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Vol. 52 ISSUE 9 SEPTEMBER 1994

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Cover
The NASA picture of Jupiter was taken from the Macintosh version of the astronomy software Redshift. The original CD ROM file size was 161Kb, but after Steve had worked on it with Photoshop on his Quadra 800 it ended up at 38Mb!

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Good Listening
editorial

Vandalism

I suppose that we should be used to bureaucratic vandalism by now, but I find it difficult to understand how anyone with the slightest interest in trying to teach youngsters about science and engineering cannot appreciate the importance of radio. As a teenager I spent many a happy day at the Science Museum - mainly, I hasten to add, in the halls containing the railway exhibits. However, I also enjoyed the electrical exhibits - I seem to recall that electronics was not used as a term then. Radio fascinated me from the age of about eight and was my introduction to a career in electronics, so I am horrified by the decision to close GB2SM - a decision obviously made by some ill-informed museum bureaucrat with no real engineering knowledge whatsoever.

One reason I have heard put forward for the closure is that Science Theme Park - sorry Museum - exhibits should be of the 'hands-on' variety. I am looking forward to turning up at South Kensington and taking Caerphilly Castle out for a drive!

Dick Ganderton G8VFH

Dear Sir

Could you ask your readers if anyone has a circuit diagram for the Sangean ATS909A as my radio, which is a Matsui MR4099, has filters - wide (4.7kHz), narrow (1.3kHz).

I would like to improve my radio by adding new filters 6.2kHz (wide) and 2.7kHz (narrow).

M. Formosa
Ely
Cardiff

Dear Sir

Is there anyone who can supply a circuit diagram to help this reader, if so send it c/o the Editorial Offices and we will pass it on.

Dear Sir

In reply to Ivor Nathan and other readers in your columns about r.f. noise and pollution on the various wave bands, I had a similar experience myself until I bought and built a Howes ASL5 audio filter and fitted it between the receiver and the speaker. This eliminated about 75% of the noise problems and made listening a pleasure, rather than a problem.

As there are more electronic gadgets coming on the market daily, this filter will clear a lot of the problems with r.f. noise until, we hope, the boffins come up with improved engineering and make listening to the wave bands better.

SWM Reader
Merseyside

Dear Sir

I have just received my copy of February '94 SWM, which is always of great interest.

A. Webb of Gwent has a 'singing' discone, it seems, the same as I had at this windy QTH.

The solution was to lightly tension the elements together with Nylon fishing line and a blob of glue at their lower ends!

Charles Chenery
Auckland
New Zealand

Has anyone else a solution to this perennial problem?
Dear Sir

Firstly, what a brilliant magazine, keep it up, loads of information to be gained on what’s around the band.

Now then, after reading SWM May and the preview of the Sony SW100 I decided to obtain one of these sets and wow, what a beauty. The performance is great, particularly in the following respects.

1. High sensitivity, using the 880mm antenna I could easily copy on a.m. anything that registered above S4-S6 on my Icom IC735 plus 150ft l.w. at 30ft, and S2 and s.s.b. I copied the OH2TEN at S1 on my IC735 set-up and could still hear it just as well on the Sony, not bad at 28MHz!

2. Selectivity a.m. very good, especially with the synchronisor a.m., no troubles on 6 or 7MHz, at 5kHz signal being quite adequately attenuated.

3. Resistance of overload a falling on most s.w. rigs, but this one was very good, 40ft wire with no a.t.u. clipped on the telescopic and no overload/crossmod etc FM sensitivity seemed a little above average and much better than most domestic digital portables. Just a tip for owners. Sometimes on switch-on, the audio mutes or fails to switch from clock to radio, if so, turn the main power off on the side and try again. It seems quite a few gadgets I have like this sometimes lock up or crash, but it’s no real problem. I thoroughly recommend this radio and no, I don’t sell ‘em or have any connection with Sony, etc. Still, I do miss having a S-meter on a radio that has almost everything.

PS. It picks up low power pirates at the top end of medium wave and 6.2MHz well too!

Andy Foad GOFTD
Whitstable
Kent

We thought it was a very impressive set too. A great deal of radio in a small case! The Editor was very sad to have to return it to Sony UK.

Dear Sir

Thank you for an excellent publication, which I was privileged to discover this summer.

This is the first magazine I have bought which maintains a consistent standard month after month. Even for a beginner like myself, the magazine is ‘unputdownable!’ I think it is a very clever idea to have each columnist use their home address for correspondence, thus ensuring a speedy response. One can see in these columns that your writers are a truly dedicated group of people, some even giving our their telephone number for important developments.

My one complaint is this - how come none of the questions in readers’ letters are ever answered? That is the only question I will pose in this letter, because I don’t think it will even be answered.

I am currently enveloped, engrossed and enthralled by the hobby of short wave listening. In September I hope to commence a course with our local radio club for the amateur licence. I would be most grateful if you would print my letter and address because I would like to get in touch with other short wave DXers and people contemplating study for their Radio Amateur licence in my area, especially younger DXers, about 16-17.

Thanking you.

Graham O’Sullivan
20 Kingsford Park
Grange
Douglas
Rep. of Ireland

Well Graham many of the letters we receive are asking for a response from our readers and don’t really merit an answer from the Editorial Staff. However, as you will see this month we have a mail bag that does require some answers and comment. I hope that answers your query. I am very pleased that you enjoy SWM. Good luck with your RAE course.

Dear Sir

I refer to your news item “Southern Scanning & Shortwave” on page 7 of the July issue of Short Wave Magazine.

For some time, I had been trying to obtain a FRG9600 V.H.U.H.F. receiver and decided to try to telephone the number mentioned in your article.

After leaving a message on the Answerphone with my requirements, I received a call from Southern Scanning & Shortwave saying that one was available and we arranged a date and time for Bob Burrows G6DUN to call at my home address.

He duly arrived and gave me a complete demonstration of the set in my shack. The FRG9600 was in mint condition and I purchased it.

My purpose in writing to you is to say that I think that Southern Scanning & Shortwave are an excellent company to deal with and that radio amateurs and s.w.l.s are extremely fortunate to have a pair of lads who will bring equipment to their home and demonstrate it.

To have a demonstration in one’s shack must be unique and I have nothing but praise for the enterprise shown by G3XAS and G6DUN. I hope their company prosperous and that enthusiasts living on the south coast will use their services to the full. Good luck to them.

Herald McIntyre G3FLJ
Southampton

Hants

Dear Sir

This morning I called at my local Tandy store with the intention of purchasing a Netset PRO44 scanner, which was on special offer at £99.95.

I asked the Salesman if I could see one as they were locked in a glass display cabinet. He handed one to me without an aerial or batteries. I said that I would like to try it out properly and he replied ‘We are not allowed to by law’, I could not believe this and was told it was ‘company policy’. I wonder if his company know about this?

I told him to forget it and that he had just lost a sale, and I walked out. Do they want to sell their products or not? No wonder the country is in financial trouble with politics like this.

Many thanks for a good read every month.

S. Wilde
Tamworth
Staffs

It is often very difficult for stores in areas that are subject to high levels of crime to offer the same level of customer support as stores that aren’t. It is quite amazing the level of losses due to theft so you cannot blame stores for being cautious. However there is no excuse for a lack of cooperation, after all it can lose the sale!

Dear Sir

After the letter I wrote to SWM last year, I was delighted with the £5 voucher on publication (thank you SWM, it was most useful).

This time I have been prompted to write as a scanner enthusiast with advice for beginners.

After a recent trip to the countryside I realised just how much the hobby is dependant on location. Aware of the difficulty in buying that first receiver, I would urge you to consider whether or not your location is suited to the hobby at all.

Scanning may be an interesting pastime here in SE England and other metropolitan areas, but try convincing someone scanning in more remote areas, where all transmissions are much more scarce, that £500 was a worthwhile investment.

I would suggest in these circumstances to avoid the scanners with limited coverage as a wide band receiver will give you much more scope. Also an extended antenna will be essential.

I won’t give you how many people have realised to their expense that there were few transmissions to listen to in their locality.

Fortunately, everyone can follow the developments in several modes of communication through SWM and its excellent columnists.

A. Provins
Reading
Berkshire

That’s it for this month, keep your letters coming in - particularly if you have a query that needs solving.
rallies

August 27, 28 & 29: A Computer Fair including a Radio Rally and Electronics Fair is being held at the old Grange Hall, Farley Hill, Alcester, Warwickshire. Doors open at 11am till 4.30pm. There will be a Bring & Buy, trade stand, club stalls, raffles and refreshments. J.G. Campbell on 0258-372607 after 5pm or any weekend.

August 28: The Fishermens Club are holding their Open Day at Barn to 4pm. There will be a Bring & Buy, car and Electronics Fair is being held on the site of what used to be a Bring & Buy, and Electronics Market will be held at the Brunel Community Hall, Whitchurch. John G3YCH, QTHR on (0452) 503786.

August 29: The East Coast Amateur Radio & Computer Rally will be held at the Clifton Leisure Centre, Vista Road, Clifton-on-Sea. Doors open at 10am to 4pm. There will be a Bring & Buy, trade stands, club stalls, raffles and refreshments. Muriel Baker G4YZR on (0275) 834282.

August 29: The Huntingdonshire Amateur Radio Society are holding their Rally at St. Germain Street, Huntingdonshire. August 28 - TARS/mobile rally. September 4th - SSB field day. Peter G4UTO. (0803) 864528.

DYEF

Aberystwyth & DARS: 2nd & 3rd Tuesdays. 7.30pm. 131 St. Peter's Road, Aberystwyth. August 25 - GW0ARA on the air, listen on S17, Sept 3 - Across Wales Via - BATVET non-disaster event & Control at Pantllwyfan, U.C.W. - 8th - Preparation for JOTA. Katy GW8MSO. (0546) 883867.

EA/SSR

Hastings Electronics & RC: 3rd Wednesday. 7.30pm. The White Horse, A25. Sept 1st - Field Day. Hastings. Sept 21 - Get together evening to meet other club members who may have a similar interest in the hobby. G3HYN on (0243) 830454.

EDINBURGH

Lothians RS: 2nd and 4th Wednesdays. 7.30pm. Orwell Lodge Hotel, Pollock Terrance, Edinburgh. Sept 14th - President's address. (G4MUDH). On 0131-337 7311.

ESSING


FIFE


GRAMPAN REGION


GREAT LONDON

Crystal Palace & OCR: 3rd Saturdays. 7.30pm. All Saints Church, Palm Rooms, St Paul's Hill, London SE1. September 11th - SSB field day, Sheilla Blumfield G7SSM. (0747) 361951.

Club Secretaries:

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

SOVEREST

Yevoli ARC: Thursdays, 7.30pm. The Red Cross Centre, Grove Avenue, Yeovil. October 3rd - sponsored rally on air and committee meeting. September 1 - Morse Competition - Round 6, 15th - Sponsored rally on air, introducing amateur radio, 22nd - Sponsored rally on air.

SUFFOLK


WARWICKSHIRE

Mid Warwickshire ARS: 2nd & 4th Tuesdays. 8pm. St. John's Hall, Warwick. Sept 1st - Sponsored rally on air, 15th - Bury St Edmunds rally. 22nd - Sponsored rally on air and committee meeting. September 1 - Everyone can enjoy DXing by G3HTA. 9th - Morse Miscellany by G3KSK. 15th - Open evening to local schools, introducing amateur radio, 22nd - Sponsored rally on air by G4LJ/4. Cedic White, G3HTA. (0269) 473345.

WEST MIDLANDS

Sandwell ARC: The Broadway, Warley. RAE classes on Monday nights, MSO class on Wednesday nights and RAE classes on Thursday nights. Three operating shacks.

WHITEHAVEN


WILTSHIRE


Worcestershire ARS: 2nd and 4th Mondays, 7.30pm. Home Guard Club, 95, High St, Malvern. Sept 7th - Sponsored rally on air.

WARWICKSHIRE

St Albans ARC: 3rd Thursday. 7.45pm. St Albans Radio Club, St Albans. September 13th - Sponsored rally on air by G3HTA. 20th - Sponsored rally on air.

WEST MIDLANDS

Sandwell ARC: The Broadway, Warley. RAE classes on Monday nights, MSO class on Wednesday nights and RAE classes on Thursday nights. Three operating shacks.

WILTSHIRE


Worcestershire ARS: 2nd and 4th Mondays, 7.30pm. Home Guard Club, 95, High St, Malvern. Sept 7th - Sponsored rally on air.
Following on from the item about abbreviations on the air, Day Watson has written to remind me of one that slipped the net. Quite often those sending Morse numerals abbreviate the number 0 (- - - - ) to the letter T (- ) to save time. This can be very disconcerting if you are concentrating on receiving some numbers and suddenly the letter T appears when you weren’t expecting it. If you can think of any others please drop me a line.

Good Book
I’ve recently come across a new book that looks like it could be well worth adding to your technical library, especially if you like making antennas and experimenting with them. Receiving Antennas Handbook written by Joe Carr. I’m told that it should be in the SWM Book Service next month. It’s not a good idea to skimp on the antenna, but that’s often when the money runs out – especially if you are on a junior budget! Making your own can be good fun and doesn’t have to be expensive. Even simple long wires or dipoles can be very effective.

All the instructions in the book are very easy to follow and older readers will be delighted to learn that all the measurements are in feet and inches! It covers long wires, dipoles vertical antennas, directional antennas, loop and i.f. antennas. So you should find something to interest you.

Bearing in mind that the evenings start getting darker in the next couple of months, why not try and build a few antennas and do some experimentation with them in the autumn? A couple of warnings. Ladders are very dangerous things – something we know to our cost in this household – and can inflict very unpleasant injuries. Be careful. Always get help if something we know to our cost in this household – and can inflict very unpleasant injuries. Be careful. Always get help if.

Money Short?
Not enough cash for a new scanner, what about part exchanging your existing radio/scanner for the one of your dreams. I’d forgotten all about part exchanging pieces of kit until I received a press release from Link Electronics about the new Tandy scanner. The PRO-50 is the latest scanner from Realistic and it replaces the PRO-41. It has 20 channels with a 6-digit liquid crystal display and a 2-digit memory number. It can search up and down its search channels and has the usual priority frequency. Gavin Taylor at Link Electronics reminded me at the end of his press release that they offer a part exchange service.

Most main dealers do offer this service and it can be a lot less hassle than trying to sell your kit privately. It’s well worth a telephone call to check what sort of deal you can get.

Contact Gavin Taylor, Link Electronics, 216 Lincoln Road, Millfield, Peterborough PE1 2NE, Tel: (0733) 345731.

DIY QSL Cards
With the summer slowly slipping away, it’s time to get down to some serious logging. For many this means seeking out some more of those interesting QSL cards. But what if you never tried QSLing, how do you start and where do you send your QSLs? The answer depends on whether you’re dealing with amateurs or commercial broadcast stations. If your interest lies with amateur stations the best way is to join the RSGB and take advantage of their excellent QSL bureau. This is a wonderfully simple but effective system for sending and receiving QSLs throughout the world.

Once you have joined the RSGB you sort the QSLs you are sending into country order and send them to the Headquarters QSL Manager. There, all the cards for a particular country are grouped together and sent to the QSL manager for that country. The National QSL Manager then sorts them and sends them to the appropriate Regional Managers where they are then sent to the final destination. In order for this to work efficiently you have to send your own regional manager a supply of stamped self-addressed envelopes. This system has been working reliably for many years now and is a great way of keeping your postage costs under control.

QSLing with commercial stations is not quite so easy, as you have to write direct to the station concerned. It’s also a good idea to include an International Reply Coupon to help ensure you get a reply. Finding an address to write to can also be a problem and the simplest solution is to arm yourself with one of the broadcast listening guides such as the World Radio TV Handbook. When QSLing with commercial stations it’s important to give them as much information as possible about the signal you heard. As well as signal strength and the programme details, make sure you include full details of your receiving station including the antennas.

One way of helping to make sure you get a reply is to make your own distinctive QSL card. With so many people having access to computers it’s quite easy to make a striking QSL card by adding a few clip-art pictures to your card. To give you an idea of what can be done I’ve included my own first QSL card. It’s a bit dated now, but then it is pretty old!

Christmas is Coming......
I know we’re just getting to the end of the summer holidays, but Christmas will be upon us quicker than ever, especially as my writing deadlines appear about six weeks before the magazine appears on the shelves. I want to start thinking about good Christmas presents. So if you have any really good ideas as to what should be included in the Dear Santa letter, let me know. Have you come across a good book that you think should be in everyone’s Christmas stocking? Is your choice of radio such good value for money you think others should find it under the Christmas tree too? What accessories have you found to be the best and you now couldn’t do without? Drop me a line so I can put them all together and let’s see if we can write the best Dear Santa letter ever!
The AR3030 receiver provides an ideal marriage of classical appearance on the outside of the cabinet with high tech DDS circuitry inside. Many features are supplied as standard ensuring the highest level of performance and capabilities straight from the carton box.

- Frequency coverage 30 kHz ~ 30 MHz
- All mode receive AM, S.AM, NFM, USB, LSB, CW & FAX
- DDS with smooth 5Hz minimum tuning step
- Large custom rear illuminated LCD with frequency resolution to 10Hz
- Excellent stability for data & ECSS due to TCXO
- Collins 6kHz AM mechanical filter fitted as standard (2.4 kHz & 15 kHz ceramic filters are fitted for other modes)
- Easy to use keypad frequency entry featuring MHz, kHz and mtr entry
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- Supplied with low noise 240V mains power supply & English language operating manual

OPTIONS: Collins mechanical 500Hz CW filter. Collins mechanical 2.5 kHz SSB filter. CR400 record lead... to follow AM & NFM VHF converters, computer software.

As previewed in January 1994 SWM and reviewed in this issue of SWM by Mike Richards who reported:

"... the 3030 looks and feels like the top quality receiver it is...
The standard of both mechanical and electrical construction is very high...
The frequency stability is excellent and well up to the standards required for the most demanding applications such as unattended FAX reception.
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The 3030 is very much a receiver crying out to be used."

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Please phone or send a large S.A.E. (36p) for full details. Fast mail order available for direct orders.
*Collins is a trade name of Rockwell International.
Highly successful C804 series. In low power applications at frequencies of up to a maximum of 100MHz, C824 and C804 types are mechanically and electrically interchangeable, allowing the new units to be used as low-cost service replacements in existing equipment. The C894 range, with its ceramic front panel and silver-plated brass vanes is still available to meet most exacting requirements.

For further information contact, Jackson Brothers Limited, Kingsway, Waddon, Croydon CR9 4DG. Tel: 081-681 2754. Fax: 081-681 3728.

New Howes Kit

C M Howes Communications have added the Howes MW1 Medium Wave and 'Top Band' Receiver to their well known range of home construction kits. This project has been introduced with the interested 'junior operator' in mind. It is designed to be simple enough for a first project whilst giving a respectable level of performance. Provision has been made for the inquisitive mind to explore the technicalities a little further, this includes an extra component so that the frequency coverage can be altered to other short wave bands.

The MW1 kit includes detailed, fully illustrated instructions and all the parts needed to build the project, except the battery and some solder. A small loudspeaker is being included free of charge as an introductory offer whilst stocks last (there is a socket for headphones, too). Price for the kit is £29.90 plus £4.00 P&P.

Further details are available by sending a s.a.e. to C M Howes Communications, Eydon, Daventry. Northants NN11 3PT. Tel: (0327) 60178. The Howes MW1 kit is also stocked by many amateur radio shops in the UK and abroad.

Low Power Coaxial Switch Offers High Reliability

Tesoel’s Model TS 360-00 is a coaxial switch featuring low power consumption - the fail-safe actuator consumes only 220mA at 28V - is ideally suited for use in telecommunication, avionic and instrumentation applications. Available from Anglia Microwaves Ltd., this highly reliable Swedish-designed switch is both lightweight and compact.

The switch comprises a s.p.d.t. fail-safe switch mode, a 'break before make' switching sequence and a built-in position indicator contact (500/2500A max. 4V/10mA min). Extra high power is optional and for higher power applications special dielectric material can be incorporated to give a power handling capability of 1kW at 1GHz - average power handling is 200W for the 1GHz standard switch version.

Model TS 360-00 has 100ms switching time, an operating life of approximately one million operations and an operating temperature range of -40°C to +85°C. The unit, in a black aluminium cover, weighs 350 grams.

For further information please contact: Anglia Microwaves Ltd. Tel: (0277) 630000.

Five Function Digital RF Analyst™ RF1

The pocket-sized RF Analyst™ is designed to check and adjust antennas, feedlines and r.f. networks. It includes a microprocessor, A/D converters and a low-distortion, levelised, sine-wave generator with a 4-digit frequency readout, continuously adjustable from 1.2 to 35MHz in five bands. It measures r.f. values of impedance (0-2000Ω), s.w.r. (1 to 15:1), capacitance (0-9899pF) and Inductance (<0.04 to 300μH). The digital readout of all parameters is claimed to be unique in its price range. The instruments connects to any antenna or feedline, and instantly reads out impedance and s.w.r. at any frequency in its range. Antennas are easily trimmed after noting their resonant frequencies with its miniature 'transmitter', minimising trips to the antenna. Feedline loss and phasing, Q, tuned-circuit resonance, and many other antenna and tuner parameters can be accurately measured and adjusted for best performance, even by inexperienced users.

Land and C are measured at the r.f. frequency of interest, not at 1 or 100kHz as with other L/C meters. This is necessary to see the true r.f. values of these components.

Basic accuracy is 2.5 to 5% over most of its range. The unit fits in a shirt pocket and runs on a standard 9V battery. An illustrated manual is included.

The RF Analyst™ RF1 is available from: Eastern Communications, Cavendish House, Happpishall, Norfolk NR12 8RU. Tel: (0852) 650077. Fax: (0852) 650926. Price, including delivery within Europe is £139.95.

Handheld TV Test Pattern Generator

Teletest, designed and manufactured in the UK by Ozan, is a brand new TV Test Pattern Generator. Whilst it has been designed with the TV repair engineers need in mind it is also an invaluable tool for all AV and TV enthusiasts.

There are four essential PAL test patterns; colour bars, grey scale, crosshatch and red purity. A 1kHz audio test tone is also generated by the Teletest.

The unit is powered by a 9V battery and fits in the palm of the hand, outputs are provided for r.f. via a 75Ω terminated coaxial socket which is preset to channel 36 with the audio sub carrier set to 6MHz for the UK (a 5.5MHz version is available for other countries). Two phono sockets provide composite video signal terminated at 75Ω and the line out audio signal terminated at 1kΩ.

An external mains p.s.u. is included with the Teletest for continuous use. The Teletest is only available direct from Ozan and costs £99.00 plus VAT and carr. Further information can be obtained from: Ozan. 37 Haviland Road, Ferndown Industrial Estate, Poole, Dorset BH21 7SA. Tel: (0202) 877270.

Four New Antennas From SRW

SRW announce that their latest antennas are now in production. The 'CobWebb Mk II', 'Spider', 'FlyTrap' and '5-element CobWebb' all feature low-loss transmission line transformer traps and pre-assembled resonators so no pruning or adjustment necessary. The 'CobWebb Mk II' and '5-element CobWebb' cover the 14, 18, 21, 24 and 28MHz bands, the Spider and FlyTrap 1.8, 3.5, 7 and 10MHz bands. The antennas can be bent to fit into small gardens. A FlyTrap has even been bent to form a triangle.

For further information contact: SRW Communications Ltd., Astrid House, The Green, Swinton, Malton, N. Yorks. Y017 OSY. Tel: (0653) 67513.

SRW transmission line transformer trap.
The Worldwide Aeronautical Communications Frequency Directory

- 260 full size pages 8.5 X 11 inches
- 2,350 discrete frequencies
- Full commercial and military coverage
- Shortwave voice communications
- Shortwave digital communications
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Shortwave Voice Communications
- Comprehensive 18 page introduction to aero monitoring
- 66 page shortwave frequency list
- 2000 frequencies, service types and stations

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- MWARA region breakdown by sector
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- Cross-referenced Country/City/Sector listings

Company Operations (LDOC Facilities)
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- Proprietary carrier identifiers
- Worldwide common carrier stations and frequencies

VOLMET
- 15 VOLMET networks (70 cities) with broadcast times and frequencies

World Air Forces, Military & Government Facilities
- Frequencies for 30 world airforces
- Separate USAF ACC, AMC, ARS, CEN, CI, GHFS, SAM and USSTRATCOM listings
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- NASA, NOM, NORAD, FAA flight tests
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- Customs, DEA & DOD counter drug networks
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Shortwave Digital Mode Communications
- Intro to the Aeronautical Fixed Telecommunications Net
- 194 Digital mode frequency list

VHF/UHF Voice Communications
- Introduction to VHF/UHF aero communications
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- 44 paired frequency sets for airphone operations
- 69 common VHF/UHF North American frequencies

VHF Digital mode communications
- Aircraft Addressing Communications and Reporting System
- 18 page ACARS primer
- North American and European ACARS frequencies
- Sample decoding of ACARS traffic

Appendices
- 270 world wide cross-referenced AFTN location indicators
- IATA & ICAO city location indicators for 404 world cities
- IATA & ICAO carrier designators for 378 world airlines
- 216 worldwide aircraft registration prefixes
- 270 Worldwide Enroute High Altitude Waypoint Names, with geographical co-ordinates, general location descriptions and MWARA sectors
A "turbocharged '225"! The HF225 Europa is probably the best receiver to use if you are a dedicated broadcast band DXer. We've replaced the standard AM filters with 7, 4.5 & 3.5kHz, giving excellent selectivity for winking out those weak tropical band stations. The SSB filter stays at 2.2kHz to allow for exhausted carrier reception. We're also fitting magnetically shielded coils and low-noise switching diodes in the bandpass filters which reduces residual noise in the receiver. The Europa model includes the KPAD1 frequency controller and the synchronous detector fitted as standard.

All for just £699.00

The SP150 is a combined audio filter, amplifier, and speaker combination that can be used with any shortwave receiver or transceiver. When used with the Lowe HF150, it will also provide S Meter indication once the HF150 has a very minor modification.

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- 10W Audio amplifier
- Low cut filter
- Variable high cut filter
- Variable notch filter
- Built-in loudspeaker
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The world's most popular short-wave receiver just got a younger brother! The HF150 Marine is now available! A stylish white cabinet with tropicalised PCBs make the HF150M the ideal basis for broadcast, maritime mobile and NWFAX and NAVTEX reception in the harsh environment of the high seas. Complete with mains PSU and DC lead for 12V operation, the HF150M will complement the chart table or main cabin on any boat.

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One could argue that once you've seen one scanner you've seen them all - not true. The AR8000 represents a significant step forward, particularly where portables are concerned. Not only does the AR8000 feature continuous coverage from 500kHz through to 1.9GHz, but it has tuning steps down to 50Hz, a 2.4kHz s.s.b. filter and true carrier re-insertion on s.s.b. and c.w. All this is supplemented by a versatile display system, twin v.f.o.s and 1000 programmable memories.

Smart Display

One of the significant changes with the new AR8000 is the addition of a versatile dot matrix display system. This gives total flexibility in the use of the display space and provides a foundation for many of the new features. One particularly powerful option that makes good use of the new display is the BAND SCOPE. This provides a graphic display of the channel activity over the five channels above and below the current tuned frequency. This is just one example of the increased flexibility and there are many more to be found as you explore the features of the AR8000.

Getting Going

Thanks to the clear panel markings and excellent user manual, getting started with the AR8000 was really very easy. The power for the AR8000 could be supplied in a number of ways, but in most cases the internal battery compartment will be used. This held four AA size cells and could operate from Ni-Cads or dry batteries. For mains power the supplied power unit delivered the required 12V d.c. at 300mA via the external power socket. There was also an adapter for running the AR8000 from a car cigar lighter.

The antenna connection used a good quality BNC connector, so external antennas could easily be used. Whilst the internal miniature speaker provided remarkably good sound quality, you could connect headphones/ear piece to the 3.5mm socket on the top panel.

Two Radios in One?

One of the problems facing designers of state-of-the-art equipment is how to incorporate all the advances of new technology whilst not over complicating the operation. This is particularly true when dealing with portable receivers as there's very little physical space for any extra controls. AOR have tackled this problem by introducing two operational modes called New User and Expert.

The New User mode provides a set of operational features and pre-sets that will suit the needs of most. For example, when scanning the AR8000 is set to stop on any signal that opens the squelch and then pause for a further two seconds after the signal disappears. This is probably the most common setting and is likely to satisfy most people most of the time.

In Expert mode the operator is given complete control of the scan stop settings and can adjust the timings and the type of signal - more on this later. Closely associated with the New User mode is the automatic parameter settings. Here the AR8000 automatically
sets the frequency steps, receive mode, etc., in line with a stored band plan. The plan was tailored to the country where the receiver was supplied, so this was a really useful option. You could confidently tune around the bands and the receiver would automatically configure itself for the selected frequency. The Expert/New User system was certainly a neat way of combining advanced features with simple operation.

**Frequency Selection**

In addition to the usual tuning options with UP/DOWN buttons and a twenty way rotary control the AR8000 included direct frequency entry. This used the front panel keypad and included options to correct mistakes as you went. Perhaps the most significant aspect of the basic frequency selection was the provision of two v.f.o.s. Each of the v.f.o.s could be adjusted separately and switching between the two was by a single button press that acted as a toggle. In addition to holding different frequencies, each v.f.o. could retain a full set of operating parameters such as mode, attenuator, step size, etc.

The dual v.f.o.s also included an option to equalise the contents of the v.f.o.s. You could even use them as the basis of a manual frequency search and set the receiver searching between the two v.f.o. frequencies using the mode and frequency steps stored in the selected v.f.o. The provision of two v.f.o.s is a real boon and makes monitoring split frequency transmissions a dream. The manual search is also a lot easier to set-up than most traditional systems.

An important aspect of any manual tuning or searching is the provision of a good range of frequency steps. As you would expect the AR8000 has total flexibility here. In New User mode the steps were preset with 19 settings to cover all the normal requirements between 50Hz and 500kHz. If you have any special needs you can switch to Expert mode and set-up any frequency steps you like with a resolution of 50Hz. One particularly interesting feature was the provision of a step off-set. This lets you off-set the start point for the first step. This is perhaps best illustrated with an example. If you're looking at the u.h.f. cellular band, you'll find that, although the channel spacing is a conventional 25kHz, the band starts at 917.125MHz i.e. a 12.5kHz off-set. By using the step off-set facility of the AR8000 you can be sure of accurate tracking throughout any band.

**1000 Memories**

Every scanner needs a good set of memories to form the foundation of the whole scanning process. The AR8000 is extremely well set-up with a total of 1000 user programmable memories available. Just having lots of memories is only part of the answer as you have to be able to find the required stations easily. The AR8000 has a touch of tricks up its sleeve to solve this problem. The first is to group the 1000 memories into 20 bands of 50 memories. These can then be used by the operator to group similar transmission types together. The real gem though is the text option that lets you store a separate seven character comment in every memory location. This feature is very comprehensive AOR have provided an enormous character set, which include, accented European letters and even Japanese symbols. The option to store a comment was available every time you manually saved a frequency and you could add these comments at any time. Entering the text was done using the rotary tuning knob to select the required letter and the left and right cursor keys to build up the comment. This proved very quick and easy to use and was really helpful when trying to keep track of stored frequencies. To help identify the twenty banks of memories, each is assigned a letter of the alphabet. The first ten use the letters A-J whilst the last ten use lower case a-j. Another feature associated with the final ten memories is that they can be protected from prying eyes by the use of a four-digit password.

In all this wasn’t enough, there was even a set of memory editing routines so that you could alter and tidy-up the memories. With this you could swap, move, copy or change any memory channel. This was great for general housekeeping and for ensuring you catch all the action. The Expert mode gave access to total customisation of the scanning options. By entering the Select Edit mode you could adjust the delay times, engage audio scan, set the level signal level and restrict the scan to specific receive modes.

Just to complete the scanning options there was a powerful scanning option is loaded with facilities designed to make this as easy as possible. For a start you can have up to twenty pre-programmed searched stored in the search memories. To get you started, the AR8000 comes with the first 10 search memories pre-programmed with amateur bands, civil and military aviation, marine plus p.m.r. allocations. As with the individual memories, you could assign a seven letter comment to each stored search to make life easier. You can also employ the auto memory mode to automatically store all active frequencies into a chosen memory bank. This makes the search process extremely powerful and easy to use. As with the scanning options, entry into the Expert mode enabled all the search parameters to be tailored to suit individual needs.

**More Expert Facilities**

In addition to the sophisticated options already covered, the AR8000 gave the operator access to a range of detailed system settings. The first is the power save feature which is particularly useful when operating portable at an airfield or air show site. You could make a select scan of all the local frequencies and so efficient. The Expert mode gave access to total customisation of the scanning options.
you want to transfer. I can see exactly which memory banks you can simply transfer all this you need the optional CU - two AR8000 receivers. To do these is the facility to transfer The AR8000 even includes a you're doing.

As you can see, these are very advanced features and I would advise you leave well alone unless you're sure of what you're doing.

Remote Control

The AR8000 even includes a number of remote control operations to complete its range of features. The first of these is the facility to transfer memory information between two AR8000 receivers. To do this you need the optional CU-8232 interface fitted to each receiver. In New User mode you can simply transfer all memories in one hit. When in expert mode you can select exactly which memory banks you want to transfer, I can see that this could be a really handy way of transferring information between friends.

Using the same interface and some dedicated software, you can link your AR8000 to a computer for full remote control. This gives the AR8000 the versatility to become an effective base station receiver. (This option is available soon, When it's released we will be featuring a review - Ed.)

On Air

Despite the provision of coverage below 30MHz, the real reason for buying any scanner must be primarily to explore the v.h.f./u.h.f. bands. In this area the AR8000 was great to use. AOR have used their years of expertise well to create a sophisticated receiver that's very user friendly. The ease with which manual scans could be set up was particularly good and enabled me to track down all the local stations very quickly. Combine this with the ability to add text comments and working with stored memories becomes a real pleasure.

The sensitivity of the AR8000 was about right and there was good image rejection. Although most of the tests were carried out with the supplied short antenna, I did experiment with external antenna systems. On v.h.f. this worked very well and the AR8000 handled the strong local signals with no signs of distress. This was especially good considering the high sensitivity of the AR8000. Looking through the measured results with the review model, the sensitivity showed remarkable consistency throughout the v.h.f./u.h.f. spectrum. Between 30 and 950MHz the sensitivity ranged as follows: a.m. -115 to -121dBm and n.f.m. -106 to -114dBm. Although not measured for this review, the audio distortion levels appeared to be very low. This was most noticeable when monitoring the air bands as the a.m. audio was remarkably clean.

Moving onto the m.w. and h.f. coverage the performance was acceptable for this type of receiver. Affordable technology has not yet advanced to the point where a wideband portable receiver can start to approach the performance of a dedicated h.f. communications receiver. Despite this the AR8000 has a few very positive points. When using the s.s.b. receive mode it was good to see that proper carrier re-insertion has been used. This pays dividends in many areas not the least of which is the received audio quality. More importantly, the frequency stability is excellent.

Just to prove the point, I connected the AR8000 to my computer using the basic JVFAX interface and attempted FAX reception. This is a critical test as the receiver needs to remain within about 50-100Hz of the original frequency for at least 15 minutes to produce a decent image. The AR8000 achieved this with ease. The most critical aspect of achieving success on h.f. was choosing the correct antenna system. Like all wide range portable receivers, the front end of the AR8000 is wide open and very susceptible to overload from strong signals. The ideal solution is to use a preselector between the antenna the AR8000 as this will suppress the strong out-of-band signals. Second choice is to use an a.t.u. to provide a degree of filtering and some adjustable attenuation.

Summary

The AR8000 is a truly remarkably little receiver that's packed with sophisticated, but easy to use, features. As a portable receiver it has features that many base station units are unable to match. The provision of h.f. coverage was a real bonus and this was a good implementation though h.f. through a scanner is never up to the standards provided by a dedicated h.f. receiver. Overall I thought the AR8000 was a refreshingly new scanner that will find favour with many scanning enthusiasts. The AR8000 costs £449 and is available from AOR (UK) Ltd., Adam Bede High Tech Centre, Derby Road, Wirksworth, Derby DE4 4BG. Tel:(0629) 825926. My thanks to AOR for the loan of the review model.
ICF-SW7600 .................................. £69.95
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Short Wave Magazine, September 1994

13
DT-1 Dual - Time Quartz Station Clock £24.95 Carr. £2.50

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100kHz - 1300MHz Scanner Receiver

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Short Wave Magazine, September 1994
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**news**

**NTech Communications Move**

Recently appointed as distributor for Hoka Electronics, N'Tech Communications have moved to 6 The Crescent, Willingdon, East Sussex, BN21 9RN. Tel/Fax: (0323) 483966.

**Listener Saves The Day**

It must be every listener's dream to pick up a mayday signal from a vessel in distress. That is exactly what happened to Ron Oswald on 17 July this year as he scanned the bands with his Icom receiver.

"I immediately dialled 999 and was put through to Dover Coastguard," Ron said. "I was astounded when they said they couldn't hear it."

The mayday call was made by the Swedish skipper of the yacht Aida which had lost its rudder off Beachy Head, Eastbourne. The captain, sailing single-handed, did not require assistance but wanted to alert any nearby shipping of his position.

Ron observed that, "Dover Coastguard would transmit to the yacht and the yacht would reply. I then had to dial 999 and relay the message back to Dover."

A rescue helicopter was despatched to monitor the Aida's progress and the yacht eventually limped safely into the port of Newhaven.

Gail P. Stevens

**Radio and TV DX News**

Further erosion of the Band 3 (former UK) TV spectrum is likely with the news that South Yorkshire's Supertram Light Rapid Transit System has received seven Band 3 channel allocations to use between their 25 trams and HQ. Each double ended tram will have a Philips FM1200 mobile transceiver in the driver's control cab, though only the controlled cab unit will operate. And 'Trunked Radio Networks' (who operate the 'Wavelength' network) has an additional 200 Band 3 radio channels allocated for increasing regional networking. The new licences will open further comms systems in the following areas: Nottingham/Derby; Norwich/Norfolk; Birmingham and South M5; Bristol Channel; Exeter/Plymouth; Yorkshire/Leeds/Humberside/Grimsby; Southampton/South Wilt; Bedfordshire/Cambridge; Thames Valley/M3; London/East Kent; Aberdeen/Glasgow; Edinburgh/Cumbria/Glasgow. The Luxembourg CLT is to launch a third channel - RTL Club terrestrially in parts of Germany from their Cologne studio from September and later via satellite delivery on Astra 1D.

A letter from our contact in Bahrain advises the local terrestrial TV services as follows: ch. E4/10 local Arabic service; ch. E4/10 local Arabic satellite TV; ch. E3/8 MBC satellite TV; ch. E5/5 local (Bahrain) English language service; ch. E5/5 BBC WS satellite TV - which could change to the new BBC World Service TV, currently linked into Orbit's Rome Studio via Eutelsat I F4 and thence via compression across the Middle East on further TV channel that could be utilised by the GBC. The long term plans will be to move all of GBC's transmitters to u.h.f. The new allocations have been reached in consultation with the Spanish authorities. Cyril Willis (Kings Lynn) has successfully received North American TV signals via multiple hop Sporadic E in June. Wednesday 22nd weak system M signals were logged from 2245 BST on chs. A2/A3 but unidentified. Saturday 25th from 2057-2200 BST Cyril logged chs. A2/A3,4 though only ch. A2 provided recognisable pictures: at 2100 male announcer over classical music/Baroque documentary and 17th Century life, buildings etc; 2145 female news announcer and weather forecast which mention of Chicago. Signal quality was very poor and positive identification was impossible. Can anyone help identify Cyril's ch. A2 signal please?

**More additions to the SWM Book Service**

**Practical Antenna Handbook Second Edition**

Joseph J. Carr

A new addition to the SWM book service, this second edition may be the most extensive volume available anywhere on communications antennas. It is the only book you will find that offers so many useful projects. Joseph J. Carr gives you all the practical, nuts and bolts information you need to make antennas work. He also tells how to extend that work into new projects. In addition to including a new chapter on small-loop direction finding antennas and all-new BASIC computer programs for antenna design and impedance matching, Carr covers a wide variety of antenna types: high frequency dipole, vertically polarized h.f., multi-band and tunable wire, hidden and limited space, directional phased-vertical and directional beam, v.h.f./u.h.f. transmitting and receiving antennas, antennas for shortwave reception, microwave antennas, mobile and emergency antennas.

560 pages, £23.95 plus carr (£1.00 UK, £1.75 overseas surface).

**Major Blow to Amateur Radio - GB2SM to Close**

In a shock announcement from the Science Museum it was revealed that from 7 November 1994 the museum radio station will close down. The comprehensive station features reception capabilities for satellite, FAX and RTTY modes. The amateur radio station section of the display has the famous call sign GB2SM, which has acted as an international ambassador for the museum for nearly 40 years.

Speaking on behalf of the Science Museum, Graham Farmelo, Head of Education Interpretation said, "The station exhibit no longer reflects the contemporary image of modern communications required by the broader audience attending the museum."

The space currently used by GB2SM will be given over to a display related to data communication superhighways-something which would not have been possible without radio amateurs developing data communications in the first place.

This decision will be a major loss to the promotion of radio and communications as a hobby.

Anyone wishing to comment on the closure should write to the museum at the following address: Sir Neil Cossons, The Science Museum, Exhibition Road, London SW7.

Short Wave Magazine, September 1994
Radio Amateurs Examination Courses

The following establishments have informed us of new courses:

**North Trafford College**, Talbot Road, Stretford, Manchester, are offering various courses from September. Enrolment dates are 31 August, and 1 and 2 September. Details are as follows:

- **Theory**
  - Monday evening or Wednesday morning
- **Computing for Radio Amateurs**
  - Tuesday morning
- **Electronics Servicing/Construction**
  - Tuesday afternoon
- **Morse Code (intermediate level)**
  - Tuesday evening
- **Morse Code (Beginners)**
  - Wednesday afternoon

For further information Tel: 061-872 3731

**Newbury College** classes start Wednesday 14 September 1990-2100. The course will have a practical emphasis, with 'hands on' experience of amateur radio equipment provided by the course tutor G3NPS. Further details: Tel: (0635) 37000/35383 quoting course no 99018A.

**Reddish Vale Evening Centre** are running both an RAE and a Morse course. RAE is a course of 25 sessions leading up to the exam in May 1995. The Morse course is 25 sessions for all levels of ability up to 20 w.p.m. Several tutors will be available to cater for all levels. Both sessions will be held on Monday evenings between 1900 and 2100, beginning on Monday 26 September. Enrolment for the courses takes place on the evenings of 12, 19 and 26 September, between 1900 and 2000. Further details from Dave Wood. Tel: 061-430 6246, most evenings.

**Arnold and Carlton College of Further Education**, Digby Avenue, Mapperley, Nottingham, are offering three courses, a 30 week course starting 14 September every Wednesday, 1830 - 2115, a 12 week course starting 19 September every Thursday this is an intensive course and not intended for beginners, time as above, lastly a Morse class for both beginners and those wishing to brush up their speed to test level, every Wednesday evening 1900 - 2100 starting 14 September.

**West Nottinghamshire College of Further Education**, Derby Road, Mansfield, have a courses commencing 12 September held every Monday for 28 weeks 1900 - 2100. Further details for both above centres can be obtained from: Alan Lake G4DVW Tel: (0602) 382509.

**Kingston College** announce their '94/95 RAE course. The college is also a City and Guilds examination centre and external candidates are welcome.

Enrolment will take place on the evening of Monday 5 September in the Engineering Department at Kingston College, Kingston Hall Road, Kingston-upon-Thames KT1 2AQ. Tel: 081-546 2151 ext. 2066 for further information.

**Trowbridge and District Amateur Radio Club** have informed us that the RAE course will be offered to prospective Radio Amateurs at the club head quarters which are located at Southwick Village Hall, Nr. Trowbridge, Wiltts. The course commences September 1994. Further details can be obtained from the course tutor, Chris Parnell G0HFX Tel: (0225) 768474 evenings or Ian GOGRI the club secretary Tel: (0225) 864698 evenings.

An RAE course is being held at the Newnatt Woods School, Avebury Road, Oprington, Kent. Starting 22 September course will be held on Thursday evenings 1930-2130. Enrolment should be at least 2 weeks before the start of the course, this can be done by post to, Bromley Adult Education College, Church Lane, Prince's Plain, Bromley BR2 8LD Tel: 081-462 9184. The course leads up to the May 1995 examination which will be held at the school. For further details contact the course tutor, A.E. Bettis. Tel: 0689 831123.

**The City of Westminster College** will be running an RAE evening course commencing early September for May ’95 exam. Both class A and class B licences, will be catered for, i.e. a Morse course will run concurrently. It is hoped that an ‘Advanced Morse’ course will be conducted taking candidates up to 22/25 w.p.m. Professional College lecturers will conduct the course. Prospective candidates should contact The Science and Technology Dept. Tel: 071-723 8826 for details.

**Joseph Priestley College** is to run three part-time courses starting in September at its Alce Beavers Centre in Hunslet, South Leeds. Two one year City and Guilds courses 733 (Novice) which starts 29 September and runs on Thursday 1900-2100. and 7651 RAE starting 13 September 1900-2100 on Tuesdays. A morse course will run for 13 weeks on Wednesdays 1900-2100. For more details Tel: (0532) 711994.

**Avondale Adult Education Centre** announce their RAE course for 1994. enrolment week starts 13 September, the course tutor Rik Whittaker will be available Monday and Tuesday evening of that week. The course will run Tuesdays 1900-2100. With new funding arrangements for Further and Adult Education students may be entitled to free tuition. In addition, course members are offered free access to Stockport Radio Society for the duration of the course. Further information can be obtained from Rik Tel: 061-427 4730

Pyramid Power

The Scarborough Special Events group will be on the air as GB3OFY during the weekend of 17 - 18 September 1994 to celebrate the 30th Anniversary of RAF Fylingdales.

The world-famous 'Golf Balls', landmarks on the bleak North Yorkshire Moors since September 1964, have now vanished to be replaced by a state-of-the-art Array Pyramid. This makes Fylingdales the most sophisticated radar in the world-wide chain of Ballistic Missile Early Warning Stations - BMEWS.

Operation of GB3OFY will be on 3.725 and 7.055MHz with some 144MHz as well - but obviously no 70cm activity ! - from 0900 to 1800 on both days. Short wave listener reports will be most welcome and all reports will receive the full-colour QSL card specially produced for this event. This will be the first time that amateur radio has operated from within the base.

The All Ireland International Radio and Hobbies Exhibition

During 7 and 8 October the Armagh and District Radio Club will host the second All Ireland International Radio and Hobbies exhibition.

This year’s event promises to have even greater impact than the first exhibition held in Dundalk last year.

From March 1994 until March 1995, Armagh is holding the most ambitious year long festival ever staged in Ireland - Armagh Together 1994/5. The exhibition is set to be the highlight of the festival.

For further information contact: John R. Ash G0RLE, 40 Deans Walk, Sleepy Valley, Richhill, Co. Armagh, N. Ireland BT61 9LD.

Droitwich Memories

Between 27 August and 8 October the Droitwich Spa Heritage Centre will celebrate the 80th anniversary of the opening of Droitwich Transmitting Station with an exhibition entitled ‘Radio Remembered’. Alongside details of the station’s history will be working exhibits of studio equipment from the 30s, 40s, and 50s and wireless sets from the early days of ‘Droitwich Calling’.

Many items on display have been kindly donated by Ariei readers in response to last year’s letter from Assistant Engineer-in-Charge John Phillips. Entrance is free. For further information please phone the centre on (0905) 774312

Lowe Electronics Announce New Module

The SP150 provides audio filters (high pass, variable low pass and variable notch), a 10W audio amplifier and speaker that can be used with any short wave receiver or transceiver. When used with the Lowe HF150 it will also provide 'S' meter indication after a minor modification to the HF-150. Price is due to be announced shortly.

Low Electronics Announce New Module

The SP150 provides audio filters (high pass, variable low pass and variable notch), a 10W audio amplifier and speaker that can be used with any short wave receiver or transceiver. When used with the Lowe HF150 it will also provide 'S' meter indication after a minor modification to the HF-150. Price is due to be announced shortly.

Short Wave Magazine, September 1994
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Second-hand equipment
Lowé HF-125 shortwave receiver. 30kHz - 30MHz. AM, FM, USB, LSB. C/w mains power unit and manual. £299.00.
Yupiteru MVT-6000 Base/Mobile scanning receiver. 25 - 550MHz & 800 - 1300MHz. AM, FM, WFM. C/w mains unit and manual. £225.00.
Yupiteru MVT-7100 handheld scanner. 500kHz - 1650MHz AM, FM, WFM, USB, LSB. This is complete and as new. £225.00.
JIL SX-40N base station scanning receiver. 25 - 550MHz. All modes. This unit is complete with all accessories and is as new. £225.00.
Yaesu FRG-9600 base station scanning receiver. 60 - 905MHz. AM, FM, WFM, WAM, USB, LSB, CW. C/w mains unit and manual. £299.00.
AOR 1500EX handheld scanning receiver. 500kHz - 1300MHz. All modes. This unit is complete with all accessories and is as new. £279.00.
Sangean ATS-803A portable shortwave receiver. 2 months old. £99.00.
Yaesu MVT-6500 scan receiver. 100kHz to 30MHz all-mode
Sanyo JFC-7600 portable shortwave receiver. (mint condition). £129.95.
Pf.230MBX terminal unit. Decode, Packet, AMTOR, RTTY, c.w. and FAX. (Needs to be used in conjunction with a computer). £279.95.
**Receiver Specifications Explained 2**

In the second part of our series, Peter Buchan takes a look at that all important attribute of any receiver’s characteristics - selectivity.

Now that the sensitivity of a receiver has been examined we should turn our attention to the selectivity characteristics. Selectivity is a broad and relative term, because it can describe the characteristics of tuned circuits or filters, with bandwidths ranging from several megahertz to only a few tens of hertz. In more specific terms, selectivity is used to select either individual frequencies, or a band of frequencies, to the exclusion of others. The band (band-pass, pass-band, bandwidth), of frequencies required is governed by the mode used for communication, be it f.m., a.m., s.s.b., or c.w. Ideally, the selectivity of a receiver should have selectivity curves as per the ‘ideal’ curve shown in Fig. 1a. In practice, though, selectivity curves look more like the ‘actual’ curve. To give figures of merit to selective circuits they are given a ‘shape factor’. A characteristic curve is examined and a note made of the frequencies where the response has fallen to -6dB, and -60dB, above and below the centre frequency. Divide the pass-band at -60dB, by the pass-band at -6dB and you have the shape factor in Fig. 1b. An ideal shape factor would, of course, be 1. The -6dB ‘nose’ and -60dB ‘skirts’, Fig. 1b, as they are called, also indicate the bandwidth at these points as expressed in the manufacturer’s brochure. For example: s.s.b. 2.3kHz at -6dB, 4.0kHz at -60dB. Shape factor 1.74.

Designs by manufacturers of amateur radio equipment dictate that the ‘front-end’ of communications receivers, have a wide bandwidth from antenna input to the first mixer. Bandwidths range from 1.5 to 5MHz, and a typical receiver front-end response is shown in Fig. 2, unbroken line. Here, the signals between 7 and 10.5MHz will be amplified and presented to the first mixer. The broken line curve shows the next band up, 105MHz to 15MHz. After the first mixer there will probably be found a 2-pole monolithic filter, (single block/self-contained), with a bandwidth of about 15kHz. This filter continued on page 22.

**Fig. 1a.** Showing an ideal shape for a filter. Shape factor for this filter would be 1.0. **(b)** Shows more realistic shapes for practical filters. These would have shape factors from 1.5 for the s.s.b. filters to about 2.0 for the narrow 250Hz c.w. filter. (c) Indicates how one obtains the shape factor for a filter and also how the -6dB nose and -60dB skirts are expressed.

**Fig. 2.** (a) A typical front end filter characteristic. These are usually formed by overlapping a low-pass and high-pass filter. The overlapped sections define the band-pass of the receiver for the particular range. The dashed line indicates the shape of the next filter range.
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continued from page 19

defines the maximum bandwidth for this particular receiver, it would be used for f.m. reception.选址s at this point some clarification of the term bandwidth should be made. It is important when expressing bandwidth to make it clear whether one is talking of the -3dB bandwidth, (often known as the half power bandwidth), or bandwidth at some other point, as for instance expressed in the calculation of the shape factor. (i.e. -80dB is one quarter power bandwidth). So it is worth keeping this question in mind when examining characteristics.

Returning to the 15kHz filter found after the first mixer. The centre frequency of this filter will be governed by the manufacturer’s choice of the first i.f. frequency. The popular frequencies nowadays seem to be either 70, or 45MHz for the first i.f. with a second i.f. somewhere around 9MHz. Third intermediate frequency stages are at 455kHz, with a fourth at 100kHz. Other i.f. frequencies are used, but the foregoing seem to be the most popular. The centre frequency of the filters, then, will be that of the i.f. where the filtering is to take place. The filters will be designed to pass only the band of frequencies considered necessary to convey the information content of the signal. It is possible to resolve s.s.b. signals using a 1.5kHz filter.

Establishing the shape factor of the various filters between -6 and -80dB does not tell the whole story. What happens below -60dB is of considerable importance especially for strong adjacent signal performance. If the filter flattens out quite sharply below -60dB, then the receiver will not be anything like as quiet as one with filters which continue to descend below -60dB, to -90 or -100dB. Most manufacturers nowadays seem to offer filters which have skirts that continue down to -90dB and a little beyond. They will certainly not be inexpensive filters, but the improved performance might make the investment worthwhile. Don’t forget that filters are usually an extra, except for a 2.5kHz s.s.b. and a 6.0kHz a.m. filter, which are usually included in the price.

By stating that the receiver will be quiet with a -90dB filter skirt, does not necessarily refer only to the ‘noise’ performance of the receiver. Though such a filter must reduce both received and receiver noise, it also very effectively cuts-off the side bands of adjacent stations. This is evident when using a.m. reception on the broadcast bands. Steep sided filters can make the stations slide down the filter skirt, and disappear like magic, as the receiver is tuned through the band. This effect allows ‘quiet’ reception (or non-interfered with), reception of the weaker stations.

The curve in Fig. 3a may be plotted by tuning a signal generator through the pass-band, keeping the filter output constant. This is achieved by increasing the output of the generator by an amount equivalent to the attenuation caused by the filter skirts. These curves are plotted the other way up, to show how the generator input is varied, in dB, to keep the filter output voltage constant, as the signal is tuned through the pass-band. Looking at Fig. 3b, assuming the wanted signal was at the centre frequency of the filter, then signals at either ±10kHz of that frequency would have to be 60dB greater to match the amplitude of the wanted signal. Having said that, Fig. 3b also shows that the filter characteristic opens out considerably after passing the 60dB point. This, in fact, makes the filter less effective at frequencies beyond 10kHz either side. For example, at 15kHz either side a 70dB greater signal would match the wanted one, but if the filter design had taken the skirts further then something like a 90dB greater signal would be required.

In practical terms what does this mean? Well, if the wanted signal were, say, 3μV (about 55, then at 15kHz out from the centre frequency a signal 70dB greater would be about 99+35dB. If, however, the skirts had been extended dashed lines Fig. 3b a signal 90dB greater would have to be about 99+65dB. Something approaching 100mV at the antenna input, and that is an extremely strong signal. Some recent test reports show that this level of selectivity is becoming more common.

It is possible when using c.w. to tune out interfering signals by simply dropping the unwanted one off the upper or lower edge of the filter, as in Fig.4a & b. This does mean that the note of the wanted signal will be changed, but might be an acceptable trade-off for a clear channel. It is here that the i.f. shift, (similar to i.f. slope tuning), fitted to many of today’s receivers/transceivers, can come into its own. Fig. 4c & d show the effect graphically. The i.f. shift enables the c.w. note to remain the same whilst shutting out the unwanted signal. Of course, this is also very useful when using s.s.b. Having tuned in a s.s.b. signal the frequency can only be moved slightly or the voice will become unintelligible. Therefore to be able to shut out the unwanted signal without having to re-tune the receiver is invaluable.

The effect is that the centre frequency of the filter is changed - but this is not the case. It is the i.f. signal that is shifted above and below the pass-band of the filter. This is accomplished using a VCXO (voltage controlled crystal oscillator), and a mixing process which gives the desired result of being able to move the (i.f.) signal about within the pass-band of the filter. Fig. 4c & d shows that the wanted signal is unmoved whilst the interfering signal, also unmoved, is now outside the filter pass-band - the i.f. signal being shifted slightly h.f. Placing the filter about the wanted signal to the best effect is obviously going to be an acquired skill, especially with s.s.b.

Another variable selectivity feature found on the more expensive receivers is the Pass-Band Tuning (PBT), also known as Variable-Bandwidth Tuning (VBT). These, and the i.f. shift, use some quite...
complicated circuitry within the Phase Locked Loop and Mixer boards, to produce the desired effect. They are particularly useful if one has bought a receiver without the additional filters, and only the 2.5kHz s.s.b. and 6.0kHz broadcast filters are fitted as standard. The PBT is particularly effective for c.w. reception.

For the PBT two i.f. stages and filters are used, one i.f. remains fixed whilst the other is moved across the face, as it were, of the fixed one. See Fig. 5a & b. There is another feature that is now almost standard on most receivers - the 'notch-filter'. Although perhaps this is not strictly involved in the selectivity of the receiver, it most certainly is 'selective'. The role of the notch-filter is really self-evident and is provided to virtually eliminate unwanted carriers. This it does very effectively but is so sharp that a small adjustment of receiver tuning requires re-adjustment of the notch-filter.

In addition to the filtering that is carried out at the i.f. frequencies, there are often found audio filters, though again, these are usually only found on the more expensive equipment. These filters are variable, and allow the operator to peak a c.w. signal, or to enhance the reception of s.s.b. signals by judicious cutting of interfering signals above and below the wanted signal. They are of course very useful when wanting to narrow the pass-band for the reception of broadcast stations and are effective in doing so. But all of this is done at audio frequency.

This brief look at selectivity only covers the modern approach, there has been no mention of front-end selectivity as found on the older receivers. The days of the low gain two r.f. stage front ends have made way for the veritable 'barn door' front ends, which at last seem to have been brought under control. Of course the problem of 'tracking' the tuned stages of the older receivers has gone. This was overcome by providing pre-selectors, which were very popular for a while, but eventually these were put aside for the relatively very much cheaper methods used today.

One must remember that, no matter how good the selectivity is, if an interfering signal enters the pass-band, such as splatter from badly adjusted, and over driven amplifiers, there is nothing one can do about it but grin and bear it, and regrettably there is plenty of opportunity to have to do just that nowadays.

Looking into the front-end of the receiver from the point of view of the signals, what is it that they actually see? Well, to start at the antenna there will be literally thousands of signals present upon it, but the receiver is only capable of selecting those whose frequency lies between say 0.5 and 30MHz. This fact indicates to the signals that selection will take place. Further, let us assume that the receiver is using the front-end filters as shown in Fig. 2a, where a further very definite selection is made. Here only signals between 7 and 10.5MHz will be accepted without attenuation. But, as we already know, only a minute fraction of these present will be allowed through the following 15kHz filter. So the signals as they each occupy their particular place in the spectrum are confronted with a series of ever narrowing doors that only a selected few are allowed through. The actual selection, of course, is made by the operator, or at least is under the control of the operator. As the signals progress through the various stages of the receiver, further selection will take place, although these selections will be taken from signals whose frequency has been changed. Frequency changing takes place in the mixer circuits and it is here that local oscillators are used. When the ultimate selection is made by using the 250Hz, or even the 100Hz, filter for c.w. reception, it is vital that the mixer local oscillators are stable. Drift in these oscillators would be intolerable with such narrow bandwidths. It is in this area that progress has been made by utilising frequency synthesis. Stability, at least long term stability, has reached a high standard and variations of only a few parts per million is commonplace.

Short term stability of the continued on page 25
Collisions in the Solar System

Comet Shoemaker-Levy 9 hits Jupiter

The week of 16 to 22 July was an historic one for astronomers everywhere. For months we waited with anticipation for the series of collisions marking the end of comet Shoemaker-Levy 9 as it impacted the top of planet Jupiter's frozen atmosphere. Although discovered only last year, the comet's orbit was analysed and found to have been in a highly eccentric orbit around Jupiter since 1970.

In July 1992 it grazed the planet, passing within some 40,000 km. This exceedingly close approach caused severe gravitational disruption of the comet, breaking it into a string of some 20 pieces. The scene was then set for its discovery a few months later, followed by impact of the fragments during the week starting 16 July.

Jupiter has been an interesting planet to observe optically ever since the invention of the telescope. Its appearance is one of constantly changing colourful belts and spots. Another fascinating aspect of Jupiter is its radio emission. Radio waves from Jupiter were first detected in 1955, on frequencies between 500 kHz and 40 MHz. If you view the planet using any optical aid, you will soon observe its four large moons (natural satellites), of which the innermost is called Io.

Astronomers believe there is a vast tube of magnetic flux between Jupiter and Io, along which electrons spiral. Radiation received on earth is believed to be caused by electrons escaping from this flux tube. The process is not continuous, so high frequency radiation is not constant - but sporadic. Radio astronomers have found a correlation between the movement of Io around Jupiter and the detection of this radio emission.

A good short wave receiver fitted with a suitable antenna, preferably a directional loop or dipole antenna, can receive this radiation - best heard around 21 MHz. During the week commencing 16 July 1994, fragments of comet Shoemaker-Levy 9 hit the planet Jupiter. The following pictures were recorded on 20 July, shortly after one of the larger fragments penetrated its atmosphere. Each fragment is believed to have caused an enormous explosion many miles below the surface of Jupiter's atmosphere. The explosion pushed dark material (shown here as dark 'blobs' near the south pole) to the top of the atmosphere. Because of the planet's rapid rotational rate, these dark areas are seen to rotate with the planet during a period of a few hours.

These images were taken by Lawrence Harris using a 10 inch (25 cm) SCT telescope in Plymouth. A CCD camera is mounted behind a Barlow lens and produces an electronic image for relay to a computer. The images are later enhanced to reduce the effect of atmospheric turbulence.

Lawrence Harris, our 'Info in Orbit' columnist, has been involved in astronomy both as an amateur and, for more than 18 years, as a professional. He also writes on astronomy for his local paper.

Here he recounts his experiences of the recent cosmic activities around Jupiter.

2043 UTC

2103 UTC

2113 UTC

Short Wave Magazine, September 1994
Feature

band completely. Jupiter also emits radiation between 100 and 1000MHz (v.h.f. - u.h.f.). This is believed to be caused by electrons spiralling inside the planet's own magnetic field, and is called synchrotron radiation. Suitable equipment for its reception includes a high-gain, steerable antenna and a low-noise amplifier, so such monitoring remains the province of the well-equipped amateur.

Interest in monitoring radio emission during the comet's collision was because of the uncertainty of the likely effects following the expected explosions. It was difficult enough to predict whether the impacts would actually leave their mark on Jupiter. Predicting the effect on Jupiter's 21MHz radio emissions was in a field of its own! Radio astronomers around the world tuned their receivers to monitor Jupiter, while optical astronomers prayed for clear weather.

In Plymouth we had clear skies for most of the period and I used my 25cm Schmidt-Cassegrain Telescope, fitted with eyepieces for optical work, or the CCD camera (charge-coupled device) for electronic imaging. A few hours after the first impact I was astounded to see a huge dark spot the size of the Earth appear near the southern polar region. Jupiter has an equatorial diameter almost 143000km (over ten times that of the Earth), so each dark area exceeded the size of our planet. This was history in the making.

During the hours following later impacts, more dark areas appeared on Jupiter's surface. I continued to record some video sequences of the movement of the spots, collecting an occasional image for computer processing.

We are unlikely to see such drama again. Astronomers will continue to search the skies for near-Earth asteroids and smaller fragments, as well as those near the outer planets. An American team called Spacewatch is currently involved in this survey. Occasionally one will provide cause for excitement, but Shoemaker-Levy 9 was definitely in a class of its own.

APPENDIX
For -3dB bandwidth the power has been reduced to one half. That is $P_r = 0.5P$, and $P_r/P = 0.5$.

$10\log_{10}0.5 = -3\text{dB}$.

For the same -3dB bandwidth the voltage, or current, has been reduced by a factor of 0.707.

That is $V_r = 0.707V$, and $V_r/V = 0.707$.

$20\log_{10}0.707 = -3\text{dB}$.

The same argument goes for the current.

$S_9$ is the same as $-73\text{dBm}$, assuming $50\text{uV}$ across $50\Omega$ for $S_9$.

$P_{S_9} = (50\times10^{-12})/50 = 50\times10^{-12} \text{W}$.

Now, $10\log_{10}50\times10^{-12}/50 = -73\text{dBm}$.

$S_9+20\text{dB} = -73+20 = -53\text{dBm}$.

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<td>(µV)</td>
<td>(µV)</td>
<td>(dBm)</td>
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<td>500.0</td>
<td>500.0</td>
<td>-53</td>
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<td>158.0</td>
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<td>0.5</td>
<td>1.3</td>
<td>-113</td>
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Abbreviations

a.m. amplitude modulation

- c.w. continuous wave (Morse)

dB decibels

- dBm decibels (ref. 1mW)

- f.m. frequency modulation

- h.f. high frequency

- i.f. intermediate frequency

- kHz kilohertz

- MHz megahertz

- mV millivolt

- PBT pass-band tuning

- SSB singlesideband

- V volts

- VBT variable-bandwidth tuning

- VXCO voltage controlled crystal oscillator

- W watts

- µV microvolts

Receiver Specifications 2

continued from page 23

mixer local oscillators however is another matter and perhaps this can be looked at later.

Operators may enhance the apparent selectivity of their receivers by providing an antenna matching unit, not one of the 'L' type units because these are really only high or low-pass filters. What is needed is a band-pass matching unit where the selectivity may be quite high. Such a unit provides pre first mixer selectivity and at the same time can be made to match the antenna to the receiver.

Short Wave Magazine, September 1994
The choice of antenna for use with a v.h.f. - u.h.f. scanner is quite often a difficult one to make. For many listeners space limitations preclude the use of discones or beams. In these instances it would seem to make sense to consider some form of active antenna. The antenna needs of a wide band receiver, or scanner, dictate that any design must be broad band if it is to be of any use. The traditional wide band antenna for use with a scanner is the discone mounted either in the loft or outside on a suitable pole. The main disadvantages of this arrangement can be summed up as feeder cable losses.

An active antenna system can be made physically smaller than a passive system - the electronics compensating for the effects of incorrect matching and electrical element lengths. It is possible to design out the feeder losses by making the amplifier part of the antenna itself. However, there are disadvantages. Very strong signals can easily overload the scanner's input circuitry causing intermod. distortion.

As the prize for helping us by returning a completed Readers' Questionaire form we gave away a Dressler ARA 2000 Active Antenna, kindly donated by South Essex Communications Ltd. Before presenting it to the winner, Ian Shields of York, we tried it out using a Trident TR-2400 hand-held scanner that we happened to have in the offices. Although we were only able to give the antenna a quick test we are hoping to publish Ian's comments on the antenna later on in SWM after he has installed it.

The ARA 2000 has a large printed circuit board with the actual antenna etched into the copper foil. The p.c.b. also carries the wide band amplifier and impedance matching network. The amplifier uses a monolithic microwave integrated circuit to give a low nose figure with good overload performance over the 2GHz bandwidth of the antenna. The antenna element is housed in a u.v. stabilised plastics tube sealed against the ingress of water. This allows the unit to be mounted outside. An N type connector is fitted in the recessed bottom plate and up to 50m of 50Ω coaxial cable can be used with the unit. Power is fed to the antenna from the 12V mains adaptor via the coaxial cable and RSM 2000 Remote Supply Unit. This unit is housed in a metal box to give r.f. shielding and is fitted with BNC sockets for the r.f. cables and a phono socket for the d.c. supply. The two lengths of RG-58 coaxial cable - one 15m the other about 1.6m long - have N type moulded plugs at one end and BNC at the other! So you will need to find a BNC to N type adaptor or a short coaxial cable with 50Ω BNC plugs at both ends - unless your receiver is fitted with N type sockets.

Quick Test

Our quick tests using the Trident TR-2400 scanner showed that there was a considerable improvement in the signal, as shown by both listening and the bar-type S meter on the scanner. The noise level with no signal was, of course, significantly increased, but overall the antenna seemed to give an improvement in signal input to the scanner. For these tests we were only able to compare the ARA-2000 with the 'rubber duck' whip supplied with the scanner. With the antenna properly installed the improvements in signal should be significant. The AR-2000 costs £299 from South Essex Communications Ltd, 292 Francis Road, Leyton, London E10 6NQ. Tel: 081-558 0854.

Specification

<table>
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<tr>
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<tr>
<td>Gain</td>
<td>11 - 13dB below 1.5GHz</td>
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<td></td>
<td>10 - 11dB above 1.5GHz</td>
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<tr>
<td>3rd Order Intercept Point</td>
<td>+40dBm below 500MHz</td>
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<td></td>
<td>+43dBm above 500MHz</td>
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<tr>
<td>Output Impedance</td>
<td>50 - 75Ω</td>
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<td>Socket</td>
<td>N type (see text)</td>
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<tr>
<td>Cable</td>
<td>RG-58 coaxial. Max length 50m</td>
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<td></td>
<td>15m supplied with moulded plugs fitted.</td>
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<tr>
<td>Power</td>
<td>12.5 - 15V d.c. 200mA. Mains adapter and remote supply unit supplied.</td>
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<tr>
<td>Dimensions</td>
<td>450mm x 90mm dia.</td>
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<tr>
<td>Weight</td>
<td>2.5kg</td>
</tr>
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</table>

All figures quoted are the manufacturer's.
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<td>SMC (Northern)</td>
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28 Short Wave Magazine, September 1994
So you thought the HF225 was good - then you should try the Europa! Kevin Nice did and as a result he bought one. Read on and find out why.

The Europa is described a turbo-charged HF225 - a very apt choice of phrase. This is a very refined and powerful package with lots of get up and go. The turbo package offers as standard fitment items that are optional on the standard HF225. These are the direct entry keypad, synchronous a.m. detector, f.m. detector, and whip antenna amplifier. The a.m. filters have been replaced with 7, 4.5 and 3.5kHz items. Inductors and switching diodes have been replaced in the bandpass filters with superior specification devices, resulting in lower residual noise. The whole package then offers

The receiver is very compact and is ideal as a portable or base station set. Weight is about 1.9kg (2.6kg with optional internal ni-cads batteries fitted).

Tuning

The receiver covers a frequency range of 30kHz to 29.999MHz, which is covered in one continuous range. If you have the time and good enough muscles in your hand, wrist and arm you can tune from one end of the range to the other just by turning the main tuning knob. The tuning rate is variable and depends on which mode is selected and the speed that the tuning knob is actually turned i.e. if you rotate it quickly then the tuning rate is increased by a factor as follows. Predictably the tuning rate is the slowest for s.s.b. and c.w. modes, this being in 8Hz steps with a rate of 1.6kHz per revolution, essential for accurate resolution of phone and data signals. The fast rate is twelve times faster. For a.m. the tuning step is 50Hz with 9kHz per revolution fast rate is ten times faster. The f.m. rate utilises 125Hz steps with a normal rate of 25 per revolution, fast rate being four times the speed.

Finally synchronous a.m. (a.m.s.) is the same as s.s.b. and c.w. to enable easy lock on a phase lock loop circuitry. With the above set-up it's very easy to traverse set bands, though rather more difficult to shift large frequencies steps. No matter, there are three ways around this difficulty. Firstly, MHz up and MHz down buttons which are self-explanatory. Each depression of these buttons shifts the receiver's v.f.o. frequency up or down by 1MHz. Secondly and most useful the external keypad allows direct entry of any desired frequency in kilohertz. Lastly the 30 memories allow your favourite frequencies to be maintain for later recall by a simple key sequence, these memories do not, unfortunately, store mode or filter selection.

Connecting it Up

I eagerly connected a random length wire antenna to the 600Ω terminal on the rear of the receiver - there is provision for open wire input and SO259 for either low impedance coaxial feeder or the optional plug-in telescopic whip. The antenna input required is selected by a 3-way slide switch between the SO259 and the 600Ω connectors, selecting the whip position places a wide band amplifier in circuit. Other

Specifications

Frequency Range: 30kHz-30MHz continuous

Sensitivity: 30kHz -2MHz: a.m. <1.2μV s.s.b. <1.0μV f.m. <0.6μV

2-30MHz: <0.9μV

Selectivity: i.f. filter (kHz) B/W (kHz) @ -6dB Shape factor 6:60 dB

100Hz: 1:2 2.3 1.5

400Hz: 1:1.5 5.9 1:1.7

1kHz: 1:1.5 8.8 1:1.5

2kHz: 1:1.5 10.5 1:2

Dynamic Range: Reciprocal mixing effects 2kHz filter >90dB at 5kHz from wanted signal >90dB at 10kHz from wanted signal >80dB at 100kHz from wanted signal

Intermodulation effects 2.2kHz filter at 10kHz signal separation, 3rd order intercept point > +3dBm Intermodulation-free dynamic range > 85dB at >50kHz signal separation, 3rd order intercept point > +12dBm Intermodulation-free dynamic range > 93dB

Spurious responses:

Images: At 90kHz >75dB rejection At 910kHz >90dB rejection

Fixed responses: At 45MHz >85dB rejection At 455kHz >100dB rejection At 22.5MHz >75dB rejection

Power Supply: 12V d.c. @ 300mA 250V a.c. with supplied mains adapter Internal Ni-cads (option)

Dimensions: 235x109x204mm.

Weight: 1.9kg (2.6kg with batteries)
RC818 (SSP £219.99)
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- Waveband coverage:
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Short Wave Magazine, September 1994
Around the Bands

This receiver is addictive and easy to use. It comes supplied with an excellent user's manual, but frankly it doesn't need one. I only read it after hours of listening. What the manual does provide though, is a good basic introduction to short wave listening for complete beginners. Anyone who has never owned or operated a communications receiver could use this receiver to good effect in next to no time.

But back to using the set. I found the Europa a joy to use, with extremely high power broadcast stations in the 7MHz band where things can get very crowded. - here the a.m. filters definitely proved their worth. - and with very weak crowded maritime beacons where the standard 200Hz filter is 'out of this world'.

The set is very stable and I had no problems decoding many FAX stations with the receiver left unattended for many hours. Dynamic range proved to be very good and I encountered no perceivable problems with overload on very strong signals. A very useful feature is a permanently enabled noise blanking circuit which proved to be very effective in dealing with motor and thermostat generated noise.

Nuts and Bolts

The Europa is a double conversion superhet using up-conversion to the high frequency first i.f. of 45MHz and a second i.f. of 455kHz for the selective filters. This design gives good i.f. image rejection at all tuned frequencies in the h.f. band, coupled with good filter shape factor in the 455kHz i.f.

There is no r.f. stage before the first mixer. This, coupled with use of a high performance transistor-tree mixer gives the Europa a high dynamic range and good resistance to strong signal overload. A four pole crystal filter with a bandwidth of 15kHz in the first i.f. (45MHz, limits the signals fed to the second mixer and removes image responses from the second i.f.

Most of the receiver's gain is derived from the second i.f. stage, where amplifiers and filters are interspersed in a chain. The Europa uses ceramic multi-element filters in the second i.f. and switches in as many as possible for a selected bandwidth.

All the switching and tuning functions are under the control of a dedicated microprocessor which receives commands from the user via the front panel and sends information to the receiver control register and p.i.l. system via serial busses. The logic circuits are mounted separately from the main r.f. and i.f. circuits on a p.c.b. behind the front panel. The control system is designed to use the 'static idle' principle, whereby there are no signals other than the basic clock, in the system until the operator requires a change in receiver condition. The logic responds to the user's commands and then returns to its static state. This method of operation virtually eliminates any chancapeshirous signals from the control system being picked up by the receiver's input stages.

Criticalisms

None - well almost none. the display is sometimes quite difficult to read in high ambient light due to its construction and back lighting arrangement. Several in-car stereo manufacturers have had a similar arrangement in the past and have with out exception dropped the format in favour of superior solutions.

Win One

Priced at £699 inc. VAT, this receiver offers a very good price/performance ratio. If you want to avoid flashy front panels and gimmick engineering this is the ideal choice - a down to earth, well engineered work horse wireless. Many thanks to Lowe Electronics Ltd. Chesterfield Road, Matlock, Derbshire, DE4 5LE. Tel: 0629 580800 for the loan of the review model which has kindly been donated as a prize for a forthcoming competition, so watch these pages and you may be lucky enough to win the review model for your own station.
Computers are playing a much bigger part in peoples lives today, both at work and in the home. There are a growing number of short wave enthusiasts using computers to enhance their listening, using computer logging and decoding. It was inevitable that the technologies of radio and computing would come together at some stage and ComFocus Corp. of America have done exactly that.

SoftWave consists of a remote receiver, built into a screened box plus an interface card that plugs into your PC and of course the software. You will need to have a IBM PC type computer, and we recommend at least a 386 type with 4MB RAM and 6MB hard disk space. A maths coprocessor is also desirable. You will also need DOS 5.0 and Windows 3.1 or higher.

The built-in map-driven station database makes selecting world band radio stations very easy and you can change the "personality" of the receiver to give you just the functions you need for various applications. You get no less than six receiver functions with SoftWave:
- AM DX receiver
- Communications receiver
- Worldband receiver
- VHF receiver
- Time sync receiver
- Wideband spectrum analyser

As you would expect, the specification and facilities are also excellent:
- Frequency range: 0.5 to 30MHz and 108 to 174MHz
- Tuning resolution: 1Hz
- Modes: AM, AM-sync, WFM, NFM, CW, USB, LSB
- Selectivity: 11kHz to 49Hz in 48 steps
- Dynamic range: 97dB
- 3rd Order Intercept Point: 2.5dBm (HF, 20kHz spacing) and 5.5dBm (VHF, 20kHz spacing)

SoftWave is unique. Being software driven, upgrades should be straightforward. Already planned are decoders for FAX, RTTY, SSTV and these will become available in due course.

But you can have the radio of the future today for just £1495.00 including VAT

We'll be happy to send you a set of demo disks so you can "see" SoftWave for yourself. Just send us your cheque for £5.00, refundable on purchase of SoftWave.
Crime prevention and short wave listening are not necessarily two terms that you would normally link together. However, even by just thinking of them in the same sentence could save you a lot of money, anxiety and heartache.

Securing your short wave radio, scanner and amateur radio equipment should be a high priority. So what advice is offered? I recently spoke to Keith Cook, Crime Prevention Officer for the Poole Borough and you’d be well advised to read and take note of the following.

Preventable

Many of the burglaries that occur today on property are preventable. A high percentage of the burglaries committed are carried out by the ‘opportunist’ thief. The opportunist tends to look for windows that have been left open or doors that have been left unlocked. This type of thief doesn’t want to spend a lot of time breaking into a house or cause a lot of noise in the process. Therefore, rule number one is obviously to have all accessible doors and windows on your property fitted with locks.

Of course much of the advice on protecting your property is just plain old common sense, but statistics show that plenty of people just don’t bother. So, what extra precautions can you take to stop your precious radio equipment being stolen in the event of a burglary?

Fortunately, with the hobbies of short wave listening and amateur radio being specialised, the equipment is not necessarily at a high risk from being stolen from domestic property. However, if an opportunist thief thinks he can ‘get a few quid’ for it the risk is always there.

Make An Inventory

A sensible thing to do is to make an inventory of the equipment that makes up your short wave station or amateur shack. The inventory should include model numbers, descriptions, any distinguishing features and most importantly serial numbers. Once this is has been done you should put the inventory in a safe place.

By having an inventory you are increasing the chances of getting your equipment back in the event of it being stolen and then later recovered. It not only helps you, but the Police as well. The quantity of unclaimed, unidentifiable goods is becoming more and more of a problem for the Police.

Of course making an inventory is not going to do much in deterring a thief from taking your radio equipment in the first place. One thing that is, however, is to make it as difficult as possible for the equipment to be taken.

Things that you can do yourself include making sure that all the connectors and cables belonging to the main unit are as hard as possible to detach. This can be done by dropping cables behind your workbench so that the thief has to physically move it to release the cables.

If this sounds a bit too easy and not much of a deterrent, think about it - with the design of some of today’s scanning and amateur equipment special connectors are often needed for the power cables and antenna sockets. If the thief takes only your radio, he could be in for a shock when he tries to sell it on as the chances are that it won’t be much use without all the specially supplied cables etc. Not being able to steal the full set-up easily may just be enough to stop it being taken altogether.

Security Marks

Another valuable tip offered is to mark your equipment with identifying marks. This can be done in a variety of ways. Marking your radio with a marker pen that only shows up under ultraviolet light, or hand engraving it are just two preventative measures that you can carry out very easily.

You need to remember though that it’s more effective to mark your equipment using your postcode and house number or name because this enables the owner to be pinpointed exactly. The engraving method is obviously more permanent, as it’s virtually impossible to remove and therefore has a slight advantage over the marker pen method.

If you decide to opt for the engraving method you can make it even more effective by engraving the details somewhere where they will be highly visible. The advantages of marking your radio equipment in this way are very high as by doing so you are lessen the chances of it being sold on. If it’s marked with someone’s name or address it could make it more difficult for the thief to sell it and may just make him think twice about stealing it.

Donna Vincent brings you an interesting and informative article on how to prevent your radio equipment from being stolen.
Secure Property

You can make all the provision you like for securing your equipment in your home but it's not much use if your property isn't secure and well protected.

Things such as extra locks on external doors and windows, burglar alarms, internal and external lighting can all help. These can all go towards putting potential thief off, especially as they all increase the chances of getting caught. Statistics show that the percentage of burglaries in houses with alarms is considerably less than those without.

It's no good investing in extra security if the individual items are incorrectly fitted, not suited to the type of property or not used. If you are in any way unsure of what would be the best form of security to suit your needs your local Crime Prevention Officer will be only too pleased to help.

All you need to do is contact your local Police Station and tell them that you want some advice on crime prevention. They will then arrange for someone to call and assess your property and requirements. In many areas the community Policeman or 'beat bobby' has been trained in crime prevention, so one of them may call instead of the Crime Prevention Officer.

Keep It Out Of View

You local Crime Prevention Department can also supply leaflets on security measures, as well as a list on recommended reputable security companies who can supply and fit burglar alarms, etc. You should also give consideration to protecting out-house buildings like sheds, short wave listening stations or shack and in the case of radio societies and clubs - club houses.

Another piece of general advice is to wherever possible keep your equipment out of full view. This is easy to do inside the house but what do you do in the case of the huge antenna that is firmly fixed in your back garden?

If the antenna is not of the fold-over or easily removable type the only things you can really do are to make it as difficult as possible for someone to get around to your back garden.

Preventative measures include having good fencing, thorny hedges, locked gates and security lighting. All of these are also good general security measures.

Going Mobile

If you own a portable hand-held scanner or short wave radio you may be wondering what precautions you can take to prevent crime when going mobile out in your car. As news reports are stating more often that car crime is continually escalating, operating mobile and installing equipment in your car is in danger of becoming a less desirable option.

With the introduction in recent years of car stereo's that are easily removable from the dashboard, thieves are tending to look for other items and your scanner could be on their list. The advice offered to me by Keith Cook was, whenever possible to take your scanner with you when you leave the car. This is a particularly important point when you consider that many of today's hand-held scanners could easily be mistaken for car phones - an area of car crime that is increasing all the time.

If you have no choice but to leave your radio in the car then make sure that it is out of sight, but take great care not to be seen hiding it in the boot or stashing it under the seat! Of course you also need to ensure that your car is properly locked and secured.

In the case of amateur radio equipment and certain short wave set-ups, an antenna permanently fixed to your car can attract attention and in turn invite the potential thief to investigate further. One way around this is to keep antennas to the absolute minimum and not to plaster your vehicle with lots of stickers that advertise your hobby.

When choosing a new radio, especially if you are a radio amateur, you would be well advised to think long and hard about investing in one of the wide range of mobile rigs that are designed with detachable front panels. These types of radio enable the owner to put the main part of the set-up as far away as the boot, and to just have on the dashboard the front panel and microphone, both of which can be removed easily and taken with the owner.

Insurance

Insuring your radio equipment is also an important factor that should be considered, but is very often over looked. In the case of your home your contents insurance is likely to cover you in the event of loss. However don't forget to read the small print on your policy.

Many people don't realise that insuring over a certain amount can mean that you are required to take extra security measures as condition of the policy. It's well worth speaking to your insurance company about this. There would be nothing worse in thinking that your radio equipment was covered only to find out after the burglary that it wasn't!

Car insurance is another matter and again you'd be well advised to seek advice on whether or not your policy needs ammending to cover any radio equipment carried in your car.

Common Sense

Much of the above mentioned advice is plain common sense and applies to protecting any of your personal effects and property not just radio equipment. Commercial properties such as radio dealers should also be aware of the risks and what they can do to help prevent crime. Crime Prevention advice is equally as available for the commercial world of radio despite the fact that the requirements will often be more complex and detailed.

My thanks go to Keith Cook, Crime Prevention Officer for the Poole Borough for giving up his time to chat to me about preventing crime and for freely offering the advice.

Of course, even by implementing all of the points raised in this article you are not necessarily going to stop crime, but you can go a long way to help prevent it.

One of the ways to both deter theft and recover your property should the worst happen is to use this kind of security marking kit. This one is very comprehensive and comprises of diamond tipped, permanent ink, u.v. and ceramic markers. A stencil and warning stickers. This kind of package can be found in most d.i.y. superstores.
Review

Most burglar alarm systems require a lot of installation - wires running around the house to connect up door and window sensors or motion detectors, outside siren boxes, etc. If the equipment you want to protect is in an outbuilding the problems become even greater with the need to conceal the cable between the house and the outbuilding. The solution to that particular problem should be obvious to readers of this magazine - replace the cable by a radio link!

The Fox Security Wireless Home Burglar Alarm does just that. We asked one of our readers, whose radio shack is at the bottom of his garden, to install and comment on the Fox Model FSS7500. For reasons of security no photographs or specific details of his installation will be given in this review - you wouldn't want a potential burglar to know all the details of the installation, would you?

Vulnerable

The average radio enthusiast's home is readily identifiable as having a high probability of containing some valuable equipment that is readily disposable. Even the simplest of S.W. listening stations will have antennas that are different to the normal - especially to trained eyes. That long wire strung from the tree at the bottom of the garden to the highest point on the house and then disappearing into the radio room is a dead giveaway. If you are into the more dedicated modes then the number and visibility of the antennas will increase. If the radio room is a wooden 'shed' in the garden it is very vulnerable.

The property used for this test has upvc double glazed windows and doors all round with security locks, so that the actual house itself is probably about as secure as it can be. The owner has always resisted fitting a conventional burglar alarm on the grounds that it could signal the presence of something in the house worth protecting, whilst not really deterring the determined professional thief. The opportunist burglar would probably be put off trying to gain access thorough the windows and go on down the road to older properties with decaying wooden window and door frames!

However, the radio room is 25m away from the house at the bottom of the garden. With an increase in what can only be organised burglaries in the area - including the next door neighbour's place - with the targets seemingly being outbuildings containing easily removed small tools and equipment, it seemed sensible to try to install some form of alarm that would, hopefully, scare off any intruders.

Passive infra-red security lights are already fitted, but cannot cover all the plot. The solution is an alarm linked to the house by a radio link. The Fox FSS7500 meets this need.

Installation

The alarm is supplied as a complete kit ready for installation. As well as the main control panel, you also get a wireless passive infra-red detector, a wireless contact transmitter, two-button key-fob transmitter, magnetic reed switch, cable, instruction manual and the necessary hardware to complete the installation.

The instruction manual is easily understood and no difficulty was found in actually installing the various components. The control panel needs to be mounted on a wall somewhere where it can be conveniently reached to either activate or turn off the alarm. Obviously it needs to be close to a suitable mains socket, although it is recommended that a separate feed is installed with its own fuse at the consumer unit.

The wireless contact transmitter unit, like the wireless passive infra-red detector, is powered by a PP3 style battery inside the unit. Tests showed that the transmitter unit was able to communicate with the main control box in the house from anywhere within the perimeter.

For many readers the contents of their radio shack represents a large investment. This can be very vulnerable, particularly if it's in an outbuilding. One answer is a burglar alarm system that doesn't use hard wiring.

Short Wave Magazine, September 1994
Although the wireless passive infra-red detector in the kit offered the simplest solution to monitoring the radio room, it was decided that fitting the magnetic reed switch in series with some form of window breaking detection would be even better and not prone to false alarms from any small furry creatures that might manage to gain entry. Maplin stock, self-adhesive window foil and terminals, so these were purchased and fitted to each window. The foil is in the form of a thin metallic tape that is stuck to each window pane about 25mm in from the frame. If the glass breaks, so will the tape. This opens the loop and the contact transmitter unit is activated, transmitting a coded signal to the control box in the house. This signal tells the panel which ‘zone’ the unit is in. The same thing happens if the door is opened. If the burglar tries to be clever and opens the unit to disconnect the battery, the anti-tamper system operates the alarm. A special signal is also transmitted when the battery is getting low.

The control panel is capable of monitoring up to four ‘zones’ and it is also possible to activate the system with ‘Zone 4’ switched out. This is usually arranged to allow the alarm to be activated at night and yet still allow you to move around designated areas of the house without setting the alarm off. In this case Zone 4 has been designated to the radio room so that the alarm can be left on with the downstairs area of the house still protected by another set of switches and PIR units while you are enjoying yourself at the bottom of the garden.

Siren

The control panel has provision for fitting an external siren if it’s felt that the internal one is not audible enough. It does produce an ear-piercing and very unpleasant 120dB noise - but this might not be enough to deter someone trying to get into your radio room. There is also provision for a back-up rechargeable battery inside the box. The instructions do not, however, give any details as to exactly what the battery should be.

Setting Up

Once everything is in place the setting up of the system is straightforward and is detailed in the manual. The system can be operated either by the key which fits into the switch on the main panel or by using the remote key-fob.

Price

Unlike most reviews it is not really possible to state how well the system works - until the worst happens and a real burglar activates it! It is hoped that, in this case, we will always be unable to tell you how well it performs!

The Fox Security FSS7500 costs £99.99 plus £3.70 carriage from Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR. Tel: (0800) 136156. We would like to thank Maplin Electronics for the loan of the review system.
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**Short Wave Magazine, September 1994**
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How to use the Propagation Charts.

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim. The bold middle line indicates the optimum working frequency (MUF) with a 50% probability of success for the particular path and time. Lastly, the upper dashed line represents the maximum usable frequency (MUF) with a 90% 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.
Mike Richards takes a closer look at the heart of d.s.p. technology whilst reviewing the JPS NIR-10 advanced noise reduction and filtering system from Lowe Electronics.

The NIR-10 is a more sophisticated version of the NTR-1 that I reviewed in the July issue and features a wider range of operating modes plus more scope for the operator to optimise the characteristics for different listening conditions. As you can see from the photographs the NIR-10 is a very compact unit and is housed in a particularly substantial aluminium case. With the exception of the standard 6.3mm headphone jack, all connections were on the rear panel with all except power using phone jacks.

The interconnections have been kept extremely simple starting with a high impedance audio input that can be fed from either a line or speaker output. The processed output of the unit is fed directly to an external speaker where the NIR-10 can supply up to 2W into a 3.2Ω load. Power connection was via a conventional coaxial power socket and required an external power source capable of delivering 11 to 16V at up to 1A maximum.

With all the connections made, getting started was helped by the 174 x 142mm, 31-page manual which included a useful Quick Operation section to get you going. If you’re new to d.s.p. devices, I would strongly recommend you spend some time with the manual before you start so as to avoid being disappointed.

Noise Reduction Modes

Advances in d.s.p. have meant that accessories such as the NIR-10 can now be produced at prices affordable by individuals. Perhaps the feature that sets d.s.p. apart from other forms of filtering or noise reduction is its ability to adapt to a range of incoming signals. Whereas many conventional systems provide a range of features to cope with most signals, they need the operator to decide and set the best settings. With d.s.p. much of this work is done automatically and the adaptation is much closer to the optimum.

The major operating mode of the NIR-10 is NIR (Noise and Interference Reduction) hence the product name. This system analyses the incoming signal and attempts to reject all signals that are not speech components. This provides a reduction in all types of noise and heterodynes. Although the NIR-10 adapts itself to the characteristics of the received signal, the degree of noise reduction is continuously adjustable via a rotary knob on the front panel. Using this mode the specification claims a general white noise reduction of up to 25dB and single tones or heterodynes reduced by around 40dB. This is pretty impressive by any standards.

In practice I found this level of performance was attainable but the NIR level control required careful adjustment when dealing with weaker signals. With these weak signals you find that as the noise reduction level is increased there comes a point where the spurious noise generated by the d.s.p. software exceeds the noise reduction benefits. However, even with very weak signals, there was a distinct improvement in readability. Incidentally, the spurious noise generated by the d.s.p. unit can best be described as a collection of swirling synthetic tones. This is where the software has mistakenly identified noise components as potential speech and allowed individual bursts to pass through to the output.

Another noticeable feature of the NIR mode is the adjustment period of about 1 second while the software analyses and adapts its filtering to suit the incoming signal. Although this may at first seem slow, the processor will have performed thousands of calculations in that period.

Specialist Modes

Utility listeners will find the PEAK mode particularly attractive. This is enabled by the front panel switch and automatically analyses the incoming signal as passes only coherent tones. Although this does work with speech, it’s at its best with RTTY and c.w. signals. The response time was very rapid and the process was completely automatic. I tried this with great success on all utility modes except h.f. packet. Here all was OK providing the frequency was busy, if it was quiet, I found the response time of the d.s.p. adaptation was too slow and the front end of the packet was often clipped. All is not lost though as the NIR’s band pass modes were excellent under these conditions.

The last of the adaptive modes is the notch filter. As with the peak mode, the notch was completely automatic and was able to provide a 50dB notch for up to four automatically tracked tones.

This was great for getting rid of interference heterodynes and featured a 3ms response time. The final noise reduction mode was the bandpass filter which used pre-set parameters so the NIR-10 didn’t have to adapt itself to the incoming signal. To provide the necessary flexibility there were three bandwidths available; NARROW, 250Hz, MEDIUM, 600Hz and WIDE, 1800Hz all selectable using the toggle switch on the front panel.

Adjustment of the centre frequency of the filter over the 300Hz to 3kHz audio spectrum was done with the front panel located rotary NIR/BP control.

DSP Background

If you missed my coverage of the analogue to digital conversion in the NTR-1 review, here’s a quick resume. Before we can carry out any clever digital manipulations of our signal, we first need to convert it into a form that the processor can understand, i.e. numbers. The device that does this is called an analogue interface converter or AIC. This takes repeated snap shots of the incoming signal and converts the signal voltage to a number in much the same way as a digital voltmeter does.

In order to give a good representation of the signal, these snap shots, or samples as they’re really called, have to be taken at least twice as frequently as the period of the highest frequency signal to be processed. For a speech communications system this would mean taking a sample of the signal at least 6000 times every second! This series of numbers is then fed to the digital signal processor for
handling through its software program.

Once the signal has been processed, the conversion process has to be repeated in the opposite direction to reconstitute the audio signal. So you can see speed is of the essence when dealing with digital signal processing.

So what is this mysterious digital signal processor? Quite simply it's a specialised development of the type of microprocessor that forms the heart of all home computers. As the NIR-10 uses a Texas Instruments TMS320C2x series d.s.p. device, I'll use this as an example to illustrate the operating principles. All the electronics are contained within a Very Large Scale Integration (VLSI) chip with around 160,000 transistors and some 40,000 gates. The main components being a 32-bit arithmetic logic unit, hardware 16-bit multiplier, on-chip memory, memory access control and a serial port. Perhaps the main difference between a general purpose processor and a d.s.p. unit is the accent on speed and maths capabilities.

When carrying out digital processing of audio or radio signals it's necessary to perform a series of quite complex calculations on each individual data sample. When you consider that these samples arrive at a rate of several thousand per second, you begin to appreciate why speed is so important.

In order to maximise its speed of operation, the Texas TMS320C25 has a number of special features. Before I cover these, let's just quickly run through the way a modern processor operates. The microprocessor is essentially a simple electronic machine that carries out a sequence of instructions called a program. If you equate this to the addition of two numbers using a calculator, you can imagine the two numbers as being the data and the + key the instruction. The instruction just tells the calculator what to do with the numbers or data. The next development from here is the programmable calculator. This has many more instructions available, e.g. logs, reciprocals, etc., and can store sequences of calculations (programs) to save the operator time. The microprocessor in home computers works in basically the same way but can handle much bigger programs and has a wider range of instructions at its disposal. The d.s.p. processor takes this a step further with a more comprehensive and specialised set of instructions available. These instructions have been geared around the needs of d.s.p. and many of them carry out several complex tasks in a single instruction.

The other critical aspect of any processor is its clock speed. This determines how quickly it can carry out the instructions we've just discussed. In the case of the TMS320C25, the processor runs at 40MHz and is capable of executing instructions in just 100ns - that's 1 ten millionth of a second! When you add this speed to the TMS320's sophisticated instruction set you can appreciate the potential speed.

So why do we need all this high speed operation to handle some straightforward audio processing? If you imagine we are trying to design a digital filter we need to have some method of analysing the stream of numbers that are arriving at high speed from the Analogue Interface Converter. The only way to do this is to continually perform some complex mathematically calculations on each data sample and compare each result with previous results and/or a set of stored parameters. This process has to be completed for a large number of samples before an output can be generated. Even when the output is ready, it still has to be converted to a serial format and rebuilt using the Analogue Interface Converter. By using the complex instructions and fast operating speed of the TMS320 the NIR10 manages to do this whilst only incurring a 130ms delay in the progress of a signal. Incidentally if you're using the NIR-10 as part of a transceive system you can remotely disable the processor when monitoring your own signal off-air. This avoids having to listen to your own delayed voice which can be very distracting.

**Summary**

The NIR-10 is a very good example of what can be achieved with d.s.p. technology. Although the non-adaptive bandpass filters were very good it's the adaptive modes that provide readability improvements that aren't readily available by other means. The facility to adjust the degree of noise reduction is a very worthwhile addition as there's nothing quite like to human ear for deciding when things are just right! It's also worth noting that the best results are generally obtained with conservative settings of the NIR control.

**Thanks**

Many thanks to Lowe Electronics Ltd. for loan of the review unit, They can be contacted at Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (0629) 580 800. The NIR-10 costs £399 inc VAT Lowe Electronics can supply their own 12V 1A regulated supply (PSU JPS), which is specially designed to run the NTR-1 and NTR-10, for £29.95 inc VAT.

---

**Specifications**

| Audio Input | 22Ω or 47kΩ phono jack |
| Frequency Response | 300-3200Hz ±2dB |
| Input Level | 120mV to 2.8V r.m.s. |
| Absolute Output Delay | 130ms NIR & BP modes |
| NIR Mode White NoiseReduction: | 0ms Bypass mode |
| PEAK Mode White NoiseReduction: | Approx 20dB |
| NIR Mode Single tone reduction: | Typically 10 to 20dB |
| Time to Cancel a Tone: | Greater than 40dB |
| BP Bandwidth: | approx 250ms NIR |
| BP Centre Frequency: | approx 3ms NF |
| BP Bandwidth: | NARROW: 250Hz |
| | MEDIUM: 600Hz |
| | WIDE: 1800Hz |
| BP Centre Frequency: | variable 300-3200Hz |
| BP Ultimate rejection: | typically 50db (1 to 4 tones) |
| Speaker Output: | 2W into 3.2Ω speaker |
| Power: | +11 to +16V d.c. at 1 amp peak |
| Size: | 177(W) x 160(D) x 46(H)mm |
| Weight: | 0.91kg |

---

Short Wave Magazine, September 1994
There are some who really don't care about anything bar the lowest price. In eighteen years of retailing one product - Amateur Radio, the person who usually screws for the lowest price makes the biggest noise in the event of something going wrong. To those of you in this category, I'm pleased I won't have the opportunity of letting you down as a MARTIN LYNCH CUSTOMER. You probably will never be one. At MARTIN LYNCH, we like to treat customers as though you will be with us for life, not one for a "few bob" and onto the next....

In the meantime, I'll carry on giving you the BEST DEAL versus the best after sales service you will find in the world. Now that is guaranteed!

**These are yet more comments from our satisfied customers**

<table>
<thead>
<tr>
<th>Number</th>
<th>Customer Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Has he got most of the products he's quoting for on the shelf or does he have to chase around ordering it, after your credit card's been debited?</td>
</tr>
<tr>
<td>2</td>
<td>Has demonstration stock on show for you to browse at your leisure and doesn't wrap up the demonstrator when you wish to purchase, because he hasn't another in stock?</td>
</tr>
<tr>
<td>3</td>
<td>Has he got a proper workshop facility on site, sanctioned by the manufacturers?</td>
</tr>
<tr>
<td>4</td>
<td>Is he familiar with the product you're inquiring about or can he only quote you the lowest price. (Gives you real confidence if you have an operating query - or worse - it goes wrong).</td>
</tr>
<tr>
<td>5</td>
<td>When you visit the store, are you confronted with non Amateur Radio-related items - what is this retailer's speciality?</td>
</tr>
<tr>
<td>6</td>
<td>Is he limited in the choice of goods you wish to view? A store biased to one make cannot compete fairly with it's competition - you may be forced into buying the wrong product.</td>
</tr>
<tr>
<td>7</td>
<td>Does he employ a &quot;Quality Control&quot; facility, ensuring goods sent, New, Used or Repaired are tested to specification?</td>
</tr>
<tr>
<td>8</td>
<td>Does he have a &quot;family&quot; area for those waiting, who are not so nuts about the radio you want to buy?</td>
</tr>
<tr>
<td>9</td>
<td>Does he present you with staff who aren't Licensed Radio Amateurs. Would you visit your Doctor, if he wasn't qualified?</td>
</tr>
<tr>
<td>10</td>
<td>The only method of attack he has is to keep slashing the price, not realising the care and attention you will need if it goes wrong.</td>
</tr>
<tr>
<td>11</td>
<td>Can't offer you &quot;instant credit facilities&quot;, either by phone or in the store at very advantageous rates.</td>
</tr>
</tbody>
</table>

---

**Scanners**

AOR 8000UK

AOR always lead with technology in scanner design and every time details are "leaked" to the press, the phone doesn't stop ringing for months. A detailed specification sheet is now available for this truly amazing item and is available to those of you who call in or phone. Stocks will be limited but I am assured of a limited quantity from June onwards. The price? I'm told around the region of £440. A deposit of only £50 will secure your 8000UK and payments in the region of £33 a month are given as a reasonably accurate estimate. MRP £440.00

MVT 7100

The new A8000 has arrived but sales of the MVT 7100 will continue as strong as ever - especially as the price is slashed to only £389! All mode, no gaps and it's available from stock.

AR: 1500SX

I remember when you had to wait almost six months to get your hands on this one - no more, they're in stock and excellent value.

VT125

The no nonsense, simple to use Air Band handle. It only retails at £189.00 and it comes complete. Give yourself a birthday present. Order one today and I'll pay the delivery charge (U.K. only mind).

VT225

The same as its little brother, but this ones measured to enable you to listen to Military Air Traffic as well as a civil. Just a touch more green backs and I'm still throwing in FREE CARRIAGE and the very latest AIR BAND FREQUENCY GUIDE. Deposit your £229.80 with me today.

A3000UK

Still the best selling base scanner/receiver and at a price that's unbelievable. If you want ZERO FINANCE, we can arrange that too.

DRAKE SW4

Available since the London show, the new Drake SW4 is a deal based transportable scanner for the nineties. Featuring coverage from 500kHz to 30 MHz and built-in Air Band, this is a world first in communication receivers. For good measure you even get, 8W (18W broadcast band) and a built-in telecopie terminal. All for £399? Have they got the price wrong? Buy one before the price goes up!

AOR23030

As last, I've got stock. With a distinctive AOR style, the new 23030 stands out amongst the crowd. Not because of its...
NEW MyDEL ATU-2

Now styled and finished in a much better case, the ATU-2 is a more conventional approach to resonating that length of wire or centre fed dipole for an antenna system. Built in the U.K. to our own specifications, the ATU-1 is housed in a strong metal case and employs two quality tuning capacitors with a taped coil in the standard "Pi" configuration. Almost identical to a similar Japanese model costing nearly 40% more, isn't it time you bought British?

£99.95 incl. VAT and patch lead to your radio.

The new MyDEL SCAN-2513

Wide band scanner antenna

Ideal as a direct replacement to the telescopic antenna offered with the Yupiteru models, the NEW MyDEL SCAN-2513 (see diagram overleaf) antenna covers 25 - 1300MHz. It's far more convenient than the standard unit and a lot safer! Will suit any hand-held to scanner.

£19.95 incl. VAT, plus £2.00 p&p.

The "Eavesdropper"

From The U.S.A. the "EAVESDROPPER" is a fully developed multi-band receiving antenna for the dedicated listener, including 1000ft of 72 ohm transmission line *50ft of 450-pound test nylon support rope *Automatic''bucking'' by trap circuits *All connections soldered & enclosed in ultrasonically sealed, weather resistant trap covers *Heavy 14SWG hard drawn stranded wire *Zip Trapper Lightning Arrester *"Only 42" long *Full 12 month warranty & built like no other wire antenna you've ever seen!

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Universal Range of Decoders

M-400

As featured in August Shortwave Magazine, the NEW UNIVERSAL M-400 decoder is a must for those who want a serious RTTY, STOE, FEC weather/FM plus much more CODE CONVERTER at a sensible price. Available from stock.

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M-900

Similar in features to the M-400, the M-900 has a powerful FAX-to-SCREEN processor built in, enabling weather and other 'picture' transmissions to be viewed by a simple video monitor, before dumping to printer.

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M-1200

Got a PC and want a powerful decoder using your own computer as part of the system? The UNIVERSAL M-1200 is a complete CODE CONVERTER on a single card, ready to slot into an IBM compatible PC. Full colour on screen graphics are at your disposal. This one IS fully recommended - our Chief Engineer uses one!

£399.95 incl. VAT.

M-8000

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Upgrade old MKII Microreader £20.00

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Computer Terminal Program £10.00
Upgrade old MKII Microreader £20.00

Waters & Stanton
Short Wave Magazine, September 1994
Review

AOR AR3030

Mike Richards takes a look at a production version of this new receiver.

Following my review of the prototype receiver back in the January issue, I have now had the opportunity for a more detailed study of a standard production unit. The review model was completely standard except for the inclusion of the optional 500Hz Collins c.w. filter and an external power lead.

Delivery of the new AR3030 is supported by a brand new production line that's been set-up at the Japanese HQ. The original review was based on an early pre-production unit that was demonstrated at the Leicester show and I was pleased to see that all the minor shortcomings of the prototype had been corrected and the AR3030 looks and feels like the top quality receiver it is.

Operation

I'll summarise some of the key operational features here but for more details, see the full review back in the January issue. AOR have put a lot of effort into the ergonomics of the AR3030 and I found the receiver very easy to use. The front panel layout was simple and logical with good sign writing to show the various functions. Selecting frequencies within the comprehensive 30kHz to 30MHz range could be done in a variety of ways by utilising the two internal v.f.o.s. The most obvious being to use the main tuning knob on the front panel. As with all synthesised receivers the tuned frequency changed in discrete steps rather than continuously. The size of these steps could be changed from 5Hz through 100Hz, 1kHz to 1MHz by a single press of the kHz or MHz keys. This proved to be a very quick and effective system.

For larger frequency changes the numeric keypad has a clear speed advantage. Using this system, frequencies can be entered in kHz or MHz simply by pressing the appropriate key after entering the frequency digits. The AR3030 even included a backspace key so that you can correct wrong entries as you go.

To complete the frequency selection options, the AR3030 included 100 user-programmable memories that held all the important operational parameters. Closely allied to the memories was a comprehensive set of scanning options that included all the standard options such as band scanning plus memory lock-out.

One very welcome feature of the AR3030 was the standard provision of a full set of receive modes. In addition to the usual s.s.b., c.w. and a.m., there was synchronous a.m. along with n.b.f.m. and a special FAX mode for utility enthusiasts.

Clear Manual

The new operating manual for the AR3030 was very up to the standard you would expect from AOR and was presented as a glossy, A5, 54-page booklet. In addition to giving clear and comprehensive operational details the manual included welcome chapters on antenna systems and propagation. To help you find answers quickly, the main core of the manual was arranged with a well indexed section covering every control and connector. This was supplemented with a methodical description of how to use all operating modes.

For those with an interest in computer control of the AR3030 there was a full description of all the commands and how to implement them. This was a pleasant change as with some systems you have to buy a special interface and software before you can operate computer control. If the idea of computer control appeals to you then you will be pleased to know that there's a new Windows-based control program for the AR3030 about to be released by AOR.

Under the Bonnet

Access to the internals was very easy having first removed the close-fitting top and bottom U covers. The standard of both mechanical and electrical construction was very high and AOR have achieved excellent access for servicing and the fitting of accessories. The internal layout was very clean with the r.f. and oscillator sections mounted in the top section, control electronics on the front panel and the main i.f. and audio units underneath.

The frequency stability was excellent and well up to the standards required for the most demanding applications such as unattended FAX reception. One of the secrets of this high stability is the standard...
fitting of a Toyocom temperature controlled reference oscillator.

Although not standard practice, the review model was supplied with a complete set of test results. These showed that the AR3030 is able to complete with the best receivers currently on the market. Whilst its always difficult to accurately compare figures from different manufacturers, the AR3030’s results were extremely good. The O. sensitivity ranged from -117 to 119dBm for 10dB SINAD and showed very good consistency across the operating spectrum. The AR3030 should also fare well in the presence of strong signals thanks to the good 3rd order intercept figure (50/25kHz) which ranged from +15dBm at 1.8MHz to +18dBm at 28MHz. This compares very favourably with the best receivers currently available.

On-Air

The AR3030 is very much a receiver crying out to be used. The layout is very well thought-out and enables the operator to use all the facilities with minimal reference to the operating manual. The receiver was also very well dimensioned and didn’t take up too much valuable bench space.

During the review I used the AR3030 to receive a very wide range of signals from local broadcast stations to unattended FAX reception. All the utility modes were received with no problems and I was pleased to see the provision of a dedicated line out jack for utility use that provided a nominal 0dBm (775mV), 600Ω output signal. Incidentally, the FAX mode was basically u.s.b. but with some audio tailoring and the carrier injection frequency off-set to suit the AOR WX2000 weather FAX decoder.

I was particularly pleased with the excellent frequency stability that paid dividends by enabling the s.s.b. modes to be used to receive a.m. broadcast signals. The advantage of this system is a reduction in the effects of selective fading plus the opportunity to reduce adjacent channel interference. All you do is tune in the wanted signal using standard a.m. mode then switch between u.s.b. and l.s.b. to find the best result.

The use of a Collins mechanical filter for the a.m. produces excellent selectivity, but can result in some loss of treble. AOR suggest that you tackle this by off-tuning the receiver by 1kHz.

The only anomaly with the audio performance was the speaker mounting that had been changed from the original ducted front facing design of the prototype to a larger 93mm unit mounted face down on the base plate of the cabinet. Although this worked OK, there was a distinct lack of bass due to cancellation between the front and base plate ports. The resultant bright sound remained fine for communications use but I would strongly recommend the use of an external speaker or headphones for broadcast listening.

Summary

The production version of the AR-3030 has certainly been worth the wait and AOR have maintained their reputation as manufacturers of fine receivers. Its strong points are ease of use combined with compact size. I’m sure the AR3030 will prove to be extremely popular amongst a wide range of short wave listeners. The AR3030 costs £699.00 (inc VAT)

For more information on the AR3030 and the range of accessories contact AOR (UK) Ltd., Adam Bede Tech Centre, Derby Road, Wirksworth, Derbyshire DE4 4BG. Tel (0629) 825926.

Review

specification

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>30kHz to 30MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuning Indication</td>
<td>MHz, kHz, 100Hz, 10Hz (5Hz tuning steps)</td>
</tr>
<tr>
<td>Receiving Modes</td>
<td>a.m., s-a.m., u.s.b., l.s.b., c.w., FAX &amp; f.m.</td>
</tr>
<tr>
<td>Frequency Stability</td>
<td>5p.p.m. -10 to +50°C</td>
</tr>
<tr>
<td>Memory Channels</td>
<td>100</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>s.s.b., FAX, c.w. (10dB s+n:n)</td>
</tr>
<tr>
<td></td>
<td>3pV 30-50kHz</td>
</tr>
<tr>
<td></td>
<td>1μV 30-50kHz</td>
</tr>
<tr>
<td></td>
<td>5μV 540-1800kHz</td>
</tr>
<tr>
<td></td>
<td>0.5μV 1.8-30MHz</td>
</tr>
<tr>
<td></td>
<td>a.m. (10dB s+n:n)</td>
</tr>
<tr>
<td></td>
<td>1.5μV 1.8-30kHz</td>
</tr>
<tr>
<td></td>
<td>0.5μV 1.8-30MHz</td>
</tr>
<tr>
<td></td>
<td>1μV 30-50kHz</td>
</tr>
<tr>
<td></td>
<td>5μV 540-1800kHz</td>
</tr>
<tr>
<td></td>
<td>1μV 1.8-30MHz (narrow)</td>
</tr>
<tr>
<td></td>
<td>f.m. (12dB SINAD)</td>
</tr>
<tr>
<td></td>
<td>0.5μV 1.8-30MHz</td>
</tr>
<tr>
<td></td>
<td>s.s.b./FAX 2.4kHz -6dB</td>
</tr>
<tr>
<td>Selectivity</td>
<td>a.m. 6.0kHz -3dB</td>
</tr>
<tr>
<td></td>
<td>a.m. narrow 2.4kHz -6dB</td>
</tr>
<tr>
<td></td>
<td>c.w. 500Hz -3dB (optional filter)</td>
</tr>
<tr>
<td></td>
<td>f.m. 15kHz -6dB</td>
</tr>
<tr>
<td>Image/spurious rejection</td>
<td>70dB</td>
</tr>
<tr>
<td>Dynamic range</td>
<td>100dB @25kHz spacing with 500Hz filter</td>
</tr>
<tr>
<td>Audio Output</td>
<td>1.8W into 8Ω at 10% t.h.d.</td>
</tr>
<tr>
<td>Power</td>
<td>Internal 8 x AA cells</td>
</tr>
<tr>
<td></td>
<td>External 12V d.c. @ 0.8A</td>
</tr>
<tr>
<td>Size</td>
<td>250 (W) x 88 (H) x 240 (D)mm</td>
</tr>
<tr>
<td>Weight</td>
<td>2.2kg without batteries.</td>
</tr>
</tbody>
</table>
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**SHORT WAVE MAGAZINE, SEPTEMBER 1994**

---
Lake Electronics are a long established and respected manufacturer of kits for the radio enthusiast. Their philosophy has always been to provide the constructor with as complete a kit as possible, together with a set of comprehensive instructions to enable it to be put together successfully first time.

The Carlton is a direct conversion receiver covering 3.5 - 3.8MHz, 7.0 - 7.1MHz and 14.00 - 14.35MHz. A direct conversion receiver takes the incoming radio signal, mixes it with a signal from a variable frequency oscillator so that the resultant output from the mixing circuit, or product detector, is at audio frequency. Tuning is achieved by varying the frequency of the v.f.o. The pre-selector circuit between the antenna and product detector input also needs to be adjusted to suit the frequency of the signals being received.

A sharply tuned low pass filter immediately before the audio amplifier gives a good response for both s.s.b. and c.w. reception. The audio amplifier is the ubiquitous LM386 i.c. giving up to 500mW into an 8Ω load - a loudspeaker or low impedance headphones.

Instructions

The instructions provided are both clear and comprehensive. They are divided into logical stages, starting with a general set of notes on kit construction. The next 'chapter' deals with the Carlton itself and how it works. This is followed by detailed instructions for each section of the receiver, including a circuit diagram with test voltages shown - very useful for checking out the finished p.c.b.

Setting up and testing is also comprehensively covered, so that there should be no difficulty in getting the receiver working properly. However, if the unthinkable does happen and you cannot get it to work, Lake Electronics operate an alignment, repair or investigation service - for a minimum charge of £15.00. If the fault turns out to be not of your making you get your £15.00 refunded. If, however, you messed it up then you get 45 minutes of bench time for your £15.00 with any extra time at £10 for every extra half hour. Lake promise to tell you how much extra time you could be in for.

Finally, there are some hints on how to operate the Carlton. Taken all round the instructions are both understandable and complete - essential for any kit.

Abbreviations

- a.f. audio frequency
- c.w. continuous wave (Morse)
- d.c. direct current
- dB decibels
- i.c. integrated circuit
- kg kilograms
- kHz kilohertz
- l.s.b. lower sideband
- mA milliamperes
- MHz megahertz
- mm millimetres
- mW milliwatts
- p.c.b. printed circuit board
- r.f. radio frequency
- u.s.b. upper sideband
- v.f.o. variable frequency oscillator
- Ω ohms
MultiScan comes to Britain

AMDAT are pleased to announce that we are now able to supply this superb data interface which has been taking Europe by storm. The basic unit will receive FAX, SSTV in all the latest colour modes, RTTY and TOR-FEC/NAVTEX. With the addition of the TX board full colour FAX and SSTV can be transmitted.

MultiScan prices
All units include the cost of the MultiScan software
RX + TX Built, tested and aligned .............. £249.00
RX only Built, tested and aligned ............ £159.00
TX/RX PCBs + kit of parts ................. £149.00
RX PCB only (includes software) ............ £49.00

Prices include VAT @ 17.5%

The MultiScan interface, which is powered from 12V, is connected between the radio and the serial port of the PC. In all modes the MultiScan software gives a real time audio spectrum display which makes tuning into signals easy. In Fax mode the full screen is used to display the incoming picture. If you want a permanent record it can be saved to disk as a GIF file. In SSTV mode two windows are used on the screen which can be configured for receive or transmit. The multitasking software allows GIF pictures to be loaded into the window and overlaid with text ready from sending while a picture is being received off air.

The superb performance of this unit and the features it provides make it standout from the existing products which are currently available.

AMDAT
4 Northville Road, Northville,
Bristol BS7 0RG
Tel: 0272 699352 Fax: 0272 236088

C.M.HOWES
COMMUNICATIONS

RECEIVER KITS

<table>
<thead>
<tr>
<th>Kit Code</th>
<th>Description</th>
<th>Kit Price</th>
<th>Assembled Price</th>
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<tbody>
<tr>
<td>MW1</td>
<td>Medium Wave &amp; 160M receiver. Excellent beginners project. Complete kit contains everything except battery and solder. Great value!</td>
<td>£29.90</td>
<td>£49.00</td>
</tr>
<tr>
<td>TRF3</td>
<td>Shortwave Broadcast TRF receiver for AM/SSB/CW, 5.7 to 17MHz. Kit plus HA33R Hardware Pack (case, dial, knobs etc.):</td>
<td>£41.40</td>
<td>£57.70</td>
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<tr>
<td>DcRx</td>
<td>Single Band SSB/CW for 80, 40 or 20M amateur bands or 5.45MHz HF Air. Kit plus HAY80R Hardware Pack and DCS2 &quot;S Meter&quot;:</td>
<td>£44.40</td>
<td>£64.50</td>
</tr>
<tr>
<td>DXR10</td>
<td>Three band 10,12 &amp; 15M SSB/CW amateur radio receiver kit with HA1OR Hardware Pack and DCS2 &quot;S Meter&quot; kit:</td>
<td>£57.90</td>
<td>£84.50</td>
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The famous HOWES Active Antennas

AA2 150kHz to 30MHz ACTIVE ANTENNA
The neat compact answer for those with limited space, holiday use, mobile operation etc. Two selectable gain settings, local or coax powering (12 to 14V). Good strong signal performance, 3dB +38dBm. Easy to build, and much liked by customers!

AA2 Kit: £8.90
Assembled PCB Module: £13.90

AA4 ACTIVE ANTENNA FOR SCANNERS
Covers 25 to 1300MHz. Broad band performance in a neat, compact package. Just over 16 inches long. Excellent performance in a small space!

AA4 Kit: £19.90
Assembled PCB Modules: £27.90

AB118 AIR-BAND ACTIVE ANTENNA
Optimised for long distance reception on 118 to 137MHz air-band. Tuned antenna with pre-amp & band-pass filter. Hear ground stations you've never heard before!

AB118 Kit: £18.80
Assembled PCB modules: £25.90

NEW! Antenna Tuning Unit.
The new HOWES CTUB SWL ATU covers medium and shortwave bands (500kHz to 30MHz). Increases wanted signals by providing impedance matching, and at the same time reduces spurious signals and interference with "front end" selectivity for the receiver. Kit contains case and all parts. The top value general coverage receiving ATU.

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PLEASE ADD £1.50 P&P for active antenna kits or £4.00 P&P for the other items in this advert (which contain cases and other hardware).

AMDAT KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets. Delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.
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- Kit complete with ALL components and hardware including pre-punched case and panels.

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The reception of weatherfax radiostations and meteorological satellites has become a mere child's play. Inexpensive FAX hard- and software connects a radio receiver directly to a laser or ink jet printer. Advanced digital technology puts real-time satellite images on your PC video monitor, with fascinating colour and zoom features. This manual is the basic reference book for everybody interested in FAX via radio.

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Short Wave Magazine, September 1994
The receiver is built on three p.c.b.s. Each board contains a logical building block which, when connected to the other boards, makes up the complete receiver.

Both the v.f.o. and product detector use toroidal cores and the instructions for winding these are both clear and concise. However, care is still needed to ensure that the windings are put onto the cores in the correct sense.

The p.c.b.s are of good quality epoxy glass material and are a sensible size. This means that the components are not tightly packed or the pads so small that soldering becomes a nightmare. Sockets are provided for the two i.c.s on the audio and product detector boards. The components for each board are packaged separately to avoid confusion. The instructions contain a complete component list for each board so that each component can be ticked off as it is soldered in place.

The Case

With the printed circuit boards completed and tested the next stage is the case. The case is a two-piece aluminium affair with the main part being folded up to provide the front and rear panels. To overcome the usual difficulties of annotating the controls, a self-adhesive, plastics overlay is used to cover the front panel with a smaller one for the rear. Full-size drawings are provided for both panels, together with detailed instructions on how to drill the necessary holes for the controls.

I must admit that, although possessing a workshop that is fully equipped for such operations, I have always found working on these large, one-piece 'chassis' has always been a bit of a bind. The soft aluminium from which they are made does not lend itself to being drilled without snatching and the awkwardness of the shape means that it is difficult to get the panels over the drill table without a lot of juggling with blocks of wood and clamps. A lot of potential builders of this kit would not have access to the metalworking equipment and for them the only way out is the trusty Black & Decker and a round file to open up the holes to size.

The self-adhesive, plastics overlays work well and will cover up a small amount of amateur 'panel bashing'. Be warned, however, that once in place they cannot be removed without destroying them - so you have to be confident that you have got it right first time and that that time is the right time in the construction sequence!

Once the front panel has been successfully drilled the p.c.b.s can be fitted using the pillars provided. This is simple as the boards themselves can be used as templates to mark out the holes in the bottom of the case.

Wiring

A clear wiring diagram of the receiver is provided so that it is easy to see where the various interconnecting wires and coaxial cables go. Miniature coaxial cable, rather than audio-style screened lead is used for carrying both r.f. and audio signals. Connections to the p.c.b.s are made to pins and by following the wiring diagram this part of the construction is simple. A power-line filter, using a bifilar wound torroidal inductor is fitted into the d.c. power line close to the terminal block on the rear panel. This is to reduce any interference being injected into the receiver through the power supply.

Alignment

Aligning a direct conversion receiver such as the Carlton, can be a trifle awkward. Again, the instructions are straightforward and the only test gear needed is a multimeter and a 'calibrated' receiver. Of course, a suitable 12V d.c. power supply is also needed.

With the cover removed and no antenna connected, the v.f.o. radiates enough signal to be picked up by another s.w. receiver placed alongside. The trimmer capacitors are adjusted using a non-metallic trimming tool. A suitable trimming tool can be made from an old plastics knitting needle with one end sharpened to a screwdriver blade shape. It needs to be long enough to enable the trimmers to be adjusted with your fingers outside the case.

Performance

This type or receiver needs a good antenna and earth system to give results. The instructions give some hints and tips on how to use the Carlton.

Although I have aligned the set I have not had enough use with it to give a performance report - this will have to wait until a future issue.

The Carlton costs £69.50 and is available direct from Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel: (0602) 382509. My thanks to Lake Electronics for supplying the review kit.

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Australiana

I worked away from home under contract in our Federal Parliament in Canberra during June, July and August. That cut into my dial wandering but kept me near the broadcast and telecommunications decision makers. It was a fascinating time and one that I miss now it is over. Closer to home, our local bushfire brigade has been in the throes of making decisions about discharging and recharging policies for hand-held transceiver nickel cadmium batteries. As with all a brand new brigade it seems to be as many opinions as decision makers. Anyway, time for this quarter's news.

Radio Australia

Radio Australia has commissioned two new high powered transmitters on the National Transmission Agency's (NTA) Cox Peninsula broadcasting complex outside Darwin. The two 250kW transmitters were custom-built in Europe to NTA specifications and they give the Cox Peninsula facility a total of five transmitters with three able to operate at one time.

The upgrade at Cox included a complete refit of the station control room and installation of a new main station computer control system. Capacity of the antenna matrix switch system that controls signals from the transmitters to the broadcasting antennas was increased by 60%. The transmitters and other equipment cost a total of $40.5 million (approximately $45.5 million) and expenditure at the Cox Peninsula and in the Darwin area has totalled about $14 million ($16.5 million) in recent times.

In an associated project the NTA has provided five new broadcasting antenna arrays for Radio Australia at the Shepparton station in Victoria.

Mobile Towers

Mobile telephone transmissions lie a little outside the range of transmissions most SWM readers will be able to hear; they are probably outside the range that most will want to hear. However, the mobile telephone carriers and their subscribers are using the radio frequency spectrum and that makes their news of interest.

The mobile telephone war has been here with the three carriers energetically vying for subscribers with the new UK entrant Vodafone pushing the future with all digital networks.

The carriers have operated on a draft telecommunications code since late 1991. Under this code, numerous residents of urban areas and many local councils were dismayed to see a proliferation of mobile telephone towers placed on high points throughout city suburbs. Residents and councils were largely powerless to affect siting or to have environmental concerns heard.

A new Telecommunications National Code has now come into effect. It requires that carriers consult more on the location of these towers with local councils, planning and land use departments and the Australian Heritage Commission. According to the Minister for Communications and the Arts, Michael Lee, the carriers will now be subject to more stringent environmental requirements. He says that, “towers and antennas must now be co-located where this action is technically feasible, compatible with network configuration and capable of microwave broadcast efficiencies to the environment”. Although that sounds like a lot of escape clauses for the three carriers, the code does also allow the federal Department of Environment, Sport and Territories to preside relativity merits of a siting proposal.

Budget News

In the federal budget this year the government has provided $A515.1 million ($240 million) for the Australian Broadcasting Corporation (ABC) and $A75.7 million ($35 million) for the ethnic language broadcaster Special Broadcasting Service (SBS) in the financial year 1994-95. Minister Lee has promised more than $A11.2 million ($650 million) to ABC over the next three years and $A220 million ($110 million) to SBS. Lee says that this demonstrates the government's commitment to the future of national broadcasting.

No doubt friends of SBS and the ABC here are pleased with this news that the NBC in Port Moresby is no plans to extend the service. Comments are saying that Australia now has a stranglehold over Australia's pay television market at least in the short term; in the long term they see a British-style pay television battle of different and incompatible technologies. Lining up in Sydney for example will be Australia's 18 MDS channels, PMT with 64 cable channels and Optus with 30 cable channels. I think I will just wait and see how it all shakes out before reaching for the cheque book to sign up for any of the competing systems.

Microwave licences in 119 regional centres will be auctioned after the first round is complete.

Siphoning

A major concern of Australia's television viewers has been the problem of programmes that are currently shown on free to air television being "siphoned" off to pay television when that is in place. In an attempt to allay some of that concern the federal government has announced a list of programmes that will be preserved on free to air television. The list proves perhaps Australia's enthusiasm for sports, all programmes on the list are major sporting events and they remain on the anti-siphoning list until the year 2000.

This is fine for sports lovers of course but I await pay television with a mixture of interest and dread. Sports may remain on free to air television but what of the many excellent British television dramas now broadcast at no charge? Maybe I'll be forced to reach for the cheque book after all.

BBC World Service

The BBC World Service is now being beamed into the Pacific and Asia courtesy of the Royal Australia transmitters at Shepparton in Victoria. Frequency is 11.695MHz; times are 2200 - 2300UTC and transmitter power is 100kW. The transmission uses an antenna array with a bearing of 356° and a beam width of 36°. It is designed to overshoot the Australian mainland and to fill a need in the region to this country's north. Local reception of the same program is available through medium wave and f.m. stations including Radio for the Print Handicapped stations.

I have yet to confirm that the BBC is providing transmitter time to the ABC in exchange for use of the Shepparton facilities.

Other News

From Australia's Amateur Radio Action (ARA) magazine comes the news that pirate New Zealand radio Radio Kwi can be heard on 7.445MHz u.s.b. between 0600 and 1100UTC. Best of luck with that one! Also from ARA the New Guinea news that the NRC in Port Moresby is alternating between 9.675 and 4.890MHz for the relay of its Kari service in English. Times are 1900 - 2200 and 0800 - 1200UTC for 9.675MHz; other times are on 5.675MHz. The transmitter puts out 100kW.

With the inauguration of two new transmitters in Darwin the SBS now reaches all capital cities in Australia. SBS would have been broadcast earlier in Darwin, but the original transmitter was wrecked in a storm at sea while being shipped from Japan. The ABC has begun to use what was downtime on its Parliamentary Broadcasting Network for a 24 hour parliamentary and news service now known somewhat unimaginatively as the Parliamentary and News Network. It is heard in the capitals Sydney, Melbourne, Brisbane, Adelaide, Perth, Hobart and Canberra and in the New South Wales city of Newcastle. There are no plans to extend the service.

I welcome any news and comments. In particular I am interested in any s.w.l. information on Australian stations heard by SWM readers so I can chase down details and interesting snippets from this end. My address is PO Box 208, Bradwood, N.S.W. 2622, Australia. For personal replies please send 2 IRCs.
Listening to the Amateurs

The quite spectacular collapse in the solar flux in the past several months seems, as I write, to be lastly standing up. However, we have some way yet to reach the bottom—maybe, 1996? Meanwhile, we must make the best of things.

Letters

Quite a pile to get my return.

Tony Capon lives in Lindfield and says he found Top Band a silent part of receiving.

Whoever wrote that down either didn’t know what he was talking about! Any receiver is made to tune into the incoming energy and overload its circuits. It is quite a different parameter. To make the mixer a bipolar transistor is poor practice, to use an FET is even worse. Didn’t know what he was saying either. I thought of checking M.60 on 40MHz.

Frank reports a 2mFm station in DL7UZ in Germany while on 7MHz CE3VAD, ZP5GMR, PS8JA and VP2YE were noted. 14MHz provided the best entertainment with such DX as G4AIK, MAJEK, 3DI, VE71W (Vancouver Island), 3VQA on Peter 1 Island, 3U2VQA, 3V1S and (Namibia), 3YQG, 3H0G4AW, VE5HM, 3GDXA, 3GQF and VE5YJ. GB2RAF, GB4HP and GX2IC/P. At 7MHz we see 3Z2SO, GM52MD, AA1AS (c.w.), PY7HM, JW4C for Bear Island, VE71Z, ZU1JR, LU4FM, RUSKH, 3ZBEC, UX2OR, ZU4KF, W4BK and W5FB, both on the key, AZ3A0N and I4ICF.

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Next we come to Geoff Crowley. He is up in Aberdeen. Geoff is now GM7SJC as well as TF3XXT and on the low bands listens with a Yaesu FRG-100 and a half-sized G5RV. Geoff has also now joined the local club. The logs include: on Top Band, G6PZ, GW4QIP, G4JU, G4OHG and G4V01H1 and for 3.5MHz we see Europeans plus 4U1TU, 9H1EL, D44BS, EA9PB, ZP9, VK7AZ and ZP9. 7MHz managed 3G1MR under a ‘large economy’ pile-up, plus Europeans, while on 14MHz I note UT7FP, 9K2NU, CP8PL, PT2AZ, 3PPRM, 4X1NMO, T9EA, 3K2YZA, 3Z3DRS, W4OSH/M, 3CS9H, ZB2JO, PY2LQ, L22KL running all homebrew, PY2LQ using 1200W from 18m above the 30th floor, W2ZOOM, PY1LI and 9Y4NZ. The yield from 18MHz was RK6AX, A22CT, JW4C, 4STEA, 4STAVR, 4G1MR, PY5SC, 3G1UW and J1LWBO. Turning to 21MHz I find 4DXL and on 24MHz Geoff caught most of the Europeans, and just as he’d expected it on 28MHz.

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Aerial Techniques

RR-50 Manually Tuned Satellite Receiver

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reflected by an auroral display, various regions of the ionosphere, decaying meteor trails and a disturbed troposphere.

Solar
Each month I hope to report about the activity of our own special star, the sun, from a variety of dedicated observers. Looking back to the solar eclipse on May 10, John Locker (Newton), whose main interest is based around multi-satellite TV, told me, "I saw the whole thing from three different view points, via satellite TV. Firstly, a Reuters feed via Intelsat 1C at 21° West, this was a re-fed from NASA. Then I got a glimpse of the start, here in Wirral and finally a one hour feed from a German TV crew who left the camera running for the whole event. Thanks for that John, it certainly shows how valuable the satellite TV service is to the whole world. I don't think any of us who heard the 'bleeps' of Spunik 1, around 20MHz, back in October 1957, fully realised how space communications would develop and become a service to all mankind.

At his observatory in Bristol, Ted Waring, using a projection system, counted 12 sunspots on June 10 and 8 on the 15th. He also saw two active areas crossing the central meridian on the 13th. Although Patrick Moore (Selley) found his solar projection screen blank on June 18, 19, 22, 24, 25, 27 & 28, he saw an interesting grouping of sunspots at 1310 on the 30th which developed further by 0630 on July 1. Fig. 2.

In June, Ron Livesey (Edinburgh), using a 2.5in refractor telescope and a 4.0in projection screen, located one active area on the sun's disc on days 7, 8, 28 & 30 and two, from the 9th to 13th inclusive.

Auroral and Magnetic
The magnetometers used by John Fletcher (Tuffley), Tony Hopwood (Upton-On-Severn), Karl Lewis (Saltash), Ron Livesey, David Pettitt (Carlisle) and Tom Rackham (Goostrey) between them recorded some disturbance to the earth's magnetic field on June 1-7, 10, 12, 13, 19, 20, 22, 23, 25, 26 & 28-30. In addition to gathering magnetic data from the people listed above, Ron Livesey is also the auroral co-ordinator for the British Astronomical Association. One of Ron's observers Jay Brausch (Glen Ullin, North Dakota) reported seeing auroral 'glow' during the overnight period on June 4/5, 6/7, 25/26 and 29/30, 'aurora arc' on 11/12, 'rays' on 5/6, 17/18, 26/27 and 28/29 and 'pulsating activity' on 3/4 and 10/11.

Sporadic-E
Sporadic disturbances in the E region of the earth's ionosphere were frequent in June. In Basingstoke, John Woodcock noted openings in Band I (46-58MHz), for varying periods on days 12, 14, 15, 17, 20, 22, 25 & 26. At times he watched programmes from Italy (RAI), Spain (TVE) and Yugoslavia (JRT). Signals were so strong around 1800 due to a thunderstorm accompanied by some spectacular fork lightning. The best of the weather up here was enjoyed in the first part of the month, wrote Arthur Grainger at the end of June. The barometer went up and down like a see-saw, he added and kindly sent a graph of his atmospheric pressure readings for the period May 27 to June 25. If you now compare Arthur's chart, Fig. 4, with the one recorded on my barograph, Fig. 5, beginning one day earlier, we can see the difference in pressure, at a given time, between Scotland and the South of England.

In June, I recorded 1.18in of rain during the overnight period May 31, June 1, 2, 15, 30 & July 2. Spread through those days he logged programmes and items from Czechoslovakia (NOVA), France, Germany (ARD1), Italy (RAI UNO), Poland (TVP1), Portugal (RTP1 with 'C1' on screen), Russia (1st Network, football and a big '1' on screen), Spain (TVE1, Switzerland (DRS) and some unidentified programmes from Scandinavia. He also saw the caption 'WERBUNG' that he thinks came from Austria (ORF1) on CA, E2A (48.75MHz).

As the 25th, John Scott (Glasgow) noted that the 26 and 50MHz amateur bands were open during the late afternoon.

Weather
On June 25 and 26, Richard Bell (Merton Mowbray) received programmes, including on the church service, fashion show, news (Telediair) and weather, from Spain's TVE1. During the afternoon of the 26th he added Italy (RAI UNO) and, in the evening, he saw, what looked like a documentary, with a large '1', in a square, Fig. 3, in the bottom right hand corner of the picture. Richard saw World Cup football from an unidentified source, with the letters 'PTJ' in the top left hand corner on June 25 and on July 2 he received a film with possibly 'TBK' in the bottom right plus a film from another station with the figure '1' in the top right hand corner.

North of the border, David Glenday, using a loft dipole, received pictures in Band I (46-58MHz), for varying periods on days 12, 14, 15, 17, 20, 22, 25 & 26. At times he watched programmes from Italy (RAI), Russia, Spain (TVE) and Yugoslavia (JRT). Signals were so strong around 1800 on the 22nd that he could get a DX picture with just a metre of coaxial feeder in the antenna socket. John also noted that when the Barcelona beacon (EA3/UA) on 28,250MHz could be heard TV pictures from that area were received in Band I.

During an opening on the 20th, Arthur Grainger (Carstairs Junction) identified the following stations, in Band I, by their RDS and radiotext, from France, Info (104.7MHz), Culture (98.8MHz), Musique (89.2MHz) and RFM (104.1MHz) and from Italy, RAI MF2 (93.7MHz), RAI DE2 (110.3MHz), Radio Radicale (86.6MHz), Radio Dimensione Suono (103 and 105MHz) and RAI on 103-4MHz.

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

Short Wave Magazine, September 1994
storm began there was a sudden
gust of strong wind and then the
temperature started to decline. An
early warning of this came at midday
on the 23rd when a bright solar halo
was visible in our atmosphere.

Tropospheric Openings
Pictures on Ch. E6 in Band III and
strong co-channel interference on
stations in the u.h.f. band were
observed as the high atmospheric
pressure was falling during the
evening of June 27 and the early
hours of the 29th.

Tim Bucknall (Congleton) had a
good cross country haul on the u.h.f.
bands in June. He logged Anglia and
Central South TV via the Sandy Heath
and Ridge Hill transmitters
respectively on the 7th, BBC1 from
Belmont on the 10th, RTE2 on the 11th
and Border TV on the 12th. He added
signals from Sandy Heath on the 15th,
Portop Pike (16th), Divis (17th),
Crystal Palace (18th), Emley Moor,
Oxford and The Weirkin (19th),
Hannington (20th), Mendip and
Waltham (21st) and Belmont,
Middlesfield and Coldbeck on the
27th.

On the 12th, David Glenday
received good pictures in Band III
from RTE.

Band II and high quality sound is
Arthur Grainger’s specific interests. He
replaced his existing gear with a
Pioneer F-502RDS tuner that can
receive radiotext in lines of up to 64
characters. This provides programme
details including the names of the
presenters. In addition to good
sensitivity the new set-up has narrow
line’ interference on both Figs. 6 and

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

The weather had been hot still and
‘muggy’ all day until the late
afternoon when black clouds
approached us from the west. As the
storm began there was a sudden
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England.
For those satellite zappers that are also into radio, you would have had a ball these past few weeks with the World Cup games across the USA being back-linked into Europe. Apart from football feeds on Intelsat’s 601 at 27°W uplinked from the ‘States in C Band (4GHz) and cross strapped into a Ku band downlink for Europe, there have been the pan-European distribution feeds via the EBU leased circuits on Eutelsat II F4 7°E and yet more football relays on the dedicated OTH-cable programme downlinks from the broadcast centre.

With football feeds uplinking from all over the ‘States so there have been numerous localised telepods with their own unique identifiers which have added spice to an otherwise boring period of football - that is if you dislike football! ‘Dallas Fort Worth Telescope’ has quite a dramatic ring, certainly more than the London Teleport on the Isle of Dogs.

An alternative to the noble art is golf and Intelsat K at 21°W seems to have remained aloof from football and concentrated on various golf tournaments. Late June into July saw the Ford Senior Players Championships from Oesbourne, Michigan and the PGA Tour Motorola Western Open tournaments - the Eastbound circuit using NTSC 525 lines system M standards with both paid and free feeds.

Politics during this balmy Summer continued as ever with the Italian G7 Summit in Naples and the controversial European Commission talk in Corfu.

‘Cable Plus’, the Czech cable feed has experienced an active life this past few weeks. Normally resident on the 11°W Gorizont at 11.525GHz the programming ceased only to reappear amongst the EBU leases on Eut. II F4 at 7°E, largely in the clear. At the time of writing it has moved to Moscow Bureau circuit normally on the 14°W Gorizont (though in recent times lacking) transferred to the now vacated 11°W bird. Obviously negotiations for a cheaper downlink succeeded and Cable Plus departed 7°E and popped up on the 40°E Gorizont. This status quo didn’t last too long! A new Gorizont craft (it’s suspected) became operational at 14°W, the predecessor at 14°W thought to have subcumbed to the dreaded inclined orbit syndrome. Reuters moved back home to 14°W and Cable Plus deserted 40°E for life back on the range at 11°W.

This new 702 which launched earlier mid June and destined to replace 512 at 1°W has been seen testing at 37°W with carriers and telemetry though as of mid July no pictures. The new 702 bird carries 20 C Band and 10 Ku band transponders.

Aidan Murphy (Co. Meath, Eire) logged an Intelsat K (21°W) news feed of a simulated aircraft hi-jacking with the Soviet Special Forces carrying out the rescue - these boys know their stuff and I take pity on any terrorist organisation who feel like hijacking a Russian plane comments Aidan! Aidan has been watching the nighttime BR BSF-3 space footage on Astra, these are NASA and Russian videos showing space launches, shuttles etc. and run from approx. midnight through to the early hours on Astra.

‘La Chaine Info’, the rolling news service of the TF1, France is now on air, check out Telecom 2B at 5°W - 12.585GHz horizontal and audio 6.0MHz - not as earlier suggested a shopping channel! The channel hit June 24 last in clear SECAM.

One of my contacts in Bahrain advises that Saudi Arabia has now banned the use of home dish systems enforced with the threat of a heavy fine and/or imprisonment for non compliance. Since the satellite company Orbit (that now transmits across the Middle East) is partly backed with Saudi cash, the ban is an odd decision. Decoders for the digitally compressed service are rumoured to be costing $10,000 each + subscriptions after the first year, take up for Orbit in Saudi at least could be very limited. I have heard the rumour that Iran has banned home satellite dishes though it’s yet to be confirmed.

And from Bandula

Gunasekera (Colombo) is the report of great success with a simple u.h.f. TV satellite circuit that is being made by fellow enthusiasts in both South India and Sri Lanka. There are currently two satellite TV Gazas receivable from Eivan/Gorizont satellites at 99°E in Group B on relatively simple equipment, I hope next month to feature the circuit to inspire other Middle and Far Eastern readers to ‘have a go’.

July 1 saw ‘Yasser Arafat the Palestinian leader return to Gaza City after 27 years of exile. Scenes of rejoicing as Arafat entered the town, the events being covered by the TV media circus. Eutelsat II F4 and 3 were widely used for SNIG circuits in both PAL and NTSC. Unfortunately the rejoicing of early July changed to violence and riots mid month - once again the SNIG trucks fired up from Gaza.

Baby Abbie hit the headlines following her kidnapping and return 10 days later, numerous feeds both 1 and 2 ways were carried from Nottingham, outside the hospital and various news conferences. Many of the UK national events are satellite linked via Eutelsat I F4 at 25°E, a slot masquerading completely to me by trees. I’m grateful to John Locker (Wirral) for keeping me advised of what I’m not seeing!

One mystery signal logged here July 15 on Intelsat 601 at 27°W was the caption ‘Reserved for United Artists Programming’ at 11.055GHz horizontal late evening. There have been no media reports to date as to what United Artists may be offering. It’s been a busy month with many news circuits and unusual signals. It demonstrates what a varied selection of signals there are from space, there is life after Astra!

Satellite News

Recent negotiations by Star TV in Hong Kong have secured the TV transmission rights over 10 years to show selected matches from the Chinese National Football League. Up to a dozen matches will be shown during 1994 with over 20 next season, kick-offs being tabled for 1815 Hong Kong time to meet peak viewing times on the Prime Sports satellite network. It’s likely that the Chinese football matches will appear on Sky Sports due to the major interest that Rupert Murdoch owns in Star TV.

The Russian Federation has now been accepted as a full member of the Eutelsat organisation making the roll call to 41 countries. Russia intends to increase use of the Eutelsat fleet with radio/TV distribution and for programming/news exchanges.

With Poland being one of the most avid satellite viewing countries of the former Eastern Europe, Filmmet is introducing a dedicated Polish movie channel over Astra from October 1 using Videocrypt II as part of the MultiChoice programme package. If successful, then other former Eastern European countries may come aboard the package with dubbed audio subcarriers. With the present Astra fleet all but fully booked, Filmmet-Polish transponder capacity is likely via the late August booked, Filmnet-Polish transponder capacity for the former Eastern Europe, Filmnet satellite fleet with radio/TV distribution and for programming/news exchanges.

Another news feed via 16°E carrying newsreel of rioting in the Gaza Strip.

Roger Bunney, 33 Cherville Street, Romsey, Hants S051 8FB

Homestead Teleport control, via PanAmSat - PAS-1 45°W during the Dallas football extravaganza.

Tape roll instructions via Intelsat 601 27.5°W.

Not seeing! Eutelsat I F4 25.5°E now carries the BBC Arabic World Service into Rome for Orbit Middle East.

Another news feed via 18°E carrying newsreel of rioting in the Gaza Strip.

Satellite News

The Flat Antenna Company Ltd. of Stansted, Essex, have produced a 3m square flat C Band antenna that it is claimed has a gain similar to a standard dish of same dimension, the advantage of the flat position is reduction of potential interference. The flat plate can lay flat on the ground or tilt up to maximum 20°. The low profile makes it of interest to the Middle East states that have banned conventional dish antennas.

NTL are to uplink a 2-channel C Band service for the UK’s MBC Arabic service at the MBC studio facility in London. On-air date is thought mid-November.

Short Wave Magazine, September 1994

master cards (from which the pirate trade would mass produce copies) at exchange sums thought approaching £2 million total - one pirate is thought to have paid over £100 000! Once the pirates had produced several hundred thousand cards Sky enacted ECM (electronic counter measures) that knocked out all the pirate cards instantly.

The Flat Antenna Company Ltc. of Stansted, Essex, have produced a 3m square flat C Band antenna that it is claimed has a gain similar to a standard dish of same dimension, the advantage of the flat position is reduction of potential interference. The flat plate can lay flat on the ground or tilt up to maximum 20°. The low profile makes it of interest to the Middle East states that have banned conventional dish antennas.

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</thead>
<tbody>
<tr>
<td>TIMEWAVE DSP9</td>
<td>£189.00</td>
</tr>
<tr>
<td>TIMEWAVE DSP9+</td>
<td>£239.00</td>
</tr>
<tr>
<td>SCANNER BASE</td>
<td>£39.00</td>
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<tr>
<td>SCANMASTER DISC</td>
<td>£49.95</td>
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<td>SCANMASTER DBL</td>
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<td>SCANMASTER MOBILE</td>
<td>£29.00</td>
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### AERIALS

<table>
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<th>Price</th>
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</thead>
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<tr>
<td>SHARP .7 extended LNB</td>
<td>£35.00</td>
</tr>
<tr>
<td>1.2 Metre dish C/W Polarmount</td>
<td>£160.00</td>
</tr>
<tr>
<td>SHARP 7 extended LNB</td>
<td>£329.00</td>
</tr>
<tr>
<td>SWEDISH microwave triple .9LINB</td>
<td>£125.00</td>
</tr>
<tr>
<td>Twin Output LNB</td>
<td>£48.00</td>
</tr>
<tr>
<td>H-H Mount (up to 1 mtr)</td>
<td>£77.00</td>
</tr>
</tbody>
</table>

### Many Radio Amateurs and SWLs are puzzled. Just what are all those strange signals you can hear but not identify on the Short Wave Bands?

Many of them such as CW, RTTY, Packet and Amtor you'll know but what about the many other signals?

HOKA ELECTRONICS HAVE THE ANSWER! There are some well-known CW/RTTY decoders with limited facilities and high prices, complete with expensive PROMs for upgrading etc., but then there is CODE3 from Hoka Electronics! It's up to you to make the choice - but it will be easy once you know more about Code3.

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

Maritime Beacons

T

The long hours of daylight during April, May and June discouraged many listeners from waiting for the sky waves from distant beacons to arrive after dark. However, those who did manage to stay awake and search the band were rewarded. Eight beacons, which were inaccessible during daylight, were logged by Steve Cann (Southampton) during the only night he stayed up to search the band. They included Punta D.Perena, Italy (TL1 31.4.61), Cape Cross (F1) on 286.5, also the Faroes beacon at Akaberg (AB) 381.0 and Nosso (NL) 404.0. The Akaberg beacon (AB) was also received after dark by Robert Connolly in Kilkeel. He picked up the sky waves from several beacons around the coast of Ireland at night, but his reception of the beacon at Prins Christian Sund, Greenland (O2N) on 372.0 was quite remarkable.

All of the entries in the log from Peter Rycraft (Wickham Market) were received after dark. He was the first to discover that only one Icelandic beacon could be heard (Grimsey Lt (GR) on 306.0) and there was no trace of the Greenland beacon (O2N). While staying in Appleby, Gloucestershire, Peter picked up the sky waves from the Cabo Villano beacon in N.Spain on 290.5 at 2330UTC. She says, "This is an excellent way to check my progress in learning Morse." The move from Iceland to Aberdeen by Geoff Crowley has brought many beacons within range! His initial exploration of the band was after dark, when he logged quite a few of the Scandinavian beacons and some along the coastline of France and Spain. By listening during the early morning, in the evening and at night, Jim Edwards (Bryn) was able to compile an extensive log! He heard for the first time the Latvian beacons on 312.5 at 0245. Another new one for him was Cabo San Sebastian, Spain (SN) on 291.0, which he logged at 0445. The beacon at Ballylisk, Latvia (6K) on 312.5 was also noted in a log from John Eaton in Working.

In an attempt to improve his results Tom Smyth (Cf Ferengan) walked up a local mountain! He says, "Although I enjoyed the scenery I did not pick up any more beacons." Several of the beacons in his list were logged during daylight, but his reception at night of the beacon at Ile de Giraglia Lt, Corse (GL) on 305.0 suggests that further checks after dark may be worthwhile.

The beacon at the Butt of Lewis (BL) on 305.0 was heard in the report from Kenneth Buck. He says, "This was a good signal here until six months ago but I have not heard it since December." There was no mapping of the beacon, so perhaps it has been closed down. Any information about it would be very welcome here.

---

Note: Entries marked with a star are calibration stations. Entries marked * were logged during daylight. All other entries were logged during darkness. The following stations were also received during daylight:

---

Short Wave Magazine, September 1994
I recently received a letter asking me to provide a listing of NDBs (Non-Directional Beacons) that can be heard between the top of the I.W. and bottom of the M.W. portions of the h.f. spectrum. These NDBs transmit their identification in Morse code every few seconds, and are mainly used by aircraft for navigation, but they do make excellent propagation indicators. I thought long and hard about mentioning these, as they are not really s.s.b. signals, but they certainly can be considered 'utility signals'. Once I started to compile the listing, I soon realised that those in Europe are enough to fill this page, so instead I am going to recommend some books which list them.

The first of these is the RAF En-Route Supplements covering the UK and Europe. Actually, there are three books in the series that cover the whole of Europe - British Isles, Northern Europe and Southern Europe. Towards the back of each book is a long list of navigational aids, listed in alphabetical order - the NDBs are listed within this section. A typical entry for an NDB reads OE London/Heathrow NDB 389.5 N51 27.92 W000 20.43, which indicates that beacon OE refers to London/Heathrow Airport. It is an NDB beacon operating on a frequency of 389.5kHz. The final set of figures are a set of accurate latitude/longitude positions for the beacon. In fact, this particular beacon is quite special, as there is an almost identical beacon OW operating on exactly the same frequency just a few miles further west - this pair of beacons are markers for the runways at Heathrow, one to the east (OE) and one to the west (OW). This book (or 'books' if you get all three) is available from: 1 AIDU, RAF Northolt, West End Road, Ruislip, Middlesex HA4 6NG. I do not know the current price for these books, but a few years ago they cost about £10 each. Fortunately, NDBs do not change too often, so you won't need to buy a new copy too often.

The second book that I can recommend is the Europe & Middle East Supplement available from British Airways AERAD. In this book, there is a section that lists all the navigational and communication aids at every airfield and airport in the area covered by the book. These are listed in alphabetical order, so you will have to search through the whole section extracting the NDB information as you go.

One benefit of this particular book is that it contains an excellent list of h.f. VOLMET stations and frequencies, as well as listings for Speedbird London, Stockholm Radio and Portishead Radio. This book is available from: AERAD Customer Services (S464), British Airways PLC, PO Box 10, AERAD House, Heathrow Airport, Hounslow, Middlesex TW6 2JA. Each copy costs £10, plus £1.15 for post and packing.

The latest edition of this latter book also contains a diagram of the North Atlantic Track (NAT) system, along with all the frequencies assigned to each NAT system. The NAT system consists of six areas, labelled 'A' to 'F', with 'F' having recently come into operation. As I have not mentioned these before, and they are always worth a regular mention, here are the areas with their assigned frequencies (in MHz):

<table>
<thead>
<tr>
<th>Area</th>
<th>Frequencies</th>
</tr>
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<tbody>
<tr>
<td>NAT-A</td>
<td>3.016, 5.598, 8.325, 8.906, 13.306 &amp; 17.946</td>
</tr>
<tr>
<td>NAT-B</td>
<td>2.899, 5.616, 8.864, 11.279, 13.291 &amp; 17.946</td>
</tr>
<tr>
<td>NAT-C</td>
<td>2.872, 5.649, 8.879, 11.336, 13.306 &amp; 17.946</td>
</tr>
</tbody>
</table>

As we are currently at the bottom of the sunspot cycle the lower frequencies in each set are being used. As we start the long climb back to the top of the cycle, the higher frequencies will be used once again.

**Globemaster**

This month's photograph shows an example of the new C-17A Globemaster operated by the USAF. They are designed to replace the C-141 Starlifter and (partially) the C-130 Hercules. This particular aircraft was 'snapped' at the RAF Mildenhall airshow during late May, on its first visit to Europe. It arrived on 25.5 using the callsign 'Reach 23291' (did anyone hear it on h.f.?).

Another two C-17A Globemasters visited the UK during early June, 'Reach 807GU' on 2.6 and 'Reach 807NG' on 3.6. If anyone can send in a months worth of h.f. logs including the above flights, I will send them a print of the above photograph.

**Hurricane**

I recently came across a huge list of h.f. loggings that are likely to be used during the Hurricane Season in the USA. Since we are now in the middle of that season, the chances of these frequencies being used are very high. The list originates from the USA, but many readers send in logs that include hurricane related traffic, so the signals can certainly be heard on this side of the Atlantic.

The list is too large to include in this page, but if you send me a stamped s.a.e. I will forward you a copy of the list.
Airband

One of the features of aeronautical engineering is not to assume that a piece of equipment can’t go wrong. Instead, alternative or back-up facilities exist to deal with the failure of critical services. What if my transmitter works (sends out pulses of carrier wave when I press the transmit button) but my microphone is broken? Can I, as a pilot, still communicate with air traffic control? The first thing to do is to set the secondary surveillance radar transponder to the ‘Radio failure’ squawk code of 7600. This device is independent of the communications transmitter. All is not lost, even without a transponder, though. As described in A.C. 91/94 (from the CAA) there is a speechless code that is like a simple alternative to Morse. As Neil Fry (Tenbury Wells) is wondering how this works, I’ll explain. A short burst of carrier means ‘Yes/Acknowledged’ but two short bursts is the opposite. Three short pulses mean ‘Say again’. A long burst means ‘Murphy’s Law: we’re complete’. Four short pulses, H in Morse code, mean Homing (to an airfield) requested; in case things go really wrong, Morse letter X (dah-dit-dah-dah) signifies that another emergency has just occurred.

The controller might find a ‘speechless’ aircraft on frequency with no clear means of identifying it - in which case, the callsign ‘Speechless’ would be spoken by the controller. Unfortunately, many pilots adopt the poor procedure of acknowledging someone’s transmissions with two pulses even under normal conditions. This conflicts with the speechless code but seems to be generally understood: however, it takes no longer to utter a quick ‘Roger’.

Information Sources

High in the sky is such a useful book that I’m always recommending it because it enables an aircraft to be identified once its Selsel is known. Unfortunately, The Aviation Hobby Shop are out of print! Malin Thorpe (Norwich) has 20 copies of this book, available for £10 each (plus postage). I’ll refer you to sources that cater for particular interests. Signet says it is the ‘Military Monitors Newsletter’ and is suggested by Bill Reeve (Norwich). Each issue, available from 19 Crescent Road, Hunstanton, Norfolk PE36 5GU, will cost you 50p (payable to The Black Cat Aviation Group) plus an A4 reply envelope with postage for 30 contents (that’s 19 or 25p in the UK). The bias is clearly to USAF information, with call-signs and specialised frequencies being listed.

Another military aircraft communications newsletter is Intercept, which is available from David Gregg, 11 Newton Close, South West Dinton, Newcastle Upon Tyne NE15 7OP. Please note that the address has changed since I last gave it in the July issue.

Many readers are familiar with the From the Flightdeck series published by Ian Allan. Recommended by Chris Brenton (Plymouth) is No. 7: Cessna 172 Around Britain. Isn’t the subject aircraft (G-WACL) operated out of Wycombe? Good book shops (such as W.H. Smith and Dillons) are becoming equipped with computer databases to find books more easily these days, or there’s always the public library.

Let’s Fly

A new service is provided by Euro Direct Airlines. Their network takes in Amsterdam, Berne, Bournemouth, Brussels, Dublin, Gatwick, Manchester and Paris (which includes routes relinquished by Dan-Air). Interestingly the ATP operates the Berne run with its load reduced from 68 to 50 seats. Landing distance available on runway 22 at Berne is a mere 1200m (which you can compare with 26 at Luton, 2075m). Compounding the problem is Berne’s relatively high elevation: 1673ft.

Receiver Hardware

Antennas always make a popular topic! Neil Fry would like a directional antenna that can be pointed at a visible aircraft. If the signal strength peaks, then that is the aircraft that is being received!

Sorry to disappoint you, it isn’t that simple. You are asking rather a lot of the antenna: really sharp directivity in two planes yet enough signal coming in ‘off the side’ to keep the transmission audible whilst taking aim. The radiation pattern must not change, even when the elevation is adjusted in order to point at the target aircraft. A tiny error in angular placement would mean the inability to distinguish between two closely-spaced aircraft. You could never be certain that you were receiving from a visual aircraft, rather than another one hidden in cloud but along the same line of sight.

Finally, aircraft transmissions are short and so the entire direction-finding operation must be possible in a couple of seconds. Now you know why the best position fixed of all - radar - sends its own transmission rather than waiting for the aircraft to make a spontaneous one. And just look at the size of antenna you need, despite the exceedingly short wavelengths involved!

Aerodromes do have a v.h.f. direction-finding system (v.d.f.), though. This equipment is nonetheless complicated (i.e. expensive). Several vertical antenna elements are grouped at the top of a mast as if stuck onto the curved surface of a vertical cylinder. Electronic equipment gives a bearing read-out by sensing the relative phases of the signal arriving at each element. Accuracy (typically ±5”) isn’t adequate to detect which visible aircraft is being received, however, so this doesn’t solve Neil’s problem. It is only intended to guide an aircraft to the general vicinity of the aerodrome. A full position fix requires antennas in at least two (preferably three) widely separated locations.

From Bracknell, Graham Long writes with a whole list of questions aimed at improving reception in general. In summary, different advice is needed for ‘short waves’ (correctly known as h.f. or strictly 3-30MHz) and v.h.f. (30-300MHz). For h.f. as great a length of wire as possible (sometimes called a ‘random’ or ‘long’ wire) is a good start. Bring this into the receiver through an antenna tuning unit. A magnetic balun (advertised in this magazine) sometimes reduces interfering man-made noise.

Now, v.h.f. requires a different approach. Airborne signals come from all directions, so there is no point in having a directional antenna. It will miss most of the signals! Fortunately, high-flying aircraft are able to cast transponders’ downward transmissions with little obstruction - i.e. the signals are strong. So go for a simple, omni-directional antenna such as a quarter-wave vertical. More expensive (but better as it covers a wider frequency range) is a discone. You don’t need a rotator for an omni-directional antenna. As the signals are strong, get rid of that pre-amplifier! They tend to pick up a wide range of interference, especially the broadband ones intended for TV and f.m. broadcasts.

No matter what the frequency, it’s far better to place an antenna outside (usually as high as possible). Make sure the antenna is constructed in a suitably weather-proof manner, though!

Can s.s.b. transmissions be resolved on a receiver intended for a.m. reception? It will please John Morrison (Edinburgh) to know that they can, provided that a suitable oscillator (called a b.f.o.) is available. You need to look in your receiver’s manual to find the intermediate frequency (i.f.). This should be listed in the specifications. The oscillator needs to be set to this frequency and held physically close to the receiver. If the oscillator is powerful enough, no electrical connection is necessary. It might help to bring a length of wire from the oscillator’s output terminal and wrap it around the receiver. The oscillator needs to be slightly variable in frequency and adjustment for best results will be fiddly; it comes with practice. If you’ve an r.f. signal generator to hand, your problem is solved. If you’re not that lucky then I suggest you contact H. Corrigan, 7 York Street, Ayr KA8 6AR, to see if one of their b.f.o. kits would be suitable.

Frequency and Operational News

In June, CAA’s G4SAL announced some d.m.e. changes. I think that there might have been some confusion - I passed on changes at Lydd. Certainly, the 22 l.t.s. has been withdrawn (according to A/C 74/1994) but the v.o.r. is presumably unaffected. The d.m.e. on 1105MHz (reply) previously identified as ILYX but now is LDY. Berne


Christine Mlynek
On a flight a few days ago I found myself confused about Gatwick's new TIMBA reporting point. It was once called Eastwood, but that doesn't conform with the new 5-letter 'computer friendly' codes. So it's TIMBA from now on (wood and timber, get it?).

Graham Tanner's (Harrington) list of LATCC frequency changes continues with those scheduled for September. Original 134.25 now becomes 131.125MHz. Next batch becomes 118.375; 128.4 becomes 120.525; 121.025 becomes 127.1; 123.6 becomes 131.125MHz. Next batch will be in November. Further noted by Chris Brenton is a new Cardiff sector which will be in November. Further noted by Chris Brenton is a new Cardiff sector frequency of 132.95 whilst Seaford area changes from 134.45 to 135.05MHz. I believe Shannon area (September 2), Benson (September 15), Finningley & Leuchars (September 17) and Cranfield (September 18) have changed to 123.2MHz, as noted by Ian McDowell (Peterborough).

Red Arrows

In September, the Red Arrows are scheduled to perform (excluding foreign locations) at Cleethorpes (September 2), Benson (September 3), Southport (September 4), Newquay (September 6), Duxford & Farnborough (September 10), Guernsey & Jersey (September 11), Cranfield (September 17) and Cranfield (September 18). Watch out for last-minute changes.

And finally, television news last night reported a proposal to close the air-sea rescue service at Manston. I leave you with this thought. Public spending cut-backs sound attractive - as long as it isn't YOU who needs rescuing.

The next three deadlines (for topical information) are September 16, October 14 and November 4. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/queries: 081-958 5113 (before 2130 local please).

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.m.</td>
<td>amplitude modulation</td>
</tr>
<tr>
<td>ATP</td>
<td>Advanced Turbo-Prop</td>
</tr>
<tr>
<td>b.f.o.</td>
<td>beat frequency oscillator</td>
</tr>
<tr>
<td>CAA</td>
<td>Civil Aviation Authority</td>
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<tr>
<td>d.m.e.</td>
<td>distance measuring equipment</td>
</tr>
<tr>
<td>ft</td>
<td>foot</td>
</tr>
<tr>
<td>g</td>
<td>gram</td>
</tr>
<tr>
<td>GASIL</td>
<td>General Aviation Safety Information Leaflet</td>
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<tr>
<td>h.f.</td>
<td>high frequency</td>
</tr>
<tr>
<td>i.s.</td>
<td>instrument landing system</td>
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<tr>
<td>LATCC</td>
<td>London Area &amp; Terminal Control Centre</td>
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<td>m</td>
<td>metre</td>
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<tr>
<td>MHz</td>
<td>megahertz</td>
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<tr>
<td>PFA</td>
<td>Popular Flying Association</td>
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<td>r.f.</td>
<td>radio frequency</td>
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<tr>
<td>Selcall</td>
<td>Selective Calling</td>
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<td>s.s.b.</td>
<td>single sideband</td>
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<tr>
<td>USAF</td>
<td>United States Air Force</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
</tr>
<tr>
<td>v.o.r.</td>
<td>very high frequency omni-directional radio range</td>
</tr>
</tbody>
</table>

Plane Sailing's Consolidated Catalina is based at Duxford. Taken at Duxford D-Day Airshow, May 1994. Christine Myrek.

To cope with the high volume of aircraft visiting the Silverstone Grand Prix, temporary air traffic control was set up on 121.075MHz. Can anyone tell Keith Goodchild (Tring) if the old Upper Heyford frequency (128.55MHz) played any part in this operation?

Cranfield no longer has radar on 122.85MHz but, as I found out at the PFA Rally, the frequency itself is still available. So's 123.2MHz, as noted by Ian McDowell (Peterborough).

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Fax: (0959) 57671 24 Hour
Now that my house is being worked on under the guise of some Euro Grant Aided Project, and scaffolded all round, it seems like a good time in which to draw down my antennas and give them some very serious attention in terms of maintenance. Many scanner and radio owners neglect their antennas. This is quite a bad move as the adage 'your radio is only as good as your antenna' is something you should be giving attention to! Neglecting the often forgotten antenna on your roof can have serious results. Also, whilst up there, it is equally a good idea to check the security of mountings and to allow some time for preventative maintenance to them, too.

Every antenna will benefit from an overhaul. A rub down with a fine piece of emery cloth or sandpaper followed by a light coat of 3 in 1, or sewing machine oil is beneficial. For antennas exposed, as mine are, to salt in the air due to my living on the coast, the liberal application of waterproof tape on joints, Vaseline on any screw threads round the base, and masticed with waterproof compound. The addition of tape sealing it with its rubber jointing, a quality waterproof tape. My AD370 has, obviously, benefits in keeping the joint externally with good quality waterproof tape. My AD370 is now many years old, exposed to everything thrown at it and is still as good as new. A little bit of common sense, some attention to ensuring the antenna is in a workable condition, and a little bit of preventative maintenance will ensure you get many years use out of the most important piece of your station. What's more, saves money in the long run, and I daresay that can't be a bad thing!

Safety
One last thing, be aware, at all times, of safety! Exposed areas like ground planes, should be wire-brushed and, again, coated in Vaseline. Joints, Vaseline on any screw threads, should be carefully checked and, if need be, re-masticed with waterproof compound. The addition of tape afterwards is a good idea, both to retard the ingress of moisture as well as to offer some protection from rust and dirt particles. Glass-fibre or GPP can be checked for small, vertical splits in the fabric. I use candle wax to fill in these, as they are never very deep but look pretty awesome, and waxing them gives them a good element of protection from the trying properties of rain. Plug connections should be cleaned off, sprayed with WD40 and allowed to dry, then given a very light smear with Vaseline before being mated again. I also believe in smothering plugs with Vaseline which keeps moisture at bay. Don't presume that because you have a plug connection shielded by a downpipe section and placed a good venture of protection, you don't! Application of Vaseline here is of inestimable benefit for longevity of plug life, by plugs I mean PL259 or 'N' connectors at the antenna site. Attention to weatherproofing has, obviously, benefits in keeping water from the coil, or, in the case of AD370's and other active types, from the delicate electronics inside the antenna head. To ensure maximum protection here I always spray WD40 inside the case before re-sealing it with its rubber jointing, a smear of Vaseline and I also secure the joint externally with good quality waterproof tape. My AD370 is now many years old, exposed to everything thrown at it and is still as good as new. A little bit of common sense, some attention to ensuring the antenna is in a workable condition, and a little bit of preventative maintenance will ensure you get many years use out of the most important piece of your station. What's more, saves money in the long run, and I daresay that can't be a bad thing!

Advice is sought by Steven Rogers of Saxmundham, who has AR-2000 and wishes to know the following: Can channels be 'wiped' quicker than the one at a time method? In other words, can the memory be wiped out on this model? Also, has anyone an idea how to disarm the 'beep' from the front panel? Steven says the set is very like the AOR AR 2000.

Interesting letter from Leslie Griffiths, 9 Rhos-y-Goer Avenue, Holyhead, Gwynedd LL65 2BE. He writes that when he was a radio enthusiast and you know where to find these, drop me a line and I'll feature it within the column. Again, any form of sport using radio can be featured, so get writing!

Coastguards
Marine monitors may be interested in a 'new' frequency that I have heard recently, used by Auxiliary Companies of HM Coastguard. The designator was 'Channel 99' and the frequency 160.600 mode being FAN. In this case, the Auxiliary Teams were taking part in a location exercise and reporting back between their base and the various mobiles being used. The callsigns used were '......Coastguard', geographical area preceeding designating the region. This is a very interesting aspect of this frequency to work the Maritime HQ at Holyhead. This makes me think that mobiles are used, co-ordinating any event on their own frequency and working a certain extent, in The VHF/UHF Scanning Frequency Guide but nothing about coastguard mobiles or how to keep the traditional Channel Zero of 156.0 clear. Obviously this makes a great deal of sense as things can get congested on Zero when there are coastguard mobiles, a lifeboat or two and a helicopter all involved in a scenario. The scenario could then be relayed back to the main coastguard station on landline. Channel Zero is used by many SAR units, from Nimrods to mobile vehicles, and congestion causes confusion. Obviously, this may be a local exercise and may not be in use nationwide. Write me if you know any different.

Also, can someone confirm with me that 456.825 is in use with any coastguard mobiles? Many books report this variously as coastguard mobiles and inshore lifeboats. I know, from my RNLI...
experience, that it is not an RNLI frequency. It may be a private rescue company or even HM Coastguard, but certainly not RNLI! Having said that, I recently bought The VHF/UHF Scanning Frequency Guide - through the Short Wave Magazine Book Service of course, and found it very easy to use as well as informative. Given the limitations of the hobby in terms of accuracy, as I've said above, this is an excellent book, full of good information and clearly managed into readable and well defined sections. I may now change allegiance to this from another well-known publication if only because it is easier to read! Books are really personal choice but if you're into the market for a book, give this one real consideration. Price wise, it is affordable, something a few other publishers should note.

If any reader has information on other frequency sources I would be interested in knowing about them. Maybe we can go for a column on publications allied to the hobby at a later date? That's UK as well as everywhere else by the way! Some readers like to track down these on his Realistic PRO-34 but, within the past month, things have become very quiet indeed. This is a clear case of columns overlapping as Godfrey Mannings 'Airband' is the best, so far, in any magazine for up-to-date news on frequencies and any changes. My own 'gen' on airband comes from books that are available on the market and, living almost on top of both RAP Valley and RAP Mona plus the 'covy' field at Caernarfon, I tend to favour what is on my doorstep, although I can hear overflights heading to places like Dublin, Manchester and so on with ease. May I suggest that up-to-date info would appear, without doubt, in Godfrey's column before anything else?


Informative

In my first column I requested information on a set I had here, a Sony ICF-5500M or 'Captain 55'. To prove that requests do work, I had a very informative letter from someone who not only bought theirs new, but still has it, and is as pleased with its performance as I am! It was, in fact, this set that I used to get the Band II v.h.f. signals in and on its own telescopic whip. Not bad for a portable sitting against the window, albeit with no absorbing or electrically blocking objects in its path! It seems that the ICF-5500M was popular with the boating fraternity, which would explain its Marine Band h.f. switch and dial. Obviously, emissions on h.f. are now H/A/J/R3E mode - H3E full carrier, single channel on 2162kHz, A3E is double sideband, J3E suppressed carrier, single channel s.s.b. and R3E single channel, rescued, but back when it was on sale, s.s.b. wasn't an issue! It would appear to be circa mid to late 70s and constructed ruggedly, which explains its still very good audio and external experience. Like my informant, Don Lewis of Crawley, I too find the tuning to be a bit on the spongy side. However, that is a very small price to pay for what is a damned good radio.

As I write this last piece for this month, the '55' is on and I'm listening to Key 103 out of Manchester at 59 and that is something! A short 'skip' through the band has shown up Irish f.m., Spanish f.m. and a few of the f.m. stations 'across the border' like BRMB! They do not come up on my PRO-80 or the AR 2000.

Bit of a hitch-potch for this month, but I hope that the bit on looking after your antenna serves. It makes sense! Remember to write if you have any queries or any general information you wish to pass on, frequencies, problems requiring answers and so on. I'm here to assist and if I can't then there's always someone out there who can.

Until next month, good listening.

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During the days around July 20, comet Shoemaker-Levy 9 has been impacting Jupiter. Not a predictable start for a column on WXSATs, but the point is that the instant availability of images of our weather systems is once more proving invaluable. I had local TV crews filming my set-up, and more radio interviews than are decent for most people. One phone-in was 'swamped' with callers asking about Jupiter's atmosphere! Animating earth's atmospheric imagery is very useful for amateur astronomy.

A number of readers have written asking about the possibility of reviews of WXSAT receivers. Curiously - this is a delicate matter! I believe such reviews would be of considerable interest and help to many newcomers to this hobby. A letter from Nigel Tucker from Zm babwe made such a request. Behind the scenes, during the last two years I have written to UK suppliers whom I hoped would provide suitable hardware for me to test comprehensively, for this magazine. In one instance the unit was never sent, and in another instance the unit, regrettably, had to be returned.

Following several weeks of marking examination papers, I am now trying to belatedly catch up on correspondence for the column. Some very interesting letters have been received from places as far away as Australia and Cape Town. At last we have the definitive situation on METEOSAT encryption. For most people monitoring WXSAT transmissions there are no changes - at least for some years.

Current WXSATS

I have logged only five polar orbiting WXSATS during early summer weeks. NOAA 9 through 12 have continued routine operations with the expected short breaks from NOAA 10 while it overtook NOAA 12. For new readers to 'info' it is worth mentioning that each NOAA WXSAT has a slightly different orbital period, so at regular (predictable) intervals, their passes over Britain (and elsewhere) overlap. During these times, transmissions from NOAA 9 or NOAA 10 will be terminated for the period of overlap. Check out your Kepler elements for each NOAA pair (NOAAs 9 and 11, then NOAAs 10 and 12) and you will notice their Mean Motions (number of orbits per 24 hours) are similar. For the first pair, the difference is only 0.006 orbits per day. The second pair differ by 0.086 orbits per day. Consequently, overlap periods for NOAAs 10 and 12 are more frequent but last for a shorter time.

Only METEOR 3-5 transmitting on 137.85MHz (at least during June and July) has represented the Commonwealth of Independent States (formerly Russia). Summer so far has seen the largest areas of clear skies that I can remember since I saw my first WXSAT image many years ago. On several different occasions I recorded Europe with a clarity that I had not previously seen. Not a cloud over the Mediterranean sea. Such was my enthusiasm that I saved and printed these images.

METEOSAT Encryption

Details for the future encryption of METEOSAT transmissions were published in mid-July. They include both favourable and less favourable news, depending on your exact image requirements.

As most readers will know, METEOSAT-5 (the geostationary WXSAT positioned near longitude zero) transmits several types of telemetry. The two of special interest to 'info' readers include WEFAX (officially known as Secondary Data User Station) imagery, and Primary Data (known as PDUS). Transmission of Primary Data test images in encrypted format began some months ago. Encryption will be increased in April, June and September next year. From 1 September 1996 all high resolution images (HIR) will be encrypted - with the exception of images at six-hourly intervals.

The Good News

Images at 0000 UTC will not be encrypted. This means that no changes will be necessary to PDUS hardware and software for those for whom six-hourly images are acceptable.

The Other News!

For anyone wanting more than the previous few un-encrypted images, a licence agreement will be required. EUMETSAT have issued a registration form to all known users of both WEFAX and PDUS. It is well worth completing and no liability or commitment attaches to its content. It allows the user to record their details with EUMETSAT for which they will receive a licence agreement will be required. EUMETSAT will grant free access to certain scientific research and educational programmes if the data is not used commercially or operationally. Each case will be examined individually.

If you wish to decode encrypted telemetry, you will need to purchase a METEOSAT Key Unit (MKU) from the equipment supplier at a cost of 700 ECU. An additional annual payment may also be required depending on your official status. EUMETSAT will grant free access to certain scientific research and educational programmes. Additional annual payment may also be required depending on your official status. EUMETSAT will grant free access to certain scientific research and educational programmes if the data is not used commercially or operationally. Each case will be examined individually.

If you have not had this questionnaire you can write to EUMETSAT, Meteosat Operational Programme Manager, Am Ellengrund 45, D-64242 Darmstadt-Eberstadt, Germany.

Fig. 2: METEOSAT C2D with C3D from Roger Ray.

Fig. 1: Iceland METEOR 3-5 from Peter Hampson.
be monitoring WEFAX transmissions that are mostly disseminated on channel 1 (1691MHz). The schedule of transmissions shows that some additional WEFAX formats are transmitted on channel 3 (1694 MHz). These extra formats include whole disc images of the earth in three wavebands (visible, infra-red and water vapour) from METEOSAT-5, plus relayed collected from two other geostationary WXSATs. Japanese GMS images are also available, giving us very large coverage of global weather systems. I am sure readers will wish Brian a speedy recovery following his recent spell in hospital.

**METEOSAT Interference**

A reader living in London sent me several pictures taken with his METEOSAT equipment. The image recorded on channel 1 were noisy and un-synchronised, yet those on channel 2 were perfect. He had contacted the hardware supplier but had not received any help so wrote to me some weeks ago in a state of agitation.

What actually happened was METEOSAT-6 was undergoing tests at the time. Currently METEOSAT-5 (the operational WXSAT) is positioned at about 23° east, and METEOSAT-6 (the backup) is located at 9.5° west - though these positions may not remain constant.

Simultaneous transmissions from both WXSATs invariably cause some interference because tests are carried out on channel 1 - 1691 MHz. The result can be heard as a characteristic buzz on the signal, and computer software may fail to synchronise properly.

EU METSAT point out in their technical specification for METEOSAT equipment that in order to avoid all interference between the two satellites at your receiving station, a minimum dish size of about 1.8m is theoretically required for WEFAX telemetry. In practice, we rarely use dishes larger than about 1m diameter because, for most of the time, only one signal is transmitted on this frequency and good signal strength is achievable. Smaller dishes have wider signal capture characteristics - hence this occasional interference.

**Queries and Reminiscences**

A correspondent (S. Bright) from Portsmouth kindly sent me some GOES (FAX) images and asked whether we can receive direct transmissions from the GOES WXSATs here in the UK. The answer is no..There are several GOES WXSATs and occasionally give their locations in geostationary orbit along the Clarke belt. They are all below our horizon. For those suitably equipped, some images from these satellites can be obtained via h.f. transmissions from some utility stations. As detailed previously, METEOSAT-3 is currently in the GOES east position at 75° west longitude, so may be heard by those suitably located.

Abroad again, this time to Capetown, South Africa where Robert Hall set up two different WXSAT receiving systems at relatively low cost. He tells me that METEOSAT channel 1 data is transmitted continuously from a local relay on 145.45MHz. This would certainly be a cheap way into METEOSAT images! Robert uses a Yagi for this frequency, feeding a Kenwood RZ-1 receiver. He uses JFVAX 6 and PRosat and comments that the schedule timetable changes last March required editing into the software. He also points out the importance of checking the computer's internal clock before leaving it under automatic software control.

From Wellington, New Zealand came a letter from Len Maxim who worked at the local Meteorological Office for 33 years. He became very familiar with the characteristics of METEOR WXSATs dating back to 1977. He tells me that he saw imagery from METEOR 2-2 before the use of binary edge code was implemented. This code - the changing bars along the side of METEOR images - represents sensor aperture settings. Len saw a.p.t. transmissions from METEORs 1-25, and 1-30, giving excellent imagery. I still have some original METEOR 1-30 recordings saved on cassette audio tape. Those images were of high quality and good resolution. When I first heard METEOR 1-30 in the mid-eighties, I had not known of its existence, but recognised the sound as a.p.t. coming in on 137.06MHz. After connecting the lead from the receiver to my framestore it produced a picture of Italy - of a quality never seen before. My enquiries at the time were inconclusive - suggestions were that I had measured the frequency wrongly. Later it was acknowledged that my Dartcom receiver had given the correct frequency - METEOR 1-30 was drifting! Since retiring two years ago, Len no longer sees METEOR images, but still operates a v.h.f. receiver to monitor WXSATs.

**Apple Mac**

Graham Cockshutt of Sheffield uses a Dartcom receiver with his Apple Macintosh III computer. He writes that the software was developed by Newcastle Computers and provides many facilities. This is one of only a few letters that I have received from people using the Mac, though some correspondents have previously asked about the availability of such software. Graham is proposing to send up two different photographs from his set-up, about which he writes very favourably.

**DIY PDUS and HRPT**

When I built my first a.p.t. receiver (for the polar orbiters), based on the Cirkit design, I quickly realised what a major project d.i.y. WXSAT image-decoding hardware construction was. My framestore took several weeks to build, including professional help, before everything was working. Consequently, realising just how much test equipment was needed, building my own high resolution decoding hardware for either PDUS (METEOSAT) or h.r.p.t. (NOAAS) was a non-starter.

About two years ago I had a letter from Peter Hayes of Ayr in Scotland who wrote telling me about his mostly home-built equipment, so I invited him to bring me up-to-date. A general view of his PDUS gear, taken in June 1991 can be seen in Fig. 4. The PDUS decoder and framestore is in what Peter describes as 'the rat's nest on the left'. The receiver is unboxed in the foreground right, and is in use, still in this form. Peter even built his own spectrum analyser (!) from a 'Badger Boards' kit. His PDUS set-up has its own computer - a 280 chip with operating system on EPROM. This computer was used to de-multiplex the METEOSAT data stream. For those unfamiliar with the complex nature of METEOSAT Primary Data telemetry, data from the various channels are combined (multi-plexed) before transmission to users, instead of transmitting each image separately. A computer, or suitable hardware, is required to separate channel components for picture re-construction.

**Fell off a Roof!**

Peter's PDUS dish is 1.8m diameter. It was originally used at a school for receiving educational programmes from satellites. The tripod had only been cemented into the flat roof of the college, so the first gale sent it hurtling off! He was able to retrieve the dish for the cost of a new one. Peter uses a RIG (Remote Imaging Group)-type pre-amp fitted to the feedhorn.

For receiving NOAA h.r.p.t. (high resolution picture telemetry) in the 1700MHz band, Peter now uses a 0.9m dish with a Timestep dual-feed horn. This set-up is currently fitted to a Yeaes 5500 rotor that sits on a Versatower at about 10m height. Because of his location overlooking the Firth of Clyde to the north, he has a good horizon and can track satellites and receive h.r.p.t. well into polar regions. More pictures and further details of Peter's advanced set-up will appear in future editions.

**Recommendations**

When I receive details of new products, I am happy to provide brief summaries on the basis of information sheets. This allows readers to become aware of such products so they can make further enquiries. I can't make personal recommendations on equipment or software, because this column needs to remain independent of any manufacturer or supplier.

**Kepler Elements**

I will send a print-out of the latest WXSAT elements upon receiving a stamped, addressed envelope with separate, extra stamp. All WXSATs plus MIR are included, together with transmission frequencies if operating. This data originates from NASA.

Some readers like to receive monthly Kepler print-outs. To join the list please send a 'subscription' of £1 (plus four self-addressed, stamped envelopes) to cover four editions. I also provide files containing recent elements for the WXSATs, and a massive 0.5Mb ASCII file holding cataloguing numbers for the WXSATs, amateur radio satellites, and others of general interest. This is ideal for computer data retrieval. The option is constantly being improved and notes are provided. Please enclose cash, a cheque, or PO for £2 (yes - down from £3 because there are more requests than expected).

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**Fig. 3: METEOSAT-3 relay from Brian Dudman.**

**Fig. 4: Peter Hayes home-built PDUS system.**
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All the Data Modes

I've just been sent an interesting new decoding package called WeatherSpot by the author John Standen. John has a keen interest in meteorology and has produced this program to process the full range of weather data that's available on h.f. As a result, this program is very much aimed at those with a more serious interest in weather data.

The package is supplied complete with a manual and two high density 3.5in disks. Installation was easy using the supplied installation routine that created the appropriate sub directories on your hard disk and transferred all the files. It's worth noting that the program and its support files occupy around 7MB of text disk space so it's not possible to run the program from a floppy disk. The system requirements were not too well defined other than the need for an AT compatible machine or better. If you want to be able to use the sophisticated Workstation option you will need a VESA, Super VGA graphics system capable of operating at 600 x 800 resolution.

Unlike many decoding systems WeatherSpot is not able to decode data direct from your receiver as it relies on a log file having been created by a conventional RTTY system. Virtually all these programs have the option to log received data to disk and this information that's used by WeatherSpot.

In operation, you first turn into an appropriate met station such as Bracknell on 4.489MHz and set your RTTY decoder to save all the received text to a log file. When you have received a good quantity of data you need to view the information with a text editor and clean out any obvious errors. The sort of thing you're looking for are the 'loss of a shift character where the information appears as letters instead of neat 5-digit groups. Once you've completed the basic tidy-up you can run WeatherSpot and complete the data processing. To help with this, the main menu contains a filter option that automatically scans the data file, groups and extracts the relevant sections.

The main menu of WeatherSpot contains 13 options for further processing and displaying data from Radiosonde stations. The data could be displayed in tabular form or, more usefully, as a pict of temperature against altitude. Those with an interest in v.h.f. propagation will find this information very useful for spotting the temperature inversions that often lead to enhanced propagation conditions.

One particularly unusual, and interesting, sequence of reports was the European lightning strikes. The reports are apparently transmitted from Brecknell and in this program these are displayed graphically on a map. For those interested in longer term weather trends WeatherSpot could interpret and display the monthly climateology reports. These showed a variety of weather data including the hours of sunshine/rain per month for a variety of locations.

The serious weather watcher will find the VESA workstation particularly impressive. This took full advantage of the increased display resolution to enable different reporting systems to be directly compared. To do this the screen was divided into four windows, each of which could be used to display different elements of the weather pattern. In a typical example a satellite image could be compared with a surface chart and a number of individual station reports displayed in the remaining windows. By presenting all the information on one screen you could build up a much more complete weather picture.

The only problem with this mode was its dependency on the VESA graphics card. Although the system worked fine with the SPEA V7 Mirage on my home system, it failed to work when loaded on a Cirrus GS5xxx based 486SX machine. John reports that WeatherSpot has been tested with Trident, Oak, Orchid and Paradise systems, so I would check for compatibility with your system before you commit yourself.

Overall the system provided a very useful insight into areas of weather reports that are not normally easy to decode. Providing you have a fully compatible VESA card WeatherSpot looks to be a well thought out package. For more details contact Cross Electronics, Unit 3, Medina Court, Artic Road, Cowes, Isle of Wight PO31 7XD.

The current price is £93.00 plus £3.50 post and packing.

Right: German Met men display a sense of humour.

Stafford Hamfest Clinic

The Decode clinic at Stafford proved to be very worthwhile with lots of readers taking the time to stop for a chat and to exchange views on our hobby. There was also a very strong interest in Hamcomm and JVFAX from people who had not seen them before. Although I took up a good selection of my lists, these were quickly snapped up with the Interference FactPack proving particularly popular. Much interest was attracted by my simple demonstration station that comprised a Lowe HF-150, Dafying FL3 with a laptop, PC running Hamcomm, JVFAX and the Lowe Modemaster. The Hamcomm spectrum analyser display seems to be a real attention grabber and I even had one person who wanted a copy of the program just for that feature. Apparently he had been trying to develop a fast, computer based spectrum analyser for some time with very little success. I'm sure the magazine will be running more of these Clinics, so watch this space for more information.

Interference Problems

My new interference FactPack is proving to be very popular with new requests arriving daily. I have also received feedback from a number of readers reporting great success with the packs methodical approach to the problems.

By using this system T. Trentfield of Tamworth discovered that his main source of interference was the domestic video recorder! Looking through an RS catalogue recently I found a couple of items that may prove very useful for filtering mains interference. If you are electrically competent and can manage some simple soldering, it may be worth considering replacing the mains socket of your computer (or any other noisy devices) with a filtered socket. The RS PS360 range of replacement sockets feature excellent filtering properties including an earth line choke. The RS stock numbers are 288-788 for the 3 amp version and 288-794 for the 6 amp model.

If you don't have the skills to change the internal socket you could try using the RS in-line filtered lead. This is a short lead with an IEC plug at one end and a filtered socket at the other, that's ready for use without any soldering. The stock number for this BA filter lead is 288-822 (around £3.00) and should prove suitable.

If you've succeeded in reducing or eliminating interference using the FactPack please write and let me know. I'd also like to know of those cases where the process doesn't work so I can expand it to cover as many problems as possible.

Decoding Accessories

My latest FactPack attempts to throw some light on the wide range of accessories that are available. Rather than deal with individual products, I have looked at different types of accessory and made my comments on their value and what you should look for when choosing an accessory. Perhaps one of the most common areas that cause uncertainty is the choice between a.t.u., preselector or something at the wire antenna socket. The main source of interference usually passes unimpeded. If you want to try using the RS in-line filtered lead. This is a short lead with an IEC plug at one end and a filtered socket at the other, that's ready for use without any soldering. The stock number for this BA filter lead is 288-822 (around £3.00) and should prove suitable.
coaxial feeder to bring the antenna into the shack. This presents a problem in itself as coaxial feeders are low impedance devices of usually 50 or 75Ω, whereas a random wire antenna offers a varying impedance which is often high. One of the more practical solutions to this dilemma is to use a magnetic long wire balun to couple your antenna to the coaxial feeder.

If you are using a more sophisticated tuned antenna system you will find that you can generally directly couple the antenna to its feeder without any special precautions or matching devices.

Once we have the antenna in the shack we have the option whether or not to use an a.t.u. When used in this way, the main benefit of the a.t.u. is not to provide matching, but to reject out of band signals. This is only really of value when using the cheaper receivers as these often have poor overload characteristics and are prone to strong signals. Because the a.t.u. contains at least one tuned circuit, it tends to reject out of band signals so helping the receiver cope. The best option is to use a preselector as this is designed specifically to ‘remove out of band signals so is generally more effective than an a.t.u. Unfortunately, they also tend to be rather more expensive!

For more information on accessories including filter, speakers, headsets, power units, etc., see the special offers section in this column.

Hamcomm 3 Now Available

Yes, I’ve just received a brand new version of Hamcomm from the author Wilhelm Schroeder, in Germany. This latest version is a real winner as it now includes the transmission and reception of AMTOR/SITOR modes.

Wilhelm has also made a few changes to the distribution conditions and asks for a $30 or DM40 payment for the new 90 day evaluation period. In view of the costs of commercial decoding packages this is more than reasonable. Once you’ve formally registered you will receive an updated version of the program with the registration prompt removed. You will also receive the latest updates as they are developed.

One of the great points about Hamcomm is that it is still capable of running on the older and slower 8088 based PCs. This means that virtually every PC or compatible will be able to run the program. The only areas that may suffer on slower machines are those that demand a lot of processor time like the spectrum and oscilloscope displays.

To install the new program you just create a destination floppy disk or hard disk sub-directory and copy the five files HAMCOM30.EXE from the distribution disk. From the new disk or directory just type HAMCOM30 and the program will automatically unpack itself and create the operational files plus documentation. Once this process is complete, you can delete HAMCOM30.EXE to some precious disk space. The final installation occupies a very conservative 995K of your hard or floppy disk.

Along with the new version comes a fully updated on-disk 38-page operating manual. This contains full details of the hardware interface as well as the operating controls. You will all no doubt be pleased to hear that the interface requirements remain unchanged so you will be able to receive SITOR straight away. The only extra you may have to sort out is the clock correction so let me explain the reasons. SITOR is what’s known as a synchronous transmission system, which means that the receiving station follows the speed of the sending rather than setting its own speed. Because of this, before displaying a signal on the screen the computer spends a short time analysing the incoming signal to find the right point to start decoding and also to look onto the right speed. Once this phasing sequence is complete the computer continually tracks the signal to maintain lock. However, if the signal is suffering very bad interference or becomes lost in the noise, the computer keeps trying to resynchronise but uses it’s own internal clock as a reference. It’s because of this that the computer clock has to be as close as possible to the right speed or you will always have to completely resynchronise after any form of signal loss.

Although all PCs are controlled by stable crystal oscillators, the absolute frequency is rarely accurate. To compensate for this, Hamcomm now has a built-in clock correction system that can be set for your PC. To do this you first have to find a good commercial STOR signal to synchronise with. The best place to start is around 4.2 or 6.32MHz, so start Hamcomm and press F4 for AMTOR listen mode. You will now see the correction counter in the lower left hand corner of the screen. Once you have locked onto a good signal, press Escape to zero the counter and then how long the counter takes to + or - 10. A tip here is to use the PC’s clock displayed at the top right of the screen. If it takes any longer than two minutes to reach 10, your PC clock is already accurate enough for this mode. If its less than this the clock correction factor becomes 100 x S, where S is the number of seconds taken to reach + or - 10. This value is then added to the configuration file HC.CFG as set clockcorr n where n is the correction factor. Don’t forget to add the minus sign if your correction counter moved to -10. Adding this value to the config file is best done with a simple text editor such as the DOS 6 editor.

One of the other plus points for short wave listeners is the facility to disable the transmit type ahead buffer. This takes out the transmit section at the top of the screen and makes the whole screen available for received text. You can do this either by typing Control R or by setting twixdown off in the config file. If you would like a copy of Hamcomm 3, see the offers at the end of the column.
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Searching the bands for the broadcasts mentioned in LMS & S.W. may be rewarding experience, but other people in the house may find the sounds objectionable. If the windows are open the noise could easily annoy the neighbours. One should also bear in mind that sound travels long distances in the dead of night.

The solution, which may also clarify reception, is to wear headphones. There is a wide choice available at reasonable prices, but do make sure the impedance is correct - refer to the receiver handbook.

Long Wave Reports

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

R.Pakistan, Islamabad 17.900 (Eng to Eu 0900-1000) 52233 at 1050 by Harry Richards in Middlesbrough.

The broadcasts from Radio Monte Carlo via Roumoules on 21.655 and 21.590 (Eng to Africa 1730-2025) 34444 at 2200 by Peter Pollard in Rugby.

In the evening Sheila Hughes (Morden) picked up their 5am news bulletin the band in Quebec, Alan Roberts heard for the first time R.Nacional in Canada on 21.595 (Eng to Eu 0800-0900) 45444 at 0847 by Geoff Crowley in Aberdeen.

The broadcasts mentioned in LMS & S.W. unless logged before. In contrast, many broadcasters had difficulty in receiving the stations heard regularly during the night.

The most distant report on their broadcasts was from the UK in June. Several of the stations heard regularly during daylight by Fred Pallant in Storrington had difficulty in receiving the broadcasts from Denmark via Kalundborg on 24.232 and there was no trace of Topolina on 270.

Radio Dar Al Hikma 21.585 (Eng to M.East, India? 1430-1500) SI0344 at 1430 at 1900 in Bridgwater; Voice of Greece, Athens 17.510 (Gr, Eng to Eu 1500-1600) SI0444 at 1800 in Millstreet.

Medium Wave Reports

There were two reports of m.w. transatlantic reception this time. The first came from Paul Logan in Lisnaskea. On May 30 he awoke around 0300, checked the band and heard for the first time R.National in Canada on 21.595 (Eng to Eu 0800-0900) 45444 at 0847 by Geoff Crowley in Aberdeen; RFI via Isla Bonita 21.620 (Eng to Africa 0900-1000) 44444 at 1045 by Robert Connolly in Newry.

These notes were logged during darkness. All other entries were logged during daylight or after dawn.

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

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# Medium Wave Chart

<table>
<thead>
<tr>
<th>Station</th>
<th>Country</th>
<th>Power (kW)</th>
<th>Listener</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 Hz Sacke</td>
<td>Germany</td>
<td>0.2</td>
<td>F</td>
</tr>
<tr>
<td>520 Hz Sacke</td>
<td>Germany</td>
<td>0.2</td>
<td>A, F</td>
</tr>
<tr>
<td>531 Hz</td>
<td>Algeria</td>
<td>600</td>
<td>A, F, J</td>
</tr>
<tr>
<td>542 Hz</td>
<td>Lebanon</td>
<td>800</td>
<td>A, F</td>
</tr>
<tr>
<td>554 Hz</td>
<td>Sacke</td>
<td>100</td>
<td>A, F, J</td>
</tr>
<tr>
<td>576 Hz</td>
<td>Germany</td>
<td>200</td>
<td>B, C, D, F, M, P, X</td>
</tr>
<tr>
<td>600 Hz</td>
<td>Japan</td>
<td>10000</td>
<td>A, F, M</td>
</tr>
<tr>
<td>656 Hz</td>
<td>France</td>
<td>10000</td>
<td>B, C, D, X</td>
</tr>
<tr>
<td>675 Hz</td>
<td>France</td>
<td>5000</td>
<td>A, C, D, F</td>
</tr>
<tr>
<td>708 Hz</td>
<td>Germany</td>
<td>1000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>711 Hz</td>
<td>France</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>720 Hz</td>
<td>Germany</td>
<td>10000</td>
<td>B, C, D, X</td>
</tr>
<tr>
<td>725 Hz</td>
<td>France</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>768 Hz</td>
<td>France</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>775 Hz</td>
<td>Germany</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>792 Hz</td>
<td>Italy</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>780 Hz</td>
<td>Italy</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>801 Hz</td>
<td>Italy</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>805 Hz</td>
<td>Italy</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>819 Hz</td>
<td>Italy</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>828 Hz</td>
<td>Algeria</td>
<td>1000</td>
<td>A, C, D, M, P, X</td>
</tr>
<tr>
<td>829 Hz</td>
<td>Algeria</td>
<td>1000</td>
<td>A, C, D, M, P, X</td>
</tr>
<tr>
<td>832 Hz</td>
<td>Algeria</td>
<td>1000</td>
<td>A, C, D, M, P, X</td>
</tr>
<tr>
<td>846 Hz</td>
<td>Spain</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>850 Hz</td>
<td>Italy</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>855 Hz</td>
<td>Italy</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>864 Hz</td>
<td>Kenya</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
<tr>
<td>871 Hz</td>
<td>Italy</td>
<td>5000</td>
<td>A, B, D, F</td>
</tr>
</tbody>
</table>

## Short Wave Radio

- **74 MHz**
  - **Italy**: Rome (RNB-FM) 1620 kHz
  - **Spain**: Barcelona (RNE1) 1588 kHz
  - **Germany**: Munich (WDR) 1550 kHz
  - **UK**: London (BBC) 1535 kHz

- **13.5 MHz**
  - **Brazil**: Belo Horizonte (RBR) 1505 kHz
  - **Japan**: Tokyo (JTN) 1490 kHz

- **21.5 kHz**
  - **India**: New Delhi (AIR) 1350 kHz

**Short Wave Magazine, September 1994**
### Tropical Bands

<table>
<thead>
<tr>
<th>Frequence (MHz)</th>
<th>Station</th>
<th>Country</th>
<th>UTC</th>
<th>DXer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.325</td>
<td>ABC Alice Springs</td>
<td>Australia</td>
<td>2010</td>
<td>D.H.</td>
</tr>
<tr>
<td>1.375</td>
<td>ABC Toowoomba</td>
<td>Australia</td>
<td>2018</td>
<td>H.P.</td>
</tr>
<tr>
<td>2.465</td>
<td>ABC Katherine</td>
<td>Australia</td>
<td>2003</td>
<td>H.</td>
</tr>
<tr>
<td>2.515</td>
<td>ABC Newcastle</td>
<td>Australia</td>
<td>1989</td>
<td>6.R.K.B.</td>
</tr>
<tr>
<td>2.525</td>
<td>ABC Darwin</td>
<td>Australia</td>
<td>1987</td>
<td>6.R.K.B.</td>
</tr>
<tr>
<td>2.535</td>
<td>ABC Adelaide</td>
<td>Australia</td>
<td>1984</td>
<td>H.</td>
</tr>
<tr>
<td>2.540</td>
<td>ABC Sydney</td>
<td>Australia</td>
<td>1981</td>
<td>6.R.K.B.</td>
</tr>
<tr>
<td>3.325</td>
<td>ABC Darwin</td>
<td>Australia</td>
<td>1971</td>
<td>D.H.</td>
</tr>
<tr>
<td>4.815</td>
<td>ABC Canberra</td>
<td>Australia</td>
<td>1960</td>
<td>H.P.</td>
</tr>
<tr>
<td>4.835</td>
<td>ABC Melbourne</td>
<td>Australia</td>
<td>1943</td>
<td>H.P.</td>
</tr>
<tr>
<td>4.915</td>
<td>ABC Brisbane</td>
<td>Australia</td>
<td>1930</td>
<td>H.P.</td>
</tr>
<tr>
<td>4.935</td>
<td>ABC Sydney</td>
<td>Australia</td>
<td>1928</td>
<td>H.P.</td>
</tr>
<tr>
<td>4.955</td>
<td>ABC Adelaide</td>
<td>Australia</td>
<td>1919</td>
<td>H.P.</td>
</tr>
<tr>
<td>4.975</td>
<td>ABC Melbourne</td>
<td>Australia</td>
<td>1917</td>
<td>H.P.</td>
</tr>
<tr>
<td>5.005</td>
<td>ABC Sydney</td>
<td>Australia</td>
<td>1905</td>
<td>H.P.</td>
</tr>
</tbody>
</table>

### Table

<table>
<thead>
<tr>
<th>Country</th>
<th>Station</th>
<th>Frequency (MHz)</th>
<th>DXer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>R.Chefe de Feira</td>
<td>2.235</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Curitiba</td>
<td>2.265</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Cuiaba</td>
<td>2.275</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Porto Alegre</td>
<td>2.285</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Londrina</td>
<td>2.295</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Belo Horizonte</td>
<td>2.305</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Belo Horizonte</td>
<td>2.315</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Cuiaba</td>
<td>2.325</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Curitiba</td>
<td>2.335</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Porto Alegre</td>
<td>2.345</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Belo Horizonte</td>
<td>2.355</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Londrina</td>
<td>2.365</td>
<td>D.H.</td>
</tr>
<tr>
<td>Brazil</td>
<td>R.Belo Horizonte</td>
<td>2.375</td>
<td>D.H.</td>
</tr>
</tbody>
</table>

### Additional Information

- **Country**: Brazil
- **Station**: R.Chefe de Feira
- **Frequency (MHz)**: 2.235
- **DXer**: D.H.
### Local Radio Chart

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency</th>
<th>ELR</th>
<th>m.s.c.p</th>
<th>Listener</th>
</tr>
</thead>
<tbody>
<tr>
<td>556</td>
<td>Stockport R</td>
<td>I</td>
<td>7:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>565</td>
<td>Stockport R</td>
<td>I</td>
<td>7:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>565</td>
<td>Stockport R</td>
<td>I</td>
<td>7:40</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>575</td>
<td>Stockport R</td>
<td>I</td>
<td>8:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>585</td>
<td>Stockport R</td>
<td>I</td>
<td>8:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>595</td>
<td>Stockport R</td>
<td>I</td>
<td>9:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>605</td>
<td>Stockport R</td>
<td>I</td>
<td>9:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>615</td>
<td>Stockport R</td>
<td>I</td>
<td>10:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>625</td>
<td>Stockport R</td>
<td>I</td>
<td>10:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>635</td>
<td>Stockport R</td>
<td>I</td>
<td>11:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>645</td>
<td>Stockport R</td>
<td>I</td>
<td>11:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>655</td>
<td>Stockport R</td>
<td>I</td>
<td>12:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>665</td>
<td>Stockport R</td>
<td>I</td>
<td>12:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>675</td>
<td>Stockport R</td>
<td>I</td>
<td>13:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>685</td>
<td>Stockport R</td>
<td>I</td>
<td>13:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>695</td>
<td>Stockport R</td>
<td>I</td>
<td>14:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>705</td>
<td>Stockport R</td>
<td>I</td>
<td>14:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>715</td>
<td>Stockport R</td>
<td>I</td>
<td>15:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>725</td>
<td>Stockport R</td>
<td>I</td>
<td>15:30</td>
<td>B.C.E.H.J.M.O</td>
</tr>
<tr>
<td>735</td>
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<td>16:00</td>
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<tr>
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<tr>
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</tr>
<tr>
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<td>07:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
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<tr>
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<td>08:00</td>
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</tr>
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<td>08:30</td>
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</tr>
<tr>
<td>1115</td>
<td>Stockport R</td>
<td>I</td>
<td>09:00</td>
<td>B.C.E.H.J.M.O</td>
</tr>
</tbody>
</table>

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

### Station Addresses


**Radio Nacional de Bolivia**, Cas.2532, La Paz, Bolivia.

**Radio Vlaanderen International**, P.O.Box 26, B-1000 Brussels, Belgium.

**Slovak Radio International**, 81290 Bratislava, Mytna 1, Slovakia.

**Tajik Radio**, Chapayev Str.31, 734025 Dushanbe, Tajikistan.

**Trans World Radio Pacific**, 1868 Halsey Dr, Agana, Guam 96922-3505.

### Listeners:

- B: Andrew Stokes, Wells-next-the-Sea.
- C: Geoff Gowrie, Aberdeen.
- D: John Eaton, Woking.
- E: Gilly Mayes, Balgaght, Power.
- F: Skott Moschetta, E. Bristol.
- G: Sheila Hughes, Morden.
- H: Tony King, Swindon.
- I: Laurence Mason, Lowestoft.
- J: George Millanor, Winford.
- K: Martin Price, Shrewsbury.
- L: Martin Price, Sheffield.
- M: Andrew Stokes, Leicester.
- N: Tim Smith, Darlington.
- O: Andrew Stokes, Leicester.
- P: Peter How, London.
- Q: John Wells, East Grinstead.
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Lab ground plane civil airband aerial, mint condition, purchased new in March ‘94. Buyer collects, £12. Tel: Suffolk (0638) 578318.

Lowe Modemaster decoding kit for FAX, RTTY, NAVTEX and C.w. reception, includes hardware, software and extensive manual, all you need for excellent results on your PC for just £150 o.n.o. Mark, Crewe. Tel: (0270) 580341.


Realistic PRO2004 base scanner, boxed, operators manual, aerial, plus service manual, no mods. Yupiteru MVT-7000 hand-held scanner, ten months old, boxed with accessories, reluctant sale, buying h.f. receiver. Paul, Suffolk. Tel: (0264) 701931.

Rohe & Schwarz type EK07 D/2 short wave receiver, German, best valves receiver, excellent condition in cabinet, work shop manual, heavy. Offers over £450. Inspect and collect. Tel: London 081-813 3193.

Signal R32 airband receiver, 100 memories, v.h.f., NiCad pack, charger, case, two antennas, auto or manual scan, £120 or part exchange for Kenwood R1000. Tel: Warwick (0295) 670749.

Sony ICFSW55 power supply with A1 ant., manual, carry case, original packing, good condition, £155 carried pack. Diawa AF606K all-mode active filter, good condition, no instructions, hence £60 carried pack. Seon Smyth, 20 Talbot Drive, Scostanthoull, Glasgow G31 3RR. Tel: 01-959 7466.

Kenwood communications receiver R1000, good working condition, £180 o.n.o. Also RNR535D receiver, superb working order with Dressler antenna, £1100 o.n.o. SatCom scan 4000, full working order with accessories, £120 o.n.o. D. M. Dennison, 21 Merlyn Road, Thornton-Cleveleys, Nr. Blackpool, Lancs. Tel: (0253) 867402.

Kenwood communications receiver R1000, covers all bands 200kHz to 30MHz, a.m., s.s.b., c.w., clock timer, three separate antenna inputs, ‘phone output and noise blanker. New condition with manual, £265. Peter, Essex. Tel: 081-505 7207.

Kenwood R2000 with v.h.f. ERA microreader MkII V4.4, also RS232 display unit with synoptic decoder. Datong FL2 audio filter, UCI up converter, PC1 GC converter. Radio mobile 930 broadcast band car radio, m.w. to 17.5MHz analogue, spindgle mount, all with data, £50 each plus postage. Tony, Worcester. Tel: (0905) 647159.

ICS FAX1 facsimile and RTTY receiver terminal unit includes cables and manual in excellent condition, £150. G3KZU, Oxford. Tel: (0865) 630600.

ICS FAX1 weather fax, Navtex, RTTY, receive terminal unit includes cables and manual in excellent condition, £150. G3KZU, Oxford. Tel: (0865) 630600.

JPS N1R10 noise/interference/bandpass digital (DSP) filter, reduces/eliminates white, ignition, power line noise, heterodynes etc. Bandpass mode, steep skirts, adjustable centre frequency and band width for RTTY, Morse, s.s.b. etc., boxed, mint with manual, £300. Tel: Middlesex 081-570 5603.

JPS N1R10 revision 2.1 noise reduction filter, very little used, condition as new. Roberto Robba, 14063 Canelli (AT), Italy. Fax: 141 822022.

JRC NRDS25 receiver, mint condition, 12 months old, boxed with manual, RDI white paper. Peter Rouse said in Short Wave Communications ‘Stunning performance, leaves all others standing’, £695. Nigel Cross, Devon. Tel: (0392) 56638 daytime, (0647) 24687 evenings.

Kenwood communications receiver R1000, good working condition, £180 o.n.o. Also RNR535D receiver, superb working order with Dressler antenna, £1100 o.n.o. SatCom scan 4000, full working order with accessories, £120 o.n.o. D. M. Dennison, 21 Merlyn Road, Thornton-Cleveleys, Nr. Blackpool, Lancs. Tel: (0253) 867402.

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Sony SW1E ultra compact multi-band receiver, many features, c.w. phones, instruction manual, leather case and frequency guide, world-wide reception in your pocket, ideal travel companion for keeping in touch, £350, reduced to £185 for Sony SW77, new condition, Answerphone or FAX.

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Universal M900 decoder, new, £350, bargain at £450 o.n.o., as new, under guarantee, reason for sale, monitor available. Tel: Warwicks (0926) 54556 anytime.

Technical Software RX-8 multi-mode receive system for BBC-B, FAX, Packet, colour SSTV, RTTY, c.w., AMTOR, UsSAT, ASCII, Eprom, interface, leads, instructions, also Dumpmaster screen dump ROM with manual instructions, also Dumpmaster ASCII, Eprom, interface, leads, RTTY, c.w., AMTOR, UoSAT, BBC-B, FAX, Packet, colour SSTV, multi-mode receive system for Yaesu FRG8800 h.f. communications receiver, 530kHz to 1650MHz, telescopic and rubber antenna, supplied with case, charger, manual, ear-piece, boxed, as new condition, supplied with scanning directory, £230. Tel: Beds (0592) 412725 after 6pm.

Yupiteru VT 125I1 airband receiver, 10 months old only, excellent condition and performance, 20 memories, can be left in radio if required. Complete, boxed with manual, £100 delivered. Tel: Lincs (0754) 762359.

Yupiteru MVT7100, all-mode receiver, 100kHz to 1650MHz, a.m., f.m., w.f.m., u.s.b., l.s.b., c.w., NiCads charger, earphone, belt clip, aerial, Leatherette case, cigar lighter, manual and scanning directory, £220 o.n.o. Peter, Glos. Tel: (0608) 651721.

Yupiteru MVT8000 scanner, complete, all accessories and power supply, six months old, mint, £250. Books and discone antenna, £450. Reg Timmins, 20m magnetic long wire balun, £40. Tel: Derby (0332) 702094.

Yaesu FT790R multi-mode transceiver, mint, £90. Frequency counter, Black Star meteor 500, 5-600MHz, £50. Oscilloscope, Scopex 25MHz with case and probes, £60. Wex SP300 s.w.r. meter, £30. Wex CT150, £14. Tel: Surrey (0252) 870861 after 6pm.

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Yaesu FT790R multi-mode transceiver, mint, £90. Frequency counter, Black Star meteor 500, 5-600MHz, £50. Oscilloscope, Scopex 25MHz with case and probes, £60. Wex SP300 s.w.r. meter, £30. Wex CT150, £14. Tel: Surrey (0252) 870861 after 6pm.

Yupiteru 7100, 100kHz to 1650MHz, a.m., f.m., w.f.m., u.s.b., l.s.b., c.w., NiCads charger, earphone, belt clip, aerial, Leatherette case, cigar lighter, manual and scanning directory, £220 o.n.o. Peter, Glos. Tel: (0608) 651721.

Yupiteru MVT7100, all-mode receiver, 100kHz to 1650MHz, telescopic and rubber antenna, supplied with case, charger, manual, ear-piece, boxed, as new condition, supplied with scanning directory, £230. Tel: Beds (0592) 412725 after 6pm.

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Yaesu FT790R multi-mode transceiver, mint, £90. Frequency counter, Black Star meteor 500, 5-600MHz, £50. Oscilloscope, Scopex 25MHz with case and probes, £60. Wex SP300 s.w.r. meter, £30. Wex CT150, £14. Tel: Surrey (0252) 870861 after 6pm.
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Published by RSGB
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