FOR THE RADIO LISTENER

shortwave magazine

ISSN 0037 - 4261

March 1993 £1.75

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short wave magazine

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Cover: The striking picture on our front cover this month was supplied by the RAF and shows the RAF Historic Flight with Avro Lancaster, Supermarine Spitfire and Hawker Hurricane. Our theme for this issue is, of course, Airband!
Photograph Crown Copyright Reserved.

features

regulars

good listening

editorial

SWM SERVICES

Subscriptions

Subscriptions are available at £21 per annum to UK addresses, £23 in Europe and £25 overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £36(UK) £39 (Europe) and £41 (rest of world).

Components for SWM Projects

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

The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service.

Back Numbers and Binders

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

Binders, each taking one volume are available for £5.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for p.c.b.s, back numbers, binders and items from our Book Service should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW,** with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole (0202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (0202) 659950.

I know that many of my readers are getting very worried about the way in which it appears that scanners could be banned in the wake of the recent tapes of alleged telephone conversations made by members of the Royal Family. Some of your letters are printed in this issue and on page 12 you will find an Open Letter to the Home Secretary. I suggest that you use this as a model and write to both the Home Secretary and your local MP yourself. Only by all working together will we be able to alleviate the harm done to our hobby by the actions of a handful of greedy and senseless people. There is no reason at all for he government to ban scanners - legislation is already in place to allow them to deal with any problems - if only they would use it.

Picketts Lock

Following the very successful *SWM* SSB Utilities Clinic at the Leicester Show, Mike Richards has agreed to run a *SWM* Decode Clinic on our stand at the London Amateur Radio Show at Picketts Lock.

RadioLine

Now that the new-style RadioLine is up and running, are you listening in regularly? If you are not bothering to dial the RadioLine number you will not only be missing out on useful information, but you will be loosing the opportunity to enter the competitions and win valuable prizes. If you are a subscriber then it is even more important that you listen in - nobody claimed the reward in January so it was still up for grabs as I was writing this. What was It? Oh, nothing exciting - just a £100 voucher to spend with SWM!

Dick Ganderton G8VFH

letters

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

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

Those Tapes

Dear Sir

The 'true' story of those tapes you're hearing about!

It was a dark winter's night in '89 when Tarquin was on watch at GCHQ, still smarting from that DX scoop young Smith in Morse Section had got with one of those new-fangled scanners.

"Hell, Penguin Island was a oncer and my Eddystone 840 hadn't even whistled on that frequency, even though we both used the same antenna. Hate Scanners! Hate Scanners! and Scanner Operators!" thought Tarquin.

"It's not DX, no dial tuning, no knob twirling, no guess-work!".

Then an idea hit Tarquin. GCHQ, The Home Office, DTI as well as the RIS all have a headache over both the media and scanner operators.

"A chance to get even, do the country a service, maybe a gong, or better - Sir Tarquin sounds OK".

Slowly the plan took shape. Why not broadcast a tape of 'Sir' - Tarquin hated him, too - talking to that sexy Sam from the escort agency. Hopefully, if broadcast on successive nights it would be picked up and passed on to the tabloids.

Off he went to the 'ears only monitoring bunker', down in the basement, to get the cassette.

"Hell, so many to choose from, Number 2 from Middlesex will do", thought Tarquin. "How easy, just re-broadcast over the cellular frequencies".

Too late! It's not 'Sir', but 'Him' talking to the bar-maid at the Hounds' Breath. "Even better, hope some-one hears this," thought Tarquin.

Some 3 months later, young Smith mentioned a 'phone conversation he'd taped one night. Tarquin mentioned that perhaps Smith should let the media know, might be some 'big bucks' in it. Nothing happened for 18 months, then all hell broke loose. MI5 investigated and Smith was cleared. The law stated it was over 6 months old and no use under Section 42.

The DTI and the Home Office banned the sale of scanners, except those on h.f. and w.b.f.m. 88-110MHz. All short wave listeners were exposed as traitors by a spokesman for the RSGB in a *Telegraph* article. Smith received a knighthood and Tarquin was given a new job on £100k and a CBE. Finally, the BBC World Service was defunct as no-one was left to send in for QSL cards!

D.A. McKenzie, London

letters

Scanners to be Banned?

Dear Sir
With reference to the item in the *Sunday Mirror* 24/1/93 headed "Squidgy bugs are banned".

The Home Secretary, Kenneth Clarke, states he will outlaw scanners before the end of the year.

This must be the most blatant display of face saving cover-up ever. Why should we be singled out as law-breakers when it is apparent to anyone that understands our hobby that the so-called 'Squidgy' recordings were not recorded by a short wave listener. Do not let this ill-informed man put a stop to our fascinating hobby and force the collapse of *Short Wave Magazine*, as without scanners we will not want to read *SWM*.

So, please let us all stand fast together and not let this happen, let every reader put pen to paper and let all of our wishes be heard.
Peter Reeves
Kent

Dear Sir
Following the 'Squidgy bugs are banned' clip from a Sunday paper with Kenneth Clarke about to ban scanners. This is just a face saving move by him after the recent publicity, although he admits that scanners were not involved.

Will owners who bought them legally be compensated? How will this affect amateur radio users? What will the impact be on the industry? Lastly what of the future of the magazine?

It is up to *SWM* as a national magazine to unify all the users in the country in a petition. Could you format an open latter, stating our objections and the facts - I am sure that you could word this better than any of us - and publish in the magazine with spaces for names and addresses. Then all your readers would be encouraged to send a copy to Kenneth Clarke and also their own MP.

This type of protest has worked in the motorcycle world when the government tried to impose unrealistic restrictions the national motorcycle papers organised it to the surprise of some MPs, who had more letters than votes in their last election!

Please help us save our hobby.
R.I. Warren
Kent
Ed: See page 12, SWM *is making a stand - who will join us?*

What was it?

Dear Sir
Re the letter from John Redmond, in the January edition, I think I know what the piece of equipment is.

I was a Royal Signals wireless operator in the late 1940s, and, if memory serves me correctly, it is the top of a military Telephone D Mk V. The box of 'electrical equipment' is actually a Mk 1 Buzzer Unit, which serves as a speech transformer, and an a.c. generator. It has six terminals, outputs 1 & 2, Plus, Minus, Mic and Receiver. It is centre-tapped for anti-sidetone. I have still got the notes I took during training so many years ago.
Ted Wickett
Birmingham

Dear Sir
In reply to John Redmond's letter, the board is in fact part of a field telephone, field telephone set D, which came in a metal box complete with a single earphone headset and a micro-telephone handset. To call the exchange and/or other users direct, the Morse key was either depressed which either jerked the eyeball or made an appropriate buzzing noise in both the earphone and earpiece on both the called and sender's telephones. The buzzer tone could be adjusted by tuning the two knobs on the box to the right of the drawing. The field telephone could also receive conventional calling signals via the magneto bell, seen to the left of the drawing. Line connection was via the two terminals L1 and L2 or E seen to the left of the drawing. Single line could be used using earth return to complete the circuit, via the L2 or E terminal.

I hope this information will be helpful. Incidentally, I am missing the handset, together with connecting cord and 4-prong plug, from my telephone and would like to purchase same from any reader who may have one in his junk box.
R M Templeman
Rickmansworth

Dear Sir
I have renovated two of the Telephone Set Type D as mentioned by John Redmond, and these are ideal for a portable radio station. When cleaned and correctly adjusted they are a pleasure to use and have a nice feel when operating them. For its use as a 'Press-to-Call' switch, this key with its some 36 component parts must have attracted considerably higher production and assembly costs compared with those Morse keys provided for military wireless operators; something of an anomaly in my opinion!

If John Redmond would like an empty case for a Telephone Set Type D Mk V (minus Morse key and other components) he is welcome to give mine a good home for the carriage cost of 4kg of metalwork. The case includes the metal plates showing the circuit diagram and operating instructions.
Dave Rycroft
Weston-super-Mare

SWLs, what are they?

Dear Sir
Under the heading 'It wasn't us. It was them', The *Daily Telegraph* for January 16 dealt with the mis-use of scanners in an interview with Peter Kirby, General Manager of the Radio Society of Great Britain. Among other things, we were told that radio hams build their own equipment, something that I think used to apply to most Russians. I wonder who buys the wide variety of rigs advertised in the magazines! From time to time one does hear about some 'home-brew', but it is more often about the purchase of a better ready-made rig. It would be interesting to collect some facts about the above.

Peter Kirby also states that hams greet one another by number (as in the boating lake when the time is up?). I thought they used a christian name in conjunction with the callsign.

Then followed the placing of hams in groups as follows:
1: Those operating with a licence via the examination
2: Those operating under Citizen Band conditions
3: The Johnny-come-lately scanners.

From this you will gather that the RSGB has no consideration for short wave listeners, assuming we think of ourselves as hams.

There are usually valid reasons for us not obtaining the licence.

I would like to know the opinion of other readers regarding Peter Kirby's attitude and for myself think it is typical of my experience in the past. Having joined the Society by sponsor I found them rather unhelpful with a wrangle about subs and no representation regionally and later left, directing my problems to the magazines with better response.

Finally, I would like to express my thanks for the welcoming attitude of the majority of 'real hams' when I have contacted them by post or 'phone. One prized contact was with Andy on the Rothera Base in Antartica when he followed up by bringing along a slide show after he had failed to reply to my letter.
Bill Solley, Bristol

Oops!

Deak Sik
I enjoy youk magazine, and find the content useful and pkactical. In the Januaky issue, I especially lired, and found the akticle about decoding Mokse intekesting, but noted one small ekkok. It was only a small one, I rnow, bdt it could, in cektain cikcdmstances, become moke noticeable, and indeed could even on occasions cause confusion!

Othekwise, please keep up the good wokr.
Geoff Crowley
Iceland

grassroots

Club Secretaries:
Send all details of your club's up-and-coming events to: Lorna Mower, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Please tell us your County and keep the details as brief as possible.

rallies

* Short Wave Magazine & Practical Wireless in attendance

***March 13/14**: The London Amateur Radio & Computer Show will be held at Picketts Lock Centre, Picketts Lock Lane, Edmonton, London. There will be a large trade presence, free parking, lectures, disabled facilities, Bring & Buy and Special Interest Groups. **Tel: (0923) 678770.**

March 13: Lagan Valley ARS will be holding their annual Hamfest at 1130 in the Nurse's Recreational Hall, Lagan Valley Hospital, Lisburn.

March 14: Wythall Radio Club will be holding their annual radio rally at Wythall Park, Silver Street, Wythall. Doors open from 11am to 5pm. The usual traders in three halls, and a bar and frefreshment facilities will be available. In addtion there will be a Bring & Buy. Talk in on S22. Admission 50p. G0EYO. Tel: 021-430 7267.

March 28: Pontefract & DARS 13th Annual Components Fair & Springtime Rally will be held at the Carleton Community Centre. Doors open 11am to 4pm. Admission by prize programme, 3 prizes plus free prize draw for lady visitors. Traders, Bring & Buy, Bookstall, licensed bar, hot or cold snacks. Free car parking, 2m talk-in. Car boot spaces will be available. **G0NQE. Tel: (0977) 677006.**

March 28: Bournemouth Radio Society's 6th Annual Sale at Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open 11am to 5pm. Talk-in from G1BRS on 2m S22. Amateur radio and computer traders, clubs and specialised groups. Excellent refreshments. Admission £1, including free raffle tickets. **Ian G2BDV. Tel: (0202) 886887.**

April 18 Marske-by-the-Sea Radio Rally will be held in the Marske Leisure Centre, High Street, Marske-by-the-Sea near Saltburn. Doors open at 11am. There will be the usual traders, a Bring & Buy and refreshments. Talk-in will be on S22. **Mic G7ION. Tel: (0287) 610030.**

May 3: The Dartmoor Radio Club Rally will be held at a new and larger venue, the Yelverton War Memorial Village Hall, Meavy Lane, Yelverton, Devon. Doors open 10.30am with Talk-in on S22. **Ron G7LLG. Tel: (0822) 852586.**

June 6: The Spalding & DARS are holding their Jubilee Mobile Rally at Springfield Gardens, Spalding. T Kettlewell. Tel: (0775) 722940.

June 27: The 36th Longleat Amateur Radio Rally, Longleat House, near Warminster, Wiltshire. Shaun. Tel: (0225) 873098.

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

Co. Antrim

Lagan Valley ARS: 2nd Wednesdays, 7.30pm. Harmony Hill Arts Centre, Harmony Hill, Lambeg, Lisburn. GI0GDF, QTHR.

Avon

***RSGB City of Bristol Group**: last Mondays, 7pm. The Small Lecture Theatre, Queens Building, University of Bristol, University Walk, Bristol. March 29 - Radio Servicing by Castle Electronics. Dave Bailey G4NKT. (0272) 672124.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. March 3 - Resuscitation & First Aid, 10th - WARC Bands Activity Evening, 17th - Amateur Wine Making, 24th - Members Quiz Evening, 31st - Voice Your Opinions. Len Baker. (0275) 832222.

CORNWALL

Cornish RAC: 7.30pm. The Village Hall, Perranwell Station, Perranwell, Nr Truro, Cornwall. March 4 - Power Supplies by G3VWK, 9th - Activities Night, 15th - Computer Section. Geoff. (0209) 820836.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. March 3 - Junk Sale, 10th - The Robin Hood & Ivanhoe Lines by Stuart Smith of Regional Railways, 17th - Night on the Air, 24th - AGM, 31st - Around the World in 43 Days by G4MHB. Richard Buckby. Ambergate 852475.

DEVON

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. March 19 - Talk by the RNLI. Walt G3HTX. (0803) 526762.

EAST SUSSEX

Hastings E&RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey Close, Hastings. March 17 - AGM. Reg Kemp. 7 Forewood Rise, Crowhurst.

GREATER LONDON

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. March 16 - Low Power Field Day. Colm Mulvany G0JRY. 081-749 9972.

Edgware & DRS: 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. March 11 - Bring & Show Evening, 25th - Morse Training Evening. Hank Kay G0FAB. (081-205 1023).

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. March 11, Rig Check by G4DFB, 25th - Cartography at Kings College, London. Brian Shelton G0MEE. 081-360 2453.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. March 12 - SWR Measurements, 26th - Secret Listeners by G8DIU. Chris Frost. 081-397 0427.

GREATER MANCHESTER

South Manchester RC: Fridays, 8pm. The Community Centre, Norris Road, Sale. March 5 - DF Preparation, 12th - Tracking in ZL, 19th - Surplus Equipment Sale, 26th - Packet Radio by Mike Mansfield. G7FQY. 061-969 1964.

HAMPSHIRE

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. March 4 - Control & Communications/First Action First Aid by the Hampshire Ambulance Service. S.W. Swain. (0705) 472846).

HEREFORD & WORCESTER

Bromsgrove & DARC: Fridays. Avoncroft Arts Centre, South Bromsgrove, Worcester. March 12 - AGM. Joe Poole. (0562) 710010.

HERTFORDSHIRE

Dacorum AR & TS: 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. March 16 - Junk Sale & Blue Smoke Evening. Dennis Boast. (0442) 259620.

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. March 4 - Natter Night, 18th - Operating in Sri Lanka by G0LUH. Roy G4UNL. 081-804 5643.

Verulam ARC: 2nd & 4th Tuesdays, 7.30pm. RAF Association Headquarters, New Kent Road, St Albans. March 23 - Good Radio Housekeeping by G3JWI. Walter Craine. (0923) 262180.

KENT

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

***Sevenoaks & DARS**: Sevenoaks DC, Council Offices, Argyle Road, Sevenoaks.

West Kent ARS: 3rd Fridays, 8pm. The School Annex, Albion Road, Tunbridge Wells, Kent. March 5 - Informal Meeting, 19th - The History of Amateur Communications for the Kenya Safari Rally by G3GWD. John Taylor G3OHV. (0892) 664960.

NORFOLK

Dereham ARC: 8pm. St John's Ambulance Hall, Yaxham Road, Dereham. March 11 - Strange Noises on HF Explained! Mark Taylor G0LGJ. (0362) 691099.

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. March 3 - History of Television in Pictures by G4UUB, 10th - Practical Oscilloscope Part 1 by G3PTB, 17th - Weather Charts De-Mistified by G3YLA, 24th - Practical Oscilloscope Part 2 by G4EOL, 28th - Surplus Equipment Auctions/Bring & Buy, 31st - Informal & Committee Meeting. Sheila Snelling G0KPW. (0603) 618810.

NOTTINGHAMSHIRE

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. March 4 - The British Repeater Network by G8SSL. Mary G0NZA. (0623) 755288.

SOUTH YORKSHIRE

Barnsley & DARC: Mondays, 7.15pm. Darton Hotel, Station Road, Darton, Barnsley. March 1 - On the Air Night, 15th - Junk Sale, 22nd - AGM. Ernie G4LUE. (0226) 716339.

STRATHCLYDE

West of Scotland ARS: Fridays, 8pm. Garnethill Multi-Cultural Centre, Rose Street (Off Suchiehall St), Glasgow. March 13 - Has CW Had its Day Debate, 26th - DFing with a Difference by the Ordance Survey. Jack Hood GM4COX. (0698) 350926.

SUFFOLK

Sudbury & DARC: 1st Tuesdays, 8pm. The Five Bells Inn, Great Cornard, Sudbury. March 2 - Natter 'n' Noggin Night at the Five Bells, Great Cornard. Colin Muddimer. (0787) 77004.

WARWICKSHIRE

Stratford upon Avon & DARS: 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford-upon-Avon. March 5 - Open Forum, 12th - Construction at Fairham College, 19th - VHF Linear & PSU Design by G6ABU, 26th - On the Air Night. A. Beasley G0CXJ. 060-882 495.

WILTSHIRE

Trowbridge & DARC: 3rd Wednesday. The Southwick Village Hall, Southwick, Trowbridge. March 3 - Direct Conversion RX by G0BBL. Ian G0GRI. (0225) 864698.

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

junior listener

Equipment Advice

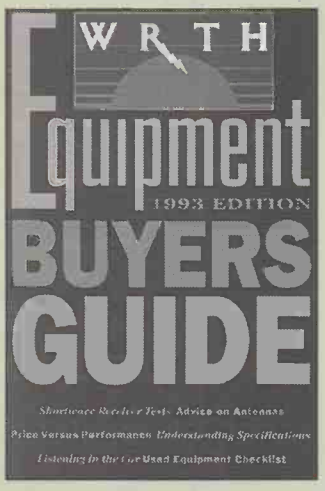
As I have said before, probably the most difficult decision ever made by a radio listener is which radio to buy. I'm sure that most of you have heard of the *World Radio TV Handbook*, well they have brought out a book to help you make that decision. The yearly edition of *WRTH* only publishes reviews of sets that have appeared in the previous 12 months, but this new book has collated the reviews since 1987 and, in some case, re-tested upgraded models.

The chapters cover, amongst other things, such subjects as:

Where to Buy a Receiver
Steps to Picking the Right Receiver
Sorting Out Reader Specifications
Antenna Reviews
Receiver Test Results
Radio Related Computer Software
Contact Addresses

Just to finish the book off, there is a prize competition, you could win a digital portable receiver to the value of $300, or cash equivalent. You just have to answer the five questions at the back of the book and send your name, address and answers to *WRTH*. Nothing simpler. Oh yes, you have to do this by August 15.

You'll see an advert for the book elsewhere in this issue as I have been reliably informed that *SWM* will be stocking the book in the *SWM* Book Service.



Radio Habana Cuba

Just a quick note to let you know Radio Habana Cuba are running two competitions. One is related to Cuban Health Tourism and the other to the islands most important tourist sites. The deadline is September 30 and the winners will be awarded all expenses paid trips to Cuba - not a bad prize really. To find out what you need to do, you have to write to **Radio Habana Cuba, PO Box, 6240, La Habana, Cuba**.

Novice Licence Changes

The Radiocommunications Agency have completed their review of the novice licence scheme for radio amateurs.

A number of improvements, especially to the examination questions, have already taken place. The other changes are to the frequency allocation, there's still no 144MHz or 2m allocation - that's the bad news. But the good news is that some allocations have been increased. The 3.5MHz and 28MHz allocations have been increased so that Novices can use the accepted low power frequencies. The, the 50MHz allocation has been increased so that Novices can use Morse and 'phone as well as data. Finally, the 430MHz band, or 70cm, has been increased to allow Novices to use s.s.b., slow scan TV and fast scan TV.

Who knows the 2m allocation may not be far away.

Novice Award

Keith Goodwin 2M0ACT is the first recipient of the G-QRP Club Novice Award. He's used 3 watts to make 50 contacts, which include 7 with North America (W) and Canada (VE), two with Indonesia (YC) and a total of 12 DXCC countries.

Keith can usually be found, most evenings, on 3.565-3.570MHz between 2000-2100. He invariably works a minimum of one contact a night and his logbook confirms he is quite adept at recognising/reading signals in some most frustrating band conditions. He now has over 300 contacts to his credit and continues to chase awards.

Keith is just 12 years old, yet passed his Novice City & Guilds at 11 and then his c.w. exam at 12 w.p.m. in June last year.

The photograph shows Keith borrowing his dad's Ten Tec whilst his own rig is away for repair.

Have we got any other novice licensees out there achieving great things? If so let's hear from you.

Radio 1 FM

I'm sure that many junior listeners are Radio 1 FM listeners too. Well, if you live in Sheffield you can now receive the stereo f.m. transmission. You have to tune into 99.5MHz. The transmitter is at Tapton Hill, not far from Sheffield city centre.

DX Tips for Free

The English language service of KNLS recently began airing a series of articles for those who are new to DXing. *DX Tips for Beginners* is written and recorded by Carl Mann, he's a veteran news reporter and has been DXing for more than 20 years.

Now a new printed version of *DX Tips for Beginners* is available. It's a 32-page book, containing twelve of Carl Mann's radio articles and has been printed for KNLS by Universal Radio Incorporated.

This book is free, but write quickly as they only have a limited number of copies. Failing that, if you'd like to write to me and tell me about your best DX, the first letter to arrives gets the copy I have here - and a very interesting read it is too! **KNLS, Anchor Point, Alaska**.

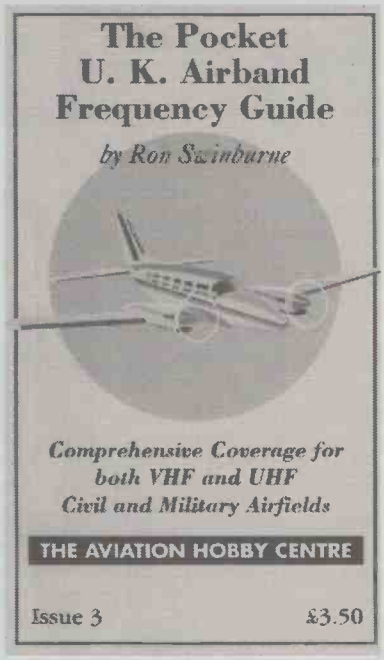
news

Frequency Guide

The UK Pocket Frequency Guide, 3rd edition is a small (just 90 x 153mm!) booklet containing coverage for both v.h.f. and u.h.f. civil and military airfields and frequencies. The first half of the book is an alphabetical list of airfields with their appropriate tower, ground, approach, etc., frequencies. The second half of the book contains UK ATTCC airways frequencies.

The guide costs £3.50 plus 24p for P&P.

The Aviation Hobby Centre, 1st Floor, Main Terminal, Birmingham International Airport B26 3QJ.



London ARS Lectures

Saturday March 13

1200-1400: DXpeditioning Pacific & Africa by Roger Western G3SXW.

Recalling two of his many DXpeditions, Roger Western gives an insight into operating from faraway and rarely activated countries. The talk includes a multi-media display and will give those who are considering mounting a DXpedition much to think about in terms of planning, operating techniques, managing pile-ups, log-keeping and QSLing.

1400-1600: Computer Logging by John Linford G3WGV.

Covering everything from the legal requirements of computerised logging through to the principles of operation, this talk will also touch upon the statistical and database functions that can be obtained from modern, computer logging software.

Sunday March 14

1200-0200: The Colour TV Repeater for London by Adrian Hurt G0OJV.

Following an introduction to ATV, the speaker will cover the development of an actual ATV repeater, including siting and technical considerations, but with particular emphasis on equipment building. The talk will also cover the conversion of satellite TV receivers to ATV, with a view to demonstrating how easy it is to get going on ATV.

1400-1600: Morse Clinic by Ron Ray G3NCL and Jim Lycett G0MSZ

This multi-faceted talk will start with the design theory behind Morse keys. The relative merits of different types of Morse keys will be discussed, as well the setting-up of them. This will be backed-up with hand-outs. Ideas about learning the code will be followed by a practice QSO, so bring your key!

Archimedes Programs

Steve Hunt G3TXQ has a selection of amateur radio software available for the Archimedes. A Morse tutor, an antenna designer, frequency prediction and filter design programs are available on a compilation disk priced £9.95 inc VAT and P&P. For further details, send and s.a.e. to **21 Green Street, Millton Malsor, Northampton NN7 3AT.**

International Marconi Day

The arrangements for the 1993 International Marconi Day, April 24, are now well in hand. Twenty-one stations are taking part this year. To claim the Marconi Day Certificate, stations must work 12 of the special stations. Any claims should be made to **PO Box 100, Truro TR1 1RX**, who will also act as a clearing centre for QSL cards. An s.w.l. award is available for hearing and logging 12 special stations. The cost of the award is $8, £3.50 or 12 IRCs and for the s.w.l. section, $5, £2.50 or 8 IRCs.

GB4IMD - Truro, Cornwall
GM0MID - Poldhu Marconi Site, Cornwall
GB0IMD - Isle of Wight Marconi Centre
GB2IMD - Rathlin Island Marconi Site, N. Ireland
GB2MDI - Marconi Site on Salisbury Plain
GB2MID - Sandbanks Marconi Site, Poole
GB0SFL - South Foreland Lighthouse Marconi Centre
CT1TGM - Tertulia Radiomadoristica Gugleimo Marconi, Coimbra
EI2IMD - Crookhaven Marconi Site, Eire
EI4IMD - Galway Marconi Site, Eire
DA0IMD - Borkum Island Marconi Site
IY0TCI - Civitavecchia
IY1TTM - Sestri Levante
IY4FGM - Villa Grifone, Pontecchio
IY0GA - Golfo Arancci, Sardinia
ZS6IMD - Johanesburg
VO1IMD - St Johns, Newfoundland
VE1IMD - Glace Bay, Nova Scotia
K1VV/IMD - Cape Cod Marconi Site, Mass
N2FCZ/IMD - Babylon Marconi Memorial Site, New York
KK6H/IMD - Marshall Marconi Park, California

New Shop

January saw the official opening of Norcall's new retail showroom in central Northampton. Specialising in all forms of wireless communications systems, Norcall are offering sales and service facilities for CB, amateur and business users alike.

Both new and used transceivers, receivers and associated items are available. The shop is open Monday to Saturday, 9am to 5.30pm and can be found at **Victoria Chambers, 1 Victoria Road, Northampton. Tel: (0604) 26283** - 24hr answerphone.

news

N.E. Systems

On Thursday January 28, Mr T. Cooper of N.E. Systems was charged with various offences including obtaining property and money by deception and impersonating a police officer. He was remanded on bail to appear at Highbury Magistrates Court.

We recently carried a series of advertisements for this company and would appreciate hearing from anyone who responded to them. Please write to the *SWM* Advertisement Manager, **Roger Hall, at PO Box 948, London SW6 2DS** with full details and we'll keep you informed of any further developments.

VA1S Certificates

From 1 December through 31 December 1992, the Marconi Amateur Wireless Society operated a special event station VA1S. Operation was on all bands s.s.b. and c.w. Approximately 10 000 QSOs were made to all parts of the world.

The event commemorated the 90th anniversary of the first successful transatlantic west to east transmission made by Marconi from Glace Bay, Nova Scotia to Cornwall on 15 December 1902. The callsign VA1S is similar to the callsign VAS which was issued to Marconi for his station at Glace Bay.

The cost for the certificate, which is different to 1991's, is $4 or 8IRCs. Applications may be made to **Marconi Amateur Wireless Society, 846 George Street, Sydney, NS B1P 1LP, Canada.** Certificate request need not include a return envelope. QSL requests should include a minimum of return postage and a self-addresses envelope.

Royal Air Force 75th Anniversary

The Royal Air Force celebrates its 75th birthday on April 1!

To commemorate this momentous occasion a Royal Review will take place at Royal Air Force Marham on April 1, where the Queen and other members of the Royal Family will be shown the past, present and future of the Royal Air Force.

There will be 850 personnel on parade, including members of the Air Training Corps and the Royal Air Forces Association, and there will be a spectacular flypast involving 148 aircraft including a Red Arrows flypast with the aircraft vertically stacked in a '75' formation.

In addition, the Royal Air Force North Luffenham Amateur Radio Club (G6RAF/G3TCQ) will be on air for 24 hours and April 1 from 0001 hours to 2359 hours using an appropriate Special Event Callsign (hopefully GB75RAF) and QSL cards will be available.

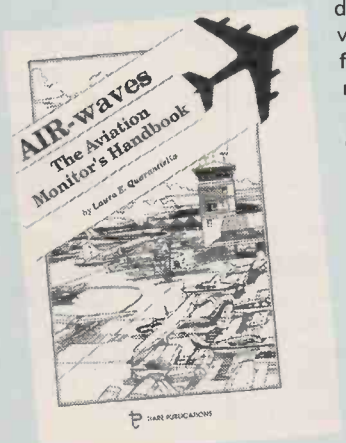
It is hoped that the station will participate in all RAFARS nets on the day with as many other Royal Air Force Amateur Radio Clubs as possible.

Help will be needed on and around the day and it is intended to invite all serving amateurs to Royal Air Force North Luffenham to aid in operating and/or setting up the Special Event Station. Visitors will, of course, be welcome on the day but, as space is fairly restricted in the club house, prior notice would be appreciated.

Rob Luckham. Tel: (0780) 720041 ext 7283 or Mark Havard G6UYT ext 7455.

New Airband Book

AIR-Waves - The Aviation Monitor's Handbook is a new American guide to tuning the aviation bands and understanding what's being heard. The book discusses the whole field of v.h.f./u.h.f. aero communications, from airport identifiers to runway numbering. Chapters cover airspace, the airport, air traffic control services, air navigation radio aids, radar transponder terminology, airport emergency communications, aviation weather, other frequency types, air to ground telephones, aviation charts amongst others.



The books costs $17.95 plus $3 postage (Access and Visa are welcome) from **Tiare Publications, PO Box 493, Lake Geneva, WI 53147, USA.**

Flying High

BBC World Service Television has added a new high-flying audience to its millions of viewers on the ground. Now, passengers on all international Lufthansa flights will be able to keep up-to-date with the latest world events with BBC World Service Television. The news will be recorded live off-air and dubbed into German. Translations will be monitored by BBC World Service's German Service.

The arrangement - made with Clintec Airline News, based in Frankfurt - marks the fourth major in-flight entertainment deal for BBC World Service Television. Currently, Cathay Pacific, British Airways and Royal Brunei also carry the service.

Stolen

Back in October, an expensive (and very desirable) receiver was stolen from the Edinburgh area. It was an Icom IC-R9000 receiver, serial No. 01060. Any information should be sent to **Lothian & Borders police, Tel: (0506) 31200**, PC M Forsyth PC3467 is dealing with it. It's the big radio with spectrum display and 30kHz - 2GHz coverage, worth over £4000.

LOWE ELECTRONICS

Bringing the world to your home

WORLD BEATING SHORTWAVE RECEIVERS

LOWE HF225

Everybody loves a winner! It probably came as no surprise to owners of the HF225 when our receiver won yet another award. After all, they are already appreciating the excellent sensitivity, superb IF filtering and the remarkable ease of operation. Add a keypad for direct frequency entry, an active whip antenna, synchronous detection and FM unit and you have one of the most versatile receivers on the market today – significantly less expensive than some of its far eastern competitors!

HF225.....**£479.00**
HF225 EUROPA.....**£699.00**
(A very special limited edition – telephone for details)

LOWE HF150

Small, but perfectly formed, the HF150 is really establishing itself as a premier receiver for serious listening. It's complete with selectable sideband synchronous detection, three AM bandwidths and SSB filtering optimised for DXing utility stations. But we don't just stop there. We've just made it a lot more useful by launching a quick release mobile mounting bracket, and now we've added computer control for complete versatility. Call at any of our branches for full details.

HF150.....**£359**

THE BEST OF THE REST...

KENWOOD R5000

Despite its age, still proving a tough, reliable HF receiver. IF Shift and Notch controls allow you to process the incoming signal and narrower CW and SSB filters are available for those who need them. Now the only shortwave set with provision for installing a VHF converter. (And our unique two year warranty!)

From.....**£949**

ICOM R72E

An ideal choice for those who need lots of memory channels and scanning facilities. FM can be added as an option as can narrower CW filters. DDS technology ensures smooth tuning. Direct frequency entry from the keypad, clocks and timers enhance the operation.

R72E.....**£759.00**

JRC NRD535

Probably the finest receiver available today. Designed to give you total control of the incoming signal, its many features include pass band tuning, notch filters, noise blankers, dedicated data modes including FAX and built in RS232 interface for computer control via our Multiscan software.

From.....**£1395**

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BOURNEMOUTH
27 Gillam Road,
Northbourne,
Bournemouth
BH10 6BW
Tel: 0202 577760

Dave G4KFN at
NEWCASTLE
Newcastle Airport,
Woolsington,
Newcastle Upon Tyne
NE20 9DF
Tel: 0661 860418

Tony G4CYE at
BRISTOL
79/81 Gloucester Rd,
Patchway,
Bristol
BS12 5JQ
Tel: 0272 771770
NEW

Fred G4RJS at
LONDON
223/225 Field End Road,
Eastcote,
Middlesex
HA5 1QZ
Tel: 081 429 3256

Tony G4NBS at
CAMBRIDGE
162 High Street,
Chesterton,
Cambridge
CB4 1NL
Tel: 0223 311230

Sim GM3SAN at
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Cumbernauld Airport,
Cumbernauld,
Scotland
G68 0HH
Tel: 0236 721004

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Beryl G7LME, Julie
Tom G6PZZ, Richard G3OQT
John G3PCY

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

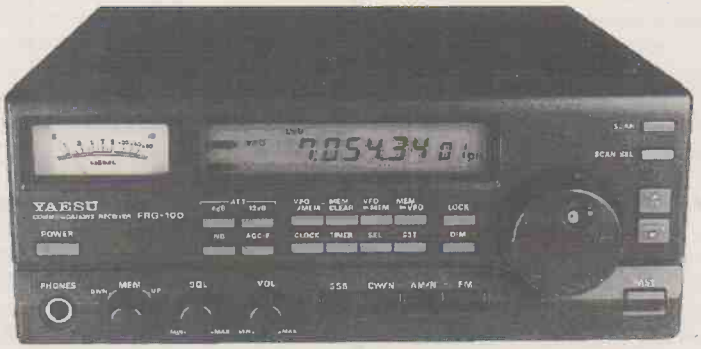
Steve G6URJ
KENT
Chatham Road,
Sandling,
Maidstone
Kent ME14 3AY
Tel: 0622 692773

Tom G4LAR at
LEEDS
34 New Briggate,
Leeds,
LS1 6NU
Tel: 0532 452657

Steve G1WSY at
HEATHROW
6 Cherwell Close,
Langley,
Slough, Berks
SL3 8XB
Tel: 0753 545255

NEXT?

NEW! YAESU FRG100



A new receiver from Yaesu has been a long time coming and the FRG100 sets a new standard from this manufacturer. Broadcast listeners may like the 6 and 4kHz bandwidths and the fifty memory channels will store both frequency and mode.

Seems good value at.....**£499**

LOWE NEWS!

Seems we forgot to tell SWM readers about our new branch! A few months ago, we formally adopted KW Communications of Maidstone into our branch network, bringing Lowe sales and service to the south east for the first time. Now under control of our latest recruit, Steve Jelly, G6URJ we look forward to meeting readers old and new there. Steve is currently upgrading the computer system there so we can demonstrate the full range of datacomms products.

As part of our expansion plans, our Bristol branch has also relocated to offer customers a larger demonstration area. The new address is shown opposite and a quick call to Tony, our manager there, will provide you with directions if you need them.

MULTISCAN

Computer control of receivers is a growing interest with many SWL's and as a result, Lowe Electronics have commissioned the Multiscan program for IBM PCs and compatibles. This is quite a sophisticated and versatile program offering a high level of control of functions depending on the receiver in use. It supports the current range of receivers from Kenwood, Yaesu, AOR, JRC and Icom's R7000 and R7100.

Multiscan features 2000 memory channels with dual VFOs and space for a fifty character "comment". Manual tuning can be accomplished with keyboard entry, up/down controls or by mouse control, together with mode change, filter selection, BFO control, passband tuning, noise blankers etc., depending on your receiver.

A spectrum analyser display is also incorporated, together with a comprehensive logbook and precompiled database of over 1000 entries. The database is fully editable, allowing you to create a number of files.

A datasheet is available but a demonstration at one of our branches allow you to see the full potential of thise excellent software.

MULTISCAN.....**£75.00**

RF SYSTEMS

This small company from the Netherlands has really turned on the world of shortwave listeners. Their products are highly innovative, extremely well made and offer great value for money – and what's more they work!

Comprehensive datasheets are available on all their products and we'll be happy to supply these on request.

Magnetic Longwire Balun.....**£39.95**
MLB Antenna Kit 1 (12.5m long)
.....**£66.95**
MLB Antenna Kit 2 (20m long) **£76.95**
MLB Marine (special MLB for maritime use).....**£54.95**
DXONE the ultimate active antenna
.....**£289.00**
DX7 Active antenna.....**£179.00**
T2FD Low noise antenna.....**£169.95**
DXListener.....**£249.00**

NEW! FROM RF SYSTEMS

THE MAGNETIC TRANSFER ANTENNA

Developed primarily for marine applications, the MTA is a passive antenna. Comprising of a 2m long, UV resistant, plastic pipe with stainless steel fittings, the MTA can be mounted in a variety of locations. It has a specially wound helical element designed for omnidirectional reception and is elliptically polarised to make the most out of transmissions vertically or horizontally polarised. Two versions are available: one covering 100kHz – 25MHz and the other 500kHz – 30MHz. We expect the price to be around £159.00. Full details on request.

The Sun - The Source

Part 5

In the penultimate part of this series Kevin Fox explains the relationship between sunspots activity and radio propagation.

Collins English Dictionary defines the word prediction as follows. "On a reasoned basis, foretell a future event". The keywords here are 'reasoned basis' and 'future event'. So, what exactly do we mean, in terms of h.f. propagation, by reasonable basis?

HF Radio Wave Propagation

The main problem with h.f. band propagation prediction is that there are simply so many variables which have to be taken into account for consistent success. You may of course ignore quite a lot of them and concentrate solely on trends, tradition or other peoples' word. But then of course, your accuracy will only be as good as your information. So, exactly what are these variables which have to be taken notice of? There are four basic types of ionospheric variation which directly influence your ability to place a signal into a certain country successfully at a particular time. These are:- day and night - summer and winter - geographical and cyclic (solar activity).

Day and Night

As the earth rotates the positions of the transmitting and receiving stations are moved into and out of areas of ionised atmosphere (sunrise/sunset). Ionisation of earth's atmosphere is greatest during the day and lowest at night. There is a further propagation mode known as 'greyline', which is the shadow area between evening/sunset and dawn/sunrise. For example, amateurs like to use the morning greyline as, within this dawn zone, daylight ionisation of the various layers is just beginning, whilst the D zone hasn't yet re-formed . Radio signals can and do travel over great distance along the path of the greyline, but obviously the receiving and transmitting stations must both be within the borders of the greyline to achieve maximum success (**Fig. 5.1**).

Summer and Winter

During winter in the northern hemisphere both F layers recombine at a reduced altitude of around 160 - 240km. During the summer, as the sun crosses the equator and the northern part of the globe receives sunlight more directly and for longer periods, earth's atmosphere swells outwards re-forming separate F1 and F2 layers again. The altitude of the F1/F2 layers (or the recombined F layer) is a vital component in the calculation used to ascertain the maximum usable frequency (m.u.f.) - see later; and as u.v. irradiation of earth's atmosphere varies seasonally this has to be included in any m.u.f. calculations.

Geographical

The concentration of u.v. irradiation arriving as a component of the solar wind varies with geographical location. Along the equator, where the sun is often directly overhead and the sun's rays pass through the minimum amount of earth's atmosphere, ionisation is very intense (**Fig. 4.1** Part 4). Ionisation around the polar regions is again weakest, due the the thickness of atmosphere the u.v. has to pass through, although this is offset to a certain degree by the polar magnetic fields which attract certain types of ions. No-one is quite sure how the polar magnetic fields effect ionised atoms, but just as polar regions show intense magnetic influence, equatorial regions of earth have the least amount of magnetic strength.

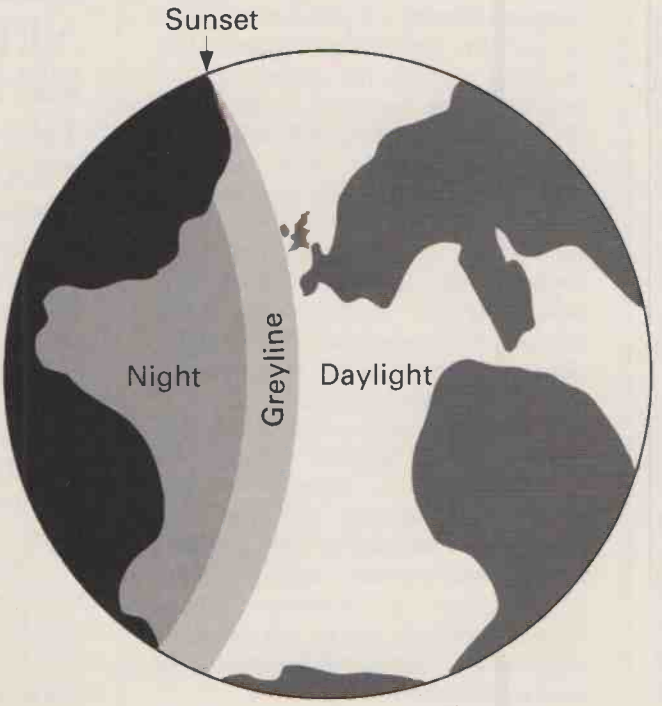


Fig. 5.1: The greyline effect.

Cyclic Changes

The ionisation effects discussed so far are variations on the amount of ionisation arriving at earth - where and when it is strongest, and why this is so. From now on we will be dealing with the actual driving force of ionisation itself which is responsible for the greatest changes in radio wave propagation. Cyclic changes on the sun have a profound effect on earth's atmosphere, and we've already discussed the most important ones, such as prominences and flares which causes the daily ebb and flow of the solar wind. Apart from changes on the surface of the sun, alterations in earth's magnetosphere also modify the solar wind, deflecting some of it away from the planet whilst entrapping other particles (see aurora etc.) Just as we use the height of the F layer in m.u.f. calculations, we must also add to this the actual number of observed sunspots so that we have a another figure to add to the equation. Don't worry what all these terms mean just yet. I'll be bringing them all together in a short while.

Counting the Spots

Sunspots have been under observation for a few hundred years. Indeed, Galilaeo was himself blinded by continuously looking at the sun through his telescopes (See my warning in Part 1). During the early days sunspot observers simply looked at the

sun's globe and counted how many spots they could actually see. This was (and still is) a very hit and miss affair because such observations depend on the visibility at the viewing site, the eyesight and experience of the observer and the geographical position of the observatory. New observation methods, whilst still having their basic roots in physically counting the number of spots, neatly sidestep these problems.

Spotting the Counts

An astronomer named Rudolph Wolf, who was for a time director of the Zurich Solar Observatory, realised the importance of accurately counting the number of spots during each eleven-year cycle for his work on solar mechanics. It's purely by accident that his method became the accepted way of counting the number of sunspots for use in radio propagation prediction. Wolf was very dissatisfied with the accuracy of the reports coming into the Zurich Observatory from around the world. Therefore he invented a new way of counting sunspots which would present him with the needed data in a standard format and also got rid of a lot of observational errors, improving enormously the accuracy of the spot counts. Even to this day, some sunspot data is often prefixed by the words Wolf Count in his honour.

Basically, Wolf's method took into account the experience of the observer(s), the sophistication of their observatory equipment, (for which he applied the 'k' constant); but most importantly of all made the absolutely vital distinction between single sunspots and groups of spots. Wolf's method was reduced to a formula which I've shown as DSN = k (10sg+ts). Where 'DSN' is the Daily Sunspot Number (also known as the Wolf number). 'sg' is the observed number of sunspot groups, 'ts' is the total number of sunspots seen (groups plus individual spots) and 'k' is the constant assigned to remove differences between observers and observatories.

Wolf was the first person to realise that solar activity and the 'strength' of the solar wind depended much more on groups of spots rather than individual sunspots. That's why he applied a weighting factor of ten to the number of observed spots groups to reflect their importance.

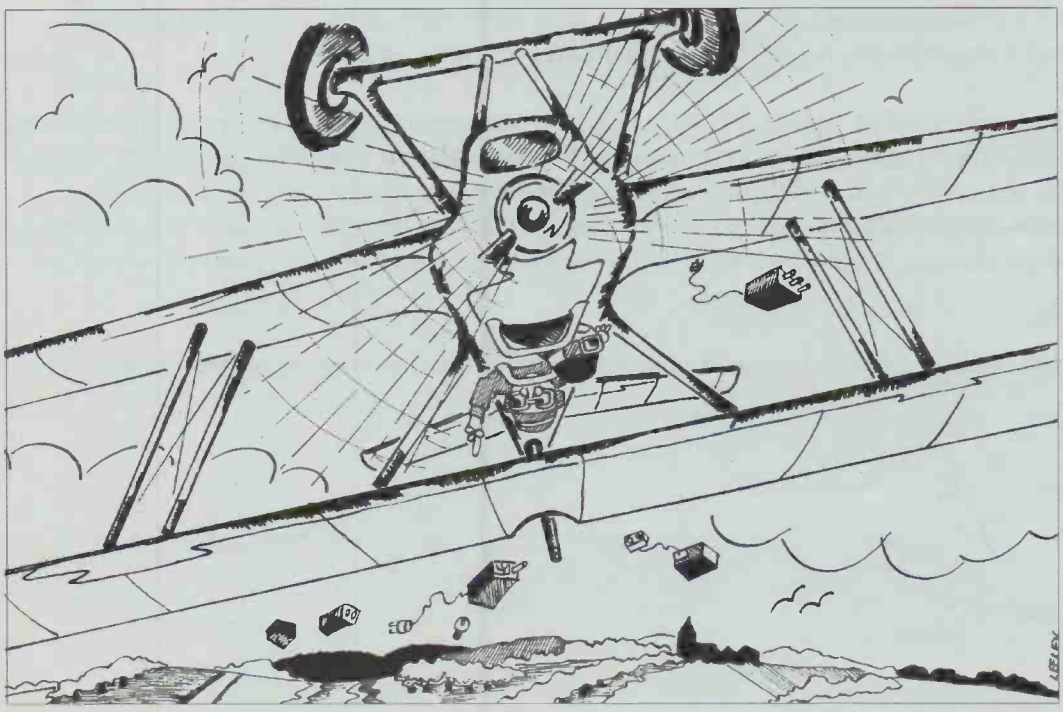
As you may now deduce Wolf's method was more of a daily index to solar activity rather than an actual count of the number of spots seen. Because the Zurich Spot Count was 80, it doesn't mean that if you looked at the sun you'd be able to see 80 actual sunspots. In 1981 responsibility for the daily sunspot count was moved from the Zurich Observatory to the Sunspot Index Data Centre at Brussels in Belgium.

Counting the Counts

Wolf's method of reducing all incoming sunspot data, whilst leading to greater accuracy, still left quite a lot of noise in the system. Although short-term predictions were pretty accurate, longer term predictions and trends were covered with 'system noise'. Another formula was introduced which smoothed Wolf's index over a twelve-month period. This long and rather boring formula (the details of which I won't burden you with) removed this 'system noise' and showed up much longer trends. We're all more familiar with this second formula as it is the one used by *Radio Communication* magazine each month. For example. "The predicted SIDC sunspot count for July, August & September is....."

■

In the final part we'll tie the ribbons on this fascinating subject by introducing two far more accurate methods of measuring solar activity on earth, information sources and the Miniprop h.f. propagation computer program.



Listen With Grandad

by Leon Balen and David Leverett

I know my new equipment needs airing but this is ridiculous!

Open Letter

An Open Letter to The Home Secretary

The Right Honourable Kenneth Clarke QC MP
Home Secretary
The Home Office
Queen Anne Gate
SW1H 9AT

Dear Home Secretary
I am becoming increasingly worried by reports in the press that you are seriously considering banning all types of scanning receivers. I sincerely hope that this is not your intention.

The readers of *Short Wave Magazine* all have one thing in common - they are interested, often passionately so, in radio. They might listen to short wave broadcast stations around the world - they could tune in to aircraft. On the other hand their passion might be for utility stations, satellites, amateurs, or even beacons to study propagation. In all cases it is not the programme content that draws them like moths to the flame, but rather the challenge of trying to pull in that elusive station under difficult conditions.

Scanning receivers offer the enthusiast the means to search for and store stations in the bands in which he, or she, is interested. The vast majority of scanner owners keep their hobby strictly to themselves and would not dream of divulging details of what they had heard to anyone.

The taped telephone conversations, which have received so much bad publicity and are probably the reason behind your thoughts on banning scanners, were recorded and passed on to the press by people with whom the real listening enthusiast would not wish to be associated. To make matters worse, the media insists on referring to these people as 'radio hams' - thus inferring that they are licensed radio amateurs. As far as can be ascertained, none of them hold amateur radio licences.

Enough legislation already exists to enable you to control the illegal use of any form of receiver without resorting to a blanket ban on one type. Would you be able to enforce such a ban? What about car radios? Most of these now have the ability to search, store and scan. What about the thousands of scanners already in use? As these were acquired quite legitimately, and in the vast majority of cases are causing no one any harm, would their owners be compensated by the Government if you were to impose a ban on scanners?

I do hope that you will not be rushed into making hasty and ill-founded decisions on this matter.

Yours sincerely

Dick Ganderton G8VFH

Dick Ganderton G8VFH
Editor, *Short Wave Magazine*

South Midlands Communications Ltd

Southampton *(0703) 255111* ***Leeds*** *(0532) 350606* ***Chesterfield*** *(0246) 453340*
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AWARD WINNER

'BEST COMMUNICATIONS RECEIVER 1992'

FRG-100

As awarded by the *World Radio TV Handbook* in their 1993 Radio Industry Awards. This is what they have to say about the new FRG-100 . . .

"Yaesu has succeeded in bringing improved technology and features within the price range of a much wider group of shortwave broadcast listeners. It has been a long time since Yaesu revamped their broadcast receiver but for many listeners it will be worth the wait! A good package at an affordable price."

WHAT MORE NEED WE SAY!

TRY ONE TODAY, YOU'LL NOT BE DISAPPOINTED

The widest range of receivers in the UK.

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9am–1pm Sat

Leeds *(0532) 350606*
SMC Northern
Nowell Lane Ind. Est.
Nowell Lane
Leeds LS9 6JE
9am–5.30pm Mon-Fri
9am–1pm Sat

Chesterfield *(0246) 453340*
SMC Midlands
102 High Street
New Whittington
Chesterfield
9.30am–5.30pm
Tues–Sat

Birmingham *021-327 1497*
SMC Birmingham
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Alum Rock
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9am–4pm Sat

Axminster *(0297) 34918*
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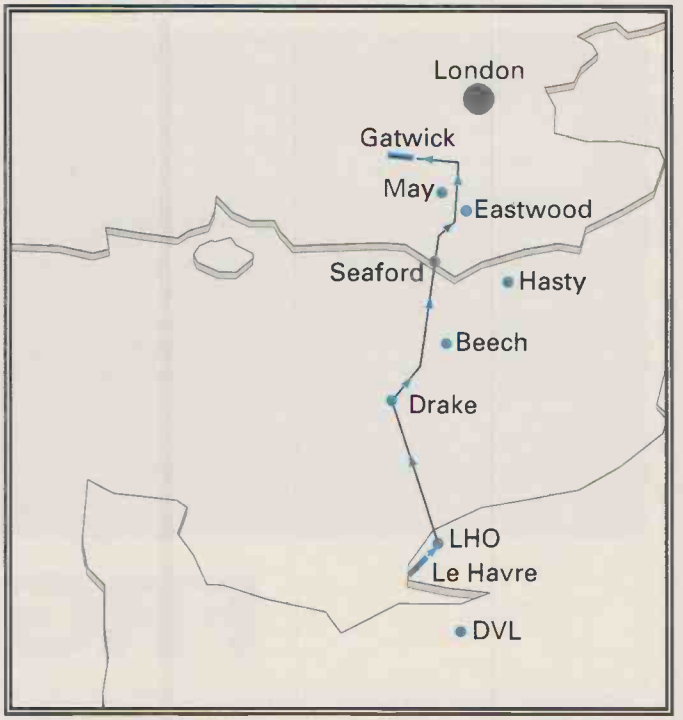
West Street
Axminster
Devon EX13 5NY
9am–5.20pm Tues–Sat

Le Havre To Gatwick

Airband columnist Godfrey Manning G4GLM tells the story of his cockpit trip from Le Havre to Gatwick.



Radio check complete - Le Havre Tower/Approach (119.15MHz) is readability 5 (maximum clarity). The Captain of our twin turbo-prop runs through the pre-start checklist, with only a momentary delay whilst the cargo hold door is made secure by the ground engineer. Even from my cramped jumpseat I can see the engineer walking round to the front of the aircraft to be in good view of the pilots. I'm just behind the central control pedestal, behind the crew, and if I'm not careful my knees bang the pilots' elbows as they reach back to adjust the trimmers. Very cosy!

"Whiskey Mike request start and taxi." We're cleared to start. The ground engineer holds a finger of one hand in the air (signifying No. 1 engine) and waves a finger on the other hand in a horizontal circle - the signal that it looks clear to start. The First Officer (F/O) engages the automatic start sequence from the roof-mounted switch. As the engine r.p.m. increases to 40% of maximum, F/O puts No. 1 throttle half-way forwards which opens the fuel cock. The exhaust gas temperature kicks up and then falls back a little to a stable position. The propeller speed has started to rise and the engine r.p.m. has steadied. "Light-up" calls F/O. No. 2 (right-hand) engine is on the opposite side to the passenger doors. It has been kept running whilst on the ground but the propeller is braked and doesn't turn. Although this consumes extra engine hours, it enables the aircraft to power itself whilst on the ground; they call this 'hôtel mode'. There's no need for an auxiliary power unit, so weight is saved.

Both props are now turning and the after-start checklist ensures that all systems are set as required. The c.r.t. 'glass cockpit' displays are switched on, cabin pressurisation is fed automatically from the engines, No. 1 generator is taking its share of the load, fuel booster pumps are all on and let us not forget details like 'No Smoking - Fasten Seat Belt' captions illuminated. Boing! A loud chime sounds. It's the cabin attendant on the interphone, reporting that all is secure for takeoff. Checks complete!

Airways Clearance

The Captain is scribbling hurriedly, then repeats something back to the Controller. I'm handed the note of the airways clearance that has just been copied, so that I too may know what the Captain and controller have just discussed. Our initial clearance, after take-off from runway 05, is to a compulsory reporting point called ETRAT on the coast to the north and east of the airport. We're to set a 'squawk' of 7620 on the aircraft's secondary surveillance radar transponder. This means that our flight can easily be identified on controllers' radar screens as this number will appear next to our target image. Our cleared flight level is 60, which means that the altimeter will show 6000ft when set to the standard pressure (always 1013.25mB).

After entering the runway (with clearance, of course) the aircraft backtracks - that is to say, taxies along the runway towards the take-off end where it will then turn through 180° in order to face the correct direction. On receiving take-off clearance, the propeller pitch is set for maximum performance (rather than best fuel economy), the throttles are opened to take-off power and the brakes are released. We're off!

Accelerate

F/O and I have our eyes glued to the airspeed indicator (a.s.i.) and engine instruments. Both engines must give similar indications for r.p.m., propeller torque (amount of power being developed), temperature and fuel-flow. Oil pressure matters too! The airspeed, meanwhile, is starting to rise as we accelerate down the runway. "80 knots" calls F/O and the Captain's hand is lifted from the nosewheel steering tiller and placed on the control column itself. F/O has been holding the column central and forwards and now releases it to the Captain. The Captain's

right hand never leaves the throttles, ready to cut back power if something goes wrong and correctly placed to maintain power in the initial climb. Steering at speed is now done by the Captain's feet which are on the rudder pedals. Heels on the floor, they say - this ensures that the toe-operated brakes aren't applied by mistake. "V1" shouts F/O. Speed is 100kt and this is the moment of truth. No matter what goes wrong now, we take-off! There simply isn't enough runway left in which to stop.

Gear Up

"Rotate!" At 110kt the Captain pulls back on the control column and then, as the nose rises off the runway, checks forwards a little so as to set the best pitch angle for the climb. I start my stopwatch, and will quote all times from now as minutes airborne. "Positive climb" calls F/O, the needle on the vertical speed indicator (v.s.i.) rising from the 0 mark into the 'Up' segment. The Captain calls for gear up, F/O raises the handle and the three green lights go out. Three reds come on instead: as the gear locks up, each red light extinguishes in sequence - nose, left, then right. V2 has been reached - a safe enough handling speed even if an engine fails. At 125kt the flaps come up.

Where are we now? Ahead in the takeoff direction lies an n.d.b. (LHO, 346kHz) and on passing overhead the a.d.f. needle swings round in a circle. The Captain now turns us left towards the ETRAT reporting point. We're at 600ft and 2min airborne, and already control is passed to Paris Airways (a radar service) on 129.35MHz. The transition altitude is 3000ft at which point today's QNH altimeter setting of 1016 is replaced by 1013mB. Climbing through FL30, then, the autopilot is engaged. I see that we're re-cleared to FL100, as F/O has put the new level into the altitude alerter. This device sounds a warning about 200ft short of the targetted top-of-climb so we'll know not to go too far. The v.o.r. at Deauville (DVL, 110.2MHz) indicates the 349° radial, approximately following airway A34. Seaford v.o.r./d.m.e. (SFD, 117.0MHz) on the other receiver is showing 56nm distance.

Just 6min and things happen quickly. Having contacted London Airways on 127.7MHz the Captain turns to me complaining that the routing is the long way round. We'll have to work our way along the closely-spaced reporting points of DRAKE, BEECH and HASTY which form a line heading north-east from a point about mid-way across the English Channel. After that, a left turn will be needed to head north-west towards the Eastwood reporting point. If the airspace wasn't so busy today, it might have been possible to get a direct routing to Gatwick's runway 26L instead of following the Eastwood 1G arrival. Navigating by reporting points isn't so easy, but this aircraft's flight system lets you set up bearings and distances from beacons as lines and points on the c.r.t. screens.

Good news at 9min! The hoped-for direct track to Seaford is granted. We're climbing through FL80 and the Captain now has further cause to grumble. We've been told to make the top of climb at FL110 but the Captain prefers FL90. With the relatively warm outside air temperature of 4°C, engine performance is degraded and the climb will be heavy on fuel. By 14min, we've made it to FL110 with Seaford at 25nm. As a cross-check, Mayfield (MAY, 117.9MHz) is tuned in on No. 2 navigation receiver - it shows 40nm.

Weather

Having copied the weather on the a.t.i.s. (128.475MHz) the crew write down the details on a card that they clip to the window-frame. Wind is 215° at 6kt (light breeze), CAVOK (no low cloud or fog), with a temperature of 25°C and dew-point of 18°C. The QNH is 1015, QFE 1008mB. Gatwick's elevation of 202ft explains the 7mb difference (at about 30ft per mb). Vref, the speed for the final approach, is calculated at 113kts when the expected landing weight is allowed for. During the flight, fuel burn-off has reduced the aircraft's total weight.

The south coast of England is crossed at 18min and the next London frequency of 126.45MHz is contacted. At 21min we're overhead Seaford; the radio-magnetic indicator's pointer turns round to face the opposite direction and the distance starts to increase. We are also descending with a new target of FL70 set on the altitude alerter, and we're tracking Mayfield's 313° radial. Coming down quite fast now, at 1000ft/min on the v.s.i., a right turn is made onto a heading of 030° to take us over the Eastwood reporting point. Gatwick is now a mere 20nm away in our 10 o'clock but we can't see it yet because of the high-level clouds.

Gatwick Airport check-in desks. Photo courtesy Gatwick Airports Ltd.

Progress

At last, progress! 22min airborne, and Gatwick Approach is

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When you own the miniature AR210 Packet TNC, you have to open the case just to marvel at the beauty!

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- **Lithium backed BBS with mail indicator**
- **CWID & 3rd party commands**
- **Standard DE9 connector**
- **Two sets of transceiver connection**
- **Ideal for portable operation**

Photo not to scale

Front - actual width

The *New* AR210 Packet TNC has an extremely small case size of only 100 x 60 x 22mm approx. and ultra light weight of 90g (without NiCad battery fitted). However, nothing is compromised, the AR210 features five status LED indicators (CON STA PTT DCD PWR), a standard DE9 RS232C connector, power socket, power switch, plus two sets of radio connectors and externally accessible hard reset switch.
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Actual size!

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Receivers: 'All Mode' ~ 'All the time'

With the **AR3000A** your listening horizons are truly extended providing receive coverage from 100 kHz all the way up to 2036 MHz without any gaps in the range. The AR3000A offers the widest coverage on the market today with a high level of performance and versatility from long wave through shortwave, VHF and onward to the upper limits of UHF and SHF.

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Enhanced model - **AR1500EX** - the World's first true compact hand-held wide range receiver offering SSB as standard has been made even better. Coverage is from 500 kHz all the way to 1300 MHz without any gaps in the range. Channel steps are programmable in multiples of 5 kHz and 12.5 kHz up to 995 kHz, the BFO will allow tuning between these steps for SSB operation. All popular modes are provided NFM, WFM, AM and SSB (USB, LSB and CW) with the BFO switched on.

The receiver is supplied with a comprehensive selection of accessories: DA900 wide band flexible aerial, NiCad pack, Dry battery case (for use with 4 x AAA alkaline cells), Charger, DC lead fitted with cigar lighter plug, Earphone, Soft case, SW aerial wire terminated in a BNC connector for shortwave reception and Operating manual.

Versatility is excellent. The AR1500EX may be powered from it's internal NiCad pack, spare dry batteries may be carried for extended operation and used with the dry battery case, the set may also be plugged directly into the cigar lighter socket of a motor vehicle (external input range 11 - 18V DC). **RRP £299.00 including VAT.**

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contacted (125.87MHz). We don't need to go to Eastwood after all, the Captain is turning us left onto a more direct track under radar control. Heading is now 350° and both crew set the QNH on their altimeters, with 4000ft the target on the altitude alerter. It's 24min, and to speed things up the throttles come back to give 2000ft/min descent on the v.s.i. Selecting 110.9MHz on both navigation receivers enables the Morse identification (IWW) of the i.l.s. to be checked.

In rapid succession, Director (118.6MHz) is our next contact. With 14nm still to run, we've passed 5000ft and are now re-cleared to 3000ft. Airspeed is indicated as 240kt and it's time for the descent checks. The Vref speed is marked on the airspeed indicator with a movable pointer called a bug. Anti-icing is selected off, since it consumes engine power and we won't need it in the warm air. Landing lights are on - scares away the birds as much as other aircraft! As we're still to the left of the runway centreline, we now turn left to head 290°and at 27min the localiser is captured. Its indicator bar moves to the centre of the directional display on each pilot's lower c.r.t.

While talking to the Tower now (124.22MHz) the crew set the QFE on their altimeters and, as the glide-slope pointer moves down the c.r.t. screen to take up its central position, the descent is controlled to follow it. At 28min the runway is in sight and F/O pulls the gear handle down - three red lights come on immediately and then each is replaced in turn by the corresponding green light as the gear locks down. A Speedbird 737 can be seen holding at point A North, awaiting its clearance to line up for takeoff after we've landed.

ATR 42 and ATR 72 twin turbo-prop aircraft.
Photo courtesy M.J. Hooks.

Touch Down

At 30min we touch down; full reverse brings the aircraft to a smart stop - propellers score better than pure jets in this respect. Ground Movements Control on 121.8MHz allows us to taxi along the parallel 08L runway, then we take taxiways 7 and 4 to the General Aviation Terminal where a friendly marshaller waves his arms around until we stop in the allocated parking space. Ground power is quickly connected up and both throttles can be pulled right back to the fuel shut-off position. There's silence at last as the engines die away. Flying has not itself been a problem: you will have noticed that the pressure on the crew was mainly caused by the constraints of the way in which congested airspace has to be controlled.

As I write this, several Northolt arrivals have flown low past the window, glinting clear and bright in the late winter sunlight. It makes me wish I was back up there, flying again.

If you want to follow the flight on radio-navigation charts you will need the following (Aerad reference numbers in parenthesis). Le Havre Northerly Departures Let-down Plate (LFOH Le Havre G1). European Low Altitude Chart Northern France & Southern England (EUR/1). Gatwick ILS/DME 26L Let-down Plate (EGKK Gatwick M2). Gatwick Taxiway (or waiting positions for delayed flights) Let-down Plate (EGKK Gatwick F4). Send a reply envelope to the Editorial Offices for your copy of Airband Factsheet, which lists suppliers of charts (including Aerad). ■

Abbreviations

a.d.f.	automatic direction finder	MHz	megahertz
a.t.i.s.	automatic terminal information service	min	minutes
c.r.t.	cathode ray tube	n.d.b.	non-directional beacon
d.m.e.	distance measuring equipment	nm	nautical miles
FL	flight level	QFE	altimeter pressure setting, reads zero when on aerodrome
ft	feet	QNH	altimeter pressure setting, reads height above sea level
i.l.s.	instrument landing system	r.p.m.	revolutions per minute
kHz	kilohertz	v.o.r.	very high frequency omni-directional radio range
kt	knots	°C	degrees Celsius
L	left		
mB	millibars		

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Spoce Shuttle operations, War games, in-flight refuellings, interception of Soviet **BEAR** Recon-Bombers, Military Airshows, secret coded transmissions, these are only a taste of what's in store in this publication. Frequency, Locations & some maps for Europe & North Africa are included for reference ..... was £17.95 – **now £9.95**

S.R.P. TRADING

SANGEAN ATS 803A

(Direct key-in world receiver with quartz alarm clock timer)

Tunable BFO SSB/CW!

Specifications and features

★ 150-29.999 continuous tuning with no gaps. Phase locked loop-double conversion Superheterodyne ★ Full shortwave/AM/SSB 150-29999kHz no gaps! + FM87.5-108 mono/stereo ★ Five tuning functions: Direct press button frequency input auto scanning, manual scanning memory recall and manual tuning knob

★ Built-in clock and alarm. Radio turns on automatically at preset time and frequency. ★ Large digital frequency display. ★ Fourteen memories – nine memory channels for your favourite station frequencies. Last setting of mode and waveband stored in five memories. ★ Direct press-button access to all 12 shortwave broadcast bands. ★ Two power sources – battery or AC mains adaptor. ★ General coverage of all AM bands in LW/MW/SW (dedicated broadcast band coverage on all versions), plus of course the FM band for quality sound broadcasts in headphone stereo. ★ SLEEP function turns the radio on or off after an adjustable time of 10-90 minutes. ★ Separate BASS and TREBLE controls for maximum listening pleasure. ★ External antenna jack for better reception. ★ Adjustable RF GAIN control to prevent overloading when listening close to other strong stations or if there is interference. ★ New improved wide/narrow filter (6/2.7kHz) ★ BFO control (Beat Frequency Oscillator) enables reception of SSB/USB/LSWB (single side band) and CW (Morse Code) transmissions. ★ Illuminated display to facilitate night-time use. ★ Designed for both portable and desk top use. ★ Five dot LED signal strength indicator.
DIMENSIONS: 29.2cmx16.0cm (11.5inx6.3inx2.36in).
OUTPUT: 1200mW (10%THD) WEIGHT: 1.7kg (3.75lbs) without batteries. Wide/narrow filter switch.

£109.95 + £5 check, test and p&p.

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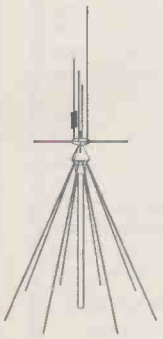
Built and designed for use with scanners. Coverge: 25 to 1300MHz. Total height – 36ins – 9ins at widest point. Comes complete with 4 metres of RG58 coax cable and BNC connector fitted.. Ideal indoor – high performance antenna and can also be used as a car antenna when your car is static. REMEMBER YOUR SCANNER IS ONLY AS GOOD AS YOUR ANTENNA SYSTEM!

£49.00 + £3.00 p&p

SKY SCAN

V1300 Antenna



Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

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For improved performance, wide band reception, 25 to 1300MHz. Comes complete with protective rubber base, 4m RG.58 coax cable and BNC connector. Built and designed for use with scanners.

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ANT 60

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- Greatly improve reception power of portable shortwave receiver
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MVT 7000 HANDHELD

PROBABLY THE UK'S MOST POPULAR HANDHELD SCANNER!

- ★ Receives 8 to 1300 MHz 100kHz-1300MHz (at reduced sensitivity)
- ★ 200 Memory channels
- ★ Rotary or keypad freq. control
- ★ AM/FM/NFM
- ★ Large display with signal strength ..mete

EACH SET IS SUPPLIED COMPLETE WITH:- Full set of high power NiCads, AC charger, DC power lead and carry strap.

March Special Offer.....£PHONE

MVT 8000 MOBILE/BASE

This new model is the mobile version of the popular MVT 7000 Handheld above.

- ★ Receives 8 to 1300MHz, 100kHz to 1300MHz (at reduced sensitivity)

THIS RADIO IS ESPECIALLY SENSITIVE AT UHF FREQS. Set is supplied with mains power unit.

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MVT 6000 MOBILE/BASE

An economy version of the new MVT 8000 above housed in the same case.

- ★ Receives 25-550MHz, 800-1300MHz
- ★ 100 Memory channels

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AIRBAND RADIOS

This month we are pleased to introduce **THE WORLDS FIRST DEDICATED CIVIL/MILITARY AIRBAND RECEIVER, THE VT225.**

A powerful pocket scanner that leaves the competition standing. - A super sensitive set designed for optimum performance on the Civil/MilitaryAirbands.

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- ★ 100 Memory channels
- ★ AM/FM on VHF
- ★ Priority channel function

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March Special Offer.....£PHONE

VT-125 UK CIVIL AIRBAND RECEIVER

Using the same technology as the VT-225, this set covers the full Civil Airband - hearing distant signals that are inaudible on some other scanners.

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- ★ 30 Direct entry memories
- ★ Search steps 25, 50, 100kHz SUPPLIED

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HP2000

STILL ONE OF THE MOST POPULAR HANDHELD SCANNERS ON THE MARKET.

Over the last year the HP2000 has outsold almost all other models.

- ★ Continuous coverage from 500kHz to 1300MHz
- ★ 1000 channels of memory
- ★ Keypod or rotary control
- ★ AM, FM and WIDE FM modes
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MOBILE VERSION OF THE HP2000 HANDHELD BUT WITH SEVERAL ADDITIONS:-

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- ★ Automatic - signal operated tape recorder switching
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- ★ Receives:- 500kHz - 600MHz, 805 - 1300MHz. Supplied with mains power supply

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AOR SCANNERS

AR1500 HANDHELD

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- ★ Dry cell battery case
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- ★ Ear piece
- ★ Soft case

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AR2800

- ★ Receives 500kHz - 600MHz, 800 - 1300MHz AM, FM, WFM. SSB capability with BFO.
- ★ 1000 Memory

March Special Offer.....£PHONE

SCANNERS

ALINCO DJ-X1 HANDHELD SCANNER

- ★ Covers 500kHz to 130MHz
- ★ AM/FM/WFM
- ★ 100 Memories
- ★ 3 Scanning speeds

PLEASE NOTE:-
ALINCO DO NOT INCLUDE BATTERIES AND CHARGER AT THIS PRICE.

.....£249

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A Link with the Past

Flying training was a hazardous business and many embryo pilots were lost due to their inability to carry out instrument flying, until in 1929 an American engineer, Edward Albert Link, invented the Link trainer. Flying Officer J.V. Moorhouse RAFVR(T) Retd., recounts the story of a Link that's still 'flying'.

The year was 1929 and the aviation era was beginning to get into its stride. Advances, accelerated during WWI, had brought flying from a dangerous amateur sport to a practical form of transport that could be achieved by the average person. This had been proved by the training of many thousands of aircrew during WWI.

Flying training was still a hazardous business, however, and many embryo pilots were still being lost due to their inability to carry out instrument flying. Aircraft were increasingly being fitted with specialised instruments to assist 'blind' flying, e.g. flying at night and in cloud, which was hitherto impossible without instruments.

Bright Idea

During 1929 an American engineer by the name of Edward Albert Link had a bright idea, which, like all successful bright ideas, was simple in concept. Why not, he thought, have an aeroplane - sorry, he was American so it would have been an 'airplane' - in which pilots could practice their flying skills on the ground. this would save a great deal of money for the trainees, the up and coming airlines and military schools, in addition to the insurance companies, who hated paying out policies on crashed pilots and aeroplanes.

So was born the Link Trainer, which was patented in America on 14 April 1929, and still held in affection, and sometimes trepidation, by those of us who are left, who remember many hours in hot serge RAF uniforms 'under the hood', carrying out navigation exercises. The relevent Air Publication AP2285A, which gave maintenance instructions for the Link, had an amusing cartoon depicting an airman staggering out of the aircraft all hot and bothered, with his head spinning like a top. Of course, in those days there were no special tea bags to 'bring you round'.

In 1931, the Link was adopted by the US Navy and in 1934 the US Army for training and during WWII was extensively used by the RAF for training purposes. So it was that on 13 September 1942 Link Trainer ANT.18 Serial No.11771 was delivered from America to Air Trainers Company based at Aylesbury, England and subsequently from 32 Maintenance Unit to 23 RFS at Usworth. This was in 1949. During October 1952, the Link was issued to 195 Grimsby Air Training Corps, where it has remained to this day.

This Link Trainer, originally built in 1942, is still with 195 Grimsby Air Training Corps and is in full 'flying' condition.

National Service

During the days of National Service there was a much bigger demand for aircrew than today and much useful experience was gained by cadets prior to joining the RAF. At that time most of the officers had useful wartime experience to pass on, but as time passed we older officers retired, and the old technology used by the Link became

The cockpit of Link Trainer ANT.18. Thousands of airman have probably handled these controls in the fifty one years since it was built.

forgotten, so they were scrapped. In any case, modern electronics and hydraulics took over, by necessity, as aircraft became more sophisticated.

However, the old and now defunct Link at the Grimsby Headquarters remained silent for some time, but nobody wanted to sling it out, because it was rare, there were very few left and, who knows, we might get it going one day!

That 'one day' was the day that I visited my old Squadron, from which I had retired as Adjutant some thirty years earlier. The intervening years prior to attaining Senior Citizen status being taken up in different parts of the country on 'something to do with flying'.

The present CO, who was one of my cadets all those years ago, introduced me to my old friend and, sometimes, enemy - The Link, and asked if I could get it going again. It must have been during a weak moment as I said yes and along with another of my old cadets and his NCO son, we had a go.

To cut a long story short, we have now brought it back to life and are using it for basic instrument flying and, in due course, navigational exercises. It would be interesting to know how many 'Links' are still around, perhaps in 'flying trim', like ours. Of course, we never loop the old girl! ■

Very primitive when compared to the modern flight simulator with their computer generated displays. This is the Link Trainer chart associated with GY195.

Ringing Up a Plane

The entire British fleet of airliners in reglar use between London and Paris is now equipped with wireless telephones, and during their aerial journeys the machines are in constant communication with the ground stations.

It is no uncommon thing to hear while "listening in" at a ground station the pilot of an incoming air express speaking to the pilot of an outgoing machine and advising him of peculiarities of the weather along the route.

Aviation & Wirless News, December 1921.

Balloon Makes Canoes for Canadian Indians

Popular Mechanics publishes an articles which is probably the last word on the ill-fated expedition of United States balloonists last winter.

"Those who live on the border of civilisation are always on the lookout for some product of civilised government that they may appropriate for their uses. Recently a group of very fine light-weight canoes appeared in the James Bay region in Canada. The source of these was quite a mystery. No such canoes had been seen there before. And they were in the hands of a group of outlaw Indians who lived in a small village over sixty miles from Moose Factory and hundreds of miles from any place where they could get material suitable for making such canoes.

"But finally someone solved the mystery. The great balloon that the United States naval balloonists had abandoned when it fell near Moose Factory had been destroyed. Orders had been issued from Moose Factory that it should not be touched, but the outlaw Indians were out of the jurisdiction of Moose Factory and the temptation to use it for canoes was too strong."

Aviation & Wireless News, December 1921.

An Appetite for Aircraft

The plane spotter needs to have an insatiable appetite for aircraft. Alan Williams offers his thoughts on what the fascination really is for listening in to airband transmissions.

The air crackles and pops with radio static; l.e.d.s on airband receivers flash and flutter and necks crane out over the barriers of the airport viewing enclosure.

An unusual aircraft is arriving at Heathrow and a score or more of the UK's hard-core plane spotters are all jostling for position, eager to get a glimpse of this new arrival.

The plane, a mere dot on the horizon, sways back and forth, winking its powerful landing lights across the sky. It's too far away to be identified by sight, or even with a powerful telephoto lens as the angle of the plane's body is all wrong. Within moments however, the aeroplane's signal has been identified, noted and speculated upon. It's rumoured to be the surviving plane from a hijack/bombing incident that took place a couple of years ago - but the aircraft registration number needs to be seen for confirmation. Some of the more proficient spotters have already confirmed, from the pilot's accent, his terminology and other hidden clues, the ownership of the airliner; and it only remains for the formal identification to take place. After a while an audible acknowledgement ripples down the compressed line of spotters, heads nod, raised binoculars are lowered onto neck straps, cameras are fired and more pencilled notations are jotted into notebooks, Kuwait Airlines 9k ABD has arrived over London, England and been duly recorded by a number of enthusiastic spotters. Before the plane has even landed most of the men have returned to their portable airband receivers, tuning in for the next arrival.

Heathrow airport, as airports go, is quite hospitable to plane spotters. It costs a mere 75p to enter the viewing enclosure and for that you can stay practically all day. There's a heated, glassed-in viewing area for food and rainy days, an ice cream kiosk for heat waves and an airport souvenir shop where you can buy British Airways hats, scarves and model planes. There's even a self-service rooftop cafe. Not that the regular spotters avail themselves too often of the pricey sandwiches and snacks that the cafe try to sell to the tourists. No, most of the spotters at Heathrow bring their own food and drink, made in kitchens as far north as Edinburgh and as far south as Penzance, all wrapped up, workmanlike, ready for a long day of observation.

Typical

It's hard to define a typical plane spotter, except to say that they are predominantly male, come from all over the world, are all quite shifty looking, especially when they're keeping one ear cocked for the radio and constantly glancing nervously from left to right along the invisible, but very active, inbound and outbound flight paths. Apart from that distinction there's little else to distinguish them from your average football fan out on an Away Day to support his local side. Of course, the sophisticated, miniaturised receiving equipment used by the spotters, the s.l.r. cameras and the jargon that they trade in is unique to themselves. It's this complicated form of codes and abbreviations used by flight crews and air traffic controllers that makes the modern form of plane spotting so interesting and compelling. The spotters constantly mix bouts of this curious 'aircraft speak' with regular English, and then throw in a few slang words for good measure. It's really like listening to another language, except for the fact that unlike most other conversations, these exchanges

Steve works at Manchester Airport. He drove down to Heathrow for a day on airband. Heathrow's main air traffic control tower is in the background.

refer to the manoeuvring and safety of giant, multi-million pound aircraft, along with the lives of hundreds of passengers.

Up in the air the flight crews, inbound, say after a long haul flight from the Middle East, are concentrating hard on getting down safely and their dialogues are kept short and to the point. There's no time for gossip. The air traffic controllers, in their turn, dole out precise landing instructions in a dry, concise manner. The spotters with the best equipment can pick up every word of these two-way transmissions, but they themselves cannot transmit as they are limited to 'receive only' apparatus.

Final Adjustments

The pilot continues his landing countdown and makes final adjustments to his aircraft trim, confirms his position to the tower and reduces power and glides in to a landing at around 160mph. Reverse thrust is applied to slow the planes progress further. The scream of the engines drift across the airport and reaches the viewing enclosure, cancelling out most other sounds. At this stage the aircraft starts conversing with the ground crew and it is then given taxiing directions and allocated a berth or a slot on the apron. All these transmissions, and more, are picked up by even the most basic airband receiver, and they all give vital information as to the identification, condition and progress of each aircraft. Transmissions at take-off and landing are equally dramatic and riveting, but it is the aborted take off, the go-arounds, the requests for customs, police or fire crew intervention that really get the spotters' ears and tongues twitching. Like the time when a pilot requested police intervention to manage a drunk and unruly pop star, or the occasion when a lot of landings were diverted because of fog. These and similar transmissions

Heathrow Tower, the viewing area and a few plane spotters.

are what a modern day spotter lives for, and they have earned the spotters the brusque title of the 'hidden ears of the aircraft airwaves'.

Inexpensive Hobby

Years ago plane spotting was all about collecting plane registration numbers. While plane spotting is still a relatively simple and inexpensive hobby that allows a person to note numbers, log them and perhaps collate additional information on the plane, the addition of a pair of high-powered binoculars, camera and portable, scanning, airband receiver, the plane spotter is now not only able to identify planes in the sky at an earlier stage - and at Heathrow, one of the world's busiest airports, it's important to be able to sort the common British Airways Boeings from the rare Russian Tupolev TV 134s - but also pick up large volumes of information by listening in to the pilots and air traffic controller's conversations. Today a manually controlled airband receiver can be purchased for as little as £20 and prices can go up to around £200 or more for a portable, miniaturised, automatic scanner. Similarly with binoculars, the sky's the limit as to what you can pay for the super-duper telescopic and wide angled models. Most cameras in use remain as manually focused s.l.r.s with a single zoom in the 100-200mm range.

Focal Point

Plane spotting invariably takes place at or around airports and while it doesn't really matter what size the airports are or whether or not they're civilian or military, by far the most popular airports are near the major cities. Heathrow has to be the focal point of a lot of spotting activity, but many airports like Gatwick, Luton, Stanstead, Manchester and Edinburgh attract their fair share of enthusiasts. Some enthusiasts are so involved with the activity that they arrange holidays and week-end trips to airports around the country - and even around the world. Some spotters travel to Dallas or even Dakar to catch a glimpse of some exotic planes. At this level of commitment an s.l.r. camera is essential. Travelling around the world just to view aircraft may not be everyone's idea of fun, but if the thrill of logging the registration number of a two-seater Chinese Chipmunk trainer turns you on then, naturally, evidence of such an accomplishment must be gained for visual proof at a later stage. Plane spotting is a hobby that is self-regulatory, to the extent that a spotter would only be deceiving himself if he was to log an unseen plane. That is why cameras are vital documentary tools, especially on foreign trips. Unfortunately foreign airports and governments are not always sympathetic to having their aircraft and airports photographed. Many foreign powers have military and civilian aircraft berthed at the same airport and are reluctant to have their weapons of war captured on celluloid. This makes the game of capturing images of these planes all the more exciting, at least to some of the younger members of the practice. In reality, though, there are few spotters who would be willing to put their freedom at risk just to photograph a Libyan MiG, though many would be very content to log one in their notebook!

Essential

Another essential part of a plane spotters tool kit is the Civil Aircraft Markings Directory. This book, written by Alan Wright and available at most bookshops and some airports, gives an

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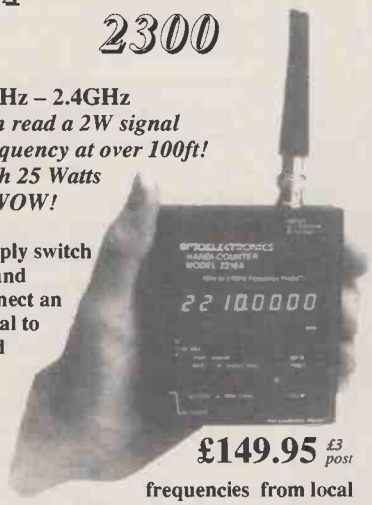

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- Fast Band Search
- Battery Saver
- Programmable Steps
- Carrier/Audio Scan
- Excellent Sensitivity
- Power from 4 x AA cells
- External 12V Socket
- Telescopic Whip
- Carry Strap

VT-225 £Phone

- Military & Civil Airband Monitor
- Civil 108 - 142/149.5-160MHz
- Military 222 - 391MHz
- 100 Memories 10 Bands
- Scanning and Search Modes
- Delay and Lockout
- Priority Channel
- Memory Lockout
- Steps 10 - 25 - 50 - 100kHz
- Superb Weak Signal Reception
- Illuminated Display
- Power from 4 x Ni-cads
- 240V AC psu + 12V cigar lead
- BNC Helical Antenna & Strap
- Size only 127 x 35 x 58mm

VT-125 £169

- Superb Civil Airband Monitor
- 108 - 142MHz
- 30 Memories
- High Quality AM Reception
- Scanning and Search Mode
- Priority Channel
- Memory Lockout
- Steps 25 - 50 - 100kHz
- Superb Weak Signal Reception
- Illuminated Display
- Power from 3 x Ni-cads
- 12V Cigar charger/supply lead
- BNC Helical Antenna & Strap
- Size only 57 x 127 x 35mm

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- 142 - 170MHz
- 30 Memories
- Crisp FM Reception
- Scanning and Search Mode
- Priority Channel
- Memory Lockout
- Steps 10 - 12.5 - 25kHz
- Superb Weak Signal Reception
- Illuminated Display
- Power from 3 x Ni-cads
- 12V Cigar charger/supply lead
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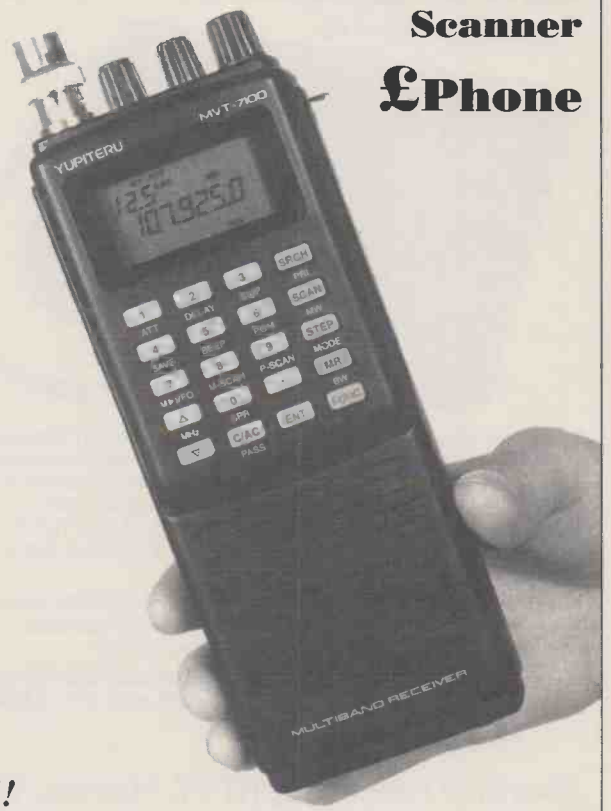

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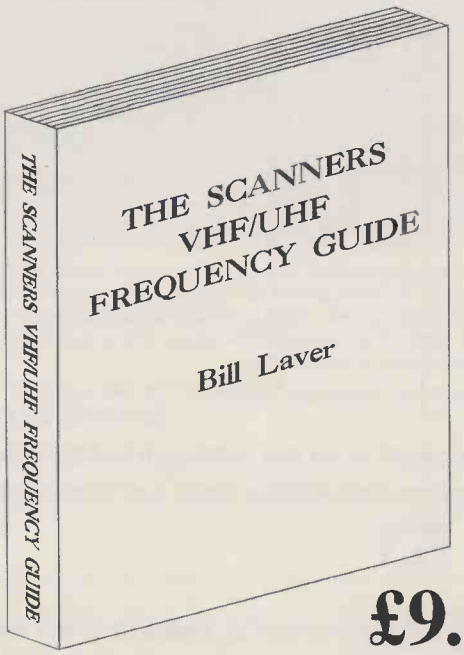

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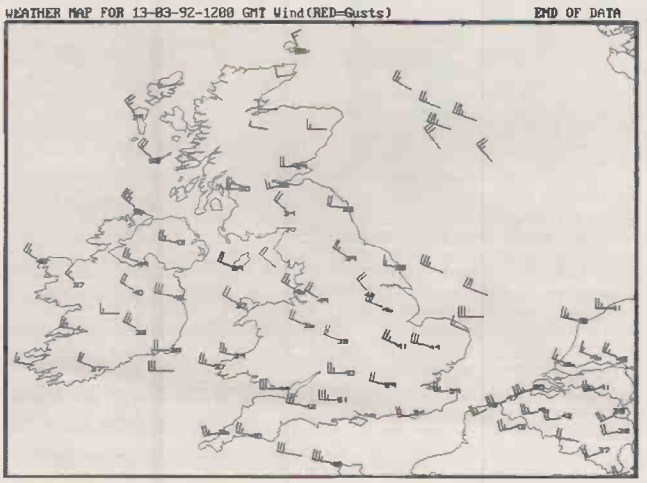

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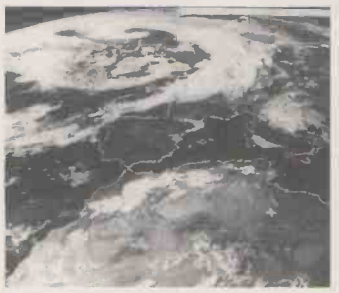

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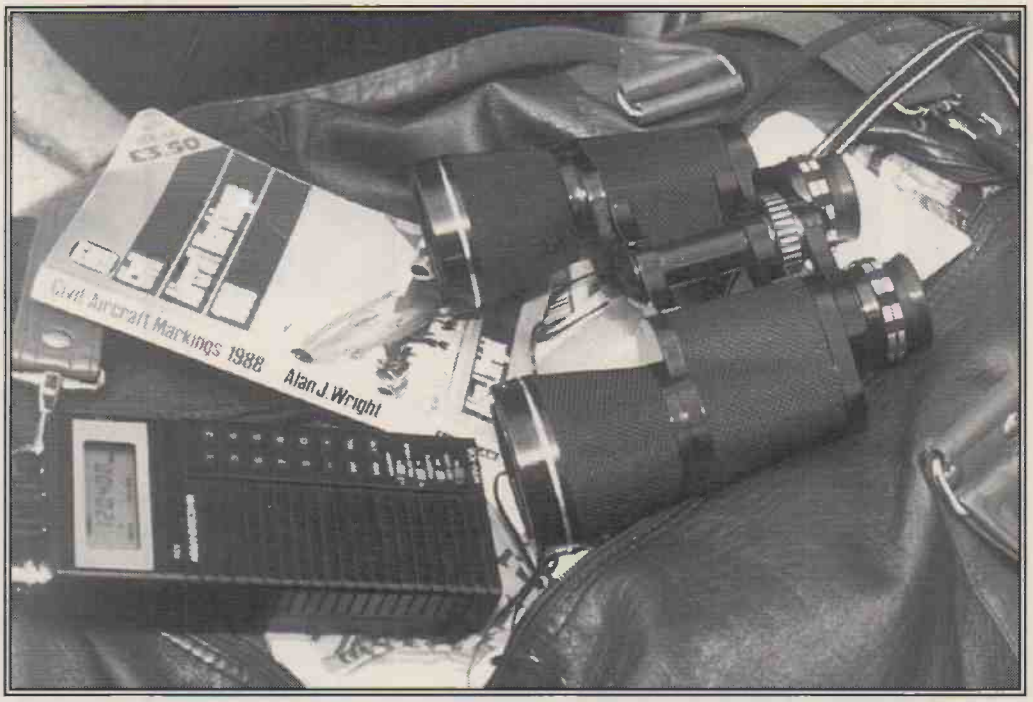
annual list of all the world's civilian aircraft, their operators, airlines, type of craft, number of seats and a host of other relevant information. In essence it is the plane spotter's bible and is constantly referred to as well as used as a log book - many spotters use it by running a pencil line through the listing of the aircraft they have spotted!

So, if the idea of sitting around airport lounges this summer, waiting for your inevitably delayed aircraft to arrive doesn't appeal to you, why not take to the root-top viewing area and 'spot' a few planes? All it takes is a good pair of eyes, a decent s.l.r. camera and an appetite for aircraft, their fuel, noise and radio conversation.

■



Plane Spotting. This is the equipment needed: Airband scanner, Civil Aircraft Markings by Alan J. Wright, binoculars and a holdall for food, drink, etc.

AVIATION & WIRELESS NEWS

Jumping from the Sky

The real designer of the parachute was Leonardo de Vinci, in 1500, although at the coronation of the Emperor Fo Kein, as early as 1306, Chinese acrobats were seen to jump from a high scaffolding with huge parachute umbrellas.

Major Orde Lee, who has made more parachute descents from aeroplanes than any other man, considers that all passenger aeroplanes should carry life-saving parachutes, just as ships carry lifebelts and boats. In a recent lecture he referred to a scheme of lowering a whole cabinful of passengers by one great parachute.

The prevailing idea that parachutes frequently fail to open is a fallacy. In 600 parachute descents from observation balloons during the war, only three failures occurred.

Many inventors do not realise that if a parachute is much less than 2ft in diameter the speed of descent is fatal. In 1914 an Austrian tailor jumped from the Eiffel Tower in Paris with a combined parachute-overcoat. The apparatus worked perfectly, but as it was only one-sixth the size of a standard life-saving parachute, it descended too quickly and its inventor was killed.

The real danger of parachuting is in landing. You never know where you are going to land. Major Lee has described how in July 1920, a rival parachutist in Sweden challenged him to land on a given spot, and how he dropped from only 400ft and scored an 'inner'. His rival ascended to 3000ft and landed a third of a mile away.

Aviation & Wireless News, December 1921

A Light-weight UHF Dipole

Although this project does call for some means of turning down and cutting a screw thread on aluminium rod, this should not deter readers from making this simple antenna for their airband scanning receiver. The author, A.A. Jarvis, thinks that the end certainly justifies the effort.

The recent acquisition of a particularly sensitive hand-held v.h.f./u.h.f. airband receiver prompted me to investigate the possibility of making a knock-down u.h.f. dipole antenna in an attempt to push the signal capture potential of the receiver to its limits whilst maintaining its portability and scope for hill-top use. Experiments had already shown that a quarter-wave telescopic antenna, critically adjusted for the u.h.f. airband frequency sought, was a lot more sensitive than the supplied 'rubber duck'.

I decided to go for a design based on the use of BNC plugs and adaptors. Attaching a BNC Tee adaptor to a right-angle adaptor immediately gave me two BNC sockets pointing upwards and downwards, easily connected to the receiver, with vertical alignment being maintained by movement of the joints. The next task was to find a means of attaching elements to the inner connection on the 'up' Tee socket and the outer connection on the 'down'.

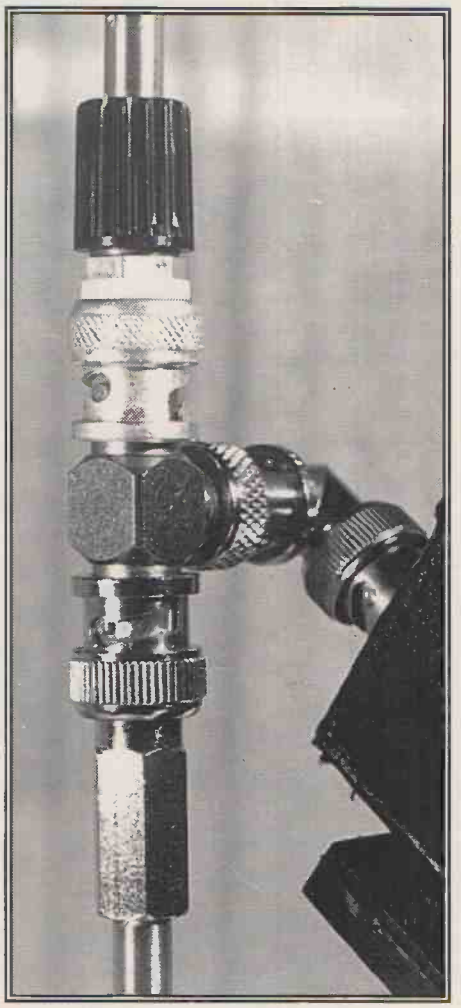
The dipole fitted to an airband scanner.

Lucky Find

A lucky find at a local rally was a male BNC to banana socket-cum-screw terminal adaptor. This curious item was the critical component that gave access to the inner connection and made the rest of the job comparatively easy. The downwards connection was made with a 'solderless' BNC plug.

A length of 0.25in diameter aluminium rod formed the upper element, 190mm being the length calculated to resonate at around 376MHz, the frequency I was chasing. The lower rod was made 20mm shorter than the upper to take account of the differing shielding in the BNC plugs, as shown in the photographs. I turned down about 15mm of one end of the longer rod to a sliding fit in the banana socket, then carefully split it down the centre with a fine saw and opened it out slightly with a screwdriver to give a firm push-fit.

Solderless BNC plugs have a threaded hole into which it is intended the turned-back braid of RG58 or UR67 coaxial cable should be screwed. Investigation showed, rather surprisingly, that the thread on my chosen plug was 0.25in Whitworth, so it was not difficult to run the appropriate die down the other rod for about 10mm. Not all makes of solderless plugs have this particular thread.



Close-up of the central assembly of BNC plugs.

Encouraged

The job was done. Taking the assembly to my favourite local high spot overlooking the Bristol Channel, I quickly discovered that, although of an electrically questionable design, my new antenna had the edge over the 0.25in telescopic in pulling in distant ground transmissions. Thus encouraged I subsequently made some longer elements to enable me to match lower frequencies in the band.

I was then able to capture u.h.f. ground transmissions from an airfield at a distance of nearly 130km and never heard before. The only direct expense incurred in the construction of the dipole

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was 65p for the BNC/banana adaptor. Regrettably, I have not been able to find any more of these, nor the name of the manufacturer or importer.

I have since acquired two small telescopic antennas with short hinged bottom sections made of solid brass. When time permits I shall treat these in the same way as the aluminium rods, which will enable me to easily adjust each arm for maximum sensitivity at a given frequency. When using the single quarter wave telescopic I have found that adjustment is critical to within about 12mm either way when trying to pull in a distant transmitter.

I have found that v.h.f. transmissions from my three local civil airfields also come in well. But a v.h.f. antenna to a similar design would, of course, be rather heavy and unwieldy. ■

I suggest that those readers who do not have access to a lathe should contact their local model engineering society for help. **Ed.**

This picture shows how the various BNC plugs are assembled to form the central section of the dipole. The aluminium rods are threaded as described in the text and screwed into the adaptors.

DXing Civil Aircraft on Short Wave

The short wave civil aviation bands are alive with radio traffic all day long, providing an easy target for the novice short wave listener, as well as a challenge to the more experienced. Matthew Probert offers some advice on when, where and how to listen to them.

Each year over 130000 aircraft fly over the Atlantic Ocean That's fifteen aircraft every hour or one aircraft every four minutes! With the rest of the world similarly busy with aircraft flying, it is of little wonder that the short wave civil aviation bands are alive with radio traffic twenty four hours a day! This provides not only an easy target for novice short wave listeners to receive interesting, and impressive stations, but also, as a result of the multitude of ground stations broadcasting, a haven for the more experienced DXer to find a challenge in searching out new stations and listening out for the rarely heard super DX!

With so many aircraft flying each day, a vast network of air traffic control (ATC) stations are required to prevent the congestion becoming a catastrophe. For aviation purposes, the world is divided into ten geographical areas:the North Atlantic, NAT; the South Atlantic, SAT; Europe, EUR; The Middle East, MID; Africa, AFR; the Indian Ocean, INO; South East Asia, SEA; South America, SAM; the Caribbean, CAR; and the Pacific, P. Geographical areas which have a large volume of aircraft flying through them are further sub divided into groups called 'families'. The NAT area is divided into five families NAT A, covering the southern routes west of 30° west between Europe and the USA/Caribbean; NAT B, covering the central/northern routes west of 30° west between Europe and Canada; NAT C, covering the central/northern routes east of 30° west, between Europe and Canada; NAT D, which covers the northern routes across the North Pole, between Scandinavia and Canada; NAT E which covers the central southern routes between southern Europe and the USA.

The Southern America area, SAM, is similarly sub-divided into five families: C SAM, covering the northern part of the South American continent between Recife in Brazil, and Bogota in colombia; NE SAM covering the north eastern slice of South America that encompasses French Guiana, Bolivia, Surinam and the island of Trinidad; NW SAM covering that area of South America encompassing Paraguay, Urugay, Argentina and south eastern Brazil; SW SAM 8, which covers the area around Easter Island, some distance off the west coast of the South American continent.

Civil aircraft over the African continent is handled by five families: AFI 1, covering the north western part of Africa and southern Spain/Portugal, ranging from as far north as Lisbon, to as far east as the Ivory Coast and west to the Canary Islands in the Atlantic Ocean; AFI 2, covering the north central part of Africa encompassing Libya, Nigeria, Niger and Tchad; AFI 3, covering the vast area of north east Africa, the Middle East, and the Indian Ocean as far as Southern India, in doing so AFI 3 takes in Egypt, Sudan, Kenya, Saudi Arabi, Yemen, Ethiopia and the Seychelles Islands; AFI 4, covering central and southern Africa, encompassing Nigeria, Cameroon,Zaire, Angola, Zambia, Namibia and South Africa; AFI 5, which covers the south eastern part of Africa and the routes from there to India, encompassing Mozambique, Madagascar, Tanzania and the Seychelles islands.

The Middle East area is divided into just two families MID 1 which may be thought of as the Middle East proper, i.e. encompassing Iran, Iraq, Yemen,

The Satellite Terminal at London's Gatwick Airport.

Air France Airbus A-300 F-BVGA takes off.

Table. 1: NAT A ATC

Frequency (MHz)	3.016	5.598	8.825	13.306	17.946	SELCAL
Canaries	Night	24hr	24hr	Day	Day	Yes
Gander	24hr	24hr	24hr	24hr		Yes
New York	24hr	24hr	24hr	24hr	24hr	Yes
Paramaribo	24hr		24hr			No
Piarco		24hr	24hr			Yes
San Juan	24hr	24hr	24hr	24hr		Yes
Santa Maria	24hr	24hr	24hr	24hr		Yes
Shanwick	24hr	24hr	24hr	24hr	As Req.	Yes

Table. 2: NAT B ATC

Frequency (MHz)	2.899	5.616	8.864	13.291	17.946	SELCAL
Gander	24hr	24hr	24hr	24hr		Yes
Reykjavik	24hr	24hr	24hr	24hr		Yes
Shanwick	24hr	24hr	24hr	24hr	As Req.	Yes

Table 3: NAT C ATC

Frequency (MHz)	2.872	5.649	8.879	13.306	17.946	SELCAL
Gander	24hr	24hr	24hr	24hr		Yes
Reykjavik	24hr	24hr	24hr	24hr		Yes
Shanwick	24hr	24hr	24hr	24hr	As Req.	Yes

similarly covers eastern Pacific area between Hawaii and California in the USA; SP 6 is a small south Pacific area around south eastern Australia and New Zealand taking in Fijian Islands SP 7 covers the remainder of the South Pacific from Easter Island in the south east, west to Fiji and north to Hawaii.

The three remaining geographical areas; EUR which covers Germany, Switzerland, Italy and as far south east as Cyprus; CAR, which covers the Caribbean islands and central America between New York in the north, French Guiana in the south east and Panama in the west; INO, which covers the Indian Ocean from Perth in Australia, west to Johannesburg in South Africa and North to Madras in India; are not sub divided into families.

Jordan, Syria, Kuwait and Saudi Arabia; MID 2 covers routes between the Middle East and the Indian sub continent, covering the area from Iran, Iraq and Kuwait out through Pakistan to Northern India.

South East Asia, SEA, is divided into three families: SEA 1, which encompasses the north west part of the area, from India east through Burma to Thailand and south Thailand through Borneo and north to Hong Kong; SEA 3 covers the remainder of the SEA area which is primarily Australia, and north to Indonesia and southern Thailand, and west to the Cocos Islands.

The Pacific is the largest of the geographical areas, and accordingly is divided into the most families; 7: CWP 1, covers the western part of the Pacific from Papua New Guinea north to Japan; CWP 2 overlaps most of CWP 1, covering from Papua New Guinea north to Japan; and east to Hawaii; NP3, covers the northern Pacific routes between Japan and Alaska; NP 4

Table.4: NAT D ATC

Frequency (MHz)	2.971	4.675	8.891	11.279	13.291	17.946	SELCAL
Bodo	24hr	24hr	24hr				No
Cambridge Bay	24hr	24hr	24hr	24hr			Yes
Churchill	24hr	24hr	24hr				Yes
Gander	24hr	24hr	24hr		24hr		Yes
Iqaluit	24hr	24hr	24hr	24hr			Yes
Reykjavik	24hr	24hr	24hr	24hr	24hr		Yes
Shanwick	24hr	24hr	24hr		24hr	As Req.	Yes

Table.5: NAT E ATC

Frequency (MHz)	3.476	6.628	8.906	11.309	SELCAL
New York	24hr	24hr	24hr	24hr	Yes
Santa Maria	24hr	24hr	24hr	24hr	Yes

Table. 6: CAR ATC

Frequency (MHz)	2.887	5.550	6.577	8.918	11.387	11.396	13.297	17.907	SELCAL
Barranquilla	24hr		24hr	24hr	24hr				No
Cayenne		24hr		24hr		24hr	24hr		No
Cenamer	24hr	24hr	24hr	24hr		24hr	24hr		No
Havana	24hr	24hr	24hr	24hr		24hr	24hr		No
Merida	24hr	24hr	24hr	24ht		24hr	24hr	24hr	No
Maiquetia		24ht	24hr	24hr			24hr		No
New York	24hr	24hr	24hr	24hr		24hr	24hr	24hr	Yes
Panama			24hr	24hr		24hr			Yes
Paramaribo		24hr	24hr	24hr					
Piarco	24hr	24hr	24hr		24hr	24hr	24hr		Yes
San Andes	24hr		24hr	24hr	24hr				No
San Juan	24hr	24hr	24hr	24hr		24hr	24hr	24hr	Yes
Santa Domingo			24hr						No

Alternative Working Frequencies

The International Telecommunications Union (ITU) has allocated a large expanse of the short wave band for aircraft communications, split into a multitude of frequency ranges. Within these frequency ranges, or 'bands', the International Civil Aviation Organisation (ICAO) has allocated set frequencies for communications between families so as to minimise interference and to provide alternative working frequencies to take changing propagation conditions and noise into account. These frequencies are scattered amongst 10 bands: 2, 3, 4, 5, 6, 8, 10, 11, 13 and 17MHz. Other frequencies within the ITU allocated bands are used for weather stations (Volmet), area control centres (ACC), flight information centre (FIC) stations, company stations, and search and rescue (SAR) operations. There are far too many frequencies in use to list here, and the reader is advised to consult the works listed under further reading, at the end of the article, for complete details of specific frequencies.

Within each family are a number of ATCs which broadcast on set frequencies. Some frequencies are used 24 hours a day, others are only used during specific periods, such as the hours of daylight or darkness. Tables 1 through 6 provide, as an example, details of the distribution of communications frequencies for the North Atlantic and also the Carribean families. Where an ATC uses a frequency 24 hours a day, '24hr' appears in the relevant column of the table. If the ATC only makes use of a frequcency during the hours of daylight, the word 'Day' appears in the relevant column. Similarly, if that frequency is only used by an ATC during the hours of darkness word 'Night' appears in the relevant column. It will be seen that 'Shanwick' ATC, a sharing of responsibilities between Shannon and Prestwick stations, provide communications on some frequencies only when required, indicated by 'As Req.' appearing in the relevant column.

Jargon

Listening to the civil aviation transmissions, one cannot help but notice the vast amount of jargon in use, and also the occasional burst of four musical tones of varying pitches. The musical tones are a system of calling a particular aircraft called 'selective calling', SELCAL for short. It works like this; each aircraft is equipped with a radio transceiver which is normally muted when not required. Each aircraft also has a SELCAL receiver which may be programmed with a unique access code. When a ground station wishes to contact a particular aircraft they may transmit the relevant SELCAL access code, a pattern of four musical notes. If this transmission is received by the target aircraft's SELCAL unit, a visual or audible warning is generated for the benefit of the aircraft navigator who may then switch on the aircraft transceiver and transmit that the SELCAL message has been received. The navigator then waits for the ground station to pass its message to the aircraft.

The call signs used by aircraft operators can be a little confusing at first. For example; you will never hear a British

Airways aircraft identify itself as British Airways, but rather it will use the call sign 'Speedbird', Air Holland uses the callsign 'Orange', South African Airways use the call sign 'Springbok',Trans Mediterranean use the sinister sounding call sign 'Tango Lima', finally, Titan Airways use the rather strange call sign, 'ZAP'. Other airlines use their own name, often in an abbreviated form, as a call sign which makes identifying them quite straightforward.

Exotic

The newcomer to civil aviation DXing will find that at most times of the day and night 5.598MHz is active with traffic across the Atlantic Ocean. For something a little more exotic try 11.300MHz during the hours of darkness or in the early morning. It is usually quite busy with African traffic, Nairobi, Seychelles, Tripoli, and Cairo ATCs are all easily and regularly heard. More challenging is 5.658MHz. This frequency is reguarly used by African stations, and offers the potential for a catch of the rare Kigali ATC in Rwanda. More difficult still is 8.855MHz, which is alive with South American stations. There are a number of problems with this frequency; firstly it is only readily receivable during the night; secondly the equipment of many of the South American (and African) ATCs is of fairly poor quality, with the result that their modulation is often very difficult to understand; thirdly, they often speak in Spanish or such a broad accent that coupled with the poor modulation, making a positive ID is very challenging. ■

Iberia flies Airbus A-320s. Here is EC-575 Sierras de Cazorla y Sequra.

Further Reading

The Worldwide Aeronautical HF Radio Handbook, by Martyn R. Cooke, published by World of Transport has details of all ATC broadcast frequencies and much more besides.

Air Band Radio Handbook, by David J. Smith, published by Patrick Stephens Ltd has comprehensive details of aircraft radio procedures, call signs and v.h.f./u.h.f. frequencies used in the UK.

Short Wave Listener's Confidential Frequency List, by Bill Laver, published by SPA Publishing Ltd details frequencies used by aircraft and others throughout the short wave bands .

See SWM Book Service on page 78 for details of price and availability.

Actual Weather Broadcasts

Following on from previous descriptions of aeronautical broadcasts, here is a more detailed look at weather reporting as heard on VOLMET and a.t.i.s.

First comes the aerodrome name and the time (24-hour u.t.c.) of the report. On a.t.i.s. each successive report has an identity letter as well as a time; the first one is A for Alpha and the alphabet continues up to Z for Zulu before re-cycling back to A. So VOLMET says "Heathrow at 1815" (each digit being spoken separately, "One Eight One Five" being quarter past six in the evening). ATIS would say "Heathrow information Bravo, the 1815 hours weather."

Special Mention

Next comes the wind as direction and speed. The direction is the true heading from which the wind is coming and all three digits are always given (in the range 001 to 360 degrees, of course). Speed is in knots, two digits being given. Sometimes gusty or variable wind requires special mention. Example: "260 degrees 08 knots" or perhaps "230 degrees 12 knots, variable between 180 and 250 degrees."

Horizontal visibility is in metres or, under better circumstances, kilometres. It might be "3 kilometres or more" (but not less). Seriously reduced visibility is reason for quoting the (instrumented) runway visual range or (i.)r.v.r. The instrument that measures this looks like two yellow torpedoes, mounted on poles, and facing each other; one transmits light and the other measures it by a photo-electric cell. You'll see these at each end of the runway and often in the middle as well. The report might be "RVR 500 metres, threshold" meaning a reading taken at the touch-down end of the runway. Significant weather is also reported (such as rain, drizzle, haze, mist, fog or smoke).

Cloud is measured by counting how many eighths of the sky are covered. Each eighth is an octa; the height of the cloud base (the lowest part of the cloud layer) is given as feet above ground. Example: "2 octa 600 feet, 7 octa 5000 feet" (note: 600 = "six hundred" and 5000 = "fife tausend" in exaggerated phonetic pronunciation). If foggy, then the report is simply "Sky obscured" but perfect conditions are "Cav OK" where Cav is "cloud and visibility."

Temperature is simple enough, plus or minus two digits in degrees celsius. Dew point is the temperature to which the air must fall before the water it contains could appear as fog.

Barometric pressures are in millibars (one bar = one atmosphere under standard conditions) and will not change, other than in name, when hectopascals take over from millibars. QFE is the reading on a barometer at airfield level, and when set on an altimeter results in the latter reading zero on touchdown. If QNH is instead set, then the altimeter reads height above sea level at all times.

Thunderstorms

A trend forecast may follow. Examples are "Tempo: thunderstorms" where a storm will temporarily pass through. Unlike VOLMET, the a.t.i.s. also tells you the active runway and other information - such as unserviceable radio beacons. It also ends with, typically, "Please report your aircraft type and that information Bravo is received, on first contact with Heathrow Approach." ■

Yupiteru VT-150

Hand-held Scanner

Photo kindly supplied by Waters & Stanton Electronics.

For the enthusiast who combines an interest in aviation with both amateur and marine band listening, the Yupiteru VT-150 is an ideal compliment to the VT-125 civil, and VT-225 civil/military airband monitors. Like its predecessors, it is destined to become a big seller here in the UK, says Chris Yates, who has been trying it out.

The latest receiver from Yupiteru is small, perfectly formed and a powerful little performer. The VT-150 is all this and more, providing full f.m. coverage of the v.h.f. high band from 142.000 to 170.000MHz in 10, 12.5 and 25kHz steps with a sensitivity that quite simply beggars belief.

It has to be said that my own QTH is not the best of locations for v.h.f. reception. Living in the low Pennines and almost completely surrounded by hills, there is little that gets in here without the aid of a loft-mounted or outside antenna and mast-head pre-amplifier. Therefore, it came as a surprise that after unpacking and initial switch-on, the East Lancashire repeater GB3RS, 145.775MHz came booming whilst I was sat at the kitchen table and using just the supplied helical antenna.

With a clean signal and very respectable S4 reading on the in-built signal strength meter - far better than I had previously achieved with similar specified equipment - this receiver was obviously going to surpass expectations, and with its quoted less than 0.5µV (10dB S/N) sensitivity I was not going to be disappointed.

Knobs and Buttons

In styling, size and layout, the VT-150 is identical to the VT-125 airband monitor. It is also as easy to drive with just sixteen front panel keys - twelve of which are dual function - to get used to, and no need for a PhD in advanced programming methods to switch on, input the first frequency and get a signal out of the box.

Tuning is accomplished by direct input through the numbered keys using the up/down keys to step through the band, by commanding the VT-150 to search, or by scanning up to thirty frequencies committed to memory. It is also possible to monitor a pre-defined frequency while listening to something else with the aid of a priority function.

One annoying snag here is that in search mode the VT-150 will only step thrugh the entire 142.000 to 170.000MHz, there being no provision to define upper and lower search limits. While it could be argued that this type of refinement is unnecessary on a receiver with such limited coverage, if your interest lies in just one part of the v.h.f. High Band then you will be missing much of the action while the VT-150 is looking the other way!

Being an inveterate twiddler, I normally foresake scanning for the much more rewarding frequency search operation, However, the particular band is littered with high power carrier only signals and I found myself having to prod the up key every few seconds to move onward. The second order pass function would have been useful here, but sadly this facility was limited only to scan mode.

Although the VT-150 allows the user to choose between 10, 12.5 and 25kHz steps in reality 12.5kHz channel spacing is the norm for much of the v.h.f. High Band with the exception of the Marine allocation where 25kHz is used. Selection is accomplished by first pressing the Function key and then making your choice accordingly.

On The Air

On the air, two problems immediately arise. First the VT-150 is an f.m. only hand-held and whilst that is OK for much of the rest of the world where this is the preferred method of modulation, here in the UK amplitude modulated signals are much in evidence throughout the band. That said, a.m. is used predominantly by the emergency services and given that it is illegal to listen to their transmission I suppose it is just as well this receiver is incapable of resolving them.

Secondly, while trying to find something to listen to, you are likely to come across a considerable number of signals where only one side of a conversation can be heard. This is known as duplex operation and allows for simultaneous two-way communication with the aid of separate transmittter/receiver combinations spaced a few megahertz apart.

Although most text books consider that it is impossible to monitor full duplex without a secondary receiver a neat trick that works quite well given a little patience and perseverance, is to load both frequencies into memory and scan between the two. Although this doesn't work all the time it is worth giving it a try, you never know your luck.

In checking out the Yupiteru VT-150's capabilities on the air my first port of call was the 144MHz amateur band. As already mentioned I was pleasantly surprised when on switch-on the East Lancashire repeater came through stronger than it ever had done before and with a very strong signal indeed, but my greatest shock came with the revelation that all users could be heard working the input frequency on 145.175MHz, including one high up on the North Yorkshire Moors, adding up to a very creditable premier performance for this latest

offering from the Yupiteru stable.

But the VT-150 is not marketed as an amateur band receiver, rather it is aimed squarely at the growing hobby of marine band monitoring. Given the difficult terrain and the fact that my own QTH is some 80km from anything remotely resembling coastline, it was obvious that drastic methods were necessary if I was to make at least a valiant attempt at hearing anything within the confines of the international marine allocation 156.000 to 1622.025MHz.

Thus, purely in the interest of science, one cold windswept Saturday night in November I was to be found a top Winter Hill, a 1458 foot beauty spot, site of the main television transmitter for the north-west, and an area popular with what are politely termed 'courting couples', reasoning that from here with a clear line of site to the coast I should at least hear a trawler or two working inthe Irish Sea.

The marine band is divided into 90 channels spaced 25kHz apart and given that they are referred to by number rather than frequency, to avoid giving yourself a headache doing the mental arithmatic to find the right spot on the dial, a marine bandplan is not only useful, but vital.

Switching on and tuning to the marine calling and distress channel on 156.800MHz, my interest was immediately arroused with a voice in the very back of the box. However, my hopes were dashed when it became clear this was coming from an emergency services repeater located just a few hundred yards away with a true frequency precisely 1MHz lower.

Not being deterred, a few minutes spent carefully repositioning the VT-150 yielded results when the fishing vessel *Colleen* was heard calling Morecambe Bay Radio to initiate a link call. Signals on both the calling and working channels were clean and strong, despite the fact she was still some considerable distance from port.

Given the lateness of the hour, the calling channel was deathly quiet, but armed with the knowledge that many of the marine band channels are assigned to particular operators I decided to tune about and see what else was happening. Channel 0 on 156.000MHz is given over permanently to emergency maritime services, and it was here that considerable activity was heard with Liverpool Coastguard attempting to raise a fishing vessel somewhere out at sea and in deep conversation with the Walney Island lifeboat station at Barrow-in-Furness.

Elsewhere a couple of in-ballast oil tankers were heard talking to Liverpool Radio whilst heading up the Mersey to the terminals at Elsemere Port and Queensferry. Out in the estuary, in an area that is littered with wrecks, two trawlermen were discussing the best places to fish in language that could best be described as 'ripe'.

All of this made for interesting listening, but I had yet to determine the maximum useable range of the VT-150. Liverpool was some 72km from my location and the *Merchant Trader*, a cargo vessel heading into Fleetwood, was some 88km away, but I couldn't help thinking this sensitive little receiver was capable of much more.

Therefore, I decided to sit it out on the 156.800MHz calling channel in the hope that some far distant signal would eventually come my way. It had gone midnight, I was getting colder by the second, and occasional voices masked by noise were proving very elusive when, suddenly, Fishguard Radio popped up above the mush with a call to the *Merchant Venturer*!

A quick look at the map revealed Fishguard to be some 330km distant by road. No, it couldn't be, I told myself but still the voice persisted.....*'Merchant Venturer, Merchant Venturer,* Fishguard Radio calling the *Merchant Venturer'*....but how and why, particularly at v.h.f.

On reflection, two factors played into my hands that night. First, at 444m above sea level, the clear line of sight almost certainly helped but more than that a short period of lift conditions, as discussed by several amateurs on 144MHz the following evening, far in excess of the distances that can normally be achieved at the frequencies.

Still it proved to be a remarkable achievement on a hand-held with just the supplied helical antenna, and one that I will certainly remember for a long time to come.

Beginners Advice

For the newcomer to v.h.f. marine band listening, it is worth pointing out a few basics. First, it is pointless sitting on a working channel for hours in the hope that you will hear something, because shore stations swap and change frequencies dependant upon a ship's geographic location. It makes more sense to monitor 156.800MHz, the designated calling channel and where contact is first made.

On receipt of a call the shore station will instruct the ship's radio operator to move to a working channel. Here duplex operation becomes the norm with the ship transmtting 5.6MHz lower in frequency than the coastal station. The exception to the duplex rule is for intership and in-port communications where both operate simplex on the same frequency.

Elsewhere it is well worth keeping 156.000MHz in the priority channel. This is designated Coastguard/ Lifeboat channel and can be very active, particularly during periods of bad weather when rescues ranging from the crew of small pleasure craft to major incidents such as that involving the *Herald of Free Enterprise* can be heard. During such events it is normal to hear rescue helicopters on this frequency as well.

Programming

Of the many scanning receivers I have looked at over the years the Yupiteru hand-helds, including the VT-150, are perhaps the easiest to use and program. Manually loading frequencies is fairly universal on most receivers, but entering them into or retrieving them from memory is often not as easy as first appears.

On this score the VT-150 wins hands down. For example, when it is decided to save a frequency, all one needs to do is select a memory bank, press Function and then Memory Write. Recall is just as simple with a prod of Function and Memory Read followed by the Up/ Down keys to step through the possible thirty stored frequencies.

There is only one departure from the norm and that is in saving priority frequencies. Here it is necessary to use the Function, Priority, Enter keys despite the fact these are held in memory 0. To monitor the priority channel automatically press Function and Priority and the receiver will check this frequency every few seconds.

One final and extremely useful feature is the M-VFO button. As the name implies this allows frequencies stored in memory to be returned to the v.f.o. allowing you to tune up or down or alter the stored parameters. A final control worth mentioning is the C/AC function that allows for correction or cancellation of manually input frequencies with either a single or double pad. ■

Summary

Despite its obvious shortcomings, the VT-150 proved to be every bit as good as its predecessors the VT-125 and 225 airband monitors. In styling, sensitivity and audio quality - a factor rapidly becoming a trade mark of Yupiteru - this receiver is well worth every penny of the £149 asking price.

However, not all of us live by the coast and given the normally short range of ship-borne signals I can't help thinking that having a dedicated marine band monitor that is only used whenever a trip to the seaside is in the offing might prove to be an expensive luxury. That said there is a wealth of activity elsewhere in the band including a goodly percentage of p.m.r. signals to listen in on.

From my own point of view, with much listening activity taking place at home, I now hope and pray that Yupiteru introduce us to the definitive base air and marine band monitor, incorporating the frequency coverage and features of not only the VT-125 and VT-150 but the VT-225 as well.

Thanks to **Nevada Communications, 189 London Road, North End, Portsmouth PO2 9AE. Tel: (0705) 662145** for the loan of the review set.

Weather

Ron Ham has always had an interest in weather watching, so he jumped at the chance to review the Weather Monitor II from ICS Electronics Ltd.

Fig.1: Weather Monitor II with the Weatherlink software on the left.

Fig.2: (below) The combined wind speed and direction monitor.

The prevailing weather is usually the first topic of conversation whenever people meet or casually greet each other. I noted a few such remarks, during the last two weeks in December, while I had this weather instrument under review. My daily walk to the village and back is about 2.5km and among the replies to my 'Good Mornings', were, 'nice day', 'bit of a frost', 'won't last', 'windy night', 'too much rain' and 'they've got it wrong again'. Apart from these casual comments, more people seem to have a real interest in the weather which, I feel sure, is due to the friendly and informative way that the television presenters explain the complexities of our climate in their reports and forecasts.

Many folk have weather instruments in their home, but few have a co-ordinated plan of using them. The hall barometer gets a regular tap to see if 'the glass' is beginning to rise or fall, the gardener frequently checks the inside/outside thermometer for upward or downward trends and many places have a rain-gauge in the garden and a 'weather cock' on the roof. But, what about having your own weather-station and adding the wind-speed, inside and outside humidity, wind-chill and dew point to your observations and, what's more, being able to get the information at the touch of a button. I am not dreaming readers, thanks to ICS Electronics of Arundel, Sussex, I had the chance to try out the Davis Weather Monitor II and couple its output, via the associated Weatherlink Software, to my Amstrad PC2286 computer.

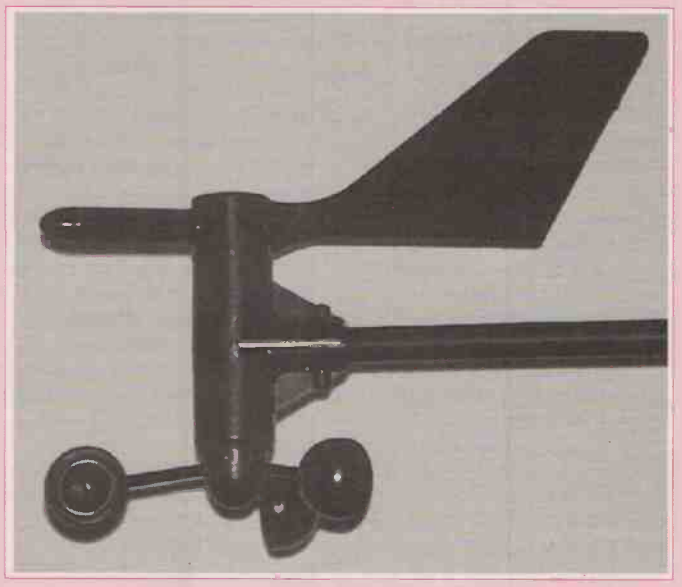
The Main Station

Weather Monitor II is attractively presented, **Fig. 1**, both inside and outside of its box. The package contains the station, the combined wind-speed and direction indicator, **Fig. 2**, with its support arm, mounting bracket and 12.2m of fitted cable, an outside temperature sensor with 7.6m of cable, a junction box, a mains power unit, a 2.4m terminated lead to connect the junction box to the rear of the station, a packet of hardware and a comprehensive owner's manual, **Fig. 3**. From first sight onwards the equipment looks stylish, feels good and is obviously well thought out and finished. In addition, the station itself contains a barometer, clock and date, the inside temperature and humidity sensors, alarm and scan facilities and the computing arrangements for optional extras like a rain collector and outside humidity detector.

The owner's manual is adequately illustrated with easy to follow instructions. The vane and the anemometer cups slide on to their respective spindles and are secured by allen screws, each gently tightened with the supplied key. The stand-off arm and bracket for outside use are fixed to the pole by two 'U' clamps. Special attention must be paid to the fitting of the vane to ensure that its direction agrees with the compass rose points on the station screen. I tested this indoors by moving the (upper) spindle, with my fingers until North was indicated on the screen, then fitted the vane so that the 'sharp' end faced North in line with the support arm. When I installed the wind unit outside, I made sure the arm was pointing North by rotating the pole. From inside the loft I tucked the outside temperature sensor under a roof tile which enabled it to do its work while being protected from the rain. The leads from the latter and the wind detectors plug into the sockets indicated on the left side of the junction box. Finally, before clipping the rear cover on the station, a PP3 type back-up battery is needed under the oblong cover just below the cable inputs. The manual shows that a lot of thought has been given to this rear cover/come mounting bracket. One way round it lets the station sit on your desk and the other way it can stand upright on a shelf, or be fixed on the wall.

Preparing The Station

The front casework of the station, measures approximately 140 x 130mm with a depth ranging between 40 and 70mm. The data on the oblong, liquid crystal, viewing screen, measuring



Monitor II

Fig. 4: Keyboard.

Fig. 3.

approximately 112 x 43mm, is easy to read and is well laid out. Although I found it unnecessary, a screen back light can be turned-on if required. After the first switch-on it is wise to set the time and date, correct the barometric pressure to a known local source and decide whether you want the various read-outs to show 12 or 24 hours, Celsius or Fahrenheit, inches or millibars, or miles or knots per hour. It's best to familiarise yourself with the workings of the station keyboard, **Fig. 4 and study the owner's manual** before commencing this or any other procedure.

Your Weather station is now operational and by touching 'TEMP' on the keyboard, **Fig. 4**, the inside temperature is displayed on the right of the screen while the wind direction and speed (right-centre of the rose) indicators remain on the left, as in **Fig. 3**. Touch the 'TEMP' key again and the outside temperature is given. This dual roll also applies to humidity, 'HUM' (if the outside humidity detector has been added) 'TIME' switches to date and 'WIND', changes speed to direction in degrees. Instructions can be given from the station's keyboard to 'SCAN' through the various modes and to set 'ALARMS' for unexpected changes and/or extreme conditions. In fact a customised scan and alarm system can be set.

Weather Station To Computer

If you have an 'IBM or 100% IBM compatible computer (PC,XT,AT or PS/2) with at least one high density floppy drive, or a low density floppy drive and a hard drive...Hercules Monochrome, CGA, EGA, or VGA display...640K of conventional memory installed... and one serial port', says the manual, then you can run the Weatherlink software and greatly increase the scope of your weather station. To my mind, this really puts the icing on the cake.

The Weatherlink package, left **Fig. 1**, contains the interface, left centre Fig. 10, that fits under the rear cover of the station, version 2.1 of the program on 3.5in and 5.25in floppy discs, an owner's manual and two serial port adapters. These are for connecting the interface output lead to a 9-pin or 25-pin RS232 socket. Read the Software manual and load the program. This is easy, I placed the 3.5in floppy disc into the 'A' drive on my Amstrad, typed INSTALL, at the 'A' prompt, pressed ENTER and it quickly transferred the files to the hard-drive 'C' creating its own directory \PCLINK2. When required I typed CD\PCLINK2 at the 'C' Prompt, then ENTER and the directory appears. Follow this with PCLINK - ENTER, the program loads and you are presented with a panel containing 13 oblong labels in groups of 3, 3, 5 and 2. The day, date and time are working at the top ends of the menu panel and the instructions 'TAB to choose', 'ENTER to make selection' and 'Press F1 if you need help' are written along the bottom. A box can also be selected by pressing a high-lighted letter. The first group offers 'Setup', 'Commands' and 'Plots', the second 'Bulletin', 'Download' and 'Quick plots', the third, 'Browse', 'Backup', 'Delete', 'Restore' and 'Print' and finally, 'Help' and 'Exit'.

The set up menu consists of 'Station', 'Serial Port', 'Printer' and 'Units'. These enable you to select, 1, the model of the station you have purchased (in this case Weather Monitor II), extra accessories like the outside humidity detector and/or rain collector and the name to your database. 2, the serial port (COM1, 2, 3 or 4) that you intend to use and, if required, the setting up of a modem to use Weather Monitor II as a remote station. This also includes a 'TEST' operation to be sure that your PC and the station are 'talking' to each other. 3, offers a list of printer types from which yours is selected and 4, gives you the choice of display readings, Fahrenheit or Celsius, etc. All the station 'setups' including the following 'Commands' can be done, via this program on the PC.

Commands

Having arranged the program to your liking the next step is to command the setting of the barometer (I took my current barograph reading), time and 'Archive Interval'. The latter asks the station to provide information at 1, 5, 15, 30, 60 or 120 minute intervals (I chose 15m, see dots in **Fig. 5**.). From this commands menu, highs and lows and rain records can be cleared.

From the Plots menu your weather-information selection can be titled or the plot settings cleared. On the 'X' axis it offers plot-periods of one day (my choice), a week at 2, 6 or 24 hour intervals or a month or a year. Further options are a dual plot between two dates and horizontal grid lines on the graph. The optional left or right hand 'Y' axis gives a choice of plotting 11 weather

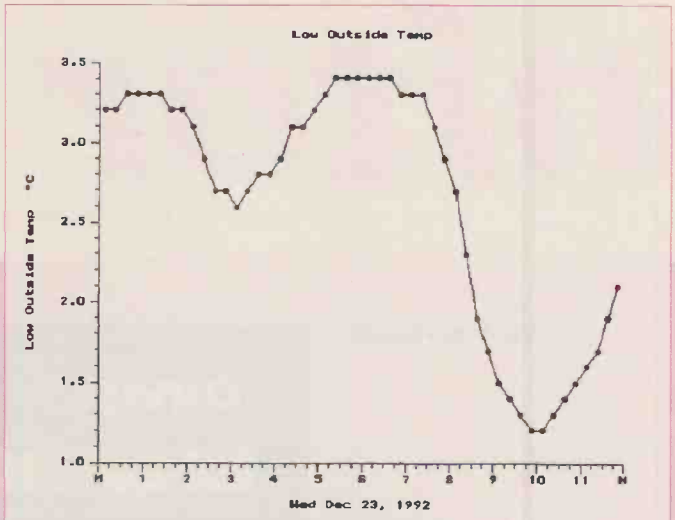


Fig. 5: Low outside temperature plot.

happenings and to select a line graph or a bar chart. The on-screen trace can be printed out by pressing ALT and 'P' on your computer. The chart in **Fig. 5** is a typical example which shows that the system is ideal for detailed study. What about using something like this to compare the prevailing atmospheric pressue, temperature and humidity with tropospheric openings?

Fascinating

Having requested a current weather bulletin the program asks for a Yes or No to 'Download high's and low's'. Yes, means that the bulletin display will include marks showing the latest extremes. A slight delay follows before your computer screen shows the prevailing barometer trace for the previous 6 hours inside and outside temperatures and humidity and the dew point. Two dials in the top centre boxes, above the barometer trace, show the wind speed and direction, all working and, while the indicators are moving, the prevailing wind direction, highest wind-speed and wind-chill factor is being calculated and shown on the screen below the two dials. This must be both fascinating and educational to watch while a storm is in progress.

The weather station is continually storing blocks of information in its archives and by pressing 'DOWNLOAD' the number of stored blocks are counted and you have the option 'Yes' or 'No' to transfer these to your PC. Select 'Yes' and they are transferred. You are then asked if you want this information written to your database. Say 'Yes', the data is moved and the archive memory cleared. This memory now continues to gather weather data until it is cleared again. Having downloaded several days data, you can show the prevailing weather trends with 'quick-plots' and go through all the recorded weather information by using the cursor keys. Left and right for backwards and forwards in time and up and down to select temperature, wind speed, barometer, etc.

Browse

In addition there is a 'Browse' chart, like a spread sheet, listing the stored data and giving the recorded readings of all functions at 15 minute intervals (my choice of archive-period). Browse is updated after each download of archive blocks. From the backup menu, information in your database can be recorded on to a floppy disc in the 'A' drive and from here all or some records can be reloaded by using the 'Restore' key. A choice of items can be removed from the database using the 'Delete' menu and the 'Print' key asks what records you want printed and enables the creation of ASCII and export files from the database. I found it difficult to stop playing with this fascinating program and select 'EXIT' from the panel to return to DOS and the 'C' prompt.

I also tried the external temperature/ humidity sensor which is supplied with about 12m of lead ready to plug into the station junction box in place of the supplied outside sensor. This unit, measuring approximately 80 x 80 x 32mm, has four fixing screws and should be mounted outside, but sheltered from the rain. As it was temporary, I fixed it under a roof tile in my loft. One advantage of having this unit is the capability of reading the 'DEW' point already provided for on the station's keyboard.

Observations

I kept the station running continually for several days and the mains power unit hardly got warm. At one time, when the mains failed, the back-up battery took over and part of the display kept flashing to warn of the supply problem. While in use the station-screen constantly displayed the wind speed and direction in addition to my request for a barometer reading. Also, in this mode, an on-screen arrow indicates the current barometric trend. A display of information from the other functions is obtained by pressing the appropriate button on the station-keyboard.

A Practical Test

Around 0730 on December 23, I met a neighbour tending her horses and we commented about the frost and how cold it was. I saw her again about 1030 when she felt sure that it had got colder over the last couple of hours because the fastenings on her equipment had frozen since she had been in the stables. Now was my chance to see the advantage of having the Weatherlink software. Although the 'outside' sensor was in my loft, thus giving higher readings than they were in the garden, the trend should be the same. However, at 1145, I downloaded the archives from the Weather Station to my Amstrad PC and then asked for a 'Low Outside Temperature' plot, which it produced, **Fig. 5** and the lady was right, the temperature fell dramatically, as the print-out confirms, between 0800 and 1000. This one example proves how easy it is to make graphs and comparisons for any period that you have stored data and then analyse the results.

The Cost

In my view this weather station is not expensive when you see all that you are getting for your money and compare it to the price of individual good quality weather instruments. Weather Monitor II is £339.95, Weatherlink Computer Module for IBM-PC - £149.95, the Rain Collector - £59.95 and the External Temperature/Humidity Sensor - £65.95, all inclusive of UK VAT at 17.5%. With all its hi-tech and observational advantages, the whole lot will cost you £615.80. You could pay that much for a new barograph alone. For more information I suggest that you ask **ICS Electronics Ltd, at Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 OBD**, for their catalogue of Davis Instruments and accessories.■

short wave magazine

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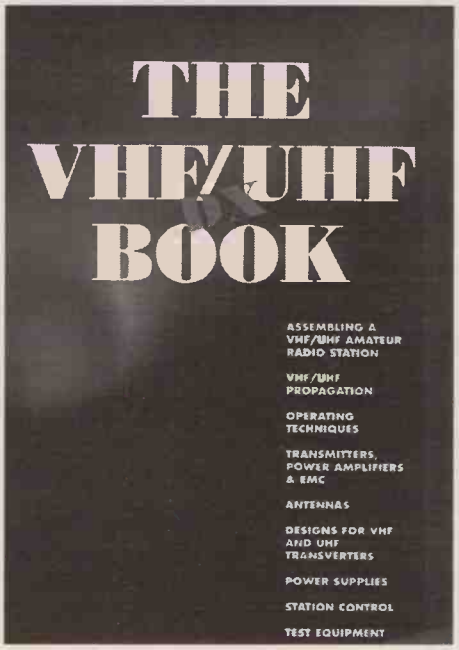
The VHF/UHF DX Book

Reviewed by John Fell G0API



If your communications interests lie within that part of the frequency spectrum known as v.h.f./u.h.f. i.e. 50 - 1000MHz or so, then *The VHF/UHF DX Book* will come as a welcome source of reference and inspiration for both the s.w.l. and radio amateur. Within its 450 pages you will find 12 chapters dealing comprehensively with virtually all relevant aspects of today's amateur band v.h.f./u.h.f. communications, written by well known radio amateurs who are well versed in their particular fields.

The specific object of this book is to promote your ability to work DX, making contacts at the limits of propagation and system performance. The ways and means of doing this effectively take a long time to master - reading this book will provide a means to speed up the process and if it leads to more activity, I am sure it will have fulfilled the authors' objectives.

Fundamental to all radio operations, the chapter on Propagation mechanisms is given a comprehensive review by Geoff Grayer G3NAQ. The style is such that the reader is introduced to the subject at atomic level and progresses through propagation mediums, to path losses and enhanced modes. All tropospheric and solar influenced modes are covered to a level consistent with current knowledge.

Operating techniques may appear at first glance to be a dry subject but under the guidance of David Butler G4ASR a solid basis to maximise your station's effectiveness is given. Topics covered include weak signal DX, listening to determine what is going on before you put your foot in and how to handle pile-ups. One of David's classic lecture comments comes up *viz* "a little c.w. can go a long way - a lot of c.w. can go even further".

Meteor scatter, e.m.e. (moonbounce) and how to increase the available intelligence flow are also well covered. Early April seems to be the only regular part of the annual cycle available to repair the antenna system, at least according to the DXer's Year Planner Chart.

Ian White G3SEK is the overall editor of this book as well as a regular and well-respected author on subjects from receiver design to microwave amplifiers, so who better to cover the subject of assembling your station. Ian explains how to determine the optimum requirements for all available modes and why, for instance, trading noise figures for dynamic range is worthwhile for terrestrial communications where ground noise rules. Station improvements and record keeping to constantly evaluate your performance are also regarded as imperative. Receivers and local oscillators are covered in depth with regard to overall system performance allowing evaluation of current 'black box' technology and providing you with the knowledge to specify your 'best case' system.

The theory given is put into practice by Sam Jewell G4DDK, Dave Powis G4HUP, Dave Robinson G4FRE and John Wickenson G4HGT to present designs for 'state of the art' transverters for 50, 70, 144 and 432MHz.

Driving from 28MHz using the best of todays h.f. rigs is still seen to be the most effective combination, certainly for strong signal handling capability such as contesting.

Power amplifiers and power supplies can take many forms, but if you want the best in terms of reliability, clean signals and raw power, John Nelson GW4FRX, has always been a firm advocate of tetrode valves, preferably those made by EIMAC. In the chapter covering transmitters, power amplifiers, and e.m.c. John gives full vent to his long-time love of r.f. power devices, quoting the good and bad points of most available methods of generating strong signals. Not surprisingly the valve approach comes out well ahead of all contenders for the station p.a. and detailed information is given on the design, construction and commissioning of amplifiers, including mods to tame most known amateur designs. No one could fail to acknowledge the comprehensive protection systems designed into GW4FRX power supplies - belts, braces, you name it, it's all in here and at the end of the day, as John says, nobody wants to stop working the DX to repair a duff p.a. - even in GW it can be quite rare. For the sake of local spectral purity it would have been nice to see details of a single valve amplifier of, say 150W, but I suppose this does represent less than ultimate station capability in John's eyes.

Antennas are covered by Gunter Hoch DL6WU from theory to practical realisation. After reading previous works by Gunter on double optimised long Yagis I can do little more than say that the material presented here is both comprehensive and invaluable if your intention is to build antenna systems capable of predictable and efficient performance. Specific long Yagi designs for all the v.h.f./u.h.f. bands covered are presented in table form together with stacking and matching techniques.

To round off the book Roger Blackwell G4PMK discusses the requirements for test equipment and station accessories to make measurements of r.f. power, voltage, frequency, etc. Practical details of impedance and v.s.w.r. measurement, receiving and transmitting, test gear and filter designs also feature.

Each chapter contains references in text which are given at the end and are for the most part available to the reader. Some may well present difficulties in obtaining but will be worth the effort.

As an all round source of reference and inspiration I thoroughly recommend adding *The VHF/UHF DX Book* to your armoury of DX chasing equipment - see you on the bands.

The VHF/UHF DX Book DIR Publishing Ltd. ISBN O 9520468 0 6. Price £18.00 plus £1.00 p&p. Available from SWM Book Service, FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (0202) 659930

Propagation

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

It is surprising just how many sunspots have been turning up at this late stage of the solar cycle. At his observatory in Bristol, **Ted Waring** counted 6 sunspots on November 16 and, while observing the sun's disc with his spectrohelioscope, **Cmdr Henry Hatfield** (Sevenoaks) located 4 sunspot groups, one slightly active, 9 filaments and 8 small quiescent prominences at 1213 on the 17th and 3gps and a medium sized 'hedgerow' prominence, on the East-limb, at 1155 on the 26th.

In December, he found 2fs, 8 small qps and a "very faint thin 'pillar' prominence on the south-west limb" at 1120 on the 5th, 3fs, 8 small qps and a small plage and prominence on the West-limb at 1103 on the 7th, 4gps, 8fs and 8 small qps at 1222 on the 12th, 2gps "a nice medium prom. on SE-limb and a medium pillar prom. (quiescent) on the NW-limb at 1115 on the 21st, 2gps, 5fs and 4 small qps at 1224 on the 27th and 2gps, 5fs, a large 'U' shaped filament near SW-limb and 3 qps at 1130 on the 29th. Despite Henry's observations being restricted on November 26 and December 3, 5 and 7 by cloud, his 136MHz, radio telescope told him that the sun was active when it recorded a medium burst of solar noise, from 1412 to 1416, on the 3rd. Toward the end of November, **Ron Livesey**, this time observing from Glasgow with a 2.0in refractor telescope and a 1.5in projection screen, identified three active areas on the sun's disc on days 19 and 23 and four on the 24th and 25th.

Although clouds prevented a fuller examination of the sun by **Patrick Moore** (Selsey) at 1040 on the 20th, he was able to draw the spots, **Fig. 1**, that he did resolve on his telescope projection screen. Weather conditions were better at 1130, on December 21, when, as shown in **Fig. 2**, he located a number of spots and a reasonable sized group.

Solar Archives

At 1505 on June 13, 1991, Henry Hatfield observed great clouds of gas above a sunspot group, **Fig. 3**, which he photographed and kindly sent me a print so that we can all see the spectacular results that are possible with a spectrohelioscope.

Aurora

Regardless of the extra-cloudy periods in North Dakota and Scotland, Ron Livesey, the auroral co-ordinator for the British Astronomical Association received reports of auroral, 'glows' for the overnight periods on November 17 & 23, 'homogeneous arc or band' on the 20th, 'rayed bundles' on the 21st, 25th, 27th & 28th, 'active and pulsating' on the 25th and 'all sky activity' on the 30th. It is not surprising with the number of sunspots throughout December that **Tony Hopwood** (Upton-on-Severn) detected auroral reflected radio signals at 1930 on the 1st, 2115 on the 15th, 2200 on the 19th, 2000 on the 20th and 21st, 2100 on the 28th and 1830 on the 29th. The quality of auroral reflected c.w. signals is so poor, like a low pitched rasp, that they are simply described as tone 'A'.

Magnetic

The various types of magnetometers used by Tony Hopwood, **Karl Lewis** (Saltash), Ron Livesey (Edinburgh) and **Tom Rackham** (Goostrey), between them recorded magnet 'storm' conditions on November 1, 9, 16, 22 & 23. Tony also recorded disturbed conditions on December 1, 2, 4, 10, 14, 15, 18-20, 23 & 28-31.

	November					December																					
Beacon	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
DF0AAB	X									X										X										
DL0IGI	X						X	X		X			X						X					X						
EA3JA						X																								
HG5GEW	X																	X						X						
IY4M	X	X					X	X	X	X			X	X	X		X					X		X						
KA1NSV	X	X			X		X	X		X					X	X	X	X	X	X	X			X	X	X	X	X	X	
KB9DJA																					X									
KC4DPC																					X									
KD4EC	X		X		X												X			X	X									
KF4MS																X														
KJ4X																				X		X					X	X		
LA5TEN		X																												
LU1FHH	X																													
NX2O	X	X	X		X		X		X	X	X		X		X		X	X	X		X	X		X		X	X	X	X	
OH9TEN	X	X	X	X	X							X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PY2AMI	X	X				X	X	X	X	X			X	X		X	X		X					X						X
SK2TEN	X				X														X									X		
SK5TEN																										X		X		
SV3AQR	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
VE3TEN	X	X	X	X			X	X	X					X			X		X	X	X	X		X						
VK2RSY		X	X				X				X													X						
VK3SIX			X																											
VK5WI																						X								
VK6RWA																	X													
VK8VF														X				X						X				X		
VP8ADE							X																							
WC8E	X	X	X		X		X	X							X		X	X	X	X	X	X		X			X	X		
W3VD	X	X	X	X	X		X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
W9UX0		X	X																	X	X			X						
Y02X										X														X						
Z21ANB	X	X		X	X	X	X	X	X			X	X	X																
5B4CY	X	X	X	X		X	X	X		X		X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X

Fig. 4.

Propagation Beacons

As usual, my thanks are due to **Gordon Foote** (Didcot), **Simon Griggs** (Chelmsford), Henry Hatfield, **Ted Owen** (Maldon), Ted Waring and **Ford White** (Portland) for their 28MHz beacon logs. These enabled me to compile the chart, **Fig. 4**, of beacon signals heard in the UK from November 26 to December 25. Thanks also to **Costas Krallis** (Athens) for his letter telling me that the new beacon in Greece, SV3AQR, sends about 4W to 5l/8 antenna on 28.265MHz. Costas added that the Finish beacon, OH2TEN, should be radiating about 50W on 28.2525MHz from December 1992.

Ford White heard an old friend VP8ADE on December 2 and Gordon Foote said that apart from SV3AQR, OATEN and 'good old 5B4CY' which gave a good showing, he found the American beacons predominant. Ted Owen added the Australian VK3SIX to our chart on November 28 and on December 22nd he copied EM4SED. From Jacksonville, USA, **Mike Hardester**, reports hearing KE0UL on 28.2947MHz from 2121 to 2155 on the 19th and again at 2150 on the 20th and WC8E (28.294MHz) around 2115 on the 19th but nothing at the same time on the 20th.

Tropospheric

The variations in atmospheric pressure for the period November 26 to December 25 and a detailed account of the tropospheric openings during the last few weeks of 1992 can be seen in my television column elsewhere in this issue. By what I have been told and heard myself, signals in Band II (87.5 to 106MHz) were also upset when the v.h.f. and u.h.f. TV bands were open.

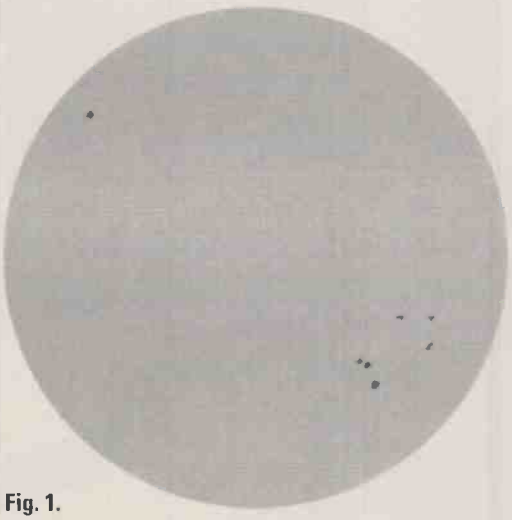


Fig. 1.

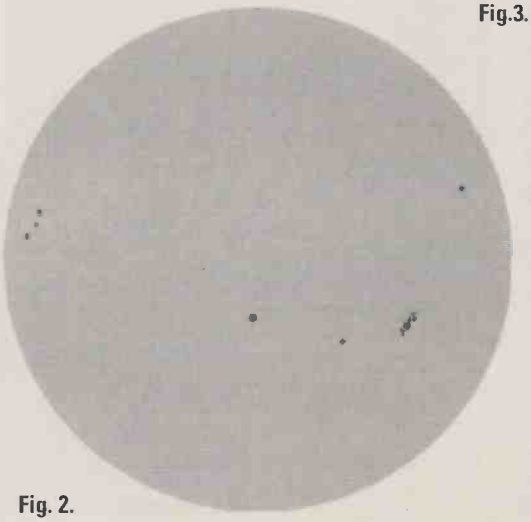


Fig. 2.

Fig.3.

Satellite TV News

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

It's an ill wind... as the saying goes and the January gales produced considerable satellite activity resulting from the grounding of the good ship *Braer* on the Shetland coast and the spread of oil pollution from the ruptured tanker. Eutelsat II F1 at 13°E seemed the most active with numerous SNG (satellite news gathering) feeds uplinking from Shetland via 13°E using Telecom band (12.5-12.7GHz). Several were live injects into main news services both the UK and overseas. SNG links included CNN, ITN, BBC, SVT Sweden and Reuters.

One rather hassled reporter attempting to complete a news item in an obvious gale on a local housing estate became rather punctuated when the uplink dish repeatedly moved from the main beam axis in the strong wind gusts, pictures dissolving into severe sparklies and loud audio shash. The BBC were feeding ex-Shetland via their BBC SNG unit with 'BBC UKI20 BBC FEED' caption over 13°E - and a few days later another SNG caption 'UKI 17 BBC feed for ITN ex Bosnia' from a further trouble spot. The seriousness of the above events, not forgetting the mini Gulf interventions in mid January portrayed a harsh reality compared with the 11.07GHz vertical sports SIS feed over Intelsat 603 27°W from the Oxford Greyhound dog track on New Years Day!

Vatican News

Since early December the TV station 'Telepace' has been producing a regular (daily) news programme on the day by day happenings in the Vatican, the Pope meeting visiting priests, church masses and blessing the population gathered beneath the Vaticans' balconies. Interesting to see the familiar Philips PM5544 test card, much of it lost with an inlaid computer graphic shape of a peace dove carrying an olive branch in its beak. Check out Eutelsat II F4 7°E at 11.67GHz horizontal for this mid afternoon papal offering from 1530 onwards.

Though January 14 was the official move day for the EBU leased news services from Eutelsat I F5 21°E to the series II bird at 7°E, news pictures were being carried several days early and at greater strengths than previously seen over 21 East. The reason for the move is because the East and West broadcasting organisations (the EBU and OIRT) have combined into just the EBU and the need to offer a footprint coverage extending from the Canaries in the West to Moscow and the Urals in the East - the wide-beam footprint of the series II craft offers this facility. Enthusiasts will note that many of the pictures are very shaky and difficult to lock up due to sound in sync transmission being used. This can be overcome by feeding the baseband signal through certain pirate decoders which can regenerate the sync information locally and clean off the incoming sync - the result are steady pictures. The Crestel RTL4/Filmnet pirate decoder is capable of producing locked pictures and we'd be grateful in hearing from any reader if any other decoders have been found able to clean up sound in sync pictures.

Readers' Reports

Exiled Bob Black out in the deserts near Riyadh is hard at work constructing a 2nd dish for C Band following the demise of his first 3.4m assembly, a heavy sandstorm caused the bending of several aluminium ribs in his first dish, the new 2.8m version is using welded rather than stressed beams. Using a 25° K C Band LNB Bobhas received AsiaSat, ArabSat, Gorizont and several Intelsats. Next on the list is a Ku band special based around a glass fibre dish. Further to the East, **Alan E. Smith** in Si Racha, Thailand (100 miles south of Bangkok is also using a similar size dish and LNB to Bob with a locally manufactured 'Samart Starfinder' receiver. Alan says that a Russian Gorizont satellite is now down-linking the Asian Television Network (ATN) from 101°E. The Indonesian Palapa series satellites carry a large variety of stations, recently TPI Television Pendidikan Indonesia and SCTV Suriya Citra TV appeared together with 3 encrypted channels, so far unidentified. Odd that sat in deepest Asia, Alan has been able to watch ITN News!

December 30 saw the end of the BSykB Marco Polo 1 service from 31°W, earlier last year Marco Polo 2 had been sold to the Norwegian NSB company which has now taken up orbit at 1° West and has suffered a name change, answering now to 'Thor'.

Amstrad now can supply a 950mm dish pack with 1.2dB LNB (non polariser) for under £80 excl VAT though you'll need a friend that is 'in the trade' - this could represent an inexpensive route to satellite 'DXing' with a simple ground stand and polar mount.

Orbital News

An amalgamation of the Eurosport and Screensport channels into a single Eurosport (The European Sports Network) was announced early January with the new operational base likely to be in Paris (rather than London). Astra will still carry the new Eurosport in English, Dutch and German, a French language version will be carried over the Telecom 2a satellite. Another new channel for Astra will be a UK version of the US Nickelodean Channel. UK Nickelodean will open October 1993 on Astra 1C running a 12 hour day, rather a set-back for The Children's Channel (TCC) that has just signed a programme package deal with BSkyB for subscription funded financing. Nickelodean are also involved with BSkyB which will be based at the Sky HQ in Osterley Park, West London, within which the Nickelodean programmes will be made and presented.

Even cattle auctions from around the UK markets are now carried via satellite, bidding carried over the 'phone. Several have been viewed both in the mornings and afternoons over Eutelsat II F3 16 East - 10.986GHz horizontal.

Below: A selection of test cards from reader Andrew Sykes, West Yorkshire using his 800mm tracking dish.

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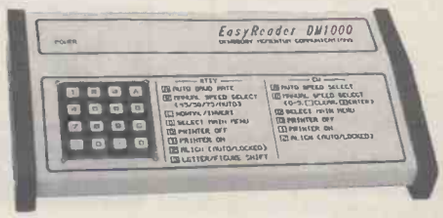

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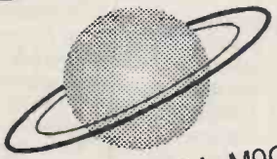

To Station.. GB4LON
RST..... 59
Mode..... FM
Date..... 13-3-93
Time..... 10:00am
Rig..... ICECOM
Antenna..... VERY LONG WIRE
Power..... LOTS

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READERS' VOICE

Bandscan

AUSTRALIA
Greg Baker

With a late start this southern summer has finally warmed up and where I live, the sun is finally reminding us what it can do. Even with the growing worry of the ozone hole extending over this area, for most people sun still means going outdoors to enjoy it. I seem to be one of the very few who prefer to stop indoors when the sun is out which, of course, gives me more time to drive everyone near me crazy with sixteen hours a day radio.

As well as that I have finally been connected into the local bushfire radio network with a grubby old Philips FM 828 high band v.h.f. transceiver now installed in the car.

Stereo Broadcasts

David Hunt from Brighton in East Essex has written asking me about the advent of stereo television in this country. Stereo sound television broadcasts were announced in December 1983 after a series of tests by the then Department of Communication (DoC) in collaboration with television stations operating at the time. The German dual carrier system was chosen as the Australian standard among other things for its possibilities in providing two sound tracks to accompany the video content of television signals. Stations such as those operated by the Special Broadcasting Service (SBS) were keen too to install this system to give them the possibility of simultaneously transmitting sound tracks in two languages. Approvals for stereo transmission were given at the time of the announcement in 1983 and transmissions commenced shortly afterwards.

As an aside, television began in Australia in 1956 and went colour in 1975. For the technically minded - and aren't we all in this hobby? - the primary sound carrier is 5.5MHz above the vision carrier with the secondary sound carrier 242.1875kHz above the primary sound carrier. The f.m broadcast band transmissions run stereo here too, of course, and so too do many a.m. broadcast band stations. This latter came about as an a.m. broadcast station response to the growing popularity of stereo f.m. broadcasts. This approach was not wildly successful however.

I've no idea who or how many people actually listen to stereo a.m. and I have yet to find anyone who does know. As an indication though I've been unable to find any widely available or reasonably priced radio receivers with this as a feature. The system used here is the Motorola C-Quam system (Compatible quadrature amplitude modulated) and was chosen after extensive 1984 DoC and radio station tests from a field of contenders including as well as Motorola, systems from Kahn, from Harris and from Magnavox. The Motorola system was chosen in 1984 and by February 1985 there were 31 a.m. stereo broadcasters. I do not yet have figures on the current number of a.m. stereo broadcasters in the m.w. band but will pass them on when they come to hand.

Special Broadcasting Service

I reported in *SWM* for March 1991 that the SBS here operated two a.m. broadcast band stations to service Australia's large and growing ethnic communities. These two stations - 2EA in Sydney and 3EA in Melbourne - are to be joined by a network of stations across Australia. Stations will begin operating in December this year in Adelaide, Perth, Darwin and Brisbane and in July 1994 from Canberra and Hobart.

In July 1994 also Sydney will get a second SBS station. Australian ethnic communities have been urging the government to fund a second Sydney SBS transmitter and for a national network for some time. They say that some ethnic communities currently can only listen to thirty minutes every fortnight in their own language. The expanded network will give listeners throughout Australia access to broadcasts in 64 languages. Prime Minister Keating in announcing the expanded network said that 'ethnic radio programming is an important vehicle for accommodating the information and communication needs of people from non-English speaking backgrounds'. And with an eye on the ethnic communities vote at the election due in the first half of this year he took great glee in commenting that the current opposition had promised to cut $A6 million (about £2.5 million) from the SBS annual budget.

MI6 Quits Radio Base

According to a report in Australia's *CB Action* magazine MI6 is closing its monitoring station at Kuwandi which is 30km north of Darwin. The station began operations as a joint Australian Security Intelligence Service - MI6 relay in 1968. By 1984 Kuwandi was operating on 32 frequencies with a callsign of VJW. Among other defence related tasks Kuwandi was used to relay information to London from diplomatic stations in this area and was the last British relay station in the world for this type of work.

Other News

Radio Australia started a thirty minute a day Khmer language broadcast service in early December 1992.

A new Radio Australia schedule is due out this month. Copies can be obtained from Radio Australia, PO Box 755, Glen Waverley, Victoria 3150, Australia.

The Intelsat 18th Assembly of Parties took place in Sydney last November. Intelsat carries 60% of Australia's international voice, data and video communications traffic. Intelsat shareholding is held by the 124 member countries in proportion to their usage of the system and Australia is Intelsat's sixth largest shareholder behind the United States, the United Kingdom, Japan, France and Germany. The Assembly decided among other things to relax barriers to separate satellite systems competing with Intelsat.

The Australian government has decided to permanently restrict the now vacant sixth television channel in each transmitting centre to non-commercial purposes.

The proliferation of telecommunications agencies continues apace. I reported the formation of the National Transmission Agency and also the coming overhaul of spectrum policy in *SWM* for December 1992. Since I wrote that column the Australian Broadcasting Authority (ABA) has commenced operations and a Spectrum Management Agency (SMA) has been announced. According to the Department of Transport and Communications the ABA will provide an integrated approach to broadcasting regulation, dealing with planning, licensing & programme standards. The SMA is the outcome of the spectrum management overhaul and is the agency designed to implement the introduction of a market based system for spectrum management. The SMA will be in place by July this year.

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

DXTV Round-up

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

This month pride of place goes to the several tropospheric openings that took place in December and early January. In my view, the reason for these events was the complex patterns of predominantly high atmospheric pressure and the frequently changing temperature. My readings for December ranged from 18°F, one night, to around 50°F on some days. In addition, there were periods of thick fog, sometimes freezing, with the relative humidity often between 80 and 84%.

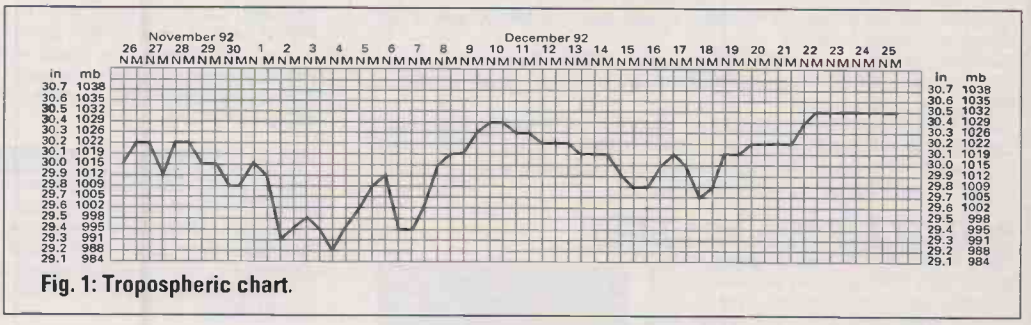


Fig. 1: Tropospheric chart.

Super DX

After a poor showing in October and November, TVDXers were looking forward to something like this happening and, as the logs revealed, many of them received pictures on the v.h.f. (Band III) and u.h.f. (Bands IV & V) bands from Ireland to Poland and France to Scandinavia. Apart from the enjoyment readers get from DXTV, their logs also show the extent of the complex weather systems by the path and distance of the signals they received.

For instance, in Birkenhead, **Andrew Jackson** saw a number of test-cards and/or watched a variety of programmes in the v.h.f. band from Belgium (BRT1) on Ch. E10 on the 17th, 29th & 30th. Belgium's RTBF1, Ch. E8, on the 28th, 29th & 30th and France (Canal+), Ch.F5, on the 28th & 30th. Between the 28th & 30th he logged signals in the u.h.f. bands from Anglia TV, Border TV, France (TF1 & France 2), Germany (ZDF), Holland (NED1, 2 & 3) and Ireland (RTE1 & Network2).

Andrew found most stations on the 30th when he reported seeing some English programmes, like *On The Buses* and *London's Burning*, on Dutch TV and noted a strong signal from RTE1, on Ireland's Ch. E (183.25MHz), with a letter 'E' in the top right hand corner.

"December certainly made up for the lack of tropo DX in October and the poor November," wrote **David Ashley** (Norwich), who, like other readers he found u.h.f. DX on days 10, 13 & 14 and daily from the 24th to the 30th. Between those days he logged pictures from Denmark (TV2), Germany (MDR, West3 & ZDF) and Holland (NED1, 2 & 3) and, in the UK, from BBC1 (Wales), Central, HTV (West), Tyne Tees and Yorkshire TV. During the daylight hours on the 14th, David reports that "NED-1 and 2 were visible, although they were rather weak and Denmark's TV2 and NED-3 were giving strong signals, pointing to a northerly tropo disturbance. However, as soon as it started to get dark, NED-1 and 2 and TV2 disappeared in a matter of seconds and NED-3 was reduced to a pale ghost of what it had been during the day. Then the German stations appeared, together with RTL-Lux which lasted all of ten minutes."

In New Radnor, **Simon Hamer** received pictures in Band III from Spain (RTVE1), on Ch. E7, during the opening on December 10, Germany (ARD1) on at least 7 channels on the 14th, Denmark (DR) on 5 channels, possibly the Faroe Islands on Ch. E6, Finland (YLE-1) on Ch. E6, Norway on 6 channels, Poland (TVP) on Ch. R8 and Sweden (SVT1) on the 21st and Austria (ORF1) and Czechoslovakia (CST1/F1) on Ch. R10 on the 28th. In addition, the u.h.f. bands produced Spain (RTVE2) on the 10th, Belgium (RTBF1 & TELE21), Germany (ARD1, BR3, Hessen3, MDR3, N3, SDR3, SWF3 & ZDF) on the 14th, Denmark (TV2) and Sweden (TV4) on the 21st and Austria (ORF2), Czechoslovakia (CST2/CN) and Poland (TVP), on the 28th.

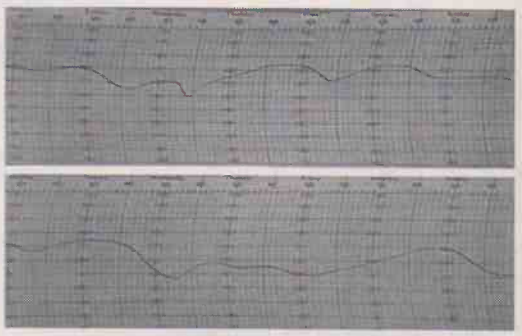
In Melton Mowbray on the 29th, **Richard Bell** logged pictures from Anglia TV, BBC1 (East) from Sandy Heath, (North) from Bilsdale, (South) from Crystal Palace and (West Midlands) from Sutton Coldfield plus Holland (NED3) from the transmitter at Goes.

Falling pressure on December 14 sent **Carl Bowen** (Strelley) to his set where, from 1830, he received VHF pictures from Belgium (BRT & RTBF), France (Canal+) Germany (ARD1), Holland (NED1) and Luxembourg (RTL). He saw *Columbo*, in German, in full colour, with good sound, from RTL on Ch. E7 but his best catch was Canal+ because for the first time he was able to resolve a System 'L' picture. Carl also found 'messy co-channel' signals around Chs. E9 and L9. However, all this was his reward for adding a new 13-element Band III array to his antenna mast last September.

"By midnight on the 26th, quite strong signals from France, Germany and Netherlands were being received," wrote **David Glenday** (Arbroath) on January 3 and adding, "Conditions continued to improve the following day with the addition of good pics from Belgium, Crystal Palace and a penultimate glimpse of 'TVS' on E.66." David's best days were the 28th and 29th about which he said, "I haven't seen such powerful signals at this time of year before - normally only during the summer months."

Among the 'firsts' he logged was Denmark's TV2 from Vordingborg on Ch. E58 and Poland's TVP-2 from Szczecin, on Ch. R30, 'n noise-free SECAM colour'. During the afternoon of the 29th, he caught TVP-2 again but this time from Zielona Gora on Ch. R29 and Jelenia Gora on Ch. R35. David thinks that Poland are soon to change from SECAM to PAL. "Early on the 29th in came the British Forces Broadcasting Service from the 0.9kW Osnabruck transmitter on Ch. E48 with the 'SSVC UK' PM5544," test-card, said David, whose v.h.f./u.h.f. log for the last week of 1992 includes stations from Belgium (BRT1, Canal+ Belgique, RTBF1 & Tele21), Denmark (DR & TV2), France (TDF, TDF5, TF1, France 2 & 3), Germany (ARD1, NDR3, SAT1, WDR3, & ZDF), Holland (NED1, 2 & 3), Norway (NRK), Sweden (Kanal1) and the UK (Crystal Palace & Dover). He saw a regional caption 'AF pb tv' from Denmark on Ch. E58 and a Scandinavian subtitled programme on Ch. E50 on the 28th.

Fig. 2: Baragraph chart.



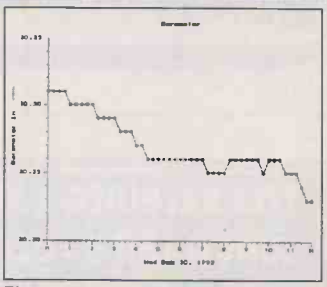


Fig. 3: Baragraph chart.

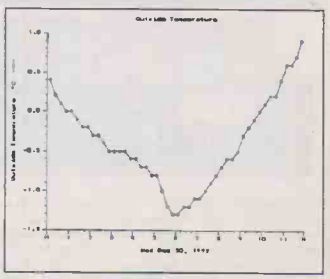


Fig. 4: Outside temperature.

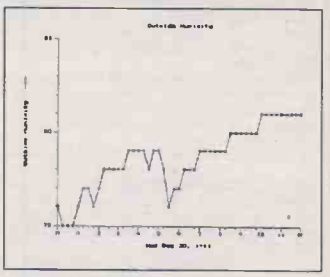


Fig. 5: Outside humidity.

Good Start To 1993

On January 2, Andrew Jackson received 'very strong pictures' from the transmitters of Anglia TV (Sandy Heath and Sudbury), Ch4 (Crystal Palace, Hannington and Midhurst), LWT (Crystal Palace) and TVS -now Meridian (Dover and Rowridge). Incedently Andrew, I can just see the Midhurst transmitter mast from my window, that's why I only need a loft dipole for the domestic TV set and VCR.

Tim Bucknall (Congleton) caught the tropo-opening on January 5 and logged BBC1 and 2 and ITV Border, Central, Granada, Ch4 and S4C from their respective transmitters at Caldbeck, Fenton, Glenridding, Leek, Macclesfield, Moel-Y-Parc, Dverbiddulph, The Wrekin and Winter Hill in the u.h.f. band. Tim is equipped with a Goodmans 2600 VCR and a Vega 402 receiver. David Glenday received pictures from Denmark (DR) on both the v.h.f. and u.h.f. bands on the 3rd and Germany and Holland on the u.h.f. band only on the 2nd and 3rd. David told me that this opening ended when

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This month: STATION ACCESSORIES

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73 from Dave G4KQH, Technical Manager.

Aerial Techniques

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Fig. 6: Euronews test-card.

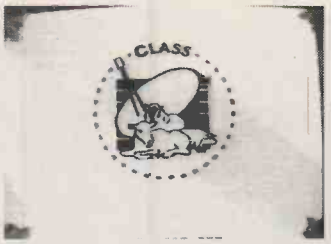

Fig. 9: Cattle auction by satellite.

Fig. 12: Swedish SSTV.

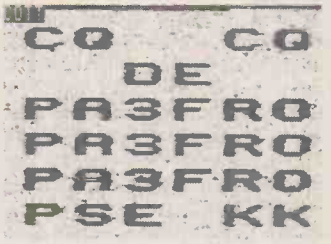

Fig. 14: SSTV from Holland.

Fig. 7: ESC ident.

Fig. 10: Pakistan TV.

Fig. 13: Swedish SSTV.

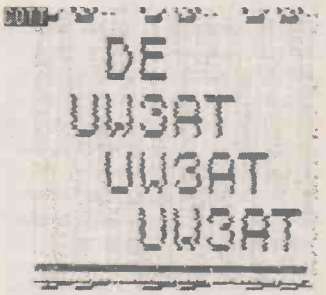

Fig. 15: Russian SSTV.

Fig. 8: ESC programme showing logo.

Fig. 11: German SSTV.

'at 1300, a cold front passed over and by 1400 conditions were flat'.

Weather

Apart from being an interesting subject, the prevailing weather conditions can, sometimes suddenly, make or break a tropospheric opening. Because of this, more of your weather reports are included this time along with a few of my own examples. For instance, "J. Brausch reports the cloudiest period in North Dakota since 42 years ago. The locals have been complaining for they had 12 days in succession of 80% daytime cloud cover plus a lot of other cloudy weather," wrote Ron Livesey (Edinburgh) in his November auroral report to the British Astronomical Association. "They want to live in Scotland to know what cloud is like," quipped Ron.

David Ashley tells me that the December weather in Norwich was "very variable, with daytime temperatures as high as the mid-fifties Fahrenheit and as low as minus six Celsius. Somehow, we managed to miss out on most of the thick fog,". From Arbroath, David Glenday said that the pressure was established at 30.3in (1026mb) by the 19th giving a "frosty week" until the 26th when the barometer had reached 30.9in (1046mb). "Night time temperatures were often higher than day-time ones, sometimes up to 10°C," wrote David and added, the "weather has been generally mild here on the coast with temperatures seldom below freezing since the 26th."

The atmospheric pressue readings for the period November 26 to December 25, **Fig. 1**, were taken at noon and midnight from the barograph installed at my home in Sussex. During December, I recorded 3.28in of rain compared to only 0.91in in December 91. The largest amounts, averaging 0.66in fell on the 2nd, 6th and 18th. There were severe frosts on the 28th and 29th with overnight temperatures down to 21°F. My total rain for 1992 was 35.49in compared to 30.76in in 1991. The barograph charts for the weeks November 23 to 29 (upper **Fig. 2**) and November 30 to December 6 (lower **Fig. 2**) show some typical pressure changes as a storm passed through. In the first week we had 2.62in of rain with the heaviest falls around the two pronounced 'dips' on the 25th and 27th. The general downward trend continued from November 29 to the big fall on December 2. In the second week (lower chart) we had 2.23in of rain.

Home Weather Station

Throughout the last two weeks in December I had the pleasure of reviewing the Davis Weather Monitor II station and the Weatherlink software. The latter enabled me to use the station in conjunction with my Amstrad PC2286 computer. Briefly, I asked it to plot information every 15 minutes and when Andrew Jackson told me that he logged most stations on December 30, I decided to print-out the results I had for the morning of the that day. The barometer kept falling, **Fig. 3**, except for that steady period between 0415 and 0700, the outside temperature did a rapid change around 0600, **Fig. 4**, as did the outside humidity, **Fig. 5**, some 30 minutes earlier. Obviously there was a sudden change in the early hours.

Band I

As expected signals in Band 1 were sparse in December, however, Andrew Jackson saw a test-card from Czechoslovakia (CST1 (Bratislava) ISR-P) on Ch. R2 (59.25MHz) on the 22nd and I found some 'F2' activity around Chs. E2/R1 (48.25/49.75MHz) at 0930 on the 29th.

Meteor Scatter

Although Andrew Jackson found the reflected 'pings' of pictures 'weak', in Band I, during the Quadrantids meteor shower on January 4, Simon Hamer had better luck in December when he managed to identify bursts of signals originating from stations in Denmark, Norway and Sweden on the 10th and from a Commonwealth Of Independant States (CIS, formerly USSR) station, on Ch. R2, on the 24th. Both Andrew and Simon must have a lot of patience, because this is the only way that you can hope to catch television signals bouncing off the decaying ionised gas left in the atmosphere by a burning meteor particle. While talking about the heavens, **Peter de Jong** (Leiden, Holland) observed comet Swift-Tuttle, with binoculars, during a short bright spell on November 19.

Satellite TV

On December 18, Peter de Jong, using an Amstrad receiver, logged the Euronews test-card, **Fig. 6**, an ident, **Fig. 7** and a programme with logo, (top right) **Fig. 8**, from the Egyptian Satellite Channel and the Class international cattle auction by satellite, **Fig. 9**, from Eutelsat II. "It's a matter of catching them before they start scrambling," said Peter. Simon Hamer found a new German news channel (NTV) on Astra transponder 29 and **Lt.Col Rana Roy** (Meerut, India) sent a photograph, **Fig. 10**, of a programme from Pakistan TV that he received via Asia Sat.

SSTV

Toward the end of 1992, **John Scott** (Glasgow), using an upgraded Robot 1200c decoding system, copied slow-scan television pictures between the 14 (around 14.230MHz) and 21MHz (around 21.340MHz) bands from stations in Germany, **Fig. 11** and Sweden, **Figs. 12** and **13** and 'CQ' captions from Holland, **Fig. 14** and Russia, **Fig. 15**.

"It is just a case of setting my Robot to AUTO-RX and sit back, wait and watch," said John.

SSB Utility Listening

Graham Tanner, 42 David Close, Harlington, Middlesex UB3 5EA.

My thanks to many of you who replied with details of Rainbow Radio heard by Christopher Frank Beavers. John Fenton, Mike Ellard and Chris Haigh supplied more details than most ad say Rainbow Radio is a Canadian message handler that operates like Portishead, Berne and similar stations. Their frequencies are: 3.458, 5.604, 8.819, 13.339, 13.878, 17.910 and 21.765MHz. The Delta 72 that was heard will be the daily New York-Frankfurt flight, usually a Tri-Star). Paul Hilton adds that the station uses a 14 acre site at St John's equipped with omni-directional and log periodic antennas. Chris has also copied some brief British military traffic on 11.178MHz. The frequency falls slap between two well-used USAF channels, but I have no idea why they popped up here or who they may have been. Chris also mentions that he is now the proud owner of a Drake R8E, so I will expect his logs to reflect this - real exotica from now on.

Portishead Radio Station

Portishead

I recently listed to the marine band frequencies used by Portishead and Bruce Sutherland of Bristol has sent in the current list of their air to ground frequencies. These are 4.807, 5.610, 5.670, 8.170, 10.291, 11.306, 14.890, 14.945, 16.003, 16.273, 20.065, 22.871 and 23.142MHz. Bruce also mentions that British military personnel in Yugoslavia are currently 'phone patching back to the UK on 14.945MHz.

Mike Le Ves Cowte runs an HF-225, Eddystone 730/4 and Eddystone 640 (circa 1947) all fed from long wire and vertical antennas and he recently logged Perth ATC on 5.634 and Sydney Volmet on 6.676MHz. He has also logged a lot of numbers stations and I will go into these in more detail next month because Simon Mason has not only responded to my request for details of what the current situation is but has also sent me a copy of his excellent book *Secret Signals*.

I am convinced that Keith Elgin sleeps and eats with one hand on the dial. This month his logs include *Air Force One* with president Bush going from Somalia to Moscow. The aircraft and several escorts were working Mystic Star on a number of frequencies. Keith also heard UN stations in Somalia trying to work Incirlik and Ascension on 11.176MHz but without making contact. Shuttle communications were heard via WA3NAN on 21.395MHz and MARS operations using callsigns NNN0HBD and NNN0CNA were heard from the USS *Tripoli* aircraft carrier whilst President Bush was on-board. Frequencies is use were 14.4415 and 14.4835MHz. Keith queries a US Navy ship called *Invincible*, which has also been heard. I can confirm that USNS *Invincible* is an ocean surveillance ship of the Military Sealift Command. She beard the hull number T-AGOS 10 and has the radio callsign NIYJ.

Keith has also sent in details of operation Restore Hope in Somalia. Frequencies to check are 3.878, 7.844, 8.192 and 9.175MHz. A variety of African Ground stations are involved and callsigns to monitor are those prefixed with 'Absolution' and 'Accuse'. The latter three, Alpha, Bravo and Delta are tankers. He also believes that some frequency shuffling has been taking place on the NAT and CAR civil aviation tracks and that the following allocations are now in use:

NAT-A 3.016, 5.598, 8.905, 13.306 and 17.946MHz

NAT-E 2.962, 6.628, 8.825, 11.309 and 13.354MHz

NAT-F 3.476, 6.622, 8.831 and 11.336MHz

CAR-A 2.887, 5.550, 6.577, 8.918, 11.396, 13.297 and 17.907MHz

CAR-B 3.455, 5.520, 6.586, 8.846, 11.387 and 17.907MHz

Keith asks if there is any source for details of the 5-letter reporting points quoted on the NAT tracks. My guess is that the RAFs charts are probably the best bet and are available from 1AIDU, RAF Northolt, West End Road, Ruislip, Middlesex HA4 6NG. Tel: 081-845 2300 and ask for extension 209 to check on prices. As far as I am aware many of the charts such as the high level ones show information that is no available on the low level charts such as EUR 1/2 from Aerad. RAF chart numbers that will be of most interest are:

505 SE England area
510 British Isles
511 North Sea (north)
512 North Sea (south)
513 Low Countries
523 United Kingdom & North Sea (high)
550 Sub Polar
551 North Atlantic and North Canada
552 North Atlantic Ocean
553 North Atlantic South
555 Eastern Atlantic

Nigel Cann with his AR-3000A heard a USAF cargo flight over Luxor in Egypt working Ascension on 11.176MHz. The callsign was 4G5KN and he wonders if it is possible to identify the aircraft type. Any offers? He also asks about the Skyking and Mainsail calls. Strictly speaking Nigel these are not callsigns. Minsail is a general call put out by an aircraft crew when a 'phone patch is required. The call will be taken up by any of the ground stations that form the Global High Frequency System. Similarly Skyking is an alert to certain Air Combat Command stations to stand by for a message (usually coded). Nigel asks about a station on 5.628MHz where Sierra Yankee November Two is repeated over and over again. Sounds like a numbers station to me, coded messages will follow to spies, agents of whoever.

This & That

Lee Williams asks if it is possible to QSL with ATC s or Volmet stations around the world. The answer is yes and you can usually get away with stabbing an intelligent guess at a name and address. For instance, The Chief Radio Officer, Air Traffic Control Services, Sydney Airport, Sydney, New South Wales, Australia, would get right to the very person you need and I just made that one up.

Several readers have asked where they can get the USAF's Flight Information Handbook. The answer is with great difficulty as it is no longer available int he UK. It is only available from source, must be paid for in US dollars and takes anything up to five months to be delivered! For what it contains it really is not worth the bother and all worthwhile information is available in the book *Shortwave Communications* with updates in this column.

Leslie Bliss uses an R600 fed from a trapped dipole in his roof space and is plagued with TV timebase harmonics. He asks if television set makers are aware of the problem and the answer is yes and they care not one jot. It's all down to what is known as cost shaving - if you can get rid of one component than its cost multiplied by the number of sets made adds up to a considerable sum. The result is that many TV sets have their chopper circuit strapped right across the mains sending a juicy dirty signal along miles of antenna (live and neutral). Your dipole sits next to that r.f. pollution in the loft so see if you can get it out in the garden and as far away from mains cables as possible.

An overwhelming number of letters lately. I have kept the more generalised questions and comments over until next month.

First Aid

Several years ago, *SWM* carried an article by Hugh G3XSE, which described how to carry out a particularly difficult 'service' on the Trio TS-700 to 'clean' a contact on the v.f.o. unit that carries current to the receiver oscillator. With the fault on, the receiver will randomly switch on/off as the v.f.o. is 'tuned' due to a build-up of silicone grease and hence is particularly inconvenient and annoying!

I have tried unsuccessfully to trace this article, can anyone help?
Jim Sleight, 'Orchard House' School Hill, Napton-on-the-Hill, Rugby, Warks CV23 8NN.

Please, could anyone help with details on an Eagle International transistor checker model TT145.
N.J. Clark, 'Bali-hai', 2 Moorview End, Marldon, Paington, Devon TQ3 1PJ.

I have recently acquired a Codar pre-selector PR-40, and have no information at all. If anyone knows the company's address or has any information on it at all, I would be grateful. Postage will, of course, be refunded.

Also I do my listening on a Sony ICF-2001D with one problem, the internal oscillator generates spurious signals on 6275kHz. Is there any way to get round this and listen to weak signals on 6275kHz as they are almost always masked.
Tim Bucknall, 33 Churchill Close, West Heath, Congleton, Cheshire CW12 4QU.

Amateur Bands Round-up

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

To have a running check on the state of the ionosphere and band conditions, one handy way is to tune to beacons such as DK0WCY on 10.144MHz and listen to the data doled out on slow Morse. While the sunspot count or solar flux number are worth noting and should be as high as possible for good conditions, it's the negative factors which upset our applecart. You are looking, then for either the A or K numbers as your guide, and these should be as low as possible. For example K of 3 is acceptable, below is better. Where A (Ak or Ap) lies beteen 0 to 10 things are good, but major storm levels can go as high as 300! For K look for a number below 3.

The aa indices, mentioned on the RSGB News Bulletins, are given in nano-Teslas, and again should be low for preference - 0-20nT is good, rising to, say 70nT for unsettled, or as high as 500 in a severe storm. All these indices seem to correlate quite well, so the ideal case is a highest possible sunspot or solar flux number, and lowest possible for the K, aa, Ak or Ap numbers. The forecast in the RSGB News Bulletin gives the outlook for the coming week, but if you monitor the beacons you are getting nearer to real-time information. Personally, I use the DK0WCY beacon on 10.144 MHz most of the time since it is S9 plus here - it sends its callsign, the word 'beacon' and a long dash for several minutes, and then gives the data you want, and the cycle repeats. Now, if your system sounds 'dead' but the beacon says conditions are super, you have at least some sort of cross-check before you chuck it in the family carriage and take it to 'the doctor.'

Attention!

One of the joys in writing this piece comes when one can see two listeners helping each other through the column. **Adrian Rees** writes now from 4 Moorland Road, Ellesmere Port, South Wirral L66 1NF. He used to be in Eldon Grove in Liverpool. There was a reader in Scotland who had an FR50B for which type they both wanted data. Adrian lost this gentleman's address in the move, and asks now that he should get in touch again at the new address above, as he now has all the data to share.

Adrian still runs his FR50B and AR88 receivers; each has an antenna tuner, and a recent addition is a phasing system to reduce local QRM which he finds valuable on the low frequency bands. Operating-wise, Adrian covers 1.8-28 MHz bands, and particularly Forty. On this band, he reminds us that while the UK allocation is just 7.0-7.1, the Americas have 7-7.3MHz. In the extra 200 kHz, Adrian logged AA3B, K9PUI, N1KOE, N4BW, K3TUW, N3BVW, W1WEF, N3MRC, WA6KU, KW8CX, K8CX, N8DDW, KB5LER in Ohio and using low power, and WR6P. In the European segment, he noted JY40, VK4MZ, TK5EP, JAs, PT7YS, VK9LD, HB0/DL2OBO/P and CU3LF.

A first letter from **Viv Franklin** in Swindon, who has a Lowe HF-150, fed through 20m of wire end-fed, by way of a tuner. On the back of the receiver is connected an ERA Micro-reader, while the v.h.f. bands are covered with a PRO-2006. He listens mainly in the weekday evenings and between 0800-0900 at weekends. On 3.5 MHz sideband was copied from AB4YO, FM5CD, TZ6VV, VE1ZZ, VE1UK, ZL4KS, Ws and Europeans. 14MHz listening yielded CN8NP on the key, plus sideband from CX5BW, HV4NAC, JA2YKA, KL7CMQ, PT7WX, VE7IM, VE7ATP, VP9AD, VKs, ZLs, ZS5BL, ZD8Z, ZL4APW, 5Z4BI, 6Y5EW, 7X2DG and the usual smaller fry.

QSL card sent to G2CX back in 1928.

Next we go to Iceland, where **Geoff Crowley** lives at Hafnarfjordur. Geoff uses three nested dipoles, to a Datong matcher/pre-amp. The dipoles are slung, like a washing-line and are surrounded on five sides of a cube by concrete, the open bit being to the south. Surprisingly enough Geoff does quite well, even to the north. In fact a normal thin skin of concrete isn't too bad, though obviously several feet thickness would be serious. Geoff listens to most modes, and uses for RTTY, amtor and other such modes some software from Software Sywstems called PC SWL.

If the band is open, try for the DX-information net on 14.236MHz run by INDEXA at 2330UTC. This will give you some indication of what is coming up. Other useful sources include the RSGB's DX News Sheet each week, the American *The DX Bulletin* and its companion The *DX Magazine* and of course Geoff Watts's various lists will help you resolve the question of where that oddball call comes from.

And, talking of oddball calls: have you heard a BA, BB, BC, BD call since December 22? If you did, and you dismissed it as an oddball you were wrong, because these prefixes are being allocated to individuals in China, to add to BY for their clubs and BZ for individuals operating from club stations.

Another one to move home is **Gerald Bramwell** in Swinton, who for the moment is using a couple of metres of wire hanging from the living-room window. On Top Band c.w. Gerald copied GW8GT, GB5CW, GW3YDX, GX3PRC, SM6MCW, GI0KOW, GJ3YHU, GD0PWN, SP5ZIM, F6CNI, G3XRE, EI2FJ, GW3JSV, LY1A, UA1NDY, UW2F, LY4W, plus a crop of side-banders too. On 3.5MHz, sideband W, VE, VO in number 39 were booked in, plus RO0F, UF6FL, UL7TX, a large assortment of Europeans including 3A2LU and ZB2F, plus rare ones such as EA9LZ, EA8YG, 6Y5IC, YV5NCK, 9K2WA, 9K2MM, VP2EY, 9M8PV, KP4CKY, VP9/WB3KBZ, EA9PB, VK6LK, 9V1XQ, YV5FAL, 7X2BK, TI4CF, YV5IVB, JA8EAT, EA8BYL, EA8AM, 4X6WB, WP4AZT, NL7GP/NP2, JE2URX and TA3D. Just one W, WG4F on 7MHz, plus 4X6LD, ZP6EM, EA8RR, KP4ERJ, YV5JDP, 9K2MU, 7X2WK, 5X5WR, EA8YL, KP2BH, YV4EOH, OD5WS, 4Z5AC and EA9UQ, plus RTTY from IK8EYS, IK8PAE and lots of assorted lesser creatures. Turning to Twenty KE1Y, W7KCN, N2BFH. Europeans, EA8/W0ECM, LU6AMW, ZP5FGS, 5N6/N9MDW, 5N8LRG, 4X6SJ, JA9AA, 5T5SN. On 18MHz Gerald stuck to sideband, and had a relatively poor crop, mainly in Europe, plus a sprinkling of Ws, VO1HMB, ZP2JI, 7X2WK, ZS5BH, and 7X2BK. 21MHz showed Ws, including the more distant W7 and W0, VEs, Europeans, and ZP5FGS on RTTY, 4X1CB, OD5ZZ, KP5BB, 8P9EM, 7X2DG, CN8HA. Yet another mode on 28MHz, by way of UA1COB on f.m., a daffy of W/VEs including RTTY from WE0T, HP2CWB, and sideband again from 9K2YF.

Don Robertson, up near Wick is a c.w. lover who first learnt his craft listening to such things as 'fishfone' in Top Band and went on from there. This time round, 7MHz offered him PT2FK, FY5YE, JW3E, VR/WX3N, 4K4BB, RA0FA, RA0FN, OA4AWE, KP4AJ/MM, NV7S/MM in mid-Atlantic, UA0XAO, TI4CF, FG4FR, OH0W, NL7G, FS/AI7B, UL7BAY, UX9C, 8P9Z, VP5T, KP4YD, KL7IKF, 8P6AU, HK1AMW, 6W6/K3IPK, JAs, LY2BMI/UA0B, BV2TA, BV4CT, UI8BDK, 4J4GDA and W6/7, by long path. Even 28MHz yielded 8R1K, VP5T, EZ8L, P40J, P40W, 6V6U, FS/AI7B, RW9C, US1U and 5N0HKJ.

Our next contributor **Clive Penna**, lives at Deerness in Orkney. Again it is 7MHz c.w. that is favoured, and the crop included 3W4VL, XX9TRF, BV2TA, PJ2AM, TU2SR, 3DA0BK, TI4SU/5, C6A/N4RP, 8P6AU, KL7IKF, J79MAE, OD5/SP1MHV, A71AL/SP5EXA, 9K2MU, VP2EST, VQ9IO, D44BC, P40J, ZA1A, EA9EA, 9M6MA, HZ1AB, VS6WO, PT0F, KP2A, 9Y4H, JW5NM and NH6T.

From the Isles of Orkney to the Isle of Sheppey, where **E. H. Trowell** operates. Ted only uses sideband nowadays on Top Band, where he notes GW4RPU and ON7BW. Other wise we see all c.w: Top Band HB9AGA, ON7TK, GM3POI; 3.5MHz N6BV/1, K1VR, K1IU, OH0W, N2NT, W1MK, W3LPL, AA4S, KY1H, KT3Y, K1ZM, KN8Z, AB2E, WE3C, EA9LZ; 7MHz produced K4PQL, UL7BAY, UL8PYL, EA6/N6RA, EA9EA, N2RM, W3LPL, K8PO, K1AR. 10MHz saw to ZC4ST and UF6FCZ, while on 14MHz Ted found W3FV, N3RS, W3LPL, K1AR, WW2Y, 9H4R. 24MHz managed K4II and some Europeans, but 28MHz was the spot where Ted noted CX9AF, WA6KUI, EA1FBJ/MM off Guinea-Bissau, W4XJ, W8JSM, K6LEB, W6/G3MHV, K3TEJ/KP4, YN/SM0OIG, K2MGR, NJ1T, 6W7/F6AUS, 8P9Z, 9H1EL, ZA1A, N2RM, K1AR, K1AR, EA9EA, W4RX, K5NA, W3LPL, K4PQL, KA6A, K3ZO, K2SG, AD1C, N3RS, N2NT, K3WW, W4MYA, VP5P, N4AR, N8II and W9GXR.

Vince Cutajar in Malta used 24MHz for J28BG, 5X5WR, UD6DFT, C9RJJ, 7Q7ZZ, 5U7M, FP/G3LMD, 3W1D, HI3DX, and XX9TNB, while a flip to 18MHz scored C31YA, S52LC, 7Q7TA, 5Z4FM and OH0NLP.

QSLs

It is understood there is a problem in the way of cards for Bosnia-Herzegovina; there just isn't an address to which cards can be forwarded by the Bureau, so for the moment at least don't waste your time reporting these stations.

Deadlines

Always the beginning of the month to arrive with me. The address is as above.

Airband

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

The way we were: Westland Whirlwind 8662 M in RAF colours at the Museum of Army Flying, Middle Wallop. *Christine Mlynek.*

Before relying on any radio navigation aid, it's important to check that it is working and that its performance is suitable for your intended purpose. **AIC** 112/1992 from the CAA reminds us of the limits of coverage of i.l.s. Standard localisers can only be received up to 25nm away within 10° either side of the course centre-line (usually the extended runway centre-line). Coverage increases to 35° within 17nm of the antenna. Glideslopes can be received within 8° of the course centre-line up to 10nm away, and the vertical extent is between 0.45 and 1.75 4 times the glidepath angle (usually 3°). Steeper glidepath angles are associated with more limited glideslope and localiser coverage.

In good conditions, aircraft follow the i.l.s. until a visual decision height (usually 200ft) is reached. At this point the runway should be clearly in sight a.d the pilot takes manual control for completion of the landing. In poor visibility, automatic landing equipment can follow the i.l.s. right down to the runway assuming the radio beams are accurate enough. One cause of inaccuracy is the effect that other aircraft have when taxiing near the antennas. When visibility is low, Ground Movements Control keep such aircraft out of the range of the i.l.s. transmissions when another flight is on the approach. This doesn't apply in good visibility. In a reportable accident at Gatwick last August (*AAIB Bulletin* 12/92 Ref: EW/C92/8/3) an MD-83 was making a practice automatic landing in good visibility. A B.737 was cleared for take-off whilst the MD-83 was on approach, and distorted the i.l.s. beam by flying through it. The MD-83 crew were slow to observe the deviation and the last-minute corrective action caused a wing-tip to touch the runway. No-one was hurt.

Receivers & Propagation

In Cheltenham, **Anne Reed RS87871/G-20126** has tried out the Yupiteru VT-225. It is sensitive and, of course, allows frequencies to be entered directly (not just via memories). Unfortunately it is let down by being difficult to operate. Although specially written in English the handbook is hard to follow and the operation of the receiver is itself complex. Manufacturers can incorporate vast numbers of functions on one chip, which is cheap to produce in quantity. What they can't do is to miniaturise keypads and switches so they tend to economise by giving multiple functions to some keys. Some equipment, though, is better than others in this respect!

From Stanford-le-Hope, **Don Jackson** (hope I've read the name right) sends details of his v.h.f. antenna experiments. One arrangement is a quarter-wave vertical mounted over a horizontal cross of radials - the turnstile antenna, or perhaps we can call it a ground-plane. Strictly speaking a ground-plane has to be just that: a continuous sheet. However, very little performance is lost by having just four radials and in fact two will do! Don would like to try a folded dipole but I wouldn't recommend it for two reasons. First, the main reason for folding a dipole is to increase its impedance. This is necessary for the active element of a large Yagi array, but on its own would cause a mismatch when feeding a standard 50Ω receiver input. Secondly, why have a dipole at all? They tend to be narrow-band which could be a disadvantage. Don has already achieved good results with a discone and I agree that it will be hard to improve on this if a broadband, omnidirectional, vertically-polarised antenna is needed.

Don also asks the locations of the LATCC repeaters. They are at Ash, Birdlip, Burrington, Chedburgh, Clee Hill, Daventry, Davidstow Moor, Grantham, Great Dunfell, Greenford, Kelsall, Mount Gabriel, Preston, Snaefell, St. Annes, Swingfield, Trimmingham, Ventnor, Warlingham and Winstone (source: CAA Doc 260, November 1985). The CAA do not wish to have published which frequency belongs to which relay. To visit my Museum at a mutually convenient time, 'phone the number at the end of this article.

More on the above from **Ken H.** (Norwich). As stated, I can't go into detail but Ken suggests that the u.h.f. network is served by the Chedburgh, Daventry, Grantham and Trimmingham relays as well as a site at Rothwell among others.

A member of the Shackleton Association (see December 'Airband') from N. Yorkshire is puzzled by unpredictable u.h.f. propagation. In general, the signal will be expected to travel along a line of sight with a little extension due to the effects of diffraction. The intervening terrain and also the refractive index of the air (closely affected by air pressure and humidity) all play their part. In an amateur test, a 432MHz repeater output was received whilst driving along the tunnel at Heathrow Airport! Quite a big waveguide... Aeronautical transmissions from LATCC are complicated by the fact that they originate from remote relays - sometimes more than one at the same time. To finish off this reader's questions, reporting points are defined places along airways. The Aerad charts (see Airband Factsheet) show these as triangles - solid if reporting is compulsory, outline if the report is only given when air traffic control have made a previous request for it. An example is MARGO (on request) at N54°42.5' W002°46.4' on airway B4. If asked to "Report passing MARGO" the flight might announce "Shortwave 393 passing MARGO, estimate Talla at 45." ROBIN is at the intersection of B4 and R3 to the north of East Midlands Airport. Most reporting points are just defined places on airways, but a few are located at navigational beacons.

Aeronautical Happenings

Despite heavy rain and a 20kt wind, Eurocypria A320 5B-DBC arrived at Ronaldsway for a direct sector to Cyprus in early December reports **Mrs. B.** (Douglas). Previously, a B.737-300 had visited whilst serving Larnaca directly. At 74 tonnes and with 179 seats, the Airbus beats the 57 tonne 149 seat Boeing for size. Acceptance of heavier aircraft is now possible on Man thanks to previous runway resurfacing. Since landing is charged by payload, the airport should eventually recover its investment. As a rough comparison, Ronaldsway's runway length is 5751ft which compares with, say, the 5597 at Jersey on which I landed in a B.757 just over a year ago.

Spoils of war: FMA Pucara A-528 as captured from the Argentinian Air Force during the Falklands War. Now exhibited at the Museum of Army Flying, Middle Wallop. *Christine Mlynek.*

Staying on the island, Manx have taken delivery of a new Jetstream 41. Manx is part of the Airlines of Britain Group which includes Midland and Loganair. Mrs. B. finishes off her report in a most complimentary fashion, pointing out how the educational value of 'Airband' helps us all to enjoy our interest. Well said - that sums up the purpose of this column.

Tim Christian (North Walsham) reminds us of the cultural differences that become so apparent when aviation shrinks the globe. While we over here get obsessed by Christmas and extra flights are put on to transport people going to see relatives or take holidays, eastern countries remain unaffected! There's a big world out there.

Callsigns

Callsigns always cause confusion, as **R. Keary** (Manchester) will doubtless agree! I was once sitting in the passenger cabin of an aircraft awaiting its delayed departure clearance. I'll change the callsign to protect the guilty, but over the cabin address system came the announcement "Menorca Tower, Shortwave 393" plain for all to hear! Britannia callsigns end with A for outbound flights and B for the return. Midland's answer to the Shuttle uses suffix letters such as B for Belfast, E for Edinburgh and G for Glasgow. British Airways Shuttles (one end of the flight is always Heathrow) have a number and letter such as 9U. The numbers are as follows: 2 is to Manchester, 3 from Manchester; 4/5 to/from Belfast; 6/7 Glasgow and 8/9 Edinburgh. The letter changes with every flight along each route but is not a simple A to Z progression.

Information Sources

Where can **J.A. France** (Shrewsbury) buy *Airlines and Airports Coding and Decoding*? Try The Aviation Hobby Shop, 4 Horton Parade, Horton Road, West Drayton, Middlesex UB7 8EA. Tel: (0895) 442123. Alternatively, any good bookshop should be able to order it, see details in the December 1992 'Airband.'

Now to Mr. France's other request. Each state publishes its detailed rules of the air, communications frequencies, airspace restrictions, etc., in the relevant *Aeronautical Information Publication*. The UK *AIP* was also known as the *UK Air Pilot*.

CONTINUED ON PAGE 60 ➡

Scanning

Alan Gardener
PO Box 1000, Eastleigh, Hants S05 5HB.

I owe a lot to the readers who write to me with questions and information relating to various aspects of the hobby. One problem I have found during the past year is that I have not been able to respond to events and news stories as quickly as I would wish. It often takes two months before any information I receive by post can be included in the column. To try and speed up the process I have installed a combined answerphone and FAX machine to allow me to receive information, comments and questions more directly. I intend to leave the machine on 24hrs a day to automatically receive your calls, I regret however that I will not be able to reply to calls other than via this column. The whole idea is a bit of an experiment, but I hope that it will encourage readers who perhaps don't feel like writing to me to call or FAX items they think may be of interest to other enthusiasts. The new number is (0703) 262246.

The Royal Tapes

The scandal relating to the intercepted Royal telephone calls continues to rumble on. At the time of writing the first Camillagate transcripts have just been published. There is also a rumour of another similar tape in existence and a recording of what is alleged to be a conversation between Prince Andrew and Fergie. The Cellular telephone operators are beginning to admit that it is easy to intercept calls and the newspapers and Government are continuing to argue in public about the freedom of the press and the need to expose corruption. Because of this debate it is likely that new laws relating to the use of electronic eavesdropping equipment will be introduced.

This could have serious implications for scanning enthusiasts as one target for such legislation may be a ban on the sale of certain types of receiver.

Scanners can, of course, be misused, as can cellular phones, pagers, FAX machines, computers and many other items sold in the high street. The difference is that the average person only knows about scanners from reading newspaper reports relating to their use in connection with various criminal activities. Under these circumstances it is very difficult for people to believe that there is a legitimate use for such equipment. I know that the vast majority of scanner owners reading this column use their receivers for perfectly innocent activities. These include monitoring Amateur Radio stations, Aircraft and Marine Communications, receiving weather satellites, etc. To the outsider however it may appear that such activities can only be considered to be in the realm of 'Train Spotting' in that there is no obvious gain to society other than the individual's satisfaction in knowing that a particularly scarce item of rolling stock or unusual transmission has been logged. From the public's point of view there is little harm in 'Train Spotting', it is a different story when scanning hits the headlines, as the reader only sees a very negative aspect of such activities.

With similar hobbies such as Amateur Radio justification can be made by the 'Self Training' aspect of the hobby, but this cannot easily be applied to Scanning. I would be interested to hear your views on this subject, especially if you have any suggestions how the hobby can progress beyond the current phase of bad press.

New Models from Bearcat

My thanks to **Ron** from East Lothian who sent me details of a new range of products from Bearcat. After a relatively quiet period they have now announced nine new models for 1993. Two of these are likely to be upgraded versions of existing designs but the most interesting models as far as I am concerned are the BC-8500XLT base station and the BC-2400XLT portable. These will be similar to each other except the portable model may have slightly fewer features. The most important of which are likely to include continuous frequency coverage from 25MHz to 1.3GHz, 500 channels in 20 banks, 10 priority channels, scan speed of 100 channels per second, automatic storage of new active frequencies, automatic tape activation on specified frequencies and finally a counter that will log the number of times a frequency becomes active.

The base station is also likely to accept optional boards for CTCSS (Sub audible tone squelch) decoding. The prices in America have been provisionally set at $650 for the BC8500 base station and $700 for the portable model, but these may be significantly different by the time the models become available in this country, with the constantly varying exchange rate affecting the UK price.

Frequency Counter Modifications

Several readers have expressed an interest in the frequency counter automatic display 'Hold' modification I mentioned briefly in the January column. The model experimented with was an Optoelectronics HC1300 hand-held counter, but I would imagine that the HC2300 is very similar - which should please **A.J. Harding** of Herts. Fortunately for us the manufacturers are good enough to provide a circuit diagram with the counter which makes life a lot easier.

The main frequency counter functions are provided by a special ICM7216 DIPI counter and display chip made by Intersil. This has several extra features that have not been used in this design. One of these is a 'Hold' facility which can be selected by means of Pin 27 on the chip. This is permanently wired to 0V and has the effect of continuously enabling the clock and display. The modification adds an additional circuit that enables the counter and sounds a warning 'bleep' when a sufficiently large input signal is present. When the signal ceases, the frequency display is frozen and the warning 'bleep' stops. This is achieved by detecting the r.f. signal present at the output of the pre-scaler i.c. and using it to switch the 'Hold' Pin to 0V.

The new circuit operates by detecting r.f. at the output of the pre-scaler i.c. by means of a diode pump circuit. This feeds the base of a switching transistor which pulls Pin 27 low when r.f. is present. With the counter switched to the 'normal' sensitivity position the pre-scaler i.c. is biased so that it doesn't produce an output unless an input signal is present. However when it is switched to the 'High' sensitivity position the bias is changed and the pre-scaler produces a random output signal which is sufficient to switch the new circuit on. This means that the counter operates normally in the 'high' sensitivity position and automatically 'normal' position.

Although the modification is simple it is not for the faint-hearted as a fair amount of surgery is required, so if you are not sure of your own ability or are worried about invalidating any guarantees don't attempt it.

The first step is to open the counter and remove the 'guts'. De-solder the two sets of NiCad batteries and put them in a safe place. This step can save a lot of heartache if you accidentally short out the supply rail while working on the circuit. Remove all the plug-in integrated circuits after first noting their location and pin orientation. Observe the rules for dealing with static sensitive devices especially with the pre-scaler i.c. as this can easily be damaged.

The next stage is to isolate Pin 27 - this is not easy as it is used to provide an earth connection between the two sides of the board. Cut the track on the display side and then carefully de-solder the 28 way i.c. socket on the other side of the board, note its orientation. Cut the track going to Pin 27 near the i.c. and trace the track back to its opposite end. This is on the reverse side of the l.e.d. frequency display, solder a thin insulated wire between this point and the negative end of the large electrolytic capacitor (470µF 16V) that lies alongside the i.c. socket. Once this has been completed carefully re-solder the i.c. socket back into place.

Looking at the l.e.d. display side of the board again, build the small circuit shown in **Fig. 1**. This is constructed by soldering the components together in free space between the i.c. Pins. Follow good r.f. construction techniques and keep all interconnecting leads as short as possible. Pin 18 has +5V on it and provides the supply for the new circuit. Pin 7 is at 0V and the track between it and C6 provides a convenient earth point.

Before you refit the i.c.s and batteries you need to build an audio 'bleeper' circuit. This is used to give an audible indication when an input signal is present and is achieved by connecting the circuit across the 'gate' l.e.d. and current limiting resistor. The only piezo buzzer I could find at the time small enough to fit inside the

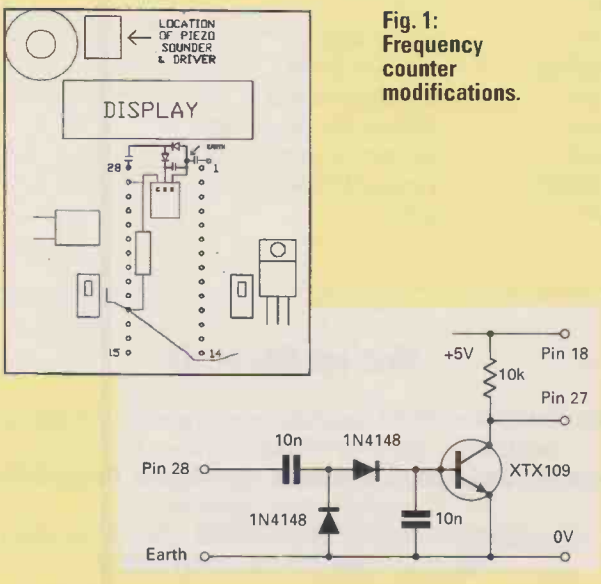

Fig. 1: Frequency counter modifications.

counter casing was sold by Tandy (part no. 273-064). This is very small but has the disadvantage of requiring an external drive circuit, however there may be other types available from different suppliers. The circuit for the drive circuit is given on the back of the Tandy 'Blister' pack so I won't include it in the column. As before the circuit was built-in free space and mounted on the l.e.d. side of the p.c.b. on the underside of IC3, and coated in epoxy resin to help protect it against mechanical strain. The 'bleep' volume can be adjusted by placing some insulation tape across mouth of the sounder.

Check the circuit for obvious errors before refitting the i.c. s, and test the counter with an external current limited supply before refitting the NiCads. Make sure the metal case will not short against any part of the new circuitry.

The counter should now be a lot more useful in tracking down those elusive frequencies as it is no longer necessary to keep your eyes glued to the display awaiting a transmission. By listening to the 'bleeps' from the sounder you can tell if a signal is consistent enough to get a good reading. If you find the signal is only just strong enough, switch to the high sensitivity position for a few seconds which should give a good reading.

Other modifications I have tried include altering the gate timing to be able to capture very short transmissions. This involves rewiring the 'Gate' switch and a lot of track cutting but provides a much faster (X 10) gate period at the expense of one decimal place of accuracy. You will definitely need a copy of the i.c. data sheet if you want to try this but I find that I don't need to use it that much in practice.

If you want to extend the battery life you can blank the display by connecting a diode such as a 1N4148 between IC1 Pin 4 and IC1 Pin 20 (Cathode to Pin 4). You will need to connect a switch in series with the diode to display a stored frequency reading. This is because the display will only be illuminated if the 'Hold' Pin is held at 0V when an input signal is present.

One final modification is to solder a couple of back-to-back diodes across the BNC input socket as a safeguard against overloading/static damage. This can happen when you least expect it. In my case the pre-scaler i.c. blew up when a horse tried to eat the antenna it was connected to. My car was parked at the roadside and the horse was in an adjacent field. At some point it started licking the antenna, which provided a static discharge path for the car body via the antenna and frequency counter - in this situation a couple of diodes could have prevented damage occurring.

And Finally

Has anyone managed to provide a.m. reception outside the aircraft band on a Tandy PRO-35 ? A modification was included in the May 92 column but some readers suggested that it didn't work on the 68-88MHz range. Any mods for the PRO-37, 38 & 41 and Bearcat 50XL & 100XL would also be appreciated. Remember you can now write, phone or FAX information to me. Until next month - Good listening.

Airband CONTINUED FROM PAGE 57

Urgent amendments are by NOTAM. I don't know the source of the Republic of Ireland AIP but I suggest that Mr. France first contacts the UK's CAA Aeronautical Information Service at Control Tower Building, London (Heathrow) Airport, Hounslow, Middlesex TW6 1JJ. Tel: (081) 745 3456. They might be able to give you the address of their opposite numbers in Eire, or even furnish small amounts of information if there is a genuine need. Most of the usual suppliers will sell you Irish half-million topo charts and radio-navigation charts and supplements; several addresses are listed in the *Airband Factsheet* which is free of charge if you send a pre-paid self-addressed envelope (capacity: one A4 sheet) to the new editorial offices in Broadstone. The complete AIP is likely to be an expensive document!

Information is wanted this time by **George Newport** (Canterbury). Was there a transatlantic helicopter flight recently? Does anyone know anything about it? Please write in!

Abbreviations

AAIB	Air Accidents Investigation Branch
AIC	Aeronautical Information Circular
a.t.i.s.	automatic terminal information service
B.	Boeing
CAA	Civil Aviation Authority
ft	feet
i.l.s.	instrument landing system
kt	knots
LATCC	London Air Traffic Control Centre
MD-	McDonnell-Douglas
MHz	megahertz
N	north
nm	nautical miles
NOTAM	NOTice to AirMen
u.h.f.	ultra high frequency
u.t.c.	universal time coordinated
v.h.f	very high frequency
VOLMET	VOLume METeorological report
W	west

Frequency & Operational News

AIC 135/1992 withdraws runway 09/27 at Cardiff and adds helicopter runway 01/19 at St. Mary's, Scilly Isles. *AIC* 137/1992 introduces a Danger Area Activity Information Service, callsign Pembrey Range, for EGD118 on 122.75MHz.

The next three deadlines (for topical information) are April 8, May 7 and June 4. Replies always appear in this column and it is regretted that no direct correspondence is possible. All letters to 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS. Genuinely urgent information/ enquiries: 081-958 5113.

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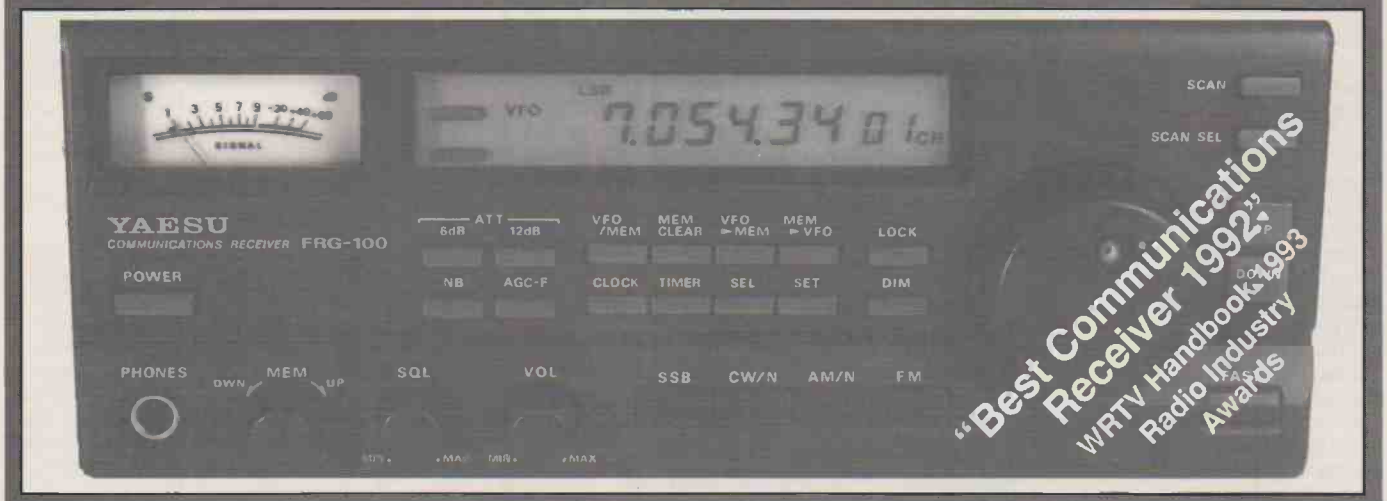

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Info in Orbit

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

The majority of letters received during the weeks around Christmas were from beginners, and some worthwhile questions were posed. Some involved other imaging satellites, so extra details are included this month.

Pictures from Space

During the last 30 years, various types of satellite have been used to transmit pictures of the earth in varying degrees of detail. There are interplanetary craft that collect pictures, one of which is called MAGELLAN and has spent several months collecting images from the surface of the planet Venus. These radar images are reconstructed back on earth after the signals are received and processed.

The frequencies used are very high, in order to allow the largest amount of data to be transmitted in the shortest time. The signals are extremely weak when they arrive back here, and can only be received by large dishes with extremely sensitive amplifiers. Several of these images have been released by NASA and are available through various BBS. **Paul Wilson** of Macclesfield has sent me some on disk, for which I am grateful.

Military Imaging

The military authorities want the highest resolution pictures possible, so they use imaging satellites fitted with state-of-the-art hardware. These satellites use special telemetry formats (the signal beamed down to ground operators) that cannot normally be decoded by amateurs. Neither can professionals easily decode this telemetry without having details of the formats used. The CIS (Russians) sometimes use photographic methods onboard a satellite, and then recover the satellite and process the film when the mission is completed.

This column doesn't carry regular information on any of these, though NOAA publishes considerable data, and one of my satellite tracking programs is kept updated with this orbital information - purely for interest!

Commercial Imaging

Another type of 'picture-generating' satellite is the LANDSAT and SPOT series. These are commercial ventures - the satellites pass over ground, collecting high resolution pictures, which are then available for purchase by various interested parties. One can buy selected images at a price, but you cannot normally obtain 'live' pictures, simply because of the advanced nature of the hardware that is needed to collect and process it. I will stick my neck out here and wonder aloud, whether the impressive advances in current computer technology and electronic chip processing speeds, on which much of the signal processing for these advanced techniques depends, may one day bring direct reception (under licensed use) to a new breed of user?

Fig. 1: NOAA 10 recording from Mark Pepper.

Amateur Satellites

Over the years, radio hams and others have financed the building of satellites carrying equipment for use by amateur radio enthusiasts. Some of these include imaging hardware, a good example of which is UoSAT-5, pictures from which we published, courtesy of the University of Surrey team, some months back. I believe that this field is covered by our sister magazine *Practical Wireless*, so I don't normally include regular updates in this column, although it is an interest of mine.

WXSATS

These are the ones which mostly feature in this column, and comprise both those that orbit near the poles (NOAA, METEOR, FENGYUN and OKEAN), and those in geostationary orbits (METEOSAT, GOES, INSAT and GOMS). Strictly speaking, the OKEANS are oceanographic satellites which carry different imaging systems, but because they use a.p.t. it is reasonable to include them with the WXSATS. The transmissions from these groups are in two distinct bands - the v.h.f. (using 137 to 138MHz) and the s.h.f. (using around 1691MHz). Reception from all of these is basically straight forward, and picture decoding can now be done in ways that were not available even a few years ago.

Current WXSATS

In early December the only CIS WXSAT operating was METEOR 3-4 on 137.30MHz. Around December 9, METEOR 3-3 came back on, using 137.85MHz, and then 3-4 was switched off a few days later. METEOR 3-3 has continued to transmit continuously, - visible pictures during the daylight part of its orbit, and, when it reaches the terminator (day-night boundary) it switches over to thermal infra-red pictures. The change-over is a slow but not graceful operation!

At the point of change, the picture becomes black, with a few phasing bars to mark the edge of the frame. Sometimes there are hiccups and a line or two are missed before transmissions resume. The 'bars only' format continues for about four minutes and can be clearly heard on a scanner. Then there is a minute of white-only picture lines, and finally the proper picture commences. Quality seems to be good, so I collected some overnight data, on my cassette tape recorder, (see later) as have some readers who rang to tell me of the good quality overnight images. Due to the slow drift (the correct word is precess) of METEOR orbits, we can expect satellite swopping to occur. For newcomers, this just means one METEOR being switched off, accompanied by the switching on of another that is in a more sun-lit orbit. If you use a satellite tracking program, you can monitor the orbits of METEORS 3-3, 3-4 and 3-5 to see which has the most sunlit exposure.

The CIS satellite operators tend to avoid leaving the METEORS transmitting when they approach the terminator, probably due to the low sun angle which illuminates the solar cells on the satellite. Each METEOR goes through this low-illumination cycle for a couple of weeks, and that is when they are usually taken out of operation. The American NOAA WXSATS have continued normally during December and January, but some changes are scheduled to occur later this year.

The Next NOAA

For the last couple of years we have had up to four NOAA WXSATS operating at any one time. The launch program for replacement satellites slipped some years ago, but launch date for the new NOAA-I WXSAT has now been announced as 1 June 1993. NOAA-I (to be called NOAA-13 after launch) will be put into an afternoon ascending orbit - that is, one which crosses the equator during the afternoon while travelling northwards (ascending). This is a similar orbit to that of NOAA 11 which is nearing the end of its operational life, so NOAA 13 can replace NOAA 11.

Once NOAA 13 is operational, one of the 'back-up' satellites will be switched off. The reason is not simply the use of similar transmitting frequencies (see the frequency list included in this column), but rather the availability of ground station operations. Every working satellite, whether WXSAT or not, requires ground station housekeeping activities.

For example, when I was involved in daily operations with the British scientific research satellite programme, it was necessary to command the satellites every day, and preferably every few hours, in order to monitor the health of the on-board

Fig. 2: NOAA picture from Roger Ray.

systems, and to regularly 'dump' (i.e., cause the satellite to transmit) all of the collected scientific measurements. One cannot just leave the WXSATS to transmit a.p.t. all day without intervening! The numerous sub-systems require regular checks to ensure that no faults occur. Although we can all see good a.p.t. most of the time, in the case of the NOAAs this data is derived from the high resolution scanners on the WXSATS, and those few amateurs now receiving h.r.p.t. (the high resolution data) will be aware that all is not well on-board some of the satellites.

Orbit Precession

Even the orbits themselves are changing! NOAA 9 was launched into a nominally sun-synchronous, mid-afternoon, ascending orbit. If you monitor it now, you can hear (or see from its pictures) it pass overhead during the evening. Its orbit continues to precess about four minutes per month. NOAA 10 has drifted (precessed) into a descending equator crossing at about 0645UTC. So we see NOAA 10 travelling southbound every morning, with its highest pass around 0730UTC. Regular monitors will know that, like the other NOAAS, each day we can hear NOAA 10 about 10 to 20 minutes earlier than the previous day, but at a different elevation. The maximum elevation pass will happen around 0730UTC but the precess slowly moves this time earlier by nearly two minutes per month. Consequently, we will see NOAA 10 morning passes receiving less and less sunlight, so that some degrading of satellite data will occur. NOAA 12 was launched in May 1991 and is the primary morning satellite, descending around 0734UTC. Its main equipment packages - TOVS, AVHRR and ARGOS (more about these another month) - are operating well. These notes on the NOAAS include information made available by NASA.

METEOSAT 3

The Atlantic Data Coverage satellite (ADC) METEOSAT 3 should be on the move when this appears. From its position at 50° west, over the eastern coast of America, it has served the Americans (and us) well. It is being moved slowly, starting in late January, to longitude 75° west where we in Britain and Europe will not be able to receive it.

GOES Satellites

As of mid-December 1992, the GOES constellation includes GOES-2 now positioned at 136° west, GOES-3 at 175° west, GOES-6 at 108 west°, and GOES-7 at 112 west°. Broadcasts from these WXSATS include WEFAX from GOES-2 (in the western position), and from GOES-7 in the eastern position. From Britain we cannot receive any WEFAX (or PDUS) data from these satellites.

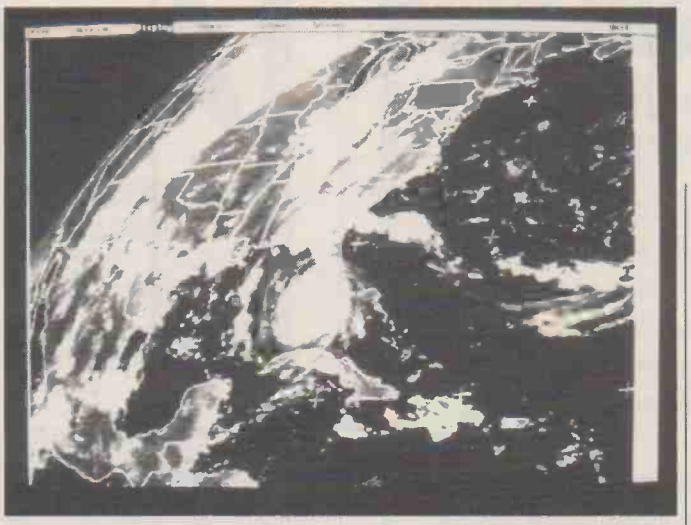

Fig. 3: METEOSAT 3 Hurricane Andrew from Brian Dudman.

Letters

A lady from Fife in Scotland rang during the holiday period to enquire about satellite prediction times that were calculated by her program. She and her husband use the PC GOES/WEFAX program running on a 386SX computer which runs at 25MHz. They were finding that satellites were not apparently keeping pace with the program. During our conversation it became apparent that one or more of the programs that they were using, cause the computer's system clock to run inconsistently.

I have noticed this problem myself when running my usual word processing program. After changing over to one of my satellite tracking programs, the system clock can be up to one minute slow. This means that satellites don't appear to be keeping good time. The cure is obviously to change the computer's clock. If you haven't done this before, it is an easy process. From the DOS prompt (usually c: or similar), type in 'time 12:23:30' or whatever GMT time is appropriate. Press the RETURN key at the correct time and this will reset the clock. This fault only affects real-time satellite displays; calculated times for future satellite passes are obviously not dependent on the time that the program is run. I keep my computers on GMT rather than re-setting by one hour every few months. To be fair, satellite tracking programs may cater for summer, and other time zones.

My thanks to **Matt Taylor** of Woking who points out that the captions for the two photographs published in the January edition of Info in Orbit - NOAA and METEOR 3-3 - were inadvertently swopped. Matt supplied the METEOR picture and Mark Pepper provided the NOAA picture, as indicated in the text. S Turner of Bromyard tells me that he has recently completed the construction of a WXSAT receiving system. He is using a Cirkit receiver with a Maplin decoder and framestore. The equipment is apparently working OK but the almost continuous cloudy weather had prevented him recognising any land. Hopefully he will let us know how effective the system is, particularly being home constructed.

More Letters

Mark Pepper of Camberley sent me a batch of splendid pictures, including one replayed from a tape recorder - see **Fig. 1**. The picture provides a useful demonstration of the effect of tape recorder circuitry on a.p.t. images. I hope that the horizontal white lines show clearly. They follow immediately after the black minute markers, and this isn't coincidence! The tape recorder's electronics have an automatic gain control (a.g.c.) circuit, and when a strong (in this case black) signal is received, the a.g.c. forcibly reduces it before recording. Consequently, the part of the signal immediately following, is heavily attenuated until the circuit recovers, so you see the white line gradually recover. Ideally, the tape recorder input signal should be reduced enough to avoid triggering the a.g.c. My thanks to Mark for this helpful illustration.

Peter Finn of Milford Haven asked whether a 'hi-fi' tape recorder is better for recording a.p.t. signals. In my experience the cheaper ones are actually better because they don't affect the recorded signal so much. Some expensive ones have other signal conditioning circuits (apart from the a.g.c.) that can be difficult to disconnect or avoid. Peter also asks for some details on the edge markings of NOAA pictures so I shall prepare a diagram for next month. Another regular picture supplier for this column is **Roger Ray** who produced a set of NOAA pictures, including **Fig. 2**. **Brian Dudman** sent the picture of hurricane Andrew, see **Fig. 3**.

New Products

Apparently thin on the ground, but I have heard comments about evolutionary new products for the WXSAT market'. I hope to give details of as many products as suppliers and distributors inform me. They should see my wish to keep readers up-to-date as an opportunity for one-off free advertising! An upgrade to the METEOSAT Primary Data System software has been issued by Timestep Weather Systems Ltd, following my request for two specific modifications. The system can now record selected pictures from specific times, and can now display temperatures from the calibrated sensors. This brings it into line with the corresponding advanced WEFAX systems, but Primary Data is perhaps the ultimate in regular high resolution imagery. **Brian Taylor** of Woking has asked me for clarification following rumours about the possibility of METEOSAT primary data being encrypted soon. I am making enquiries about this and will give the answer as soon as possible. Personally, I don't think that we have a problem. I am expecting to review a new Martelec WXSAT receiver shortly, and possibly one from another supplier.

Forthcoming Launches

A note from **Geoffrey Falworth** of Preston tells me that the CIS (formerly Russian) GOMS WXSAT is re-scheduled for imminent launch. I believe it will be similar to METEOSAT, so if we point a METEOSAT dish along the Clarke belt occasionally, we might be lucky and hear some test transmissions. The satellite is way overdue, but then so is the next GOES. Stay tuned to 1691.5MHz for WEFAX images. The next METEOR launch (presumably 3-6) is re-scheduled for early February, so keep listening on your scanner. I will be happy to publish the name of who-ever hears it first and rings me, if they so wish! February 23 should see the launch of shuttle Columbia STS-55, and March 23 is the scheduled date for STS-56. My thanks to Geoffrey and NASA sources for this information.

Kepler Elements

I will send a print-out of the latest elements upon receiving an s.a.e. and separate stamp (which goes towards associated expenses). All operational weather satellites are included, together with their transmission frequencies when on. This data is supplied courtesy of NASA.

Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.50MHz; NOAA beacons on 136.77 and 137.77MHz; METEOR 3-3, 3-4 or 3-5 on 137.30, 137.40 or 137.85MHz; OKEAN 3 on 137.40MHz occasionally & FENGYUN 1-3 monitor 137.06 and 137.80MHz

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With so many computers being used for decoding data signals it's not surprising to learn that I receive many letters asking for help with interference problems. By way of a change, I though it might be useful to publish a case history. This should help to illustrate that the final solution is often a combination of cures. For this exercise, I've selected a particularly useful letter from **Geoff Crowley** in Iceland. Geoff's station comprises the following:

Datong AD-370 antenna with modified dipoles.

Yaesu FRG-7700 receiver.

PC-HF-FAX and PC-SWL from Comar Electronics.

IBM PS1 computer and NEC P20 24 pin printer.

When Geoff completed this station he was greeted with horrific computer noise that peaked at S9 every few kHz. This was despite using coaxial cable for all the signal leads! Needless to say, Geoff was a little disappointed! He tried all manner of cures, but the following actions added together to virtually eliminate the interference. The first move was to try the computer connecting lead suggested by Mark Pepper in the October 'Decode'. This gave a useful improvement, but the noise was still a problem.

Next Geoff took a look at the video monitor supplied with his computer. As is common practice, the case was plastics and Geoff decided to line it with a earthed aluminium foil screen. Although this can be effective **PLEASE don't attempt this unless you are experienced with work on this type of high voltage equipment**. Not only is there a risk of severe electric shock but you can damage you monitor by restricting the ventilation. If you are competent to work on a monitor, you may like to try screening with one of the conductive sprays that are available from specialist component suppliers. These often provide effective noise reduction without impairing airflow. Getting back to the case, it was while screening the monitor that Geoff noticed the earth lead for the computer had been left unconnected. That was quickly rectified and the noise dropped a little more.

Encouraged by the progress, Geoff decided that it might be wise to move the computer away from the receiver. He increased the spacing to about a metre, with another drop in the noise level. The next move was to try a separate power outlet - this gave another improvement. By now the noise had been reduced to a level where it was barely audible and the project was declared a success. As you can see, there was no single action that solved the problem. You just need to apply patience and logic to hit all the likely problem areas one by one. If you've managed to cure a difficult noise problem, please let me know the details so I can pass them on to other readers via the column.

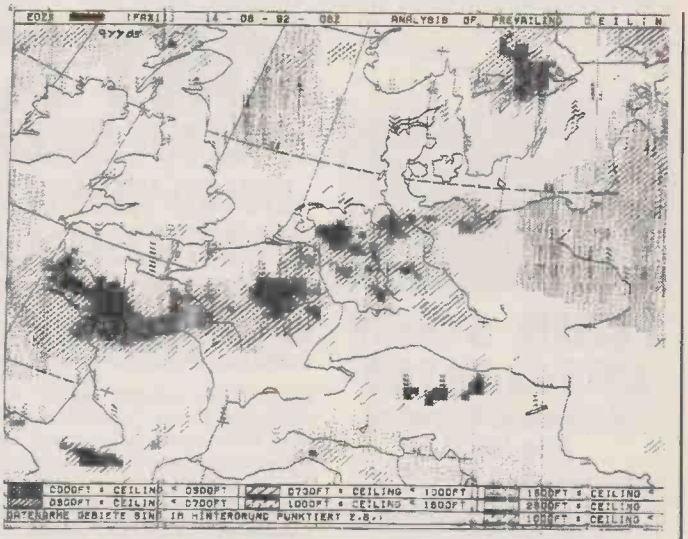
Klingenfuss Releases

As promised last month, here's my report on the new *Guide to Utility Stations* and *Radioteletype Code Manual*. I'll start with the *Guide to Utility Stations*. This annually updated guide is probably my most used reference book with it's comprehensive frequency listings covering all utility services from 9kHz through to 30MHz. One of the secrets of the guide's success is the annual update. This ensures that new stations are captured and obsolete ones removed. It is particularly appropriate with the volatile political climate that appears to prevail in our troubled world.

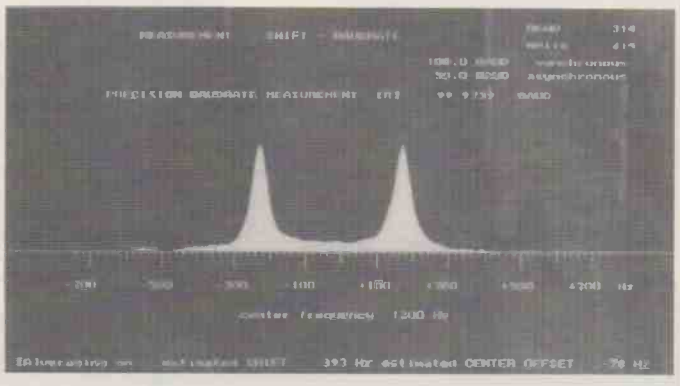
As an example, the new, eleventh edition shows the utility stations of Yugoslavia apportioned to Slovinia, Bosnia Herzegovina and Serbia respectively. In addition to the comprehensive frequency list, the guide is packed with a host of useful information. One that is often missed is the chronological list of press stations. This really makes the location of popular press stations extremely easy. All you do is look-up the time of day in the listing and you are presented with a list of all the press stations that could be on air. The system is based on the fact that all press stations operate to pre-set schedules. For those that like to QSL with utilities there's a comprehensive station address list indexed by country. Other particularly useful sections are callsign list, meteorological FAX schedules, NAVTEX, Q and Z codes, plus many more. If you'd like a copy of this vital reference they are available from the *SWM* Book Service price £24.00

The *Radioteletype Code Manual* is another key reference for the serious listener. This gives lots of detail on the technicalities of the various data modes. For those involved in data analysis and looking for unusual stations, the *Code Manual* provides an invaluable reference. The book starts with a general description of the basics of telegraph transmission, including modulation types. This is followed by a detailed run through the various teleprinter alphabets including, Arabic, Cyrillic, Hebrew, Third shift Cyrillic, Greek, Korean, Amharic, Thai, six element Japanese, four shift Arabic and Chinese. The next section gives an in-depth analysis of a wide range of transmission modes. The latest, twelfth, edition includes the following modes: SITOR, NAVTEX, ARQ-M, ARQ-E and E3, FEC-A, SI-ARQ/FEC, MFSK, Packet, TWINPLEX, ARQ-N, ARQ-6, AUTOSPEC, CIS teleprinter, COQUELET, DUP-ARQ, HC-ARQ, HNG-FEC, POL-ARQ, RAC-ARQ, RS-ARQ, RUM-FEC, SPREAD, SWED-ARQ and Morse. As you can see, its a very comprehensive list!

If you're into encrypted transmissions, there's even a section giving a few ideas on how to decode some of the simpler systems. This includes a computer listing that will encode and decode Vigenere, Beaufort and Variant systems. I can thoroughly recommend the *Radioteletype Code Manual* as essential reading for anyone with an interest in the technical workings of utility signals. As with the utility guide the *Radioteletype Code Manual* is available from the *SWM* Book Service price £11. My thanks to Joerg Klingenfuss for the supply of the review copies.



Wavecom 4010 FAX chart.



Code-3 spectrum analyser display.

Code Zero Explained

Back in January I published a request from Neil Peppe of Chippenham for an explanation of the term Code Zero. As I suspected, there is always a reader out there somewhere with the answer. In this case, **Bill Clark** of Aspatria has come up with the goods. Apparently, the term Code Zero is an unofficial abbreviation used in upper air weather reports. When reporting turbulence a scale running from zero to seven is used with zero used to represent smooth. It is for this condition that Code Zero is used - simple when you know the answer! My thanks to Bill for providing the explanation. Don't forget, if you have any queries such as this, drop me a line and I'll do my best to answer through the column.

Signal Analysis

With many of the advanced decoding systems featuring complex analysis modes, I thought I'd better tackle the subject in 'Decode'. Rather than try and cover the subject in one article, I'll include the odd feature over the next few months. Let's start with a look at the spectrum analyser type display that provides speed and shift information. For those that have never experienced this type of display, I've shown an example of the Hoka Code-3 version in the column.

As you can see, the display gives a comprehensive view of the received signal. The popularity of this type of analysis has come about through the extensive use of computer based decoding systems. With a modern computer, such as the IBM PC, there is more than enough processing power

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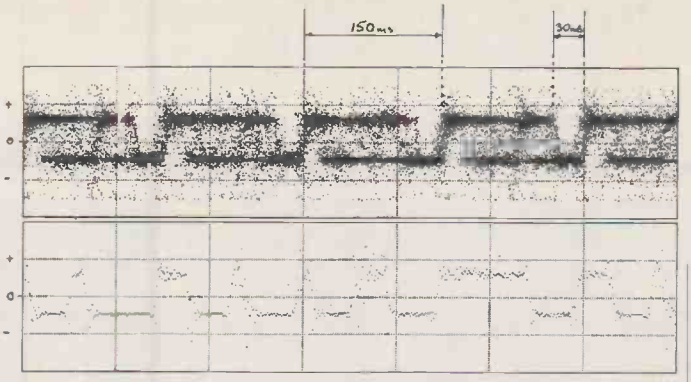

Code-3 oscilloscope display.

to handle the decoding. Also, once a signal has been converted into a form that the computer can work with, it's comparatively simple to add a wide range of supplementary processes.

Now let's take a more detailed look at the Hoka system. The signal I've shown in the example is a weather RTTY signal from Bracknell Met on 4.489MHz. The horizontal base line is used to indicate the audio frequency of the received signal, while the vertical scale shows the amplitude or signal level. Rather than showing the absolute frequency of the signal, the base line shows the off-set from the centre frequency. Just below the display you will see the centre frequency displayed. From this you could work out the actual frequency but, in practice, it's the offset that's important.

In this example, you will see that the two frequencies displayed are approximately 200Hz above and below the centre frequency. These represent the mark and space frequencies of the RTTY signal. As you alter the receiver tuning the two frequency displays move across the display. To use this as a tuning aid, you simply adjust the receiver tuning so that the displayed signal straddles the centre point. With the Code-3 there is extra help in the form of an off-set display. This gives an accurate measure of the degree of tuning offset. In addition to acting as a tuning indicator this type of display gives useful information when trying to eliminate interference. By carefully studying the display you can adjust the receiver and external filter controls to give the best compromise between interference reduction and signal quality. The Code-3 speed-shift screen also contains other valuable information to aid signal decoding. The most obvious of these is the shift measurement. This is important information for the decoder, especially when receiving difficult signals. As well as helping to find the correct settings for the decoder, the shift gives a useful clue as to the type of signal being analysed. However, I'll cover that in more detail later.

The other key area of this part of the Code-3 is the baud rate measurement. You will see that this is shown at the top of the screen. The two readings representing synchronous and asynchronous signals. These have to be shown differently due to the half elements that occur in many RTTY signals. An extra feature is a high precision baud rate measurement that can work to 0.001 baud. For this to have any real meaning the decoding package has to be accurately calibrated against the computer's internal clock. By combining the speed and shift characteristics of a signal you can usually determine the type of transmission you're about to decode. Typical examples of this are shown in several publications including the Radioteletype Code manual described in this month's column.

The second decoding aid for this month is commonly called an oscilloscope display. This is due to it's similarity to a conventional oscilloscope. You will see I've included an example of this in the column. In this example there are two displays one stacked above the other. In both cases the vertical axis shows the frequency shift of the received signal and the horizontal represents time. Two displays are provided to show different aspects of the signal. The top trace is rather like a storage scope in that the display is built-up by continually reading and displaying the signal without clearing the screen. The bottom trace on the other hand, is a single sample of the signal. Other than the differing densities, the two traces show significant features of the signal.

This type of display is most commonly used as a tuning aid for FAX signals, but I'll concentrate on a more unusual application. If you look carefully at the darker top trace, you will see that it has a period of 150ms. Though not obvious at first, this shows the duration of each character in the received data signal. With some simple maths I can demonstrate that the signal in question is a standard 50 baud RTTY transmission.

If we look back at the basics of RTTY, you will recall that each RTTY character comprises a start bit, five data bits and one and a half stop bits. For a signal to have a rate of 50 baud, each bit must have a length of 1 second/50 = 20ms. So, if we add the components bits together we have 1 + 5 + 1.5 = 7.5 bits. If we now multiply this by the bit length of 20ms, we get 20ms x 7.5 bits = 150ms, i.e. the period of the signal in the display. This analysis is confirmed by looking at the spacing between the larger blocks of the signal which turns out to be 30ms, exactly right for 1.5 stop bits. In this particular example, the lower trace shows an individual RTTY signal and you can see how the character elements align with the upper trace.

Before going on, I ought to explain that a trace as clear as this can only be obtained if the horizontal sweep of the display is carefully aligned with the baud rate of the signal. With the Code-3 package this locking is achieved by running the speed-shift analysis first and then entering the oscilloscope and pressing B. This brings the measured baud rate into the oscilloscope.

SWM is holding a 'Decode Clinic' at the London Amateur Radio Show, March 13/14. Mike Richards will be there to answer your questions!

USCG Boston

Day Watson has sent me the latest details on this station which I'm sure many of you will find interesting. Although you're unlikely to receive NAVTEX from this station they do transmit data on 518kHz at 0045, 0445, 0845, 1245, 1645 and 2045UTC Regular weather bulletins are sent on the following frequencies:

0140UTC: 6.314, 8.4165 and 12.579MHz

1630UTC: 8.4165, 12.579 and 16.8065MHz

There are also regular ice bulletins transmitted between March and July on the following frequencies:

0030UTC:6.314, 8.4165 and 12.579MHz

1218UTC:8.4165, 12.579 and 16.8065MHz

If you want to QSL with this station the latest address is:

Commanding Officer, USCG Communication Station Boston-NMF, PO Box 608, Marshfield MA 02050, USA.

MFA Lagos

For those of you who enjoy a little detective work, here's a riddle for you to work on. There are many MFA (Ministry of Foreign Affairs) stations around and most have been identified. However, there seems to be a couple of new stations that are proving difficult to positively identify. The frequencies in question are: 7.8217, 10.2317, 11.1987 and 18.1899MHz. The transmission modes seem to be 96 baud FEC-A but some reports suggest that 100 baud SITOR A may also be used. The marker for these stations sends LYNX followed by a tuning burst. The best suggestions to date show this as a link between the capital, Lagos and Abuja which is located in central Nigeria. Although the traffic on the link is off-line encrypted, you may find the odd header is sent in plain text. If you have any further information on either of these stations, please write to the address at the head of the column with details.

Frequency List

This month's selected frequencies have been supplied by Day Watson, Geoff Crowley and **Robert Hall**. The format follows the usual standard, i.e. frequency, mode, speed, shift, callsign, time and notes. If you would like a copy of either my Decode list or Day Watson's beginners list, just drop me a line with three first or second class stamps. To help me achieve a fast turn round, I'd be grateful if you could mark your letter Beginner or Decode and include an adhesive label with the return address.

0.1174MHz, FAX, 120, 576, DCF37, 0015, Offenbach meteo

4.692MHz, ARQ-M2, 96, 1200, -, 0440, UNID

4.782MHz, FAX, 120, 576, GFE21, 1935, Weather maps

5.785MHz, FAX, 120, 576, AOK, 2126, US Navy Rota

5.8879MHz, RTTY, 50, 850, IMB32, 0358, Rome meteo

6.917MHz, FAX, 120, 576, ECA7, 0429, Madrid meteo

7.75MHz, FAX, 120, 576, RAW78, 2340, Moscow meteo

8.04MHz, RTTY, 50, 460, BZC7, 0103, Urumqi met news

8.412MHz, RTTY, 50, 170, VVIO, 1923, Sergei Esenin - CIS Ship

8.421MHz, ARQ, 100, 170, 9VG78, 2138, Singapore Radio

8.598MHz, CW, -, -, OXZ4, 2348, Lyngby traffic lists

9.947MHz, TWINPLEX, 100, -, 1340, MFA Madrid

10.536MHz, RTTY, 50, 400, CFH, 2158, Canadian Forces Halifax

10.603MHz, RTTY, 100, 137, -, 1649, NAN Lagos

14.932MHz, RTTY, 50, 400, -, 1251, APS Algiers

16.343MHz, RTTY, 75, 400, YZI4, 1313, MFA Belgrade English

16.816MHz, ARQ, 100, 170, ZSC64, 1730, Capetown radio

18.288MHz, ARQ-E, 96, 183, DMK, 1110, MFA Bonn

19.529MHz, RTTY, 50, 850, JMG5, 0820, Tokyo Met

19.845MHz, RTTY, 50, 514, -, 0635, MFA Havana

22.448MHz, CW, -, -, GKB14, 1119, Portishead radio

Long Medium & Short

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Freq kHz	Station	Country	Power kW	Listener
520	Hof-Saale	Germany	0.2	J*
531	Ain Beida	Algeria	600	B*,G*,K*,L*
531	Torshavn	Faroe Is.	5	D*,K
531	Leipzig	Germany	100	J*,L*,M*,O*
531	Oviedo	Spain	10	G*,J*,K*
531	RNE-5 Pamplona	Spain	10	K*
531	Beromunster	Switzerland	500	O*
540	Wavre	Belgium	150/50	E*,G*,J*,L*,M,O*,R*
540	Solt	Hungary	2000	J*,O*
540	Sidi Bennour	Morocco	600	G*,L*
549	Les Trembles	Algeria	600	J*,L*,O*
549	DLF Bayreuth	Germany	200	C*,J*,L*,M*,R*
549	Thurmau	Germany	200	O*
558	Espoo	Finland	100	E*,J*
558	La Coruna	Spain	10	K*
558	Valencia	Spain	20	D*,E*,J*,L
558	Cima di Dentro	Switzerland	300	O*
567	Berlin	Germany	100	J*,L*
567	RTE-1 Tullamore	Ireland (S)	500	C*,D*,E*,J*L*M,P*R*
576	Vidin	Bulgaria	100	J*
576	Muhlacker	Germany	500	O*
576	Stuttgart	Germany	500	D*,J*,L,S
576	Riga	Latvia	500	K
576	Braga	Portugal	10	K*
576	RNE-5 Barcelona	Spain	20	C*,K*,L*,O*
585	Orf Wien	Austria	600	K*
585	FIP Paris	France	B	J*,L
585	RNE-1 Madrid	Spain	200	D*E*J*KL*M*O*R*S*
585	Gafsa	Tunisia	350	K*
594	Frankfurt	Germany	1000/400	J*,L*,O*,S
594	Oujda-1	Morocco	100	K*
594	Muga	Portugal	100	O*,J*,L*
594	Izhevsk	CIS	100	K
603	Lyon	France	300	E,L*,O*
603	Sevilla	Spain	20	J*,K*,L*
603	BBC-R4	UK	2	J*
612	Kiel	Germany	10	K
612	RTE-2 Athlone	Ireland (S)	100	C*,D*,E*,L*,M,P*,R*
612	Sebaa Aioun	Morocco	300	K
612	Lerida	Spain	10	L*,O*
612	Vitoria	Spain	10	S*
621	Wavre	Belgium	80	C*,E,J*,L*,O*,R*
621	Batra	Egypt	2000	K*
621	Barcelona	Spain	10	J*,K*,L*,O*
630	Vigra	Norway	100	D*,J*,O*
630	Tunis-Djedeida	Tunisia	600	L*,P*
639	Praha (Liblice)	Czechoslovakia	1500	J*,K*,O*,P*
639	RNE-1 Almeria	Spain	20	D*
639	La Coruna	Spain	100	D*,J*,L*,O*,R*
648	P. de Mallorca	Spain	10	J*,K*
648	BBC Orfordness	UK	500	C*,D*,E,F,J*,L*,M,R*
657	Burg	Germany	250	J*,L*
657	RCE-2 Madrid	Spain	20	G,J*,L*,O*
657	BBC-R.Wales	UK	2	J*,M*
666	SWF Boden'der	Germany	300/180	J*,O*
666	Lisboa	Portugal	135	L*
666	Barcelona	Spain	20	O*
675	Marseille	France	600	J*,L*,O*
675	Hilversum-3	Holland	120	D*,E*,J*,L*,M*,O*,R*
684	St.Petersburg	CIS	10	K
684	Hof-Saale	Germany	100	O*
684	RNE-1 Sevilla	Spain	250	J*,L*,O*,R*
684	Beograd	Yugoslavia	2000	J*,K,L*,R*
693	Berlin	Germany	250	J*
693	BBC-Scot.	UK	50	D*
693	BBC-R5	UK	150	E*,M,P*,R*
702	Aachen/Fl'bg	Germany	5	J*,L*
702	Monte Carlo	Monaco	300	J*,K*,O*,R*
702	Zamora	Spain	5	L*
711	Rennes 1	France	300	E*,J*,K*,L*,O*,R*
711	Heidelberg	Germany	5	J*
711	Laayoune	Morocco	600	L*
711	COPE Murcia	Spain	5	K*
720	BBC-R4	Ireland (N)	10	D*,L*
720	Norte	Portugal	100	J*,L*
720	BBC-R4	UK	0.5	E*,LP*
729	Leipzig	Germany	5	J*
729	RTE-1 Cork	Ireland (S)	10	D*,J*,L*,M
729	Oviedo	Spain	50	J*,L*,O*
738	Paris	France	4	J*
738	Poznan	Poland	300	L*
738	RNE-1	Spain	250	J*,L*,O*,S*
747	R.Baltika	CIS	?	K*
747	Hilversum-2	Holland	400	C,E*,J*,L*,M,O*,R*
747	R.Cadena	Spain	10	J*
756	Brunswick	Germany	800/200	E*,J*,L*,M*,O*,R*
756	Bilbao	Spain	5	K*
765	Sottens	Switzerland	500	E*,J*,L*,M*,O*
774	Abis	Egypt	500	K*
774	BBC-R4	Ireland (N)	1	J*,S*
774	RNE-1	Spain	60	J*,K*,L*,O*,R*
783	Burg	Germany	1000	C*,J*,L*,O*,R*
783	R.Porto	Portugal	100	K*,L*
783	Tartus	Syria	600	K*
792	Limoges	France	300	D*,E*,J*,L*,O*,R*
792	Sevilla	Spain	20	J*,L*,O*
801	M'hen-Ismaning	Germany	300	J*,K*,O*,R*
801	Ajlun	Jordan	2000	K*
801	St.Petersburg	Russia	1,000	K*
801	Burgos	Spain	10	L*,O*
810	SER Madrid	Spain	20	J*,L*,O*
810	BBC-Scot.	UK	100	D*
810	BBC-Scot.	UK	100	E*,F*,J*,L*,M,P*,R*
819	Batra	Egypt	450	K*,L*
819	Toulouse	France	50	E*,O*
819	Trieste	Italy	25	L
819	Rabat	Morocco	25	J*
819	San Sebastian	Spain	5	J*,L*,O*
837	Nancy	France	200	E*,G,J*,L,O*,R*
837	R.Popular	Spain	10	E*,G,J*,K*,L*
846	Rome	Italy	540	C*,D*,J*,O*,R*
855	Berlin	Germany	100	C*,D*,J*,O*,R*
855	Murcia	Spain	125	D*,E*,J*,L*,O*
864	Santah	Egypt	500	K*
864	Paris	France	300	E*,L*,O*,R*
864	RNE-1	Spain	10	K*
873	AFN via Frkf'rt	Germany	150	E*,F*,G,J*,L*,M*,R*
873	Zaragoza	Spain	20	L*,O*
873	R.Ulster	UK	1	J*,P*
882	Wachenbrunn	Germany	250	G
882	COPE Malaga	Spain	5	J*
882	BBC-Wales	UK	100	E*,G,J*,K*,L*,M,R*
891	Algiers	Algeria	600/300	E*,G*,J*,K*,L*,M*,O*
891	Huisberg	Netherlands	20	J*,L*
891	Antalya	Turkey	600	K*
900	Pilsen	Czech	40	J*
900	Milan	Italy	600	G*,J*,K,O*,P*,R*
900	COPE-Bilbao	Spain	10	E*
900	Qurayyat	S. Arabia	1000	K*
909	P. de Mallorca	Spain	10	K*
909	BBC-R5	UK	140	E*,M,P*
909	BBC-R5	UK	50	D*
918	R.Intercont.	Spain	20	G*,J*
918	R.Ljubljana	Slovenia	600/100	G*,K*,L
927	BRT-1	Belgium	300	C*,G*,J*,L*,M,O*,R*
927	RRE Evora	Portugal	1	K*
927	Izmir	Turkey	200	B*
936	Bremen	Germany	100	J*
936	Venezia	Italy	20	K*,O*
936	SER Lerida	Spain	2	J*,K*
945	Toulouse	France	300	J*,L*,P*,R*
954	Brno (Dobrochov)	Czech	200	K*
954	RCE Madrid	Spain	20	J*,L*,O*,R*
954	Trabzon	Turkey	300	K*
963	Sofia	Bulgaria	150	J*
963	Pori	Finland	600	D*,E*,J*K,L*M*O*R*
963	Paris	France	8	K*,L*
963	Tir Chonaill	Ireland (S)	10	K*,L
972	Vukovar	Croatia	1	Q*
972	Hamburg	Germany	300	C*D*E*,J*,K,L*,O*,R*
972	Monforte	Spain	2	K,S*
972	RNE-1 Cordoba	Spain	5	J*,L*
981	Alger	Algeria	600/300	J*,L*,M*,O*
981	Megara	Greece	200	B*
990	Berlin	Germany	300	E*,J*
990	SER R.Bilbao	Spain	10	J*,O*
999	Torino	Italy	20	K
999	R.Popular	Spain	20	J*,O*,R*
1008	Hilversum-5	Holland	400	B,D*,J*,L*,O*,R*
1017	Rheinsender	Germany	600	B,E*,J*,L*,O*,R*
1017	RNE-5 Burgos	Spain	5	J*
1026	Graz-Dobl	Austria	100	J*
1026	SER Alicante	Spain	3	L*
1026	Vigo	Spain	3	O*
1035	Prog.3 Lisbon	Portugal	120	J*,L*,O*
1044	Dresden	Germany	250	R*,C*,E*,J*,O*
1044	Thessaloniki	Greece	150	B*
1044	Sebaa-Aioun	Morocco	300	L*
1044	S.Sebastian	Spain	10	B*
1053	COPE	Spain	10	J*
1053	BBC-R1	UK	20	D*
1053	BBC-R1	UK	150	E*,M,P*,R*
1062	Kalundborg	Denmark	250	B*,D*,J*,L*,R*
1071	Brest	France	20	E*,J*,L*
1071	Lille	France	40	B,C*,O*,R*
1080	Katowice	Poland	1500	E*,L*
1080	SER-Granada	Spain	5	J*,L
1080	La Coruna	Spain	3	K,O*
1089	BBC-R1	UK	150	E*,M
1089	BBC-R1	UK	50	D
1089	Krasnodar	CIS	300	J*
1098	Nitra (Jarok)	Czechoslovakia	1500	B*,J*,L*
1098	RNE-5 Lugo	Spain	10	J*,K,O*
1107	AFN via Munich	Germany	40	J*
1107	RNE-5	Spain	20	G,J*
1107	RNE-5	Spain	5	L*
1107	RNE-5	Spain	10	K,O*
1107	BBC-R1	UK	0.5	D*
1116	SER	Spain	2	J*
1125	La Louviere	Belgium	20	J*,L,O*
1125	RNE 5 Vitoria	Spain	10	K*,L*
1125	BBC	UK	1	M
1134	COPE	Spain	2	K
1134	COPE	Spain	2	K
1134	Valencia	Spain	10	J*,L*
1134	Zadar	Yugoslavia	1200	J*,L*,R*
1143	AFN via St'gart	Germany	10	E*,J*
1143	Messina	Italy	6	J*,L*
1143	Kaliningrad	Russia	150	K*,P
1143	COPE Reus	Spain	2	O*
1161	Strasbourg (F.Int)	France	200	G,J*,O*,R*
1170	Krasnodar	CIS	500	K*,P*
1170	Vila Real	Portugal	10	K*
1179	Santiago	Spain	10	J*
1179	Solvesborg	Sweden	600	B,D*,J*,L*,M*,O*,R*
1188	Kuurne	Belgium	5	B,J*,L
1188	Reichenbach	Germany	5	K*
1188	Szolnok	Hungary	135	B
1197	VOA via Munich	Germany	300	H,J*,L*,M,R*
1197	Agadir	Morocco	20	K*
1206	Bordeaux	France	100	J*,L,O*
1206	Wroclaw	Poland	200	J*,L*,R*
1215	Lushnje	Albania	500	K
1215	Kaliningrad	Russia	500	J*,K
1215	COPE	Spain	2	J*,K,O*
1224	Vidin	Bulgaria	500	J*,L*
1224	COPE Madrid	Spain	20	J*
1224	COPE	Spain	5	O*
1224	COPE Vigo	Spain	5	K
1233	Liege	Belgium	5	J*,L*
1233	Nitra	Czechoslovakia	40	B*,J*
1242	Marseille	France	150	O*
1251	Marcali	Hungary	500	J*
1251	Huisberg	Netherlands	10	L*,O*
1251	Viseu	Portugal	10	D*
1260	Valencia	Spain	20	J*,L*,O*
1269	Neuminster	Germany	600	BD*E*J*L*M*O*P*R*
1269	COPE Leon	Spain	5	K*
1278	Strasbourg	France	300	J*,L
1278	RTE-2	Ireland (S)	10	E*,J*,L*,R*
1287	Litomysl	Czecho	300/200	D*J*
1287	Melnik	Czecho	400	E*,O*,R*
1296	COPE	Spain	5	K*,O*
1296	S.Sebastian	Spain	5	J*
1296	Rebia	Sudan	1500	K*
1296	BBC	UK	500	E*,J*,L*
1305	Marche	Belgium	10/5	O*
1305	Rzeszow	Poland	100	J*
1305	Orense (RNE5)	Spain	5	K*,L*
1314	Kvitsoy	Norway	1200	B,E*,HJ*L*M*O*P*R*
1323	R.Moscow	Germany	150	J*,N,P*
1323	Wachenbrunn	Germany	1000/150	O*
1332	Rome	Italy	300	J*,L*,O*
1341	BBC-Ulst.	Ireland (N)	100	D,E*,H,L*,M,R*
1350	Nancy/Nice	France	100	B,E*,J*,L*M*O*P*R*
1350	Cesvaine/Kuldiga	Latvia	50	K*
1359	Tirana	Albania	50	G*
1359	Berlin	Germany	250/100	J*,O*
1368	Manx R.	IOM	20	G*,J*,P*
1368	Venice	Italy	20	O*
1377	Lille	France	300	B,J*,L*,O*,R*
1386	Kaliningrad	Russia	500	B,E*,J*,L*,O*,P*
1395	R.Tirana	Albania	1000	J*,K*,L*,O*,R*
1404	Brest	France	20	B,J*,L*,O*,P*,R*
1413	RCE Zaragoza	Spain	20	J*,L*,O*
1422	Heusweiler	Germany	1200/600	B,E*,J*,L*,M*O*P*R*
1431	Dresden	Germany	250	E*,J*
1431	Foggia	Italy	2	O*
1440	RTL Mamach	Luxembourg	1200	B,E*F*J*L*M*O*P*R*
1449	Berlin	Germany	5	J*
1449	Squinanzo	Italy	50	K*,L*,O*
1458	R.Tirana	Albania	500	L*
1467	TWR	Monaco	1000/400	G*,J*,L*,O*,R*
1476	Wien-Bis'bg	Austria	600	E*,J*,L*,O*,R*
1476	Bilbao	Spain	20	L*,O*
1485	AFN	Germany	1	K*
1485	RR	Spain	2	K*
1485	SER	Spain	2	G*,K*,R*
1485	BBC-R1	UK	2	L
1494	Clermont-Ferrand	France	20	J*,L*,O*,R*
1494	St.Petersburg	Russia	1000	J*
1503	Stargard	Poland	300	G*,J*,L*
1512	Wolvertem	Belgium	600	A*BC*G*I*J*L*M O*P*R*
1512	Jeddah	Saudi Arabia	1000	B*,K*
1521	Kosice	Czecho	600	J*,L*,O*,R*
1521	Duba	Saudi Arabia	2000	K*
1530	Vatican R.	Italy	150/450	G*,J*,L*,O*
1539	Mainflingen	Germany	700	J*,L*,M*,O*,R*
1557	Nice	France	300	J*,O*
1566	R'stantsiya M'k	CIS	?	K*
1566	Monte Cenerie	Switzerland	300	B*
1566	Samen	Switzerland	300	J*,L*,O*,R*
1575	Burg	Germany	250	B,J*
1575	Genova	Italy	50	B*,O*
1575	Cordoba	Spain	5	L,O*
1584	SER	Spain	?	L*
1584	Pamplona	Spain	2	B,O*
1593	Langenberg	Germany	400/800	B,E,J*,L*,M*,O*,P*,R*
1602	Vitoria	Spain	10	B,L*,O*
1611	Vatican R.	Italy	5	J*

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

Medium Wave Chart

Listeners:

A: Tim Allison, Middlesborough.
B: Ted Bardy, N.London
C: Vera Brindley, Woodhall Spa.
D: Geoff Crowley, Iceland.
E: John Eaton, Woking.
F: Simon Hockenhull, E.Bristol.
G: Sheila Hughes, Morden.
H: Rhoderick Illman, Oxted.
I: Ross Lockley, Stirling.
J: Eddie McKeown, Newry.
K: Roy Merrall, Dunstable.
L: George Millmore, Wootton, IOW.
M: Sid Morris, Rowley Regis.
N: Roy Patrick, Derby.
O: Philip Rambaut, Macclesfield.
P: Tom Smyth, Co.Fermanagh
Q: O. Tomic, Birmingham.
R: Phil Townsend, E.London.
S: Ted Walden-Vincent, Gt.Yarmouth.

The UK time system will change from Greenwich Mean Time (GMT) to British Summer Time (BST) on March 28. If you have a small clock set to Universal Co-ordinated Time (UTC) beside your receiver make no adjustment to it on that day. International broadcasters will still refer to time in UTC. When sending contributions for LM&S please indicate the time of reception in UTC and not BST.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, all logs compiled during the four week period ending December 31.

Improvement in propagation the week before Christmas enabled signals from European l.w. stations to reach Canada! Whilst checking the band in Quebec on December 19, **Alan**

Roberts heard clear signals from Allouis, France on 162kHz (2000kW) at 0500UTC, their signal rated SINPO 34343. At 0520, he found Saarlouis, Germany on 183 (2000kW), at 0540 their signal was 34343. Encouraged by these results he checked again on December 22 and found a signal on 216. An announcement established it was RMC via Roumoules (1400kW) rated 23322 at 0400.

Medium Wave Reports

In St.Andrews, **Eric Duncan** found propagation favourable for m.w. transatlantic DXing most nights in December. He heard CJYQ in St John's, NF on 930kHz before midnight on 25 nights! He also logged CHER in Sydney, NS on 930; VOAR in Mount Pearl, NF on 1210; CKCW Moncton, NB on 1220, all before midnight. VOAR was the most consistent, audible on 16 nights. Two broadcasters in S.America were also noted, Radio Globo in Rio, Brazil 1210, heard on seven occasions between 1st and 17th and R.Vision (YVKG) in Caracus, Venezuela 950, heard only once.

CJYQ 930 & VOAR 1210 were also in other reports. **Roy Patrick** (Derby) logged them soon after midnight on several occasions. Despite the high levels of electrical noise in N.London **Ted Bardy** heard CJYQ at 0337 rated 22232. Over in Co.Down **Robert Connolly** (Kilkeel) noted CJYQ as 32332 at 0020. He also listened to VOCM in St.John's on 590, rated 22222 at 0010. Around 0100 he heard WOGL in Philadelphia, PA 1210 and WKNR in Cleveland, OH 1220, both rated 33333.

Signals from the Caribbean Beacon, Anguilla on 1610 were clearly heard on December 22 by **Tim Bucknall** in Congleton, they peaked 33353 at 0049. In Northwich, John Parry checked the band around dawn. He found the signals from VOCM on 590 peaked to 33553 at sunrise and then there was a rapid decline. He heard a weather report on 1130 at 0740, which may have come from WNEW in New York.

Unusual m.w. propagation conditions were noted by **George Millmore** in Wootton, IOW. Many of the local radio signals he can normally hear during daylight were swamped by interference from Continentals. The reverse seemed to apply after dark and some of the Spanish stations heard previously were inaudible, but on 972 he logged RNE-1 via Cordoba for the first time at SIO434. In Dunstable, **Roy Merrall** spent some time trying to identify the numerous Spanish signals he heard.

Roy Patrick says, "I notice more and more BBC local stations now relay the BBC World Service at night. R.Stoke is the latest, but R.Derby still carries R-2". **Michael Williams** (Redhill) tells me that the BBC R.Scotland transmitters on 810 radiate the World Service on Saturdays from 2000 and on Sundays from 1600.

Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R.	I	7.50	L,M,P
585	R.Solway	B	2.00	K
603	Invicta Snd(Coast)	I	0.10	L,O*,P
630	R.Bedfordshire	B	0.20	E,G,I,L,M,O*,P
630	R.Cornwall	B	2.00	L
657	R.Clwyd	B	2.00	A,H,K*,L,M,P
657	R.Cornwall	B	0.50	L
666	DevonAir R.	I	0.34	K*,L,P
729	BBC Essex	B	0.20	H,L,N*,O*,P
738	Hereford/Worcester	B	0.037	L,M,P
756	R.Cumbria	B	1.00	K
765	BBC Essex	B	0.50	D,H,L,O*,P
774	R.Kent	B	0.70	L,O*,P
774	R.Leeds	B	0.50	A
774	Severn Sound (3CR)	I	0.14	L,M
792	Chiltern R.	I	0.27	P
801	R.Devon	B	2.00	G,K*,P
828	Chiltern Radio	I	0.20	E*,D*,P
828	2CR	I	0.27	L,P
837	R.Furness	B	1.00	K*
837	R.Leicester	B	0.45	L,M,P
855	R.Devon	B	1.00	L,P
855	R.Lancashire	B	1.50	K
855	R.Norfolk	B	1.50	P
855	Sunshine R.	I	0.15	H,M,P
873	R.Norfolk	B	0.30	D,H,P
936	GWR (Brunel R.)	I	0.18	K*,L,P
945	R.Trent (GEM-AM)	I	0.20	K*,L*,M,N*,P
954	DevonAir R.	I	0.32	D,K*,L,P
954	R.Wyvern	I	0.16	G,M,P
990	WABC (Nice & Easy)	I	0.09	M,P
990	R.Devon	B	1.00	L,P
990	Hallam R.(Gt.Yks)	I	0.25	B*
999	R.Solent	B	1.00	E*,I,L,P
999	R.Trent (GEM-AM)	I	0.25	B*,P
999	Red Rose R.	I	0.80	K*
1017	WABC Shrewsbury	I	0.70	M,P
1026	Downtown R.	I	1.70	N*
1026	R.Cambridgeshire	B	0.50	H,I,O*,P
1026	R.Jersey	B	1.00	H,L,P
1035	R.Kent	B	0.50	L,P
1035	West Sound	I	0.32	J,K*
1107	Moray Firth R.	I	1.50	A,K*
1116	R.Derby	B	1.20	K*,M
1116	R.Guernsey	B	0.50	L,P
1152	BRMB (Xtra-AM)	I	3.00	F*,M
1152	LBC (L.Talkback R)	I	23.50	E*,H*,L,P
1152	R.Broadland	I	0.83	B*,K*,P
1161	GWR (Brunel R.)	I	0.16	K*,L,P
1161	R.Bedfordshire	B	0.10	P
1161	R.Sussex	B	1.00	H,L,P
1161	R.Tay	I	1.40	C*
1170	Ocean Sd.(SCR)	I	0.12	L,P
1170	R.Orwell (SGR-FM)	I	0.28	P
1170	Signal R.	I	0.20	J*,M
1170	Swansea Sound	I	0.58	C*,K
1242	Invicta Snd(Coast)	I	0.32	J*,P
1242	Isle of Wight R.	I	0.50	K*,L,P
1251	Saxon R. (SGR-FM)	I	0.76	K*,P
1260	GWR (Brunel R.)	I	1.60	K,L,P
1260	R.York	B	0.50	A
1260	Sunrise R.	I	0.29	K,M,P
1260	Marcher Sound	I	0.64	J*
1278	Pennine R(Gt.Yks)	I	0.43	B*
1305	R.Hallam (Gt.Yks)	I	0.15	B*
1305	Red Dragon (Touch)	I	0.20	K*,L,P
1323	R.Bristol (Som.Snd)	B	0.63	P
1323	S'thern Sound(SCR)	I	0.50	K*,L,P
1332	Hereward R.(WGMS)	I	0.60	J*,P
1332	Wiltshire Sound	B	0.30	K*,L,P
1359	Essex R.(Breeze)	I	0.28	O*,P
1359	Mercia Snd(Xtra-AM)	I	0.27	M
1359	Red Dragon (Touch)	I	0.20	F*
1359	R.Solent	B	0.85	K*,L
1368	R.Lincolnshire	B	2.00	P
1368	R.Sussex	B	0.50	H,L,P
1368	Wiltshire Sound	B	0.10	K*,L
1413	Sunrise R.	I	0.125	D,E*,H*,I,L,P
1431	Essex R.(Breeze)	I	0.35	J*,O*,P
1431	R.210 (Cl. Gold)	I	0.14	L,P
1449	R.Peterboro/Cambs	B	0.15	H,P
1458	GLR	B	50.00	E*,H*,L,N*,P
1458	R.Cumbria	B	0.50	K*
1458	R.Devon	B	2.00	L,P
1458	R.Newcastle	B	2.00	K*
1476	County Sound	I	0.50	E,K*,L,P
1485	R.Humberside	B	1.00	K*
1485	R.Merseyside	B	1.20	K*,M,N*
1485	R.Sussex	B	1.00	H,P
1503	R.Stoke-on-Trent	B	1.00	I,K,M,N*,P
1521	County Sound	I	0.64	E,K,L,P
1530	Pennine R(Gt.Yks)	I	0.74	K*
1530	R.Essex	B	0.15	H,I,P
1530	R.Wyvern	I	0.52	K*,M
1548	Capital R. (Gold)	I	97.50	E,H*,L,N*,P
1548	R.Bristol	B	5.00	K*,L
1548	R.Forth (Max AM)	I	2.20	A,K*
1557	Chiltern R.(Gold)	I	0.76	J*,K
1557	Ocean Sound (SCR)	I	0.50	J*,L,P
1557	R.Lancashire	B	0.25	K
1557	Tendring R.(Mellow)	I	?	J*,P
1584	R.Nottingham	B	1.00	H,K*,P
1584	R.Shropshire	B	0.50	H,M
1602	R.Kent	B	0.25	E,K*,L,P

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

Listeners:
A: Leo Barr, Sunderland.
B: Vera Brindley, Woodhall Spa.
C: Geoff Crowley, Hafnarfjordur, Iceland.
D: Ron Damp, Worthing.
E: John Eaton, Woking.
F: Francis Hearne, N.Bristol.
G: Simon Hockenhull, E.Bristol.
H: Sheila Hughes, Morden.
I: Rhoderick Illman, Oxted.
J: Ross Lockley, Stirling.
K: Eddie McKeown, Newry.
L: George Millmore, Wootton, IOW.
M: Sid Morris, Rowley Regis.
N: Tom Smyth, Co.Fermanagh.
O: Phil Townsend, E.London.
P: John Wells, East Grinstead.

Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Donebach	Germany	500	A,B,C,D,E,F*G,I*J,L,M*N* O*R*
153	Brasov	Romania	1200	D,E*,J*
162	Allouis	France	2000	A,B,C*D,E,F,G,I*J*L,M*N* O*P,Q*R
162	Agri	Turkey	1000	K*
171	Medi 1-Nador	Morocco	2000	E
171	Minsk	CIS	1000	E*
171	Kaliningrad	Russia	1000	B,D,E,F*I*J*K*L,M*,N*,P,Q*
171	Moscow	Russia	500	R*
177	Oranienburg	Germany	750	A,B,D,E,I*J*L,M*,N*,P,Q*,R*
183	Saarlouis	Germany	2000	A,B,C*D,E,I*J*L,M*N*O* Q*R*
189	Caltanissetta	Italy	10	K*
189	Tbilisi	CIS	500	D*,K*
198	BBC Droitwich	UK	500	A,B,E,G*,I,J*,L,M,N*,P,Q*,R*
198	BBC Westerglen	UK	50	D
207	Munich	Germany	500	A,B,C*,D,E,G*H*J,L,M*N*R*
207	Vatnsendi	Iceland	100	F
207	Azilal	Morocco	800	E*
207	Kiev	Ukraine	500	K
216	RMC Roumoules	S.France	1400	A,B,D,E,G*,J,M*,N*,O*Q*R*
216	Oslo	Norway	200	B,D,E*,I*,J*,R*
225	Raszyn Resv TX	Poland	?	A,B,D,E,G*,I*,J*,L,M*,N*,Q*
234	Beidweiller	Luxembourg	2000	A,B,D,E,G*,J*,L,M,N*,Q*,R*
234	St.Petersburg	Russia	1000	D,E*,J*,K*
243	Kalundborg	Denmark	300	A,B,C*DE,G*I,J,L,M*N*Q*R*
252	Tipaza	Algeria	1500	B,E,I*,L*,R*
252	Atlantic 252	S.Ireland	500	A,B,C*D,E,F*G*H*I*J,L,M N,P,Q*R*
261	Burg	Germany	200	B,D,E*,N
261	Chita	CIS	1000	E*
261	Moscow	Russia	2000	A,B,D,E,J*,M*,N*,Q*
270	Topolna	Czech	1500	AB,C*DE*G*I,J,M*N*PQ*R*
270	Orenburg	CIS	15	E,J*
279	Ashkhabad	CIS	150	K*
279	Minsk	CIS	500	B,D,E,J*,K,L,N*,Q*

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

Listeners:
A: Ted Bardy, N.London.
B: Darren Beasley, Bridgwater.
C: Vera Brindley, Woodhall Spa.
D: Kenneth Buck, Edinburgh.
E: Tim Bucknall, Congleton.
F: Geoff Crowley, Hafnarfjordur, Iceland.
G: John Eaton, Woking.
H: Simon Hockenhull, E.Bristol.
I: Sheila Hughes, Morden.
J: Eddie McKeown, Newry.
K: Roy Merrall, Dunstable.
L: George Millmore, Wootton, IOW.
M: Sid Morris, Rowley Regis.
N: Harry Richards, Barton-on-Humber.
O: Alan Roberts, Quebec, Canada.
P: Tom Smyth, Co.Fermanagh.
Q: Phil Townsend, E.London.
R: Michael Williams, Redhill.

Short Wave Reports

Conditions in the **25MHz (11m)** band varied from day to day, but the signals from R.Australia via Darwin on 25.750 (Eng to Japan, China, N.Eu 0800-0855) could usually be heard in the UK. Considerable variations in signal rating were noted. In E.Bristol **Simon Hockenhull** logged them as 24332 at 0850.

Other broadcasters use this band to reach areas outside Europe, but their signals can often be heard here via back scatter and other modes. They include UAE R, Abu Dhabi 25.690 (Ar to ? 0900-1300) SIO343 at 1230 by **John Coulter** in Winchester; R.Norway Int, Oslo 25.730 (Norw to Asia, Aust 0800-0830 & 0900-0930, Norw* to W.Africa 1300-1330, *Eng Sat/Sun) 33333 at 1315 by **Peter Pollard** in Rugby; Radio Denmark via RNI 25.730 (Da to W.Africa 1330-1355) SIO333 by **Ted Walden-Vincent** in Gt.Yarmouth; DW via Julich 25.740 (Ger to M.East, E.Asia 1100-1355) 45444 at 1210 by **John Eaton** in Woking; RFI via Issoudun 25.820 (Fr to E.Africa 0700-1550) 45233 at 1243 by **Darren Beasley** in Bridgwater; R.Nederland via Flevo 25.970 (Du to W.Africa 1030-1115, Sun Only) SIO355 at 1045 by Kenneth Buck in Edinburgh.

The broadcasts from RNI, DW & RFI have also reached Iceland and E.Canada. **Geoff Crowley** (Hafnarfjordur) rated them 44343, 55555 & 45555 respectively at 1328. Alan Roberts (Quebec) noted them as 'fair'. Weak signals from UAE R, Abu Dhabi (25.690) were logged by him some days.

In the **21MHz (13m)** band good reception of R.Australia's signals has been noted by listeners here: Darwin on 21.525 (Eng to SE.Asia 0200-0800) rated SIO333 at 0740 by **Cyril Kellam** in Sheffield & 21.725 (Eng to S.Asia 0800-1300) 44344 at 1130 by **Vera Brindley** in Woodhall Spa; 21.590 from Carnarvon (Eng to Pacific areas 0100-0900) 35543 at 0720 by **David Edwardson** in Wallsend.

In the morning, R.Pakistan, Islamabad 21.520 (Eng to Eu 0800-0845) was 44243 at 0831 by **Eddie McKeown** in Newry; R.Finland via Pori 21.550 (Eng to SE.Asia 0900-

0925) 54534 at 0900 in E.Bristol; R.Austria Int via Moosbrunn 21.490 (Ger, Eng to Aust 0800-1100) 24323 at 1000 by **Rhoderick Illman** in Oxted; BBC via Limassol 21.470 (Eng to M.East, E.Africa 0430-1615) SIO333 at 1005 by **Bill Clark** in Rotherham; UAE R.Dubai 21.605 (Ar, Eng 0615-1645) 45544 at 1042 by **Peter Polson** in St.Andrews; HCJB, Ecuador 21.455 (world-wide u.s.b. + p.c.) 43232 at 1147 by **Ronald Kilgore** in Londonderry.

Later, SRI via Sottens? 21.820 (Eng to SE/C.Asia 1500-1530) SIO333 at 1529 by **Philip Rambaut** in Macclesfield; R.Portugal via S.Gabriel 21.515 (Eng to M.East 1530-1600) 55555 at 1535 by **Chris Shorten** in Norwich; RCI via Sackville 21.545 (Eng to Eu 1700-1730) 43434 at 1700 in Rugby; WYFR via Okeechobee 21.500 (Eng to Eu, Africa 1700-1900) 45434 at 1748 by **Tim Allison** in Middlesbrough; R.Nederlands via Bonaire 21.590 (Eng to Africa 1730-2025) 34343 at 1751 by **Ken Milne** in Basingstoke; WCSN, Maine 21.640 (Eng to N/E.Africa 1600-1955) 45434 at 1820 in Icelend; HCJB, Ecuador 21.480 (Eng 1900-2000) 33222 at 1930 by **Bernard Curtis** in Stalbridge; WYFR, Florida 21.615 (Eng to Eu, Africa 1900-2000) SIO455 at 1940 in Edinburgh.

Some **17MHz (16m)** broadcasts noted in the morning came from R.Australia via Carnarvon on 17.750 (Eng to Asia 0000-0400, 0700-0900) SIO222 at 0830 in Sheffield; KHBI, N.Mariana Is 17.555 (Eng to NE.Asia 0800-1155) SIO454 at 1015 in Rotherham; BBC via Kranji 17.830 (Eng to S.Asia, Aust, NZ 0600-1030) 25443 at 1017 by **Richard Radford-Reynolds** in Guildford; DW via Wertachtal 17.765 (Eng to W.Africa 1100-1150) 54554 at 1103 in Middlesbrough; Voice of Israel, Jerusalem 17.545 (Eng to USA, W.Eu 1100-1130) 44444 at 1100 by **Sheila Hughes** in Morden; BBC via Woofferton 17.640 (Eng to E.Eu 0800-1500, M.East 1030-1200) SIO443 at 1110 by **Sid Morris** in Rowley Regis; R.Sofia, Bulgaria 17.780 (Eng to Eu 1130-1200) 53343 at 1150 in Norwich.

After mid-day R.Yugoslavia, Belgrade 17.740 (Eng to USA 1200-1300) was 55454 at 1230 by **Ross Lockley** in Stirling; R.Cairo, Egypt 17.595 (Eng to S.Asia 1215-1330) 55554 at 1250 in Bridgwater; Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) 43333 at 1255 by **P.Gordon Smith** in Kingston; R.Romania Int, Bucharest 17.720 (Eng to Eu 1300-1400) 32232 at 1310 in Newry; R.Japan via Ekala 17.775 (Eng to ? 1700-1800) 33323 at 1708 in Woodhall Spa.

In the evening HCJB, Ecuador 17.790 (Eng to Eu 1900-2000) was SIO344 at 1945 in Edinburgh; BBC via Ascension Is 17.880 (Eng to C.Africa 1400-2030) 23322 at 2011 in Basingstoke; R.Nederlands via Bonaire 17.605 (Eng to W.Africa 1930-2030) 45444 at 2014 in St.Andrews; R.Havana, Cuba 17.705 (Eng to Eu 2100-2200) 33233 at 2105 in Kilkeel.

Tropical Bands

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2000	J,U
2.325	ABC Tennant Creek	Australia	2027	F,J,U
2.360	R.Maya de Barillas	Guatemala	0019	H
2.485	ABC Katherine	Australia	2040	J,L,U
2.560	Xinjiang BS, Urumqi	China	1553	J
2.850	KCBS Pyongyang	N.Korea	2104	J
3.200	TWR	Swaziland	1831	P,1
3.205	AIR Lucknow	India	1715	C,J,K,U
3.220	R.Togo, Lome	Togo	1730	U
3.240	TWR	Swaziland	1820	P,U,1
3.255	BBC via Maseru	Lesotho	2055	C
3.270	SWABC 1, Namibia	S.W.Africa	1812	H,U,1
3.275	AIR Srinagar	India	1540	K
3.280	R.Beira	Mozambique	1831	P
3.300	R.Cultural	Guatemala	0348	J
3.315	AIR Bhopal	India	1725	K
3.315	SLBS Freetown	Sierra Leone	2214	R
3.320	R.Orion	S.Africa	2339	H
3.325	FRCN Lagos	Nigeria	2137	C,O,U,1
3.330	R.Kigali	Rwanda	1800	U
3.338	R.Maputo	Mozambique	1714	T
3.355	R.Botswana	Gabarone	2115	K,Q,U,1
3.355	AIR Kurseong	India	1600	J,K
3.365	AIR New Delhi	India	1555	J
3.365	GBC Radio 2	Ghana	2100	C,L,O,Q,R,U,1
3.375	AIR Gauhati	India	1648	J,K
3.380	R.Malawi	Malawi	1720	O,1
3.395	RRI Tanjungkarang	Indonesia	2330	H
3.905	AIR Delhi	India	1654	J,K,U
3.915	BBC Kranji	Singapore	1610	J,K,U,V,Z
3.925	NSB Tokyo	Japan	0825	J
3.950	Qinghai PBS, Xining	China	0028	J
3.955	BBC Skelton	England	2004	F,G,I,J,K,L,O,V,Z
3.960	RFE/RL Munich	Germany	1829	K
3.965	RFI Paris	France	2155	F,H,I,K,L,M,O,Q,Z
3.970	RFE Munich	Germany	2006	K,L,U
3.975	BBC Skelton	England	2143	K
3.980	VOA Munich	Germany	2003	F,I,K,L,O,Q,V,Z
3.985	China R via SRI Berne	Switzerland	2200	F,H,I,K,L,M,O,V,X,Z
3.990	Xinjiang BS, Urumqi	China	2200	V
3.995	DW via Julich	Germany	2010	F,I,K,O,Q
4.010	Bishkek, Kirghizia,	CIS	0040	F,H,K
4.035	Xizang PBS, Lhasa	China	2340	P
4.050	Bishkek, Kirghizia	CIS	1431	H
4.055	Tver relays R.Moscow	CIS	2209	C,F,K,L,Q,V
4.081	Ulan Bator 1	Mongolia	2330	P
4.220	Xinjiang PBS, Urumqi	China	0045	F
4.485	Petro'sk Kamchatskiy	CIS	2155	H
4.500	Xinjiang BS, Urumqi	China	2330	C,H,J,O,U
4.545	Alma Ata 1	Kazakhstan	0136	U
4.635	Yangi-Yul	Tadzhikistan	2335	C,I
4.735	Xinjiang	China	2320	C,F,M,O,Q,U
4.740	Ashkhabad	Turkmenistan	1847	L,O
4.740	R.Afghanistan, Kabul	Afghanistan	1918	M,R
4.750	Xizang BS, Lhasa	China	0055	U
4.755	R.Educ CP Grande	Brazil	0219	H
4.755	R.Maranhao	Brazil	0455	H
4.760	Yunnan PBS,Kunming	China	2350	C,H
4.765	Brazzaville	PR.Congo	2000	B,C,F,H,K,L,M,O,Q,R,U
4.770	FRCN Kaduna	Nigeria	2010	B,C,F,H,J,K,N,O,Q,R,U
4.775	Kabul City Service	Afghanistan	1742	R
4.775	AIR Gauhati	India	0030	Y
4.775	RRI Jakarta	Indonesia	0100	U
4.780	RTO	Djibouti	1705	P,R
4.783	RTM Bamako	Mali	2117	C,R,1
4.785	R.Baku	Azerbaijan	1900	C,O,U,1
4.790	Azad Kashmir R.	Pakistan	0102	C,O,U
4.790	TWR Manzini	Swaziland	1828	L,U
4.795	R.Douala	Cameroon	2045	C,L,Q
4.795	R.Moscow (Kharkov)	Ukraine	2230	A,F,H,I,K,M,O,P,T,U,V
4.800	PBS Xinjiang	China	2220	C
4.800	R.Popular Cuenca	Ecuador	0328	P
4.800	LNBS Lesotho	Maseru	1734	R
4.800	Yakutsk, Yakut	Siberia	2017	O,U
4.805	R.Nac.Amazonas	Brazil	2211	P
4.810	Yerevan 2	Armenia	1920	C,E,K,L,O,P,R,U,
4.810	R.Orion, Jo'burg	S.Africa	1900	K,L,P
4.815	China R, Beijing	China	2340	F,J
4.815	R.diff TV Burkina	Ouagadougou	2212	C,R
4.820	La Voz Evangelica	Honduras	2345	F
4.820	Khanty-Mansiysk	Siberia	1955	C,O,U
4.825	R.Cancao Nova	Brazil	0102	H
4.825	Yakutsk	Siberia	2055	C
4.825	Ashkhabad	Turkmenistan	1920	B,F,I,K,P,R,T
4.825	Kharkov	Ukraine	0105	L,U,1
4.830	Gaborone	Botswana	2025	K,R,U,1
4.830	R.Tachira	Venezuela	0005	F,H,J,O,Q,U
4.832	R.Reloj	Costa Rica	0800	J,S
4.835	R.Tezulutlan, Coban	Guatemala	0055	F,Q,U
4.835	RTM Bamako	Mali	2213	C,F,G,K,M,O,Q,R,U
4.840	Heilongjiang, Harbin	China	2058	P
4.845	ORTM Nouakchott	Mauritania	2000	C,F,H,K,O,Q,R,U
4.850	R.Yaounde	Cameroon	2147	B,C,F,O,Q,U
4.850	AIR Kohima	India	1922	C,H,R
4.850	Ulan Bator 1	Mongolia	2225	F
4.850	Tashkent 2	Uzbekistan	0154	O,U
4.860	AIR New Delhi	India	2055	C,M,U
4.860	Tver relays R.Moscow	Russia	1732	A,C,E,F,I,K,M,O,R,T,U,V,1
4.865	PBS Lanzhou	China	2322	C
4.865	V. of Cinaruco	Colombia	0055	F,H,J,P,U
4.870	R.Cotonou	Benin	2052	C,F,K,Q,R,U
4.870	R.Continente, Caracas	Venezuela	0005	H
4.875	Tbilisi 2	Georgia	2028	O
4.875	RRI Sorong	Indonesia	2105	P
4.885	Em.Reg.Zaire	Angola	1907	P
4.885	R.Clube do Para	Brazil	0315	P
4.885	R.Difusora Acreana	Brazil	0320	P
4.885	China R, Beijing	China	2350	F,J,U
4.885	Ondas del Meta	Colombia	0322	P

Freq MHz	Station	Country	UTC	DXer
4.885	Voice of Kenya	Kenya	1853	C,P,R,U
4.890	RFI Paris	via Gabon	0430	O
4.890	R.Port Moresby	New Guinea	1300	W
4.895	Voz del Rio Arauca	Colombia	0100	F,H
4.895	Tyumen	Siberia	2120	C,H,O,R
4.900	V. of the Strait 2	China	2215	C,J,K,P,R,U
4.900	SLBC Colombo	Sri Lanka	0023	U
4.905	R.Nat.N'djamena	Chad	2025	B,C,J,K,M,O,Q,R,U
4.910	R.Zambia, Lusaka	Zambia	1830	P,U
4.915	R.Anhanguera	Brazil	0735	H,J,P
4.915	Armonias del Caqueta	Colombia	2330	H,P
4.915	GBC-1, Accra	Ghana	2210	C,F,K,N,O,Q,R,1
4.915	Voice of Kenya	Kenya	2207	L,R
4.920	ABC Brisbane	Australia	1910	R
4.920	R.Quito	Ecuador	0307	P
4.920	AIR Madras	India	0030	U
4.925	R.Nacional, Bata	Eq.Guinea	2249	H
4.930	Tblisi	Georgia	1926	L
4.930	Ashkabad	Turkmenstan	1915	C,F,L,R
4.935	R.Capixaba	Brazil	0631	P
4.935	Voice of Kenya	Kenya	2104	C,K,L,O,Q,R,U,W
4.940	Kiev 2	Ukraine	1925	C,D,F,H,I,K,L,M,O,R,U
4.940	Yakutsk, Yakut	Siberia	2340	P
4.955	R.Marajoara, Belem	Brazil	0814	J
4.958	Baku	Azerbaijan	2155	C,O,U
4.960	AIR New Delhi	India	0100	Y
4.960	R. La Mercad	Peru	0431	P
4.970	R.Rumbos, Caracas	Venezuela	0100	F,H,O
4.975	R.Tupi, Sao Paulo	Brazil	0640	P
4.975	PBS Fuzhou	China	2250	P
4.975	R.Pacifico, Lima	Peru	0636	H
4.975	R.Uganda, Kampala	Uganda	2025	K,Q,R,U
4.975	R.Oushanbe	CIS	0200	U
4.980	Ecos del Torbes	Venezuela	2340	C,F,H,J,O,Q,U
4.985	R.Brazil Central	Brazil	2334	F,H,P,U
4.990	Yerevan	Armenia	1733	K,P,R,U
4.990	AIR via Madras	India	0004	U
4.990	FRCN Lagos	Nigeria	2036	C,N,O,Q,R
4.990	R.Ancash, Huaraz	Peru	0008	O
5.005	R.Nacional, Bata	Eq.Guinea	2108	C,K,R,U
5.005	R.Nepal, Kathmandu	Nepal	1700	U
5.006	R.Apintie, Paramaribo	Surinam	0021	P
5.010	R.Garoua	Cameroon	2053	C,J,K,M,O,R
5.010	Riobamba	Ecuador	0910	J
5.010	SBC Singapore	Singapore	1601	J
5.020	PBS-Jiangxi Nanchang	China	0001	U
5.020	ORTN Niamey	Niger	0605	O
5.025	ABC Katherine	Australia	0650	P
5.025	R.Parakou	Benin	2217	C,K,O,P,R
5.025	R.J. da Transamazonica	Brazil	0005	F,P
5.025	R.Rebelde, Habana	Cuba	2320	F,H
5.025	R.Uganda, Kampala	Uganda	1901	K
5.030	R.Catolica, Quito	Ecuador	0100	F,H,P
5.035	R.Aparecida	Brazil	0730	J,P
5.035	R.Bangui	C.Africa	2032	C,O,R,1
5.035	Alma Ata 2	Kazakshtan	2130	C,F,J,K,O,U
5.040	PBS Fujian, Fuzhou	China	2310	P
5.040	Voz del Upano, Macas	Ecuador	2310	P
5.040	Tbilisi 1	Georgia	1915	C,H,P,R,U
5.045	R.Cultura do Para	Brazil	0050	N,U
5.047	R.Togo, Lome	Togo	2152	B,C,K,O,R,U
5.050	GFBC Nanning	China	2220	P,R
5.050	Voice of the Strait	China	2259	P
5.050	Voz de Yopal, Yopal	Colombia	258	F,P
5.050	Em Jesus Gran Poder	Ecuador	2243	J,P
5.050	R.Tanzania	Tanzania	2100	K,R,U,1
5.052	SBC R-1	Singapore	2159	J,P,1
5.055	RFO Cayenne(Matoury)	Fr Guiana	0005	F,O
5.060	PBS Xinjiang	China	0005	B,F,U
5.060	R.Nac.Progr.	Ecuador	0110	F
5.075	Caracol Bogata	Colombia	0020	B,F,H,J,M,N,O,P,Q,U
5.260	Alma Ata 2	Kazakhstan	2140	C,F,K,O,U
5.290	Krasnoyarsk	Siberia	0015	F,U

DXers:
A: Tim Allison, Middlesborough.
B: Leo Barr, Sunderland.
C: Darren Beasley, Bridgwater.
D: Vera Brindley, Woodhall Spa.
E: Bill Clark, Rotherham.
F: Robert Connolly, Kilkeel.
G: Geoff Crowley, Iceland.
H: Antonio De Abreu-Teixeira, Evesham.
I: John Eaton, Woking.
J: David Edwardson, Wallsend.
K: P. Gordon Smith, Kingston, Moray.
L: Gerry Haynes, Bushey Heath.
M: Sheila Hughes, Morden.
N: Ross Lockley, Stirling.
O: Eddie McKeown, Newry.
P: Roy Merrall, Dunstable.
Q: Sid Morris, Rowley Regis.
R: Fred Pallant, Storrington.
S: John Parry, Northwich.
T: Roy Patrick, Derby.
U: Peter Perkins, Hemel Hempstead.
V: Peter Pollard, Rugby.
W: Alan Roberts, Quebec, Canada.
X: Chris Shorten, Norwich.
Y: Tony Singh, Hitchin.
Z: Phil Townsend, E.London.
1: Vladimir Vassilev, Bratislava, Cz.

DXers:
A: Ted Bardy, N.London.
B: Tim Bucknall, Congleton.
C: Robert Connolly, Kilkeel.
D: Eric Duncan, St.Andrews.
E: John Parry, Northwich.
F: Roy Patrick, Derby.

Transatlantic DX Chart

Freq kHz	Station	Location	Time (UTC)	DXer
		USA		
1130	WNEW	New York, NY	0740	E
1210	WOGL	Philadelphia, PA	0050	C
1220	WKNR	Cleveland, OH	0100	C
		Canada		
590	VOCM	St.John's, NF	0010	C,E
930	CJYQ	St.John's, NF	0020	A,C,D,F
950	CHER	Sydney, NS	0000	D
1210	VOAR	Mount Pearl	0015	D,F
1220	CKCW	Moncton, NB	0000	D
		C. America & Caribbean		
1610	Caribbean Beacon	Anguilla	2321	B
		South America		
950	YVKG R.Vision	Venezuela	0000	D
1220	R.Globo	Rio, Brazil	0000	D

R.New Zealand's **15MHz (19m)** signals to Pacific areas have reached the UK some evenings. Their 100kW signal from Rangataiki on 15.120 (Eng 1850-2138) was 35233 at 1900 by **Chris Haigh** in Huddersfield. Also to Pacific areas, R.Australia's broadcasts via Shepparton on 15.240 (Eng 0030-0830) have been very clearly heard here most mornings. They often peaked SIO444 at 0800 in Sheffield. In contrast, their signals to Asia via Darwin on 15.170 (Eng, Chin 0900-1400) was 12211 at 0900 by **Gerry Haynes** in Bushey Heath.

In the day there are many 19m signals to Europe. Some stem from UAE R.Dubai 15.435 (Eng 1330-1350) 33323 at 1340 in Woodhall Spa; WWCR, Nashville 15.685 (Eng, also to E.USA) SIO223 at 1513 in Gt.Yarmouth and 45434 at 1901 in Iceland; Voice of Greece, Athens 15.630 (Gr, Eng 1500-1550, also to USA) 55555 at 1530 in Norwich; VOA via Tangier 15.245 (Eng 1630-1700) 44444 at 1645 in Morden; RNB, Brazil 15.265 (Eng 1800-1920) 43333 at 1815 by **Ron Damp** in Worthing; WSHB, Cypress Creek 15.665 (Eng 1800-2000, also to USA) 33222 at 1940 in Stalbridge; ; WINB, Red Lion 15.295 (Eng 1900-2100, also to N.Africa) 32542 at 2033 in Stirling; WYFR, Okeechobee 15.566 (Eng 2000-2145) 43443 at 2130 in Kilkeel.

Some beamed to other areas come from KHBI, N.Mariana Is 15.665 (Eng to Oceania 0800-0955) 34233 at 0915 in Newry; AIR via Aligarh 15.020 (Sin to Sri Lanka 1300-1500) 33333 at 1300 by **Tony Singh** in Hitchin; R.Moscow, Russia 15.465 (Eng to N/W.Africa 0300?-1730) SIO555 at 1430 in Rowley Regis; R.Veritas Asia, Philippines 15.140 (Eng ident 1500, Pil 1500-1600) 42333 at 1500 in Kingston; Channel Africa, Johannesburg 15.430 (Eng to Africa 1600-1800) 33433 at 1600 by **Darran Taplin** in Brenchley; China R. Int via Mali? 15.130 (Eng to E/S.Africa 1600-1700) SIO322 at 1620 in Macclesfield; RTL via Junglinster 15.350 (Eng 24 hrs, also to E.USA) SIO222 at 1702 in Rotherham; BBC via Sackville 15.260 (Eng to USA 1400-1745) 23332 at 1712 in Oxted; VOA via Greenville 15.580 (Eng to Africa 1600-2200) 45444 at 1820 in St.Andrews; R.Vlaanderan Int via Wavre 15.540 (Eng to Africa 1900-1930) 35343 at 1912 in Middlesbrough; RFI via Issoudun 15.300 (Fr to Africa 1500-2000) SIO232 at 1933 by Leslie Biss in Knaresborough; RAE Buenos Aires, Argentina 15.345 (Sp [Home Service relay] 1100-2300, Sat/Sun only) 35543 at 2105 in Wallsend; BBC via Ascension Is 15.260 (Eng to S.America 2000-0330) 33333 at 2330 by Robin Harvey in Bourne.

The 13MHz Band

Good reception of R.Australia's **13MHz (22m)** Carnarvon signals has been noted here most days: 13.605 (Eng, Chin to N/SE.Asia 0900-1400) 45343 at 1130 in Woking; 13.755 (Eng to Asia 1300-1800) 44434 at 1500 in E.Bristol.

Also heard here were AWR (KSDA) Agat, Guam 13.720 (Sh, Chin, Ca, Hak to Asia 0800-1000), noted as 25443 at 0956 in Guildford; R.Sofia, Bulgaria 13.670 (Eng to Eu 1130-1300) 54344 at 1150 in Norwich; R.Austria via Moosbrunn 13.730 (Eng to Eu 1230-1300), rated 'very clear' at 1245 by **Garry Currah** in Peterborough; Croatian R, Zargreb 13.830 (Cr [Home Service relay]) 45333 at 1300 in Derby; R.Bangladesh, Dacca 13.620 (Ident 1315) SIO444 at 1316 in Edinburgh; SRI via Sottens 13.635 (Eng to C/SE.Asia 1500-1530) 34433 at 1515 in Brenchley; UAE R.Dubai 13.675 (Eng to Eu 1600-1640) 54444 at 1630 in Worthing; VOA via Selebi-Phikwe 13.710 (Eng to Africa 1600-2200) SIO333 at 1950 in Knaresborough; RCI via Sackville 13.650 (Eng, Fr to Canadian Forces in Europe 2000-2030?) 34333 at 2006 in St.Andrews; WHRI, South Bend 13.760 (Eng to Eu, Canada 1700-0000) 24322 at 2046 by **Leo Barr** in Sunderland; R.Kuwait 13.620 (Eng to Eu, USA 1800-2100) 43333 at 2050 in Kilkeel.

The 11MHz Band

Among the **11MHz (25m)** reports were some of the signals to Europe: R.Sofia, Bulgaria 11.630 (Eng 1200-1300) 33223 at 1207 in Rugby; R.Romania Int, Bucharest 11.940 (Eng 1300-1355) 55555 at 1320 in Brenchley; BBC via Woofferton 12.095 (Eng 0730-2030, also to N.Africa) SIO444 at 1415 in Rowley Regis; RAI Rome 11.905 (Fr 1430-1455) SIO444 at 1437 in Winchester; Polish R, Warsaw 11.840 (Eng 1600-1655) 43333 at 1610 in Morden; UAE R.Dubai 11.795 (Eng 1600-1640) SIO422 at 1635 in Edinburgh; AIR via Bangalore? 11.620 (Eng 1745-1945) 33323 at 1803 in Co.Londonderry; R.Damascus, Syria 12.085 (Eng 2005-2105) 43433 at 2010 in St.Andrews; RCI via Sackville 11.945 (Eng 2000-2100) SIO444 at 2030 by **Tom Smyth** in Co.Fermamagh; R.Japan via Moyabi 11.925 (Eng 2100-2200) SIO444 at 2130 by **Francis Hearne** in N.Bristol; VOFC Taipei 11.915 (Eng 2200-2300) SIO333 at 2220 in Macclesfield.

Quite a number to other areas were also logged. The BBC via Ascension Is 11.860 (Eng to W/C.Africa 0730-0815) was 33323 at 0740 in Bourne; FEBC via Bocaue 11.690 (Eng to New Guinea? 0900-?) 24532 at 0940 in Wallsend; AWR (KSDA) Agat, Guam 11.980 (Chin to Asia 0900-1300) 43544 at 1012 in Guildford; R.Nederlands via Bonaire 11.895 (Eng 0730-1025) 44333 at 1017 in Oxted; R.Australia via Shepparton 11.800 (Eng to S.Pacific 1300-1530) SIO322 at 1318 in Rotherham; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) 44443 at 1400 in Middlesbrough; FEBC via Bocaue 11.995 (Eng to S.E.Asia) 42333 at 1442 in Kingston; R.Australia via Brandon 11.855 (Eng to Asia 1300-?) 44333 at 1625 in Bushey Heath; China R.Int, Beijing 11.575 (Eng to Africa 1600-1655) 44333 at 1654 in Woodhall Spa; R.Austria Int via Moosbrunn 11.780 (Eng to SE.Asia 1630-1655) 55444 at 1655 in Worthing.

Later, the Voice of Israel, Jerusalem 11.587 (Eng to C/N.America, W.Eu 2000-2030) was 54544 at 2029 in Bridgwater; R.Nac. da Amazonia, Brazil 11.780 (Port 0800-2200) 35444 at 2039 in Stirling; UAE R, Abu Dhabi 11.815 (Eng to USA 2200-0000) 44434 at 2213 in Iceland; R.Sofia, Bulgaria 11.720 (Eng to USA 2245-0015) 44444 at 2300 by **Martin Dale** in Stockport; R.Bandeirantes, Sao Paulo, Brazil 11.925 (Sp 0700-0500) 32222 at 0005 in Kilkeel; R.Nederlands via Talata Volon 11.655 (Eng to S.Asia 0030-0325) 44444 at 0116 in Norwich.

R.New Zealand's **9MHz (31m)** broadcasts to Pacific areas on 9.700 (Eng 0700-1100) have often reached here. In Sunderland they rated 22222 at 0843. R.Australia has been heard on new frequencies: 9.560 via Carnarvon? (Eng to S.Asia? 1430-1800?) rated 42433 at 1630 in Newry; 9.540 via Shepparton (Eng to Pacific areas 2130-2330) 33232 at 2130 in Bushey Heath; 9.510 via Carnarvon (Eng to N/SE.Asia 2100-0000) 34533 at 2145 in Wallsend.

Some of the programmes for European listeners in this band stem from Croatian R, Zargreb 9.830 (Cr [Home Service relay]) noted as 'fair' at 1030 in Derby; R.Norway, Oslo 9.590 (Norw* 1300-1330, *Eng Sat/Sun) 23323 at 1300 in Stockport; Voice of Vietnam, Hanoi 9.840 (Eng 1600-1630) 35534 at 1617 in Brenchley; Polish R, Warsaw 9.525 (Eng 1600-1655) 44444 at 1640 in St.Andrews; VOA via Gloria 9.760 (Eng 1630-2200) 44434 at 1709 in Co.Londonderry; VOIRI, Iran 9.022 (Eng 1930-2030) SIO433 at 1955 in Rotherham; Voice of Israel, Jerusalem 9.435 (Eng 2000-2030) 55545 at 2005 in Norwich; SRI via Lenk 9.535 (Eng, Fr, Ger, It 0600-2145) SIO444 at 2010 in Winchester; AIR via ? 9.950 (Hi 1945-2045) 33322 at 2015 in Stalbridge; R.Cairo via Abis 9.900 (Eng 2115-2245) SIO333 at 2115 in N.Bristol; VOFC, Taiwan 9.850 (Eng 2200-2300) SIO433 at 2200 in Sheffield; R.Vilnius, Lithuania 9.710 (Eng 2230-2300) 54444 at 2235 in Kingston.

Some to other areas have also been heard: WSHB, Cypress Creek 9.495 (Eng to USA 1000-1155) 43433 at 1011 in Oxted; KCBI, Dallas 9.815 (Eng to Canada 0230-1400) 23443 at 1132 in Guildford; R.Nederlands via Talata Volon 9.860 (Eng to S.Asia 0030-0330) SIO433 at 0045 in Rowley Regis; Voice of Turkey, Ankara 9.445 (Eng to USA 0400-0450) noted as 'clear' at 0435 in Peterborough.

In the **7MHz (41m)** band WJCR, Kentucky 7.490 (Eng to E.USA 0640-1200) 14311 at 0957 in Sunderland; R.Prague, Czechoslovakia 7.345 (Eng to Eu 1930-1957) SIO333 at 1930 by **Julian Wood** in Elgin; Voice of Israel, Jerusalem 7.465 (Eng to Eu 2000-2030) SIO434 at 2000 in Co.Fermanagh; AIR via Aligarh 7.412 (Eng, Hi to Eu 1730-2230) 44444 at 2045 in Morden; WCSN, Scotts Corner 7.510 (Eng to Eu, USA 2000-0000) 33333 at 2200 in Rugby.

The 6MHz Band

The **6MHz (49m)** broadcasts in English to Europe include SRI via Lenk 6.165 (0700-0715) heard clearly in Peterborough; HCJB, Ecuador 6.205 (0700-0830) 44444 at 0700 by Ron Galliers in N.London; R.Japan via Skelton 6.025 (0700-0800) SIO433 at 0730 in N.Bristol; R.Nederlands via Flevo 5.955 (1130-1335) 44444 at 1230 in Stockport; R.Finland via Pori 6.120 (1930-1955) SIO423 at 1951 in Redhill; R.Sofia, Bulgaria 6.235 (2045-2130) SIO444 at 2045 in Knaresborough; Polish R, Warsaw 6.135 (2030-2125) SIO222 at 2030 in Co.Fermanagh; Vatican R, Italy 5.880 (2050-2110) SIO344 by Phil Townsend in E.London; WEWN, Alabama 5.825 (2300-?) 34333 at 2300 in Derby.

Station addresses

BBC Radio Peterborough,
PO Box 95,
7 Broadway Court,
Peterborough PE1 1RP.

ILR Chiltern Radio,
53 Goldington Road,
Bedford MK40 3LS.

Radio Station KCBI,
Dallas, Texas 75221,
USA.

Radio Station WEWN,
1500 High Road,
Vandiver,
Alabama 35175, USA.

Radio CHER,
500 Kings Road,
Sydney, Nova Scotia,
B1S 1B1, Canada.

Radio CKCW, 1000 St George Blvd,
Moncton, New Brunswick,
E1C 2E1, Canada.

Sorry, there's just no room for the equipment chart.

Maritime Beacons

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

Daily checks by **John Wells** in E.Grinstead revealed that beacons heard on one day were often missing the next, which suggested variations in propagation, but he could not account for the fact that some beacons received at good strength previously, e.g. Ijmuiden Ft Lt, Holland (YM) 288.5, Falsterborev Lt, Sweden (FV) 303.0 and Le Grand Jardin Lt, France (GJ) 306.5 were inaudible during November and December. He added several new ones to his list, but some proved to be aeronautical radiobeacons, which are outside the scope of this series.

A check on the band was made most mornings by **Darren Beasley** in Bridgewater and he also found that some of the beacons he could normally receive at good strength were missing. The latest report from **Kenneth Buck** (Edinburgh) helped to clarify the situation. He says, "Whilst the beacons in the UK have settled down, changes in the power of some of the Scandinavian beacons have taken place, possibly due to interference problems during these short days". He has observed that the signals from Falsterborov, Sweden (MV) 303.0 and Feistein, Norway (FN) 303.5 are now quite weak, whereas the signal from Bjornsund, Norway (BJ) 303.5 is now very strong. Kenneth also mentioned that the callsign of the Kullen High beacon on 294.0 has been changed from KUL to KU.

Amongst the entries compiled by John Macdonald (Thurso) were some beacons around the coastline of Iceland. They were still operating on the frequencies used prior to the change-over last April. Up in Iceland **Geoff Crowley** (Hafnarfjordur) heard several beacon signals much higher up the band, see chart. He listed them as maritime, but I am unable to confirm their status because I have no information on the Icelandic beacons.

An extensive report was compiled by **Robert Connolly** in Kilkeel. Like several other DXers he logged Porquerolles, S.France (PQ) on 314.0, but he informs me that it is likely to be closed down. **Patrick McKeever** (Birmingham) has been able to receive some of the more distant beacons since he erected an antenna as far as possible from his house. It consists of a 14m wire suspended between two 7m poles. A magnetic balun couples one end of the wire to 23m of 50Ω coaxial cable, which runs along a fence to his Lowe HF-225 receiver. It has resulted in a considerable reduction in the level of received electrical interference, which masked the weaker signals.

Encouraged by previous results, **George Millmore** (Wootton, IOW) has checked the band again during daylight and added several beacons to his growing list.

In Torquay, Cliff Stapleton found the signals from Round Island (RR) 298.5, La Corbiere, Jersey (CB) 295.5 and several beacons along the coastlines of the English Channel could be heard by day or night, but more distant ones, such as Hoburg, Sweden (OB) 301.5 or Cabo Mayer Lt, N.Spain (MY) 304.5, could only be heard after dark.

Up in Largs, **John Stevens** logged several beacons for the first time. He can hear others, but in common with many DXers he finds it difficult to read the Morse idents when two or maybe three beacons of different intensity share a frequency. It is well known that the human ear and brain can detect very small changes in pitch, so it may be possible to resolve them if they produce a slightly different beat note, but this requires a good deal of practise and concentration. A simpler solution is to install a sharply tuned audio filter between the receiver audio output jack and a pair of headphones.

Some of the beacons that **Phil Townsend** heard after dark in E.London could only be resolved by using an active audio filter with his Lowe HF-225 receiver. He constructed a very narrow filter based on a design by Kenneth Buck (page 60, *SWM* December '92). A further improvement can often be obtained by using a good loop ahead of the receiver to reduce or 'null-out' completely an unwanted co-channel beacon signal.

With regard to learning the Morse code, **Leslie Biss** (Knaresborough) has pointed out that the RSGB have a good tape: *Morse Code Stage 1-5WPM (RSGB)*. It is available to non-members at £4.50 + £1 p&p. Also available is a booklet entitled *Morse Code For Radio Amateurs (RSGB)* at £3.51 + £1 p&p.

Don't forget, *SWM* has two books for learning Morse code it the SWM Book Service, *Introducing Morse* & *The Secret of Learning Morse*, see page 79 for details.

Freq kHz	Call Sign	Station Name	Location	OXer
284.5	LZ	Lizard Lt	S Cornwall	B,C,E,K*,L,M,O,R
284.5	MA	Cabo Machichaco	N Spain	C*,G*,K*
285.0	NO	Cabo de la Nao Lt	S Spain	R*
285.0	NP	Nieupoort W.Pier	Belgium	C*,R*
286.0	TR	Tuskar Rock Lt	S Ireland	A,B,C,E,H,K*,M,O,Q,R
286.5	AL	Almagrundet Lt	Sweden	G*,K*
286.5	BY	#Baily Lt	S Ireland	C,L,D
286.5	FE	Cap Frehel Lt	France	O*,R
286.5	FT	Cap Ferret Lt	W France	C*,E,G*,K*,L,R*
286.5	NK	Inchkeith Lt	F of Firth	B
287.3	BT	Bjargtangar Lt	Iceland	K*
287.3	HN	Hornafjodur Lt	Iceland	K*
287.5	DO	Rosedo Lt	France	E*,M,R
287.5	FR	Faerder Lt	Norway	A,B,C*,E*,G,K*,R
287.5	SE	Sete Mt St Clair	S France	K*
288.0	HH	Hoek van Holland	Holland	B,Q,R
288.0	KL	Sklinna Lt	Norway	B,G,K*,R*
288.0	OH	Old Hd of Kinsale	S Ireland	A,B,E,K*,O
288.5	FI	Cabo Finisterre Lt	NW Spain	B,C*,E*,G*,H*,K*,L,P*,R*
288.5	YM	Ijmuiden Front Lt	Holland	B,C*
289.0	BL	Butt of Lewis Lt	Is of Lewis	B,G,K*,L
289.0	BY	Baily Lt	S.Ireland	B,C,E,H,K,L,R
289.5	LO	Landsort S Lt	Sweden	B,G*,K*,P*,R*
289.5	MN	Hammerodde Lt	Denmark	B,C*,E*,G*,K*
289.5	SN	Ile de Sein NW Lt	France	C*,E,K*,M,P,R
290.0	BS	Port en Bessin Lt	France	L,R
290.0	FD	Fidra Lt	F of Forth	B,K*,O
290.5	OY	Duncansby Hd Lt	NE Scotland	B,G,K*
290.5	SB	S.Bishop Lt	Pembroke	A,B,C,E,H,J,K*,L,M,N*,O,Q,R
290.5	VI	Cabo Villano Lt	N Spain	K*,L,R
291.0	TG	Torsvag Lt	Norway	B,G*,K*
291.5	OR	Orskar Lt	Sweden	E*,K*
291.5	SU	South Rock LV	Co Down	B,C,E*,H,K*,L,M,O,R
291.9	RN	Reykjanes Lt	Iceland	K*
292.0	MH	Mahon, Minorca	Balearic Is	C*,E*,K*
292.0	SJ	Souter Lt	Sunderland	B,J,K*,L,O,R
292.0	TO	Torungen Lt	Norway	B,G*
292.5	SM	Pt St.Mathieu Lt	France	A,C*,E,F*,H,K*,L,M,N*,R
293.0	CP	St.Catherine's Lt	IOW	A,E*,L,M,N,O*,R
293.0	RN	Rhinns of Islay Lt.	Is of Islay	B,C,E*,G,K*,O
293.0	SY	Svinoy Lt	Norway	B,G,K*
293.5	RO	Cabo Silleiro Lt	N Spain	E*,R*
294.0	KU	Kullen High Lt	Sweden	B,C*,G,P,R*
294.0	PH	Cap d'Alprech	France	B,C*,E*,H,I,J,K*,L,M,Q*,R*
294.5	BA	#Black Hd Lt	?	C*
294.5	KA	Kaybolovo Lt	Estonia	G,K*
294.5	KC	#Old Hd of Kinsale	S Ireland	K*
294.5	MH	Mohni Lt	Estonia	G,K*
294.5	NG	Pikasaare Ots	Estonia	C*,G,K*
294.5	PA	Pakrineem Lt?	Estonia	G
294.5	PS	#Pt.Lynas Lt	Anglesey	C*,G*,L,R*
294.5	PT	#Souter Lt	Durham	B,G
294.5	UK	Sunk Lt V	Off Essex	C*,E*,F*,O,R
295.5	CB	La Corbiere Lt	Jersey	E,K*,L,M,N,R
296.0	BH	Blavandshuk Lt	Denmark	B,C*,G,K*,R
296.0	GR	George Lt	Holland	R
296.0	KN	Skrova Lt	Norway	G,K*
297.0	FG	Pt de Barfleur Lt	France	A,B,E,F*,G,H,K*,L,M,Q*,R
297.5	PS	Cabo Penas Lt	N Spain	K*
298.0	GX	Ile de Groix	France	B,C*,E*,G*,K*,L,P*,R
298.5	RR	Round Is Lt	Is of Scilly	A,B,C,E,F*,G*,H,K*,L,M,N,O,Q,R
298.5	SW	Skagen	Denmark	B,C*,G,K*
298.8	DV	Djupivogur	Iceland	G,K*
298.8	HO	Hornbjarg	Iceland	K*
299.0	AD	Ameland Lt	Holland	B,G,H,K*,Q,R
299.0	HB	Hals Barre Lt	Denmark	B,G
299.5	BN	Les Baleines	France	R
299.5	NP	Nash Pt Lt	S Wales	A,C,E*,F*,G*,H,K*,L,M,N*,O*,R
299.5	SK	Skomvaer	Norway	B,C*,G*,K*,R*
299.5	VR	Utvaer Lt	Norway	B,C*,G,K*,R*
300.0	MZ	Mizen Head	S Ireland	B,C*,E,K*,O,P*,R*
300.0	TI	Cap d'Antifer Lt	N France	E*,H,M,Q*,R
300.5	DU	Dungeness Lt	Kent	B,E*,F*,K*,L,N*,Q*,R
300.5	HG	Holmogadd Lt	Sweden	K*
300.5	LA	Lista	Norway	B,C*,G,I,K,R*
301.0	CA	Pt de Creach	France	B,C*,E*,K*,L,M,Q,R
301.0	ER	Eierland Lt	Holland	B,C*,M,R*
301.1	CN	Cregneish	IOM	K*
301.1	RG	Raufarhoefn	Iceland	G*,K*
301.5	KD	Kinnards Hd Lt	NE Scotland	B,C*,G,K*,R
301.5	OB	Hoburg	Sweden	C*,E*,N*,R*
302.0	RB	Cherbourg Ft W Lt	France	A,C*,E*,H,K*,L,M,N,Q,R
302.5	FB	Flamborough Hd Lt	Yorkshire	A,B,C*,E*,F*,G,H,J,K*,L,M,N*,O*,R
303.0	FV	Falsterborev Lt	Sweden	B,C*,G*,K*
303.0	YE	Ile d'Yeu Main Lt	France	B,C*,E*,K*,M,N*,R
303.4	MA	Malarrif	Iceland	K*
303.5	BJ	Bjornsund Lt	Norway	B,C*,E*,G,K*,R*
303.5	FN	Feistein Lt	Norway	B,G,J,K*
303.5	IA	Llanes Lt	N Spain	C*,E*
303.5	VL	Vlieland Lt	Holland	R
304.0	PS	Pt Lynas Lt	Anglesey	B,C,E,H,J,K*,L,N,R
304.0	SB	Sumburgh Hd Lt	Shetland Is	B,G,K*
304.5	MY	Cabo Mayer Lt	N Spain	C*,E*,G*,K,N*,R
305.0	FP	Fife Ness Lt	SE Scotland	B,G,H,K*,N,R
305.5	AL	Pt d'Ailly Lt	France	A,B,C*,E,F*,G,H,J,K*,L,N,Q,R
305.7	DA	Dalatangi Isle Lt	Iceland	G*,K*
306.0	EC	Elizabeth Castle	Jersey	E,M,R
306.0	FN	Walney Is Lt	Off Lancs	B,C,G*,H,K*,L,O,R
306.0	TN	Thyboron	Denmark	B,G,K*
306.5	GJ	Le Grand Jardin Lt	France	E*
306.5	MV	Morzhovskiy	Arctic	R
306.5	UT	Utsira	Norway	C*,G,K*,R*
307.0	GL	Eagle Is Lt	Ireland	B,C*,E*,G*,K*,O
308.0	RD	Roches Douvres Lt	France	A,B,C*,E,F*,H,I*,K*,L,M,N,Q,R
308.5	NZ	St Nazaire	France	E*,K*,R*
309.0	WW	Ventspils Lt	Latvia	C*,G*
309.5	BA	Punta Estaca Bares	N Spain	C*,E,F*,K*,P,Q
309.5	FH	Fruholmen	Norway	K*
309.5	MA	Marstein Lt	Norway	B,C*,E*,G,K*,P*,R*
310.0	ER	Pt de Ver Lt	N France	A,K*,L,M,R
310.3	GV	Goltur	Iceland	K*
310.5	SG	Sjaellands N Lt	Denmark	B,C*,E*,K*
311.0	GD	Girdle Ness Lt	NE Scotland	B,C*,G,K*,O
311.0	NF	N.Foreland Lt	Kent	E*,F*,L,M,O*,R
311.5	LP	Loop Hd Lt	S Ireland	C*,E,F*,K*,O,R*
312.0	DB	Deutsche Bucht Lt	Germany	K*
312.0	HO	Tennholmen Lt	Norway	K*
312.0	OE	Oostende	Belgium	B,C*,F*,K*,L,M,O*,Q*,R*
312.5	AK	Akmenrags	Latvia	G,K*
312.5	BK	Baltijsk	Latvia	G
312.5	BT	Mys Taran Lt	Latvia	G,K*
312.5	CS	Calais Main Lt	France	B,E*,K*,R*
312.5	KA	Klaipeda Rear Lt	Latvia	G
312.5	LB	Liepaja	Latvia	C*,G,K*
312.5	VS	Cabo Estay Lt	N Spain	E*,I*
312.6	SM	Skagata Lt	Iceland	K*
313.0	HA	Halten	Norway	B,G,K*
313.0	PB	Portland Bill Lt	Dorset	A,E,L,M,N,R
313.0	TY	Tory Is Lt	N Ireland	B,C*,G,K*,O
313.5	CM	Cromer Lt	Norfolk	B,E*,F*,H,J,K*,L,O*,R
313.5	OG	Olands Sodra Grund	Sweden	B,G*,K*
314.0	HK	Hekkingen	Norway	B,C*,G*,K*
314.0	PQ	Porquerolles Lt	S France	C*,E*,R*
314.0	VG	Ile Vierge Lt	France	A,B,C*,E,G*,I*,K*,L,M,N,O*,P*,R
315.0	SL	Sletterhage	Denmark	B,C*,E*,F*,G,P*,R
316.0	IN	Ingolfshofdhi Lt	Iceland	G*,K*
319.0	LEC	Stavanger	Norway	A,B,C,E*,F*,G,J,K*,L,M,O,Q*,R
335.0	EL	Ellidavatn	Iceland	D*
355.0	RK	Reykjavik	Iceland	D*
370.0	NS	Reykjavik	Icelamd	D*

Note:Entries marked # are calibration stations. Entries marked * were logged during darkness. All other entries were logged during daylight.

OXers:
A: Darren Beasley, Bridgwater.
B: Kenneth Buck, Edinburgh.
C: Robert Connolly, Kilkeel.
D: Geoff Crowley, Hafnarfjordur, Iceland.
E: Viv Doidge, Gunnislake.
F: David Oco, Chelmsford.
G: Chris Edwards, Inverurie.
H: Jim Edwards, Wigan.
I: Rhoderick Illman, Oxted.
J: Cyril Kellam, Sheffield.
K: John Macdonald, Thurso.
L: Patrick McKeever, Birmingham.
M: George Millmore, Wootton, IOW.
N: Cliff Stapleton, Torquay.
O: John Stevens, Largs.
P: Kelvin Sutherland, Anglesey.
Q: Philip Townsend, E London.
R: John Wells, E Grinstead.

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Solartron CD1400Rs double beam oscilloscope with choice of different modules, £50/75 complete. Also Telequipment D43R, Medelec FOR1002 fibre optic recorder, cost £2000, c.r.t. now £600, offers? All working well. Tel: (0483) 505504 anytime, Guildford.

Sony ICF-2001D as new, AN1 aerial, unused, both in makers boxes, genuine reason for sale, £240. 8 Tynewydd Court, Cwmbran, Gwent. Tel: (0633) 865448 buyer collects.

Index to Advertisers

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Trading Post

Sony ICF-2001D in mint condition, 6 months old. Also AN1 active antenna and 6m receive converter (28MHz i.f.), £200 or will split. Alan. Tel: (0403) 271142 Sussex.

Sony SW77 world band receiver, a.m. 150kHz-29.99MHz, f.m. 76-108MHz, u.s.b., l.s.b., synchronous detection, 162 memories, electronic stations name labelling, etc., £225 o.n.o. Ian. Tel: (0743) 365717 after 1pm, Shrewsbury.

Sony SW77, indistinguishable from new, 100% complete with manuals and all bits and pieces and boxed, £360. Also Matsui 4099 (Sangean) boxed, £45. Tel: (07048) 77234 Formby.

Spectrum 48K+, £40; RAMS IV Morse,etc., decoder program for Spectrum, £18; RAMS filter for use with RAMS IV, £30; computer modem, £25; 48K+ modem interface with software, £10; v.g.c., postage extra. Robert GI7IVX, QTHR. Tel: (06937) 62166 anytime.

Trio 2000, offers. Also Dewsbury Electronics Morse tutor, offers. Tel: (0799) 584223 Cambs.

Trio JR310 amateur bands receiver, £60. Matsui 4099 receiver, £60. Realistic PRO-9200 scanner, boxed, £50. Discone antenna unused, £15. Spectrum +3 computer RAMS IV disc 12in TV, £100. VHF Guide, £3. Dr D Rogers. Tel: (0204) 843589 after 6pm, Bolton.

Trio TH-77E 2m 70cm hand-held, hardly used, charged three times, VOX headset, mobile boot mount, quarter wave aerial, soft case, complete, £250 o.n.o. Tel: (0922) 25770.

Trio TS-120S 100W compact h.f. transceiver, matching p.s.u./a.t.u., desk mic, £425 o.n.o. Trio TR2500 2m hand-held transceiver and accessories, £140 o.n.o. Yaesu FT-101ZD Mk3 9-band h.f. transceiver, immaculate, £425 o.n.o. Rick G4BLT. Tel: (0924) 255515 Wakefield, W. Yorks.

Unused radio & electronic kits; £4 (UK) £6 (overseas) notes only. For list and free 44 unusual circuits, send A4 addressed envelope. Mr Lucas, PO Box 755, St Helier, Jersey JE4 8ZZ, Channel Islands.

Yaesu FRG-7700 receiver with FRT-7700 and FRV-7700 (two off) all boxed with instructions, perfect condition, £340 complete. Also Novatel Prestel business terminal unit with built-in monitor, £50. Les. Tel: (0450) 370937 Borders region.

Yaesu FRG-9600 Mk2 60-950MHz a.m., f.m., s.s.b. receiver, mint condition, £295. Yaesu FRG-7700 100kHz-30MHz a.m., f.m., s.s.b. receiver good condition, £225. Gary. Tel: 021-711 1553.

Yaesu FRG-9600 with h.f. modification 0kHz-905MHz no gaps, p.s.u. manual. original box, £400. PRO-32A scanner covers 68-88MHz, 108-135, 138-174, 380-512MHz c/w/ NiCads, charger, antenna, JIM75 pre-amp, £75. Prices not negotiable. John. Tel: (0494) 564422 evenings after 7pm, High Wycombe.

Yaesu FT-211RH 2m mobile with mic, £190. **FT-23R 2m** h/h with speaker/mic, £100. FT-73R 70cm h/h with mobile bracket, £120. All with c.t.c.s.s. tone boards and scanning also NC29. Tel: (0332) 781069 Derby.

Yaesu FT-221R ZM base station, Yaesu FT-703R 70cm mobile, Microwave Modules s.s.b. transverter 144MHz in 28MHz out, offers. Tel: 081-771 6553 SE London.

Yaesu FT-270 transceiver 2m 10W, £95. BSX-2 packet TNC with manuals/leads, £40. Citizen 120D printer with dustcover and stand, £60. Sony TCM 38V cassette recorder with time/date stamping and VOX, £35. Tel: (0604) 646104 after 6pm Northampton.

Zenith Trans Oceanic Royal D7000 multi-band radio with b.f.o. and including swivel stand, service manual and operating handbook, very good condition, £200 or nearest offer. Tel: (0452) 610784 evenings, Gloucester.

EXCHANGE

Fairmate HP2000, boxed, with all accessories and JIM stand in exchange for Signal R535 airband monitor. Mr P Churchill. Tel: (0642) 223076 anytime.

Icom ICR-100SSB RX in exchange for h.f. RX Trio R2000, FRG-8800, Kenwood 2000, w.h.y? Or will sell. Wanted manual for Trio JR310RX. Martin. Tel: (083787) 438 after 6pm Devon.

PRO2006 scanner, still under guarantee plus *Scanner Listener Guide*. Yaesu FRG-7 digital frequency counter, with manual in exchange for Lowe HF-225 or similar. Mr Speirs, 21 Oak Crescent, Wyesham, Monmouth, Gwent NP5 3LB.

Sony ICF PRO-80 plus v.h.f. converter and Sangean ATS-803A for Grundig 650 Satellit. All in good condition, no cash 'balances'. North Wales, Cheshire area, will collect, please 'phone. John Griffiths. 9 Rhos y Gaer Avenue, Holyhead LL65 2BE. Tel: (0407) 760565.

WANTED

BBC RX8 system to receive RTTY, c.w., AMTOR, etc., cash waiting. Tel: (0254) 831252 Blackburn.

Best prices paid for KW107, KW207, KW109 or KW E-Z Match or SEM Trans-Z-Match. Cash waiting. Tel: (03986) 215 anytime.

Drake RR3 or MSR2 marine receiver any condition, working or not. Drake CW75 keyer. Racal 1792 bits, filters, w.h.y? Racal MA1103A. Racal interface ST82762. Watkins Johnson 340A-7 v.l.f. receiver. G3YFK. Tel: (0743) 884858

Grundig new Marlborough model 3365 table radio or Bush VHF64 and Grundig portable radio model Concert Boy 1100. Hugh McCallion. No 8 Strathard Close, Coleraine, Co. Londonderry, N. Ireland BT51 3ES. Tel: (0265) 43793.

Grundig Satellit 2100 radio must be in perfect condition. Tel: (0742) 668037.

Philips, Pye, PCR, PCR2, PCR3 and information. Also Eddystone models 870, 870A, other models considered. Have 730/4 and EC10 for sale. Peter Lepino. Tel: (03784) 128170 quoting 25193, Surrey.

Radio telephones (two) plus base TX/RX wanted for taxi operator, must be DTI approved ad in working order. Suitable for crystal operation in 152-174MHz range. Phone/write. Gordon Case. 106 Prior Road, Berwick-upon-Tweed TD15 2EJ. Tel: (0289) 305660.

SEM Trans-Z-match a.t.u or KW107 or KW109 cash by return. Richard. Tel: (03986) 215 anytime.

Top prices paid for your German gear for WWII vintage. Looking for receivers, transmitters, accessories. Will collect. Lissok, Rue M. Peodts 9, B-1160 Brussels, Belgium. Tel: 010-322-6737115.

Wavelength to kHz/MHz conversion chart or instrument. Also wanted illustrated book on the history of the transistor radio. Mike. Tel: 061-740 4889.

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