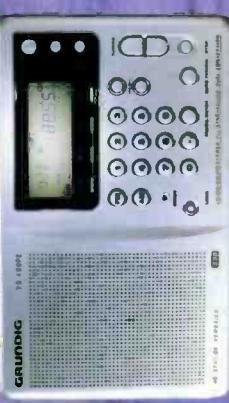


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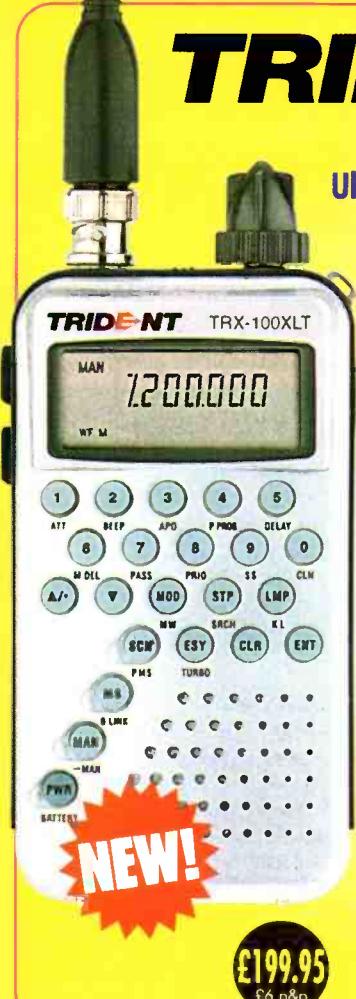
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AUGUST 1999 Issue

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John Wilson G3PCY continues his popular look at second-hand bargain receivers. This month it's the turn of Trio's R-600 to be under the spotlight.



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Kevin Nice G7TZC

The Ed spends some time with Grundig's new portable and sees how it compares to his shack in storage.



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Part 2

This month our resident antenna expert **Joe Carr K4IPV** looks at the all important issue of matching your home-built Yagi to the feeder.

Special Offer

CHECK OUT OUR OREGON SCIENTIFIC CLOCK
SPECIAL OFFER ON PAGE 31



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magazine

COVER SUBJECT

RIAT last year, and a privately owned Lockheed Constellation.

Photo Ian Doyle.

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Ian Doyle gives us a glimpse behind the scenes at the annual RIAT focusing on Air Traffic Control in the busy skies above RAF Fairford, Home of The Royal International Air Tattoo.

46 Or Was It All Done By Pigeons?

Eric Westman gives us his fascinating account of America's first commercial wireless telegraph service.



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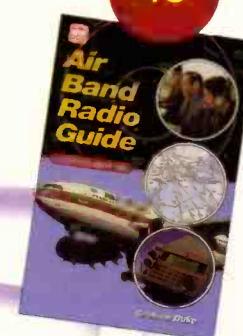


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Components For SWM Projects

In general all components used in constructing SWM projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for SWM projects are available from the SWM PCB Service, **Badger Boards, 12 Hazelhurst Road, Castle Bromwich, Birmingham B36 0BH, Tel: 0121-681 4168.** A small catalogue containing components, projects and p.c.b.s is available, free, to anyone sending **Roy or Sue Martin** an s.s.a.e.

Photocopies & Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for SWM are £2.99 each and photocopies are £2 per article. Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate. A complete review listing for SWM/PW is also available from the Editorial Offices for £1 inc P&P.

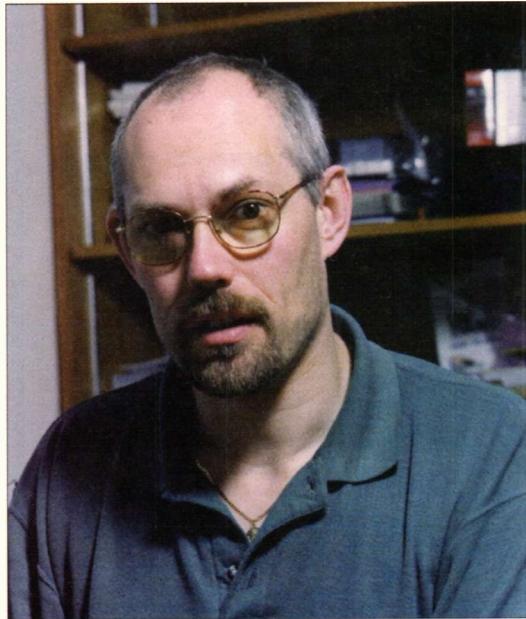
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Technical Help

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

ed's comments



Plea For Help

I have recently been forwarded a request for help from a SWM reader and s.w.l. His name is Tony Lovell he writes, "I don't like to ask you this favour, so I hope you'll forgive me if I do. I am a 33 year old disabled chap and I'm on a low income. I'm unable to work due to my disability. Some years ago now, I had my Yupiteru MVT-7100 scanner stolen along with a few other items from my old flat that I rented. I cannot replace it, due to my low income. I miss the scanner very much, I do get very bored and fed up without it.

Again, because of my low income, I can't get finance and simply don't know what else to do, which is why I'm writing to you, to ask for your help to get hold of a replacement. I'm happy to receive a visit, to show I'm genuine.

What I've always wished for, is an all mode scanner with no gaps, or perhaps a transceiver, so I can talk to others, and make a few friends. Anyway, I'm a regular reader of SWM and PW, I would appreciate anything you maybe able to do for me very much. I must stop now, as I'm limited to 32 pages, so please forgive me, and thank you ever so much for your time in reading my E-mail sent with a BT Easicom donated by BT. Many thanks."

So I'm sure there must be some generous souls amongst you who can help. If you can, and you have anything you can donate to Tony, then drop me a line, paper or electronic, at the Editorial Offices and I'll co-ordinate some help.

Nasty Letter?

That was the subject of a recent E-mail commending me for including in last month's letters page 'QSL'. I don't see that said letter was nasty, merely a disenchanted reader's opinion.

Well it seems I've stirred up quite a hornets nest by publishing said letter from Anon. I've had lots of letters, FAXes, 'phone calls and E-mails from readers, contributors and advertisers expressing their outrage at what they see as a slur by Anon, by his expression of strong views on a magazine that isn't fulfilling his/her needs.

Magazines like SWM should, in my opinion, be run by and contributed to and read by **enthusiasts**. It is enthusiasm that is the life blood of any successful specialist hobby and related publications.

For my sins, I am also Land Rover fanatic and I too find that I share similar feelings to Anon that relate to another publication that caters for this other hobby of mine. In this case though my disappointment is that the genuine enthusiasts that founded the Land Rover magazine in question have long gone. The present editorial staff and freelance contributors have wandered 'off-topic' so far as to have destroyed the magazine.

This type of problem will be avoided with SWM, not that the majority of you think there is a problem, quite the contrary. Thanks for your support. Before leaving this topic, please be aware that I'm always open to suggestions, so if there are topics you would like to see included within the pages of SWM, then do let me know.

Radio & Scooters

I recently visited an Ealing radio emporium, well Martin Lynch and Sons to be specific, to take a look at Martin's new venture ML&S Bikeshop and enjoy a glass of complimentary opening day orange juice (well they'd drunk the champagne). It is from this site that Martin and his team will be building a somewhat non radio business. However, as a fellow 'biker' I'm sure his knowledge and enthusiasm will result in similar level of success with ML&S Bikeshop as with the radio business at 140-142 Northfield Avenue. I'm sure his new two wheeled customers will be enjoying the same high level of service as those who deal with his radio business. Good luck Martin.

Not Closing Down!

The subject of dubious letters is continued with a hoax press release that was recently submitted to the SWM newsdesk and a news item was subsequently published as a result. Unfortunately, the information contained therein was incorrect. I therefore extend our apologies to John Taylor-Cram, Newsletter Editor and Treasurer of the Military W.A.R.S club. The club continues to operate on a normal basis.

PW Promo

Some subscribers to *Short Wave Magazine* will have noticed that they have been sent a complimentary copy of sister magazine *Practical Wireless*. The publishers have made this kind gesture to allow those of you who aren't familiar with PW to acquaint yourselves with the Britain's leading amateur radio publication. Those of you who are interested enough, please let me remind you that joint subscriptions are available for both SWM and PW at an attractive price of £55.00 per annum (12 issues) for the UK. For more information and non-UK rates, please see the order form on page 84 of this issue.

Frequency Chart

It seems that simple is best, many of you have enthused about the inclusion of the frequency spectrum chart that was included with last month's magazine. A chart similar to that is something that I've felt was needed for a good few years now. It seems I was far from being alone with that view - great, it's good to be on target.

Happy monitoring.

Kevin Nice

Dear Sir

I have been a s.w.l. for a good many years and a reader of *Short Wave Magazine* since the early 1950s, but I am now in my mid 70s and, with loss of hearing, it is very difficult to listen to the Amateur Bands, and so now I have taken up SSTV, which I find very interesting. This brings me to ask, why are there never any articles about SSTV in *SWM*? Is there anyone out there interested in it? I can assure them it is very interesting, and in many cases you see a picture of the person transmitting. Although I don't see many G stations, there are a lot transmitting from Europe. Here are just a few to date; HA5DW, RX3DC, UR5EVI, ZS6BTD, DF8NT, IK8BZA, CT1EDP and EA7ABY.

C. Dowding
Birmingham

PS. At the show at Donnington I spoke to the Editor of your sister magazine, *Practical Wireless*, about it, and he said he did not think there was much interest in it.

*SSTV does get some coverage within our pages. The DXTV column features captured images from time to time. As SSTV is pretty much a licensed amateur mode, with the exception of a little CB activity (legally) from some countries, we haven't covered it in detail. PW is a good place for more info. Unless there are lots of readers who would like *SWM* to feature more info. - Ed.*

Dear Sir

Whilst dusting off my savings book in preparation for my 'once a year day', more commonly known as the Longleat Rally, where I usually make my big purchase of the year, plus a lot of small useful items that the uninitiated would call junk, the XYL posed the question; "at Longleat we see thousands or more radio enthusiasts all milling around the stalls, and yet at the end of the day they all disappear, and I have never met one anywhere but at Longleat. Where are they?" She's got a point, how many are there near you? Do they all disappear into secret underground bunkers to practice their arcane art? Is there a secret flat antenna farm society in Milton Keynes?

So please, lighten my XYL's and my darkness, and probably a few others', too. Assuming that radio amateurs read *Practical Wireless* and *RadCom*, and that radio enthusiasts read *Short Wave Magazine*, how many copies of *Short Wave Magazine* are sold, at home and overseas? Are we spread fairly evenly over the world, or in clusters? Which aspects of the radio hobby are most popular at home and overseas?

Best wishes to all at *Short Wave Magazine*.

V. Prior
Devon

PS. I took the cover CD to the computer at work, I'm still working my way through it, and I must say I'm very impressed.

SWM is a UK magazine, it is however distributed worldwide. We also have a proportion of subscribers living abroad. As a rough guide, about 10% of our readers live outside of the UK. This leaves lots here at home. Perhaps some fellow Devonians would like to correspond? - Ed.

Dear Sir

Our local emporium (Lowe Electronics, Newcastle), has just recently closed. The manager, Richard, was always available to discuss equipment and demonstrate all products on sale, now I will have to purchase equipment on mail order or travel over 320km round trip.

May I give a warning to readers buying new equipment at rallies. Recently I visited the Harrogate Mobile Rally, a really fine event, which was well organised. It was supported by lots of traders, one who advertises in *SWM*. On display was a bargain price new base scanner. I decided to buy this scanner.

When I arrived home, I opened the box and my first job was to cut off the two pin shaver style plug'. I then replaced it with a fused 13A UK 3-pin plug (is it legal these days to sell electric equipment with non approved plugs?). I played

with this scanner for quite a time, making various tests against other base scanners. The results were disappointing, the receiver was 'deaf' and I had trouble picking up my local airport and amateurs. It was pretty poor with pagers breaking through on lots of frequencies.

Two days later I phoned the London dealer and he told me to return the receiver - he would have to sell it as ex demo as I had opened the box and used the equipment. I was offered a credit note (a VISA credit was refused). I then paid £7 to post the scanner back to London. The credit note arrived after a few days with the words we have docked you £20 as we cannot sell this as new.

So, now I haven't got the scanner - and at the end of the day, it cost me a total of £27. To buy a scanner at a rally, my advice to everyone is support your local dealer or lose it. I will never ever buy equipment from this London dealer again. I can only hope we get a new emporium in the north east. After all, why should the south be littered with radio dealers and the north only a couple to choose from and none now in the north east (the finest region of Great Britain).

G. Curry
Cleveland

It is worrying to hear of incidents like this one. I am most surprised that you experienced difficulties with a regular SWM advertiser. Your assumption re: the mains plug is indeed correct. As for refunds and VISA credits, if you are unhappy with any credit card transactions, I suggest you contact your credit card company with the details. - Ed.

Dear Sir

I read A. Jennings' letter (April *SWM*) with interest and thought the following may be of interest to you and your readers.

Following repairs to my MVT-7000 scanner, which I accidentally dropped(!), I operated it for some time and it appeared to be working normally. However, on a visit to RAF Waddington in company with a colleague who operates an early MVT-5000, I discovered that he could readily receive both sides of airband transmissions, whilst my scanner worked only one side of the communication!

Thinking it was either an antenna fault or I had programmed receive mode incorrectly, checks were made with no immediate improvement. Then the penny dropped! I had earlier that month visited Manchester and had been aware that other enthusiasts were receiving transmissions, whilst I received them spasmodically.

A 'phone call to the repairers confirmed that there was some form of fault and I duly returned the scanner for inspection. The problem turned out to be a faulty connection at the base of the BNC antenna connector.

Prior to identifying the problem, I had listened to some transmissions relayed by Rothwell on London Mil including callsigns REACH 6018 (C5 Galaxy?), UN49HEAVY(?) and GRIZZLY51(?), also heard were snippets of info including Squawk Codes 0143 and 5163 and 'HS5616 Oceanic'?

What I found interesting was the fact that the scanner could still receive some signals which, I assume, was due to their strength?

A recent correspondent from Sheffield mentioned aircraft tracking overhead and it was suggested that they were Civil using UB1 and UR4. Where I live in West Hull, I can see regular flights turning at Ottringham and I assume sing UB1, UR4 and at Caistor, Lincs. I can see aircraft using UL603? However, identifying them is another matter.

Having flown into Manchester from Rhodes a couple of years ago, I can advise that our let down into Manchester commenced as we overflew the city of Hull!!

Finally, I note aircraft departing Kirmington (Humbershire Airport) to the Canaries often fly via Upton, as I cannot find reference to it on the Airways map, can anyone advise where it is?

T.D. Evans
E. Yorkshire

Dear Sir

I was amused, and found memories flooding back when I read John Fuller's letter (June *SWM*) about the 'mystery' he discovered that the left and right hand stereo channels had been reversed on the Bluebell Hill (Transmitter 158) Band II transmissions.

The reason?

Well, nearly 20 years ago I was responsible for a similar sort of incident myself. It happened at the BBC station at Grantown-on-Spey (Transmitter 153.01) when another Independent Broadcasting Authority (IBA) colleague and I were working at the station investigating a possible incoming signal feed for the planned Channel Four. Becoming confused I removed various plugs and leads - thinking they were video leads - and quite forgetting the station also transmitted Band II f.m. programmes, I managed to swap the Radio 2 and Radio 3 inputs over.

All the following week, until we returned and corrected my mistake, local listeners must have wondered why they were getting Wogan instead of Verdi and vice versa! And although I cannot explain John Fuller's mystery, I have many amusing memories from my work in broadcasting. Thanks for reminding me John, but please forgive the anonymous letter...even now I'm still too embarrassed to own up fully.

A Retired 'Crawley Creeper'

Now just how many other 'strange happenings' can be explained like this? - Ed.

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

THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY SWM SERVICE.

Sole UK Distributor

Flightdeck Aviation Emporium is pleased to announce its appointment as the sole UK distributor for *AirNav V3.0 Aircraft Tracking Software*. Until now, this product, as reviewed in the January 99 issue of *SWM*, has only been available direct via the Internet. Full registered versions are now available 'over the counter' or mail order, priced at £54.95 post free. More information at www.flightdeck.co.uk

Bike It To Lynch's



Radio equipment in the UK, Martin Lynch has recently ventured into an additional market. **ML&S BikeSmart** is a new company selling Scooters from the London showroom. With space for fifty scooters and newly appointed dealerships from Suzuki, Aprilia and Peugeot, Martin is obviously taking his new venture very seriously.

"The London traffic is getting worse by the day, with parking problems reaching near impossible levels. Like Amateur Radio, I have been interested in two-wheel transport since I was a kid. The timing was right for me to open Martin Lynch in 1990, and I feel now is the right time to sell scooters to the community. I'm confident that we will do as well in selling scooters as we have in Amateur Radio" says Martin.

"Initially, both Amateur Radio and Scooters will be sold from the same location until the new showroom (literally across the road) is ready. Our position in the Amateur Radio market won't change - we will still be as competitive as ever, and in fact, have already increased storage space for Amateur Radio stock with the acquisition of more warehouse space."

ML&S BikeSmart can be contacted on **0208-566 0000**, Amateur Radio sales on **0208-566 1120**.



After almost ten years of selling Amateur

Communications a large showroom, which benefits from a large, private car park. The new premises are only minutes away from the Lakeside Shopping Centre and Blue Water.

Keep a look out for Haydon's new address and telephone number will be advertised shortly. With the new showroom due to be open in September, Haydon Communications would like to point out that trading at their West Midlands Showroom continues as before.

RAE Courses

John Beaumont G3NGD is again running another Radio Amateurs' Certificate course and an

Broadcasts In English

The Summer 1999 edition of *Broadcasting In English* is now available from the British DX Club. This 32 page A5 booklet was compiled by BDXC's general editor Tony Rogers. It includes all currently known international broadcasts in English on short wave and medium wave. It is in time order throughout and covers all target areas. It also includes a Summer 1999 Guide to DX Programmes.

Prices are as follows: UK - £1.20, Europe - three IRCs or three US dollars, Rest of World - four IRCs or three US dollars. Obtain your copy from: **British DX Club, 126 Bargery Road, Catford, London SE6 2LR**, E-mail enquiries to: bdxc@hotmail.com or check out their web site at <http://www.co.umist.ac.uk/BDXC>

On The Move

The London Showroom and Mail Order department of **Haydon Communications** will be on the move in September to accommodate their expansion requirements. Due to parking restrictions recently imposed and a total lack of space at their Edgware shop, they have

decided to move to a new location. However, their London address will remain up to the point at which their new premises is fully functional, therefore causing the minimum of inconvenience to their customers.

The new premises will offer Haydon Communications a large showroom, which benefits from a large, private car park. The new premises are only minutes away from the Lakeside Shopping Centre and Blue Water.

Keep a look out for Haydon's new address and telephone number will be advertised shortly. With the new showroom due to be open in September, Haydon Communications would like to point out that trading at their West Midlands Showroom continues as before.

Radio & TVDX News

There's a new terrestrial French TV channel being proposed as a merger between the Franco/German cultural ARTE and daytime educational channel *La Cinquième*. A new broadcasting bill now on its way through the French parliament procedures will pave the way for the new channel. The Socialist government is also seeking a reduction in advertising time carried on networks France 2 and 3, now reaching 12 minutes an hour down to eight minutes.

A much smaller channel just on air is the Leicester based Asian channel MATV that opened end May on



This is the 'Infraredcat' communications transmitter and receive unit now being fitted on geographically split industrial sites.

ch.68 horizontal running 4kW e.r.p. from Ratcliffe College to a potential audience of nearly 1.25 million. It's hoped to eventually run some 18 hours daily of sport, films and locally made programming plus a news service.

There are now three RSL-TV stations on-air, that of TV-12 (Isle of Wight, ch.E54-H 1kW); Lanarkshire TV (67-H 10kW); MATV and with The Oxford Channel (47-H 10kW) due on anytime. The ITC has now received 67 applications to run RSL-TV services across the UK, including a Birkenhead based operation run by both Chester and Liverpool newspapers.

Italy has confirmed that analogue TV will close down December 2006. DTT (Digital Terrestrial Television) is already on test in various Italian regions at u.h.f. and by 2003 DTT coverage should reach 60%.

advanced Radio Amateurs course (including construction), commencing 13 September 1999. Information is as follows:

Radio Amateurs Evening Course: Monday - 1800-2030. Radio Amateurs Afternoon Course: Wednesday - 1300-1615. Advanced Radio Amateurs (construction): Tuesday - 1300-1615. Early Enrolment: Every Wednesday throughout July and August, 1400-1900 and 1 September. Main Enrolment: Monday 6 September to Wednesday 8 September 1200-2000.

For more information, contact John Beaumont G3NGD, **North Trafford College, Talbot Road, Stretford, Manchester M32 0XH, Tel: 0161-886 7077** or contact Admissions on **0161-886 7000**. Alternatively, you can find details on the Internet at http://pages.hotbot.com/edu/john_beaumont/index.html

Alan Betts G0HIQ is also running an RAE class at **Newstead Woods School, Avebury Road, Orpington, Kent** on Monday evenings, 1930 to 2130, commencing September 20th. The course

France hopes to launch DTT before spring 2002 and extend over the country as quickly as possible, aiming for analogue switch-off by 2010.

Other analogue switch-offs are Spain 2012; Sweden 2008-2012; Holland/German 2010 and Ireland after 2009. Hong Kong's largest commercial TV station - TVB - has just started digital terrestrial TV test transmissions across the territory in conjunction with rival station Asia Television. Tests will continue until the new year when a decision is expected for full time DTT. And the Malaysian government has rejected the plans for RTM (Radio Television Malaysia) to privatise and has asked the broadcaster to return with modified plans before the end of '99.

Various new buzz words are flitting about the communications world! One new technology is 'WLL' or Wireless Local Loop. Problems arise on commercial sites with wire interconnection between offices, either by virtue of distance, obstructions, the movement of office partitioning - which is time and cost.

The use of microwaves and wide bandwidths available has resulted in discrete bands being allocated for radio data communication over a total administration area that is truly flexible in terms of equipment placement. Move the office and the communications is restored instantly.

Previously, the UK allocated the 3.5GHz band for WLANs (Wireless Local Area Networks) in the mid 90s but the communications explosion has now established the need for extra bandwidth and 10GHz is likely the next allocation. Germany has already allocated discrete bands in the 2.5, 3.5 and 26GHz bands. WLLs can run up to data rates between 64kbps to 2Mbps depending on the data mode being used.

Another industrial communications system being exploited is infra red datacomms, but emphasising the use across large plants, crossing roads, etc. which would involve immense disruption and/or cost. The data company CIE-DEDICAT are offering an infra red system that can carry up to 100Mbps with costs working out at £3200 for a 600m link. The large extended roofing panel over the transmitter/receiver

leads to the May 2000 examination, which will be held at the school.

Enrolment: post to Bromley Adult Education College, Widmore Centre, Nightingale Lane, Bromley BR1 2SQ or 'phone 0181-460 0020. Further details from Alan on (01689) 831123.

The Widnes & Runcorn Amateur Radio Club will be running an RAE and Novice RAE course at **The Beacons, Simmons Lane, Frodsham, Cheshire**. Enrolment takes place on Friday 3 September 1999 from 1930. Further details can be obtained from course tutors **Dave Bibby G1PIX on (01928) 591401 and Dave Wilson G7OBW on (01270) 761608**.

Peter Buchan G3INR is again running an RAE course (theory only) starting mid September 1999 at **Sawston Village College, near Cambridge**. Contact **(01223) 834492 or FAX: (01223) 836680** for more details.



Mobile 'phones are everywhere and Nokia are now manufacturing systems that will fill in dead holes in cellphone coverage, even to ones fitted on bus stops and lamp posts.

3/u.h.f. and even Band 1/f.m./Band 3 and u.h.f.

One standard two bay panel/bowtie u.h.f. had been modified with a stack of u.h.f. 'X' type fringe directors ahead of each dipole and claiming forward gains of 14-16dB over the whole u.h.f. band. Their standard four bay panel/bowtie u.h.f. antenna featured a small 3-element $\frac{1}{2}$ wave director chain in front of each main dipole.

Another Italian company (CB-Vicky of Valmadrera) have produced an in-line wideband log periodic for Band 3 and u.h.f. in several versions, the highest gain achieved was Band 3 @ 7.5dB and u.h.f. @ 9dB.

Wenlock Burton (Epping, Victoria, Australia) writes with news of his local ch.31 'Community TV' station appealing for funds to keep on-air. They had been relaying horse racing, but a court decision ruled that this was not in the spirit of 'community broadcasting'. As a result of the horse racing loss, revenue has dropped hence the local appeal for funds, if insufficient funding couldn't be raised by end May the station would close.

Australian DTT will be run at both v.h.f. and u.h.f. using digital channel per analogue channel spacing. In Melbourne, Band 3 analogue currently exists 7, 9, 10 and digital channels will be interleaved on chs. 6, 8, 10, 11, 12. Australian analogue TV is to close 31 December 2008.

Bangor's AGM

The Bangor & District Amateur Radio Society are holding their AGM of the Society and Millennium Contest Launch at the **Clandeboye Lodge Hotel, Estate Road, Bangor, Co. Down** on **Wednesday 1st September 1999** at 2000. New members are warmly welcomed to the Province's most popular radio club. Contact **Roy G1OWVN, QTHR, on (01247) 460716**.

Car Boot Sale

The Guildford & District Radio Society are holding a car boot sale with sausages and mash on Friday 13th August at 1930 for 2000. Also, on the 27th August, there will be a Bring & Buy show night, again 1930 for 2000. More information from **Tim G7JYO on 0181-399 5125 or E-mail: f.dabbs@kingston.ac.uk**

Send your news to Zoë Shortland at the Editorial Offices

rallies

Attention Please!

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

July 25: The Rugby Amateur Transmitting Society are holding their Radio & Computer Rally at the BP Truckstop, A5 Watling Street. Details from Arthur **M0ASD** on (01788) 550778.

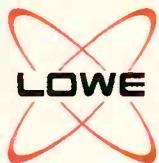
July 25: The Colchester Amateur Radio & Computer Rally is to be held at St. Helena School, Sheepen Road, Colchester, adjacent to the Colchester bypass, Avenue of Remembrance. Doors open from 1000-1600. Talk-in on S22. Admission is £1.50. There will be a wide range of Amateur Radio and Computer traders, Bring & Buy and specialist stands inside, a car boot sale and trade sale area outside. RSGB Morse tests on demand (two passport sized photos required). Catering and licensed bar. There will be ample free parking and reserved disabled parking adjacent to the main entrance, with full access for wheelchair users. Details from **Jef G7BUK** on (01206) 728710.

***August 8:** The Flight Refuelling ARS Hamfest 1999 will take place at Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. The event will run from 1000-1700 and will include the usual mix of traders, craft exhibitors, car boot sale and field events. Overnight camping facilities available for Saturday 7 August. Talk-in will be on S22. **Note - No Bring & Buy.** Further details from **Richard Hogan G4VCQ** on (01202) 691021.

August 8: The annual Derby Radio Rally will take place from 1000 at the Littleover Community School, Pastures Hill, Littleover, Derby. This is on the A5250, just north of its junction with the A38. For further details contact **Martin Shadlow G3SJZ (QTHR)** on (01332) 556875 or E-mail: **martin@martinshadlow.demon.co.uk**

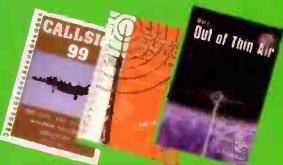
August 13: The Cockenzie & Port Seton Amateur Radio Club are holding their 6th Annual Radio Junk Night at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, East Lothians, Scotland, from 1830 to 2130. Bring along your own junk and sell it yourself. Tables will be provided on a first come first served basis - with no charge for the table. There will be a raffle at approximately 2100 and refreshments will be available. Disabled access. Entry fee is just £1 all persons, with all money donated to the British Heart Foundation. **Bob Glasgow GM4UYZ @ GB7EDN** on (01875) 811723, E-mail: **r.glasgow@x400.wins.icl.co.uk** or **bob.gm4uyz@btinternet.com**

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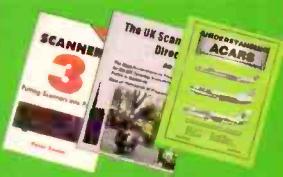


LOWE ELECTRONICS

LOWE BOOKSHOP



Air Traffic Control Today	£8.99
Air Traffic Control Today and Tomorrow	£8.99
Airband Radio Handbook 6th Ed	£7.99
Air Traffic Control	£10.95
Airwaves '99	£9.95
Calling Shanwick	£10.95
Callsign '99	£8.95
Fax, Satellite and RTTY Weather Reports by Philip Mitchell	£11.50
Ferrell's Confidential Frequency Guide	£19.95
Flight Routings 1999	£7.95
Monitoring the War in Kosovo	£5.00
More Out of Thin Air	£6.95
North Atlantic Flight Communications	£16.50
Passport to World Band Radio '99	£14.99
Pooley's Flight Guide '98	£7.00
Receiving Antenna Handbook	£17.50
Scanners 3	£9.95



Scanning the Maritime Bands 2nd Ed	£9.75
Short Wave Propagation Handbook	£15.95
Shortwave Listening Guidebook - Harry Helms	£16.95
Shortwave Maritime Communications	£14.50
Shortwave Radio Listening for Beginners	£10.95
UK Scanning Directory 6th Ed	£18.50
UK Scanning Frequency Chart	£3.00
Underground Frequency List	£14.95
Understanding ACARS	£9.95
Weather Radio - Tony Curtis	£14.95
Weather Reports from Radio Sources by Philip Mitchell	£7.50
World Airline Fleet and Selcal Directory	£16.00
World Radio and TV Handbook 1999	£19.95
Worldwide Aeronautical Communications Frequency Guide	£19.95

Pooley's Flight Guide '98



Last year's Pooleys now available for all aviation enthusiasts. Airport runway maps and loads of frequencies and other really useful data inside. Quantities are limited this year so get yours now before we run out!

Just £5.00 plus £3.00 p&p.

OPEN DAY

11th September 10.00am – 4.00pm, approx
THE ORIGINAL OPEN DAY

A great day out for the dedicated radio enthusiast at the UK's leading radio retailer. Matlock and district's superb local attractions make it a great day for the whole family to enjoy.

- ★ Great special offers
- ★ Massive reductions
- ★ Free refreshments
- ★ Loads of free parking
- ★ Workshop clearance

- ★ Free car boot sale spaces
- ★ "DX prize" for person travelling the greatest distance to us
- ★ Support staff on hand from all our major suppliers, including Kenwood, Icom, Yaesu, Garmin, RSGB & UKRS
- ★ Plus loads more we'll know next month

Located on the A632n the northern outskirts of Matlock

Icom PCR100 & PCR1000



Icom PCR100 & PCR1000
For those of you that like to combine scanning and computing, these two Icom receivers are for you!

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

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



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

Prices from £199.00 for PCR-100 & from £299.00 for PCR-1000.

ICOM IC-R2

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

Uses 2 x AA cells for power, contributing to the small size.

Price £139.00



GENERAL ENQUIRIES

All catalogue requests to Matlock address or fax please or by email to info@lowe.co.uk.
NB Carriage extra on most items.
Orders also to Matlock address or fax or email to orders@lowe.co.uk
Check or website at for latest product information www.lowe.co.uk

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Fax 01629 580020
Tel 01629 580800

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Tel 0117 931 5263

GARMIN GPS Receivers



If you walk, sail, ride or drive, there's a Garmin GPS just for you! As a Garmin main distributor, you'll find a complete range of GPS receivers and accessories to suit your outdoor activities, including some of our own custom-made items like our world-famous low-cost magnetic mount GPS antenna!

Pop in to one of our showrooms now to see the latest models and get a full demonstration of their accuracy and capabilities.

Check out how you can combine your computer with a GPS receiver and Personal Navigator Professional software to give you full route planning and tracking with local hotels, restaurants, pubs, places of interest and even filling stations.

GPS receivers from £149.00

Icom R75E



Icom's latest receiver combines analogue and digital technology to bring you a receiver with excellent performance at an excellent price.

With expanded frequency coverage from 30kHz right up to 60MHz it will truly expand your listening horizons. On the technical side, it features a high stability receiver circuit and better than 100dB dynamic range. Synchronous AM detection, twin passband tuning and optional IF filters help to reduce distortion and interference and at the audio stages, an optional Digital Signal Processor unit adds noise reduction and notch filtering. Operation is easy with several tuning step sizes and direct frequency entry complimenting the tuning dial and FM is provided as standard. For those who need them, there are 101 memory channels that can also be named and optional computer control will extend many of the functions. The May 99 Short Wave Mag said it all - "little I could not resolve, even in poor conditions" ... "remarkably easy to programme" ... "I can't praise it too highly" ... Need we say more?

R75E from £699.00

AOR AR5000

A dream receiver if ever there was one!



- Very wide frequency coverage 10kHz - 2600MHz
- All mode reception: AM, FM, USB, LSB & CW
- Automatic electronic preselection of the front end
- Excellent strong signal handling
- NCO (Numeric Controlled Oscillator) with tuning steps down to 1Hz
- TCXO fitted as standard
- Multiple I.F. bandwidths 3kHz, 6kHz, 15kHz, 40kHz, 110kHz & 220kHz
- Auto mode bandplan selection

IT IS WORTH EVERY PENNY
OF IT'S £1345.00
PRICE TAG

and buy during July and we will include an MVT7100 multimode handheld absolutely free! This offer is limited as long as stocks last so get in quick if you want the best of fixed and portable operation! Offer also available on AR5000+3 model too.

GREAT SECOND HAND BARGAINS!

Why not look at our great range of pre-owned scanners and receivers? We often have current product available at well below RRP so you make a great saving and with our full workshop inspection and warranty prior to sale, you'll have no worries either!

Ask for free second hand list.

Selected
receivers
down in price!
Phone for details!

Lowe GPS Accessories



Our world-famous Active GPS Antenna continues to lead the market! We've sold thousands of these all over the world - a testament to its high-performance and great value! It is complete with magnetic base and 4m lead with BNC connector. We also offer an adaptor to MCX for more flexibility.

GPSANT, Magnetic mount GPS antenna	£39.95
GPSLEG, GPS leg strap	£8.00
GPSCAB, Power data and computer lead for Garmin GPS receivers	£29.95
GPSCAR, Cigar lighter lead for Garmin 12V receivers	£15.00
MCXADAPT, MCX to BNC adaptor lead	£10.00

Yupiteru MVT7100

Still our best selling scanner and no doubt about it! Okay so it may lack computer control but that's hardly a problem when 99% of the time you'll probably be in a situation where it's hardly practical to lug around even the lightest of palm tops. Let your fingers do the walking over the back-lit keyboard to access the 503kHz to 1650MHz range with 1000 memories,

am/fm/wfm and ssb reception and it is so easy to use! (Cart. £10.00).

£199.00



ADVANCE NOTICE! LOWE OPEN DAY

Saturday 11th September
Staff from major suppliers in attendance
Free Car Boot Sale Spaces
Famous Green Shed Sale
Special Offers, Free Prize Draw,
Amazing Bargains

Make a note in your diary now!

Short Wave Accessories



AT2000, Short wave listener's ATU £99.95
CTU8, Short wave listener's ATU £100.00

RF Systems - World leading antennas for the very best in short wave reception.



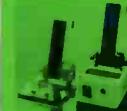
AA1, Antenna adaptor for portable receivers	£31.00
AA150, Active antenna	£148.00
AA150M, Marine active antenna	£97.00
AA2, Antenna adaptor for portable receivers	£31.00
DX10, Active antenna	£125.00
DX1PRO, High quality active antenna	£295.00
EM1, Portable SW antenna	£49.00
MINIWINDOM, Indoor windom antenna	£33.00
MLB, Magnetic Longwire Balun	£33.00
MLBAMK1, MLB Antenna kit; 12.5m	£54.00
MLBAMK2, MLB Antenna kit; 20m	£60.00
MTA, Magnetic Transfer Antenna; Vertical antenna for short-wave use	£125.00
SP1, Antenna splitter / combiner	£48.00
SP2S, Antenna splitter / combiner / with precision attenuator and medium wave filter	£95.00
SP3S, Antenna splitter / combiner	£69.95
T2FD, Tilted Terminated Folded Dipole; Low noise RX antenna; 3 - 35MHz	£135.00



Scanner Accessories



AOR ABF125, Band 2 interference filter	£28.50
Lowe LEP300, High quality ear piece	£9.95
FC1001, 10 to 2.8 frequency counter	£59.95
LA801, Scanner antenna 25-2000MHz	£12.95
LA881, Scanner antenna 25-2000MHz Enhanced gain	£19.95
LABC, Civil Airband ground plane antenna	£29.95
LABM, Military airband antenna	£39.95
LAC1, Window mount for BNC antennas	£14.95
LSA1300, Wide range discone antenna; 25 - 1300MHz	£59.95
TW535, Telescopic whip antenna	£8.95
WBANT, Wideband mini-mag mount antenna for scanners	£19.95



AIRMMASTER 2000, Software decoder for ACARS	£89.95
NEXCEL, Pack of 4 NiMH rechargeable batteries 1.35Ah	£8.00
NEXCH, Special charger for NEXCEL batteries	£9.95

SSE

BHA3, Table top stand for handheld scanners	£14.95
NF943, Tunable notch filter	£29.95
PSU101, Scanner PSU & base stand	£34.95
SW2, Short Wave antenna for scanners	£14.95

Watson

QS200, Mobile mounting bracket for handheld radios	£10.00
WSC1, Universal carry case	£19.95



Keighley ARS

Members of the Keighley Amateur Radio Society meet every Thursday evening at 2000 at the Ingrow Cricket Club, Hainworth Lane, Keighley, West Yorkshire (cricket club phone number (01535) 607653, E-mail: publicity@keighleyars.freeserve.co.uk)

All visitors are welcome to attend any Thursday evening. For details on club events, contact the club's secretary **Jack Birse G4ZVD** on (01535) 212985 or the club's Publicity Officer **Ian M1BGY** on (01274) 723951.

Free Download Packages

AOR announce a number of Internet **free** download software packages for the PC Windows based platforms, these are available from the AOR web sites <http://www.demon.co.uk/aor> <http://www.aorja.com> and <http://www.aorusa.com>

The above sites include the following:

AOR Schedule: new recording software tool to enable tuning and recording of the AOR AR5000/+3, AR3000A, AR3030 and AR7030/PLUS receivers with audio being saved to a computer's hard drive. Up to ten independent recording sessions are possible over multiple frequencies.

AOR AR8200 Toolkit: software full featured package for the AR8200 receiver with memory upload, download, search bank/memory bank editing, labelling, re-sizing, recording, bandscope and more. Very popular, now up to version number 1.16.3.

AOR ARD-2 Display

Tool: Software logging of ACARS and NAVTEX transmissions with scroll back buffer and report generator.

SDU5500: A support package is also under development for the SDU5500 spectrum display unit. Currently this is in beta-test but will soon be placed on the Internet in its final form.

In addition to the free download packages, several other demos are available to download for commercial packages, these include:

Searchlight: Windows support for the AR3000/3000A receivers.

Spectrum Master: Windows support for the AR5000/+3 receiver with data base.

Data Master: Windows support for the AR7030/PLUS & AR3030 short wave receivers with data base and other utilities.

PC Manager for Windows: Support for the AR8000 & AR2700 receivers. Upload/download, editing, bandplan, recording, etc. (DOS version for the AR8000 also available to order).

Concerto: Windows support for the AR3030 receiver.

Many operating manuals are also available as free downloads from the UK web site in PDF format - Adobe Acrobat Reader required, available free from <http://www.adobe.com/acrobat>

AOR UK Ltd. can be reached at 4E East Mill, Bridgefoot, Belper, Derbyshire DE56 2UA, Tel: (01773) 880788, FAX: (01773) 880780, E-mail: info@aor.co.uk or check out their web site at: <http://www.demon.co.uk/aor>

Summer Expedition

Unfortunately, due to work commitments, the **Northern VHF Activity Group** have had to cancel their planned trip to Shetland. Instead, this year they are off to Islay, Jura and Colonsay, IO65 and IO66.

Using the club callsigns **GS7UEG/P** and

MSOBPG/P, they will be active from 24th to 31st July on 144.222, 50.122MHz, WAB and IOTA frequencies on all h.f. bands. **G7DKX**, the Group's QSL Manager says that anyone wishing to QSL direct, please include an s.a.e. or IRC, otherwise all cards will go out via the bureau.

Operators for this expedition will be **Peter G7BXA**, **Manny G7HSP** and **Keith G4YQW**. More information about this summer expedition from **Peter Austin, 24 Fairfield Terrace, Bramley, Leeds, W. Yorks LS13 3DH** or telephone **0113-256 3462** weekends only.

Can You Help?

At the Annual General Meeting of the **Leicestershire Repeater Group** held in April, both the Chairman and Treasurer were re-elected without opposition as were the Membership Secretary and Newsletter Editor. Both the latter have been trying to stand down for some time, but in the absence of any new volunteers to fill the positions, both reluctantly agreed to remain in office for one final year.

The post of Minutes Secretary, which became vacant during the course of last year, remains unfilled, as does the newly created post of Site Manager. The committee will try

to fill these positions by co-option, but at the moment, they have no one in mind for any of these positions.

Far more importantly however, was the failure to find any new Repeater Keepers to assist the Engineering Manager, who currently holds the NOV's for all three voice repeaters: **GB3CF**, **GB3LE** and **GB3UM**. The present incumbent took on the job last year, for one year only, due to his work commitments at Leicester DeMontfort University. After some considerable persuasion, he has agreed to continue for a further six months to give the Group time to find a replacement.

By the end of October therefore, unless the committee can find some volunteers to assist, there is a risk of these Repeaters having to close down. Therefore, if you would like to offer your Services as a Repeater Keeper (Minutes Secretary or Site Manager) or would like any further information, please contact **John Senior G7RXS**, Chairman, on **0116-284 1517** or E-mail: repeaters@aol.com

Fun Day

Special Event Station **GB4SIL** will be operating I.f. and h.f. bands on **Thursday 29th July** at Llandudno North Wales Fun Day, on behalf of the Llandudno & District Branch of Soroptimist International. Soroptimist International is the largest service organisation for women, with over 97000 members world-wide in 116 countries, and in 78 years it has raised substantial funds for a variety of

Successful Open Day

Waters & Stanton PLC held its annual Open Day back on Sunday 30th May and as usual, a queue had formed well before the opening time of 1000! Those of you who have visited in previous years know that the early birds get the bargains! The total recorded attendance topped four hundred, but there were ample spaces available in the marquees that covered the greater part of the rear car park.

Peter Waters G3OJV explained that with the company's high volume of business, they inevitably accumulate considerable quantities of end-of-line items, mail order returns, uneconomic repairs, case damage products and general workshop skeletons. Peter went on to explain that because the Open Day is now so well attended, even their suppliers send them their redundant stock to dispose of.



The junk table in one marquee.

Icom, Yaesu and Kenwood had their own stands and all donated products for the free raffle. **Mark Francis** conducted his famous auction at which the star lot this year was a box full of digital test meters that all went for £3 each.

All agreed that it was an enjoyable event and as usual the free food and drink were appreciated. An added bonus was the opportunity to visit the free Southend Air Show, just ten minutes down the road.

pilots of the TSR2 Strike bomber that was cancelled so ignominiously by the Wilson Government in the early sixties. Jimmy is also one of the few people to have ejected from a fighter at over MACH one, the speed of sound, and survived when his Lightning jet failed over the Irish Sea. One of the most experienced Test Pilots of the post-war years, Jimmy was the chief test pilot on the Jaguar programme and on retirement was Director of Operations for the Panavia Tornado.

Air Supply, founded in the 1980s by two air traffic controllers at Leeds Bradford Airport, and bought in February 1994 by Ken and Doreen Clothliff, has continued a steady programme of expansion, with a move to larger premises in 1996, and the acquisition of expansion of a mobile sales trailer for use at air shows and airfield fly-ins. With the opening of

charities. Monies raised in Llandudno in 1999 will mainly be given to the Macmillan Cancer Relief Fund.

Contacts with all stations, especially YLs, will be appreciated. Frequencies to look for are 7.060 and 14.160MHz. A special QSL card will be sent to confirm contacts and the operators will also be able to use their own calls under portable regulations, preceded by 2C to celebrate the new Welsh Assembly. So there is an added reason why you should warm up your rig on 29th July.

Contact **John G3YGG** on (01372) 812776 for more information.

New Sales Unit

As part of the continuing expansion of the business, Air Supply has opened a new sales unit for the summer on the departure shopping concourse at

Leeds Bradford International Airport. As much of Air Supply's business is concerned with the enthusiast, as well as the

amateur and professional pilot, this now means that their range of products can be purchased seven days a week.

There was an opening evening held back in May, in the company of special guest of honour, former BAC Test Pilot, Jimmy Dell, one of only two

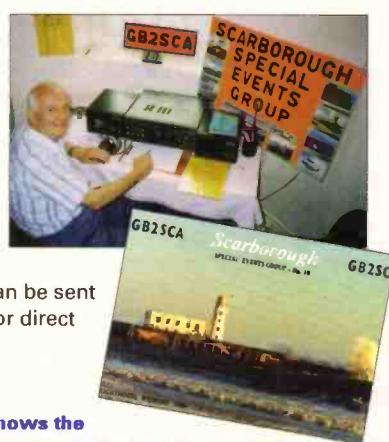


their new web site www.airsupply.co.uk which is now on line and being improved, bringing in business from around the world, they can justifiably say that they are the biggest outlet of aviation goods in the North. Air Supply's unique character is that it is the only shop which equally caters for the aviation enthusiast, and the pilot, professional or amateur.

Lighthouse Weekend

The Scarborough Special Events Group will be active as **GB0SCA** from Scarborough Lighthouse on the 21/22 August, taking part in the International Lighthouse weekend. Both s.s.b. and c.w. will be

used, and a full colour QSL card of the Lighthouse will be sent to all those who make contact. Listener reports are always welcome and can be sent via the Bureau or direct via the club call **G00OO**.



The top photo shows the operating position inside the Lighthouse last year, with **Peter G3JBR** at the mic. This year's card, will be no. 20 in the Group's series of commemorative QSL cards and will be different to the one issued last year.

Send your news to Zoë Shortland at the Editorial Offices

rallies

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

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

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

Editor

August 29: The Milton Keynes ARS Annual Rally & Car Boot Sale is to be held at the Bletchley Park Museum, Wilton Ave, Bletchley, Milton Keynes. Open from 0800 for traders, 0900 for buyers. Museum open with tours. Morse test on demand (bring two passport size photos). Talk-in on S22. Contact **Dave G3ZPA** on (01908) 501310.

August 29: The Torbay ARS are holding their annual rally at Churston Grammar School near Brixham. A wide variety of traders will be present and food and refreshments will be available. Doors open at 1000. Further details from **Peter G4VTO** Tel: (01803) 864528.

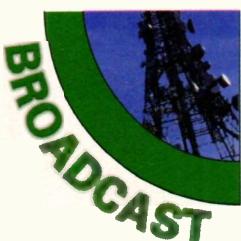
August 29: The Coleraine and District ARS will hold its annual Radio Rally in the Bohill Hotel, Cloyfin Rd, Coleraine, Northern Ireland. Full catering facilities available in Hotel. Why not stay overnight and visit the Causeway Coast? Doors open midday. All enquiries to **G1BLTB** on (01265) 52393 or **G1TMQ** on (01265) 822502.

August 30: The Huntingdonshire Amateur Radio Rally are holding their rally at the Emulf Community School, St. Neots, Cambridgeshire (near Tesco Superstore on the A428). Doors open 1000 till 1400 and admission is just £1. Hot and cold refreshments will be available. Features hall and car boot sale on hardstanding. Talk-in on S22. **David Leech G7DIU** on (01480) 431333 (between 0900 and 2100).

September 5: The Bristol Radio & Computer Rally is to be held at the Brunel Centre, Temple Meads Station, Bristol. Doors open 1030 till 1600 (disabled entry from 1015). Admission is just £1, accompanied children under 12 free. Features include 150+ tables, large Bring & Buy, under £30 Bring & Buy, refreshments, on-site parking £3.50, also NCP £1 opposite, ATV demonstration and a raffle. Details from **Muriel Baker G4YZR**, Rally Manager, on (01275) 834282 (24hr answerphone).

September 11: The Reddish Rally is to be held at 1000 at St Mary's Parish Hall, Reddish, Stockport. More information from **G4ILA** on 0161-477 6702.

September 12: The Lincoln Hamfest will take place at the Lincolnshire Showground on the A15, five miles north of Lincoln. There will be extensive free parking and overnight facilities for tents and caravans by previous arrangement. There will also be a licensed bar, catering on the day, trade stands, flea market, Bring & Buy, car boot sale and Morse tests. Talk-in on 2m. Other 'non radio' attractions. Admission is £2 per person (under 14s free). **Bob G3VRD** on (01522) 533325.



LM&S

At this time of the year, thunderstorms often arrive with little warning. A direct hit by lightning will usually result in extensive damage which will need to be fully investigated by experts before making an insurance claim.

Listeners should also bear in mind that during a thunderstorm the raindrops carry an electrical charge and those which fall on an outdoor antenna will deposit the charge thereon. A very high potential can quickly build up unless it is effectively earthed. So when not in use **always** disconnect an outdoor antenna from a receiver and earth it. Don't wait for a thunderstorm to arrive!

Long Wave Reports

Note: I.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during May.

More or less continuous monitoring of **189kHz** during an evening in May by **Ernie Strong** (Ramsey, Cambs) revealed that the sky waves from the Rikisutvarpid 300kW station at Gufuskalar, W.Iceland, started to arrive at about 2000UTC. From that time the transmission rated SINPO 11221 and it did not improve much by 0100, when he switched off.

Medium Wave Reports

There were no reports of m.w. transatlantic reception at night during May. However, the sky waves from some of the stations in the Middle East, Africa, Europe and Scandinavia did reach the UK - see chart.

A general decrease in the number of stations that became audible after dark was observed by **George Millmore** (Wootton, IoW) but he was pleased to receive Las Palmas, Grand Canaria, on **1008kHz** at SIO 211 and UAE Dubai (600kW) on **1251kHz** at SIO 222.

During daylight the ground waves from some local radio stations reached quite distant places. Whilst in Scotland, **Brian Keyte** (Gt.Bookham) used the top strand of a field fence near Strathyre as an antenna for his receiver and compiled an interesting log - see chart. He noticed that Townland Radio in Cookstown, N.Ireland, on **828kHz** had become 'Gold Beat 828 AM'; also that Red Rose 9-99 on **999kHz** was using the ident 'Magic 9-99' and carried the networked Magic programmes.

The closure of Heartbeat 1521 AM on **1521kHz** in mid-May was reported by **Eddie McKeown** in Newry.

Short Wave Reports

At present R.France International is the only broadcaster known to be active in the **25MHz (11m)** band. Their 500kW transmission is beamed to E/C.Africa on **25.820** (Fr 0900-1300) but it has been reaching some areas of the UK via back scatter. It was rated 24332 at 0902 by **Rhoderick Illman** in Oxted; 25332 at 0928 in Newry; 25443 at 1011 by **Richard Reynolds** in Guildford; 25552 at 1110 by **David Edwardson** in Wallsend; 24322 at 1110 by **Vic Prier** in Colyton; 25522 at 1130 by **Simon Hockenhull** in E.Bristol; 23322 at 1158 by **Robert**

Connolly in Kilkeel; 33323 at 1255 by **Bernard Curtis** in Stalbridge.

In contrast, quite a few broadcasters are taking advantage of the propagation conditions in the **21MHz (13m)** band. The most distant is R.Australia but there were no reports to indicate how well their broadcast to Pacific areas via Shepparton on **21.725** (Eng 0600?-0858) is being received there. It was rated 15432 at 0615 in E.Bristol.

Also received in the UK before noon were R.Finland **21.670** (Eng to Asia, Australia 0630-0700), rated 44433 at 0645 by **Stan Evans** in Herstmonceux; Voice of Russia **21.790** (Eng [WS]) 44444 at 0700 by **Sheila Hughes** in Morden; HCJB Quito, Ecuador **21.455** (Eng to Eur? [u.s.b. + p.c.]) 55444 at 0711 in Guildford; UAER, Abu Dhabi **21.735** (Ar to ? 0800?-1500?) 35544 at 0820 by **Fred Wilmshurst** in Northampton; R.Austria Int, Moosbrunn **21.765** (Eng to Australia 0830-0900) 45344 at 0833 in Newry; Voice of Turkey **21.715** (Tur to W.Asia, Australia 0600?-1100?) 34332 at 0922 in Oxted; SRI via ? **21.770** (Eng, Ger, Fr, It to Far East 1100-1330) 35553 at 1108 in Wallsend; Vatican R, Italy **21.850** (Eng to Asia) 44444 at 1112 by **Thomas Williams** in Truro; R.Sweden, Stockholm **21.810** (Eng to N.America 1130-1200) 33333 at 1149 by **Tom Winzor** in Plymouth.

After mid-day the BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) was 23332 at 1210 in Kilkeel; RAI Rome **21.520** (It to Africa 0600-1300) 43323 at 1222 by **Peter Pollard** in Rugby; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.] to N.S.America 1200-1600) 34433 at 1315 by **Ernest Wiles** in NE.Bedford; BBC via Cyprus **21.470** (Eng to Africa 1400-1700) SIO 333 at 1440 by **Philip Rambaut** in Macclesfield; Voz Christiana, Chile **21.500** (Sp to N.America 1100-2100?) 44444 at 1515 by **David Hall** in Morpeth; UAER, Dubai **21.605** (Eng to Eur 1600-1640) 44434 at 1635 in Stalbridge & 34543 at 1637 by **John Parry** in Larnaca, Cyprus; WYFR via Okeechobee, USA **21.525** (Eng, Ar, Port?, Fr to Eur, Africa 1600-2045) 34423 at 1715 in Colyton; R.Japan via Ascension Is **21.630** (Jap to E.Africa 1700-1800) 22122 at 1755 by **Robert Hughes** in Liverpool; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.] to Eur 1900-2200) 15343 at 2030 by **Fred Pallant** in Storrington.

Noted in the new **18MHz (15m)** band were R.Norway Int **18.950** (Norw to Asia 1200-1230) 35343 at 1210 in Northampton; Christian Science BC via WSHB Cypress Creek **18.910** (Fr, Eng to E.C.Africa 1600-?) 44333 at 2130 in Rugby.

Broadcasts from far away places also reach the UK in the **17MHz (16m)** band. The most distant comes from R.New Zealand on **17.675** (Eng to Pacific areas 1958-0705?), rated 24243 at 2025 in Storrington. Logged in the morning were R.Romania Int **17.745** (Eng to F.East? 0700-0800), rated 44444 at 0700 in Morden; R.Australia via Shepperton **17.750** (Eng to Asia 0600-1000?) 53443 at 0740 in Herstmonceux; R.Pakistan, Islamabad **17.835** (Ur, Eng to Eur 0800?-1100, 1100-1120) 44444 at 0900 by **Bill Griffith** in W.London; AIR via Delhi? **17.387** (Ind to Indonesia 0845-0945) 55434 at 0904 in Guildford; DW via Rwanda? **17.800** (Eng to Africa 0900-0950) 44344 at 0928 by **Tony Hall** in Freshwater Bay, IoW; BBC via Masirah, Oman **17.790** (Eng to Asia 0915-1100) 24322 at 1022 in Oxted; R.Bulgaria, Sofia **17.500** (Eng to Eur 1100-1200) 54444 at 1107 in Plymouth.

In the afternoon RCI via Sackville, Canada **17.820** (Eng to USA, Mexico, Caribbean 1200-1400) was 34443 at 1215 in Kilkeel; Israel R, Jerusalem **17.535** (Eng to Eur, N.America 1400-1430) 44444 at 1400 in Truro; BBC via Antigua, W.Indies **17.840** (Eng to C/N.America 1400-1700) 23333 at 1405 in NE.Bedford; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1100, 1200-1600) 44333 at 1429 in Newry; R.Bulgaria, Sofia **17.500** (Sp to S.Eur 1600-1700) 44434 at 1630 in Colyton; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 33553 at 1640 in Larnaca, Cyprus; BBC via Rampisham, UK **17.630** (Russ to Russia 1500-1800) 55555 at 1700 in Stalbridge; R.Romania Int **17.735** (Eng to W.Eur 1700-1756) 43333 at 1700 by **Robert Shacklock** in Westwood, Notts; Channel Africa via Meyerton **17.860**

Long Wave Chart

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

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

- Listeners:
 (A) Simon Hockenhull, E.Bristol.
 (B) Sheila Hughes, Morden.
 (C) George Millmore, Wootton, IoW.
 (D) Fred Pallant, Storrington.
 (E) Tom Smyth, Co.Fermanagh.
 (F) Ernie Strong, Ramsey, Cambs.
 (G) Norman Thompson, Oldby.
 (H) Phil Townsend, E.London.
 (I) Fred Wilmshurst, Northampton.

(Eng to W.Africa 1700-1730) 44444 at 1700 by **Vera Brindley** in Woodhall Spa.

Later, Channel Africa via Meyerton was noted on **17.870** (Eng to W.Africa 1800-1830) and rated 35433 at 1801 by **Darren Beasley** in Bridgwater; Israel R, Jerusalem **17.545** (Heb [Home Svc rly] to W.Eur, N.America 0700-?) was 45554 at 1729 in Wallsend; BBC via Ascension Is **17.830** (Eng to Africa 0700-2100) SIO 433 at 1758 in Macclesfield; R.Portugal via Sines **17.745** (Port to C.America 1300-2100) 54444 at 1830 in Liverpool; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200) 54444 at 1900 in Morpeth; R.Netherlands via Bonaire, Ned Antilles **17.605** (Eng to Africa 1730-2025) 44433 at 1955 in Northampton; RCI via Sackville **17.820** (Fr, Eng to Eur, Africa 1900-2200) 55545 at 2125 by **Simon Hockenhull** whilst on holiday in Exmouth; VOA via Greenville, USA **17.725** (Eng to Africa 2000-2200?) 43333 at 2135 in Rugby; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1700-2230?) SIO 444 at 2200 by **Tom Smyth** in Co.Fermanagh.

Although the conditions are improving in the higher frequency bands there is still a high level of activity in the **15MHz (19m)** band. In the morning the BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 0300-0800) was 34543 at 0334 in Wallsend; R.Finland **15.250** (Eng to SW.Eur? 0630-0700) 55555 at 0645 in Herstmonceux; R.Australia via Shepparton on **15.415** (Eng to Asia 0100-0400, 0600-0900) 34333 at 0735 in Woodhall Spa; R.Australia via Shepparton **15.515** (Eng to Pacific areas 0200-0900) 44434 at 0750 in Stalbridge; R.Africa 2, Eq.Guinea **15.185** (Eng to Africa 0700-1100) 25432 at 0758 in Guildford; KTWR Guam **15.330** (Eng to Asia 0800-?) 44333 at 0935 in Morden; V of Armenia, Yerevan **15.270** (Eng to Eur 1000-1039 Sun) 54444 at 1020 in W.London.

During the afternoon the BBC via Cyprus **15.575** (Eng to M.East 0900-1500) was 34433 at 1215 in Kilkeel; Swiss R.Int via ? **15.315** (Ger, Fr, It, Eng to Eur 1000-1230) 33333 at 1220 in Truro; R.Romania Int **15.445** (Eng to N.America? 1300-1356) 44434 at 1313 in Freshwater Bay, IoW; RCI via Sines, Portugal **15.325** (Eng, Fr to Eur, M.East, Africa 1330-1500) 44444 at 1330 by **Gerald Guest** in Dudley; AIR via Delhi **15.020** (Sin to Sri Lanka 1300-1500) 34543 at 1340 in Larnaca, Cyprus; R.Romania Int **15.390** (Eng to Eur 1300-1356) 44444 at 1343 in Plymouth; VOA via Woofferton, UK **15.205** (Eng to Eur, N.Africa, M.East 1500-1700) 43343 at 1622 in Storrington; R.Algeria Int via Bouchaoui **15.160** (Eng to Eur, M.East, N.Africa 1600-1700) 32442 at 1649 in Bridgwate.

Later, Israel R, Jerusalem **15.615** (Heb [Home Svc rly to W.Eur, N.America]) was 44323 at 1830 in Colyton; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200?) 34333 at 1855 in Liverpool; WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-?) 24322 at 1907 in Oxted; R.Kuwait via Sulabiayah **15.505** (Ar to Eur, N.America 1745-2300?) 44344 at 1943 by **Scott Turner** in Rye; Voice of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 44343 at 2003 in Newry; RCI via Sackville **15.325** (Fr, Eng to Eur, Africa 1900-2200) 55444 at 2010 in Northampton; BBC via Ascension Is **15.400** (Eng to Africa 0800-1130, 1500-2300) 53433 at 2032 in E.Bristol; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 55444 at 2200 by **Clare Pinder** in Appleby; LJB, Libya **15.415** (Ar [Home Svc relay]) 33232 at 2230 by **Norman Thompson** in Oadby.

In the **13MHz (22m)** band Vatican R, Italy **13.765** (Eng to Africa 0630-0700) was 44444 at 0630 in Morden; R.Austria Int via Moosbrunn **13.730** (Various) SIO333 at 0746 by **Francis Hearne** in N.Bristol; SRI via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030) 44444 at 0835 in Truro; RCI via Sackville **13.650** (Eng to USA, Caribbean 1200-1400 [1200-1600 Sun]) 44444 at 1235 in Kilkeel; V of Vietnam, Hanoi **13.740** (Eng to Eur 1800-1830) 42333 at 1815 in Colyton; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0000) 24432 at 1836 in Oxted; AIR via Bangalore **13.780** (Eng to NW.Africa 1745-1945) 43343 at 1850 in Liverpool; Swiss R.Int via Fr.Guiana? **13.710** (Eng, Ger, Fr to Africa 2000-2130) 33233 at 2000 in Appleby; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 1900-2200) 54544 at 2035 in Northampton; WEWN Vandiver, USA **13.615** (Eng to N.America ?-2200?) 33333 at 2045 in Stalbridge; R.Damascus, Syria **13.610** (Eng to N.America? 2105-2205) 35433 at 2115 in Newry; V of

Turkey, Ankara **13.640** (Eng to Eur 2200?-2300?) 54554 at 2218 in Bridgwater; Christian Science SWB via WSHB Cyprus Creek, USA **13.770** (Eng to Eur 2100-?), rated 44444 at 2258 by **Bill Griffith** while in Aveiro, N.Portugal.

The occupants of the **11MHz (25m)** band during the morning include R.Japan via ? **11.840** (Jap, Eng to E.Asia 0500-0700), rated 22222 at 0600 in Rugby; V of Greece, Athens **11.645** (Gr, Eng to Eur, Australia 0600-0800) 33333 at 0715 in Plymouth; HCJB Quito, Ecuador **11.950** (Eng to Eur 0700-0900) 44444 at 0740 in Woodhall Spa; V of Mediterranean, Malta via Russia? **11.770** (Eng) 43433 at 0800 in Newry; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N.W.Africa 0600-2000) SIO 333 at 0900 in Co.Fermanagh; BBC via Masirah, Oman **11.760** (Eng to Africa 0300-0800, 0900-1400) 24232 at 1017 in Oxted; R.Korea via Sackville, Canada **11.715** (Eng to E.U.S.A 1030-1100) 24323 at 1035 in Freshwater Bay, IoW.

After mid-day R.Australia via Shepparton **11.660** (Various to Asia 1430?-1700) was 44444 at 1515 in Morpeth; R.Pakistan, Islamabad **11.570** (Eng to M.East 1600-1630) 34433 at 1600 in Liverpool; V of Vietnam, Hanoi **12.070** (Eng to Eur 1700-1730) 44434 at 1700 in Co.Fermanagh.



**Continued
on page 16.**

Local Radio Chart

FreqStation (kHz)	ILR BBC	e.m.r.p Listener (kW)	Station	Freq (kHz)	ILR BBC	e.m.r.p Listener (kW)	Listener
558 Spectrum, London	I	0.80	C.G.I.*.L	1242 Capital G.Maidstone	L	0.32	C.G.I.*.K
585 R.Solway	B	2.00	A.F	1251 C.G.Aberbury,StEd	J	0.76	A.F.I.K
603 Capital G.Litt;brme	I	0.10	A.C.*.G.I.KL	1250 Brunel CG, Bristol	I	1.60	D.F.G
630 R.Bedfordshire(3CR)	B	0.20	C.E.G.I.J*.KL	1260 Marcher G, Wrexham	I	0.64	F
630 R.Cornwall	B	2.00	A.F.G.H*	1260 SabrasSnd,Leicester	I	0.29	F.I.J*.L
657 R.Clwyd	B	2.00	A.F.G.IK	6.York	B	0.50	A
657 R.Cornwall	B	0.50	A.G.M	1278 CI.Gold 1278 W.York	I	0.43	F.I
666 Westward R.Exeter	I	0.34	A.B,C,G,LK	1296 Radio XL,Birmingham	J	5.00	A.F.G.I.L
666 R.York	B	0.80	A.FI	1305 Magic AM,Barnsley	I	0.15	A.F.J*
729 BBC Essex	B	0.20	G.IJ*.KL	1305 Premier via ?	I	0.50	F.G.I
738 Hereford/Worcester	B	0.037	A.B,C,F,I,J*.KL	1323 Capital G.Southwick	I	0.50	F.G
756 R.Cumbria	B	1.00	A.FI	1323 SomersetSnd,Bristol	B	0.63	A.E.*F
756 The Magic 756,Powys	I	0.63	F.G.I.L	1332 Premier, Battersea	I	1.00	F.G.H*
765 BBC Essex	B	0.50	C.F.G.I.L	1332 CI.Gold 1332 Ptbo	I	0.60	A.F.I.J*.L
774 R.Kent	B	0.70	G.IK	1332 Wiltshire Sound	B	0.30	B.F.G
774 R.Leeds	B	0.50	A.F	1359 The Breeze,Chelms'd	I	0.28	F
774 CI.Gold 774,Glos	I	0.14	A.B,F.G,J*.L	1359 CI.Gold 1359,C'try	I	0.27	F.I.J*.L
792 CI.Gold 792,Bedford	I	0.27	E.G.I.K	1359 R.Solent	B	0.85	F.G.I
792 R.Foyles	B	1.00	A.FH	1359 Touch AM,Cardiff	I	0.20	B.F
801 R.Devon & Dorset	B	2.00	A.B,C,D,E,F,G,I*	1368 R.Lincolnshire	B	2.00	I.J*.L
828 CI.Gold 828,Luton	I	0.20	F.IK,L	1368 Southern Counties R	B	0.50	E.G.K
828 Asian Netwk Sedgley	B	0.20	F	1368 Wiltshire Sound	B	0.10	G
828 2CR CG, Bournemouth	I	0.27	G	1377 Asian Sd,Rochdale	I	0.10	F.I*
828 G.Bear 828AM,Ulster	I	0.80	A.F	1413 R.Gloucester via ?	B	?	B,F,I,L
837 R.Cumbria/Furness	B	1.50	A.F	1413 Premier via ?	I	0.50	F.G.H*.I
837 Asian Netwk Leics	B	0.45	B.F.G.IK	1413 Yks Dales R, Skipton	I	0.10	A.FI
855 R.Devon & Dorset	B	1.00	A.G.M	1431 The Breeze,Southend	I	0.35	E.G.IK
855 R.Lancashire	B	1.50	A.FI	1431 CI.Gold,Reading	I	0.14	E.F.IJ
855 R.Norfolk, Postwick	B	1.50	E.G.IK	1449 R.Peterboro/Cambs	B	0.15	A.F.IJ
855 Sunshine 855,Ludlow	I	0.15	E.F.I*.L	1458 R.Cumbria	B	0.90	A.F
973 R.Norfolk,W.Lynn	B	0.30	E.I.KL	1458 R.Devon & Dorset	B	2.00	A.G
936 Brunel CG,W.Wilts	I	0.18	G.IJL	1458 1458 Lite AM, Manch*	I	5.00	EH
936 Yks Dales R,Hawes	I	1.00	A.F	1458 R.Newcastle	B	2.00	F
945 CI.Gold GEM, Derby	I	0.20	A.F,I,J*.L	1458 Sunrise, London	I	50.00	F.G.IJ*.L
945 Capital G,Bexhill	I	0.75	C.F.G.IK	1458 Asian Netwk Langley	B	5.00	B,I,J
954 Westward R,Torquay	I	0.32	G	1476 CountySnd,Guilford	I	0.50	C.F.G.I,K,L
954 CI.Gold 954,H'ford	I	0.16	B.C.F,I,J*.L	1485 CI.Gold,Newbury	I	1.00	E.F.J*.L
963 Asian Sd,E.Lancs	I	0.80	A.F	1485 R.Humberside (Hull)	B	1.00	AJ
963 Liberty R,Hackney	I	1.00	F.G.IJL	1485 R.Merseyside	B	1.20	A.FG
972 Liberty R,Southall	I	1.00	F.G.IJL	1485 Southern Counties R	B	1.00	G.K
991 R.Aberdeen	B	1.00	F	1503 R.Stoke-on-Irene	B	1.00	A.C*,E*,F,G,I,J*,L
991 R.Devon,E.Devon	B	1.00	A.G	1521 Farm 1521,Reigate	I	0.64	F.G.I,K,L
991 Magic AM,Doncaster	I	0.25	I	1530 R.Essex,Southend	B	0.15	G.IK
991 CI.G,Wolverhampton	I	0.09	F,I,J*L	1530 CI.Gold,W.Yorks	I	0.74	A.F.H*
991 C.Gold GEM,Northam	I	0.25	I,J*,KL	1530 CI.Gold,Worcester	I	0.52	F.G.IJ*
999 Magic 9-99,Pstn	I	0.80	A	1548 R.Bristol	B	5.00	D.F.G
999 R.Solent	B	1.00	D,E,G,K	1548 Capital G,London	I	97.50	G.IJL
999 Valley R,Aberdare	I	0.30	F	1548 Magic 1548,Liverpool	I	4.40	A.D*,F
1017 CI.G,Shrewsbury	I	0.70	A.F,K,L	1548 Magic AM,Sheffield	I	0.74	H
1026 R.Cambridgeshire	B	0.50	I,J*,KL	1548 Forth AM, Edinburgh	I	2.20	F
1026 Downtown R,Belfast	I	1.70	A.FH	1557 R.Lancashire	B	0.25	A.F
1026 R.Jersey	B	1.00	D.G	1557 Mellow, Clacton	I	0.125	K
1035 RTL Country 1035	I	1.00	C.G.I,L	1557 CI.Gold C7,N.hant	I	0.76	F.IJ*,L
1035 R.Sheffield	B	1.00	I*	1557 Capital G,Soton	I	0.50	G
1035 N.Sound 2,Aberdeen	I	0.78	A.F	1584 R.Nottingham	B	1.00	E*,F
1035 West Sound AM,Ayr	I	0.32	F	1584 R.Shropshire	B	0.50	A.F
1107 Moray Fb,Inverness	I	1.50	F	1584 Tay,Perth	I	0.21	E*,F
1116 R.Derby	B	1.20	A.F,I,J*,L	1602 R.Kent	B	0.25	E*,F,G,I,K
1116 R.Guernsey	B	0.50	D,E,I				
1116 Royal Y,Bebu Vale	I	0.50	C,F				
1152 CI.G.Aber, Norwich	I	0.83	I,J*				
1152 Clyde 2,Glasgow	I	3.06	F				
1152 BLC 1152 AM	I	23.50	B.G,H*,I,L				
1152 PlymSnd AM,Plymouth	I	0.32	M				
1152 C.I.G,Birmingham	I	3.00	L				
1161 R.Bedfordsire(3CR)	B	0.10	I,J*,KL				
1161 Brunel CI.G,Swindon	I	0.16	B,G				
1161 Magic AM,Humberside	I	0.35	A,F				
1161 Southern Counties R	B	1.00	G				
1161 Tay AM,Dundee	I	1.40	F				
1170 CI.G.Aber,Ipswich	I	0.28	I				
1170 Magic 1170,Stockton	I	0.32	A,F				
1170 Capital G,Potom'th	I	0.50	G				
1170 Signal 2,Stoke-on-T	I	0.20	A				
1170 Swansone Snd,Swansel	I	0.58	D,F				
1170 1170AM,High Wycombe	I	0.25	I,J*,KL				

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

Listeners:-

- (A) Robert Connolly, Kilkeel.
- (B) Francis Hearne, N.Bristol.
- (C) Simon Hockenhull, E.Bristol.
- (D) Simon Hockenhull, while in Exmouth.
- (E) Sheila Hughes, Morden.
- (F) Brian Keyte, while near Strathyre.
- (G) George Millmore, Wootton, IoW.
- (H) Tom Smyth, Co.Fermanagh.
- (I) Ernie Strong, Ramsey, Cambs.
- (J) Norman Thompson, Oadby.
- (K) Phil Townsend, E.London.
- (L) Fred Wilmhurst, Northampton.
- (M) Tom Winzor, Plymouth.

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Bandscan America

There have been some interesting goings on in Cuba in recent weeks. The 'other' Cuban station, Radio Rebelde, has expanded its service. All of its life it's been something of a little cousin to the much bigger Radio Havana Cuba, having only one frequency in the tropical bands (5.025) to call its own. But now it has some new frequencies and more of an international outlook. Rebelde airs a morning program beamed to Central America and the Caribbean from 1100 to 1400 on 6.140 and 9.600 and a one hour evening show for Central America from 0300 to 0400 on 6.120.

Cuba is also playing host to a couple of new transmitters being used as a relay by China Radio International. These are operating on 5.990 and 9.570, the latter, at least, from 1200-1400. Back in late February, Cuba and China signed an agreement by which China would modernise Cuba's short wave transmitters.

No matter the ups and downs of short wave broadcasting elsewhere, there's always a lot of activity from Peru. Here's what's been heard of late:

MHz	Station
3.178	Radio Municipal
3.230	Radio El Sol de los Andes, Juliaca
3.235	Radio Luz y Sonido, Huanuco
4.534	Radio Horizonte, Chiclayo
4.655	Radio Amistad, Lima
4.664	Radio Nuevo Horizonte,
4.748	Radio Huanta 2000, Huanta
4.750	Radio San Francisco, Solano
4.775	Radio Tarma, Tarma
4.780	Radio Satelite, Santa Cruz
4.814	Radio Amazonas, Iquitos
4.824	La Voz de la Selva, Iquitos
4.826	Radio Sicuani, Sicuani
4.840	Radio Andahuaylas, Andahuaylas
4.855	Radio La Hora, Cusco
4.915	Radio Cora, Lima
4.950	Radio Madre de Dios, Puerto Maldonado
4.955	Radio Cultural Amuta, Huanta
4.975	Radio del Pacifico, Lima
4.991	Radio Ancash, Huaraz
4.996	Radio Andina, Huancayo
5.019	Radio Horizonte, Chachapoyas
5.025	Radio Quillabamba, Quillabamba
5.039	Radio Libertad, Junin
5.067	Radio Ondas del Suroriental, Quillabamba
5.305	Radio Paz y Vida, Santa Cruz
5.386	Radio Huarmaca,
5.575	La Voz de San Juan, Lonya Grande
5.637	Radio Peru, San Ignacio
5.678	Radio Ilucan, Cutervo
5.700	Radio Frecuencia, San Ignacio
5.760	Radio Sorochuco, Sorochuco
5.949	Radio Arequipa, Arequipa
5.995	Radio Melodia, Arequipa
6.020	Radio Victoria, Lima
6.046	Radio Santa Rosa, Lima
6.115	Radio Union, Lima
6.174	Radio Tawantinsuyo, Tawantinsuyo
6.188	Radio Oriente, Yurimaguas
6.195	Radio Cusco, Cusco
6.340	Radio Arcangel, San Miguel
6.480	Radio Altura, Huarmaca
6.520	Radio Paucartambo, Cusco
6.537	Radio Huancabamba, Huancabamba
6.675	Radio Super Nueva Sensacion, Huancabamba
6.690	Estudio 2000
6.798	Ondas del Rio Mayo, Nuevo Cajamarca
6.987	Radio San Miguel de el Faique
7.003	La Voz de Huarinjas, Huancabamba
9.722	Radio Victoria, Lima

Frequencies of Peruvian stations tend to vary, even from day to day, so we've rounded off the frequencies given here to the nearest hertz. Most stations sign on around 1000 to 1100 and go off the air anywhere from 0000 to 0600. The older, more established stations tend to have longer broadcast days.

DXers continue to hear a variety of domestic Argentine a.m. and f.m. stations relayed on short wave at various times. Apparently, there is no particular pattern; one just has to tune in on 15.820 upper (or lower) sideband and wait for something to

appear. Lately, people are hearing FM Ciudad B.A. (Buenos Aires), locally on 88.9 FM; Radio Diez (710 AM); Radio Mitre (FM-80); FM Soldados 88.9; Radio Uno (103.1); Feeling FM 100.7; Cadena Cien (FM-100) and the longest running of them all, Radio Rivadavia.

As with the Peruvian stations, frequencies tend to vary so those in the list are rounded off to the nearest kiloHertz. Radio Mexico International has activated another of its assigned frequencies; 5.985 is now in operation, in parallel to long used 9.705. Meantime, the other Mexican stations continue to be active on a regular basis: Radio Transcontinental de America on 4.800, Radio Mil, 6.010 and Radio Educacion on 6.185. Less so is Radio Universidad on 9.600.

Recent Additions

Recent additions to the expanded medium wave band in the United States include these stations:

KTBK in Sherman, Texas on 1700 with a sports talk format.

WTIR in Winter Garden, FL on 1680 with a travel information format.

WTTM, Princeton, NJ on 1680 with all sports.

KAZP, Bellevue, Nebraska, 1620, relaying 1180 MW with ESPN sports network.

Here's what's been heard from Bolivia lately:

MHz	Station
3.310	Radio Mosoj Chaski, Cochabamba
3.492	Radioemisora Padilla, Padilla
4.472	Radio Movima, Santa Ana
4.600	Radio Villamonte, Villamonte
4.631	Radio 11 de Octubre
4.649	Radio Santa Ana, Santa Ana
4.702	Radio Eco San Borja, San Borja
4.720	Radio Abaroa, Riberalta
4.778	Radio Andes, Uyuni
4.940	Radio Norte, Montero
4.945	Radio Illimani, La Paz
4.965	Radio Juan XXIII, San Ignacio de Velasco
5.927	Radiodifusoras Mineria, Oruro
5.953	Radio Pio Doce, Siglo XX
6.015	Radio El Mundo, Santa Cruz
6.085	Radio San Gabriel, La Paz
6.155	Radio Fides, La Paz
6.155	Radio Fides, Cochabamba

Station News

You have a chance at hearing a local Hawaiian FM station if you check LeSea Broadcasting's KWHR on 11.565. During the hours when no time has been sold to outside organisations or no in-house (LeSea-produced) original programming is being broadcast, the station airs one of the local stations in the town of Naalehu, where KWHR is based. There's no way of knowing when these situations will arise, so you just have to listen and hope to get lucky.

New in Honduras is Radio Litoral on 4.830. That's an unfortunate choice of frequency since that spot is normally loudly occupied by Radio Tachira in Venezuela. If you do manage to log the Honduran the address for reports is **Apartado 878, Le Ceiba, Honduras**. This station is backed by a missionary group which has expansion plans.

Religious broadcaster KNLS in Alaska, has plans to add a second 100kW transmitter. The site, at Anchor Point, can accommodate three transmitter/antenna systems.

That's our look at short wave and related radio happenings in the Americas (and the Pacific Ocean) for this time. Thank you, and good listening!



Colyton; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) 45554 at 1733 in Wallsend; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 55555 at 1804 in Bridgwater; V of Mediterranean, Malta via Russia **12.060** (Eng to Eur 1900-2000) 44444 at 1900 in Dudley; Israel R, Jerusalem **11.605** (Eng to Eur, N.America 1900-1930) 55544 at 1910 in Northampton; R.Nederlands via Flevoland **11.655** (Eng to Africa 1730-2025) 33222 at 1952 in Appleby; AIR via Bangalore **11.620** (Eng, Hin to Eur 1745-2230) 44434 at 2045 in Stalbridge; R.Nac da Amazonia, Brazil **11.780** (Port 0900-0200) 43433 at 2143 in Guildford; R.Bulgaria, Sofia **11.720** (Eng to Eur 2100-2200) 43344 at 2145 in Rye; R.Australia via Shepparton **11.880** (Eng to Pacific areas 1700-2200?) 25433 at 2145 in Exmouth; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2200) 44333 at 2145 in Morden; BBC via Kranji, Singapore **11.955** (Eng to Asia 2200-0000) 33443 at 2210 in Kilkeel; R.Damascus, Syria **12.085** (Ar to N.America 2215-2315) 34343 at 2215 in Oadby; BBC via Skelton, UK **11.835** (Eng to W.Africa 1900-2300) 44444 at 2255 in

Aveiro, Portugal.

In the **9MHz (31m)** band R.New Zealand's broadcast to Pacific areas on **9.700** (Eng 0706-1015) was rated 33543 at 0724 in Wallsend & 22222 at 0810 in Truro. Also received during the morning were WYFR Okeechobee, USA **9.985** (Eng to Eur, Africa 0400-0800), rated 44444 at 0557 in Rugby; TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0700-0850?) 55555 at 0719 in Plymouth; Swiss R.Int via Montsinery, Fr.Guiana **9.885** (Eng, It, Ger, Fr to Australia 0830-1030) 25312 at 0830 in Newry; V of Turkey, Ankara **9.460** (Tur to Eur, N.America 0800-2200) 24232 at 0924 in Oxted; R.Nederlands via Bonaire, Ned.Antilles **9.820** (Eng to Pacific 0930-1125) SIO 222 at 0930 in Co.Fermanagh; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 44334 at 0953 in Freshwater Bay, IoW; R.Nederlands via Wertzachtal **9.860** (Eng to Eur 1130-1325) 55555 at 1135 in Herstmonceux.

During the evening VOA via Morocco? **9.760** (Eng to Eur, M.East, N.Africa 1700-2200) was 32333 at 1710 in Stalbridge; R.Vlaanderen Int, Belgium **9.925** (Eng to Eur,

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Wurzburg (BR)	Germany	0.2	E*	837	Nancy	France	200	E*, H*
531	Ain Beida	Algeria	600/300	I*	846	Rome	Italy	1200	E*, F*
531	Torshavn	Faeroe Is.	100	D	855	Berlin	Germany	100	E*
531	Berg	Germany	20	E*, F*, J*	855	ENR1 via ?	Spain	?	E*, F*, J*, J*, M*
531	RNE1 via ?	Spain	?	I*	864	Santah	Egypt	500	E*, F*, J*
531	Beromunster	Switzerland	500	E*, M	864	Paris	France	300	B,C,F,I,K,M
540	Wavre	Belgium	150/50	C*, E*, F*, J*, K,M	864	Socuellamos(RNE1)	Spain	2	F*
540	Sidi Bernour	Morocco	600	E*, F*, J*	873	Frankfurt(ANF)	Germany	150	E*, F*
549	Les Trembles	Algeria	600	F*, J*	873	Enniskillen(R.U)	UK	1	D,E*, H*, J*
549	Sasnovy	Belarus	1000	I	882	COPE via ?	Spain	?	E*, F*, J*
549	Thurnau (DLF)	Germany	200	E*, F*, I,K,M	882	Penrith(BBCWales)	UK	10	D
558	Espoo	Finland	50	I*, J*	882	Washford(BBCWales)	UK	100	F,H,I,K,M
558	RNE5 via ?	Spain	?	E*, F*	891	Algers	Algeria	600/300	E*, F*, J*, J*
558	Valencia(RNE5)	Spain	20	I	891	Huisberg	Netherlands	20	E*
567	Tullamore(RTE1)	Eire	500	A,B,D,H,J*, K,M	900	Bmro(Cro2)	Czech Rep	25	E*, F*
576	Muhlacker(SDR)	Germany	500	E*, I*	900	Milan	Italy	600	A*, I*, J*
576	Riga	Latvia	500	F*	900	COPE via ?	Spain	?	F*, I*
576	Barcelona(RNE5)	Spain	50	I*, J*	909	Lisnagarvey(BBC5)	N.Ireland	10	H
585	Orf Wien	Austria	600	F*, I,M	909	B'mans PdBBC5	UK	140	F,H,J*, M
585	Panist(RP)	France	8	C,F,I,K	918	Domzale	Slovenia	600/100	E*, F*, J*, J*
585	Madrid(RNE1)	Spain	200	A*, E*, F*, J*, M*	918	Madrid(R.Int)	Spain	20	I*
585	Dumfries(BBCScot)	UK	2	D,E*	927	Wolvertem	Belgium	300	C,E,F,I,J,K,M
594	Frankfurt(HR)	Germany	1000/400	E*, F*, K,M	936	Bremen	Germany	100	E*, H
594	Oujda	Morocco	100	E*, I*, M*	936	Venezia	Italy	20	F*
594	Muge	Portugal	100	I*	936	RNE5 via ?	Spain	?	I*
603	Lyon	France	300	A*	945	Toulouse	France	300	E*, J*
603	Seville(RNE5)	Spain	50	A*, F*	954	Brno (CRO2)	Czech Rep.	200	E*, F*, J*
603	Newcastle(BBC)	UK	2	A,D,E*, I	954	Madrid(CI)	Spain	20	E*, F*
612	Athlone(RTE2)	Eire	100	A,D,F,H,J*, K,M	963	Pori	Finland	600	E*, F*, I*, M*
612	RNE1 via ?	Spain	10	F*, I*	963	Tir Chonall	Eire	10	F*, H
621	Wavre	Belgium	80	C,E*, F,I,K,M	972	Hamburg(NDR)	Germany	300	E*, F*, M*
621	RNE1 via ?	Spain	10	I*	972	RNE1 via ?	Spain	?	F*
621	Barcelona(DCR)	Spain	50	E*, F*	972	Nikolayev	Ukraine	500	I*
621	Orfordness(BBC)	UK	500	B,D,E*, F,I,J,M	981	Alger	Algeria	600/300	I*, M*
648	Kharvik	Ukraine	150	I*	981	Algeria	Algeria	600/300	I*, M*
657	Madrid(RNE5)	Spain	20	E*, F*, J*	990	Berlin	Germany	300	E*, F*, J*
657	Wrexham(BBCWales)	UK	2	D,E*, J,M	990	R.Bilbao(SER)	Spain	10	F*, I*
666	Messkirch/Rohrd(SWR)	Germany	150	F*	990	Redmoss(BBC)	UK	1	E*, H
666	Sitkuna(R.Vilnius)	Lithuania	500	E*	990	Town(BBC)	UK	1	D
666	Lisbon	Portugal	135	F*, I*	999	Schwerin(RIAS)	Germany	20	E*
675	Marseille	France	600	F*	999	Madrid(COPE)	Spain	50	I*, M*
675	Lopic(R10 Gold)	Holland	120	A,C,E*, F,H,I,J,*	1008	SER via ?	Canaries/Spain	?	F*, I*
684	Avala(Beograd-1)	Yugoslavia	2000	A*, E*	1008	Flevol(Hvl-5)	Holland	400	A,C,E*, F,I,K,M*
684	Droitwich(BBC)	UK	150	F,H,J*, M,N	1017	Rheinsender(SWF)	Germany	600	E*, F*, H,I*
702	Flensburg(NDR)	Germany	5	E*, F*	1017	RNE5 via ?	Spain	?	F*
702	Monte Carlo	Monaco	40	I*	1035	Tallinn	Estonia	500	F*
702	Sebaa-Aiouan	Morocco	140	A*	1035	Lisbon(Prog3)	Portugal	120	E*
711	Rennes 1	France	100	B,C,E*, F,I,K,M	1044	Dresden(MDR)	Germany	20	E*, I*
711	Laayoune	Morocco	600	F*, J*	1044	SER via ?	Spain	?	E*, F*, J*
720	Langenberg	Germany	200	I*	1053	Talk R.UK via ?	UK	2	F*, H,I,M
720	Lisnagarvey(BBC4)	N.Ireland	10	D,F*, H,J*	1062	Kalundborg	Denmark	250	E*, I*, M*
720	Lots Rd(LdnBBC4)	UK	0.5	FIM	1062	R.Uno via ?	Italy	?	E*, F*, I*
729	Cork(RTE1)	Eire	10	D,E*, H,J	1071	R.France via ?	France	?	E*, F*
729	RNE1 via ?	Spain	?	E*, F*, I*, M*	1071	Bilbao(EI)	Spain	5	M*
738	Paris	France	4	F,J*	1071	Talk Radio UK via ?	UK	?	H,I,M
738	Barcelona(RNE1)	Spain	500	E*, F*, J*	1080	SER via ?	Spain	?	E*, F*, I*
747	Flevol(Hvl2)	Holland	400	A,C,E*, F,I,K,M	1089	Talk Radio UK via ?	UK	?	F,H,I,M
756	Braunschweig(DLF)	Germany	800/200	E*, F*, H,J*	1098	Nitra(Jarok)	Slovakia	1500	E*, F*, J*, M*
756	Bitburg(EI)	Spain	5	F*, I*	1098	RNE5 via ?	Spain	?	I*
765	Sottens	Switzerland	500	E*, F*	1107	AFN via ?	Germany	10	E*
774	Enniskillen(BBC)	N.Ireland	1	D,E*, H	1107	Talk R.UK via ?	UK	?	E*, F,I,M
774	RNE1 via ?	Spain	?	E*, F*, I*, M*	1116	Bari	Italy	150	I*
774	Leipzig(MDR)	Germany	100	E*, F*, J*	1125	La Louviere	Belgium	20	E*, F*, M*
783	Miramar(R.Porte)	Portugal	100	F*	1125	Deancove	Croatia	100	A*
792	Limoges	France	300	F,J*	1125	RNE5 via ?	Spain	?	E*, J*
792	Lingen(NDR)	Germany	5	E*, F*	1125	Llandrindod Wells	UK	1	D,H,I*
792	Sevilla(SER)	Spain	20	F*	1134	COPE via ?	Spain	2	F*
792	Londonderry(BBC)	UK	1	H	1134	Zadar(Croatian R)	Yugoslavia	600/1200	A*, E*, F*, I*, M*
801	Munchen-Ismaning	Germany	300	E*, F*, I*, J,*	1143	AFN via ?	Germany	1	E*, F*
801	RNE1 via ?	Spain	?	F*	1143	COPE via ?	Spain	2	E*, F*
810	Madrid(SER)	Spain	20	F*	1161	Ain-Salah	Algeria	5	F*
810	Westerglen(BBCScot)	UK	100	D,F*, H,I,M	1179	SER via ?	Spain	?	*
819	Batra	Egypt	450	I*	1179	Solvesborg	Sweden	600	E*, F*, H,I,M*
819	Toulouse	France	50	E*	1188	Kuurne	Belgium	5	E*, F*, I*, K
819	S.Sebastian(EI)	Spain	5	F*, I*	1188	Szolnok	Hungary	135	F*
828	Rotterdam	Holland	20	E*, K	1197	Munich(VDA)	Germany	30	E*
828	Virgin via ?	UK	?	F*	1197	Virgin via ?	UK	?	E*, F*, H,I,M
828	Levylstad	Holland	50	E*	1215	Flake	Albania	500	C*
828	COPE via ?	Spain	?	I*	1215	Virgin via ?	UK	?	F,H,I,M,N
828	Liege	Belgium	5	F*	1224	Levylstad	Holland	50	E*
828	Virgin via ?	UK	?	E*	1224	COPE via ?	Spain	?	I*
828	Virgin via ?	UK	?	E*	1233	Liege	Belgium	5	F*
828	Virgin via ?	UK	?	E*	1233	Virgin via ?	UK	?	E*, H,I,M

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

Listeners:-

- (A) Simon Hockenhull, Bristol.
- (B) Simon Hockenhull, while in Exmouth.
- (C) Rhodriek Illman, Oxted.
- (D) Brian Keyte, while near Strathyre.
- (E) Eddie McKeown, Newry.
- (F) George Millmore, Wootton IoW.
- (G) Clare Pinder, while in Appleby.
- (H) Tom Smyth, Co.Fermanagh
- (I) Ernie Strong, Ramsey, Cambs.
- (J) Norman Thompson, Oadby.
- (K) Phil Townsend, E.London.
- (L) Scott Turner, Rye.
- (M) Fred Wilmhurst, Northampton.
- (N) Tom Winzor, Plymouth.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
3.200	TWR Manzini	Swaziland	0310	C	4.835	R.Tezulurian, Coban	Guatemala	0020	A	5.030	AWR Latin America	Costa Rica	0200	A
3.210	REE via Costa Rica	Costa Rica	0322	C	4.835	RTM Bamako	Mali	2129	L,P	5.047	R.Togo, Lome	Togo	2050	A,E,G,K,L,P
3.255	BBC via Meyerton	S.Africa	2110	A,C,G,K,P	4.840	AIR Bombay	India	0025	A	5.050	R.Aizawl	India	0205	A
3.270	Namibian BC, Windhoek	Namibia	1907	A,C,G,K	4.845	RTM Kuala Lumpur	Malaysia	1919	G	5.050	R.Tanzania	Tanzania	2028	G,K,L
3.290	Namibian BC, Windhoek	Namibia	1908	A,G	4.850	DRTM Nouakchott	Mauritania	2117	A,I	5.055	RFO Cayenne(Matoury)	French Guiana	0452	A,C
3.306	ZBC Prog 2	Zimbabwe	2037	A,G	4.860	R.Yaounde	Cameroon	2025	A,F,P	5.075	Caracol Bogata	Colombia	0515	A,E
3.320	SABC (RSG) Meyerton	S.Africa	1920	A,G,K	4.865	CNR 1	China	2145	K	5.100	R.Liberia, Totota	Liberia	2257	C,E
3.335	CBS Taipei	Taiwan	1950	G,H,K	4.870	AIR Delhi	India	1904	G					
3.345	AIR Jaipur	India	0050	A	4.885	PSB Lanzhou	China	0105	A					
3.356	R.Botswana	Botswana	1916	G	4.885	Voz del Upano	Ecuador	0030	A					
3.365	GBC R-2	Ghana	2022	A,E,G,K,L	4.890	R.Difusora Acreana	Brazil	0035	A					
3.395	PRI Tanjung Karang	Indonesia	0055	A	4.910	KBC East Sce Nairobi	Kenya	1839	F,G					
3.915	BBC via Kranji	Singapore	2110	A,C,L,P	4.915	Tenant Creek	Australia	2136	L					
3.955	BBC via Skelton	England	2029	A,E,F,J,M,P	4.920	GBC-1, Accra	Ghana	2029	A,E,F,G,L,P					
3.970	R.Korea via Skelton	England	2100	A,I,N	4.920	R.Quito, Quito	Ecuador	0343	C					
3.975	R.Budapest	Hungary	0000	A,C,E,F,I,J,K,N	4.930	AIR Chennai	India	0030	A					
3.985	Nexus, Milan	Italy	2030	A,F,K	4.935	R.Internacional	Honduras	0448	C					
3.995	DW via Julich	Germany	2010	A,E,P	4.940	KBC Gen Sce Nairobi	Kenya	1840	A,G,I,L					
4.005	Vatican R.	Italy	2115	A,E,F,J,K,P	4.945	AIR Guwahati	India	0110	A					
4.755	R.Educ CP Grande	Brazil	0155	A	4.950	R.Ulimani, La Paz	Bolivia	0115	A					
4.760	AIR Port Blair	India	0015	A	4.950	AIR Srinagar	India	0025	A					
4.785	R.Rural, Santarem	Brazil	0020	A	4.955	VOA via Sao Tome	Sao Tome	2042	F,G,I,L					
4.770	FRCN Kaduna	Nigeria	1955		4.965	R.Nac de Colombia	Colombia	0455	A,C					
4.775	A,C,E,F,G,K,L,P				4.965	R.Alvorada	Brazil	0115	A					
4.783	AIR Imphal	India	0100	A	4.975	Christian Voice	Zambia	2135	A,K,L,N					
4.790	RTM Bamako	Mali	2045	A,G	4.980	R.Uganda, Kampala	Uganda	2038	F,G,L,N,O					
4.800	Azad Kashmir R.	Pakistan	2050	A,K	4.980	PBS Xinjiang, Urumqi	China	0110	A					
4.815	LNB5 Maseru	Lesotho	0335	C	4.985	Ecos del Torbes	Venezuela	0340	A,B,C,E					
4.815	R.Difusora, Londrina	Brazil	0025	A	4.985	R.Brazil Central	Brazil	2325	A,E,P					
4.820	R.diff TV Burkina	Ouagadougou	2132	L	5.010	AIR Thiru'puram	India	0045	A					
4.830	R.Botswana, Gaberone	Botswana	2119	A,C,L	5.020	La V du Sahel, Niamey	Niger	2055	K					
4.835	R.Tachira	Venezuela	0105	A	5.025	ABC Katherine	Australia	2133	L					
	ABC-Alice Springs	Australia	2132	L	5.025	R.Rebelde, Habana	Cuba	0330	A,C					
					5.025	R.Uganda, Kampala	Uganda	1830	F,G					

M.East 1730-1800) 44444 at 1730 in Morden; BBC via Meyerton, S.Africa **9.520** (Eng to S.Africa 1730-1745) 43343 at 1740 in Liverpool; R.Australia via Shepparton 9.500 (Eng to Asia, Pacific 1430?-2130) 42344 at 1800 in Dudley; VOIRI Tehran, Iran **9.022** (Ger, Fr, Eng to Eur 1730-2030) 43343 at 1847 in Colyton; Africa No.1, Gabon **9.580** (Fr to C.Africa 05007-2300?) 43443 at 1854 in Storrington; China R.Int via ? **9.535** (Eng to Eur 2000-2200?) 55444 at 2000 in Appleby.

Later, R.Cairo, Egypt **9.990** (Various to Eur 1900-2200?) was 55544 at 2129 in Bridgwater; AIR via Bangalore **9.950** (Eng to Eur 2045-2230) 55444 at 2135 in Northampton; R.Tirana, Albania **9.635** (Eng to Eur 2130-2200) 34333 at 2138 in Woodhall Spa; R.Sweden **9.430** (Eng to Eur, Africa, M.East 2130-2200) 44444 at 2150 in Kilkeel; RCI via Sackville **9.755** (Eng, Fr [CBC progs] to USA, Caribbean 2200-0300) 54444 at 2217 by **Martin Cowin** in Kirkby Stephen; V of Greece, Athens **9.425** (Gr, Eng to Australia 2100-2250) SIO333 at 2244 in N.Bristol; R.Nederlands via Bonaire, Ned.Antilles **9.845** (Eng to N.America 2330-0125) 45444 at 2355 in E.Bristol.

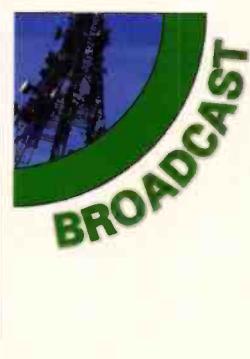
Some of the broadcasts to Europe in the **7MHz (41m)** band were mentioned in the reports: Voice of the Mediterranean, Malta via Russia? **7.155** (Eng) was rated 41432 at 0530 in Newry; R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700) 54533 at 0620 in Herstmonceux; WYFR via Okeechobee, USA **7.355** (Eng 0600-0800, also to Africa) 54444 at 0718 in Plymouth; AWR via Forli, Italy **7.230** (Eng 0930-1000 Sun) 33222 at 0930 in Appleby; R.Polonia (Polish R), Warsaw **7.285** (Eng 1700-1800) 44434 at 1717 in Woodhall Spa; R.Bulgaria, Sofia **7.500** (Bul 1800-1900) 54555 at 1800 in W.London; V of Greece, Athens **7.450** (Gr, Eng 1800-2050) 44544 at 1815 in Bridgwater; R.Slovakia Int **7.345** (Eng 1830-1857) 44444 at 1840 in Colyton; R.Thailand via Udon Thani **7.210** (Eng 1900-1958) 22222 at 1940 in Truro; R.Minsk, Belarus **7.210** (Russ) 53343 at 2005 in Liverpool; BBC via Skelton, UK **7.325** (Eng 2000-2200) 55444 at 2029 in Freshwater Bay, IoW; RCI via Skelton, UK **7.235** (Fr, Eng 1900-2200) 44444 at 2100 in Dudley; R.Ext.España **7.275** (Sp 1700-2230?) 44434 at 2135 in Stalbridge; AIR via Bangalore **7.410** (Hi, Eng 1745-2230) 44434 at 2205 in Exmouth.

Also noted were VOA via Woofferton, UK **7.170** (Eng to Eur, N.Africa 0400-0700), rated 44333 at 0636 in Morden; VOA via ? **7.195** (Eng to Africa 0500-0700) 43333 at 0600 in Rugby; BBC via Skelton, UK **7.145** (Eng to C.America? 0600-0805) SIO 444 at 0700 in Co.Fermanagh; WJCR Upton, USA **7.490** (Eng to E.USA 24hrs) rated 24332 at 0742 in Oxted; RTV Tunisienne, Tunisia **7.475** (Ar) 55434 at 2043 in Guildford; AIR via Delhi **7.150** (Eng to Pacific areas 2045-2230) 44444 at 2145 in Kilkeel; VOA via Botswana **7.415** (Eng to Africa 1800-2230?) 54444 at 2150 in Kirkby Stephen; BBC via Kranji, Singapore **7.110**

(Eng to Asia 2200-0045) 44444 at 2250 in Northampton.

The broadcasters using the **6MHz (49m)** band to reach listeners in Europe include R.Japan via Skelton, UK **5.975** (Eng 0600-0700), rated 55555 at 0615 in Herstmonceux; BBC via Rampisham & Skelton, UK **6.195** (Eng 0300-0700, 1500-1700, 1800-2200) 54444 at 0639 in Plymouth; Suddeutscher Rundfunk, Muhlacker **6.030** (Ger) 34433 at 1029 in Oxted; DW via Julich? **6.140** (Eng Service) SIO 222 at 1000 in Co.Fermanagh; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 55444 at 1708 in Northampton; R.Pyongyang, Korea **6.575** (Eng 1800-1855) 43433 at 1800 in W.London; R.Finland via Pori **6.135** (Eng 1900-1930) 53553 at 1907 in Bridgwater; R.Vlaanderen Int, Brussels **5.960** (Eng 1930-1956) 44434 at 1935 in Stalbridge; R.Sweden via Horby **6.065** (Eng 1930-2000) SIO 555 at 1952 in Kirkby Stephen; R.Prague, Czech Rep. **5.930** (Eng 2000-2027) 54444 at 2000 in NE.Bedford; China R.Int via Russia? **6.950** (Ger, Eng 1900-2157) 54344 at 2008 in Freshwater Bay, IoW; R.Korea via Skelton, UK **6.145** (Fr, Ger 1900-2100) 54444 at 2020 in Liverpool; RCI via Skelton, UK **5.995** (Fr, Eng 1900-2100) 54534 at 2025 in E.Bristol; R.Ukraine Int, Kiev **5.905** (Eng 2100-2200) 44444 at 2120 in Morden; Deutschland R, Berlin **6.005** (Ger 24hrs) 44444 at 2200 in Rugby.

Whilst beaming to other areas the BBC via Antigua, W.Indies **5.975** (Eng to C/N.America 2100-0800) was 44444 at 0045 in Kilkeel; R.Slovakia Int **5.930** (Eng to N.America 0100-0127) SIO 444 at 0116 in N.Bristol; R.Habana, Cuba **6.000** (Eng to N.America 0100-0500) 43343 at 0220 in Morpeth; RE Madrid **6.055** (Eng to America 0500-0600) 44333 at 0500 in Appleby; WWCR Nashville, USA **5.935** (Eng to USA 0100-1400) 23122 at 0700 in Colyton.



The SINPO code is used for broadcast station reports, here is an explanation of the code.

Signal Strength	Noise	Overall Merit
5 excellent	5 nil	5 excellent
4 good	4 slight	4 good
3 fair	3 moderate	3 fair
2 poor	2 severe	2 poor
1 barely audible	1 extreme	1 unusable
Interference	Propagation	
5 nil	5 nil	
4 slight	4 slight	
3 moderate	3 moderate	
2 severe	2 severe	
1 extreme	1 extreme	

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Richard Newton G0RSN puts the Icom IC-706MkII through its paces whilst taking part in the 1999 PW QRP Contest and reviews its performance for you in the September PW.

ANTENNAS IN ACTION

Tex Swann G1TEX gives you more goodies on antennas and other antenna related hints, tips, news and mini reviews.

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Build your very own 'Modulation & Ripple Level Meter' courtesy of Jim Brett G0TFP; play 'I Spy With My Little Set' with Ben Nock G4BXD as he puts the Spy Set under the Radio Amateur's microscope; join Phil Whitchurch G3SWH as takes you through his DXpedition to Les Iles Glénan, in the Bay of Biscay; collect old QSL cards with the help of John Heys G3BDQ and discover the secrets of v.h.f. propagation with Patrick Alley GW3KJW's article on 'Red Sprites And Blue Jets'.

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Comments from John Griffiths

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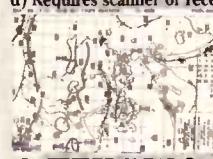
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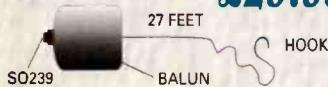
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***Compatible Receivers:**

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7000, 7100, 8500, 9000, R10
AOR

8000, 8000B, 8200

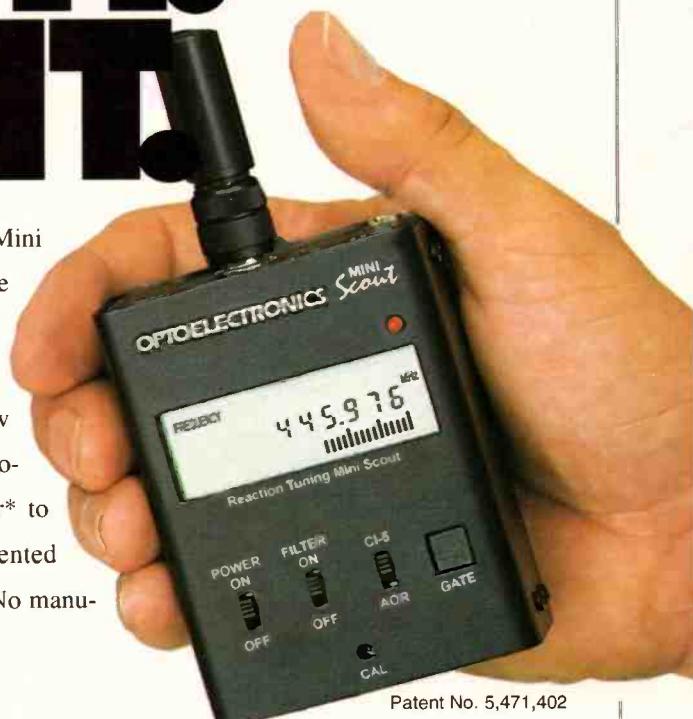
Optoelectronics

Optocom, R11

Radio Shack

Pro2005/6 with OS456/Lite
Pro 2035/42 with OS535

No modifications necessary. Interface cables required.



Patent No. 5,471,402

Specifications	Scout	Mini Scout
10MHz - 1.4GHz	•	•
Reaction Tune	•	•
LCD Display	•	•
<3mV Sensitivity	•	•
Signal Strength Bargraph	•	•
Filter Mode	•	•
Capture Mode	•	•
Backlight	•	•
Beeper	•	•
Vibrator	•	•
400 Memories	•	•
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Patent No. 5,471,402 AR8200 Not Included



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Old Lessons, often repeated for the beginner

Having written about the R-820 and R-1000 receivers, it was almost inevitable that I would try to complete the Trio (Ho-Hum, what a feeble pun) by taking a second glance at the little R-600.

Firstly, let me here tell you a story about last month's issue of the magazine in which we had pretty pictures of the R-1000. When I submitted the text, I assumed that the magazine would have loads of pictures of the R-1000 on file, but they couldn't be located. The Editor confidently contacted the major short wave dealers in an attempt to locate a suitable second-hand R-1000 to be loaned for photography, but guess what? there were no second-hand R-1000s to be found, and we eventually resorted to photographing my beat-up re-sprayed salt stained sample. "Dirty British coaster with a salt caked R-1000, butting through the Channel in the mad March days".

Bearing in mind the fact that I know how many thousands of R-1000 receivers we sold, I am truly amazed that there are none to be found on the second-hand market, but just ask yourself 'Why?' The answer has to be that the R-1000 was such a satisfying receiver that no-one in their right mind would think of getting rid of one, and the same applies to the R-600. When was the last time you saw an R-600 available as a second-hand item?

Same Team

As one might expect, the R-600 was designed by the same team which produced the R-1000, and many of the good features of the R-1000 can be found when one examines the circuits of the two receivers side by side. The R-600 was produced to sell at a lower price than the R-1000, but the designers were extremely clever in their cost cutting, and the overall performance of the R-600 was very similar to its big brother. Perhaps big brother should be quantified, because although the R-600 looked smaller than the R-1000, it was actually the same size within a few millimetres.

The front panel was much simpler, which allowed Trio to bring the loudspeaker from the top case down on to the front panel which made for better

sounding audio. The space for the loudspeaker was generated by not providing the clock and timer functions of the R-1000, and this meant that the large MSM 5524 clock/frequency readout i.c. was not fitted. However, Trio did have to provide frequency readout and used a simpler device from the same family, the M54281P containing a frequency counter with programmable i.f. offset. This was used to drive an l.e.d. display rather than the gas discharge tube used in the R-1000, which necessitated the use of two Darlington driver arrays between the counter and the display.

The resultant five digit green readout was very effective, although by today's standards of 10Hz readout on everything (even if it isn't necessarily telling you the truth), reading to 1kHz might seem strange. However, it's only the radio amateur who will spend the day discussing whether the net is on 3750 or 3749.09765kHz; for the sensible listener, readout to 1kHz is perfectly satisfactory. "Surely in vain the net is spread" (Prov. 1,17).

Simple Operation

Operationally, the R-600 couldn't be simpler, with the tuning carried out as in the R-1000 using a 'MHz' rotary switch and an analogue tuning dial covering 0 to 1MHz to fill in the steps. Unlike the

JW continues his popular look at second-hand bargain receivers. This month it's the turn of Trio's R-600 to be under the spotlight.



R-1000, the back-lit 0 to 1000 analogue dial is not provided, so loss of the digital display would leave you flying blind. The only other rotary controls are 'Volume' and 'Tone' - no r.f. gain control for the purist.

Mode selection is by a rotary switch giving a.m. (w), a.m. (n), u.s.b. and l.s.b. Two i.f. bandwidths of 2.7 and 6kHz are used, and there is no provision for fitting additional filters, although any fairly handy user could easily fit better specification 455kHz filters to sharpen up the skirt selectivity. A very nice analogue moving coil 'S'-meter is fitted, and is easily read, also being back-lit as in the R-1000.

The rear panel is very simply furnished, carrying the a.c. mains input and voltage selector, a single SO-239 connector for 50Ω antennas, and a dual impedance (500/50Ω) terminal block for wire antenna connection. No provision is made for switching external equipment such as a tape recorder, although a fixed level 'Record' output is provided on the front panel. Let's go inside and take a look at the signal path.

From both 50Ω antenna connectors the signal feeds a single 50 to 500Ω wide band transformer and then passes to an in-line fuse. I can only guess that the occasional burnt out input transformers experienced in the R-1000 prompted Trio to fit a safety fuse. Good idea, except

a little relay preceded the usual Trio carefully designed bank of front-end band pass filters: six in all splitting up the h.f. bands and giving a helping hand to second order intermodulation performance. A sharp notch filter was fitted before the filters covering 2 to 30MHz, and although no explanation was ever offered as to its function, the values of components used suggest that it was to eliminate medium wave signals from the front-end of the receiver when it was tuning above 1.6MHz.

Never did quite understand this passion for removing medium wave signals, unless it was to counter some problem encountered in Germany with stations located close to the (then) border with Eastern Germany which punched holes in the ionosphere with their massive propaganda transmitters. Who remembers the Voice of Free Europe?

Then on to a virtually identical front-end arrangement to that in the R-1000, with a dual gate f.e.t. r.f. amplifier into a single gate f.e.t. source follower to the first mixer, a push pull pair of dual gate m.o.s.f.e.t.s with a nice touch provided in a mixer balance pot. For the handy men to twiddle.

Following the first mixer conversion to 40.455MHz, came another push pull f.e.t. mixer taking the signal down to 10.455MHz - why? I don't know. Because there then followed a third mixer to get the signal down to the familiar 455kHz where all the work was being done. Filtering at 40.455MHz was by simple under coupled transformers, which could be delightfully aligned by the unwary into providing a single peak and no pass band to speak of. I often thought of sticking a label across the tops of these coils saying 'Abandon hope all ye who enter here'. 10.455MHz filtering was by a simple two pole crystal filter which defined the basic i.f. bandwidth for the later stages.

A very good noise blower was provided at the start of the 455kHz i.f. chain, using a push-pull diode gate to accomplish the hole punching in the received signal. On to the two switched i.f. filters as already mentioned, giving i.f. bandwidths of nominally 2.7 and 6kHz, and two stages of amplification at 455kHz using the ubiquitous 3SK73 dual gate f.e.t. in each stage. At the end of the 455kHz i.f. chain the signal was fed to a diode bridge s.s.b. demodulator fed with carrier re-insertion from a carrier oscillator (or b.f.o.) running at 453.4 or 456.6kHz, depending on the sideband being used.

You will note the relatively wide 3.2kHz spacing between the two demodulating carriers which is dictated by the equally relatively wide s.s.b. filter used in the receiver. If a better (narrower) filter was fitted in the s.s.b. i.f., the carrier spacing could be reduced, and since the b.f.o. uses a tuned L/C oscillator rather than the crystal controlled oscillators in the R-1000, the carrier frequencies can be easily adjusted to suit. I assume a basic knowledge of receiver techniques in anyone attempting this.

Frequency Readout

A note on frequency readout: As in the R-1000, the carrier reinsertion oscillators (b.f.o.s) are not injected into the p.i.l. chain to provide automatic frequency correction, and the dial is calibrated to coincide with the centre of the a.m. i.f. passband.



for the fact that if the fuse does blow during a thunderstorm the unwary user may think that the receiver has gone permanently to its Maker and fail to realise that it's a 'take the case off' job to replace the fuse and restore normal operation. I wonder how many servicing bills were issued to unsuspecting users quoting substantial repairs to the receiver when in fact it was only the fuse?

A single step 20dB r.f. attenuator switched in by

Switching sidebands will result in a frequency readout that is about 1.5kHz higher or lower than the actual frequency being received, so if you tune to Shanwick on 8.864MHz u.s.b., the readout will be 1.5kHz off actual. This is not a cause for weeping and gnashing of teeth - how many times I had to explain this to tearful receiver owners in the past I can't tell you. Just listen and enjoy the

quality, for quality audio is what you will get from the R-600, even though the audio stage is a single chip device delivering a massive 1.5W (at 10% distortion) into the more than adequate speaker.

AM Performance

AM? Now what is a.m.? Is catered for by a separate buffered diode detector, and works very well indeed: let me dive into an aside at this point. You will recall my review of the JRC NRD-545 receiver and my comments on the truly awful audio which resulted from using a leading edge d.s.p. system to demodulate dear old fashioned a.m. My old friend Larry Magne (*Passport to World Band Radio*) has just written in *Monitoring Times* about the abysmal a.m. performance of the NRD-545, and I'm flattered that he used my term of 'Monkey Chatter' to describe it.

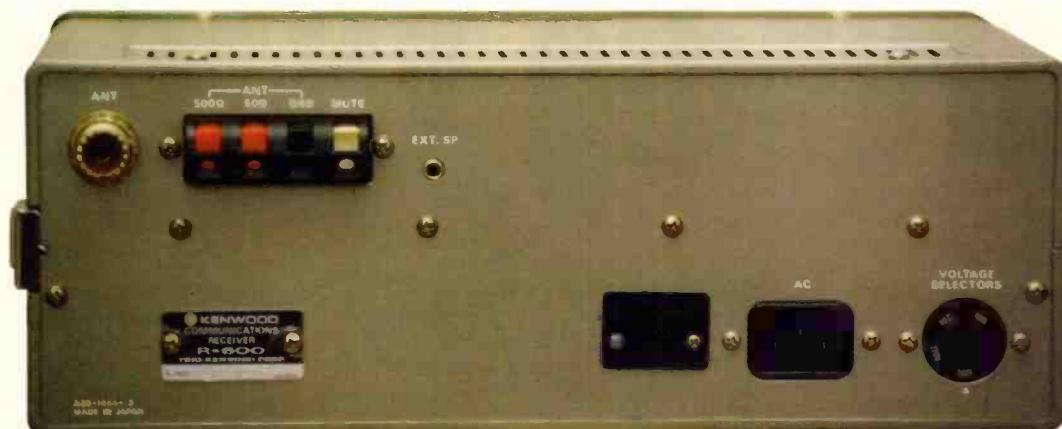
At the time I had the NRD-545 I did wonder why it was necessary to use an expensive d.s.p. chip with programming algorithms to demodulate a.m., when a couple of 10p diodes would have done a better job. Listen to an R-600 with its properly designed diode detector and you will discover what I meant. If you want a real surprise, try a three stage t.r.f. receiver with reaction and find out what quietness and quality is all about - and you can build it yourself - fancy that.

The R-600 a.g.c. is provided by a separate amplifier/detector, and suitable time constants are selected automatically by the mode switch. The 'S'-meter is driven by another separate system with zero and full scale adjustments by pre-set controls on the main receiver board. The meter linearity was always excellent, and the scale easy to read under all lighting conditions.

And so to the synthesiser which provided local oscillator injection in the frequency range 40.455 to 70.455MHz to convert the incoming signals of 0 to 30MHz to the first i.f. of 40.455MHz. There are three v.c.o.s rather than the four used in the R-1000, but although this could possibly have degraded the reciprocal mixing performance, it didn't seem (from memory, not measurement) to have made any difference.

Master oscillator for the p.l.l. system was at 10MHz, which conveniently provided a third harmonic of 30MHz to convert the 40.455MHz i.f. down to 10.455MHz, and the fundamental of 10MHz to convert 10.455MHz down to 455kHz (clever, isn't it?). Interpolation between each 1MHz segment came from an analogue v.f.o. which was a much simpler affair than that in the R-1000.

The v.f.o. tuning capacitor was an air spaced component with a built-in reduction gearbox, and I



have to say was of the type found in multi-band domestic receivers of the period. The tuning rate was by no means completely linear, hence possibly the lack of an analogue mechanical dial as in the R-1000, but linearity is not an issue when a true frequency counter readout is provided.

Good Companion Receiver

I do recall the need for cleaning and re-lubrication of the rear ball bearing when the tuning became a little erratic, but there were no other problems with the v.f.o. All in all, the R-600 was, and still is, an excellent short wave receiver, with many features and a performance equal to much higher priced units. Admitting that it doesn't provide hundreds of memory channels for storage, recall and scanning, as found in more modern offerings, in terms of digging out signals and resolving them with good quality it would be hard to quarrel with this nice receiver. I have no idea what the current second-hand price range may be, because you see so few of them being offered on the market, but if you see one, grab it as a good companion receiver for whatever else you may be using right now.

Different Versions

There were different versions of the R-600, known as the W2 and X types, and you will recognise these by the frequency coverage, the W2 covering 150kHz to 26MHz, and the X type from 2 to 30MHz. I can't remember which markets these were intended for, but in the case of the W2 version, the restriction of the upper tuning range to 26MHz was achieved by a diode gated transistor switch which placed a preset trimmer capacitor across the main v.f.o. tuning capacitor.

If you have, or come across, a W2, it is a simple matter to find a little auxiliary printed circuit board labelled J25-3120-14 and rip it out (carefully) which will restore the full tuning range. I never did see an X type, so can't help in advising how to restore coverage below 2MHz. In fact, this may not be possible if the 0.15-1MHz and 1-2MHz band pass front end filters were not fitted. If you are offered one of these beasts, just see if it will tune to Radio 4 on 198kHz and reject it if it can't do this.

Retrospective Look

I must say that I have enjoyed taking a retrospective look at these elderly receivers, and in re-reading the circuits I have been astonished at how many advanced features were incorporated, and how much care went into the design. It was certainly true that in the 1980 to 1990 period, Trio-Kenwood were consistently ahead of other manufacturers and it was a privilege for me to be their UK distributor and so actively involved with a well driven company. I also hope that my descriptions will help purchasers of second user equipment to assess the merits and features of the various units I have described. With the blessing of the editor, perhaps I can extend this series to cover receivers from the other manufacturers of the same period, and maybe remind you all that new is not necessarily better - just more expensive.

Happy listening.

Grundig YB400 PE

Missing his radios more than we can say, Editor Kevin Nice grabbed the opportunity to get to know the Grundig YB400 PE like a pot of gold. Did this world-band portable satisfy his appetite?

The timely arrival of the latest in a long line of Grundig world-band portables was a god send, well at least as far as I was concerned. With all my radio equipment packed in boxes and away in storage, I was starting to get withdrawal symptoms, this was getting serious.

The Yacht Boy 400 PE, you know that name has always conjured up thoughts of deck shoes, the south of France, Ferraris and fast women ever since I was a 12 year old looking at the first ever Grundig set that I met, is proclaimed the 'Grundig Yacht Boy 400 Professional Edition'. I'm not sure what this means, but the user guide demotes the set to 'PE' in the second paragraph on page one. And speaking of the user guide, this fairly typical booklet is comprehensive enough to get the raw beginner listening pretty quickly.

Open The Box

Of course I'm leaping ahead here, I should have mentioned what other goodies nestle in the attractive, mainly black outer box. Well, for your money, Grundig supply you with an a.c. adapter, stereo earphones, you know the type, the ones that

wonder if I'll ever see my rechargeables again. Oh, before I forget, there was a time when Grundig radios came with a separate frequency guide, this period now seems to have now passed us by, there is no such separate guide with the YB400 PE. Instead, there is included frequency information in the English (American)/French language users guide.

Alarming Time

Okay, so now I've got the tasty silver coloured portable connected to a power supply, what can it do?

One thing I demand of the YB' is that it wakes me from my exhausted slumbers in the morning, this it can do with its alarm facility. I get to choose from music or beeps easily selected from the front panel control buttons. The fixed volume 'chime' lasts for some five minutes, it is annoying enough to wake even me and I sleep like I've died! My preference though is the music option, both alarms operate with the same 'snooze' feature so that you can put off the inevitable for a bit (five minute intervals) or

Saviour

if the 'snooze' button is held for more than two seconds the alarm is cancelled. Just as you would expect with any clock featured radio, there is also a 'sleep' facility. Absolutely essential for listening to late-night jazz on R3!

Whilst discussing the clock features of the 'PE', I'd better mention that there are two time zones available, and as with any clock worth having, it operates in 24-hour mode only - after all that's how many hours there are in a day (I know, approximately).

Listening

Getting down to brass tacks, as they say in the town where I was born, using the YB400 PE is a breeze. Most controls reside under and to the left of the back-lit (switched) liquid crystal display.

The synthesised set allows both direct entry of spot frequencies; incremental, up and down tuning by use of step size and, up and down keys and memories of which there are 40 allowing a useful but not generous numbers of station/frequencies to be retained. There is though, no alpha tagging available, but then that's normally the case with a radio in this price band.

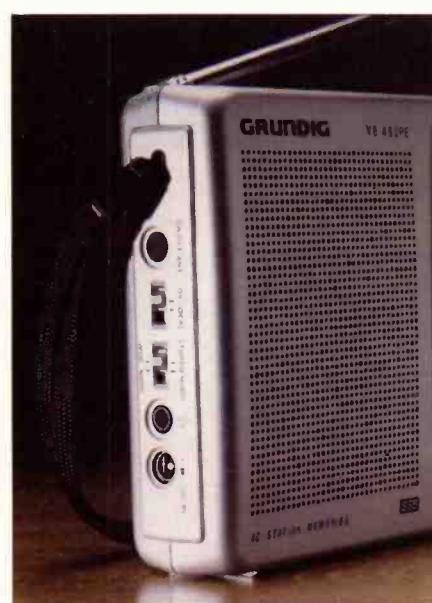
you have to locate in the hole in your ear, if your ears are like mine then it's a case of holding them in place or accepting that they will fall out after a while! To complete the compliment, there is a 7m 'reel' antenna for improved s.w. reception, the aforementioned user guide, a warranty card, a soft case and of course the radio itself.

Unlike the recent past though, none of the six AA sized cells required to power this latest Yacht Boy, sorry YB400 PE, are provided. Aha, it's the mains adapter for me until I get to the shops. I



I found that the YB400 PE provided me with a usable substitute for my normal shack compliment. There is no way that a portable is ever going to perform as well as my Icom, Plessey and Racal sets. But all the signals that are well above the noise floor were readable. I wouldn't be surprised if I would have been able to decode some of the less demanding modes that are to be found around the 1.8 to 30MHz range. Unfortunately due to my decoding set-up being packed away with my radios, I was not able to check, but the YB' seemed stable enough without any measurements. Then again let's not forget what this little radio is designed to do.

Whilst it is true that s.s.b. capability is provided with a fine tuning control to allow tuning between the minimum 1kHz synthesiser steps, this radio is clearly a broadcast set first and foremost. It performs



Satisfied?

Well, yes I guess so. All in all the YB400 PE is a set worth buying if you want to give the short wave bands 'go'. As a first radio it benefits from having s.s.b. facilities. If though, this is your main area of interest, you'll soon be buying a more capable set too. As for getting my personal radio fix - yes, this YB400 PE did it for me.

In Disguise?

this role with flying colours and is ideal as a 'starter' radio. The addition of s.s.b. makes it a useful tool for casual amateur and utility monitoring, great to 'cut you teeth on'.

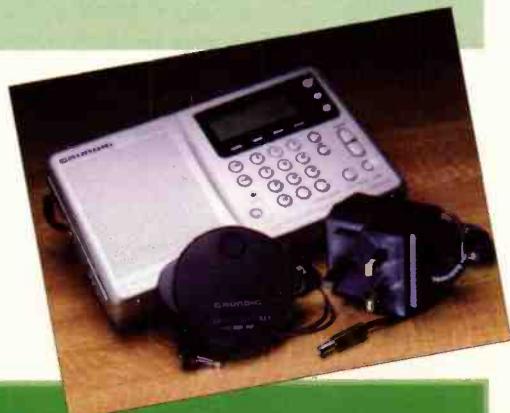
The size of the portable makes it, in my opinion, just right for every day use. The YB400 PE is not the smallest in the category but it's easy enough to slip into a bag or glove box to ensure it goes with you wherever you roam.

One niggle that kept catching me out, the side located volume control thumb wheel operates the wrong way round. To increase the volume you have to roll the control up! Not very ergonomic Grundig.

Band II v.h.f. reception yields pretty good sound quality with the internal mono speaker. Use of headphones gives you stereo capability, which is switch defeatable by use of the left hand slide switch. The display confirming whether mono or stereo mode is selected.

The same switch allows selection of narrow or wide filters in a.m. modes.

The Grundig YB400 PE costs £159. **SWM**



Specifications:

Frequency Coverage:

l.w. 144 to 353kHz; 1 or 9kHz steps
m.w. 520 to 1710kHz; 10kHz steps
s.w. 527 to 1606kHz; 9kHz steps
v.h.f. 1.6 to 30MHz; 1 or 5kHz steps
v.h.f. 87.5 to 108MHz; 50kHz steps
v.h.f. 10.7MHz

l.w., m.w., s.w. 55.85MHz and 455kHz
600mW

External 9V d.c. adaptor
Stereo Headphones (3.5mm jack)
External Antenna (3.5mm mono jack)
Six AA cells
External 9V d.c. adaptor (supplied)
200 x 120 x 38mm (w x h x d)
650g including AA cells

Intermediate Frequencies:

Audio Output:

Connectors:

Power Source:

Size:

Weight:

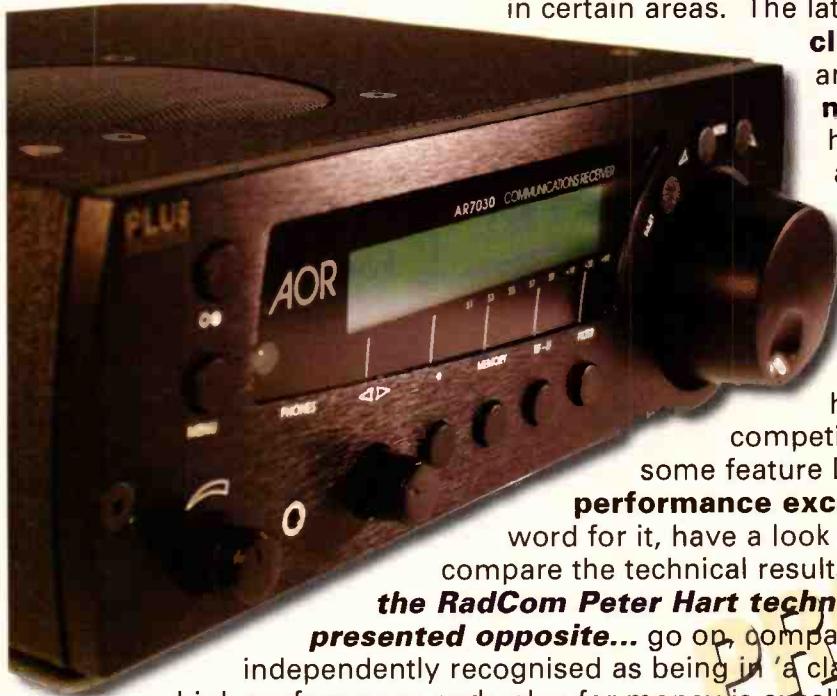
Thanks to Waters & Stanton PLC, 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835, FAX: (01702) 205843, E-mail: sales@wsplc.demon.co.uk or Web: www.waters-and-stanton.co.uk; for supplying the review model.

AOR**UNPARALLELED SH**

The 'mature' AR7030, four years of production and still ev

As reported in the June 1999 Short Wave Magazine, a new production run of the AR7030 has been completed and is shipping. The AR7030 has retained the same design but has 'evolved' in certain areas. The latest production features **alternative**

click encoders which provide a smoother and more consistent quality feel and a **new-style liquid crystal display** with higher contrast and a wider viewing angle.



Now in its 4th year of production, the AR7030 has established itself as the popular performance trendsetting short wave receiver representing the new 'bench mark' in excellence. There have been many new entries by competitors since the launch of the AR7030, some feature DSP but none can match the **sheer performance excellence** of the AR7030. Don't take our word for it, have a look at the many technical reviews and compare the technical results. **A comprehensive extract from the RadCom Peter Hart technical review of the AR7030 is presented opposite... go on, compare it to others!** Internationally and independently recognised as being in 'a class of its own'. The balance between high performance and value for money is excellent. Awarded receiver of the year 1996/97 by WRTH and consistently awarded 5 stars by WRTH and Passport to World Band Radio in every edition with Passport nominating it as the Editor's choice.

AR7030 £799 AR7030 PLUS £949

AR5000/3/C - excellent performance 10kHz - 2600MHz all mode



True base receivers are few and far between, some have simply evolved from the hand held equivalents with little tangible improvement in performance or facilities over their smaller counterparts - the AR5000 is not like this! High performance, top quality build and true wide coverage all mode receive. The "+3" version offers even more with synchronous AM, AFC and Noise Blanker. Popular with government agencies throughout the world.

When making critical measurements, the frequency coherence is very important whether a single or multiple unit is employed. Just like optical telescopes, the output from several receivers may be ADDED together to provide greater performance, however their frequencies must be absolutely coherent. This involves the use of a single reference for all oscillators employed throughout the receiver. Several receivers may then be connected to a single external frequency standard safe in the knowledge that their outputs will be coherent.

The AR5000C now provides this commercially required capability. The "C" version may be provided to order in either the standard AR5000 format or with two of the +3 additions of AFC and NB. If you are a commercial operator with this application in mind, please request the separate specification leaflet for the AR5000C. **E.P.O.A.**

The enhanced AR5000+3 has been awarded 4-stars by **Passport to World Band Radio'99** and by WRTH.

AR5000 from £1345

The **AR8200** has been the first hand portable wide band all mode production unit to arrive on the market place with the new airband channel

step of 8.33kHz correctly implemented. Add to this memory bank re-sizing, extensive step adjust capabilities to trace unusual band plans, an editable (via PC) meaningful auto mode bandplan, **free internet download** PC Windows software, optional SLOT CARDS and you have just the tip of the iceberg. The facilities offered by the AR8200 are stunning... take the 'step-adjust' feature for example. If you have a frequency of say 151.010 MHz and wish to step in 15 kHz increments, most receivers would simply assume 151.000 MHz then step 151.015, 151.030 etc. However, the AR8200 may be programmed to step in the desired manner of 151.010, 151.025, 151.040, 151.055 MHz etc.

Other real life examples would be the 27.60125 MHz CB frequency incremented in 10 kHz steps, no problem... also the 900 MHz band which implements 25 kHz steps but a 12.5 kHz offset. Add to this the foresight of 8.33 kHz airband steps and you have a very flexible unit!



AR8200 £399

Shown here with optional slot cards



*Innovation
and forward
thinking*

every bit the high performer, new production now shipping...

The following is an extract (almost in verbatim) of the Peter Hart technical review of the AR7030 from the July 1996 Radio Communications publication by the RSGB, kindly reproduced with their permission.

The RSGB can be contacted at: Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE

MEASUREMENTS

ALL MEASUREMENTS were made with the receiver powered from its dedicated PSU and the results are summarised. Additional comments are as follows:

The sensitivity is entirely adequate for most normal antennas and a good compromise for signal handling. For short whip antennas, an additional 10dB preamplifier is enabled, improving sensitivity to 0.1uV when both amplifiers are in circuit, the sensitivity is maintained down to VLF, whereas most receivers are much less sensitive on LF/MF. The S-meter calibration is very linear and applies to all modes.

The AGC has an excellent characteristic, independent of signal level with hold time prior to exponential decay.

The rejection of all IF and image related responses was in excess of 85dB, with the exception of half first IF at around 82 dB. The rejection of other spurious responses was in excess of 100dB. There were a few weak internal 'birdies' but only three moved the S meter (to S3).

The strong signal performance is extremely good. The intermodulation measurements are at the limit of my measurement capability and close-in result by far the best I have measured on any general coverage receiver. (Only bettered by the TEN-Tec Omni-V, but that is not general coverage and does not use an up conversion architecture). The reciprocal mixing results, measured at 21.4MHz are also very good and similar to receivers costing much more.

ON AIR PERFORMANCE

THE EXCELLENT RF performance of the AR7030 is certainly most apparent in on-air tests. The receiver gives very clean results under all conditions and there is no sign of overload in demanding strong signal situations. The audio quality on both SSB and AM is really excellent, the filters are well matched to the required bandwidths. The solid aluminium lid to the case is acting as good baffle for the speaker with no nasty rattles.

I was particularly impressed with the VLF performance. With my Butternut vertical on the end of 200 ft of coax (hardly an ideal VLF antenna) all the normal time and data transmissions were received at good strength. This should be a good receiver for the new 73kHz LF band. The AGC characteristic is ideal and really I cannot fault any of the functions of this radio.

I must admit to being a little apprehensive at first about the ergonomics. However after a few hours use, and having mastered the logic behind the menu driven operating system, I found it was really friendly to use. The weighted tuning knob was most smooth in operation and tuning steps were completely inaudible. The auto speed-up has been implemented very well and is virtually seamless in its operation. Fast tuning was fast and effective in navigating across the spectrum but some may prefer to use part of the extensive memory bank as band stores for switching between bands.

My criticisms are minor. I found the viewing angle of the display a little narrow. The keys on the remote a bit small, quite close together and lack a positive feel, although they do function without problem. Those with large fingers may have more difficulty. The receiver should be kept away from mains magnetic fields which induce hum in to the VCO. Do not place the mains PSU next to the case, and particular not immediately underneath.

CONCLUSIONS

THE AR7030 IS an excellent receiver for all HF applications. It is really packed with features and has a superb technical performance. The control ergonomics are somewhat different to normal, but when mastered the receiver is as easy to use as more conventional implementations. It has good performance down to low VLF and should be a good receiver for the 73kHz band.

Many other products are available including the AR3000A wide band base receiver, SDU5500 spectrum display unit, AR8000 trend setting wide band hand portable receiver, ARD2 ACARS & NAVTEX decoder, PC software, interfaces and much more... detailed leaflets available upon request.

AOR AR7030 MEASURED PERFORMANCE - by RadCom, Peter Hart

FREQUENCY	SENSITIVITY SSB 10dB S+N:N		INPUT FOR S9	
	PREAMP IN	PREAMP OUT	PREAMP IN	PREAMP OUT
1.8MHz	0.22uV (-120dBm)	0.56uV (-112dBm)	22uV	80uV
3.5MHz	0.20uV (-121dBm)	0.56uV (-112dBm)	22uV	70uV
7MHz	0.20uV (-121dBm)	0.56uV (-112dBm)	20uV	70uV
10MHz	0.22uV (-120dBm)	0.56uV (-112dBm)	22uV	70uV
14MHz	0.25uV (-119dBm)	0.63uV (-111dBm)	25uV	80uV
18MHz	0.25uV (-119dBm)	0.63uV (-111dBm)	22uV	80uV
21MHz	0.22uV (-120dBm)	0.56uV (-112dBm)	22uV	70uV
24MHz	0.25uV (-119dBm)	0.63uV (-110dBm)	12uV	80uV
28MHz	0.25uV (-119dBm)	0.70uV (-110dBm)	25uV	90uV

S-READING (14MHz)	INPUT LEVEL SSB	
	PREAMP ON	PREAMP OFF
S3	0.8uV	2.8uV
S5	2.20V	8uV
S7	7uV	25uV
S9	25uV	80uV
S9+10	90uV	320uV
S9+30	800uV	2.6mV

IF FILTER	UPBANDWIDTH	
	-6dB	-60dB
0.8kHz	600Hz	1500Hz
1kHz	2230Hz	3380Hz
5.3kHz	6170Hz	11.6kHz
6.5kHz	8170Hz	12.9kHz
9.5kHz	9530Hz	16.2kHz

Frequency	INTERMODULATION (50kHz Tone Spacing)	
	PREAMP IN	PREAMP OUT
3.5MHz	3rd order intercept +22dBm	2 tone dynamic range 102dB
7MHz	+25dBm	104dB
14MHz	+24dBm	102dB
21MHz	+26dBm	104dB
28MHz	+27dBm	104dB

Spacing	CLOSE-IN INTERMODULATION ON 7MHz BAND	
	PREAMP IN	PREAMP OUT
3kHz	3rd order intercept -6dBm	2 tone dynamic range 83dB
5kHz	-6dBm	83dB
7kHz	-2dBm	86dB
10kHz	+3dBm	89dB
15kHz	+1dBm	101dB
20kHz	+25dBm	104dB
>30kHz	+25dBm	104dB

FREQUENCY	RECIPROCAL MIXING FOR 3dB NOISE	
	PREAMP OUT	BLOCKING
3kHz	80dB	?
5kHz	85dB	?
10kHz	95dB	0dBm
15kHz	100dB	>+10dBm
20kHz	104dB	>+10dBm
30kHz	109dB	>+10dBm
50kHz	114dB	>+10dBm
100kHz	122dB	>+10dBm
200kHz	127dB	>+10dBm

AM sensitivity (20MHz): 1.1uV for 10dBs+n:n at 30% mod depth

FM sensitivity (28MHz): 0.25uV for 12dB SINAD 3kHz pk deviation

AGC threshold: 1uV

100dB above AGC threshold for +1.5dB audio output

AGC attack time: 4ms

AGC decay time: 1s (fast), 1.5s (medium), 2.5s (slow)

Max audio before clipping: 2W into 8 OHM at <1% distortion

Inband intermodulation products: -38 to -40dB

NOTE:

All signal input voltages are given as PD across the antenna terminal. Unless stated otherwise, all measurements were made on SSB with the receiver preamp switched in and with nominal 2.1kHz IF bandwidth selected.

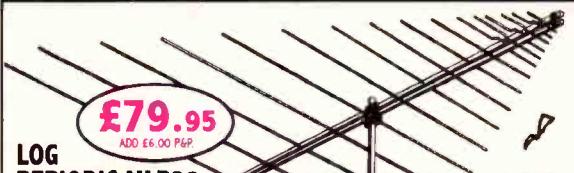
If you would like to receive a copy of the full review (in photo copy format), please forward your request to us at AOR UK LTD with 2 x 1st class stamps to cover postage and the envelope... thank you.



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Wide Band 16 Element directional beam which gives a maximum of 11-13db Gain Forward and 15db Gain Front to Back Ratio. Complete with mounting hardware. (The Ultimate Receiving Antenna - a must for the Dedicated Listener.)



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

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TURNSTILE 137

Freq. 137.5 MHz Length 1000mm

This Antenna is designed for external use to receive weather satellite signals. Complete with mounting hardware.



MWA-H.F. WIRE ANTENNA

Freq. Range 1.1-30MHz Length 60 Metres

Internal or external use. The long wire is known to be one of the best antennas for shortwave (HF) receiving. Comes complete with con box and dog bones, wire etc. (A must for the short wave listener.)

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G. SCAN II

Freq. Range 25-2000 MHz.

Length 620 mm.

Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. (Good for when you are driving about)

£19.95

ADD £6.00 P&P

SWP 2000

FREQ. 25 - 2000 MHz. Length 515mm.

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

£29.95

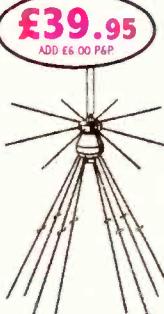
ADD £6.00 P&P

SUPER DISCONE

Freq. Range 25-2000MHz

Length 1380mm

Internal or External use (A Tri-Plane Antenna). The angle of the ground planes are specially designed to give maximum receiving performance within the discone design. The Super Discone gives up to 30db Gain over a standard conventional discone. Comes complete with mounting hardware and brackets. (Ideal for the Experienced Enthusiast.)



£39.95

ADD £6.00 P&P

DISCONE

Freq. Range 70-700MHz

Length 920mm

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

£29.95

ADD £6.00 P&P

HF DISCONE

Freq. Range 0.05-2000MHz

Length 1840mm

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

£49.95

ADD £6.00 P&P

MOONRAKER (UK) LTD. UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD, WOBURN SANDS, BUCKS MK17 8UR. TEL: (01908) 281705. FAX: (01908) 281706.

ACTUAL SIZE



Clocking On To The Weather!

When I first had the chance of trying Oregon Scientific's 'Weather Clock' I was fascinated in the idea of having an outside temperature relayed to my study desk by the use of u.h.f. radio. However, as time went by, I realised there's much more to this unit than just accurate time-keeping, day of the month and temperature sensing.

The main unit, a neat assembly in light grey two-tone coloured plastic, has dimensions of 190 x 130 x 30mm, with an attractive, slightly curving front panel. It runs on four AA sized cells while the supplied (one only) 'outstation' uses two AAA sized cells.

The main display (104 x 49mm) with its five sections, has the main control buttons mounted directly below. These control the clock mode, alarm, temperature display mode (and which of the three possible 'outstations' is currently being monitored). Incidentally, the temperature 'trend' (of the previous hour) of the 'outstation' is also displayed.

Two separate alarms can be set. The alarms are pleasant and to my surprise (they're not that loud) they woke me up effectively with the muted 'cheep'. However, there is a 'full blast' 'you must get up' alarm (three-per-second) for 20 seconds. If this doesn't work, it emits a full 'peeping' sound. The only other thing it could do would be to tip you out of bed!

The clock (on first switch on) synchronises with Rugby MSF and then every hour automatically. It shows (automatically) BST in summer and UTC in winter but can be offset by any hourly amount.

Barometric Pressure

As you'll see below, I found that the clock's built-in barometric pressure 'trends' sensor proved itself to be very sensitive and remarkably useful for providing an indication of atmospheric 'trends'. And although the clock does not display barometric pressure - instead it displays (on its l.c.d. screen) cloud, clouds and rain, sunshine and clouds and the sun in a 'clear' sky to represent the state of the weather.

At first I thought that the 'trends' indicator (the arrow which is shown as horizontal in the heading photograph) would not be that useful. However, I was soon proved to be very mistaken in this respect!

Remarkably Sensitive

Immediately on installing the clock at home, in my study, I realised just how useful the remarkably sensitive barometric sensor in the clock was. It showed this by immediately 'flagging up' very small changes in the air pressure by changing the logo (if the 'trend' was significantly long enough) to indicate the weather that could be expected, or by just indicating whether or not the trend was 'up' or 'down'.

So, if the weather prediction was 'set' to continue (as in the heading photograph) to be raining heavily - the 'trend' arrow would remain level. But, if the atmospheric pressure suddenly increased (or significantly decreased), the 'trend' arrow would immediately indicate the change. Altogether, the combination of the logo l.c.d. screen illustrations and the 'trends' arrow proved, as I've already mentioned, remarkably sensitive and effective.

The Secret?

Personally, I think that the 'secret' of the Oregon clock's successful 'trends' indicator is the fact that the barometric pressure transducer only has a very narrow operating range. However, this small range is cleverly compensated for by making it remarkably sensitive over the narrow range so that it can - and does - indicate minute changes very quickly.

The on-board electronics then interpret whether the change taking place is doing so quickly or slowly before presenting the

appropriate l.c.d. logo to accompany the 'trends' indicating arrow.

Practical In Use?

Is it practical in use? I expect you're asking. Well, in reply I've got to say a firm "Yes". I found it very helpful in letting me know if there was a chance of a 'lift' on v.h.f., along with providing excellent (radio controlled from the transmitter at BT International's Rugby site in Warwickshire) timekeeping.

The remote siting temperature sensor unit - communicating via u.h.f. (I found it could manage up to 30m providing the main unit was near a window) was great fun to use. I placed the remote unit I had next to a Blackbird's nest outside my study window at home.

Once installed near to the nest (they are so tame they'll often fly in through my kitchen window looking for food!), I could then see why mother bird had to snuggle down on the

eggs as the temperature dropped very quickly at night. On taking the unit - securely mounted in a bottomless polycarbonate bottle to protect it from the rain, I noticed that the temperature was 'up dated' every 15 seconds or so.

The battery was still showing as very 'healthy' three weeks later!

Because of this I can visualise it being very useful for anyone with sensitive 'hot house' plants in greenhouses or conservatories. You can also use the 'outstation' unit as a standard simple thermometer.

Buy & Save!

**Rob Mannion
G3XFD, Editor
of our sister
magazine
Practical
Wireless,
shares his
experiences in
using Oregon
Scientific's
Weather Clock.**



In My Shack?

So, would you find one in my shack? In answering I've got to say yes! They're marvellously useful both for the keen v.h.f. and u.h.f. listener and the transmitting Radio Amateur.

Keen gardeners will find them useful and I hope to take mine with me in 2000 to 'sniff out' those barometric 'highs' on 144MHz during my portable operations on 'Two'. I can thoroughly recommend the idea to you too.

The recommended retail price of the clock is £79.95, but we are offering it to SWM readers for only £49.95 (plus £5 P&P per order - UK only, overseas prices on application) - a saving of £30! As well as this, you can buy the additional remote sensors (one sensor is included with the clock/weather station) at a price of £18.95.

ORDER FORM

To: PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

Please send me Oregon Scientific Clock/Weather Forecast Station(s) @ £49.95 plus £5 P&P (UK only).

Please send me additional remote sensor(s) @ £18.95.

Name:

Address:

Post Code: Telephone No:

I enclose a cheque/postal order (payable to PW Publishing Ltd.) for £

Please charge my Access/Visa/Switch card the sum of £

Card no:

Valid from: To:

Issue:

Signature:

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As reviewed in Short Wave Magazine April '96 issue

ICF-SW77150 29995kHz, usl/lsl cw, 160 memories & labelling facility, 5 event timer, world timer
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ICF-SW07 New inc PSU & ANLP-1 antenna ASK price £250.00

ICF-SW55 RRP £299.95 ASK price £225.00

ICF-SW100E RRP £219.95 ASK price £145.00

ICF-SW100S Includes AN-100 & dual voltage mains adaptor £199.95

ICF-SW7600G RRP £199.95 ASK price £120.00

ICF-SW30 RRP £79.95 ASK price £69.95

ICF-SW10 RRP £49.95 ASK price £39.95

ICF-SW40 RRP £119.95 ASK price £84.95

AN1 Active SW antenna
RRP £74.95 ASK price £59.95

AN-71 Wire antenna £7.99

AN-100 Active antenna for ICF-SW100 or ICF-SW7600G £49.95

AN-102 Compact active antenna £59.95

AN-71 antenna £59.95

AOR
NEW AR8200 The ultimate in hand receivers £PHONE
AR7030 Voted best table top HF rcvr available at the best price

£799.00 £675.00

AR-5000 High performance wide band base rcvr 10kHz-2600MHz £1495.00 £1175.00

AR5000 +3 As above but with noise blanker, syncr AM & AFC £1749.00 £1375.00

AR3000 all mode base rcvr 100kHz-2056MHz no gaps RS232 port fitted £799.00 £615.00

AR3000 plus As above but with narrow AM & SAT filter, tape relay SDU ready £899.00 £670.00

AR8000 Still the best h/h rcvr available. All mode 500kHz-1900MHz £349.00 £260.00

SA7000 Ultra wide passive ant 30kHz- 2600MHz £136.00 £115.00

SA8000 Link between AR8000 & Opto Scout No mod req £24.95

CU8232 Computer control/clone interface for AR8000 £79.95

PC Manager PC based DOS management software for AR8000 £49.00

PC Manager WIN As above Windows based for AR2700 & AR8000 £49.00

Opto Scout Freq counter 400 mem 10MHz- 2GHz £399.95 £319.95

AR8000 + Scout Package AR8000 + Scout + SAC8000 £75.00 £615.00

SDU5000 £79.95 ASK price £559.95

SANGEAN

ASK price

ATS-909	RRP £189.95	£160.00
ATS-818ACS	RRP £199.95	£165.00
ATS-818	RRP £169.95	£120.00
ATS-808	RRP £99.95	£85.00
ATS-606	RRP £119.95	£105.00
ATS-404	RRP £79.95	£59.95
ATS-305	RRP £69.99	£59.95

SW Receivers

HF-250

£600.00

GRUNDIG

Grundig Yachtboy 500...£79.95

GARMIN GPS SYSTEM

GPS 35 PC 12 channel engine & antenna with serial port connection & cigarette lighter adaptor, so that it can be connected to a lap top PC or Psion directly (null modify lead/adaptor required for Psion). £209.95

GPS 12 Hand-held portable system includes: 12 parallel channel receiver, built-in antenna, lanyard. No external antenna option. £110.00

GPS 12XL Europe Hand-held portable system includes: Europe City Point Database, 12 parallel channel receiver, built-in antenna, carrying case & lanyard. £165.00

GPS 12CX Same as GPS12XL with colour screen. £210.95

GPS II Plus Europe Hand-held portable system includes: Europe City Point Database, 12 parallel channel receiver, portable antenna, velcro & lanyard. £180.00

GPS 48 Europe Hand-held portable system includes: Europe Marine Database, 12 parallel channel receiver, a built-in point database including major cities, buoys and lights, portable antenna, carrying case & lanyard. £180.00

GPS 3 Hand-held mapping portable system includes: 12 parallel channel receiver, a built-in internal basemap including major cities, roads, lakes and rivers, portable antenna, velcro mount & lanyard. £250.00

SCANNERS

YUPITERU

VT-125II	Civil air band £179.95	£159.95
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Building VHF/UHF Yagi Antennas

(Part 2) Matching To Coaxial Cable

Why buy when you can build? Our resident antenna expert Joe Carr K4IPV explains how to build a very usable and cheap beam for listening use. The ubiquitous Yagi can provide very usable gain on a budget.

All antennas work better if the transmission line is matched to the antenna feed point impedance. Maximum power transfer occurs when this situation exists, on both receive and transmit. The most common form of impedance matching for the Yagi is the 'gamma match' shown in **Fig. 2.5a**. The advantage of this form of construction is that it allows you to use a single, continuous piece of metal for the driven element. The shield of the coaxial cable is connected to the exact middle point of the half wavelength driven element (length L). The centre conductor is connected to the gamma match. The overall length of the gamma match is about $L/10$, and it is spaced from the driven element approximately $L/70$. The diameter of the gamma element (see **Fig. 2.5b**) is about one third the diameter of the driven element. A shorting bar and a capacitor are used to tune the antenna to minimum v.s.w.r.

The value of the capacitor is dependent on the operating frequency, and is found experimentally with the v.s.w.r. meter. For v.h.f. frequencies around 150MHz, the starting maximum value of C_1 is about 25pF, and for 450MHz the maximum value should be 10pF.

Another method for feeding the Yagi is shown in **Fig. 2.6**, and is especially useful for receiver operators. It works well at v.h.f./u.h.f. because the elements are small enough to keep the split driven element from being a problem. The transmission line is matched to the antenna feed point using an air core or toroid core transformer. When selecting the toroid core, make sure the material is capable of operating at the desired operating frequency. For the h.f. frequencies, suitable transformers are available, but for v.h.f./u.h.f. frequencies you will probably have to build your own. A 2:1 turns ratio will work for most antennas, i.e. make the primary 6 turns and the secondary 3 turns. Alternatively, receiver owners can sometimes get away with using a television style 4:1 BALUN transformer at the feed point, but turned around backwards. There will be an impedance mismatch, and a small v.s.w.r., but for receivers it is sufficient unless you want to optimise the situation.

This month, Joe looks at the all important issue of matching your home-built Yagi to the feeder.

Yagi Construction

Yagi antennas for the v.h.f./u.h.f. scanner bands are relatively easy to construct (although the problem can be daunting at h.f. frequencies). The

Continued on page 36...

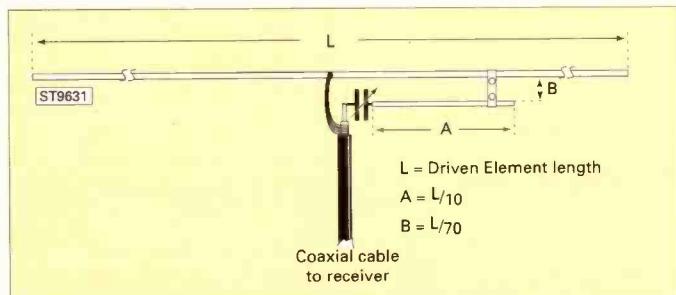
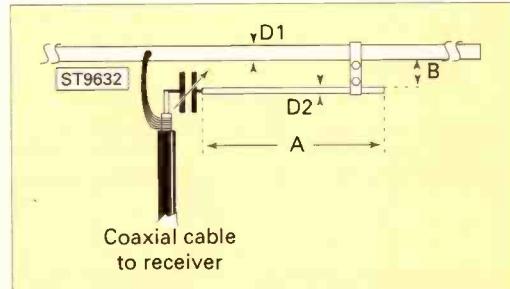


Fig. 2.5:
Gamma feed:
a) overall view;
b) close-up.



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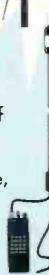


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Building VHF/UHF Yagi Antennas

(Part 2) Matching To Coaxial Cable

...continued from
page 33

antenna is built with a boom to hold the elements. The boom can be made of metal, or it can be an insulating material such as a dowel or section of PVC plumbing pipe. On metal-boom beams, the parasitic elements can be connected directly to the boom, but the driven element must be insulated from it.

A method for constructing a three-element beam on-the-cheap is shown in Fig. 2.7c.

2.7. The same method can also be used for antennas of other lengths as well. The boom can

be either metal or insulating. I've used both PVC and wood, but find that broomsticks and 25mm wooden dowels are quite easy to work with. The basic layout of the antenna is shown in Fig. 2.7a. The dimensions and spacings are found using the method given above.

The attachment of the parasitic elements is shown in Fig. 2.7b. The element is a metallic rod, such as a brazing rod or one of those brass rods that can be purchased (up to 600mm long) at hobby and model shops. A hole is drilled in the boom material at the correct point, and the rod pushed through. When the rod is centred, a piece of heavy wire is used to make the tie to hold it into place. Six to eight turns on each side of the boom should hold the antenna

element in place. Once the tie is in place, tin it with solder and solder it to the element.

If the driven element is split into two quarter wavelength sections, and the boom is made of PVC, then a mounting scheme such as Fig. 2.7c can be used. A window is cut into the boom in order to give access to the ends of the element. In this case, the ends of the element must be threaded to accept a machine nut. A tap and die set (or just the die) can be bought at any decently stocked hardware store. Make sure that the diameter of the rod used for the element matches the available standard screw sizes.

If you elect to use a metal boom antenna, then

some means must be found to split the driven element while keeping it insulated from the boom. Those goals are not met by the scheme of Fig. 2.7c. A slightly different scheme that does meet the requirement is shown in Fig. 2.8. A small plastic box, of the sort that can be bought from nearly all electronic supply vendors, is mounted to the boom with at least two machine screws (shown as a top or bottom view in Fig. 2.8a). The two halves of the driven element are then attached to the box through holes drilled in opposite sides, and fastened with machine nuts.

There are actually two approaches to doing this task.

In Fig. 2.8b we see a method for the box being either on top or hanging beneath the boom. I prefer hanging the box upside down in order to keep rain water from accumulating inside the box. The approach shown in Fig. 2.8c requires two large holes to

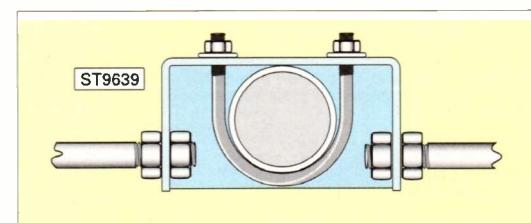
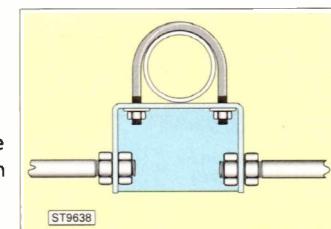
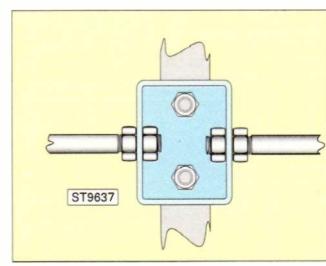


Fig. 2.8: Method for attaching driven element to metallic boom: a) top view; b) end view (method 1); c) end view (method 2).

be drilled in either end of the box so that the boom can pass through it. The box is clamped to the boom with U-bolts (two should be used side-by-side for best stability). The holes at the ends of the box can be sealed with silicone sealant.

Another approach to insulating either split or continuous driven elements to the boom is shown in Fig. 2.9. In this approach, the elements are aluminium tubing, while the insulating material is a section of PVC pipe. The tubing and the PVC pipe are selected so that the tubing is a slip-fit into the PVC pipe. Two or three machine screws (for v.h.f./u.h.f. scanner band antennas) are used on

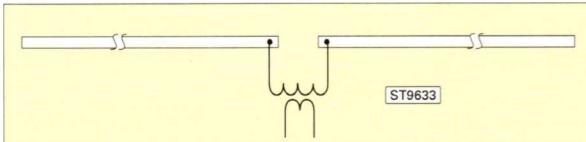


Fig. 2.6: Transformer impedance matching.

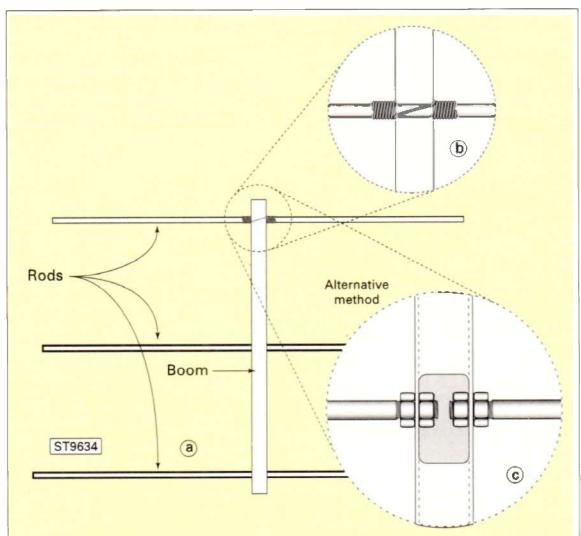


Fig. 2.7: a) Typical beam;
b) method for attaching
parasitic elements; c)
method for attaching split
driven elements.

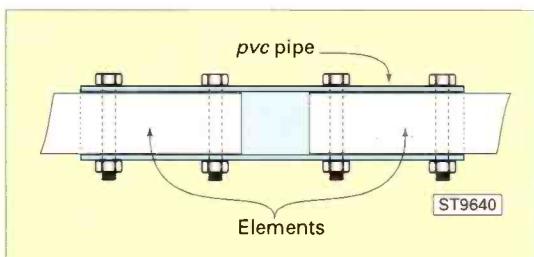


Fig. 2.9: Using PVC sleeve to insulate driven element.

each element to fasten it to the PVC pipe. This assembly can then be clamped to the boom in the normal manner using U-bolts. Two final methods for mounting elements to the boom are shown in **Figs. 2.10 and 2.11**.

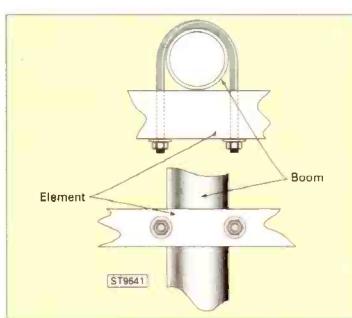


Fig. 2.10: Clamping elements to tubular boom.

In **Fig. 2.10**, a tubular boom is used, while in **Fig. 2.11** a square boom is used. In both cases, a U-bolt is used to clamp the element to the boom. These U-bolts can be bought at any well-stocked hardware store.

Conclusion

The Yagi antenna is quite sophisticated, and can be daunting to design if you want to optimise performance. But if you want a 'workable' Yagi, that will greatly improve scanner and other v.h.f./u.h.f. receiver performance, then a home-brew Yagi may well be the way to go - and it's easy. The antennas that you will design with this method, and the software accompanying the article is not an optimal Yagi - you can improve on the performance if a bit of maths isn't daunting to you. If you wish to explore this issue further, then let me recommend Lawson in the References section as a good source. **SWM**

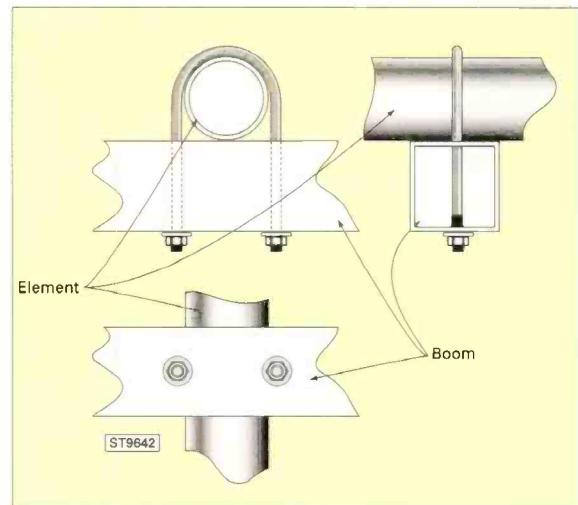


Fig. 2.11: Clamping elements to square boom.

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Orr, William I., and Stuart D. Cowan (1983). *Beam Antenna Handbook*, Radio Publications, Wilton, CT.

Book Profile

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For more antenna ideas, look no further than Joe Carr's ***Receiving Antenna Handbook***, available from the Book Store for £17.50.

Don't be one of those people who spend big money for a deluxe communications receiver and then waste its potential by using a poorly designed, inefficient antenna system with it. For top reception from 100kHz to 30MHz, your receiver needs an antenna that can deliver as much signal as possible to it.

This *Handbook* is a complete guide to high performance receiving antennas for long wave all the way to the upper end of the short wave spectrum. This isn't some warmed-over collection of slightly modified ham radio transmitting antenna designs, instead it is a comprehensive examination of antennas intended specifically for receiving purposes.

Joe Carr gives you complete construction details for each antenna. Most can be easily constructed using only wire or aluminium tubing. And you don't need to be an electronics genius to understand Joe's clear, friendly text or build one of the designs in this book. Give your receiver what it needs to pull those weak signals out of the noise - a good antenna!

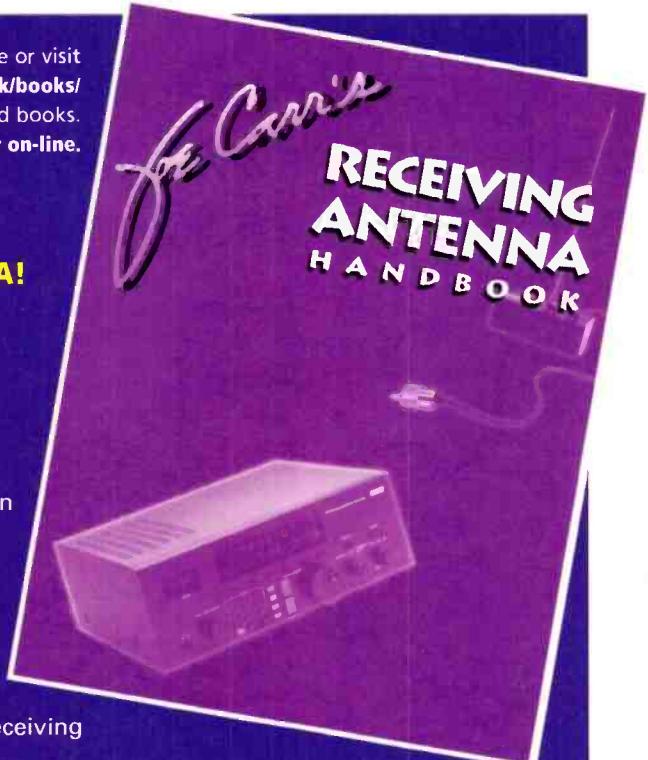
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a Matter of Control

Ian Doyle gives us a glimpse behind the scenes at the annual RIAT focusing on Air Traffic Control in the busy skies above RAF Fairford, Home of The Royal International Air Tattoo.

For anybody with an interest in aviation and specifically listening to that part of the radio spectrum that covers air traffic control, the Royal International Air Tattoo held annually at Royal Air Force Fairford, a few miles from Cirencester in Gloucestershire, must be without doubt, one of the highlights of the year. This year's event will be no exception and will provide the opportunity for both 'eager anoraks' and the idly curious to view many types of different aircraft at close quarters, both on the ground and in gut-wrenching aerial manoeuvres. If, however, your interest centres on radio listening and specifically Airband Monitoring, RIAT can be just as fascinating.

But what happens behind the scenes from the perspective of 'Air Traffic Control', how exactly do you go about organising an event as awesome as RIAT '99, when is the best time to listen, and on what frequencies? In this feature I have provided a very basic overview directed at the novice listener, supported by maps, which covers two typical approach patterns, used by traffic arriving and departing the show. In addition, the accompanying frequency blocks should assist the reader in identifying when to listen and which part of the band.

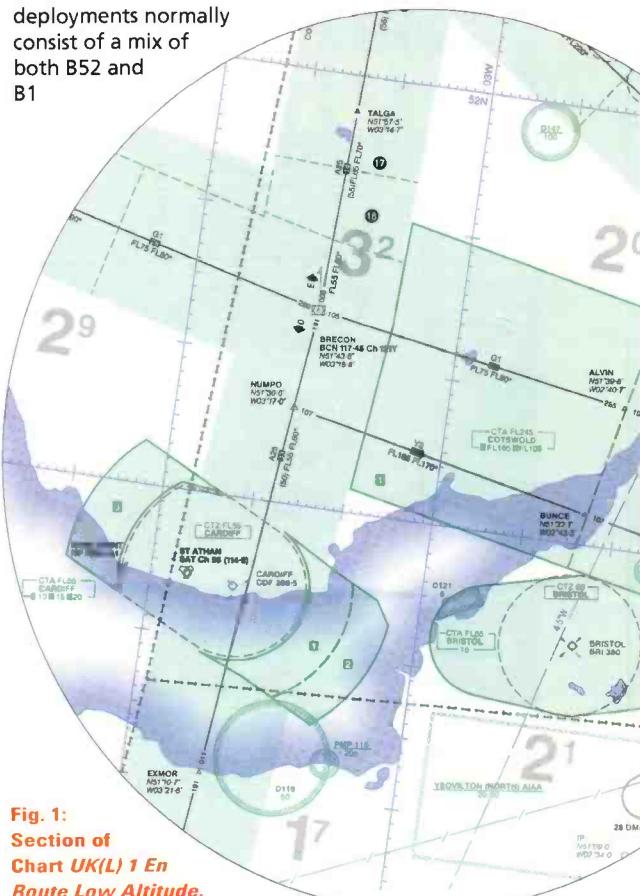
Normally, RIAT takes place over the third



weekend in July each year, with the show open to the general public on the Saturday and Sunday. Planning for each event starts some two weeks after the previous show finishes. Invitations are made to various air arms, with negotiations continuing in the intervening period almost up to the start of this year's show. The logistics involved in bringing all these aircraft together is normally a lesson in human ingenuity, but is a task accomplished safely and with complete professionalism by all the staff involved

Why Fairford?

Fairford, the unofficial home of RIAT in the late eighties, is ideally suited for this type of event with a major runway in excess of 3000m long, one of the longest in the UK. Many readers will be aware from previous articles in SWM, that the base has featured prominently during the Gulf War, and the continuing 'spats' with Saddam Hussien and more recently during the Kosovo crisis. It is still used today for the annual Central Enterprise Exercise, a joint US/NATO Exercise that sees US based heavy bombers deploy for up to six weeks at a time. These deployments normally consist of a mix of both B52 and B1



**Fig. 1:
Section of
Chart UK(L) 1 En
Route Low Altitude.**

Courtesy No 1 AIDU Royal Air Force.



bombers, two of the heaviest aircraft in the US inventory. As well as a long runway, these type of aircraft also require lots of concrete hard standing in order to both taxi and park. Not surprisingly as the base is only used once a year it was soon adopted as the natural home for the Royal International Air Tattoo, with the miles of taxiways and aprons proving an ideal location for what is the world's largest and arguably greatest airshow.

It must be said, however, that whilst the situation on the ground in terms of positioning aircraft is excellent, this



is not the case in the crowded airspace above Fairford. Positioning aircraft both in and out of the base, both before, after and during the show, was once described to me as "An air traffic controllers worst day at the office", anyone monitoring the frequencies used by the Tattoo during this period, will bear witness to this. Matters are not helped by the fact that the base is located between two of the busiest Royal Air Force Aerodromes in Britain, RAF Brize Norton and RAF Lyneham. Each base currently houses three types of heavy transport/tanker aircraft and it is as a consequence, of this role that both bases are in operation 24 hours-a-day, 365 days-a-year.

Avoiding Obstacles

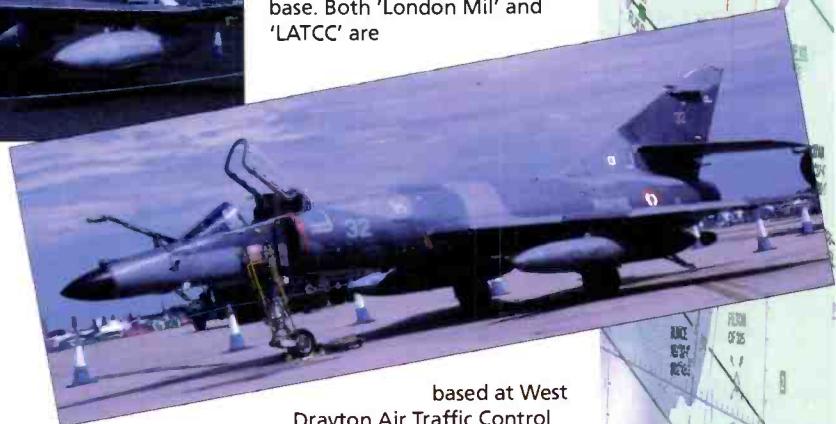
Located to the North is RAF Brize Norton with its compliment of modified formerly civilian Lockheed Tristar and BAC VC10s used in the Tanker/Transport role. To the South, RAF Lyneham, home of the RAF's fleet of slower, but more agile Lockheed C130 Hercules transport aircraft. The airspace around both bases comes under the jurisdiction of the Brize Air Traffic Control Zone, which provides both an area radar and a flight information service. As well as handling and co-ordinating movements out of Brize, Lyneham and of course Fairford when active, Brize Radar also looks after the movement of numerous light aircraft and glider traffic routing to and from a numerous other smaller airfields in a local area covering many square kilometres.

To the South East lies the boundary of the London TMA (Terminal Manoeuvring Area) serving aircraft

arriving into and out of Heathrow, Gatwick, Stansted, London City, Luton, and RAF Northolt plus a myriad of other smaller aerodromes. As if all this wasn't complicated enough, located above the base between 24000 and 45000ft is one of the busiest air traffic routes in Europe. Upper Green One is a block of airspace known as an 'airway', which traverses Southern England from Dover in the East to Fishguard in West Wales to the West.

Faced with these mounting obstacles, how do the various operating authorities go about handling such a significant traffic flow over such a short space of time in what is without doubt one of the busiest sectors of airspace in Europe.

Principally three major operating authorities control co-ordination of movements around Fairford. Located at Brize Norton Airfield, it has jurisdiction for the local surrounding area. Brize Radar is supported in this role by London Military, the air traffic control arm of the RAF. It provides coverage of the airspace immediately outside the Brize Control Zone, with additional responsibility, for all military air traffic within the UK not under control of the civil sector, LATCC. The London Air Traffic Control Centre, more commonly known under the acronym (LATCC), is run by a Government owned civilian agency the National Air Traffic Service, LATCC controls all aircraft flying airways in the upper airspace on the major air routes which surround the base. Both 'London Mil' and 'LATCC' are



based at West Drayton Air Traffic Control Centre in London. On the ground, these agencies are supported by a significant number of qualified ATC volunteers from other Air Traffic Control agencies in the UK with a significant proportion of these coming from Manchester Airport and the Manchester Air Traffic Control Sub-Centre. Many of these volunteers play in a variety of front-line roles supporting their colleagues in the RAF and LATCC in assisting with Flight planning and the co-ordination of the various movements both in the air and on the ground.

As previously indicated, Fairford is seldom used regularly, it actually belongs to the RAF, but is loaned to the USAF who maintain it year round on a care and maintenance basis in order to have it available at short notice should the need arise! Actual movements are relatively light even during exercise periods. During RIAT, the increase in movements and tempo is significant, and operational authority passes from the USAF to a team of UK based air traffic controllers who assume responsibility for air traffic control both on and around the base. A senior Air Traffic Controller is appointed to head the team and would normally be seconded from Brize Radar. This temporary transfer of power is no disrespect to our American Cousins, simply an acknowledgement that their British based colleagues, many of whom have been heavily involved

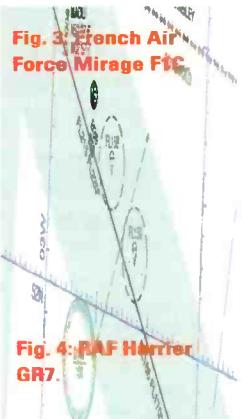


Fig. 3: French Air Force Mirage F1C



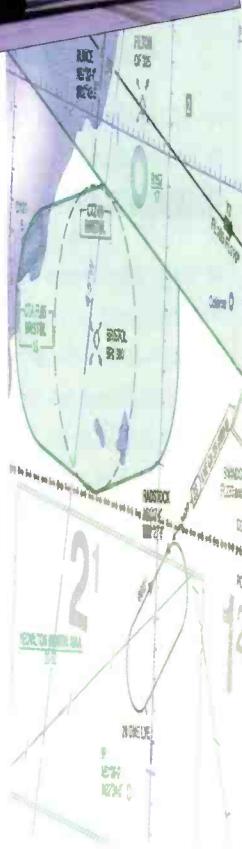
Fig. 4: RAF Harrier GR7



Fig. 5: Spanish Air Force Phantom RF-4C



Fig. 6: French Navy Super Entendard



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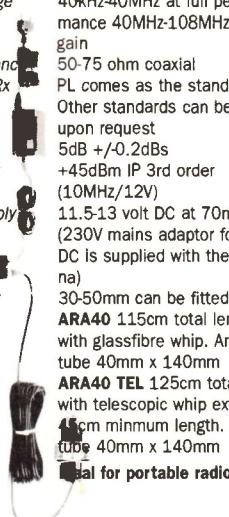
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Output impedance	50-75 ohm coaxial
Connector to Rx	PL comes as the standard. Other standards can be fitted upon request
Gain	5dB +/-0.2dBs
Intercept Point	+45dBm IP 3rd order (10MHz/12V)
DC power supply	11.5-13 volt DC at 70mA typ. (230V mains adaptor for 12V DC is supplied with the antenna)
Mast diameter	30-50mm can be fitted
Dimensions	ARA40 TEL 125cm total length with telescopic whip extended. 45cm minimum length. Antenna tube 40mm x 140mm



ARA 60

Technical performance

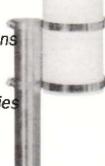
Frequency range	40kHz-60MHz (full performance) 60-120MHz 2.3dB less gain
Output impedance	50-75 ohm coaxial
Connector to Rx	PL type delivered as standard. Other standards can be fitted upon request
Gain	10dB +/-0.2dBs
Intercept Point	+50dBm IP 3rd order (10MHz/12V)
DC power supply	11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)
Mast diameter	30-50mm can be fitted
Dimensions	115cm total length. Antenna tube 50mm x 160mm



ARA 2000

Technical performance

Frequency range	50-2000MHz
Output impedance	50-75 ohms coaxial
Gain	19dB -1000MHz
Noise figure	18dB -1400MHz
3rd order IP	16dB -2000MHz
Output impedance	1.5-2dB -1000MHz
Connector standards	1.8-2.5dB -1500MHz
Power supply	2.5-4dB -2000MHz
Dimensions	+35dB typical
Weight	50-75 ohms coaxial
Accessories	N type connector at the antenna. BNC male connector to the receiver



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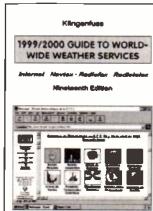
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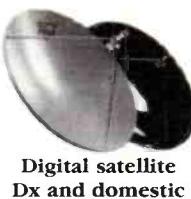
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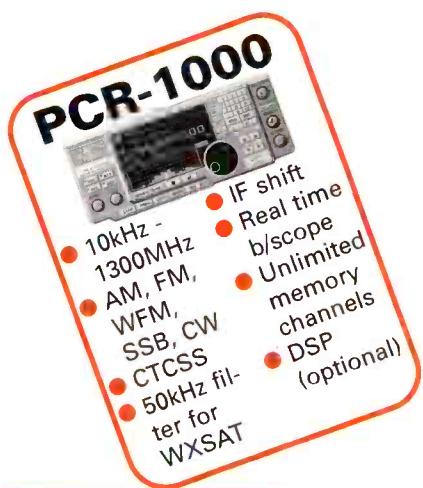
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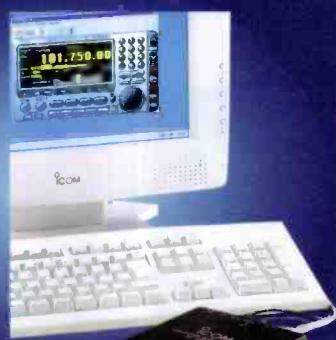
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Output impedance	50-75 ohm coaxial Connector to Rx PL comes as the standard. Other standards can be fitted upon request
Gain	5dB +/-0.2dBs +45dBm IP 3rd order (10MHz/12V)
Intercept Point	11.5-13 volt DC at 70mA typ. (230V mains adaptor for 12V DC is supplied with the antenna)
DC power supply	0.4A 115cm total length with glassfibre whip. Antenna tube 40mm x 140mm
Mast diameter	30-50mm can be fitted
Dimensions	ARA40 115cm total length with telescopic whip extended. 45cm minimum length. Antenna tube 40mm x 140mm Ideal for portable radio

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JRC NRD-545DSP Receiver



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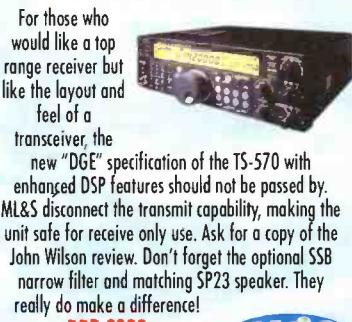
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ARA 60

Technical performance

Frequency range	40kHz-60MHz (full performance) 60-120MHz 2.3dB less gain
Output impedance	50-75 ohm coaxial Connector to Rx PL type delivered as standard. Other standards can be fitted upon request
Gain	10dB +/-0.2dBs +50dBm IP 3rd order (10MHz/12V)
Intercept Point	11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)
DC power supply	0.5A 50-55mm can be fitted 115cm total length. Antenna tube 50mm x 160mm Ideal for base stations

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ARA 2000

Technical performance

Frequency range	50-2000MHz
Output impedance	50-75 ohms coaxial
Gain	19dB-1000MHz
	18dB-1400MHz
	16dB-2000MHz
	1.5-2dB-1000MHz
	1.8-2.5dB-1500MHz
	2.5-4dB-2000MHz
3rd order IP	+35dB typical
Output impedance	50-75 ohms coaxial
Connector standards	N type connector at the antenna. BNC male connector to the receiver
Power supply	12V DC at 160mA DC. Power supply for 230V AC is delivered with the antenna
Dimensions	Length 450mm. Diameter 90mm
Weight	2kg
Accessories	Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 12m coaxial cable and mast mounting clamps

£169

This outstanding range is ideal for use with all base station receivers, the ICR-8500, AR-5000, PCR-1000, NRD-545, FRG-100 & more! Beautifully constructed and designed in Germany - we are pleased to be appointed for this range of products.

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All examples do not include P&P.

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Written quotations available on request

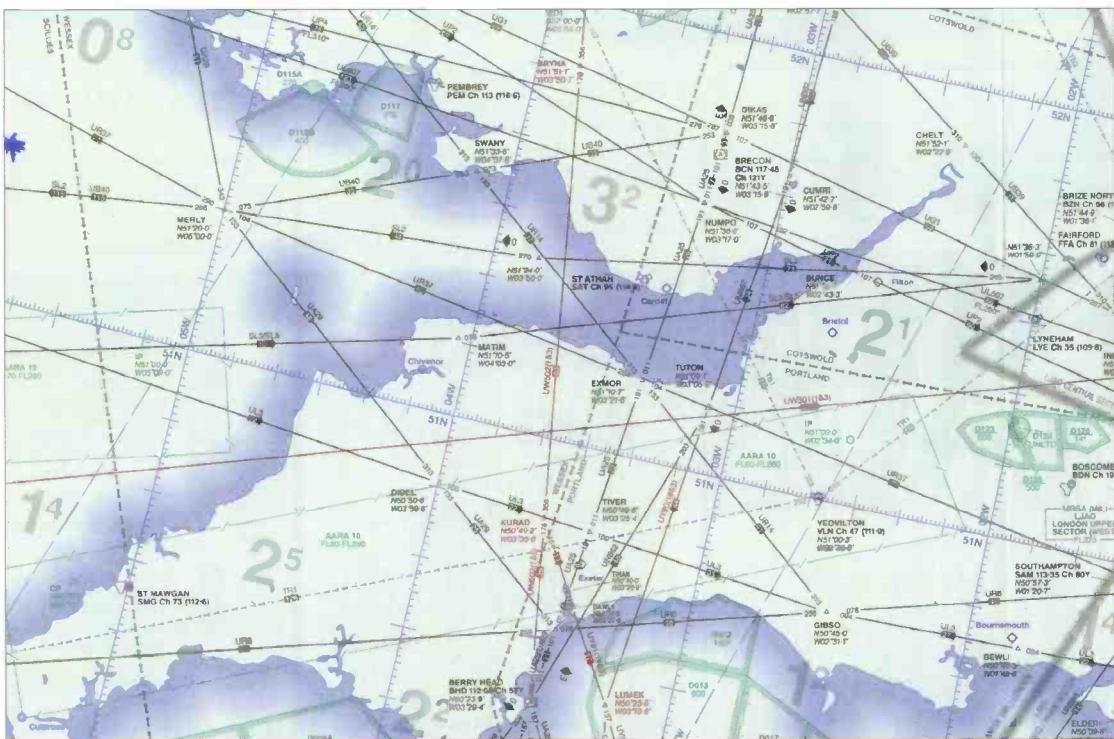


Fig. 2: Section of Chart UK(L) 2 En Route High Altitude.

Courtesy No 1 AIDU Royal Air Force.



in previous Air Tattoos, are simply more familiar with the different operating procedures which prevail at UK airshows. They have to be, last year's event attracted 465 aircraft, by its nature RIAT is truly International and featured movements from the RAF, the NATO aligned countries, a number from the former Soviet Bloc and of course the United States and Canada. One of the more interesting aspects of monitoring RIAT is the varied and interesting variety of callsigns often used. Unlike the civil sector, the military tend to adopt callsigns that may relate to the Air Force in question, a squadron or wing, a particular mission. In some instances individual pilots even have their own callsign a/a, 'Topgun' style.

Such Popularity

Such is the popularity of RIAT that in recent years the organising committee have allowed the public onto the base on both the Friday and Monday in order to witness many of the arrivals and departures. A list of movements is normally available for a modest sum that details arrival/departure times, callsigns, unit, type of aircraft and so on.

In some quarters, the arrival days might best be described as somewhat 'relaxed' strung out as they normally are over three days, although the Friday is normally the busiest. This might not be considered the case compared to the departure day, Monday, when seemingly everyone wants to get off the airfield at the earliest opportunity. In a future article we will look more closely at flight planning on the Ground, but for the time being however, let us consider events in the Air.

"... Havoc 11 is cleared direct Fairford"

Fortunately, over ten percent of total movements at RIAT belong to the USAF who have always patronised the airshow well over the years. These arrivals are relatively straightforward with aircraft originating from bases in the US, normally exiting Shanwick 'Oceanic' Airspace, along various Entry/Exit points adjoining London, Scottish and Shannon Airspace, see Fig. 1. Exact entry points into the UK will obviously depend on the flight routing taken over the Atlantic, this in turn will depend on

prevailing wind conditions.

Following hand-off to LATCC or London Mil, subsequent vectors will allow the aircraft to fly either along or outside the UK civil airways system as directed. It is possible for an arrival to be given a more direct routing straight to Fairford, however this will depend on traffic flows around the UK and the type of u.h.f./v.h.f. radio carried. Most military aircraft are equipped with both v.h.f. and u.h.f. radios, especially the larger transport types, however there are quite a number which do not carry radios that cover the civil airband, this will also have a bearing on the routing that is

given by the controlling authorities. As a general rule, aircraft on the civil airways system will be handled by LATCC, aircraft outside the airways system come under the control of London Mil.

One of the busiest routings will see aircraft entering UK airspace over Strumble Head (STU), Near Fishguard, West Wales, flying along the Upper Air Route (UG1) under civil airways jurisdiction direct to Fairford. As the aircraft approaches the base from the West it will leave the airway in decent with a following hand-off from LATCC to London Mil. Within approximately 40km of Fairford, control will pass to Brize Radar who will co-ordinate final radar vectors into the local landing pattern.

Aircraft arriving from bases which are located in the more Southerly States of the USA, might well arrive over another UK entry point Lands End (LND), after an initial call to the civil sector on passing (LND) the aircraft will be handed to the military who will then vector it direct onto a military airway system known as a TACAN route, TR1 is a direct track from Lands End (LND) to Yeovilton, Somerset (VLN) then onto Brize Norton (BZN). On the enclosed charts the civil way-points along the airways are marked with bold black lines interconnecting the various beacons. The military TACAN routes however are marked rather more faintly as a number of adjoining letter 'T's lying horizontally, see Fig. 2.

There are approximately six civil and one military TACAN route that potentially could be used, for aircraft arriving from the South West, in order to track these a good professional UK Airways chart is essential. Aerad Charts which are useful for monitoring flights in the UK can be obtained by ringing 0181-971 5522 for an order form. Send this to the postal address, 1 AIDU, RAF NORTHOLT. The charts required for the South are **UK(L)1 En Route Low Altitude, Southern Region** and **UK(H)2 En Route High Altitude, British Isles**.

In addition, a good frequency guide is also a prerequisite to satisfying listening. The publication *Lowdown* is, in my opinion, simply the bible when it comes to military aircraft listening. The guide is available both as a book and CD, see the *Lowdown* Web Page:

www.geocities.com/CapeCanaveral/Hall/4787

...Jhawk01 call Brize Radar 257.1

Once Brize Radar assumes control, the aircraft are queued for landing in a similar fashion to their civilian colleagues approaching the major civil airports such as Manchester or Heathrow. Here the similarities end, the local Brize Controllers can be handling up to 30 aircraft at one time. These may consist of a mixture of fast, highly agile fighters, to large heavy tankers, transports and bombers, interspersed of course with the odd national aerobatics team, possibly consisting of up to ten aircraft in a tight but loose formation. It must also be remembered that many pilots will be unfamiliar with both the local terrain and UK procedures, at this point one can start to see the professionalism that needs to be employed in order to safely navigate movements in and out of the base. It must also be remembered that UK airshow restrictions are quite naturally severe, with safety being paramount, this normally means that airshow participants who are taking place in the actual flying display will be required to practice and become intimately familiar with their surroundings prior to the show itself. These ongoing movements in and out of the base must also be scheduled with aircraft that may still be arriving, this is particularly so on the Friday.



Designated Route

As a general rule within the UK and most of Europe, civilian traffic will always fly along the designated civilian airways or the military TACAN route systems, outside of these airways they can also additionally 'Free Fly'. This is essentially where the co-ordination between the various civil and military authorities starts to come into its own as decisions are taken as to how best to manage traffic throughput most effectively. Military aircraft flying outside the civil airways route system will be handled by a dedicated team of controllers at London Military. They will essentially co-ordinate with their colleagues at LATCC to ensure correct separation between both sets of traffic, civil aircraft on the airways route system and military aircraft flying outside it.

Both LATCC and London Military are based in the same building at West Drayton, close to London, but are housed in two separate offices, there are however certain sectors of UK airspace where a number of Military Air Traffic Controllers sit alongside their colleagues in the civil sector of LATCC. This type of face to face liaison allows military flights to request a civil airways crossing clearance and fly through various pre-designated corridors, on the civilian airways system against the flow of civil traffic. This is particularly relevant for flights originating from the East which predominantly have to cross a combination of airways that route North/South across the spine of the UK.

Most arrivals from the East will be handled by London Mil crossing the airspace boundary which separates Dutch and UK airspace at an imaginary point in the middle of the North Sea. Dotted along

the border between the UK and Holland are a number of way-points where control passes from the Dutch Military to London Mil. The most famous of these is MC6 (Mike-Charlie 6) which is located approximately midway between Norwich and Rotterdam.

Most Fairford arrivals from the East will make their initial first radio call at MC6 following hand-off from the Dutch, and will then be vectored direct to the next beacon MLD (Mildenhall). From here they will then receive an airways crossing clearance which will direct them to be at a pre-designated flight level which will allow them to transit the civil airways via a Corridor known as the Daventry Corridor. This is located just South of Birmingham and allows military aircraft to cross a series of tightly packed civil air routes.

Not surprisingly, the Daventry Corridor is particularly busy both before and after RIAT as many European based aircraft are



vectored through the corridor to and from the show.

Once clear of the corridor, London Mil will hand-off control to Brize Radar which will co-ordinate final approach and of course any holding delays that may be required in order to permit aircraft ahead of the queue to take off or land.

Only A Glimpse

Clearly an article of this nature can only provide a glimpse behind the scenes, in a forthcoming issue we will revisit Fairford in order to provide an assessment of the situation on the ground. I have enclosed a list of potential frequencies that may be monitored which will allow listeners to capture some of this action. Aircraft flying civil air routes tend to use similar frequencies day after day, thus ensuring that these can be predicted with a fair degree of accuracy, however this is not the case with the military where the number of frequencies that may potentially be used is enormous. There are of course a few favourites and a comprehensive list has been provided to accompany this article. Good listening!

This year's RIAT Frequencies

MHz

132.9, 376.625
134.55, 337.575
119.15, 259.975
130.675
254.475

Service

Fairford Approach
Fairford Tower and display)
Fairford Ground
Fairford Ops
Fairford ATIS via Brize

Arrivals and Departures

From The West

275.475, 283.525
133.3, 133.9, 135.15
129.375, 133.6, 134.75
126.075, 132.95

London Mil
London Mil
LATCC Brecon Area
LATCC Land-End Area

From the East

254.825, 275.35, 277.775, 279.3, 291.775, 293.525, 299.975
135.275, 135.625

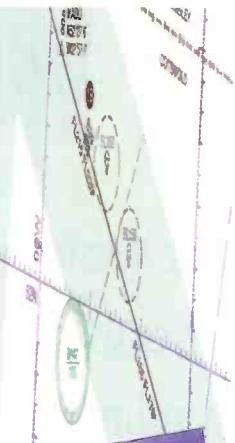


Fig. 7: Ukrainian Air Force TU-22M Backfire.

Fig. 8: Fairford is not just about military aircraft. Note the h.f. antennas on this privately owned Lockheed Constellation.

Credits

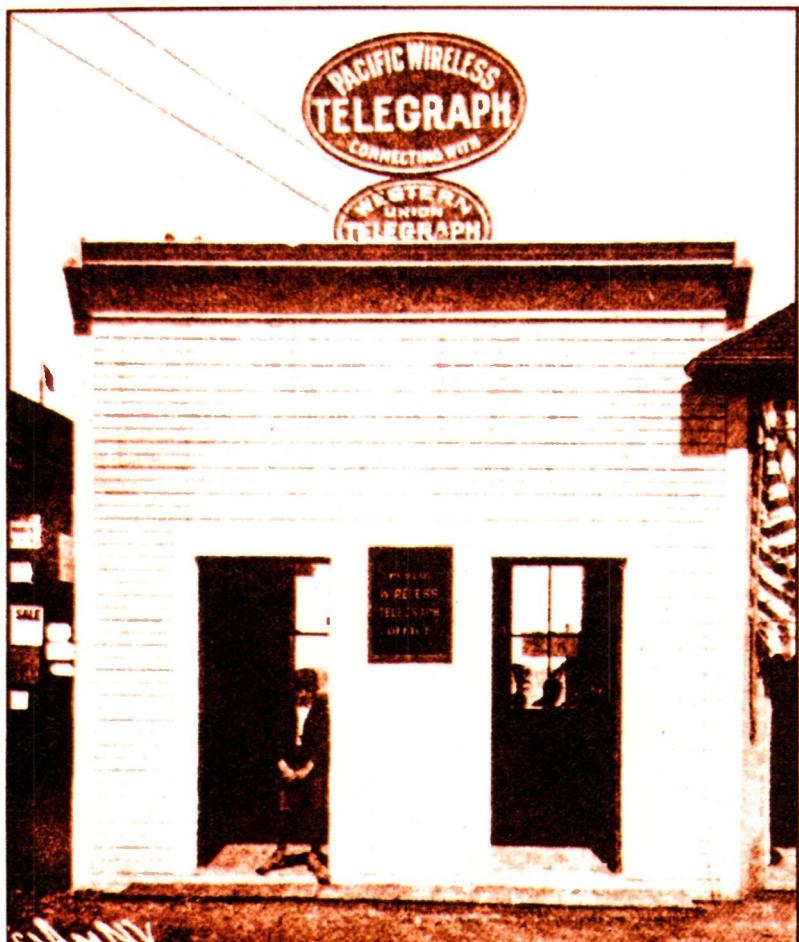
I would like to thank Patti Heady PRO RAF Fairford, Pete Fothergill, John Wildeman and Mike Ridley, without whom this article could not have been written.



Or Was It All Done By Pigeons?

Eric Westman
gives us his
account of
America's first
commercial
wireless
telegraph
service.

**Avalon Station
- Catalina Island.**
Photo: Scientific American.



In an earlier article of mine appeared in *Short Wave Magazine* ('The World's First Wireless Newspaper', March 1998) referring to a wireless telegraph link that had been established in 1903 between the coast of California and an island 53km distant. As a result of this link, the island was able to publish the world's first daily newspaper, supplied solely with reports transmitted to it by wireless telegraphy.

The creator of this link was Robert Marriott, a go-ahead young graduate from Ohio State College who, in June 1901, was taken on by a firm rejoicing in the ambivalent title of the American Wireless Tel. & Tel. Co. We assume that Tel. & Tel. refer to telegraphy and telephony respectively, though there was precious little, if any, wireless telephony at the time. But Americans are a forward thinking lot, and no doubt this name was registered with an eye to the future, when wireless telephony would become a fact. The company was familiarly referred to merely as 'American', which saved them, and us, a lot of typewriter ribbon!

Operations Begin

American started operations by building three

wireless telegraphy stations on the US east coast at Galilee, Brielle and Barnegat, New Jersey. These were not for the purpose of handling commercial messages, but to promote the sale of stock in the company. American also established a temporary station on board a ship to report back the results of the America's Cup yacht races in the autumn of 1901, and it all provided valuable publicity for the fledgling company.

By the time the races had finished, Marriott had received several months' training in wireless and was given instant promotion to the post of chief engineer of both the Pacific and the Continental Wireless Tel. & Tel. (there it is again!). These two companies belonged to a group of nine spawned at that time by American; none of them lasted long.

Having being assigned the western part of the USA, the two companies, who shared the same set of officers, set up their joint headquarters in Denver, Colorado. Within their sphere of influence lay Catalina Island, off the southern coast of California, a popular holiday resort for wealthy businessmen. Despite its many attractions, Catalina suffered a serious drawback; its sole contact with the outside world was a twice a day ferry from its town of Avalon to San Pedro, 53km distant on the mainland.

Means Of Communication

The wealthy vacationers, anxious to keep tight control of their business interests in between shooting goats and fishing for tuna, were increasingly agitating for a much quicker means of communication than the ferry SS *Cabrillo* provided. In response to this demand, and more especially to preserve Catalina's lucrative holiday trade, it was decided to lay an undersea cable across to the mainland and tenders were solicited for the project.

The matter coming to Marriott's notice, he hastily intervened with an offer to provide a two way wireless telegraph link between the island and the mainland at half the cost of an undersea cable. Although it was an unknown quantity to the authorities, it was cheap, so Marriott's offer was accepted.

When Marriott proudly told his principal what he had arranged for the company, he was told: Fine, go ahead and do it. Since American had no manufacturing facilities in the west (and probably none anywhere else, otherwise they would have relocated to take part in the project), Marriott was left to create the link entirely by his own efforts. Undeterred, he designed it, manufactured the equipment with his own hands, and had it transferred from Denver to the coast and installed at two suitable sites.

Identical Stations

In a very short time, two identical installations were set up on hilltops at San Pedro on the mainland and at Avalon, the only town on Catalina. At each site a wooden hut housed a small petrol engine that drove a generator, which in turn powered the induction coil of a spark-gap transmitter. The receiving

apparatus, which operated a Morse ticker, was claimed 'to resemble Marconi's in some details, but to be an improvement'.

In the earlier article, we were not told what this 'improvement' was, and it remained an intriguing mystery. But we have since found out, and can well understand why Pacific wanted to keep it hidden. The improvement, if such it was, entailed the replacement of Marconi's coherer with a detector, consisting of, believe it or not, 'a steel needle pressing against the side of an oxidised piece of Prince Albert tobacco tin!'

The brand of tobacco was seemingly not important, it just happened that Marriott smoked Prince Albert. Forty years later, during World War Two, a similar detector was used by British prisoners-of-war in Germany, who made illicit crystal sets employing a razor blade in place of the piece of rusty Prince Albert tin, which wasn't available in Stalag Luft III.

Commercial Messages

Marriott's link was opened to the public on 22 July 1902, and had the distinction of comprising the first wireless telegraph stations in the USA to handle commercial messages. But people, even Americans, can sometimes be resistant to new ideas, and the concept of 'wireless' communication was too far fetched for the island population to accept.

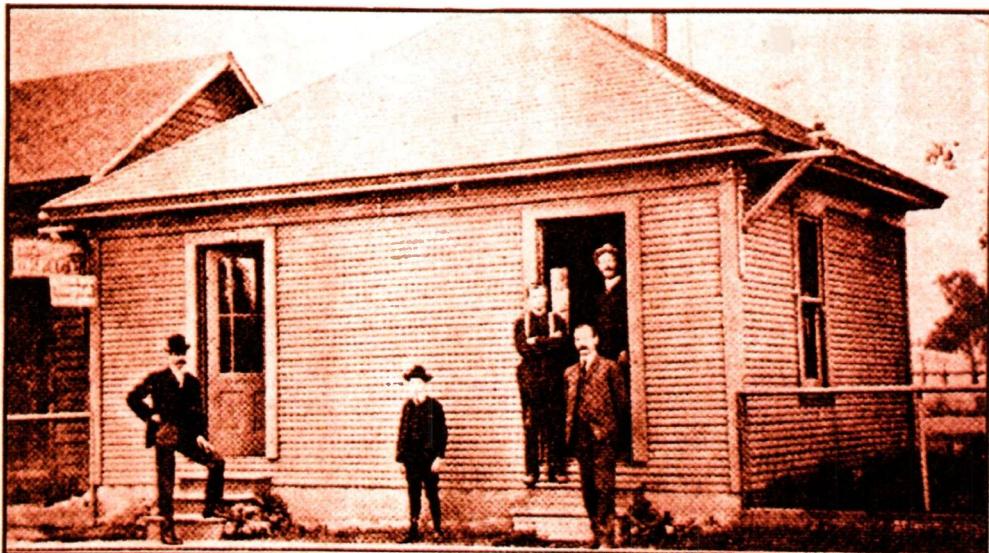
Marriott ruefully admitted that most of them believed the whole thing was a sham and the messages were really exchanged by means of carrier pigeons! The same phenomenon exists today when some people cannot believe that man has walked on the moon, but set it down to television trickery.

Wireless Magic

However, an incident soon occurred to convince the island sceptics that it was a matter of wireless magic after all. Two local bad characters one night robbed the Metropole Hotel in Avalon of its cash and some cases of expensive liquor, then boarded the 0500 ferry to escape to San Pedro. This ploy had worked successfully for the thieves several times before, as the earliest contact with San Pedro after the robbery had been discovered was by the 1100 ferry. This took three and a half hours to reach the mainland, and by that time, the robbers would be safely hidden in Los Angeles.

But Marriott's wireless link was now in existence, and as the Hotel Manager believed in its reality, and also that he knew who the robbers were, he had their descriptions wirelessly across the San Pedro. When the SS *Cabrillo* docked there, the astonished culprits were immediately arrested by the alerted police, who were waiting for them.

It was a remarkable foreshadowing of the celebrated 1909 incident, in which the unsuspecting murderer Crippen was arrested by Inspector Drew, who had also been alerted by a wireless message, when the *Montrose* arrived in Canada. As far as



Catalina was concerned, the prompt arrest of the robbers disposed of the carrier pigeon theory.

**Pacific Wireless
Telegraph Co.,
San Pedro, Cal.**

Photo: Scientific American.

Did Not Survive

In common with all the other members of the Wireless Tel. & Tel. family, Pacific and Continental did not survive, and in August 1903, both companies went bankrupt. Modern financial observers express misgivings about the integrity of the undertakings, particularly when the two companies' officers moved to Seattle and formed, on their own, the Pacific Wireless Telegraph Co., capitalised for five million dollars. There they immediately bought Marriott's creation, the prosperous Avalon-San Pedro wireless link, for a mere five thousand dollars.

Thereafter, it all devolves into a web of financial wheeler-dealing of no interest to us, so we draw to a close our account of America's first commercial wireless telegraph service. And yet a tiny doubt niggles in our minds, could it really have been worked by a steel needle pressing against a piece of oxidised Prince Albert tobacco tin? Or were those hardnosed islanders right about the carrier pigeons after all?

SWM

**Catalina Steamer,
Cabrillo.**
*New England Wireless
& Steam Museum.*



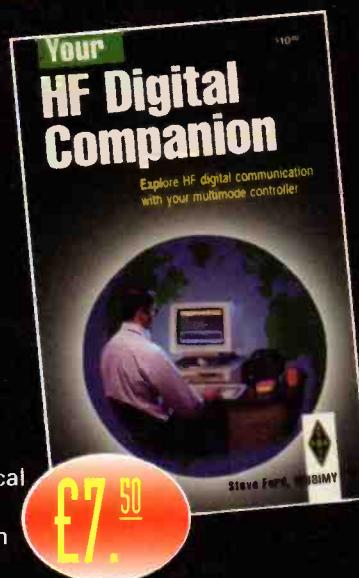
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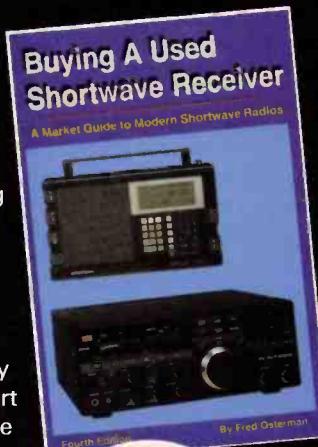
See pages 78 & 79 in this issue for our comprehensive book listing or visit www.pwpublishing.ltd.uk/books/ for lots more information on radio-related books. Internet users can order on-line.

all about, and how to go about choosing a suitable receiver. Then, having decided upon the most appropriate piece of equipment, the book deals with the next question raised by most readers - how to improve the reception of the messages by the use of external antennas, amplifiers and tuners?

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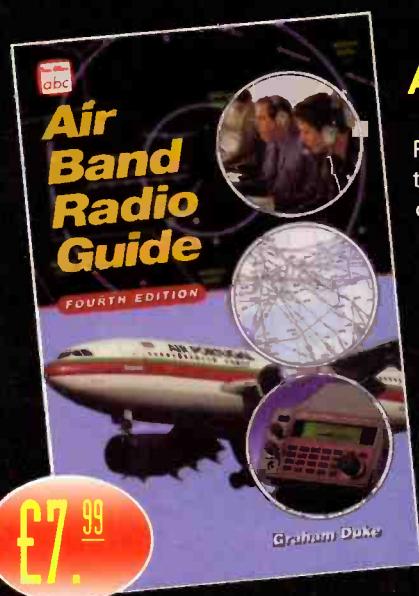
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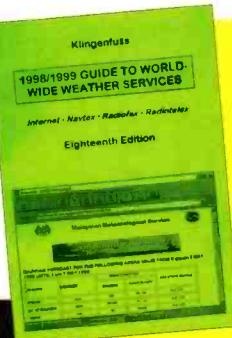
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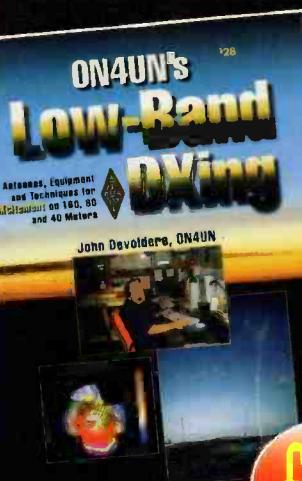
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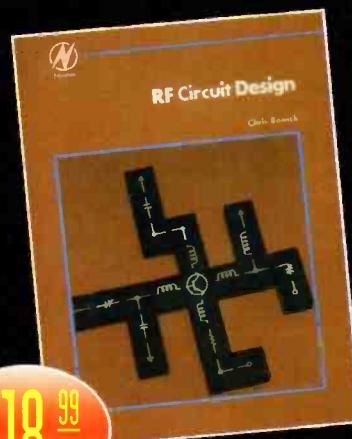
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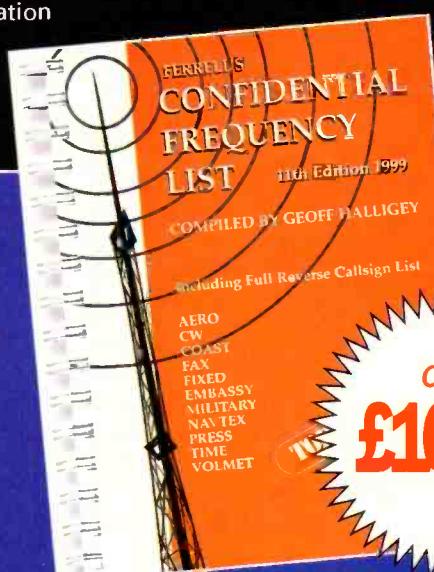
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The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

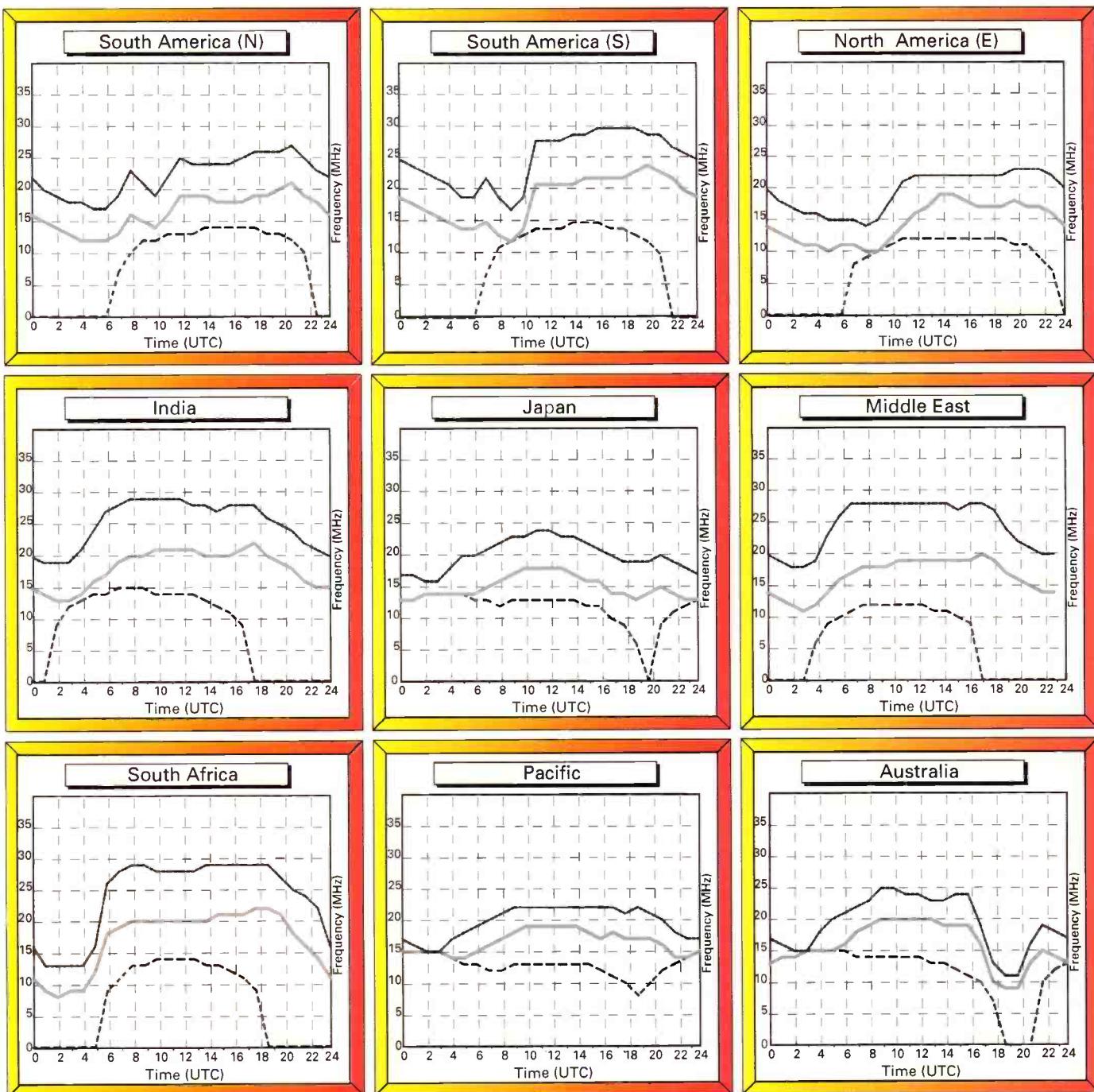
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

probability of success for the path and time.

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

Good luck and happy listening.

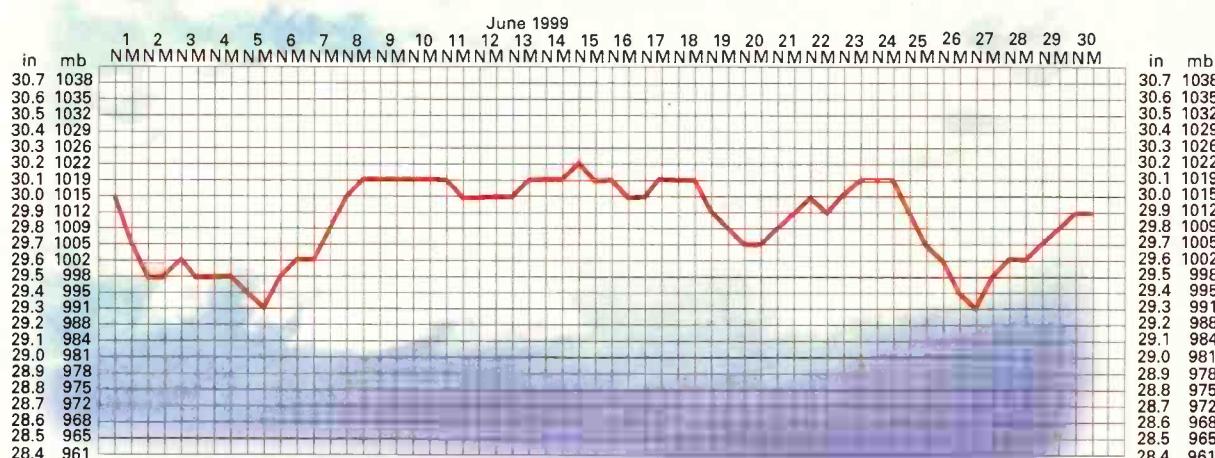
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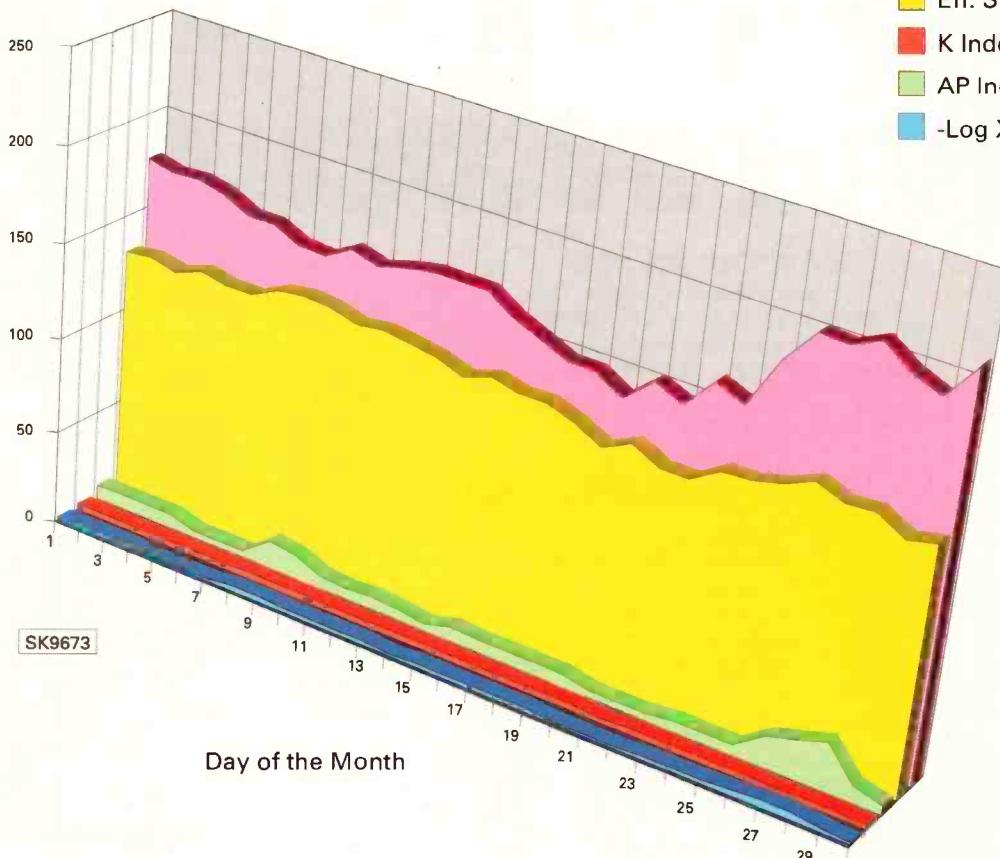
SK9672

Propagation Extra

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



June Data



- 10.7cm Flux
- Eff. Sunspot No.
- K Index
- AP Index
- -Log X-Ray

guide
to the
chart

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

The K and AP indices are measures of geomagnetic activity.

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

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Amateur Bands

Last time round I commented that the rise in flux had at least temporarily come to a stop. That Law manifested itself - immediately I dropped the copy into the letterbox things picked up!

By now, I suppose most of you will have heard of proposed changes to amateur radio licences, which were read out on the GB2RS News script on May 23. GB2RS made it clear that these quite widespread improvements will be phased in over a period. The Morse requirement is built in to the ITU Regulations, and can't possibly disappear until the WRC in 2002, or maybe the one after that; so the present proposals are by way of an interim solution.

However, a proposed form of wording for ITU Regulation S25 has been approved by IARU Region 3 and Region 2, with Region 1 to discuss at Lillehammer in this autumn, so the world's national amateur radio societies will be united when the Morse comes up for discussion at ITU.

Summer is the time when amateur radio activities change. Amateurs go out on Field Days, at h.f., while at v.h.f. we see Sporadic-E, tropo and auroral effects. Summer is also the time when we can think of antenna work - at the very least of routine maintenance.

Safety

Which brings me to the question of safety. Firstly, if for **any** reason you use power tools outdoors or inside, be quite sure you have an RCD (Residual Current Detector) between the mains plug and the socket outlet. Such a device will knock off the current in a few milliseconds should it detect any unbalance in the currents on the two legs of the mains.

When using ladders, make quite sure they are stable. That implies the bottom is sitting fair and square on the ground, and preferably that the top is lashed. Even then, don't take needless risks with ladders. The usual reason for being aloft is reeling a halyard; while you've got things set up, why not reeve a spare? Keep the spare totally unstressed, then when the main one breaks, use the spare to haul a replacement halyard over without any need for more ladder work; and at the same time you can haul up a replacement spare ready for next time!

Nylon rope is 'stretchy', up to 20% extension or more, though it may take some hours fully to recover. Terylene on the other hand is decidedly not stretchy; so nylon mast guys are very much a no-no, but terylene ones are OK. When you buy rope, watch how the chap pulls it off the coil.

If the salesman pulls a kink out, reject the rope instantly - where the kink is or has been, is forever after a weak spot in the rope. In an extreme case, you may even find such by way of a less flexible part, where the compression and stretching has been enough to cause fibres to actually melt and fuse!

Letters

Our first comes from the correspondent who prefers to remain anonymous - and for the record, I know and agree the reason is good. The letter brings up the question of 'intruders'. Firstly, we must make a clear distinction between legitimate but non-amateur signals on a shared band, for a historical example, one thinks of Top Band, shared between amateurs, 'fishfone' and Lorain.

Today, looking at my BR68 (which is not quite up-to-date), I see sharing on Top Band, 3.5, 50, 70, 430MHz and higher. A non-amateur station on these bands may well have every right to be there. However, the non-amateur signals on 7.0-7.1MHz are intruders, as are the ones on 14MHz. Perhaps we can break these down even more.

For example, if a broadcast station harmonic suddenly appears on our bands; the owner will probably be highly chuffed to hear of the problem so he can by repair get all his r.f. out on his chosen frequency. On the other hand,

there are other, less legitimate operators. The military of this-or-that country for example, and aid organisations who often don't even know they are intruding - they've bought a network from a crook dealer who sells them amateur gear because he gets it cheap and sells expensive to them.

So - what do we do? If - and only if - you're convinced it's a wrong 'un in an exclusive amateur band, monitor it, log its frequency and operating times as accurately as you can; if you have one, the beam heading; and as much other gen as you have, and let me know. I'll filter all such reports, and pass to the Monitoring Service.

Now we turn to **Paul Goodhall** in the Holywell area of Oxford. Running down the log from April 29, we see lots of VKs, EA7BA, G8PX's lunchtime session with K1UQV and KC1TX, YCs. VO1XC, 3V8BB, 9H1DE, something signing 'B15D', TP50CE, W3DZZ, PR7CM, a raft of assorted Japanese, 4X4REM, HH2/N2APL, HL1AV, TT8GWH, 2C4BVJ, VE2RP, lots of stations on for the 'windmills' event, 2S3JJ, VU2FOT and GB2PLY. It is interesting to note that Paul listens occasionally on c.w. which can't be bad!

Up in the far north of Scotland, **GMOEXN** writes to note that out of 622 contacts worked for the 'Wick Radio' commemorative, not one was Yugoslav. However, John came on with his 2SOEXN and found GOUBX/M in Canary Wharf London, when he was called by 4N1KT/1, perhaps not realising the significance of the 2S0 call.

GM0EXN of course sits right on the cliff looking out on to the Pentland Firth - turn right instead of left out of his shack door and you fall straight down into the sea! John has maximum licensed power up there, and a vertical fed against four above-ground quarter-wave radials and a couple of three-quarter wave ones. Incidentally, John has a B&B which I've sampled and can recommend, especially if you have hopes of seeing an aurora display.

It's a long way south from John O'Groats to Barnsley, where **Colin Dean** lives. Colin looked at 3.5MHz sideband for EX8M, VQ9AC, and 5Z4RL before moving to 7MHz and A41LD, A45XM, EK3GM, EZ8CQ, FT5ZJ, JA7EYK, a brace on UN8s VK4CYB, ZL1HY, ZS2JL, 3B9FR, 4L1DA, and 4S7BRG; at 14MHz we find AL7O, BV4OQ, DU8DJ, FR5ZQ/G, HS0/G0HHF, JT1CO and 5H3RK. Looking higher yet to 18MHz, PY7HW/MM was off EA8, JE1QBU, TA1AL, TU5IJ, UN7JX, VU2TRI, YB1AQU, YB7CIV, and 4S7BRG while at 21MHz AH6NJ, BV4KR, BV5GQ, DU1LK, DU3NHK, DU1KGJ/4, D44BC, EP/RA6LGM, FR5ZQ/G, KH6/W7GMH, OD5VT, TN2FB, TU2DP, VU2SWS, V8GTW, 5A1A, 7Q7RM, 9K2/SQ5DAK, 9M2TO, 9V1RH and 9V1YC, leaving us on 28MHz FR5ZQ/G, VQ9CV and 7Q7RM.

In Birmingham, **John Collins** sent three letters this time. In the first, John seems to have had a daytime session on 7MHz, which brought in 2C3RYE, a 2A0BQL, GW0SSB, GD4SXW, 2C0ABL (nice to know Dewi can still get on the bands occasionally), 3A50R, TM20H and a couple of Els, not forgetting GM3KHH celebrating 38th anniversary of the Royal Signals ARS - this one knocked John's 'S'-meter up to 60dB over...which just goes to show how untrustworthy 'S'-meters are (at 6dB per 'S'-point and a start at 1mV across 50Ω, we'd be looking at about 1700V at the receiver input which just might cause an overload!).

Later in the evening, John found T98UFH, LX1UN, FR5ZQ/G, GM0WED, OX1RN (an ex-G settles in OX-landHC8N, FM5DX, TI2CC, with an eight-element quad, CO9JEE a club station, R1FJL whose cards should go to UA3HGS. **Fritz VP2EY** who can be sent cards to **PO Box 685, Island of Anguilla**.

On a different tack, John was interested in the BBC2 TV programme *The Planets* from 2100 - sadly at the time I'm at the local club meetings. Now to the third letter, John notes TM0H on IOTA EU-48, with cards to F5RRW 7MHz conditions around mid-month were, John says 'amazing' with for example Belize in Central America at 57/58 shortly after midnight. Incidentally, John for all his listening, uses a DV27 CB dipole up at about eight metres, in the back garden.

Finis

That's it again. Input please to **Box 4 Newtown, Powys SY16 1ZZ** as usual by the first of the month. We've had to start early this month, so any late arrivals will be taken in next time around.

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FARIS RAOUF c/o EDITORIAL OFFICES, BROADSTONE**E-MAIL:** scanning@pwpublishing.ltd.uk

Scanning

Ladies and gentlemen, I have a confession to make. It's a secret I've held close to my heart, and one that, until now, only my wife has known about. But, because of the inhuman knack tabloid newspapers seem to have of digging the dirt up on people then plastering the sordid details of their personal life all over the front page, I thought I'd better pre-empt them and come clean right now. Fellow scanning enthusiasts, the fact is that, for the past year or so, I've been a closet Spice Girls fan.

Yes, I know, this is a truly shocking revelation, but now that it's out in the open, I feel much happier, and hope that you won't judge me too harshly for my taste in music. It also means that I can reveal, without fear of any repercussions, that the Spice Girls are scanner users! Well, perhaps that's being a little economical with the truth, and unforgivably tabloid, because the Spice Girls' themselves almost certainly don't actually know what a scanner is, let alone how to use one.

But, if you watched a recent Channel 4 documentary, which followed them 'fly on the wall'-style on their first post-Gerry (Ginger Spice) tour of America, you'll have seen a glimpse or two of a scanner being used by their sound crew to monitor their radio microphones. The scanner in question, incidentally, was an Icom PCR1000, connected to a notebook PC for portability's sake.

They even showed a close up of the notebook's screen, so I can reveal, for the first time in print anywhere in the world, that Spice Girl Mel C's radio microphone frequency is 790MHz, wide f.m. This is Radio Mic Channel 67 in the US, so tuning up or down in 25kHz steps would seem likely to find the other band members.

Don't bother trying to find them on these frequencies in the UK though, as all you are likely to hear is the audio component of Irish television channels. Do try listening to any frequencies between 854.75 and 860.725MHz in this country, though, as these are commonly used UK radio microphone frequencies.

You'll have to get quite close in order to hear anything, as the powers used by radio mics are quite low, but I would imagine if you live next door to the likes of the Wembley Arena in London or the G-MEX in Manchester, you'll stand a good chance of hearing something quite interesting.

Unfortunately, if you do actually hear anything on the frequencies I mentioned, you'll be committing a criminal act. In fact, you can't legally listen to anything much other than general broadcast radio, TV and amateur radio transmissions. This isn't the case in, for example, the US or Australia, where you can listen to just about anything you want, with the exception of 'private' conversations such as those conducted on cellular 'phones.

The question I ask myself, over and over again, is if they can, why can't we? It isn't as though we are living in a third-world dictatorship. What does the Government have to hide? Slipshod RT procedures on the part of ambulance personnel? Swearing by the odd Police unit when trying to arrest a violent suspect?

Now I know that the use of scanners by criminals is a problem for the Police. And, undoubtedly, there are also other types of user out there who would rather not have their radio conversations overheard, for reasons of national, or at least governmental, security. Being a law-abiding kind of person, I'm 100% in favour of preventing criminals and other anti-social types from getting their hands on information that could help them do their evil deeds. So I'd like to see the powers that be simply encrypting really sensitive transmissions, but leaving more mundane users and their routine transmissions in clear.

I know it costs a little more to add such capabilities to a radio system, but surely not that much? I'd be interested to know what you think on this subject, and how you might solve the problem of letting innocent scanner users enjoy their hobby while at the same time preventing criminal use of scanners. Drop me a line, either by post or by E-mail, and let me know.

Specific Matters

On to more specific matters now. I've received an E-mail from **Edward Attwell**, giving some interesting details in response to **Paul Wade's** query about G-HEMS, the London Air Ambulance, a couple of months back.

Edward tells me that 166.425MHz (f.m.) is the frequency for HEMS (Helicopter Emergency Medical Service)

Operations, located at the London Ambulance Service HQ near Waterloo. He says you'll normally hear the doctor from the helicopter on this frequency, callsign Medic One, giving updates on the patient's condition.

Edward also goes on to say that 122.950MHz (a.m. this time), is the frequency for the radio link between the helicopter's control room at the Royal London Hospital, callsign Mike Sierra, and the helicopter itself.

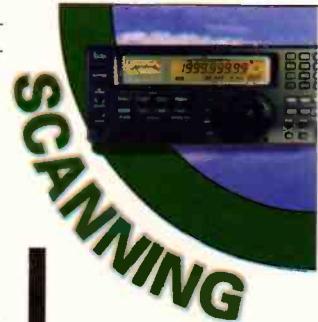
AOR Mailing List

Are you an AOR AR8200 owner? If so, you might like to know that there's a mailing list just for you, where fellow owners can pass information between themselves, and get answers to those burning problems or queries your dealer never seems to know how to sort out. I'm told there are currently over 400 users subscribed to the group, including AOR UK! To subscribe to the list, send an E-mail to ar8200-subscribe@onelist.com or visit <http://www.onelist.com/subscribe.cgi/ar8200>

Repeater News

I've had a very informative E-mail from **Simon Kennedy GOFCU**, regarding A. Lincoln's inability to hear anything from his local 70cm repeater, GB3HN. Simon tells me that the real problem is that it was shut down some time ago. The repeater was apparently sited in Weston, near Stevenage, at a scout activity centre. Unfortunately, the benevolent owner of the site died, and the inheritors of the estate got stricter with regard to the mast that had been erected for the repeater's antenna, forcing it to be taken down. Simon does point out that he has moved out of the area, so it is possible that the repeater has been re-sited and re-activated. Can anybody tell us for sure?

Simon goes on to say that GB3PI is a 2m (145.750MHz output) repeater, located near Royston, and was still going strong the last time he heard. But its 70cm relation, GB3PY (433.200MHz output), is located at Madingley near Cambridge, and it is possible that reception in Letchworth is not that good unless a high gain antenna is used.



Where's Your Letters?

Well, that's all I have room for this month. Your letters and E-mails have dried up of late, which I think is a shame, and can't be down to nobody having any questions they need answering, or comments (good or bad) about the column. So please get writing again, and don't be afraid to criticise if need be.

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

YAESU

FRG-100 Receiver
50kHz - 30MHz



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For
DEAL!

The FRG-100 has stood the test of time. It offers full coverage of the short wave bands plus long wave and medium wave. It features * USB, LSB, AM, CW, Memory Scanning * Dual Speed AGC * High and low impedance antenna inputs

* Programmable steps from 10Hz - 1kHz * Optional Narrow Filters * BFO reverse for CW * Twin Clocks. Ask for leaflet.

Fairhaven RD-500VX

20kHz - 1.75GHz



£799

This very wide range receiver offers a complete listener station in one package. Features include USB, LSB, CW, AM, FM, Video out * 5Hz step accuracy * Over 13,000 memories with 20 Alphanumeric Characters * Noise Blanker * Text Search * Pass Band Tuning * Stereo CW Reception * Notch & Peak Filter etc.

AOR-7030 Receiver

0kHz - 32MHz



£849

Needing little introduction, this receiver has become a classic of design. Features USB, LSB, CW, AM, FM, * 100 Memories * Dual VFOs * Resolution to 10Hz * Clock and Timer * Variable Bandwidth * Wide Dynamic Range * Seamless Tuning using Single Loop DDS * Clear LCD Readout * Infrared Remote Controller * AC Power Supply. Send for leaflet.

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AOR-5000 Receiver
10kHz - 2.6GHz



£1299

Covering an extremely wide frequency range and offering USB, LSB, CW, AM, FM. It features 1,000 Alphanumeric Memories * 45 Channels per sec Scan Speed * 2,100 programmable Pass Frequencies * DTMF Decoder * RS-232 Port * 1Hz tuning steps * 6 switchable bandwidths * Preamplifier * Duplex monitoring *

ICOM ICR-8500 Receiver
100kHz - 1.99GHz



£1495

Icom's wide range receiver has all the performance and engineering qualities you expect from this company. Features include USB, LSB, CW, AM, FM, WFM * Wide dynamic range * RS-232C interface * 1000 alphanumeric memory channels * Comprehensive scanning * Sleep function and Timer * IF Shift control * 3 Antenna connectors * Voice synthesizer option * Keypad frequency entry * Analogue S-meter * Large LCD readout etc. Send for brochure.

AOR-3000A Receiver
100kHz - 2036MHz



£699

The AOR-3000A goes on and on. It offers a wide frequency range at a very competitive price. Features include USB, LSB, CW, AM, FM * Fast 50 channels per sec search, * GaAsFET RF amplifier * Wide range of tuning steps from 50kHz * RS-232 port * 400 memory channels * Built-in clock * Channel pass feature * Back illumination * Rear whip antenna etc. Ask for leaflet.

AKD HF-3S Receiver

30kHz - 30MHz



£159

A budget class receiver that is an ideal beginners receiver offering complete coverage of the short wave, medium and long wave bands. It will resolve USB, LSB and AM signals. 10 memories allow you to store your favourite channels. Although the receiver operates from 12V, we include a Free AC adapter. All you need to do is to add an antenna. Then just tune into the world!

NRD-545 DSP Receiver

100kHz - 30MHz



Phone

The NRD-545 is a high quality short wave receiver, built by one of the finest communications in Japan. DSP filtering is carried out at 1F level permitting bandwidth control for 10kHz down to 40Hz!

The same system offers noise and notch filtering. And to store all your favourite frequencies, there are 1,000 memories. Send for leaflet.

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Yupiteru MVT-9000EU 100kHz - 1.99GHz

Special This Month

Here's your chance to purchase the latest scanning receiver from Yupiteru at an unbelievable price. Covering the complete radio spectrum from long wave to UHF, you have a complete station in your pocket. Features include NFM, WFM, NAM, WAM, LSB, USB, CW, * 7 Frequency steps * 1,000 Memories in 20 banks * 500 Pass memories * 10 Priority channels, * Band Scope display * Duplex receive function lets you hear both sides of the conversation * Fast tune function, * Built-in AM antenna * Dual frequency display * Fast keypad entry, * Rechargeable batteries, AC charger and helical antenna.



£269

Yupiteru MVT-7100EU 100kHz - 1.65GHz

Probably the best value for money, it has stood the test of time and is very sensitive. Offers USB, LSB, CW, AM, FM, WFM, * 1,000 memories * 500 Pass channels * 12 Tuning steps * Fast scan speed * Rechargeable batteries, AC charger and telescopic antenna.



£199

Yupiteru MVT-7000EX 100kHz - 1.3GHz

The ideal scanner for those who are mainly interested in VHF and UHF listening. Features include, FM, WFM, AM reception * 200 memories in 10 banks * 20 steps per sec scanning * 6 Tuning steps * Good sensitivity * Supplied with rechargeable ni-cads and AC charger. Telescopic antenna included.



£179

AOR-8200 500kHz - 2040MHz

This wide range scanner is fitted with a data port for computer control. Features include USB, LSB, CW, FM, WFM * Programmable steps * 1000 memories in 20 banks * Alphanumeric display * Built-in AM antenna * 8.33kHz steps for air band * Rechargeable ni-cads, AC charger and helical antenna.



£379

ICOM IC-R10E 500kHz - 1300MHz

USB, LSB, CW, AM, FM, WFM * 1,000 Memories * Bandscope * Noise Blanker * Wide range of tuning steps * alphanumeric Display * Real Time Band Scope * Voice scan feature * Data output port * Programmable scanning * Ni-cad pack, AC charger and helical antenna.



£259

ICOM IC-R2 500kHz - 1309MHz

This palm size handy offers great performance. Offers FM, WFM and AM * Auto squelch * 400 Memories * 11 Tuning steps * CTCSS decode * Duplex monitoring feature * PC Programmable * Built-in attenuator * Priority watch * Needs 2 x AA cells (extra). Antenna included.



£139

Yupiteru MVT-3300EU 100kHz - 1.99GHz

The new slimmed down version of the MVT-9000 from Yupiteru offers a high specification at a low price. Features AM, FM * 5 Channel Steps * 200 Memories * 10 Priority Channels * Duplex reception * Descrambler * 100 pass channels * Integral desk stand, low battery warning * 4 x AA cells required. Helical included.



£149

Yupiteru VT-125 II 108MHz - 142MHz

This dedicated AM VHF airband scanner offers the ultimate in sensitivity. Features 30 memory channels * Signal Strength meter * Channel Pass * Priority Function * Key Lock * Fast scanning speed * BNC antenna socket (antenna supplied) * Includes, ni-cads, Antenna and AC charger and cigar lead



£169

Yupiteru VT-225 108MHz - 391MHz

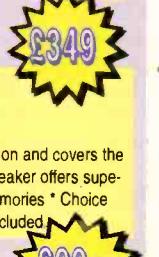
The VT-225 is a dedicated AM Civil and Military airband scanner. It offers the ultimate in sensitivity. Features AM, FM * 100 Memories * Programmable Steps * Priority Channel * Pass Function * High Sensitivity * Signal strength meter * Ni-cads, Antenna and AC charger.



£229

MVT-8000 100kHz - 1300MHz

This scanner is designed for desktop operation and covers the most popular frequency range. The large speaker offers superior audio. Includes FM, WFM, AM * 200 Memories * Choice of 6 steps * AC adaptor and Set Top whip included



£349

Super Searcher Auto Tunes Your Receiver

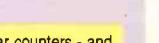
This frequency counter covers 10Hz - 3GHz and has the added ability to auto tune receivers with data ports. It will work with AOR 8200 and IC-R10 models. As soon as it finds a signal it tunes the receiver in a flash. Can also be used as a stand-alone unit. Supplied with ni-cads, charger and antenna.



£99.95

Hunter Frequency Counter 10MHz - 3GHz

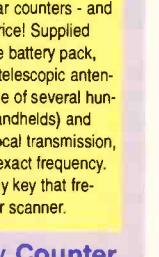
This is one of our most popular counters - and rightly so at the price! Supplied with rechargeable battery pack, AC charger and telescopic antenna. It has a range of several hundred feet (for handhelds) and sniffs out any local transmission, displaying the exact frequency. You then simply key that frequency into your scanner.



£59.95

FC-130 Frequency Counter 1MHz - 3GHz

This frequency counter functions in a similar way to the "Hunter" above. However, it offers a wider frequency range down to 1MHz and has a 10 digit display. It also offers a 16 digit bargraph field strength meter. Supplied with ni-cad pack, AC charger and antenna



£79.95

WAB-10 Airband Receiver

This receiver is ideal for the air band enthusiast. It offers proper AM reception of the complete VHF airband and has 10 memory channels. The digital display offers exact, rock-steady tuning. Needs AA cells. Includes VHF FM stereo (using headphones)

YB-400LE Yacht Boy Short Wave Receiver 520kHz - 30MHz

This compact portable offers AM and SSB reception and has 40 memory channels. A large clear LCD plus telescopic antenna make this a desirable portable.



£159.95

ICOM PCR-1000 Computer controlled Receiver 10kHz - 1300MHz

Connect this up to your PC and enjoy high quality reception with an amazing station data base and memory log. Can be used remotely from PC. Requires PC not included.



£249.95

Improve Reception Watson Scanning Antennas

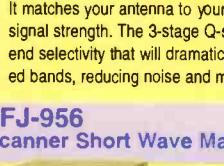
These antennas will dramatically improve your reception. They replace the factory supplied models and have BNC fittings.

W-801	Regular Gainer Rubber Duck 21cms long	£12.95
W-901	VHF / UHF Airband Rubber Duck	£19.95
W881	Super Gainer Rubber Duck 40cms long	£19.95
W-889	Telegäther Telescopic scanner whip	£14.95

Global AT-2000 Rx ATU Short Wave ATU with Q-switch

This antenna tuner covers the complete short wave spectrum. It matches your antenna to your receiver, thus ensuring maximum signal strength. The 3-stage Q-switch provides improved front-end selectivity that will dramatically improve reception on crowded bands, reducing noise and making signals clearer.

MFJ-956 Scanner Short Wave Matcher



£39.95

Improve your scanner's short wave reception. Place the unit between a wire antenna and scanner and hear signals jump out of the noise! Turns your scanner into a decent short wave receiver.

W-MM1 Data Decoder Scanner Short Wave Matcher



£69.95

This decoder is connected between PC serial socket and receiver audio socket. It is self powered. Supplied with software, it will decode data signals on your PC including Packet, AMTOR, SSTV, Fax, RTTY, CW, NAVTEX, SYNOP. Now you can read those strange noises!

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SSB Utilities

NavAids

In the February edition of SWM I mentioned an enquiry from **Paul Churchill** about NavAids from around the world. Paul wanted to be able to find the position of various navigation aids around the world, so that he could plot their positions as he heard them on h.f. **Bill Amer** sent an E-mail with details of how to get help from an unexpected direction - the flight simulator community that exists on Internet.

Although the pastime is 'virtual', the participants should not be dismissed as nerds and anoraks. Many are involved in real-world aviation and some are pilots or ex-pilots. Very often flight scenarios are set realistically and include aircraft, airfields, scenery and NavAids as accurate as the software will allow.

A small group of ultra-enthusiasts actually 'run' airlines by undertaking 'virtual' flights, with regular schedules and to set destinations. This level of realism might very well extend to accuracy in NavAids. A good place to start looking is the Flight Simulator forum/conference on Compuserve, or the microsoft.public.simulators newsgroup.

As is often the case in the forums and newsgroups, the level of expertise available is considerable, and every one is very helpful. If you can't get an answer directly, it's very likely that you'll get pointed in the right direction.

Royal Tournament

The 1999 Royal Tournament is being held at Earls Court in London between Wednesday 21st July and Monday 2nd August. As this issue of SWM will reach most of you within that period, the following information will be useful to you.

For the past few years, the Air Training Corps (ATC) have been arranging for various civil airliners and military aircraft to call-in to the ATC h.f. station during the course of the show. These contacts are usually reported by listeners, with the inevitable question what was all that about?

1999 is no different, and there are already plans to repeat the exercise this year. Numerous airlines and the RAF have been contacted and given details of how to contact the ATC station. A major difference this year is that you can now QSL the ATC station at Earls Court. As this is supposed to be the final Royal Tournament (in its present form and location), this is your last chance!

Headquarters Air cadets have given their permission that during the Royal Tournament special event station, they will be able to QSL with short wave listeners. An ATC Officer, who also happens to be a radio amateur, so understands the process, has been assigned to handle all the QSL requests.

Daily radio schedules are from 1100 local to 2100 local using the callsign MRV92, from Wednesday 21st July until Monday 2nd August. Unfortunately, I cannot tell you the exact frequency that they will be using, but I can give you some clues as to its whereabouts!

If you tune slowly through the 5MHz band and miss-out the Aeronautical Band between 5.480-5.730MHz, you should find them! You can send-in a QSL for either hearing MRV92 working an aircraft, or MRV92 to other ATC stations, but don't forget to include the date and time, frequency and both callsigns.

To get your QSL card you must send details of your loggings and a stamped s.a.e. or International Reply

Coupon (IRC) to **D. Horsley, 5 Edwards Gardens, Swanley, Kent BR8 8HP, United Kingdom**. If all goes well, its something that will continue for some future special events involving the ATC and their h.f. stations.

Mystery Callsigns

Darren Bell wrote to ask about a callsign that he heard during May, and asks if I can provide any information about what he heard. The callsign 'Spaceage' was heard giving a '30 character message' on 11.267MHz and he was talking quietly, almost whispering, as though he didn't want someone at his QTH overhearing. Darren says that it was obviously US military, but wants to know who!

Well Darren, that particular callsign is one which is changed every day, usually at midnight, and is generally considered to be an aircraft flying somewhere in the USA. These aircraft are usually E-6B Mercury radio-communications aircraft, yet another variant of the Boeing 707 aircraft, or possibly an E-4B aircraft, a military variant of the Boeing 747 Jumbo Jet.

The 30 character message is a coded message, and I am not aware of anyone who has managed to break into these codes. These messages are generally considered to be messages to the US nuclear forces, and probably include some dummy or un-decipherable messages, designed to confuse anyone trying to decode them. The messages are broken down into a 60-character prefix followed by a variable message which can be anything from ten characters to strings including hundreds of characters.

Robin Abrol writes to ask about some RAF broadcasts which he heard on 4.723MHz. Architect was working Topic 1 and Topic 3. Robin has checked these in an old callsign list, which says that these should be Harrier GR.7s. However, Topic 1 reported that they had 45 people on board (POB), so was obviously not a Harrier!

Well Robin, these callsigns were a pair of RAF Chinook helicopters operating in south-western Scotland for a military exercise called Corsican Lanyard. This exercise took place in the second half of May, and included a number of C-130 Hercules of the Lyneham Transport Wing (LTW), RAF Lyneham and eight Chinook helicopters of the Support Helicopter Force (SHF), RAF Odiham.

The idea behind this exercise was a Joint Rapid Reaction Force deployment on a UN mandate, a short duration intervention to restore political stability. During the early stages of the exercise, a Forward Operation Base (FOB) was seized by parachute assault, and during the following days troops were moved forward by Hercules and Chinook. The Chinooks were using the Topic callsign throughout the exercise.

Alpine

Stuart McMurtie wrote asking for a list of Alpine callsigns used by the Mountain Rescue Teams around the UK. I have included a list of the regularly reported callsigns elsewhere on this page. The list contains details of where each MRT is based, which should give you an idea of which mountain and hill areas they cover.

A good time to hear these callsigns is early in the morning at weekends, as each unit usually tries to make contact with Kinloss Rescue. Each unit has two callsigns, but I am not really sure why or when they would use the numeric callsign or the phonetic letter callsign. Does anyone know why?

RAF Mountain Rescue Teams

Alpine 20/Alpine Hotel	RAF Stafford, Staffordshire
Alpine 21/Alpine Victor	RAF Valley, Anglesey
Alpine 22/Alpine Lima	RAF Leuchars, Fife
Alpine 23/Alpine Kilo	RAF Kinloss, Grampian
Alpine 24/Alpine Tango	RAF Leeming, N Yorks
Alpine 95/Alpine Sierra	RAF St. Athan, S Wales

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Decode

I recently had the chance to play with the full version of this excellent program, along with a ready-built Multiscan interface unit and thought you would be interested to hear about an alternative to the usual JVFAK, etc. If you've been around the decoding scene for a while, you will know that the MSCAN range of programs have been on the market in various guises for a number of years now.

The original MSCAN programs featured both Slow Scan TV and FAX modes, and being aimed squarely at the amateur market, supported both reception and transmission of images. Although both modes were included, the programs were probably best known for their SSTV support.

Up until fairly recently, the MSCAN range were all DOS based, mainly due to the complexities of trying to operate a real-time data processing system in a Windows multi-tasking environment. The problem stems from the fact that the FAX system used over radio is in fact an analogue system, and the signal is constantly changing.

Using a conventional 'comparator' interface means the computer has to continuously monitor the input and carry out its conversion algorithm. Any breaks in this process, e.g. to service other programs, would cause a gap in the received image. The only way around this problem is to use some form of interface between the radio and the computer. Let's take a quick look at this process in a bit more detail.

has to use an algorithm to work out the frequency of the signal. To do this, it has to repeatedly measure the time between zero crossings of the signal. This is a very time consuming task on its own, and requires the program to have total access to the PC's processor.

There is also a need for the program to directly address the hardware rather than use the normal conventions. These are the reasons why programs using the simple interface don't work properly under Windows. Anyway, once the program has worked-out the frequency of the signal, it can then decide what shade to allocate that part of the image.

As well as calculating the frequency and converting the image, the processor also has to keep a lookout for start and stop tones within the signal so that it can run the automatic reception facilities. So you can see that, in a system that uses a comparator interface, the computer is kept exceptionally busy!

The alternative to this approach is to employ some external circuitry to do some of the work and take the load off the computer. This also has the advantage of letting the program use standard vector address and routines when accessing the hardware. So, how is this done?

The most common way is to carry out the basic signal analysis outside the PC. In essence, this means designing some circuitry that will recognise the frequency of the incoming signal and assign it a digital value that can then be turned into a shade of grey on the screen by the computer.

There are lots of ways to do this, but one of the most common, and the system used in the Combi-Tech Multiscan interface, is the phase locked loop. This is an ingenious system where a phase detector is used to compare the received signal with that of an internal oscillator. If there is a frequency difference, the detector sends a control voltage to the internal oscillator to change its frequency.

Once the frequencies are matched, the control voltage is used to make sure the internal oscillator stays exactly inline with the incoming signal. Clearly all this has to happen very quickly, and the design of the control circuitry is the really special part of any Phase Locked Loop.

If you haven't twigged already, it's the control voltage that's the really important bit as once the signal and internal oscillators are locked, the control voltage is directly proportional to the frequency changes in the signal. That's precisely what we started out trying to achieve.

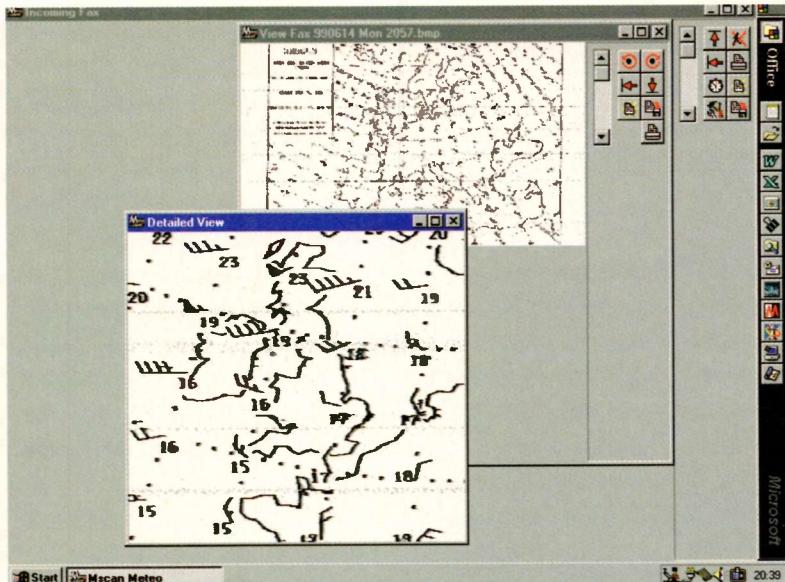
In the case of our FAX signal, we now have a precision controlled voltage available that's following the changes between black and white. However, before we can apply this signal to the computer, there's just one more step.

We need to convert the control voltage into a digital signal. This is done in much the same way as a digital voltmeter, where we use a process called quantisation to sample the voltage at regular intervals and assign the measured voltage one of 256 possible values. If this is then created as a binary number, we end up with an eight-bit number that can be sent to the PC.

Sending this number can either be done as two, four bit words through the serial port, or as a conventional serial signal, again through the serial port. By sending the data in this way, the computer can use its built-in buffering to temporarily hold this data until its ready to process the FAX data. This simple fact allows the FAX program to deal with operation in a multi-tasking environment like Windows.

MSCAN Meteo

So, having dealt with the relative advantages of a more sophisticated interface, let's take a look at how the Multiscan interface works with the new MSCAN Meteo FAX



MSCAN Meteo with Detail Display Active.

Inside Interface!

The signal coming from a receiver that's properly tuned into an h.f. FAX station comprises an audio tone that can vary between around 1500 and 2300Hz. It's not so much the actual frequency, as the frequency range that's important. The range between 1500 and 2300Hz is used to represent an infinite number of shades between pure black at the lower frequency (1500Hz), and white at the higher frequency (2300Hz).

In a comparator interface, the incoming audio tone is limited by the internal op-amp to produce a square wave at the same frequency as the signal from the receiver. This is done simply to bring the signal up to the sort of voltages the computer can handle.

In order to make sense of this signal, the computer first

program. *MSCAN* has been around for many years as a combined FAX and SSTV system with some of the earlier versions even including RTTY and AMTOR facilities. This latest version, known as *MSCAN Meteo*, has been designed solely to receive weather FAX images, so all the controls have been optimised for this mode.

For the review, AMDAT also supplied one of the matching Multiscan interfaces so I could see the program working at its best. As this is a new program, it's no surprise to find that's its been written to operate with Windows 95/98 and requires a Pentium based PC.

Installation followed the usual *Windows* convention to ensure the program was properly registered. Although the main program files only take up a couple of Mb of disk space, the received image files are big at around 3Mb each, so you will need a bare minimum of about 30Mb of spare disk space for a workable installation.

With the software installation complete, the next step is to make the connection with interface and the receiver. This is done using a standard serial lead between the chosen port on the PC and the connector on the Multiscan interface. The final connection to the receiver being via a screened audio lead terminating in a 3.5mm jack for the receiver's line-out or external speaker socket.

With all this done, you can start *MSCAN Meteo* and run through the initial configuration. Choosing the interface is the first step as the program supports the PTC-II and HariFax 1, 2 & 3 interfaces as well as the Multiscan unit. Next comes some basic calibration to help make sure you receive high quality images.

If you're using a ready built Multiscan, you just have to enter the high and low calibration factors that were supplied with the interface. If you don't have this information, then you need to calibrate the interface with some external tones. If you're fortunate like me, you can just connect-up an audio oscillator and fire-in the 1500 and 2300Hz tones when requested.

If you don't have a suitable signal source, life gets a bit trickier, but the help screen contained a number of useful suggestions to get through this. The second area for adjustment is the receive clock, but this can only be done once you've received your first FAX picture.

To help get you started, the appendix of the help file contains some useful frequencies for UK based listeners. Getting a decent FAX image is really quite simple, but you do have to be careful to get the tuning right. To help with this, *MSCAN Meteo* has a handy built-in tuning display that shows the spectrum between 1 and 2.4kHz with blue markers at the main tuning points of 1.5 and 2.3kHz. All you have to do is tune your receiver so that the signal spreads between the two markers.

If the station is already running through a FAX chart, you just have to hit the Up Arrow to start reception. When you do this, you miss the initial synchronisation process, so you will usually find that the edge of the image ends up in the middle of the screen. Putting this right is dead easy - you just click the left arrow and move the cursor to the appropriate point in the image and the program swings it around to the edge of the screen. This is one of the best sync correction systems I've seen.

Once you've received the first picture, you will probably find that it's slanted one way or the other. This is because of slight errors in your PCs internal clock and is very easily corrected through *MSCAN Meteo*'s calibration menu. You can either drag the slider to give the required correction, or just mark the top and bottom corners of the image and the program does the rest!

With the set-up complete, you can get on and enjoy using the program, which was a real doddle. The reception was set-up to be completely automatic as the program could recognise all the standard start and stop sequences, so producing perfectly synchronised images with no operator intervention.

Whilst receiving a picture, you can hit the left mouse button to display a detailed view of the image. This can be moved to any part of the image and was very useful to check the quality of the image. The high level of automation built into the program makes it ideal for those new to FAX reception and particularly attractive to those who just want the weather data without having a particular interest in the technicalities.

As well as automating the reception process, the program also stores the received images to the hard disk. Although this is a great feature, you do need to watch the amount of disk space used if you monitor over extended periods. As each image is around 3Mb you can see that disk space could be consumed at an alarming rate. To help with this the program does include an automated feature to delete files older than

As well as the reception facilities, the program also included viewing facilities along with options to make changes to the orientation of the displayed image. Overall, *MSCAN Meteo* turned out to be a very effective FAX program as you can see from the pictures. The image quality was up among the best I have seen and the automation made FAX reception simplicity itself.

If you want more information or to buy a copy, AMDAT in Bristol are the UK agents. They can be contacted at **AMDAT, 4 Northville Road, Northville, Bristol BS7 0RG, Tel 0117-969 9352**. They also have a very good Web site at: <http://www.amdat.bristol-uk.com> MSCAN Meteo is priced at £35 and the Multiscan interface is available ready built at £99.00 or in kit form at £39.00. My thanks to AMDAT for the loan of the review model.

Klingenfuss World Wide Weather Services

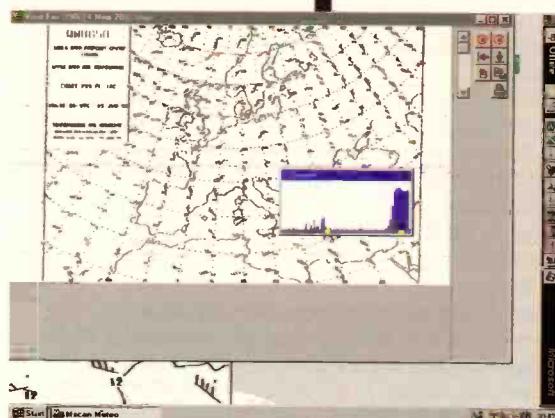
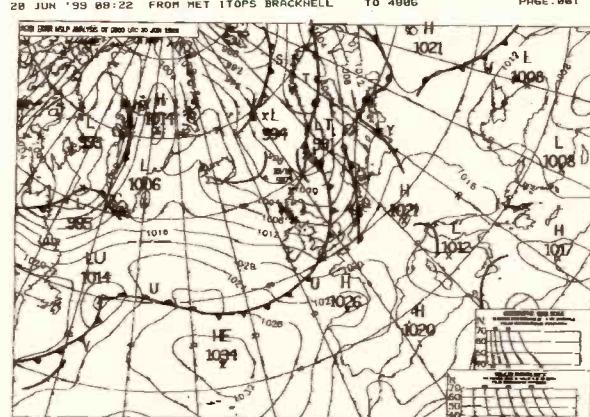
This publication changes significantly over the years I've been involved in utility work. In the early days, this was really just a list of FAX stations with a selection of sample images and station schedules. This latest 19th edition is a very different animal with its range extended to include Radiotelex, NAVTEX, Internet as well as the FAX data.

The inclusion of Internet data is particularly relevant, as many of the charts we struggle to get over the air are available at the click of a mouse on the Web. Probably the most useful section of the book is the main country listing. This provides a summary of all the weather sources grouped together by country. In here you will find the Web addresses, chart schedules and frequencies for all the countries major stations.

for all the countries major stations.

Next on the list of important data comes the straightforward frequency listing. This is getting shorter as the years go by, but there are still plenty of stations to monitor. Another great source of local weather data is the regular NAVTEX broadcasts on 518kHz. The Guide to World Wide Weather Services covered this area very thoroughly with a full international listing of station identifiers and transmission schedules.

To supplement all this useful data, there were sections containing sample pages so that you can see what you should be receiving! All in all this is an essential publication for anyone with an interest in receiving weather data. The guide is available from the SWM Book Service, priced at £23.00.



**MSCAN Meteo with
Spectrum Display**

All At Sea

Satellite Navigation Systems

The wide acceptance of man-made satellites first came into public awareness on 4th October 1957 when the Soviet Union launched the very first man-made satellite, *Sputnik 1*, into close orbit around the Earth. This small satellite, by present day standards, weighing some 65kg, was placed into Earth orbit with an apogee (the farthest point from the Earth) of 936km and a perigee (the nearest point to the Earth) of 229km. Circling the Earth every 96 minutes, *Sputnik 1* stayed in orbit until early 1958, when it fell back and burned in the Earth's atmosphere. The so-called 'Space Age' had begun.

During the orbiting phase of *Sputnik 1*, scientists noted that the transmissions from the onboard radio transmitter, when received at a fixed point on the Earth's surface, exhibited a very pronounced Doppler shift. It did not take very long for certain American geodetic scientists to reason that, by using a number of dedicated orbiting satellites in a 'birdcage framework' around the Earth, this Doppler effect could be refined and developed into producing the basis for an accurate Satellite Navigation System.

In 1964 the United States military (US Navy Astronautics Department) began a launch programme with the aim of providing an in orbit satellite constellation with the capabilities of being used for world-wide precise maritime and terrestrial navigation. This embryo system was called NAVSAT (Navy NAVigation SATellite system). A US Presidential decree in 1967 stated that civilians could now use the developed system.

By the late 1970s, with the developing NAVSTAR, a Global Positioning System (or GPS for short) became a working reality. With the same objectives in view, that of providing a world-wide satellite based navigation system, the Soviet Union military authorities started to launch in 1982, a constellation of satellites dedicated to that purpose.

By September 1993, under a decree from the President of the Russian Federation, the satellite constellation was declared to be fully operational. This system is known at the Global'naya Navigatsionnaya Sputnikova Sistema or the GLObal NAVigation Satellite System (or GLONASS).

The major components were now in place from a dedicated satellite navigation system providing global, 24 hours-a-day, all weather access to precise position, velocity and time information to a properly equipped user.

The NAVSTAR Global Positioning System (GPS)

NAVSTAR GPS is a military satellite navigation system that is owned and operated by the United States Department of Defence. The space segment of this system consists of 24 operational satellites evenly distributed between six orbital planes with an inclination to the horizon of 55° to the Equator and altitudes of 20200km (10900nm).

This configuration ensures that a minimum of four satellites with suitable elevations is visible to a receiver anywhere on the Earth's surface at any time. GPS will therefore provide continuous world-wide position fixing. The complete constellation is in place and the US

authorities have declared initial operational capability.

However, GPS users are cautioned that signal availability and accuracy are subject to change without warning. System integrity is also unreliable because of the current lack of real-time warning to users when satellites malfunction. The US policy is that GPS satellites transmit signals, which are intended primarily for military purposes, and are subject to change without prior notice.

The use of GPS signals for positioning, navigation, time transfer or any other purpose will be at the users risk. A recent announcement by the Office of the Assistant Secretary for Public Affairs in Washington DC USA stated that two new civilian signals will be provided by the US Global Positioning System (GPS). The second signal to be made available by the year 2005 will have public safety applications, particularly in international aviation, land transportation and maritime uses.

A lead-time of several years is needed because the new signal capability will have to be built into the next generation of GPS replacement satellites. The addition of a second signal will greatly enhance the accuracy, reliability and robustness of civilian GPS receivers by enabling them to make more effective corrections for the distorting effects of the Earth's atmosphere on signals from space.

The addition of a third frequency will be of particular benefit to scientific users and surveyors, adding to the speed with which users can obtain GPS positions and timings and improving the overall accuracy and reliability of the system. One of the new signals will be located in the frequency of the current GPS L2 signals, which previously has been used for military purposes.

Separate military and civilian signals can co-exist on this frequency as they already do on the GPS L1 frequency. The frequency for the third civilian signal remains to be defined. In consultation with many international users, one of the key questions that is to be resolved will be which of the new frequencies will receive the international frequency allocation and protection needed to enable it to meet safety of life requirements.

The Global Navigation Satellite System (GLONASS)

GLONASS is similar to GPS in that it is a space-based navigation system providing global, 24 hours-a-day, all weather access to precise position, velocity and time information to a properly equipped user. The system became fully operational in January 1996 and consists of 24 satellites in three orbital planes at 19100km altitude, corresponding to an 11 h 15 min orbital period. Orbital inclination is 64.8° as opposed to the 55° of GPS, this has a significant impact on operations at high altitudes.

Each GLONASS satellite continuously broadcasts its own precise position as well as less precise position information for the entire constellation, but the transmitted data is in the form of Earth Centred Earth Fixed (ECEF) co-ordinates and extrapolation terms, as opposed to Keplerian parameters as is the case for GPS. The user segment consists of the equipment necessary to track the GLONASS satellites and derive position, velocity and time from the satellite data and measurements.

Next Month

How NAVSTAR and GLONASS actually function will be covered in the next article. Full guidance and explanations are contained in *Admiralty List of Radio Signals, Volume 8, Satellite Navigation Systems*.

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73 from Dave G4KQH, Technical Manager.



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Info in Orbit

Luxury is - a new mast! I met a former school friend of mine some time ago, and discovered that he runs his own amateur radio shop just a few miles away! I currently have a QFH, METEOSAT Yagi (for GOES reception), and log periodic antenna all waiting for semi-permanent mounting, so I asked him about having a mast fitted. A few days later he arrived with steel pole, welding equipment and antenna clamps. The pole was cut to fit, and a bracket welded to the metal washing post. A support clamp was then added. I now have a mast that can be lowered by rope, hinged down to ground level and can carry each antenna! Get to know your local radio shop proprietor - he or she may be one of your best contacts. My grateful thanks to **Frank Russell** (of Maggie's CB radio in Keyham, Plymouth) for solving a long-running problem.

The QFH Arrives!

With the interest in the quadrifilar helix antenna that has arisen in recent months, I had made some attempts to gather the necessary materials together. My aim was to build the unit originally described by Bill Sykes and Bob Cobey in their three-page feature. An E-mail from a SWM reader mentioned that he had recently bought a hand-made version of this unit from a friend, and he kindly passed contact details. I contacted **Paul Hayes** by E-mail who immediately agreed to provide me with a unit for testing. It was delivered just a few days later.

The first ground test was made after fixing the unit to a wooden support just 1m above the ground. From this position, although the view from south-east to west is fairly good, north-east from my yard is non-existent, and other areas are somewhat limited by obstructions - roofs and buildings.

Despite these limitations, the antenna provided better signals from WXSATs in the east than I have seen for some years. My roof antenna has developed a problem (probably damp getting in the connector and cable), but replacement requires that a proven WXSAT antenna should be available - hence the tests. Within 24 hours it was evident that the QFH was ready for the job.

The antenna consists of standard 15mm bore copper pipe, carefully cut and soldered following the original plans. **Figure 1** shows six views of the antenna: an overall view, the view from below (seen looking at the supporting pipe), the cable feed connector and three close-ups. The feed to the receiver is connected via a connecting block - see **Fig. 2**; the signal (central) core is screwed to the right-hand side, with the outer braid (earth) being fitted to the left terminal. For ground tests I did not fit protective water-proofing covering to the antenna.

In the tests completed during a few days in May, and then repeated in early June, all high passes were received to perfection - see **Figs. 3, 4** and **5**. During the afternoon, METEOR 3-5 made a 22° maximum elevation pass to the west; despite a

neighbour's roof cutting off a portion of the pass, I obtained the longest sweep seen in some years.

The antenna was supplied complete, ready for mounting on a suitable 22mm pole. Insulation is provided by a 22mm plastic connector. After installation, silicon sealant or similar should be applied around the top of the antenna and the connection assembly, and perhaps self amalgamating tape around the 22mm plastic connector to help stop the effects of UV radiation.



Fig. 1: QFH antenna.

Contact Point

Paul Hayes can be contacted via E-mail at: paul@hayes06.freescrve.co.uk Paul is having discussions with the Remote Imaging Group concerning the sale and distribution of his antenna and anticipates completing an arrangement shortly. Details will be given in this column when known.

Current WXSATs

Hopefully, the new OKEAN oceanographic satellite - scheduled for launch in late June - will be operational, so expect to hear transmissions from the new satellite on 137.40MHz, the same as previous OKEAN satellites. Consequently, for a positive identification, check your satellite tracking program has the latest Kepler elements.

For newcomers to this specialist hobby, transmissions from OKEAN and SICH-1 (both on 137.40MHz) usually last no more than a few minutes. The picture content can be totally different from WXSATs. The spacecraft carries a scanner for visible-light images, and radar and microwave sounders, and the downlink may carry any combination of spectral images; keep listening!

Remember that overnight passes from NOAA, METEOR and RESURS WXSATs include some visible-light imagery during the summer months. The north pole is in summer sunshine, so these images show a significant portion of the polar regions. If you do leave your scanner set to receive images overnight, remember to turn the volume off so that others are not disturbed when the satellite comes over the horizon!



Fig. 2: Feeder connection.

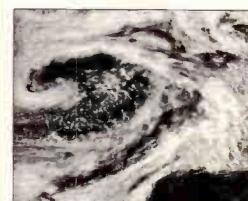


Fig. 3: RESURS 01-N4 on 1124UTC 4 June using the QFH.



Fig. 4: METEOR 3-5 1300UTC 4 June using the QFH.

Correspondence

Graham Powell of Aberdare, South Wales, is a regular reader of this column and recently added an Icom PCR1000 receiver to his station. Using a crossed dipole and reflector to obtain WXSAT signals, he then uses the program *wxsat* on his Pentium 350MHz for decoding the weather pictures. He sent in a picture decoded on 27 May during the morning pass from NOAA-15 (at 0815UTC). This

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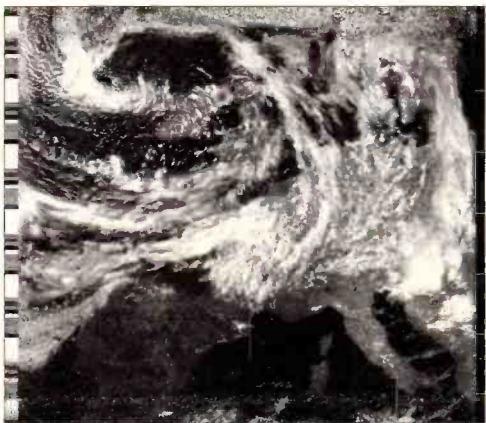


Fig. 5: NOAA-14 1431UTC 4 June using the QFH.

image shows the weather system to the south west of Cornwall, responsible for terrific thunder storms experienced in South Wales later that evening. These caused over 50000 homes in the South Wales valleys to lose their electricity supply for many hours. Graham is also the External Representative of the British DX Club, a club devoted to Broadcast Station reception.

For background information for beginners, I would like to clarify a few points that arise here. I don't know the exact specification of the Icom PCR1000, though from Graham's picture, I wondered whether it included a setting to cope with the unusually wide intermediate frequency bandwidth required for successful WXSAT decoding. Most conventional scanners have n.b.f.m. (narrow-band f.m.) and w.b.f.m. (wide-band f.m.) options - neither of which is suitable for the (approximately) 35-40kHz required for decoding WXSAT signals. I contacted Graham and he confirmed that his receiver has an adjustable i.f. which he set to 50kHz.

Secondly, SWM is regularly using colour for image reproduction - so I should remind beginners that WXSAT images are transmitted in black-and-white. Software often provides a facility for the artificial addition of colour.

A large amount of recent correspondence has concerned queries about whether specific (non-WXSAT) receivers can be used for obtaining pictures. In most cases, I have not been able to answer the questions without knowing the specification of the receiver.

In general terms, best results are usually obtained from a purpose-built WXSAT receiver that can be left collecting images all day. Those interested in experimenting with a general purpose receiver can try optimising settings, but they should be aware that poor results are likely to follow if the antenna or receiver is inappropriate. Those using the 'right stuff' usually get good results - as seen regularly in this column.

HRPT From Antarctica

There are a few UK companies utilising NOAA high resolution imaging (h.r.p.t.) hardware in the commercial environment. Dartcom, based in Postbridge near Plymouth, sent me a CD-ROM containing a large number of images

obtained by a project 'down under'. **Dave Wright**, a partner at Dartcom, told me that the company is active in the commercial and education weather satellite business, having taken the decision some years ago to concentrate on these fields. They recently supplied marine h.r.p.t. systems to the British Antarctic Survey for use on their Research Ships, RRS *Bransfield* and RRS *James Clark Ross*. They also have an h.r.p.t. system at the British Antarctic Survey base at Halley, Antarctica, that specialises in atmospheric research.

Figure 8 shows the building at Halley Base, situated on the flat, snow-covered ground. The antenna is an active-stabilised flat panel, radome enclosed unit, seen in **Fig. 9**, positioned about half-



Fig. 6: NOAA-15 0815UTC on 27 May from Graham Powell.

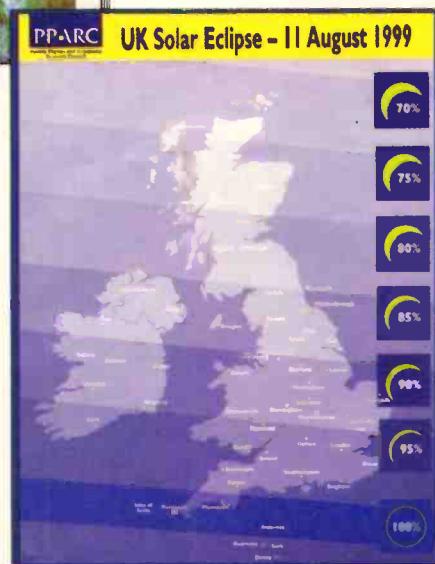


Fig. 7: Total eclipse 11 August 1999 - path of totality across Europe.

METEOSAT-6 & The Eclipse

Plymouth, south Devon and south-west Cornwall are gearing up for the total eclipse of the sun on 11 August 1999. EUMETSAT has decided to use its in-orbit stand-by satellite **METEOSAT-6**, positioned at longitude 9°W, to observe the shadow of the moon on the Earth's (or cloud) surface using a special scanning mode. Instead of scanning the full Earth disc in half-hourly intervals, a large part of the northern hemisphere will be scanned in 10-minute intervals. This allows for a more rapid observation sequence of the movement of the moon's shadow across the surface. All images will be rectified as if they had been made from 0° longitude and will be made available from EUMETSAT's web server.

way along the length of the building. The radome consists of low-loss material and houses the 0.46m flat panel antenna that is actively stabilised with solid state gyros and computerised drift control.

The region of Halley - based near longitude 26°W and latitude 75°S - was captured in **Fig. 10**, one of many high resolution images on the CD showing ice sheets and individual icebergs.

Chinese Imaging Satellite Developments

With China taking an active role in communications via the Internet, I took the opportunity to contact **Liu Jianqiang** of the National Research Centre for Marine Environmental Forecasts, in Beijing. The first Chinese Ocean Colour Satellite (*HaiYang-1*) will be launched in 2000. The spacecraft will operate in a near sun-synchronous, near-polar orbit at an altitude of 798km. Installed on the satellite will be two sensors - one having 10 bands for ocean colour,

and a temperature scanner with a spatial resolution of 1.1km, the other having four bands CCD coastal zone imager with the spatial resolution of 250m. The satellite is designed to detect some of the marine environmental parameters of the China Seas. It is believed that the satellite will play an important role in monitoring the marine environment and coastal zones, and studying global environmental changes.

METEOSAT Primary Data

Images from the far side of planet earth are routinely re-transmitted from METEOSAT-7 in both WEFAX and PD formats. For beginners, I will expand that opening sentence a little! METEOSAT-7 is the European geo-stationary WXSAT that transmits low resolution WEFAX images (requiring a fairly basic, inexpensive system for reception) and high resolution Primary Data images (requiring a relatively expensive receiving and decoding system). Both types of data are transmitted separately on 1691.0MHz, with the main WEFAX sequences transmitted on 1694.50MHz. Previous articles have included more detailed descriptions of the required hardware.

Our 'early hours' is someone else's afternoon; images originating from GOES-W (positioned at longitude 135°W) and transmitted at 0150UTC (infra-red) and 0152UTC (visible) show early afternoon solar illumination over the eastern Pacific ocean.

For several weeks there has been unseasonably stormy weather in America, particularly that coming in from the western coast. America has its hurricane season usually starting around July. This year there have been virtually daily announcements of vigorous systems arriving from the north Pacific ocean. **Figure 11** shows the latest image, the Pacific having reverted to a more pacified region. No doubt Mother Nature has more surprises in store.

Following these GOES images, the sequence reverts to a WEFAX transmission (from GMS-5 near Japan), and then the half-hourly encrypted images. The next clear images are two from INDOEX (METEOSAT-5) at 0222 and 0224UTC - infra-red and visible. A break, then more encrypted images follow - and then the test pattern is repeated. At 0254UTC, more INDOEX images complete the normal sequence of three spectral channels.

Shuttle Launch Schedule

STS-93 Columbia - Payload Chandra X-ray Observatory. Launch scheduled no earlier than 20 July at 1736UTC into a 28.45° inclination orbit.

STS-99 Endeavour - Payload RADAR Topography Mission (SRTM). Launch scheduled 16 September 1347UTC into a 57° inclination orbit. Note that orbital inclinations around 50° bring the Shuttle over Britain.

MIR Orbit Changes

Russia's **MIR** station has had its orbit raised. Current plans are for it to remain manned until August, after which it will be 'left' until February when its orbit will decay. The Russian Space Agency hopes that a last-minute funding reprise might save the station. NASA wants **MIR** de-

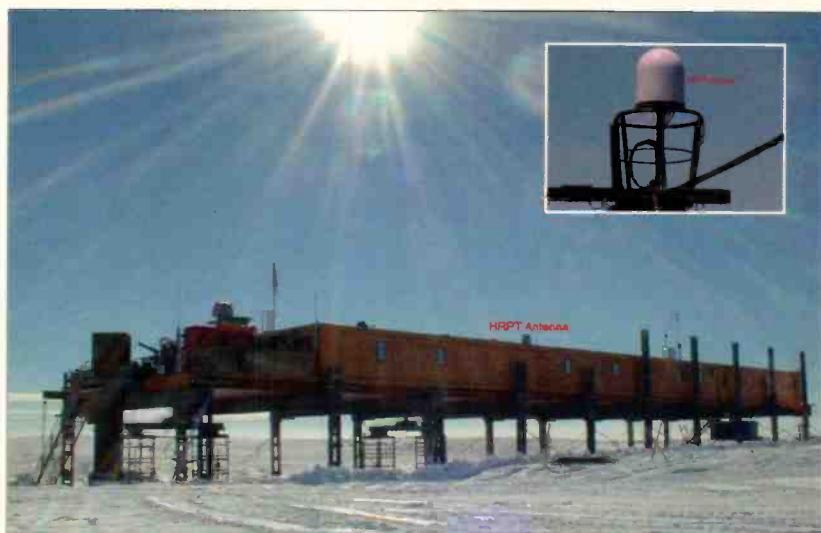


Fig. 8: Halley Base.

Fig. 9 (insert): HRPT antenna number two.

orbited so that Russia can use its meagre resources to complete its contribution to the International Space Station.

Next month I am looking at **David Taylor's SatSignal** program. It uses 'wav' files (a.p.t. sound files recorded with a sound-card), and produces perfectly synchronised images - from METEOR and RESURS.

Finally, congratulations to **Dave Cawley and Jill Cutts of Timestep Weather Systems**, Cambridge, who married on 17 July.

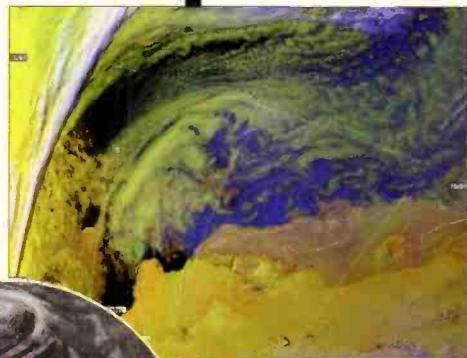


Fig. 10: Antarctica 2 January 1725UTC.



Fig. 11: GOES-W visible-light image (from METEOSAT-7) at 0152UTC 13 June.

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METEOR 3-5 uses 137.30MHz.

OKEAN-4 and SICHI-1 use 137.40MHz.

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

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

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

MIR (Russian space station) uses 143.625MHz for voice and 145.985MHz for amateur radio.

ISS (Zarya module) uses 634MHz for beacon.



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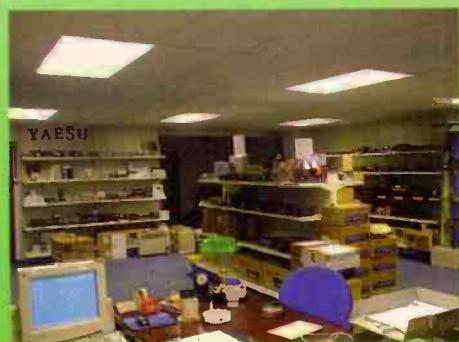


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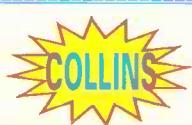
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Airband

Airliner manufacturers turn over large sums of money yet often extract relatively small profit margins. Like their products, the companies seem to get bigger too! This often happens due to mergers. Recently, Boeing took over the civil airliner business of McDonnell-Douglas.

What is the Boeing 717? On seeing a photo of one in the press, I realised that this was just a new name for the latest DC-9 derivative (MD-80 series), under changed ownership. But, did you know that the KC-135 tanker, itself derived from the B.707, at one time was going to be called B.717?

Aerial Cricket

In July's 'Airband' I mentioned seeing an airship in Goodyear markings. Well, Chris took me to Northampton to watch South Africa (one of her favourite teams) play Sri Lanka in the World Cup. I won't comment on the result (as a good friend of mine comes from a cricket-mad Sri Lankan family, and I'll make sure they get to read this!) but there was an aeronautical/radio aspect.

An airship was stationed overhead, wearing markings advertising the cricket match and its sponsors. Registered N11ZP (Zeppelin?) it looked like the Goodyear type, unducted propellers were visible.

On a platform in the ground, alongside the TV cameras, was an operator with what was probably a hand-steerable antenna mounted on a tripod. Dutifully ignoring the play, he'd follow the position of the airship, pointing the long, white, cylindrical radome at it. At the base of the radome was a circular shape, perhaps a dish. The operator also had a hand-held transceiver. Mounted to the front of the airship's gondola was a camera pod. I imagine the steerable antenna was to receive a video signal direct from the airship.

In The Air

Ex-aircraft avionics fitter Ian Johnson (St. Albans, Hertfordshire) sees northbound high-level traffic over his house each afternoon. Sometimes aircraft appear in pairs but they might be separated by at least 1000ft vertically, not obvious from the ground. I don't know if they're destined for oceanic airspace, the entry points are indeed often west of Scotland of course.

Reference to the usual radio-navigation charts and Supplements reveals UA20 and UH52, controlled on 127.425, 128.425 & 134.45MHz.

Paul Fineman (Orpington) wants me to identify some callsigns. Referring to ICAO Doc 8585 Bjet could be Bizjet Ltd. Sabre is a UK airline operating from Gatwick and Manchester but Saber is Egyptian which is confusing. Monarch's G-SMAN is Airbus A330-243 (construction no. 261). Monarch 346 routes Gatwick-Varadero, Cuba. A useful source is *Flight Routings*, updated each year and sold through the SWM Book Store.

Actually, more on the ground (but receivable in the air) are n.d.b.s. **M.C. Darke** (Reading) recommends the Amateur LF Band Ferrite Antenna for these, but in which issue of SWM did you see it, Mr. Darke? I can identify some beacons for you (all kHz). CWL = Cranwell 423, FOS = Fairoaks 348, GY = Gatwick 365, NN = Northampton 378.5 and SSD = Stansted 429. I can provide more information if you ask for what you want to know, meanwhile a look in the *British Isles & North Atlantic En-Route Supplement* from the RAF will enable beacon idents to be deciphered.

How do you buy Supplements and charts by mail order? First, send a self-addressed pre-paid reply envelope (to hold two A4 sheets) to the Broadstone Editorial Offices (**not** to me, I don't have a photocopier!). Ask for *Airband Factsheet*. This tells you how to order from the RAF, Aerad, etc.

Receiver Hardware

The letter from **Derrick Hine** (Andover), as mentioned in June 'Scanning,' hasn't reached me from Faris Raouf yet, but I'll briefly answer Derrick's question on 8.33kHz channel spacing. I imagine that transmissions will be narrow bandwidth and so you will need a scanner that gets close to the nominal centre frequency. Some months ago a suitable scanner was advertised, but I've heard no more about it, so the only remaining contender that I know of is the AR8200 as suggested by Faris.

It will be some time before these narrow channels are in use in UK airspace. Perhaps that explains why other manufacturers haven't yet offered anything suitable, they might be waiting for sufficient demand. Only time will tell.

I've had an interesting report on the AR8200 from **James MacKenzie** (Leigh) who finds less pager interference compared to the MVT-9000. The fact that co-channel offset transmissions can only be received on the wide a.m. setting is a good sign that perhaps the narrow filter really is effective. Try switching back to narrow a.m. and tuning a few kHz either side of nominal frequency, James.

Also, James was disappointed with the weak antenna socket that needed soldering back when it broke. The battery contacts also needed making secure as they slipped. Both are a shame on

Abbreviations

AIC	Aeronautical Information Circular
a.m.	amplitude modulation
B.	Boeing
CAA	Civil Aviation Authority
DC-	Douglas Commercial
d.m.e.	distance measuring equipment
FL	flight level
ft	feet
h.f.	high frequency
ICAO	International Civil Aviation Organisation
i.l.s.	instrument landing system
kHz	kilohertz
LF	Low Frequency
MHz	megahertz
n.d.b.	non-directional beacon
nm	nautical miles
STAR	Standard Terminal Arrival Route



Piper Warrior II.

Christine Mlynek.

a radio that isn't cheap. You mention high battery consumption, James, but relative to what? You might like to try the new rechargeable alkaline cells advertised variously in SWM.

A long-wire antenna (or, more properly, the random lengths we are likely to be able to string up in our own gardens) is likely to be counter-productive when feeding a wideband scanner tuned to the h.f. bands. **Chris Jordan** (Poole) found that a d.i.y. active antenna kit improved the situation when connected to the Yupiteru MVT-7200. Could you tell us which make of antenna this is, Chris? I previously mentioned receiver hardware subjects in May, page 78.



Jodel D117A.

Christine Mlynek.

Airband

Continued from page 73.

Radio Procedures

For the first time, specific phrases have been agreed in connection with ACAS, the Airborne Collision Avoidance System (A/C 54/1999 from the CAA). This system makes use of secondary radar returns to locate nearby aircraft. The pilot is warned by the on-board ACAS receiver if another aircraft could be on collision course. All avoidance action is vertical, never by change of direction.

During such a manoeuvre, the pilot might need to breach the instructions given by Air Traffic Control. This is permitted if the immediate safety of the flight demands it, but the controller must be told as soon as possible.

Pilots state any (or a combination of) "TCAS climb/descent/returning to (whatever clearance has already been assigned/TCAS climb (or descent) completed." The controller can do little else except acknowledge with "Roger" and may then issue a revised clearance. If the system warns the pilot that a given clearance could risk collision, the pilot will tell the controller "Unable to comply, TCAS RA" (where RA is a Resolution Advisory, avoiding potential collision rather than taking action to prevent an immediate threat).

ACAS (originally TCAS where T stands for Traffic) sounds great, but can generate false alarms. If two aircraft approach head-on, one climbing and the other descending, the system cannot know that the pilots will level out when still 1000ft apart.

When entering Shanwick trans-oceanic airspace, it is essential to be at the correct cruising level. Shanwick clearances are separate from mainland airspace clearances. Pilots will be careful to contact Shanwick specially prior to entry in order to assure that the correct level is being flown (A/C 59/1999).

The North Atlantic airspace is quite crowded. Pilots say that navigation failure doesn't matter, they could follow the vapour trail of the preceding aircraft! There's no radar so separation is procedural. Aircraft enter the system at set times and fly fixed speeds. That way, they don't get too close to each other. A/C 58/1999 explains that, from now on, Shanwick clearances will specify the time of entry into oceanic airspace.

Frequency & Operational News

More information from **Martin Sutton** and A/C 56/1999 (both from CAA). Aerodromes first. Edinburgh arrivals from L602 route via STARs TWEEDE 1D or EDN 1D (see HAVEN reporting point, below). Glasgow's new STAR from L602 is LANAK 1D. Henlow gets ICAO designator EGWE. Near Newcastle, Bolam Lake is a new Reference Point for visual traffic.

New beacons are at Manston with i.l.s./d.m.e. ident I MSN. There's also a locator n.d.b. MTN. If I find out the frequencies I'll let you know.

New danger areas are D061 Woodbury Common and D442 Bellerby.

Now, radar. Brize Norton no longer provides Middle Airspace Service (defined as FL100-245). Within 25nm of Colerne, below FL100, secondary surveillance 'squawk' codes 4576 and 4577 are available. Hawarden traffic is allocated 6330-6337.

New reporting points next. BOMBO is close to RAF Henlow and is an inbound *en-route* hold for London City (ALKIN STARs from north and west), Luton (LOREL STARs from the north) and Stansted (LOREL STARs from the north). HAVEN is east of the Talla beacon on L602 and appears in Edinburgh STARs. ODIMI, close to RAF Odiham, is part of Farnborough procedures.

If you need more details on any of the above operational changes, write in (stating in which issue you saw the information). Next month I'll list some aviation web sites, courtesy of **Len Woolley**.

All other letters received up to June 9 have been answered. The next three deadlines (for topical information) are August 2, September 7 and October 11. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

DX Television

The long-awaited Sporadic-E season finally kicked off during mid-May. The first real mega-opening occurred on the 16th with a deluge of signals from Spain, Italy and central Europe. The m.u.f. (maximum usable frequency) even reached Band II frequencies during the early evening. The 19th and 24th were also highly productive days. Most European countries were soon identified and a few mysteries were notched up. Tropospheric reception, notably around the 27th, produced Belgium, the Netherlands, Germany and Denmark, all at u.h.f.

Readers' Reports

Peter Barclay (Sunderland) comments that last year Switzerland (DRS SF-1) was quite a rarity, but it has already been spotted several times in just a couple of weeks. The 19th commenced with a colour-bar test pattern from the Ukraine on Channel R2 at 1148, followed by programmes at 1219. Italian and Swiss signals filled most of the afternoon, with football from Germany (ARD) at 1912. From 1737, Hungary (RTL KLUB) was monitored on R2 with programmes and commercials. Slovenia and Croatia were present until around 2100.

Richard Reynolds (Guildford) is using a rotatable Band I dipole feeding a Roadstar TVM7003 receiver. On the 24th, Spanish and Italian signals were present from 1000UTC until well into the afternoon. Reception was described as 'local' quality at times, complete with sound. Lithuania was identified on Channel R2 on the 26th at 1607UTC. Note that this station may now show an 'LRT' logo rather than the previous interlocked 'LTV' logo.

Peter Barber (Coventry) advises that the Italian private station TVA (TV Napoli) is now using a vision carrier frequency of 54.095MHz. This is quite a large offset from the nominal Channel 1A vision frequency of 53.75MHz.

During an opening on the 17th, Peter logged Moldova (tvm) on Channel R2 at 1711. This was in addition to a football match from the Czech Republic (TV Nova), also on R2.

David Hamilton (Cumnock, Ayrshire) could not resist the temptation of DXTV any longer. During the first week of May, a Norwegian test card with music was received for ten minutes. Russian broadcasts appeared later in the day. During one prolonged opening, a football match from Spain or Portugal was received but, annoyingly, the signals faded during the last few minutes of the match. David adds that he finds this column very helpful. Please keep the compliments rolling in!



Fig. 1: Start of Russian News programme received in northern India via Sporadic-E by Lt. Col. Rana Roy.

Fig. 2: Egyptian News programme on Channel E2 received in northern India.



Leicester's first RSL TV station went on-air on May 27th. Known as 'MATV Channel 6', it broadcasts on Channel 68.

■ KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

May DXTV Log

This month's collective log is supplied by Peter Barber (Coventry), **Stephen Michie** (Bristol), **Simon Hockenhull** (Bristol), **Tom Crane** (Hawkwell), Peter Barclay (Sunderland), Richard Reynolds (Guildford) and **Vincent Richardson** (Dolgarrog). All reception is via Sporadic-E unless otherwise stated.

Day Log

- 7 Unidentified ice hockey with '1' logo (similar in appearance to Portugal's but smaller) between 1905 and 1916UTC.
- 9 Denmark (DR-TV) E3; Italy (VIDEO) E2; Italy (TVA) IA.
- 14 Spain (TVE-1) E4
- 16 Spain E2, E3 and E4; Portugal (RTP-1) E3; Italy (RAI UNO) IA; Italy (TVA) IA; Russia (OT-1) R2; Hungary (RTL KLUB) R2; Rumania (TVR-1) R2; Austria (ORF-1) E2a; Norway (NRK-1) E3; Ukraine (YT-2) R2; Unidentified signal on R2 with '11' logo.
- 17 Italy (RAI UNO) IA and IB; Italy (VIDEO) E2; Italy (TVA) IA; Ukraine (YT-1) R2; Slovenia (SLO-1); Czech Republic (TV NOVA) R2; Moldova (TVM) R2.
- 18 Italy (RAI UNO) IB; Italy (TVA) IA; Unidentified '11' logo (suspected to be Ukraine).
- 19 Ukraine (YT-1) R2; Germany (ARD) E4; Switzerland (DRS SF-1) E2 and E3; Italy (RAI UNO) IA and IB; Italy (TVA) IA; Spain E3; Portugal (RTP-1) E3; Hungary (MTV-1) R1; Hungary (RTL KLUB) R2; Ukraine (YT-1) R2; Slovenia E3; Croatia (HRT) E4; Estonia (ETV) R2; Norway E2 and E4; Sweden (SVT-1) E3 and E4.
- 20 Spain E2, E3 and E4; Italy (RAI UNO) IA and IB.
- 21 Spain E2, E3 and E4; Portugal E2 and E3; Italy (RAI UNO) IA.
- 22 Portugal E3; Spain E3.
- 23 Italy (TVA) IA; Italy (VIDEO) E2; Italy (RAI UNO) IA and IB; Hungary (RTL KLUB) R2; Slovenia E3; Ukraine (YT-2) R2; Unidentified station between E2 and R2.
- 24 Italy (RAI UNO) IA and IB; Italy (TVA) IA; Italy (VIDEO) E2; Spain E2, E3 and E4; Corsica (Canal Plus) L2 and L4; France (Canal Plus) L3; Portugal E3; Spain E2, E3 and E4; Switzerland E2 and E3; Germany (ARD) E2; Slovenia E3; Hungary (RTL KLUB) R2; Czech Republic (TV NOVA) R1; Ukraine (YT-2) R2; Croatia E4; Austria E2a.
- 25 Spain E2.
- 26 Italy (TVA) IA; Italy (VIDEO) E2; Italy (RAI UNO) IA and IB; Spain E2 and E4; Lithuania (LTV) R2; Hungary (MTV-1) R2.
- 29 Italy (RAI UNO) IA; Italy (TVA) IA; Portugal E3; Spain E2, E3 and E4.
- 30 Portugal E3; Spain E2, E3 and E4.
- 31 Italy (RAI UNO) IA.

Mysteries

Tom Crane (Hawkwell, Essex) queries a logo on Channel R2 resembling a double number one in the top-right of the screen. This is a long-standing mystery and the signal is thought to originate in the Ukraine.

We have had reports of MTV-1 (Hungary) on Channels R1 and R2. The Pecs outlet on R2 is supposedly the only remaining Band I transmitter active in Hungary and this radiates RTL KLUB. Can anyone account for the MTV sightings?

Another mystery is the emergence of a programme between Channels E3 and R2 on 57.75MHz during an opening to the Ukraine. Stephen Michie (Bristol) witnessed this on the 23rd at 2130UTC and suggests this could be some form of harmonic. This channel has been received in Derby several times and its programme content differed to R1 and R2. The language sounded similar to Russian.

One enthusiast reports a type of 'test card' on Channel E3 with 'Ceuta and Melilla' inside the centre circle, towards the end of a Spanish opening. Unfortunately for DXers, these Spanish enclaves broadcast only at Band III and u.h.f., relaying TVE-1 and TVE-2 programmes.

The Far Eastern 525-line R-channel mystery rears its delightful head once again! During last September and October there were several sightings by **Lt. Col. Rana Roy** in northern India via TEP (Trans-Equatorial Propagation).

On September 26th, south-east Asian signals (possibly Thailand) were visible on Channels E2 and E3 between 1400 and 1630 (local time). From 1400 until 1530, 525-line pictures were resolved on R2! Between October 20th and 26th, 525-line pictures appeared on R1. Rana feels that the 525-line signals could have originated in Vietnam. Myanmar (formerly Burma) recently established an outlet of reasonable ERP on Channel A4 (67.25MHz).

During the last F2 peak, there were several sightings in the United Kingdom and Australia of 525-line signals on Channel R1. Usually an electronically-generated crosshatch pattern (white grid) was resolved, switching off at approximately 0900UTC. It was assumed to be some sort of jamming signal.

Japanese DXers have confirmed that such a grid was used in South Korea to prevent citizens from watching North Korean propaganda broadcasts. However, Rana's reception came from the south-east. The situation looks extremely interesting and could pave the way for some intriguing DX during the next F2 peak.

In northern India, recent Sporadic-E reception has provided good-quality images from Russia, Egypt and China (see **Figs. 1, 2 and 3**). An unidentified station called 'KIBC' (Kababayan International Broadcasting Corporation) was resolved on Channel E2 at 1350 (local time) on April 26th (**Fig. 4**).

If anyone can help solve any of these mysteries then please don't hesitate to write. There are enthusiasts out there who must know the answers!

Overhaul

Having missed two Sporadic-E seasons due to corroded antenna connections, Vincent Richardson advises anyone who has not checked their arrays to do so without delay. Peter Barber confirms that cleaning all connections using glass paper (or better still, a soap-filled pad) can produce a worthwhile improvement in gain. Replacing the coaxial downleads with satellite grade cable is also recommended, even at Band I frequencies.

Clear Band I

A recent holiday down in Sidmouth made Simon Hockenhull (Bristol) appreciate the lack of destructive interference normally present throughout Band I. There were no interfering computers, leaky cable systems, illegal 49MHz cordless 'phones and baby monitors. Whilst down there, Simon logged bursts of TVE-1 on 48.25MHz and RAI UNO on 53.75MHz. Back at his Bristol QTH, Channels E2 and R1 are impossible to clear even using notch filters.

Keep On Writing!

Please send your DXTV and f.m. reception reports, news and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS**. Pictures may be sent on a PC disk if preferred.



Fig. 3: Chinese TV programme schedules seen on Channel R1.



Fig. 4: Unidentified KIBC globe logo received on Channel E2 by Lt. Col. Rana Roy.



Fig. 5: Identification caption, featuring butterflies, radiated by Syrian TV.

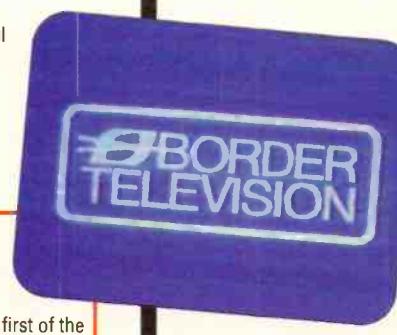


Fig. 6: This month's delve into the archives in the 'Down Memory Lane' spot features an early logo used by Border TV.

PETER BOND c/o EDITORIAL OFFICES, BROADSTONE**E-MAIL:** milair@pwpublishing.ltd.uk

MilAir

Kosovo - The End?

After much heartache, many homeless, and too much blood spilled, thanks to joint efforts of the NATO countries, the occupation of Kosovo by the Serbs has been ended. But I have to ask at what cost and for what reason - Milosevic has achieved absolutely nothing. In the end he has had his country bombed, his people killed and now, as the people of Kosovo flood back into the country, the Serbs are leaving fearing reprisals. So his actions have caused a completely negative result. If ever I saw a lesson that this form of dictatorship will never work in the modern Europe, then this was it. Now that the combined NATO air-arms have jointly flexed their muscles, let us hope that this will be the deterrent to stop such a conflict happening again around the periphery of Europe.

With the NATO ground forces now deployed within Kosovo, many aircraft have returned home or are planned to do so in the near future. Unfortunately, it is too late to save many Air Shows around Europe. As I write this, I have heard that Culdrose and Yeovilton have both been cancelled. The good news is that the RIAT '99 at Fairford is definitely going to take place. (And may actually be in progress by the time you read this).

Brize Norton

In addition to the intensive activity at Fairford, neighbouring Brize Norton also saw a fair bit of activity during the Kosovo operations. From May, the base was home to twelve USAF Air National Guard Tankers, under control of the newly formed 106th Expeditionary Air Refuelling Squadron. It included aircraft from the 117th ARW Alabama National Guard, (callsign 'DIXIE') and the 128th ARW, Wisconsin National Guard, (callsign 'UPSET'). Kosovo mission callsigns in the currency series started with 'BAHT', then during the month moved on to 'DRACHMA' and then 'YEN'. Incidentally, Brize has changed its primary v.h.f. Tower frequency from 126.5 to the radar frequency 123.725.

Cottesmore

As noted in previous columns, 3 and 4 Squadrons are now ensconced at RAF Cottesmore, 3 Squadron being the second unit to arrive on the 11th May '99. One local correspondent reports that the last Tornado to depart was flown by the base Commander and left on the 8th April for Lossiemouth. The aircraft used the callsign 'COT 01' and ended almost 19 years of TTTE Tornado operations from the base. The based Harriers have been using callsigns regularly noted in use at Laarbruch, so at present there appears to be no changes.

I have received several reports regarding the Operations frequencies in use by 3/4 squadrons since their arrival. The information I have so far is as follows :

3 SQN

Stud 14 344.75 Cocketree Ops
Stud 15 260.95 Air/Air
Stud 16 368.275 Air/Air

The frequencies 255.85 and 344.75 were both previously known Cottesmore Air to Air frequencies, plus 260.95, 365.025 and 368.275 are all frequencies transferred from use at Laarbruch. The one problem is 245.25, this was included in one E-mail as a definite Air to Air, but I have reports from two reliable sources that is still a London Military Special Tasks. (Noted Feb and Mar '99). Has it changed? Any comments would be welcome. Don't forget you can E-mail me - address at top of page.

4 SQN

Stud 14 255.85 Skeleton Ops
Stud 15 245.25 Air/Air
Stud 16 365.025 Air/Air

Wyton

As a precursor to the September return of aircraft to Wyton in the form of two University Air squadrons, the airfield is to officially re-open to Air Traffic on the 28th June 1999. The frequencies are as follows: TOWER 122.1, 357.3, APPROACH 134.05, 375.125, GROUND 249.0, plus the usual NATO Common frequencies.

Despite the fact that the residents will be operating the Grob Tutor training aircraft, the full 8200 foot concrete runway is available for use. Consequently, it is possible that the airfield may see some practice diversions, overshoots and visitors. Isn't it pleasant to be able to comment on an airfield re-opening after the many closures of the past decade!



Something different and a bit of nostalgia - an Israeli Air force C-130 circa 1983.

MilAir Scout

Dave L. from Cromer has written to me asking if an Optoelectronics Scout is going to be of use to his MilAir listening. He was advised that they only work in the close proximity of the transmitter and therefore may be of little use at an airfield, especially if you are located away from the actual transmitter site.

Well yes, the advice generally is fairly sound, but all is not lost. Subject to the power of the transmission, my experience is that the Scout normally has to be less than 100m from the subject and the distance is also dependant on the band on which the transmission is made. I have certainly found that on some f.m. transmissions the distance from target needs to be well under 50m.

Having said that, I have used mine on the a.m. v.h.f./u.h.f. airband with some success and particularly on v.h.f. up to about 400m. For example, sitting on the end of Runway 11 at Mildenhall, I have managed to receive transmissions from landing aircraft as they have touched down or been sitting at the holding point.

From the same location I have also locked onto aircraft passing overhead landing on Runway 06 at Lakenheath. So, the answer is yes it can be used with some success, more so on v.h.f. rather than u.h.f. In both of these instances, the distance was about 150 and 400m respectively.

But don't expect too much of the Scout on the airbands unless you regularly get as close to the action as possible. In many airfield scenarios that just isn't possible. Remember, the sensitivity of the Scout has to be fairly low otherwise it would spend all its time receiving f.m. broadcast transmissions.

Big Brother

I recently received some rather unusual and slightly ominous news. I have been made aware of two members of Aviation & Communication newsgroups on the Internet who during the recent conflict have been visited by 'official sources'. Specifically, because of the content of their postings onto the Net.

To my eyes the information concerned did not seem to be a particular threat to national security, in fact, it was similar to that carried in some of the enthusiasts magazines. The moral being that if you belong to one of the associated newsgroups or mailing lists, the information you post is quite likely to be monitored by the 'Men In Black', especially during times of heightened national security.



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Attention-123!

Daytime Monitoring

For many readers 'listening time' is at a premium and perhaps confined in the main to evenings or early mornings - the periods of most activity. If, however, you have the opportunity to listen during the W. European daytime hours (0700-1800UTC) there's still plenty to hear in the way of Numbers Stations. The following notes are intended to offer a sample of what you might hear, and are not intended as a comprehensive list. Remember that, unlike broadcast station news, we are unable to guarantee schedules and frequencies.

E3 (Lincolnshire Poacher)

Run by MI6 and transmitting from Cyprus (& Egypt?) this can be heard daily commencing at 1200 for 45 minutes each hour on 16.084, 15.682 and 14.487MHz in parallel. With accompanying jammers, transmissions are sent between 1400 and 2200 on the further frequencies of 16.475, 16.314, 13.375, 12.603, 11.545, 10.426, 9.251, 8.464, 7.755, 7.337, 6.959, 6.900, 6.485, 5.746 and 5.422MHz.

Its sister station E3A (formerly E4), known as 'Cherry Ripe' probably operates from the Isle of Guernsey, and can be found Mon-Fri commencing on the hour for 45 minutes at 1000 on 20.474//23.461, at 1100 and 1200 on 23.461//17.499 and at 1300 on 22.108//17.499MHz.

M10E & S10E

These two stations are quite recent and probably originate in Slovakia. They operate a peculiar schedule which runs on a 28 day cycle. Always commencing on Thursday and running daily for the next five days - the next are due on 2nd and 30th September. All transmissions consist of four messages of around 20 groups, each using encrypted 5fig addressee numbers. Repeats are never overtly sent. M10E appears at 1000 on 5.020 and S10E (a Czech male voice) at 1300 and 10.642.

S17C

Staying in this part of the world, this station uses a Czech female voice and related format to the above and originates in the Czech Republic. It has been around since the Cold War days and can be heard daily at 1250 on 8.190//6.945 (best reception in Winter) - formerly 9.386//8.190, 5.027//4.485MHz and others. The Schedule Number is always 313, decode key always 42, group count always 05, although the 'text' consists of a single non-random 5fig group sent ten times. (Middle figure always 0, 1st usually 6-9, 4th usually 2 or 3).

M16 ('8BY')

This bogus callsign is operated by the inscrutable SDECE (French intelligence) and sends no text but merely addressee lists every hour of the day, indicating that messages await the listed agents, which are picked up by other means. Occasionally Z codes give further brief instructions, and hand-keying has been noted. The lists, always in a specific order, are repeated for 20 minutes commencing at 40 mins past the hour (H+40). Four parallel frequencies are used chosen from: 7.668, 10.248, 12.075, 12.170, 12.283, 14.433, 14.931, 18.415 and 20.946MHz.

E10

Many of these transmissions come from Israel, one of many schedules being EZI. E10 is one of very few stations that use letter

groups (read phonetically) instead of numbers. EZI can be heard daily commencing at 1100, 1130 and 1330 on 15.980//17.410, 1300 on 17.410//19.715 and 1430, 1500 and 1530 on either 19.715//17.410 or 13.533//11.565MHz. If no message is due, the call EZI-2 is sent for 5 mins and the station closes down until its next time slot.

M22 (4XZ)

Staying with Israel, the so-called 'Naval' transmissions from Haifa using the callsign 4XZ can be heard sending 5fig groups 24 hours-a-day, in Morse, all over the h.f. bands - a most inefficient way of sending messages to ships at the end of the 20th century - but still the best way to control agents in the field! Using a legitimate callsign as cover is not that unusual - other examples are the Czech OLX and West German DEA47, DFC37 and DFD21.

Family Ia & b

This large family of stations belongs to Russian intelligence, whose transmissions appear at any time of day or night on almost any frequency. Operating Morse, Polytone and four languages (English, German, Russian and Spanish and possibly also Mandarin) one of these is often to be found somewhere, the busiest being the GRU's (family Ib) M12. Scheduling is complex, and it is impracticable to give details here.

However, the 'control' station S25 operates a long term schedule. It uses a non-text format and sends over a 40 minute period just four non-random groups, each in its own 10min slot. It now transmits on Mondays only, and always uses the schedule number 615, commencing at 0800 on 14.890, then at 0820 moving to 11.270MHz. The first and last frequencies of each group are selected from a fixed list of pairs, and throughout each transmission the same pair is used.

And That's Not All

Other stations commonly head between 0700 and 1800 include E17z, E5, M3, M17, M7/M10, M39, E23/M4, M29/G4, M13, M8/V2, M23, M52, M56, E15, V13, MX (many continuously) and X6.

Another Mammoth GC

On Sat/Sun 5/6th June the only English schedule of the very active Family XV sent a record 360 group count at 2100 on 8.025 with the message number 138, finishing around 2250. (These were seemingly unscheduled transmissions, yet bore the same 307 schedule number). On the following Wed/Thur the usual schedule appeared with 74 groups - message No. 139. (E18 and G22 use a very odd mode received as I.s.b., but difficult to clearly resolve on any normal receiver, including a pair of RA17s/MA168/RA98 in dual-diversity. As with normal s.s.b., there appears to be no residual carrier).

GCS of over 300 are rare for any station, and this family typically sends around 23 groups, so somebody out there had a lot of work to do! ENIGMA's record group counts so far were both suspiciously the same: 401 - and both sent by the Russian S7, and were either different messages, or the same message but each sending based on a different 'one-time-pad' code. They were sent on different schedules, many months apart.

Contacting ENIGMA

In addition to our address at the top of this page, we can also be contacted by FAX on (01274) 779004, or via E-mail at enigma.box@centrenet.co.uk

Booklet Update

We've now completed both parts of the (long awaited) ENIGMA booklet. We believe that it represents the most comprehensive document ever published on current European Numbers Stations. If you would like a copy, the cost is £5 (£7 outside UK) which includes postage. Cheques/postal orders should be made payable to ENIGMA. We will also send details of subscription to our Newsletter.

Letters

We must thank you all for the many letters and offers of help we have received. Our appeal for ex military Morse operators had a particularly promising response and we look forward to working together in this area. Again we'll make an appeal for any historical information on Cold War Numbers Stations, Stay-Behind networks technical material, site information, etc. This is an area of radio history, which although extremely important, has been neglected - largely due to the obsessive secrecy and official denial still surrounding the subject.

Nowadays, far more useful historical information comes from the old East Germany than from anywhere - Britain least of all - in the West.

Lastly, are there any I.F. monitors out there? A possible numbers station sending 5fig groups in Morse has recently been operating on 40.25kHz! Its complex preamble include 'QTC' meaning 'message for/to follow'. Can anyone throw any light on this. John (Kettering) asks what the random Morse letters sent on 640kHz are all about and does anyone know where the aeronautical NDB with the call 'DPH' (which operated on around 600kHz for a few days a while ago - strong in Lancs.) comes from? These are all mysteries to us, but perhaps somebody knows the answers.

That's all for now. Please keep on sending in your queries, information and logs.

■ ROGER BUNNEY, 35 GRAYLING MEAD, FISHLAKE, ROMSEY, HANTS SO51 7RU

Satellite TV News

The past four weeks have seen the ongoing NATO bombing campaign in the Balkans War, but as these lines are tapped out on the machine (June 10th), so the Serbians have signed on the dotted line for a withdrawal from Kosovo and NATO to occupy the former killing fields in the hope of the Kosovars returning to their homes. SNG feeds over this past month have slackened considerably with the lack of 'new' news, but the past two days has seen an upsurge in footage being satellited back to the UK and onwards to the US.

A quick scan over the 36°E *Eutelsat II F3* slot evening of June 9th revealed two new dowlink frequencies, the 11.664GHz-H digital slot (SR5632; FEC 3/4) carried 'Starbird ENC-1' out of Pristina with local video of that night's bombing - or at least the Serbians anti-aircraft attempts at shooting down the invading aircraft! This as it transpired was the final night's bombing after nearly 10 weeks of NATO air activity since operations commenced March 24th.

Sunday 6th produced a little confusion over news feeds, again on 36°E lunchtime @ 11.097GHz-H was a SISLINK/ITN OB (outside broadcast), but the colour bars carried 'UKI-495 ch.2 Brize Norton' and 'UKI-494 ch.1 Skopje'. The ITN-Lyon link is normally seen on this frequency, the service ident flag carried 'SIS LINK/ITN.8MHz SDI' - very odd. Brize Norton is the RAF airfield where the embarking UK troops flew out to the Balkans for the occupation, on this day however the New Labour minister gave a press briefing - I presume the minister was at Brize Norton to bid farewell to the embarking troops.

Roy Carman (Dorking) found many digital feeds out of the Balkans, May 12 and on *New Skies K* (21.5°W) on both 11.581-V (SR 7030) and 11.498GHz-H (SR 5632, both FEC 3/4) midday from London with a caption "Hello this is NATO calling can someone please talk to us!". Pictures then followed of the NATO boss arriving at Skopje airport, Macedonia - red carpet, guard of honour, etc., etc.

Sufficient to say that Balkans feeds over the war have been mostly digital and most activity has passed over 36°E though other carriers were 18°, 5°W and 10°, 13°, 16° and 28.5°E with trans-Atlantic offerings via New Skies K those these have been mainly West bound ex Europe or the traditional White House press conference or reporter on the front lawn outside of the White House with just a few UN building in New York.

There were few analogue sightings and the past two to three months has given valuable experience in digital sat zapping and locating hidden feeds quickly. Good results have been achieved with dishes down to only 800mm - such as **Dean Rogers** in SE2 with his Humax digital receiver - and I feel that as satellite enthusiasts, we must all consider seriously that the move must be into digital.

There have been many analogue sightings this past month, but like it or loathe it, the move over the next year or two will be into digital and an increasing number of SNG/OB linkers are going with the digits. Fortunately, several manufacturers recognise the need for flexible, easy to use digital receivers for the enthusiast market.

The RSD ODM-300 auto setting RX that I use for instance, and new generation receivers are appearing on the market. The 'Sat-Cruiser DSR-101' is a truly flexible auto parameter setting unit that has gained good reviews in SE Asia and a European version is awaited for evaluation shortly.

The period has seen many varied and interesting programme circuits, for me the annual and dramatic Indianapolis 500 motor race was the sporting highlight on May 30th. *New Skies K* @ 21.5°W carried both digital and analogue feeds, the 11.525GHz-H analogue (NTSC) carried the original network feed for ABC Sports in the 'States, this included commentary and the various links and music stings/visuals in and out of their commercial

breaks plus in-race captions.

Meanwhile, the BTI digital lease at 11.550GHz-H (SR 5632; FEC 3/4) featured exactly the same footage, but with a two second delay over that of the analogue - the digital didn't opt into the commercial breaks - this was compulsive teatime viewing around 1800UTC and the quality of the on-car live camera pictures at speed were amazing.

The following week was the Italian Grand Prix for motor bikes, the main Mugello circuit OB output to Rome MCR was uplinked via 36°E (30 May from 0900UTC, 11.170GHz-H analogue) and with Italian distribution via 18°W. Again, amazing pictures from motor bike mounted cameras including a bike that crashed!

Football and Manchester United hit Espagne with their European Cup Final v. Bayern Munchen. The BBC arrived two days before the match and they appeared up on a Breakfast Show item, digital uplinked via the Spanish Retevision E-19 truck on 36°E (11.580GHz-H, SR 5632; FEC 3/4) outside the Grand Hotel Sitges, Barcelona, interviewing English passersby.

The big day was May 26th and I found an analogue signal on *Intelsat 705* @ 18°W comprising the ITV Sports input to the UK with studio commentary, obby Charlton, interviews, etc. on 11.664GHz-H. A week later and it's Manchester City v. Gillingham's turn at Wembley and after a hard battle, Manchester were cheered the victors - this time analogue on 36°E with facilities provided by 'OB/SNG UKI-95 SIS-17'.

'Giro D'Italie 99' is the Italian equivalent of the *Tour de France* cycle experience and late May saw much coverage of the bikes as they powered up hill and down cliffs in really beautiful country and coast. The familiar helicopter visuals were tempered with several motor bike held cameras and the quality achieved from the machines without dropout was quite incredible.

Telecom 3°E carried the main OB feed into Rome MCR and again distribution around Italy was available on *Intelsat 705* @ 18°W (11.136GHz-V, both analogue). I suspect that the crewing for the cycling OB coverage were by French technicians, experienced over many *Tour de France* years! Interesting to see on one day the cyclists freewheeling into a hot seaside town and the next day standing in snow high up in the Italian Alps.

Another new facility seen by **Cyril Willis** (Norfolk) on a recent sports feed was 'International Sportsworld Communications', he saw a motor cross event coming in on *New Skies K* (21.5°W) in glorious clear PAL analogue at 11.615GHz-V, June 8th at 1830bst, the same weekend I also noted the same company caption on PanAmSat's *PAS-3R/6* @ 43°W, so they're a very active company across the globe.

It's been a rotten start to our UK summer and this was exemplified June 4th when the GMTV *Breakfast Show* unit - 'SIS4 GMTV' featured their morning weather forecasts - 0730, 0830 - from the seafront at Blackpool! It was really pouring and the earlier presentation was under an umbrella next to a Tandoori Hut, but by 0830 the rain had increased sufficient for the weather presenter to offer his wisdom sheltering inside of the actual SISLink truck itself, a shot of the sands showed wetness, a complete lack of holidaymakers - even the seagulls were sheltering. Once again it was our old friend *Eutelsat II F3* @ 36°E, 11.634GHz-H, audio 6.6-MHz.

I anticipate that the traditional *Big Breakfast* show will once more take to the beaches of Spain for the six weeks mid summer school holidays, previously SISLink have used the *Intelsat K/NSS* slot at 21.5°W in clear analogue, this year they might just opt into digital on the above mentioned two birds - I suspect Eutelsat are offering knock-down prices for short term hookups as there's lots of satellite capacity now in the European skies.



Balkans test card ex BBC showing the CO-ORDination and Interrupted FoldBack 'phone contact numbers.



SNG colour bars ex Serbia from SISLinks UK based truck. Note the service ident data flagged across the lower screen, the '151' relates to my receiver memory for this channel.



Variations on a colour bar pattern with humour from the war front. Note - all digital feeds via Eutelsat 36°E.



KFOR-TV relayed pictures from the heart of May 3rd tornadoes that swept across Texas and into Oklahoma city suburbs, via *New Skies K* @ 21.5°W (digital).



Another test card uplinked out of New York onto NSS/K.

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A reader dropped a line and suggested checking out *Telecom 2B/2D* @ 5°W at 11.493GHz-H digital. Having thus tapped in the frequency into my RSD on 'auto' within a few seconds up popped 'found 11 new video channels' on the TV screen. Scrolling through the newly established memories, many were service idented with no activity, a few 'encrypted' and a couple with the Brookmans Park Teleport test card, it might be worth checking on this bouquet from time to time.

And check out the brand shining new *Arabsat-3A* @ 26°E for new signals, I found Saudi TV at 11.839GHz-H and colour bars 11.900GHz-V, both analogue and very strong (May 19th). **Hugh Cocks** (Algarve), early June, comments that the bird is rapidly filling up with signals though as yet no problems with adjacent slot interference from *Astra* 28.2°E.

Roy Carman (see the above Balkans sightings) in sunny Dorking, now using a Praxis analogue/digital combined receiver though with back-up from an Echosphere 8700, he feels that the past few weeks have seen an upsurge in analogue circuits across the Clarke Belt. May 12th and Roy tracked his dish to the West onto *Orion-Atlantic 1* @ 37.5°W and found a German domestic situation unfolding in the Hamburg suburbs.

A forensic team arrived at a sealed up house (no.4 Hadenbecht) - apparently the occupants, a doctor and his wife, had been murdered! It's very unusual for SNG domestic local news items to appear on this satellite as German material is usually despatched via the *Kopernikus-2* bird at 28.2°E (digital 11.481GHz-V, SR 8750; FEC 7/8).

A German news item that was transmitted via their *Kopernikus 2* satellite on May 26th (digital 12.674GHz-H, SR 6111; FEC 3/4) when the ZDF were reporting via the SNG truck 'AVT-DSNG' from the town of Passau, a pretty town on the River Ulm. There had been rain in the hills and the river level rose some 9.4m bursting the banks and flooding the township.

In neighbouring Austria, a major fire in a long mountain road tunnel May 29th killed several folk and again highlighted shortcomings in safety and despite warnings from experts and locals, the owners ignored advice, the news package in digital via *Eutelsat W2*, 16°E, 12.517GHz. SR 5632; FEC 3/4 and linked by UKI-490.

Another domestic incident a few days earlier was carried in a Turkish news feed via *Turksat 1C* @ 42°E, a fuel road tanker had crashed and burning fuel was everywhere, a JCB is driving about bulldozing earth over the fire attempting to put out the flames (May 16th, 11.158GHz-V digital SR 4918; FEC 3/4). Such are the human tragedies and problems of modern life that creates the daily news.

Satellite News

The PR Department at Eutelsat have been very busy with news that at long last the differences between them and SES Astra have been patched up with agreements in their mutual co-existence in space and the utilisation of satellite capacity. In particular the disputed 28.2°, 28.5°E slot has been resolved. SES will use spectrum of 10.70-11.20 and 11.70-12.50GHz. Eutelsat will access 11.20-11.70 and 12.50-12.75GHz. SES will utilise capacity on *Kopernikus-2* (28.5°E) between 12.50-12.75GHz for activities outside of Europe.

With this settlement, Eutelsat can plan ahead and an immediate decision is to slot a new Eutelsat craft at 28.5°E carrying 24 transponders Autumn 2000. At a Cardiff meeting mid-May, Eutelsat will be opting into a full commercial operation and be privatised within the next two years (by July 2, 2001 or earlier).

Eutelsat will strengthen the new 'Atlantic Gate' slot at 12.5°W with the reslotted series *II-F2* (ex 10°E) satellite and the placing of an order for a new 'Atlantic Bird 1' for launching Spring 2001, this a 20 Ku-band transponder satellite covering the Americas, N.Africa, all of Europe and parts of the Middle East.

Eutelsat's new bird *W3* went into service at 7°E May 16th and the incumbent *II-F4* has moved to 10°E displacing *II-F2* which has moved West to the Atlantic Gate slot. *W3* is a

more powerful craft with 24 Ku-band trds including a steerable spotbeam. Coverage is all of Europe, the Middle East, North Africa and into Central Asia.

Summer 2000 will see the Acatel *Europe*Star-1* slotted at 45°E after launch via *Ariane* to provide Ku-band coverage over Europe, Asia, Africa and the Middle East. '*Europe*2*' will join the same slot with similar facilities summer 2002. The floating 'SeaLaunch' platform flew a commercial test flight end March from an Equator position 154°W Pacific Ocean and has a very full orderbook for upcoming rocket launches over the next three to four years.

The Indian *INSAT-2E* successfully launched in April into an 83°E slot. The C-band (4GHz) craft will provide TV and general communications across the continent via the 17 on-board transponders. In addition, there are several weather experiments carried on the craft. The future *INSAT-3* will have 3A-3E in the series, the first for launch in 2002.

Unfortunately, less success for the Cape Canaveral launch of the *Orion-3* satellite on May 5th, the 1st and 2nd stages fired OK but during the stage 2 burn something fizzled out and *Orion-3* is now in a low Earth orbit and useless, currently there is a think-tank considering methods of salvaging the ailing metalwork though pundits fear an expensive complete insurance write-off.

At the request of NATO, Eutelsat pulled the plug on the RTS-SAT analogue TV service from the 10°E slot late May on grounds that the programming included 'propaganda inciting genocide and racial hatred'.

The Indian government has delayed the processing of a new broadcasting bill that would have allowed the start of satellite DTH digital TV transmissions into India. Now all interested parties - which includes Rupert's *IndiaSkyBroadcasting* (ISKYB) from News Corporation - have at least a year's wait until decisions can be made.

China have banned the use of domestic DTH satellite dishes following a massive audience swing away from the staple diet of culture and military bands on the National TV channels, folk preferring the more interesting fare of international satellite programming. The Phoenix cable system also has the international satellite feeds pulled off the network.

After much negotiation, Rupert Murdoch has eventually bought into the Italian 'Stream' digital package gaining a 35% share holding. There are currently about 175000 Stream subscribers compared with the larger 'Telepiù' PAY-TV digital bouquet that sports nearly 720000. Stream plans to relaunch the service with more channels, sport and films.

The French international channel *TV-5* is at an advanced stage of planning 'TV5 Info' a 24-hour French language news channel. The new channel will draw on the news output from other French TV services plus the *TV5* own news operation. No opening date has been given.

The rival news channel, 'Canal+ Info', will be launching November 4th next, the 15th anniversary of the Canal+ operation. Sony have successfully tendered to provide most of the news server equipment, essential for the live and rapid airing of edited material. And checkout 'SAT-TV' Bulgaria in the *Hot-Bird* 13°E slot in both analogue 11.095GHz-H and in digital 12.539GHz-H @ SR 27500; FEC 3/4.

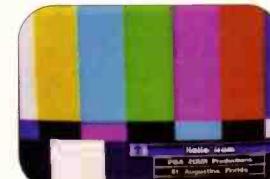
And finally there's media talk concerning the occupation of the 47°W slot by Columbia's *TDRS-6* satellite, which is only operational in C-band (4GHz). Columbia makes no use of Ku-band (11-12GHz) from 47°W and envious commercial users are seeking to gain access to the slot being of extreme interest as a major trans-Atlantic orbital position that can 'see' both into the West US coast and most of Europe. Columbia will need to establish a service quickly to retain the Ku-slot (which is not airing a test card!) otherwise the ITU will re-allocate same to another user.



The classic Indianapolis 500 road race on May 30th provided fantastic pictures this year. Digital reception will provide either an excellent picture, freeze frame and pixelation at threshold or a blank (no noise) screen at lower level signals.

Two receivers taking the Indy 500, the upper screen was the digital feed via a BT lease on

NSS/K, the lower (NTSC) the analogue feed on the same satellite prior to sending output to the ABC Sports Network across the 'States.'



Another sports feed, this time the PGA Tour ex Florida via *PAS-3R/6* @ 43°W.



The home teleport, the 1.2m distant dish uses a Chaparral dual band LNB some seven years old with ferrite polariser (and OK for digital!) but shortly a lower noise (0.5dB) Gardiner LNB and mechanical polariser will be fitted. The nearer dish is a 1.5m for C-band, both dishes are green to minimise visual impact and neighbour anguish.

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