at 2300.

Other evening broadcasts logged by George included the Greek service from Radio Bucharest, Roumania via Lugo 756 (400kW) at 1830; Radio Moscow via Lvov, Ukraine 936 (500kW); Radio Polonia via Stargard, Poland 1503 (300kW) at 2230; Radio Mediterran, Malta 1557 (600kW) at 2230.

An extensive log compiled by George Millmore in Wootton, Isle of Wight between 1915 and 2130 included five broadcasts from N. Africa — three were from stations in Algeria, Ain Beida 531 (300kW); Les Trembles 549 (600kW); Algiers 891 (600/300kW) and two stemmed from Sebba Aioun in Morocco on 612 (300kW) and on 1044 (300kW), which is about 1260km from Wootton. Eight broadcasts from Italy were included in the log — Naples 657 (120kW); Rome 846 (540kW); Milan 900 (600kW); Trieste 981 (10kW); Bari 1116 (150kW); Rome 1332 (300kW); Vatican City 1530 (150/450kW); also Genoa 1575 50kW. Bari and Naples are also about

DXers

A: Leo Gieske, Randburg, S. Africa.

B: Simon Hamer, New Radnor.

C: Tim Shirley, Bristol.

D: Jim Willett, Grimby.

1260km from the IOW.

The broadcasts in Arabic from Algeria on 891 also reach Neil Wheatley up in Newcastle-upon-Tyne, which is about 1550km from Algiers! An even greater distance (about 1820km) separates Leo Barr in Sunderland and Radio Tirana in Albania — he logged their broadcasts via Lushnje 1395 (1000kW) at 1819. Other entries included a programme in English from Radio Moscow via Lvov, Ukraine 1476 (120kW) heard at 2047; a transmission in Esperanto broadcast by Radio Polonia via Stargard, Poland 1503 (300kW), noted at 2130; a religious broadcast from TWR Monte Carlo, Monaco 1467 (1000/400kW) at 2145.

Several broadcasts from Spain were logged by Darran Taplin in Tunbridge Wells at dusk, RNE-1 via Madrid 585 (200kW) — SINPO 55555; RNE-1 via Seville 684 (250kW) — 44444; RNE-1 via Barcelona 738 (250kW) — 44444; SER Radio Bilbao 990 (10kW) — 33433; Radio Popular, Madrid 999 (20kW) — 23433. At 2150 he picked up Radio Sud, Andorra 819 (900kW), noting their signal as 44444. Darran used an Eddystone 680X communications receiver with a 25m wire antenna.

The programmes from AFN via

Frankfurt, W. Germany 873 (150kW) have been attracting the attention of Colin Godwin in Malvern at night. He rated their signal as 43334 at 2126. He has also been hearing Radio Bremen, W. Germany 936 (100kW), noting 32222 in his log at 2116. Alan Curry has been hearing AFN via Stuttgart, W. Germany 1143 (20kW) in Stockton-on-Tees during daylight! Using an Icom R-70 communications receiver with a random wire antenna he logged their signal as 22222 at 1143.

Two of the official broadcasts from S. Ireland were received during the afternoon by Chris Nykiel in Leeds. They stemmed from RTE-1 via Tullamore 567 (500kW) and RTE-2 via Athlone 612 (100kW). Leo Barr has been listening to BBC Radio Ulster via Lisnagarvey, N. Ireland 1341 (100kW) — he noted "a strong signal accompanied by some noise" in his log at 1402.

The ground wave signals from Manx Radio via Foxdale, Isle of Man 136B (20kW) reach Robert Taylor. He logged them as SIO 333 in Edinburgh at 1520. Their signals became audible in many areas after dark via sky wave paths — Alan Curry logged them as 33233 at 2315.

Some of the low power relay stations located in the UK may be heard during daylight. Using a Crown CSC-615L radio-recorder, Chris Nykiel heard the 2kW relay in Newcastle on 603 and the 10kW relay in Lisnagarvey, N. Ireland 720 — both radiate BBC Radio 4.

MW Local Radio DX

A brief holiday in the Yorkshire Dales provided Bill Griffith with a good opportunity to check the band from a quiet location. Using his Sony ICF-2001 portable with just the built-in antenna he picked up several local radio stations which he cannot normally hear at his home location in London.

"It is remarkable what a sea path does for m.w. propagation", writes John Parry. He checked the band with a portable receiver while visiting Bangor, N. Wales and was surprised at the potent signals from Radio Cumbria — a stark contrast to their signals at his home in Northwich.

Surprising as it may seem, Nick Walker has found that many of the stations noted in his log can be heard while driving around Jersey! No doubt the long sea paths helped here too. He used a Kenwood KRC-868-D radio in his car to compile most of his list for the chart, but he had to rely on a Yaesu FRG-BB00 communications receiver at his home in Grouville to help him identify Radio Trent 945 and County Sound 1476.

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

DXers:

A: Leo Barr, Sunderland
 B: Alan Curry, Stockton-on-Tees
 C: Colin Diffell, Corsham
 D: John Evans, Shawforth.
 E: Bill Eyre, Stockport.
 F: Colin Godwin, Malvern
 G: Bill Griffith, Wensleydale.
 H: Paul Hegarty, Co Dublin.
 I: Sheila Hughes, Morden.
 J: Graham Johnson, Nuneaton.
 K: Chris Nykiel, Leeds
 L: John Parry, Bangor, N. Wales.
 M: Christian Pritchard, Cambridge.
 N: Philip Rambaut, Macclesfield.
 O: Tim Shirley, Bristol.
 P: Robert Taylor, Edinburgh.
 Q: Nick Walker, Grouville, Jersey.
 R: Neil Wheatley, Newcastle-upon-Tyne.
 S: Jim Willett, Gimsby.
 T: David Wratten, Cambridge.

Robert Taylor says he spent some time trying to "null-out" the broadcasts from Kvitsoy, Norway on 1314 with his "Sooper Loop" in an attempt to hear the Red Dragon in Cardiff on 1305, but the Norwegian signal was too potent! John Evans has been putting his "Super Loop" and Lowe 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 not heard before in Stockport, the most notable being Northants 96, which was heard early one Sunday morning before Radio Lancashire came on the air!

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

Short Wave DX

The sunspot count has shown a marked increase recently — much greater than had 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 28MHz (10m) amateur band are generally unstable, many contacts are being made between amateurs in the UK and those in other continents.

A general improvement in the reception conditions prevailing on the higher frequency bands is being noted as we climb the steep slope leading to the predicted peak of the present solar sunspot cycle in 1991/92. As the level of solar activity increases a number of sudden ionospheric disturbances (s.i.d.s) can be expected — they may seriously disrupt reception for a few minutes or even a few hours.

Some broadcasts to Europe on the (21MHz) (13m) are direct transmissions from the country of origin, others relayed from unexpected locations! The early morning broadcasts from Radio Japan are relayed via Moyabi, Gabon on 21.695 (500kW). Commencing at 0700, their programmes in English and Japanese close down at 0800. Their reception is now a good deal more reliable than earlier in the year. Using a Trio R600 receiver in Wallsend, David Edwardson rated their signal as SINPO 35543.

Radio Japan also broadcast to Europe in English and Japanese via Gabon from

1500 until 1700, however this transmission is on 21.700. Edward Broadsmith is a regular listener to their broadcasts in Worcester and he has found reception to be generally good. On one or two occasions recently he has observed a prolonged breakdown in the service — this appears to be due to a fault on the satellite link between Japan to Gabon.

The direct transmissions to Europe from Radio RSA in Johannesburg, S. Africa 21.590 (500W) at 1400 usually reach the UK at remarkable strength — 55444 being the rating noted by David Wratten in Cambridge at 1430! A variety of topics are covered in their daily broadcasts in English, but their *Mail Bag* programme is a regular favourite with many listeners.

The direct broadcasts to Europe from UAE Radio Dubai 21.605 are also being very well received here — Philip Rambaut quoted SIO 555 at 1112 in his report from Macclesfield! Their programmes in English feature Arab History and Culture and may be heard at 1030 and 1330. They discuss points raised in letters from listeners, mention the reception reports they have received and answer questions in a *Mail Bag* programme which is broadcast every week on Saturdays and Sundays.

Freq kHz	Station	ILR BBC	Power (kW)	DXer
585	R. Solway	B	2.00	H,K,N,O,P,R,T
603	Invicta Sound	I	0.10	M*,N,O,*
630	R. Bedfordshire	B	0.30	Q,S,T*
630	R. Cornwall	B	2.00	C,E,J,K,M,N, O,S,T
630	R. Cornwall	B	2.00	H,Q
657	R. Clwyd	B	2.00	D,E,J,K,N,S,T
666	DevonAir R.	I	0.34	C,Q,T
666	R. York	B	0.50	D,E,K,M,N, P,R,S,T
729	BBC Essex	B	0.10	E,I,N,Q,T
756	R. Cumbria	B	1.00	D,L,R,S,T
756	R. Shropshire	B	1.00	C,D,E,J,K,N,T
765	BBC Essex	B	0.50	E,I,M,Q,S,T
774	R. Kent	B	0.70	T*
774	R. Leeds	B	1.00	D,E,K,N,P,R,S
774	Severn Sound	I	0.14	C,J,Q,T
792	Chiltern R.	I	0.27	E,J,M,N,S,T
792	R. Foyle	B	1.00	E,P
801	R. Devon	B	2.00	C,N,Q,T
828	2CR	I	0.27	Q
828	R. WM	B	0.20	E,N
828	R. Aire	I	0.12	D,E,K
828	Chiltern R.	I	0.20	O,T*
837	R. Cumbria	B	1.00	D,E,L,R
837	R. Furness	B	1.00	D,S
837	R. Leicester	B	0.70	E,I,J,M,N,T
855	R. Norfolk	B	1.00	I,J,S,T
855	R. Lancashire	B	1.00	D,E,K,N
873	R. Norfolk	B	0.25	E,I,N,T
936	GWR	I	0.18	C,I,Q,S,T
945	R. Trent	I	?	E,F,M,N,O,Q,S,T
954	DevonAir R.	I	0.32	I,O,Q
954	R. Wyvern	I	0.16	C,E,F,J,N,S,T
990	R. Aberdeen	B	1.00	R
990	R. Devon	B	1.00	I,Q
990	Beacon R.	I	0.09	E,F,J,N,T
990	Hallam R.	I	0.25	D,E,K,S,T
999	Red Rose R.	I	0.80	B,D,E,N,S
999	R. Solent	B	1.00	I,Q,T
999	R. Trent	I	0.25	J,T
1026	R. Cambridgeshire	B	0.50	E,I,J,M*,N,T
1026	Downtown R.	I	1.70	S
1026	Jersey	B	1.00	O,Q
1035	R. Kent	B	1.00	I,T
1035	Northsound R.	I	0.78	R,S
1035	R. Sheffield	B	1.00	D,E,K,N
1107	Moray Firth R.	I	1.50	S
1107	R. Northampton	B	0.50	I,J,M*,N,T
1116	R. Derby	B	0.50	B,D,E,J,N,T
1116	R. Guernsey	B	0.50	I,Q,T
1152	BRMB	I	3.00	F,J
1152	R. Broadland	I	0.83	M*,T
1152	LBC	I	23.50	Q
1152	Metro R.	I	1.80	R,S
1152	Piccadilly R.	I	1.50	D,E,N
1161	R. Bedfordshire	B	0.08	M,T*
1161	GWR	I	0.16	C,F

Freq kHz	Station	ILR BBC	Power (kW)	DXer
1161	R. Sussex	B	1.00	Q
1161	R. Tay	I	0.70	E*,T*
1161	Viking R.	I	0.35	E,K,T
1170	R. Orwell	I	0.28	S,T*
1170	Signal R.	I	0.20	E,N
1170	R. Tees	I	0.32	R
1170	Ocean Sound	I	0.12	Q
1242	Invicta Sound	I	0.32	I,M,N,T*
1251	Saxon R.	I	0.76	I,M,S,T*
1260	GWR	I	1.60	C,Q
1260	Marcher Sound	I	0.64	E,N
1260	Leicester Sound	I	0.29	E,J,T
1260	R. York	B	0.50	D
1278	Pennine R.	I	0.43	D,E,K,N,S
1305	R. Hallam	I	0.15	B,E,K,T
1305	Red Dragon R.	I	0.20	C,I,M,Q,T
1323	R. Bristol	B	1.00	C,E,T
1323	Southern Sound	I	0.50	I,T
1332	Hereward R.	I	0.60	E,I,J,M,N,T*
1359	Essex R.	I	0.28	I,M,T
1359	Mercia Sound	I	0.27	C,E,F,J,N,T
1359	R. Solent	B	0.25	Q
1368	R. Lincolnshire	B	2.00	E,K,T
1368	R. Sussex	B	0.50	I
1431	Essex R.	I	0.35	T
1431	Radio 210	I	0.14	I,T
1449	R. Cambridgeshire	B	0.15	M,S,T
1458	R. Cumbria	B	1.00	H,L
1458	R. Devon	B	1.00	Q
1458	R. London	B	50.00	T
1458	R. Newcastle	B	2.00	O,R,S
1458	R. Manchester	B	5.00	D,E,N
1458	Radio WM	B	5.00	T
1476	County Sound	I	0.50	I,M,Q,T
1485	R. Humberside	B	1.00	E,K,M,T
1485	R. Merseyside	B	2.00	E,H,N
1485	R. Oxford	B	0.50	F,T
1485	R. Sussex	B	1.00	I,Q
1503	R. Stoke-on-Trent	B	0.50	B,D,E,J,N,S,T
1521	R. Mercury	I	0.64	I,T
1521	R. Nottingham	B	0.50	E,J,T
1530	R. Essex	B	0.10	M,T
1530	Pennine R.	I	0.74	E,K,N
1530	R. Wyvern	I	0.52	T
1548	R. Bristol	B	5.00	C,E
1548	Capital R.	I	97.50	A,M,Q,T
1548	R. City	I	4.40	N
1548	R. Cleveland	B	1.00	K,R
1548	R. Forth	I	2.20	S
1548	R. Hallam	I	0.74	E,T
1557	Hereward R	I	?	M
1557	R. Lancashire	B	0.25	E,F
1557	Northants 96	I	0.76	E,J,T
1557	Ocean Sound	I	0.50	Q
1584	R. Nottingham	B	1.00	D,E,I,N,T
1584	R. Shropshire	B	0.30	D,O
1584	R. Tay	I	0.21	S
1602	R. Kent	B	0.25	E,S,T

Some of the religious broadcasts from the USA are beamed towards Europe during the afternoon. One of them stems from WHRI in South Bend, Indiana and may be heard on 21.655 at 1500 — David Wratten rated their signal as 45444. The Christian Science Monitor station WCSN in Maine, USA may be heard on 21.640 at 1600 — **Phil Townsend** has been hearing their broadcast in London, but he noted their signal as noisy. The programmes from WYFR in Oakland, California reach us via Okeechobee, Florida on 21.615. Their transmission in Portuguese, French and German was rated as SIO 444 by Philip Rambaut at 1700.

Some broadcasts to other areas were noted by several DXers. Leo Barr heard Radio Prague, Czechoslovakia 21.705 (Eng, Cz to S.E. Asia) at 0736. David Wratten logged Radio Finland, Helsinki 21.550 (Eng) — SINPO 44444 at 0800; RBI via Leipzig, GDR 21.465 (Eng, Ger, Fr to E. Asia, Sat. and Sun. only) — 45444 at 0900; RBI via Nauen, GDR 21.540 (Eng, Ger to E. Asia) — 34444 at 0900. John Parry noted Radio DW via Julich, W. Germany 21.680 (Eng to S.E. Asia) — 45554 at 0940. Philip Rambaut heard Vatican Radio, Rome 21.485 (Fr, Eng to Africa) — SIO 444 at 1110; RDP via San Gabriel, Portugal 21.700 (Port to Africa) — 333 at 1116. John Nash logged Radio Moscow, USSR 21.630 (Eng to Africa) — 53554 at 1430. John Evans noted Radio DW via Wertachtal, W. Germany 21.600 (Eng, Swa, Fr to E. Africa) — SIO 434 at 1500. David Edwardson heard Radio Nederlands via Bonaire, Ned. Antilles 21.685 (Eng, Fr, Du to C. Africa) — 45444 at 2020.

An example of a broadcast station using a suppressed carrier upper sideband (u.s.b.) transmission may be heard on 21.555 between 0900 and 1600. This 100kW p.e.p. transmission stems from Varberg, Sweden and is beamed towards the Middle East and Africa, but it can usually be received well in the UK. **Kenneth Reece** logged their signal in Prenton as 45444 at 1134.

There is certainly plenty to interest the DXer on the 17MHz (16m) band, especially in the early morning when long distance signals may be heard! The broadcasts from Radio Australia via Carnarvon, W. Australia on 17.715 at 0100 are beamed to S. Asia, but they have also been reaching the UK from the early hours of the morning until close down at 0910! Alan Curry picked up their signal at 0322 and noted SINPO 32222 in his log.

Tim Shirley

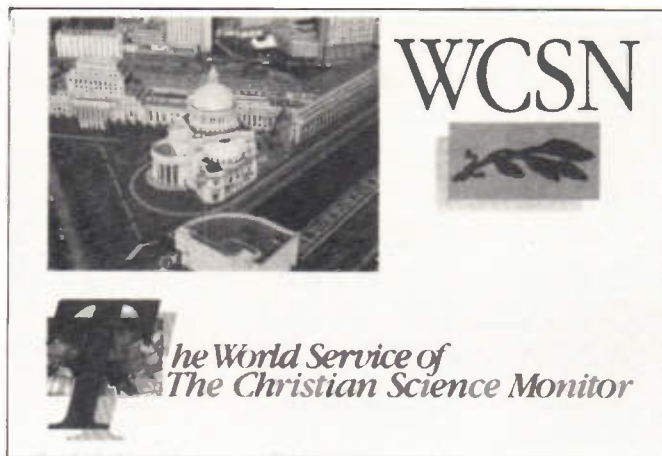


Many of Radio Australia's broadcasts are monitored by **George Hewlett** in Torquay — he starts his listening watch every day at 0400. His report notes their transmissions on 17.715 as "SIO 434 at 0400, variable, but reasonably good until close down at 0910". Two more of their 16m broadcasts were mentioned — to E. Asia via Darwin 17.750, noted as "SIO 434 at 0400, occasionally falling to 322 and lost when a jammer operates at 0600"; also to the C. Pacific area via Shepparton 17.795, noted as "SIO 434 at 0400, off air at 0600".

The direct broadcasts to S.E. Asia from Radio Japan in Tokyo 17.810 have also been reaching the UK around 0500. **Kenneth Reece** rated their signal as 24443 at 0512 and found that he could hear their programmes in English until 0800 some mornings — these are not the same as those relayed via Gabon. The broadcasts from FEBA Radio, Seychelles 17.885 have been attracting **Sheila Hughes** in Morden at 0600 — they are intended for listeners in the Middle East. Using a Vega 206 portable with just the whip antenna, Sheila rated their signal as 34433.

Some of the day broadcasts to Europe include the Voice of Israel, Jerusalem 17.555 (Heb) — heard by **Ron Pearce** at 0945, using a two valve receiver in Bungay; UAE Radio Dubai 17.865 (Ar, Eng) — logged at 1030 by Edward Broadsmith; Radio Pakistan, Islamabad 17.660 (Ur, Eng) — rated as SIO 433 at 1117 by Philip Rambaut; Radio HCJB Quito, Ecuador 17.790 (Cz, Ger, Norw, Fr, Eng, Sp) — rated as 43324 at 2150 by Colin Godwin.

Broadcasts to other areas include KYOI Saipan, N. Mariana Islands 17.780 (Eng to E. Asia) — rated as 34333 at 0720 by David Wratten; Radio Finland, Helsinki 17.795 (Eng to Australia) — SIO 333 at 0800 by Phil Townsend; Radio Nederlands via Talata Volon, Madagascar 17.575 (Eng, Du to S. Asia) — 34433 at 1428 by Darran Taplin; Radio RSA Johannesburg, S. Africa 17.755 (Eng to W. Africa) — 44343 at 1500 by David Wratten; RTM Morocco 17.595 (Ar to Middle East) — 44333 at 1635 by Sheila Hughes; VOA via Monrovia, Liberia 17.870 (Eng to C. Africa) — SIO 322 at 1721 by Philip Rambaut; RCI via Sackville, E. Canada 17.820 (Eng, Fr to Africa) 34333 at 1942 by **Paul Hegarty** in Co. Dublin; VOA via Greenville, USA 17.780 (Eng to W. Africa) — 33223 at 2155 by Colin Godwin; WYFR via Okeechobee, Florida 17.845 (Eng to W. Africa) — logged by Leo Barr at



Ron Pearce

2251.

The reception conditions prevailing on the 15MHz (19m) band have been disturbed from time to time by solar events.

Listening in Sheffield at 0645, **Cyril Kellam** heard Radio Australia via Shepparton, S.E. Australia 15.240 (English to S. Asia). Simon Hamer picked up their broadcasts to E. Asia via Carnarvon, W. Australia 15.395 (Eng, Fr, Chin) at 0600. **Kenneth Reece** logged Radio Japan, Tokyo 15.235 (Eng, Jap to Australia) as 23433 at 0653. John Parry heard the BBC Ascension Island relay 15.400 (Iish to Africa) at 0910, noting their signal as 33553.

Using a Philips D 1835 with just the whip antenna in Molepolole, Botswana, **P. R. Guruprasad** has been listening to AIR via Madras, S.E. India 15.335 at 1145 (Tam to S.E. Asia) — their signal peaks 44444, but there is severe adjacent channel interference at 1225 from Radio Nederlands via Talata Volon, Madagascar on 15.330. He has also been enjoying RDP via San Gabriel, Portugal 15.250 (Eng, Fr to Africa) at 1915 — their signal is often 55344.

During the afternoon, Simon Hamer heard Radio Denmark 15.165 (Dan to N. America) at 1300. Robert Taylor logged the Voice of Israel, Jerusalem, 15.615 (Heb to Europe) as SIO 444 at 1350; also Radio Sophia, Bulgaria 15.310 (Eng, Port, Fr to Africa) as 434 at 1545. **Tim Shirley** picked up AWR via Alajuela, Costa Rica 15.460 (Fr, Eng, Sp to C. America) at 1500. Phil Townsend heard Radio Sweden, Stockholm 15.345 (Eng, Sw, Fr to N. America) — 444 at 1415; Radio Korea Seoul, S. Korea 15.575 (Ar, It, Eng, Sp to Europe) — 333 at 1700.

Listening in Cambridge at 1800, **Christian Pritchard** heard RNB Brasilia, Brazil 15.265 (Eng, Ger to Europe) — their signal was 43333. **George Millmore** logged the Voice of Vietnam, Hanoi 15.010 (Eng) as 43333 at 1900. Using his two valve receiver, Ron Pearce picked up WCSN in Maine, USA 15.390 (Eng to Europe) at 2005. **Tim Shirley** heard the Voice of Nigeria, Lagos 15.120 (Eng, Fr, Ger to Europe) at 2045. At 2115, Sheila Hughes listened to *Post Bag Corner* broadcast in English by Radio Baghdad, Iraq 15.230, noting 43333 in her log.

Later David Edwardson logged Radio Australia via Shepparton 15.395 (Eng to N. America) — 24432 at 2204. Alan Curry noted KUSW Salt Lake City, Utah 15.580 (Eng to N. America) as 32222 at 2255; WINB Red Lion, PA 15.145 (Eng to N. Africa) as 22222 at 2300; WCSN Maine, USA 15.300 (Eng to W.

Africa) as 44333 at 2315. Leo Barr noted Radio Korea Seoul, S. Korea 15.575 (Kor, Eng to N. America) as "weak" at 2331. Simon Hamer logged ABC Perth, Australia 15.425 (Eng) at 2300; also Radio New Zealand, Wellington 15.150 (Eng to Australia) at 0400. Listening in Lockerbie, **Neil Dove** heard three broadcasts from Radio Australia via Shepparton, 15.180 (Eng to S.E. Asia) — rated as 35443 at 0200; 15.240 (Eng to S. Asia) — 45534 at 0215; 15.160 (Eng, Fr to E. Asia) — 25443 at 0340.

Although more broadcasters are now using the 13MHz (22m) band in an attempt to provide a reliable service to selected target areas, many of the receivers in use do not cover this band! Numerous transmissions from the USSR still dominate the band, but broadcasts from other areas are now audible.

Kenneth Reece checked the band one morning at 0425 and heard a broadcast in Italian from RBI Berlin, GDR 13.610 — rated as SINPO 45554; also a programme in Russian from Radio Moscow, USSR 13.615 — their signal was 33443 at 0429. Listening at 0900, Philip Rambaut heard SRI Berne, Switzerland 13.685, noting their signal as SIO 333. **Phil Townsend** heard an official broadcast by the International Red Cross via SRI on 13.685 at 1325 — their signal was SIO 444.

A broadcast in English to S. Asia from Radio Nederlands via Flevoland 13.770 was logged by David Wratten as 44444 at 1430. At 1530 John Nash heard a bulletin of Afro/Asian news in English beamed to S. Asia by Radio Prague, Czechoslovakia on 13.715 — he noted 43333 in his log. Listening in Stockton-on-Tees, **Ian Curry** heard WHRI in South Bend, Indiana 13.760 at 2020 (English to Europe) — their signal was 32333. Later, his father Alan logged WRNO New Orleans, USA on 13.760 as 33333 at 2225.

The 11MHz (25m) band is also full of activity. Radio Australia via Shepparton 11.910 (Eng to S. Pacific area) — rated as 44444 at 0627 by David Edwardson; WYFR via Okeechobee, Florida 11.580 (Eng to W. Africa) — noted as 322 by Philip Rambaut at 0854; BBC via Kranjil, Singapore 11.955 (Eng to Australia) — logged by Neil Dove as 34443 at 0910; KNLS Anchor Point, Alaska 11.860 (Eng) — logged by Dick Moon at 0940; Radio Norway, Oslo 11.870 (Eng Sun. only) — heard by Edward Broadsmith at 1100; Radio Tirana, Albania 11.855 (Eng to S. Asia) — rated as 34333 at 1030 by Sheila Hughes.

During the afternoon, John Evans

SEEN & HEARD

Freq MHz	Station	Country	UTC	D Xer
2.310	ABC Alice Springs	Australia	2215	K
2.420	RRI Denpasar, Bali	Indonesia	1000	G
2.445	Nanchang	China	1100	G
2.470	R.Cacique	Brazil	0130	K
2.490	Vos 1, Fuzhou	China	1305	G
2.560	Xinjiang	China	2356	N
3.205	TWR	Swaziland	1940	G
3.210	R.Federacion	Ecuador	0355	J,N
3.215	R.Orange	S.Africa	0419	I,J
3.220	R.HCJB, Quito	Ecuador	0430	J
3.225	R.Clube, Lins	Brazil	2300	K
3.225	R.Occidente	Venezuela	0355	J
3.230	ELWA Monrovia	Liberia	2125	B,D,N
3.230	R.El.Sol Los Andes	Peru	0049	B
3.250	R.Luz Y Vida	Honduras	0300	N
3.270	SWABC 1, Namibia	S.W Africa	2136	B,D,I,J
3.285	R.Belize	Belize	0530	N
3.300	R.Cultural	Guatemala	0433	J
3.320	R.Onion	S.Africa	2233	B
3.320	PBB PYONGYANG	Korea	1555	G
3.325	R.North Solomon	New Guinea	1630	G
3.325	FRCN Lagos	Nigeria	2130	I
3.330	R.Progreso, Piura	Peru	0451	J
3.340	R.Altura	Peru	0425	J
3.355	R.Botswana	Gabarone	0438	J
3.365	R.Cultura, Araquara	Brazil	0411	J
3.365	AIR New Delhi	India	1327	G
3.365	GBC Radio 2	Ghana	2144	B,I,J,L
3.375	R.Dourados	Brazil	0432	J
3.380	R.Iris, Esmeraldas	Ecuador	0329	J
3.910	AFRTS Tokyo	Japan	1355	G
3.915	BBC, Kranji	Singapore	2350	G,N
3.955	BBC, Davenport	England	2100	I
3.965	RFI Paris	France	0100	I
3.985	R.Beijing, China	via SRI Berne	2200	C,I
3.995	DW Cologne	W. Germany	2000	I
4.060	R.Moscow, Kharkov	USSR	2200	I
4.080	R.Ulan Bator	Mongolia	2200	K
4.220	PBS Xinjiang	China	2205	E
4.500	Xinjiang	China	2205	E,N
4.635	R.Dushanbe, Tadzhik	USSR	2352	B
4.735	Xinjiang	China	2215	E,F
4.740	R.Afghanistan	via USSR	1930	F,I
4.755	Sani Radio	Honduras	0015	N
4.760	ELWA Monrovia	Liberia	2140	D
4.760	R.Afghanistan	via USSR	1845	F
4.765	R.Moscow	via Cuba	0500	J
4.770	FRCN Kaduna	Nigeria	2000	F,H,I,N
4.770	R.Nigeria, Kaduna	Nigeria	1900	G
4.775	R.Gabon, Libreville	Gabon	2122	J
4.785	RTM, Bamako	Mali	2300	I,N
4.790	R.Atlantida	Peru	0421	J
4.790	Azad Kashmir R	Pakistan	1756	J
4.795	R.Douala	Cameroon	1930	F,H,J
4.795	R.Moscow	USSR	2215	F
4.800	AIR Hyderabad	India	2345	N
4.800	LNBS Lesotho	Maseru	1956	G,I,J,K,N
4.815	R.diff TV Burkina	Burkina Faso	2110	F,H,N
4.820	R.Botswana	Botswana	1900	I,J
4.820	R.Paz y Bien, Ambato	Ecuador	0334	J

Freq MHz	Station	Country	UTC	D Xer
4.820	La Voz Evangelica	Honduras	0145	J,N
4.830	Africa No. 1	Gabon	1920	A,B,E, F,H,I,J, L,M,N
4.830	Reloj	Costa Rica	0340	J,N
4.830	R.Tachira	Venezuela	0200	I,J,N
4.835	RTM, Bamako	Mali	1925	H,J,M
4.845	R.Nacional, Manas	Brazil	0220	D,J
4.845	RTM Kuala Lumpur	Malaysia	1500	G
4.845	ORTM Nouakchott	Mauritania	2014	D,E,H
4.850	R.Columbia Pt	Costa Rica	0218	N
4.850	R. Tashkent	USSR	0030	F
4.850	R.Yaounde	Cameroon	2100	A,C,D, F,H,I,J,L,M
4.850	R.Capital, Caracas	Venezuela	0300	I,J
4.855	R.Mauritius	Mauritius	1845	F
4.870	R.Cotonou	Benin	2015	D,F,H,J,M
4.870	R.Rio Amazonas	Ecuador	0313	J
4.880	SABC Radio 5	S.Africa	1930	D,F, H,I,J,L
4.885	Voice of Kenya	Kenya	2105	G,H
4.890	RFI	via Gabon	0430	F,J
4.890	ORTS Dhaka	Senegal	2100	D,H,J
4.895	R.Moscow, Kalinin	USSR	2130	F
4.895	R.Bare, Manaus	Brazil	0322	J
4.905	R.Nat. N'djamena	Chad	2020	D,H,J
4.905	R.Regio, Rio	Brazil	0325	J
4.910	R.Zambia, Lusaka	Zambia	1900	I
4.915	R.Ghana, Accra	Ghana	1910	B,D,E, F,H,N
4.915	Voice of Kenya	Kenya	2105	H,I
4.920	R.Quito	Ecuador	0451	J
4.925	R.Nacional, Bata	Eq. Guinea	2315	N
4.940	R.Kiev	USSR	2100	B,D,F,H
4.945	Caracol, Neiva	Columbia	0453	J
4.945	R.Nac. Porto Velho	Brazil	2200	G
4.960	R.Baku	USSR	2050	D
4.970	R.Rumbos, Caracas	Venezuela	0445	J
4.975	R.Uganda, Kampala	Uganda	1925	B,H,I,L
4.980	Azad Kashmir R	Pakistan	1243	G
4.980	Ecos del Torbes	Venezuela	0130	J,N
4.980	R.Animas, Chocaya	Bolivia	0336	J
4.990	FRCN Lagos	Nigeria	2200	C,F,J,L
4.990	R.Yerevan	USSR	2000	F
4.995	R.Nacional, Bator	Mongolia	2215	N
5.005	R.Nacional, Bata	Eq. Guinea	1925	B,F,H,J
5.010	R.Garoua	Cameroon	2050	D,H,I,J,N
5.025	R.Rebelde, Habana	Cuba	0339	J
5.035	R.Alma Ata	USSR	2015	F,J
5.035	R.Bangui	C. Africa	2107	B,D,H,J
5.040	R.Omdurman	Sudan	0600	G
5.040	R.Maturin	Venezuela	0346	J
5.045	R.Cultura do Para	Brazil	2302	B,J
5.045	R.Rioja	Peru	0427	J
5.045	R.Togo, Lome	Togo	2100	H,J,N
5.050	Voz de Yopal	Columbia	0030	N
5.057	R.Tirana Gjrokaster	Albania	2130	D,F,J
5.065	R.Candip, Bunia	Zaire	?	B,F
5.095	R.Sutatenza, Bogota	Columbia	0100	F,N
5.290	R.Moundou	Chad	2359	N

DXers:

- A: Leo Barr, Sunderland
- B: Ian Baxter, Blackburn
- C: Alan Curry, Stockton-on-Tees.
- D: Neil Dove, Lockerbie.
- E: David Edwardson, Wallsend.
- F: John Evans, Shawforth.
- G: Davy Hossack, Freemantle, W. Australia.
- I: Cyril Kellam, Sheffield.
- H: Fred Pallant, Storrington.
- I: Christian Pritchard, Cambridge.
- J: Kenneth Reece, Prenton.
- K: Tim Shirley, Bristol.
- L: Darran Taplin, Tunbridge Wells.
- M: Keith Wakelin, Hull.
- N: Jim Willett, Grimsby.

by Colin Diffell at 1920; RAI Rome, Italy 7.275 (Eng) — noted as SIO 433 at 2015 by John Evans; 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 7.270 (Eng, Ger) — rated as 55454 at 2305 by David Wratten; RPII via Costa Rica 7.375 (Eng) — logged by Tim Shirley at 0130; WHRI South Bend, Indiana 7.400 (Eng) — noted as 44333 at 0130 by Christian Pritchard.

Some of the many 6MHz (49m) broadcasts to Europe during the day include RIAS Berlin 6.005 (Ger) — logged as 33443 at 1155 by Kenneth Reece; Radio Nederlands via Flevoland 5.955 (Eng) — noted as SIO 444 at 1440 by Robert Taylor; Radio Austria Int., Vienna 5.945 (Ger, Eng, Fr, Sp) — received by Leo Barr at 1745; Radio Pyongyang, N. Korea 6.575 (Fr, Russ, Kor, Sp, Ger, Eng) — rated as 34333 at 2000 by Christian Pritchard; BRT Brussels, Belgium 5.910 (Eng) — received at 2100 by Cyril Kellam; Radio Sweden, Stockholm 6.065 (Eng, Sw) \$ rated as 44343 at 2106 by John Nash; Radio Polonia, Warsaw, Poland 6.135 (Pol, Eng, Fr, Ger) — logged by Sheila Hughes as 44444 at 2230.

Station Addresses

BBC Radio Foyle, PO Box 927, 8 Northland Road, Londonderry, BT48 7JD.

ILR Two Counties Radio (2CR), 5-7 Southcote Road, Bournemouth, BH1 3LR.

Radio Polonia, Box 46, PL-00-950 Warszawa, Poland.

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

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

Radio Conakry, Radio Diffusion National Directeur General, B.P.391, Conakry, Rep. Guinea.

Abbrv.	Language
Chin	Chinese
Cz	Czechoslovakian
Dan	Danish
Du	Dutch
Eng	English
Esp	Esperanto
Fr	French
Ger	German
Heb	Hebrew
It	Italian
Jap	Japanese
Kor	Korean
Norw	Norwegian
Pol	Polish
Port	Portuguese
Russ	Russian
Sp	Spanish
Sw	Swedish
Swa	Swahili
Tam	Tamil
Tur	Turkish
Ur	Urdu

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 1345 — SINPO 44444; Robert Taylor noted Finland, Helsinki 11.755 (Eng) as SIO 444 at 1415; P. R. Guruprasad heard Radio Japan, Tokyo 11.815 (Jap, Eng to S.E. Asia) at 1500, noting their signal as 55344; David Wratten logged UAE Radio Dubai 11.730 (Ar, Eng to Europe) as 54444 at 1630.

The evening broadcasts stemmed from RAI Rome, Italy 11.800 (Eng to Europe) — logged as 43433 at 1948 by John Nash; AIR via Algarh, India 11.620 (Eng to Europe) — rated as 44444 at 2000 by Jean-Yves Camus in Creteil, France; BBC via Ascension Island relay 11.820 (Eng, Port to Africa) — noted as 45444 at 2002 by Paul Hegarty; Radio Kuwait, State of Kuwait 11.665 (Eng to Europe) — logged as 44444 at 2012 by Darran Taplin; Radio Damascus, Syria 12.085 (Eng) — noted as "noisy" at 2013 by Leo Barr; Radio Beijing, China 11.500 (Eng) — rated as 44434 at 2015 by

David Edwardson; Radio Australia via Darwin 11.730 (Eng, Chin) — logged by Neil Dove as 344443 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 Pritchard — RAE Buenos Aires, Argentina 11.710 (Sp, Port, Eng to N. America), rated as 22322 at 2200; also RNB Brasilia, Brazil 11.745 (Sp, Eng to N. America), noted as 23333 at 0200. At 0400 Simon Hamer heard Radio New Zealand, Wellington on 12.045, broadcasting a sports report in English.

The 9MHz (31m) band is used by Radio Australia to reach listeners in Europe from 0700 broadcasting via Shepparton 9.655. A marked deterioration in their signal has been observed during the last few weeks — the 33333 rating noted at 0800 by Keith Wakelin in Hull is typical just now. George Hewlett has been monitoring their transmissions — herated 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) at 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 (Fr, Eng to Europe) — heard by Cyril Kellam at 1900; RNI via Kvitsoy, Norway 9.590 (Norw, Eng, Sp to Europe) — received at 1910 by Colin Diffell; VOIRI Tehran, Iran 9.022 (Tur, Eng to Europe) — logged by David Edwardson at 2020; Radio Sophia, Bulgaria 9.700 (Eng, It to Europe) — noted by Julian Wood at 2130; Radio Cairo, Egypt 9.900 (Eng to Europe) — heard by Ian Curry at 2145; AIR via Algarh, India 9.535 (Eng to S.E. Asia) — logged by George Efstratiades at 2300.

The 7MHz (41M) band is used by Radio Australia to reach their listeners in Europe via Carnarvon, W. Australia 7.205 during the afternoon — Phil 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 44434 at 1900; Vatican Radio, Italy 7.250 (Pol, Ger, Eng, It, Esp) — heard



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WHAT SCANNER

JIL SX-200N
Monitor Scanner



- **COVERAGE:** 26 to 88MHz, 108 to 180MHz, 380 to 514MHz
- **MODES:** a.m., n.b.f.m.
- **SENSITIVITY:** f.m. = >60dB at ± 25 kHz; a.m. = >60dB at ± 10 kHz
- **SELECTIVITY:** 26 - 180MHz f.m. = 0.4 μ V at 12dB s/n; 380 - 514MHz = 1.0 μ V at 12dB s/n; 26 - 180MHz a.m. = 1.0 μ V at 10dB s/n; 380 - 514MHz a.m. = 2.0 μ V
- **RESOLUTION:** 5, 12.5kHz
- **IMAGE REJECTION:**
- **IF STAGE:** 10.7MHz 455kHz
- **AUDIO OUTPUT:** 2 watts
- **SCAN RATE:** 4 and 8 channels per second
- **SEARCH RATE:** 5 and 10 channels per second
- **MEMORIES:** 16
- **FEATURES:**
- **REVIEWED:** Practical Wireless October 1981 (£1.30)
- **PRICE:** £325

AOR AR2002
Monitor Scanner



- **COVERAGE:** 25 to 550MHz, 800 to 1300MHz
- **MODES:** a.m., n.b.f.m., w.b.f.m.
- **SENSITIVITY:** n.b.f.m. = 0.3 μ V (12dB SINAD); w.b.f.m. = 1.0 μ V (12dB SINAD); a.m. = 0.5 μ V (10dB s/n)
- **SELECTIVITY:** n.b.f.m. = ± 7.5 kHz at 6dB; w.b.f.m. = ± 25 kHz at 60dB; a.m. = ± 10 kHz at 70dB
- **RESOLUTION:** 5, 12.5 or 25kHz steps
- **IMAGE REJECTION:** -50dB
- **IF STAGE:** 750MHz, 45.03MHz (w.f.m.), 455kHz (n.f.m./a.m.)
- **AUDIO OUTPUT:** 1W at <10% distortion
- **SCAN RATE:** 5 channels per second
- **SEARCH RATE:** 6 seconds per MHz
- **MEMORIES:** 20
- **FEATURES:** Tuning knob in addition to key pad and computer control facilities
- **REVIEWED:** Practical Wireless December 1985 (75p)
- **PRICE:** £487

JIL SX-400
Monitor Scanner



- **COVERAGE:** 26 to 520MHz continuous (100kHz to 1.4GHz with converters)
- **MODES:** a.m., n.b.f.m., w.b.f.m.
- **SENSITIVITY:** v.h.f. f.m. = 0.5 μ V at 12dB s/n; v.h.f. a.m. = 1.0 μ V at 10dB s/n; u.h.f. f.m. = 0.5 μ V at 12dB s/n; u.h.f. a.m. = 2.0 μ V at 10dB s/n
- **SELECTIVITY:** 60dB at ± 15 kHz (f.m.), 60dB at ± 10 kHz (a.m.), s/n ratio: 45dB
- **RESOLUTION:** 5, 6.25, 10, 12.5kHz
- **IMAGE REJECTION:** 50dB (v.h.f.)
- **IF STAGE:** 10.7MHz, 455kHz
- **AUDIO OUTPUT:** 2W (4 Ω load)
- **SCAN RATE:** 4 and 8 channels per second
- **SEARCH RATE:** 5 and 10 channels per second
- **MEMORIES:** 20
- **FEATURES:**
- **REVIEWED:**
- **PRICE:** £650

AOR AR2001
Communications Scanner



- **COVERAGE:** 25 - 550MHz
- **MODES:** a.m., n.b.f.m., w.b.f.m.
- **SENSITIVITY:** At 70MHz. Input signal for 12dB SINAD n.b.f.m. = 0.39 μ V; Input signal for 10dB S + N/N a.m. = 1.35 μ V.
- **SELECTIVITY:** n.b.f.m. = 13kHz @ 6dB, 21kHz @ 70dB; w.b.f.m. = 180kHz @ 6dB, 448kHz @ 70dB; a.m. = 13.5kHz at 6dB.
- **RESOLUTION:** 5, 12.5, 25kHz
- **IMAGE REJECTION:** -50dB
- **IF STAGE:** 750MHz & 455kHz
- **AUDIO OUTPUT:** 1W at 10% distortion
- **SCAN RATE:** 5 channels per second
- **SEARCH RATE:** 6 seconds per MHz
- **MEMORIES:** 20
- **FEATURES:** Good coverage of v.h.f. and u.h.f. airband
- **REVIEWED:** Practical Wireless May 1984 (£1.30)
- **PRICE:** Available in limited quantities on special production runs. Apply Lowe Electronics.

Uniden Bearcat UBC-175XL
Base Station Scanner



- **COVERAGE:** 66 - 88, 118 - 174, 406 - 512MHz
- **MODES:** a.m., f.m.
- **SENSITIVITY:** For 12dB SINAD. 29 - 54MHz = 0.3 μ V; 118 - 136MHz = 0.8 μ V; 136 - 174MHz = 0.3 μ V; 406 - 512MHz = 0.5V
- **SELECTIVITY:** -45dB at ± 25 kHz
- **RESOLUTION:** 5kHz
- **IMAGE REJECTION:** -55dB
- **IF STAGE:** 10.85MHz & 450kHz
- **AUDIO OUTPUT:** 800mW at 10% t.h.d.
- **SCAN RATE:** 5 and 15 channels per second
- **SEARCH RATE:** 5 and 15 channels per second
- **MEMORIES:** 16
- **FEATURES:** Channel lockout, auto squelch, priority channel and short term memory back-up
- **REVIEWED:** Short Wave Magazine December 1987 (£1.45)
- **PRICE:** £179.99

Saiko SC-1600
Mobile Monitor Scanner



- **COVERAGE:** 10MHz within 65 to 90MHz, 20MHz within 130 to 175MHz, 30MHz within 390 to 500MHz
- **MODES:** n.b.f.m.
- **SENSITIVITY:** 1.0 μ V for 10dB s/n
- **SELECTIVITY:** ± 15 kHz at 50dB, ± 7 kHz at -6dB
- **RESOLUTION:** 5kHz
- **IMAGE REJECTION:** -40dB
- **IF STAGE:** 10.7MHz, 455kHz
- **AUDIO OUTPUT:** 1.5W at 10% distortion
- **SCAN RATE:**
- **SEARCH RATE:**
- **MEMORIES:** 16
- **FEATURES:** Squelch, delay key, l.c.d. channel display, d.c. power cable and mounting bracket supplied
- **REVIEWED:**
- **PRICE:** £159.95

Realistic PRO-2004
Programmable Scanner



- **COVERAGE:** Continuous 25 to 520MHz, 760 to 1300MHz
- **MODES:** a.m., w.b.f.m., n.b.f.m.
- **SENSITIVITY:** (w.b.f.m. 30dB signal to noise at 22.5kHz dev). 25 - 520MHz = 3 μ V; 760 - 1100MHz = 3 μ V; 1100 - 1300MHz = 10 μ V. (n.b.f.m. 20dB signal to noise at 3kHz dev). 25 - 520MHz = 0.5 μ V; 760 - 1100MHz = 0.3 μ V; 1100 - 1300MHz = 3 μ V. (a.m. 20dB signal to noise at 60% mod). 25 - 520MHz = 2 μ V; 760 - 1100MHz = 2 μ V; 1100 - 1300MHz = 3 μ V
- **SELECTIVITY:** (n.b.f.m. & a.m.) ± 9 kHz @ -6dB, ± 15 kHz @ -50dB; (w.b.f.m.) ± 150 kHz @ -6dB, ± 300 kHz @ -50dB
- **RESOLUTION:** 5, 12.5 or 50kHz
- **IMAGE REJECTION:** -60dB
- **IF STAGE:** 611.5 - 607.505MHz, 48.5MHz, 455kHz (a.m.)
- **AUDIO OUTPUT:** 1.8W @ 3% t.h.d.
- **SCAN RATE:** 8 and 16 steps per second
- **SEARCH RATE:** 8 and 16 steps per second
- **MEMORIES:** 300
- **FEATURES:** Lock out key, squelch, priority function key and large l.c.d. readout.
- **REVIEWED:** Short Wave Magazine April 1987 (£1.45)
- **PRICE:** £329.95

Revco RS-2000E
Monitor Scanner



- **COVERAGE:** 60 to 179MHz, 380 - 520MHz
- **MODES:** a.m., n.b.f.m.
- **SENSITIVITY:** 0.5 μ V v.h.f. f.m., 1.0 μ V u.h.f. f.m.
- **SELECTIVITY:** -60dB at ± 25 kHz
- **RESOLUTION:** 5kHz
- **IMAGE REJECTION:**
- **IF STAGE:**
- **AUDIO OUTPUT:** 2W
- **SCAN RATE:** 5 or 10 channels per second
- **SEARCH RATE:** 5 or 10 channels per second
- **MEMORIES:** 70
- **FEATURES:** Auto search and store.
- **REVIEWED:**
- **PRICE:** £279

Realistic PRO-2021
Programmable Scanner



- **COVERAGE:** 68 to 88MHz, 108 to 136MHz, 138 to 174MHz, 390 to 512MHz.
- **MODES:** a.m., f.m.
- **SENSITIVITY:** 66 - 88MHz = 1 μ V; 108 - 136MHz = 2 μ V; 138 - 174MHz = 1 μ V; 390 - 512MHz = 1 μ V
- **SELECTIVITY:** -6dB @ ± 9 kHz, -50dB @ 15kHz
- **RESOLUTION:** 5, 12.5 and 25kHz
- **IMAGE REJECTION:**
- **IF STAGE:** 10.7MHz, 455kHz
- **AUDIO OUTPUT:** 300mW
- **SCAN RATE:** 4 and 8 channels per second
- **SEARCH RATE:**
- **MEMORIES:** 200
- **FEATURES:** Easy-to-read l.c.d. readout, squelch control, mobile mounting bracket included, sockets for external antenna, speaker and tape recorder
- **REVIEWED:**
- **PRICE:** £219.95

WHAT SCANNER

Copies of Reviews available
as indicated.

Regency MX 7000 Monitor Scanner

- **COVERAGE** 25 to 560MHz continuous, 800MHz to 1.3GHz
- **MODES** a.m., n.b.f.m., w.b.f.m.
- **SENSITIVITY** n.b.f.m. = 0.4µV at 12dB SINAD; w.b.f.m. = 1.0µV at 12dB SINAD; a.m. = 0.8µV at 10dB s/n
- **SELECTIVITY** n.b.f.m. ±7.5kHz at 6dB; w.b.f.m. = ±50kHz at 6dB; a.m. = ±5kHz at 6dB
- **RESOLUTION** 5, 12.5 and 25kHz
- **IMAGE REJECTION** -50dB
- **IF STAGE** 750 MHz, 45.03MHz, 5.5MHz, 455kHz
- **AUDIO OUTPUT** 1W at 10% distortion
- **SCAN RATE** 5 channels per second
- **SEARCH RATE** 6 seconds per MHz
- **MEMORIES** 20
- **FEATURES** Tuning dial as well as keypad, priority channel, mains adaptor and mounting bracket available as extras
- **REVIEWED:**
- **PRICE** £399

Bearcat 100FB Handheld Scanner

- **COVERAGE** 66 - 88MHz, 138 - 174MHz, 406 - 512MHz
- **MODES**
- **SENSITIVITY** For 12dB SINAD, 66 - 88MHz = 0.6µV; 138 - 174MHz = 0.6µV; 406 - 512MHz = 1µV
- **SELECTIVITY** 50dB @ ±25kHz
- **RESOLUTION** 5, 12.5kHz
- **IMAGE REJECTION**
- **IF STAGE**
- **AUDIO OUTPUT** 300mW
- **SCAN RATE** 15 channels per second
- **SEARCH RATE** 15 channels per second
- **MEMORIES** 16
- **FEATURES:**
- **REVIEWED:** Practical Wireless September 1982 (£1.30)
- **PRICE** Available second-hand

Regency HX850E Handheld Scanner

- **COVERAGE** 75-106MHz or 60-90MHz, 118-136MHz, 136-175MHz, 406-496MHz
- **MODES** a.m., n.b.f.m.
- **SENSITIVITY** v.h.f. f.m. = 0.7µV at 12dB SINAD, u.h.f. f.m. = 1.0µV at 12dB SINAD; v.h.f. a.m. = 1.0µV at 10dB s/n
- **SELECTIVITY** f.m./a.m. ±7.5kHz at 6dB
- **RESOLUTION** 5, 10 and 12.5kHz
- **IMAGE REJECTION**
- **IF STAGE** 21.4MHz, 455kHz
- **AUDIO OUTPUT** 10mW, 10% or less t.h.d.
- **SCAN RATE** 12 channels per second
- **SEARCH RATE** u.h.f. = 7 sec per MHz; v.h.f. 9 seconds per MHz
- **MEMORIES** 20
- **FEATURES** NiCads, flexible antennas and 240V charger supplied
- **REVIEWED:**
- **PRICE** £280

Yaesu FRG-9600 VHF/UHF Scanner



- **COVERAGE** 60-905MHz (up to 460MHz for s.s.b.)
- **MODES** n.b.a.m., w.b.a.m., n.b.f.m., w.b.f.m., s.s.b.
- **SENSITIVITY** At 435MHz 12dB SINAD n.b.f.m. 0.35µV. At 435MHz 10dB S+N/N n.b.f.m. 0.51µV. At 435MHz 15dB S+N/N s.s.b. 0.38µV
- **SELECTIVITY**
- **RESOLUTION** 100Hz, 1, 5, 10, 12.5, 25, 100kHz
- **IMAGE REJECTION** At 145MHz -39dBm
- **IF STAGE**
- **AUDIO OUTPUT** 1W into 8Ω
- **SCAN RATE**
- **SEARCH RATE**
- **MEMORIES** 100
- **FEATURES** 0.6m whip antenna, mobile mounting bracket, wire stand, 1.8m d.c. power cord.
- **REVIEWED**
- **PRICE** £525

Realistic PRO-32 Programmable Handheld Scanner



- **COVERAGE** 68 to 88MHz, 108 to 136MHz (a.m.), 138 to 174MHz, 380 to 512MHz.
- **MODES** a.m., f.m.
- **SENSITIVITY** (a.m. 20dB signal-to-noise at 80% modulation). 108 - 136MHz = 2µV; (f.m. 20dB signal-to-noise at 3kHz deviation). 68 - 88MHz = 0.6µV; 138 - 174MHz = 1µV; 380 - 512MHz = 1µV
- **SELECTIVITY** -6dB @ ±9kHz, -60dB @ ±15MHz
- **RESOLUTION** 5, 12.5 or 25kHz
- **IMAGE REJECTION**
- **IF STAGE** 455kHz, 10.7MHz
- **AUDIO OUTPUT** 300mW
- **SCAN RATE** 4 and 8 channels per second
- **SEARCH RATE** 4 and 8 channels per second
- **MEMORIES** 200
- **FEATURES**
- **REVIEWED** Short Wave Magazine November 1987 (£1.45)
- **PRICE** £239.95

Realistic PRO-38 Handheld Scanner



- **COVERAGE** 68 - 88, 136 - 174, 406 - 512MHz
- **MODES** f.m.
- **SENSITIVITY** 68 - 88MHz = 0.5µV normal, 2µV limit; 136 - 174MHz = 0.7µV normal, 3µV limit; 406 - 512MHz = 0.7µV normal, 4µV limit
- **SELECTIVITY** At 155MHz. -6dB = ±10kHz, -50dB = ±17kHz
- **RESOLUTION**
- **IMAGE REJECTION**
- **IF STAGE**
- **AUDIO OUTPUT** nominal 260mW
- **SCAN RATE** 10 channels per second
- **SEARCH RATE**
- **MEMORIES** 10
- **FEATURES** Keyboard lock switch, l.c.d. channel readout, jack for earphone, belt clip and flexible antenna supplied
- **REVIEWED:**
- **PRICE** £129.95

Uniden Bearcat 70XL Handheld Scanner



- **COVERAGE** 29 - 54, 135 - 174, 406 - 512MHz
- **MODES** f.m.
- **SENSITIVITY** 29 - 54MHz = 0.4µV, 136 - 174MHz = 0.5µV, 406 - 512MHz = 0.7µV
- **SELECTIVITY** -55dB @ ±25kHz
- **RESOLUTION** 5kHz
- **IMAGE REJECTION** -50dB
- **IF STAGE** 10.8MHz
- **AUDIO OUTPUT** 140mW at 10% t.h.d. into 8Ω
- **SCAN RATE** 15 channels per second
- **SEARCH RATE** 15 channels per second
- **MEMORIES** 20
- **FEATURES**
- **REVIEWED**
- **PRICE** £199.99

Uniden Bearcat 50XL Handheld Scanner



- **COVERAGE** 29 - 54, 136 - 174, 406 - 512MHz
- **MODES** a.m., f.m.
- **SENSITIVITY** For 12dB SINAD, 29 - 54MHz = 0.4µV; 136 - 174MHz = 0.5µV; 406 - 512MHz = 0.7µV
- **SELECTIVITY** -55dB ±25kHz
- **RESOLUTION** 5kHz
- **IMAGE REJECTION** -50dB
- **IF STAGE** 10.8MHz
- **AUDIO OUTPUT** 500mW at 10% t.h.d. in 8Ω
- **SCAN RATE** 15 channels per second
- **SEARCH RATE** 15 channels per second
- **MEMORIES** 10
- **FEATURES**
- **REVIEWED**
- **PRICE** £99.99

Uniden Bearcat 100XL Handheld Scanner



- **COVERAGE** 66 - 88, 118 - 174, 406 - 512MHz
- **MODES** a.m., f.m.
- **SENSITIVITY** For 12dB SINAD, 30 - 50MHz = 0.3µV; 118 - 136MHz = 0.8µV; 136 - 174MHz = 0.4µV; 406 - 512MHz = 0.5µV
- **SELECTIVITY** 50dB at ±25kHz
- **RESOLUTION** 5kHz
- **IMAGE REJECTION** -50dB
- **IF STAGE** 10.8MHz
- **AUDIO OUTPUT** 300mW at 10% t.h.d.
- **SCAN RATE** 15 channels per second
- **SEARCH RATE** 25 frequencies per second
- **MEMORIES** 16
- **FEATURES** Priority channel, keyboard lock, auto squelch and battery low indicator
- **REVIEWED**
- **PRICE** £189.99



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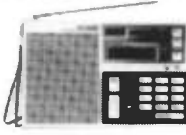
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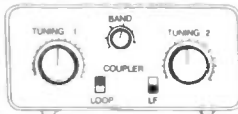
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