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Memories 1200
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Receiver... Triple Superheterodyne
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Dave Robert's regular monthly column.

24  SCANNING - THE LAW & YOU
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Can fantasy become reality? Dave Roberts considers what would be the ultimate scanner.

Author's Info
See Page 42 for Author's Contact Details.

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Orders can be placed by sending a cheque or postal order to PW Publishing Ltd, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.
Hello everyone and welcome to our exciting special issue of SWM. I’m sure you’ll find it fascinating. Dave Roberts has done a terrific job of putting together some really interesting reading for us. Please let me have any comments, you can ‘phone, FAX, E-mail or write, I’ll be glad to hear from you.

Collins 95S-1A

I’ve had several readers contact me regarding the price of the wonderful 95S-1A that JW reviewed last month. Most publicly say thanks to its owner for the loan, you know who you are and it was a very generous act, thanks.

I too was interested in just how much Rockwell Collins were charging, so I got them to formally quote me for supply. The result, well it’s actually cheaper than I expected at $7999 plus duty, carriage and VAT, but it’s still fairly well out of my league. I wonder how many SWM readers will buy one though? My guess is more than one! Incidentally I wouldn’t be at all surprised if there are current 955-1A owners/users who read these pages on a regular basis.

PMR446

A while ago I mentioned the use of PMR446 at an off-road motor sport event run by the AWDC, that I attended on Salisbury Plain. Last weekend I visited the first ever Formula Off-Road event to be run in the UK. 1000HP Icelandic off-roaders on a motorcross course is something to be seen!

Anyway, there was even more activity at this event, lots of p.m.r. hand-holds being used by the organiser too. I had an E-mail from Scott R. heavens, A2V2 from Tampa Bay in suitable auroral conditions. AHA, in which he comments that my observations, "reminded me of my own experience with our Family Radio Service (FRS). As you may know, FRS is similar to PMR446; it’s limited to 14 channels in the 462 and 467MHz ranges, at a power level of 500mW, and with no licensing requirements.

When I first bought FRS equipment a couple of years ago, the channels were so dead that I sometimes wondered if my receivers were working at all. Now, thanks to an aggressive marketing campaign, FRS has finally begun to catch on. I think the turning point was last Christmas, when nearly every department store, pharmacy, and computer store was advertising FRS radios as a possible gift item. Several families in my neighbourhood bought them, and ever since, I’ve been hearing signals on a daily basis.

Even in my suburban area, there is still more dead air than activity. Mostly what I hear is people talking from car to car as they pass by on the highway, parents keeping tabs on their children, and kids making a horrendous racket (but thoroughly entertaining in the process!). As you’ve seen, however, once you get to a crowded event, amusement park, shopping mall, etc, the number of stations increases dramatically and the channels really start jumping. That’s why I wouldn’t even consider a radio without CTCS capability.

I’m not sure how ‘old’ the PMR446 service is in the UK, but if the American FRS is any indication of things to come (and if manufacturers really try to market their equipment to the general public), I’m sure you’ll see a change in activity levels sooner."

Well Scott, I’m sure you’re correct and PMR446 will definitely catch on.

Frequency Lists

I’ve been moaned at by a contributor to the SWM readers mailing list for not publicizing an excellent web site containing lots of frequency info. It certainly is well worth a look, if you’ve got web access that is.

The URL you need is www.geocities.com/CapeCanaveral/Launchpad/8243/spectrum.html

To quote "MegHz*, "What a brilliant web site, I could spend hours there. It’s amazing that it never gets a mention in any of the mags...". Well ‘Meg’, now this one has.

SWM Readers List

And speaking of the list, Good news for that very E-mail forum, run by me especially for SWM readers. The list has moved to a server with a permanent connection to the Internet. All those of you that were subscribed to the old server have been automatically moved to the new one, as you’ll have noticed by now. Anyone wishing to subscribe and join in the exchange of ideas and news, need to send an E-mail to SWM_readers-subscribe@egroups.com and once you’ve joined messages for distribution are posted to SWM_readers@egroups.com. There are several improvements to the service as a result of the move and these are: On-line archive via web pages. Sign-up by web or E-mail. Faster turn-around of postings. A group file area to allow pictures to be shared with the list.

The URL to the list web page is http://www.egroups.com/group/SWM_readers

I hope that those of you that use the list will continue to enjoy the [SWM Reader] list in its new form.

New HF Receiver!

After a long period in the h.f. receiver doldrums, I’m glad to announce that there is now a radio about to hit the market, for more news and a review of this new receiver don’t miss next month’s SWM, and read the definitive review from JW.

Solar Flares

On Tuesday 6th June, (I’m writing this on the 9th), three major flares on the sun (an M-class and 2 X-class) were positioned such that the shock waves impacted the earth. While we have seen several X-class flares this solar cycle, none have been positioned in the centre of the sun to impact us this directly.

The next few days, starting Thursday evening, will be very exciting as the shock wave from these three flares reaches us, triggering some major geomagnetic storms and possible auroral activity into the centre of the USA. How strong of an effect we’ll experience will become more obvious as the shock wave gets closer and satellites measure its passage.

If it triggers an extremely severe geomagnetic storm, power grid failures and damage to satellites are possible too.

For h.f. users, the bands will be pretty much trashed for the duration of these geomagnetic storms, from around late Tuesday into the weekend. Also h.f. blackout conditions may occur.

Well, there was almost a blackout reported on Tuesday afternoon, we’ll just have to see what other effects are noted in the next few days.

For more detailed information before the next issue of SWM see www.sec.noaa.gov/today.html and we might get something on the SWM web site now it’s in-house.

So whatever the frequency, happy listening.

Kevin
Dear Sir
I have read the letter from Ian Johnson describing the connection of an earth to his scanner to improve the reception and the fitting of a choke in series with that earth connection. The logic used shows a misunderstanding of the function of an earth in the reception of r.f. signals.

The receiver input signal is produced by the current flowing into its antenna input connector, through its input impedance then via the body of the scanner to earth. All of this is simply explained by Ohms Law. When the impedance between the body of the scanner and earth is smallest the current will be at its maximum and visa versa.

The input to the scanner will contain both signal and noise. If a noisy earth is used then visa versa.

The above explanation assumes a whip or...
Novice & RAE Courses

The Bexley College are planning to deliver the City & Guilds Amateur Radio Course (RAE) from 12 September 2000. The course will run for an academic year, finishing in May 2001 with students able to sit the May 2001 RAE. Morse is taught for the remainder of the year until July.

If you are interested, contact the Guidance & Admissions Centre on (01322) 404000/404001, leave your name, address and telephone number and an enrolment form will be mailed out to you during the summer break.

The Radio Society of Harrow will be starting a Novice course for anybody wanting to sit the Radio Amateur Novice Licence on Monday 18th September. For further information, please contact Don Lamb GOACK on 0208-845 9575.

The East Cleveland Amateur Radio Club are holding an RAE course on Friday evenings in the committee room of the New Marske Institute Club, Gurney Road, New Marske, near Redcar. Enrolment will be on 8th September 2000. Further details from Alistair G4OLK on (01642) 475671.

CRI & WRN Strengthen Co-operation

China Radio International and World Radio Network (WRN) strengthened their relationship with a symbolic ribbon-cutting ceremony at WRN’s London headquarters back on 25th April 2000. A high-level CRI delegation was in the UK on a fact-finding mission and was invited by WRN to meet staff, visit WRN’s extensive Technical Operations Centre and discuss areas of further co-operation.

The two organisations signed a collaboration agreement in Beijing in August 1999, and have been working closely together to bring CRI programming to a wider international audience. English and German language programmes from CRI are now broadcast on three of WRN’s international radio networks; WRN1 Europe, WRN1 North America and EuroMax Deutsch.

The CRI programming on WRN1 Europe is available in 4.5 million homes in UK and Ireland and 25 million homes throughout Europe via the Astra 2A digital satellite. Furthermore, CRI’s daily one-hour news and current affairs programme in English is broadcast across London on Spectrum Radio 558 AM. The CRI programme is downlinked from satellite at WRN’s Technical Operations Centre in central London and relayed to Spectrum 558 AM for broadcast.

Heading the CRI delegation was Mr Wang Qinwen, CRI’s Deputy Director and included Mr Ji Guogang, Director of CRI Financial Department, Mr Mei Xueping, Senior Engineer of CRI Technical Department and Mr Li Feng, Senior Member of CRI Administrative Office. The meeting was also attended by His Excellency Mr Ma Zhengang, Ambassador of the People’s Republic of China to the United Kingdom.

In a speech to welcome the guests, Mr Karl Miosga, WRN’s Managing Director, underlined the reason for the close CRI/WRN working relationship, “since we signed a collaborative agreement with CRI, we have been working together to increase the audience for CRI broadcasts and thus increase the knowledge of China, its culture and the developments that are occurring within the country.”

After Mr Miosga, Mr Wang Qinwen and His Excellency Mr Ma Zhengang participated in the ribbon-cutting ceremony, the delegates toured WRN’s Technical Operations Centre. The visit was rounded off with a lunch in the WRN boardroom with representatives from Spectrum 558 AM, the Xinhua News Agency and London Correspondents from Chinese newspapers.
High Power, High Gain

Mitsubishi Electric is announcing the introduction of the MGF548V and MGF48V L and S band push-pull IMFEs for amplifier applications. The 120V operational devices are ideal for wireless local loop, base stations, radio links and other communications applications where high power, high efficiency and high linear gain are paramount.

The GaAs power f.e.t.s are both 60W devices and come hermetically sealed in metal ceramic packaging for high reliability. MGF548V/2527 produces typically 60W output power over the 2.5-2.7GHz bandwidth, with a high power gain rated at typically 10dB and a high power added efficiency of typically 40%.

MGF48V/1520 is for 1.9-2GHz applications and produces typically 60W output power, with a high power gain of typically 11.5dBi and a high power added efficiency of typically 45%. The push-pull type GaAs f.e.t.s are rated at -20V gate to drain and -10V gate to source voltages. Channel temperature during operation is around 175°C and the devices can be stored at temperatures ranging from -45 to +175°C.

More information from Mitsubishi Electric Europe BV, Semiconductors, Travellers Lane, Hatfield, Herts AL10 8XB, Tel: (01707) 276100, FAX: (01707) 278997 or visit their web site at: http://www.mitsubishichips.com

New Company

Ultimate Aerials is a new company that has recently started trading in the North, North East and North West of Scotland and are currently based near Huntly. They are now offering a local source for antennas, radios, scanners and accessories.

Radio & TVDX News

It's official! The Australian chs. A0, A1, A2 will have all closed down by 9 September 2008 with their incumbents moved onto greener pastures in Band 3 or u.h.f. and converted on route into digital.

Our old friend TV12, the Isle of Wight RSL-TV channel, has announced that the Luccombe relay will open by the end of June and Ventnor/Sandown South Wight by the end of August. Their Chichester transmitter and studio will also be operational by Autumn 2000.

Sky TV News will also be carried by TV12 at the following times: 0700-0800; 1200-1300; 1700-1800 and again at 2200. QVC is also carried late night with offering from Bloomberg at other times when local programming isn’t carried. TV12 operates on ch.654 horizontal from Rowridge and is well received on the nearby mainland - a good TVDX catch.

The Spanish government have allowed the opening of two new commercial TV digital channels, the licences running for 10 years. This will bring a total of five commercial private channels operational (already Canal+, Antena 3 TV and Tele 5) in addition to the national RTVE state players La Primera and La 2. The existing private broadcasters have all had their licences extended for 10 years - conditional on them adopting parallel digital transmissions within the next two years.

Whereas the move into digital audio broadcasting (DAB) in the UK has been to open dedicated Band 3 frequencies requiring a special antenna and very expensive DAB receiver, the Americans have gone down another road. They have evolved a system that allows the digital programming to ride piggy back alongside the normal analogue f.m. transmissions in the existing Band 2 spectrum.

Known as 'BOC' (in band on-channel) transmission, the digital info sits each side of the 200kHz channel. Two versions of this technique are operational and the FCC are to assess the current variations with a view to opening Band 2 mid 2002.

BT have been awarded the contract to provide the new PSRCP project - Public Safety Radio Communications Project. This is the largest TETRA contract ever awarded totalling £2.5 billion. The digital integrated voice/data service will install through to 2004 in the 380-400MHz band providing comprehensive and 'interlocking' communication between all emergency services including coastal rescue services.

First tests will start September 2000 with the police first using the system. The Lancashire Ambulance service will also be participating. Progressively nine police forces will go TETRA in 2001, 13 in 2002, 14 and the last five in successive years. BT will subcontract installation to both Motorola and TRW.

Hand-helds and other units will be available from Nokia, Marconi, Simoco et al. "Core services" including voice, 'messaging' and a bearer data service giving access to the Police National Computer (PNC) will be provided to all forces. These core services also utilise the inherent security of digital operation which overcomes the eavesdropping problems associated with analogue. Scanner users please note! For more information, check out the TETRA website at www.tetramou.

Finally, an interesting report in the BDIX (Holland) that details F2/TE reception during good F2 conditions in February. Ian Roberts (‘Bur’ received TV signals from Germany, Portugal, Switzerland, Madrid, Homs (Syria), Iran and Hungary on either ch. E2 or ch.R1. All three German ch.E2 transmitters were received and the m.u.f. is thought to have reached 53MHz.
Bandscans Europe

I nreported in the last ‘Bandscans Europe’ column that digital radio is starting to take off here in the UK. On 10th June, CE Digital, the group formed by Capital Radio and EMAP Radio, launched its digital radio services in London, Birmingham and Manchester, and by the end of the month, London’s digital ‘early adopters’ gained another raft of services when Switch Digital went on the air.

Two new national digital radio services joined the Digital One multiplex in the first half of the year. One is the new spoken-word station that broadcasts plays, books and comedy programming. Primetime is an easy listening service produced by SAGA Radio, a division of the company that provides services from insurance to holidays for over 55s.

The digital landscape in radio is certainly changing, and Digital One is working hard to ensure a supply of the last DAB Digital Radio receivers in the UK marketplace. Look out this summer for in-car radio sets at just under £300. For more information, call the Digital One helpline on 0207-518 2620, or if you’ve got access to the Internet, log on to www.ukdigitalradio.com

Land Of Analogue

Back in the land of analogue radio, long wave is still a force to be reckoned with. Regular readers may remember that I’ve been telling the story over the past year or two of how a group of Dutch radio operators want to launch a long wave service called Delta Radio. Delta plans to beam music programmes to the UK.

At one stage, environmental objectors forced the station to stop broadcasting, literally building the enormous long wave transmitting masts in international waters off the Dutch coast. There were enormous technical challenges, such as how to feed the hundreds of kilowatts needed to run a long wave radio station out under the North Sea with safety and reliability.

Now, however, it seems that the station may be able to locate on-shore. It has submitted an application to build the long wave transmitter and antenna at Kootwijk, an old short wave station. One major British transmission company with experience of long wave broadcasting is reportedly short-listed as the builder of the transmitting facility.

Station News

In neighbouring Luxembourg, there is still no news about the state of the English-service that was planned by Briton Eric Wilthite. It’s been almost a year since the plans were announced, and nothing concrete has been heard about the relaunch of Luxie 208.

In May, the media in Serbia suffered a crackdown. On Wednesday 17th, Yugoslav police raided Studio B television in Belgrade and forced it off the air. Studio B was the last major television station not loyal to the Serbian government, and the Serbian authorities closed it because they claim it had illegally called for the violent overthrow of the government.

Radio Station Director denied this claim. As a result of Studio B’s closure, Radio B2-92 was forced off the air. B2-92 is the successor to the formerly independent Radio B92 that was taken over the Serbian authorities in April 1999 and B2-92 had been using a Studio B radio frequency. The radio operation got back on the air via satellite and the Internet, although it is unclear whether they have regained terrestrial transmission.

Back in April, Fahri Musliu, a Belgrade-based ethnic Albanian freelance reporter for the Voice of America’s Albanian service was detained for around two and a half hours by Belgrade police. The authorities claimed that Mr Musliu had failed to pay taxes.

Russia’s deputy minister for mass media, Andrei Romanchenko, has claimed that Prague-based Radio Liberty is hostile to the Russian state. Radio Liberty, which is funded by the United States government, broadcasts in Russian and other languages of the former Soviet Union. During the Cold War, Radio Liberty and its sister organisation, Radio Free Europe, beamed propaganda and alternative programming to countries in the Soviet Bloc.

Thomas Dine, RFE/RL’s president, rejected the charges, although he recognised that the views of Mr Romanchenko seemed to reflect the views of new Russian president, Vladimir Putin. The day after Mr Dine had spoken, the head of Russia’s press ministry said that Romanchenko was expressing ‘his own private point of view’.

Talking of propaganda services, there are two little-known services funded by Britain’s Foreign and Commonwealth Office to promote the voice of the UK around the world. British Satellite News provides TV footage on a free-of-charge ‘agency’ basis to TV stations worldwide, while the London Radio Service produces news and feature material that is available for radio stations to use across the world.

Both services have been produced under contract by APTN for the past three years, and earlier this year, tenders were invited for the next three-year contract. During the final stage of presentations to the Foreign Office, APTN withdrew from the bidding process, saying that it no longer wished to produce the service as it potentially harmed APTN’s image as an independent news agency. This left four bidders: Phoenix, a new company formed by former APTN Director Steve Turner; Worldwide Television, Media Link, and United News and Media. In the end, the FCO awarded the BSN contract to Worldwide Television and the LRS contract to Media Link. The new contracts start in the autumn.

The role of international radio broadcasting at times of crisis cannot be underestimated. As the border war continues to rage between Ethiopia and Eritrea, Deutsche Welle has increased broadcasts in Amharic. It has extended its daily one-hour programme by fifteen minutes to incorporate information about international aid organisations active in Ethiopia. Deutsche Welle says that it is the most listened-to foreign broadcaster in Ethiopia, with four million people tuning in at least once a week.

At the same time, the Voice of America has added an hour of Amharic at weekends, with programmes in Tigrigna and Oromiffa for 15-minutes each, Monday to Friday. Frequencies for this hour-long transmission at 1900 are 11.68MHz from Kavala, Greece; 13.74MHz from Sri Lanka and 15.525MHz from Botswana.
Once again the holiday season is here and many listeners will be packing their bags and heading for their chosen location. Exploring a new location can be a very interesting and rewarding experience. Equally enjoyable will be revisiting favourite places and meeting old friends if you prefer to return to familiar haunts.

It may be worthwhile to search the broadcast bands with a small portable receiver during the evening, so don't forget to take one with you! If you care to make a note of the broadcasts you hear and send the details to me I will be pleased to include some of them in LM&S. Please be sure to quote times in Universal Time Co-ordinated (UTC +GMT).

Long Wave Reports

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

A broadcast in Italian by Radiotelevisione Italiana (RAI) via their 10kW outlet at Caltanissetta, Italy, on 198kHz was picked up at 2055UTC on April 30 by Fred Pallant in Storrington. Reception was very poor owing to ‘splatter’ from Saarlouis, Germany (100kW) on 183kHz. Rikutsuvapair (RUV) in Reykjavik also has an outlet on 183kHz – it is located at Gufuskalur, W.Iceland. Thomas Williams (Truro) heard it for the first time at 2305UTC on April 32. He listened again at 2305 on the 25th and heard a discussion. He says “I thought first the language was Dutch, then Spanish but the speakers are slow with a lilt something like the Welsh”. On the 29th he logged their transmissions at 2300UTC as SINPO 77777.

During a visit to the North West coast of Scotland Brian Kaye (Gt.Bootham) found he could receive the broadcasts from RUV in Reykjavik via their outlets at Gufuskalur on 189 and Eider, E.Iceland (100kW) on 207 during most of the day on an ordinary car radio plus whip antenna, with only a little splatter from BBC R4 on 198kHz. No doubt the long clear sea paths result in little attenuation of the ground waves from these stations.

Medium Wave Reports

There were no reports of broadcasts from m.w. stations in E.Canada and E.USA reaching the UK at night during April. However, the sky waves from some of the many of the m.w. stations in the Middle East, N.Africa, Europe and Scandinavia did arrive here after dark - see chart.

The ground waves from some local radio stations were received in quite distant places during daylight - see chart. While searching the band in Northampton Fred Wilmshurst noticed that RTL Country on 1035kHz were using the ident ‘Ritz 1035 AM’.

Short Wave Reports

We are now in the peak year of the present solar cycle and many listeners are very disappointed that most broadcasters are not prepared to venture into the 25MHz (11m) band. Radio France International (RFI) is still broadcasting daily on 25.820 to listeners in E/C.Africa (Fr to E/C.Africa 1600-2000) and 23544 at 2220 in Newry. They have reached the UK via back scatter and other modes and broadcasting daily on 25.820. At 1230UTC on May 9 their transmission rated 43444.

Quite a few broadcasters beam their transmissions in the 21MHz (13m) band to listeners in selected areas but they can often be received well in other areas too. Mentioned in the reports were R.Finland via Pori 21.670 (Eng to Australia, Asia, W.Eur 0630-0645), rated 55444 at 0645 by Stan Evans in Herstmonceux; V of Russia 21.790 (Eng) W53344 at 0840 in St Albans; R.Australia via Shepparton 21.725 (Eng to Pacific areas 0200-0900) 22222 at 0900 by Tony Hall in Freshwater Bay, IOW; DW via Wertachtal 21.790 (Eng to Australia, Asia 0900-1400) 4433 at 0915 by Sheila Hughes in Morden; DW via 21.680 (Eng to Oceania? 0900-0950) 35433 at 0941 in Northampton; R.Austria Int, Moosbrunn 21.765 (Ger, Eng to Australia 0930-1000) 33244 at 0950 by Robert Hughes in Liverpool; R.Norway Int 21.755 (Nor to S.America 1000-1074) 40034 at 1000 in Oxford; BBC via Cyprus 21.470 (Eng to Africa 1300-1700) 44434 at 1313 in Newry; UAE Abu Dhabi 21.735 (Ar to N.Africa 0700-1600) 44444 at 1450 by David Hall in Morpeth; WWFR Dorkeshease, USA 21.455 (Eng to Eur 1600-1700) 43344 at 1715 by Tom Winzor in Plymouth; R Nederlands via Bonaire, NL 21.590 (Eng to C.Africa 1830-2025) 35433 at 2015 in E.Bristol. The narrow 18MHz (15m) band, which is intended for s.s.b. broadcasting in the future, is being used by a few broadcasters with a.m. transmissions at present. They include R.Denmark via R.Norway 18.950 (Da to M.East? 0830-0855), rated 32423 at 0830 in Colyton; R.Norway 18.950 (Nor to N.America 1200-1230) 35444 at 1222 in Northampton; R.Sweden 18.950 (Eng to N.America 1230-1300) 45444 at 1242 in Plymouth, Christmas Science BC via WSHB Cypress Creek 18.910 (Fr, Eng to E/C.Africa 1600-2000) 34232 at 1808 in Newry. Good reception over long distances has been noted in the 17MHz (16m) band by some listeners in the UK. The most distant transmission comes from R.New Zealand on 17.675 (Eng to Pacific areas 1755-0705), rated 44333 at 0814 in Newry. R.Australia's broadcast to Asia via Shepparton on 17.750 (Eng 0000-0500, 0600-0830, 0830-1100) has also been received well. It was logged as a potent 44344 at 0915 by David Edwardson in Wallasey & 44444 at 0918 in Truro.

The latest report from Alain Roberts (Quebec, Canada) indicates that Radio For Peace International (RFPI), Costa Rica is still active on 25.930. On May 9 he rated their u.s.b. transmission (Eng to Americas 1200-?1) 34333 at 1800UTC, so listeners in the UK may well find it worthwhile to monitor that frequency. He has been receiving RFI well on 25.820. At 1230UTC on May 9 their transmission rated 43444.
**Short Wave Magazine, July 2000**

**Length 1420mm Wide Band 16 Element directional**
Freq. Range 100-1300MHz

**LOG PERIODIC MLP32**
- Rotation Torque-222Kg
- Vertical Load-45Kg
- Mast Size - 26-44mm
- Control Box-230v AC
- Cable-3 core
- Direct Compass Bearings

**MORNRAKER (UK) LTD.**
- 1.15' SWAGED POLES
- IMPROVED RECEPTION WIRE & INSULATOR
- WIRE BALUN KIT)
- MD37 SKY WIRE (LONG satellite signals.
- weather external use to
designed for

**This Antenna,.. --**
Freq. Range 0.05-30MHz Length 770mm

- SWP 2000 FREQ. 25 - 2000 MHz
- SWF HF30 FREQ. 0.05-30MHz Length 770mm
- TFK TRK MILLIAR 0.05 per mtr. Mini RFI 0.05 per mtr. R59B STANDARD 0.35 per mtr. R59B MILITARY 0.60 per mtr. 225 mm

**WEBER SATIDATELLE ANTENNA**
- TURNSTILE 137
- Freq. 137.5 MHz
- Length 1000mm

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

**SUPER SCAN STICK II**
- Freq. Range 0-2000MHz
- Length 1000mm
- It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils to give maximum sensitivity to even the weakest of signals. (For the amateur who wants that extra sensitivity)

**MULTISCAN STICK**
- Transmit 144 - 146 MHz
- 4.5 Dbd Gain

- Length 1000 mm.

**G.SCAN II**
- Freq. Range 25-2000 MHz Length 620 mm. Magnetic mount Mobile Scanner Antenna, 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. (Good for when you are driving around)

**IVX 2000**
- Transmit 50 - 52 MHz
- Mini 2.00 Dbd
- 144 - 146 MHz
- 4.00 DbB
- 420 - 430 MHz
- Gain 8.00 DbB
- Length 2.5 m.

**5' SWAGED POLES**
- Heavy Duty Angle (1.2mm wall)
- SINGLE 11/2".............. £6.00
- SET OF FOUR 1"x........... £19.95
- SET OF FOUR 11/2".... £29.95

**CONNECTORS**
- PL259/7................. 0.75 each
- PL259/6................. 0.75 each
- PL259/7 for mini 1.00 each
- BNC (Screw type) 1.00 each
- BNC (Screw type) 1.00 each
- N TYPE for N68-2...50 each
- N TYPE for N6813-2...50 each
- SO396 to BNC ........... 1.50 each
- PL259 to BNC ........... 2.00 each
- N TYPE to SO396....3.00 each

**CABLE**
- RG213 MILITARY 0.08 per mtr.
- MINI RFI 0.05 per mtr.
- R59B STANDARD 0.35 per mtr.
- R59B MILITARY 0.60 per mtr. 225 mm

**WEATHER Satellite Antenna**
- TURNSTILE 137
- Freq. 137.5 MHz
- Length 1000mm

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- Freq. Range
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- 430-440MHz
- 900-986MHz
- 1240-1325MHz

**£39.95**
- MULTISCAN STICK
- Freq. Range Receive 0-2000 MHz.
- Transmit 144 - 146 MHz
- Gain 4.5 Dbd

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- IVX 2000
- Transmit 50 - 52 MHz

**£27.95**
- MICRO MAG
- MTS42
- Freq. Range
- 25-2.1 GHz

**£39.95**
- SUPER DISCONE
- Freq. Range 25-2000MHz
- Length 1380mm

**£39.95**
- DISCONE
- Freq. Range 70-700MHz
- Length 920mm

**£19.50**
- UK SCANNING DIRECTORY

**£29.95**
- ADP SCAN PER WEEK

**£19.50**
- DISCONE
- Freq. Range 70-700MHz
- Length 920mm

**£29.95**
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- MD1 (Length 100mm Use in Cars & Vans)
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**£27.95**
- G.SCAN II
- Freq. Range 25-2000 MHz Length 620 mm.
- Magnetic mount Mobile Scanner Antenna, 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. (Good for when you are driving around)

**£19.50**
- DISCONE
- Freq. Range 70-700MHz
- Length 920mm

**£9.95**
- SUPER SCAN STICK II
- Freq. Range 0-2000MHz

**£29.95**
- DISCONE
- Freq. Range 70-700MHz
- Length 920mm

**£89.95**
- IVX 2000
- Transmit 50 - 52 MHz

**£9.95**
- SWF HF30
- Freq. Range 0.05-30MHz Length 770mm

**£34.95**
- Offset Triple 3Db Gain over a standard conventional discone. Comes complete with mounting hardware and brackets. (Ideal for the novice)
Also received here during the morning were the BBC via Ascension Is 17.830 (Eng to Africa 0800-2100) 54444 at 0835 in Stalbridge; VOA via Philippines 15.255 (Eng to E.Asia 1700-1800) 33232 at 1700 by Tom Smyth in Co.Fermanagh; Dudley; BBC via Ascension Is 15.400 (Eng to Africa 0700-1000, [also via Woofferton, UK Russ 1100-1200]) 1.50 at 1000 in Dudley. BBC via Ascension Is 17.830 (Eng to Africa 0800-2100) 54444 at 0835 in Stalbridge; VOA via Philippines 15.255 (Eng to E.Asia 1700-1800) 33232 at 1700 by Tom Smyth in Co.Fermanagh; Dudley; BBC via Ascension Is 15.400 (Eng to Africa 0700-1000, [also via Woofferton, UK Russ 1100-1200]) 1.50 at 1000 in Dudley.

Later, the vehicle from Greece, Athens 13.685 (Gr, Eng to N.Africa 0700-0800) 33232 at 0800 in Dudley; BBC via Ascension Is 15.400 (Eng to Africa 0700-1130) SIO 444 at 0700 by Tom Smyth in Co.Fermanagh; KTVG, Khabarovsk 14.950 (Eng to Russia 1600-1900) 53333 at 1600 in Dudley; BBC via Ascension Is 15.400 (Eng to Africa 0700-1000, [also via Woofferton, UK Russ 1100-1200]) 1.50 at 1000 in Dudley. BBC via Ascension Is 15.400 (Eng to Africa 0700-1000, [also via Woofferton, UK Russ 1100-1200]) 1.50 at 1000 in Dudley.

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/vee.
Wooferton, UK 12.095 (Eng to Asia 1700-2100) 43333 at 2015 in Morden; R.Bulgaria 11.700 (Eng to Eur 2100-2200) SIO 444 at 2109 by Francis Heanne in N.Bristol; WWCR Nashville, USA 12.160 (Eng to Asia) 1400-2200 SIO3433 at 2200 in Co.Fermanagh; BBC via Ascension Is 12.095 (Eng to S America 2100-0000) rated 2622 at 0045 in E.Bristol; BBC via Cyprus 12.095 (Eng to E Africa) 0330-0400 2222 at 0315 by Bill Griffith while in New York.

There is much to interest the listener in the 9MHz (31m) band too! During the morning R.Nederlands via Bonaire, Ned.Antillies 7.995 (Eng to Asia, Far East 0930-1125) rated 43334 at 0940 in St Albans; AVR via 7.961 (Eng to Eur 0700-1000) 4344 at 0940 in Freshwater, Bay of Limfjord; R.Nederlands via Wetzachtal 9.860 (Eng to Eur 1030-1224) 5444 at 1150 in Plymouth; R.Vlaanderen Int., Belgium 9.255 (Eng to Eur 1130-1200) 5544 at 1150 in Northampton.

During the evening VO4 via Kavala 9.760 (Eng to M.East) 1700-2100 was SIO 333 at 1730 in Co.Fermanagh; BBC via Kranji, Singapore 9.740 (Eng to Australia) 1800-2200 23222 at 1825 in Calyon; R.Pyongyang, Korea 9.335 (Eng to Eur 1900-2000) 43334 at 1900 in Duisburg; R.Nederlands via Flevo 9.895 (Eng to Africa 1830-2025) 5555 at 1930 in Liverpool; R.Australia via Shepparton 9.500 (Eng to Asia 1430-2130) 24343 at 1941 in Storrington; V of Armenia via Kamo 9.865 (Eng to Eur 1995-2015) 43443 in 1955 in Morden; China R.Int via 9.440 (Eng to Eur 2000-2100) 4444 at 2037 in London; BBC via Bulgaria 9.400 (7 to 7-7) 33443 at 2043 in Stockport.

Later, VO4 via Thailand? 9.525 (Eng to 7.2100-2200) was 32333 at 2151 in Woodhall Spa; R.Cairo, Egypt 9.990 (Eng to Eur 2115-2245) 39343 at 2211 in Newry; R.Nac del Paraguay 9.735 (Sp 0800-0900) 24543 at 2256 in Wallseid; BBC via Kavala 9.410 (Eng to 7.0800-8.007) 07333 at 07301 in New York; Swiss R.Int via Sottos 9.885 (Eng, Sp, Fr, It to N & C America 0030-0545) 44444 at 0348 by John Parry in Larnaca, Cyprus.

Some of the broadcasts to Europe in the 7MHz (41m) band were mentioned in the reports; R.Japan via Wooferton, UK 7.230 (Jap, Eng 0500-0700) was rated 55444 at 0530 in Herzommsone; V of the Mediterranean,
Tropical Bands Chart

<table>
<thead>
<tr>
<th>Freq (MHz)</th>
<th>Station</th>
<th>Country</th>
<th>UTC</th>
<th>DXar</th>
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<tr>
<td>3.245</td>
<td>SWF Lima</td>
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<td>3.740</td>
<td>BBC via Moreton Inlying</td>
<td>England</td>
<td>1500</td>
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<td>3.770</td>
<td>Namibian BC-Windhoek</td>
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<td>3.885</td>
<td>NLBC Yaounde</td>
<td>Cameroon</td>
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<td>3.915</td>
<td>SLSG Goudaidon</td>
<td>Senegal</td>
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<td>3.935</td>
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<td>3.945</td>
<td>AIR Bujumbura</td>
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<td>3.955</td>
<td>RTL via Stuttgart</td>
<td>Germany</td>
<td>2300</td>
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<td>3.975</td>
<td>R.BBC via Stuttgart</td>
<td>Germany</td>
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<td>4.015</td>
<td>DW via Julien</td>
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<td>4.255</td>
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<td>4.730</td>
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<td>4.745</td>
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<td>Pakistan</td>
<td>0800</td>
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<td>4.755</td>
<td>ENBS Amena</td>
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<td>1000</td>
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<td>4.800</td>
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<td>4.820</td>
<td>RTN China</td>
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<td>4.900</td>
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<tr>
<td>4.950</td>
<td>R.France via</td>
<td>France</td>
<td>1500</td>
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<tr>
<td>4.980</td>
<td>R.Iran via</td>
<td>Iran</td>
<td>1600</td>
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<tr>
<td>5.020</td>
<td>R.Brazil via</td>
<td>Brazil</td>
<td>1700</td>
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<tr>
<td>5.040</td>
<td>R.India via</td>
<td>India</td>
<td>1715</td>
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<td>5.060</td>
<td>R.Brazil via</td>
<td>Brazil</td>
<td>1800</td>
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<tr>
<td>5.100</td>
<td>R.Bosnia via</td>
<td>Bosnia</td>
<td>1900</td>
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<tr>
<td>5.110</td>
<td>R.Taipei via</td>
<td>Taiwan</td>
<td>2000</td>
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<tr>
<td>5.150</td>
<td>BBC via</td>
<td>England</td>
<td>2100</td>
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</tbody>
</table>

List Of Equipment Used

**LM** for $5 to $5, # June 1, *July 2000.*

- Vera Brindley, Woodhall Spa: Roberts R-687 or Sangean ATS-803 a.r.
- Michael Casey, Manchester: Roberts RC-828 + Howes CTUB a.t.u. + MFIS fl. s.p. filter + 66m & 46m loops in loft.
- Robert Connolly, Kilkeel: JRC NRD-525 + Timewave DSP a.ri. filter + Datong AD370 or Sangean ATS-803 a.r.
- Brian Keyte, Gt. Bookham: AOR AR7030 + loop or a.t.u. + 200m top strand.
- Simon Hockenhull, E. Bristol: Roberts R-617, R-817 or R-876.
- Robert Hughes, Liverpool: AOR AR7030 + loop or a.t.u. + 30m top strap.
- Tony Hall, Freshwater Bay, I.O.W: Yaesu FRG-7 + 13m wire or RF-B45.
- Martin Goodey, St. Mary's, Isles of Scilly: AOR AR7030 + 25m wire.
- Robert Connolly, Kilkeel: JRC NRD-525 + Timewave DSP a.r. + filter + Datong AD370 or Sangean ATS-803 a.r.
- David Edwardson, Wallisend: Trio R-660 + 2.5m x 2.5m fixed loop or 22m long trap dipole.
-based station reports, cipher text.
- Fred Wilmshurst, Northampton.
- David Edwardson, Wallisend: Trio R-660 + 2.5m x 2.5m fixed loop or 22m long trap dipole.
- David Edwardson, Wallisend: Trio R-660 + 2.5m x 2.5m fixed loop or 22m long trap dipole.
- Vic Prieg, Colyton: Redifon R-551N + a.t.u. + r.w. or loop in loft.
- Brian Keyte, while at Rhue, Scotland: AOR AR7030 + loop or a.t.u. + 200m top strap of roadside fence.
- Eddie McKeown, Newry: Grundig Yacht Boy 400 or Sangean ATS-818.
- Philip Rambaut, Macclesfield: Int. Marine Radio R.700M or ITT Mackay Marine.
- Alan Roberts, Quebec, Canada: Lowe HF-225 + 11m vertical dipole.
- Brian Keyte, while at Rhue, Scotland: AOR AR7030 + loop or a.t.u. + 200m top strap of roadside fence.
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**Signal Strength**
- 5 excellent
- 4 fair
- 3 poor
- 2 barely audible
- 1 extreme

**Propagation**
- 5 nil
- 4 slight
- 3 moderate
- 2 severe
- 1 extreme

**Overall Merit**
- 5 excellent
- 4 good
- 3 fair
- 2 poor
- 1 unusable

Malta via Russia? 4.795 (Eng 0400-0500) 54554 at 0445 in New York; WEWN 4.920 AIR Chennai India 0022 1941 4.950

**Radio**
- 6 Berlin, Germany 0600 (Eng 2200-0900)
- 200m top strap of roadside fence.
- Eddie McKeown, Newry: Grundig Yacht Boy 400 or Sangean ATS-818.
- Philip Rambaut, Macclesfield: Int. Marine Radio R.700M or ITT Mackay Marine.
- Alan Roberts, Quebec, Canada: Lowe HF-225 + 11m vertical dipole.
- Brian Keyte, while at Rhue, Scotland: AOR AR7030 + loop or a.t.u. + 200m top strap of roadside fence.
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SANGEAN ATS-505
FM-STERO/MW/LW/SW/PLL SYNTESISED RECEIVER

- Professional digital multi-band world receiver.
- Continuous AM coverage 150-29999kHz.
- Five tuning methods - direct frequency access, auto scan, manual tuning, memory recall and rotary tuning.
- 45 presets.
- ATS (auto tuning system) - auto scan and preset, SSB.
- Short wave dual onversion, 1kHz/step fine tune.
- Memory scan.
- Tone control, etc.

£99.00 + P&P

AKD HF3S
SHORT WAVE RECEIVER
30kHz-30MHz. USB/LSB/AM. Included in this package: The popular HF3 short wave receiver with NEW 10 memory facility, data output on the receiver and data lead to your computer. Software JFAX7.1 & Hamcomm 3.1 UK power supply & long wire aerial.

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BEARCAT
UBC9000XLT
AM/FM/WFM SWITCHABLE BASE SCANNING RECEIVER
25-550MHz and 760-1300MHz.

Features: Headphone socket, speaker socket, backlight orange LCD display, squelch control, rotary tuner, sound squelch, scan delay, auto sorting, RF attenuator. 500 memories, scan rate of 100/300 channels/sec.

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SANGEAN ATS-909
QUALITY PORTABLE SHORTWAVE RECEIVER

153kHz to 30MHz (AM, SSB). 87.5MHz to 108MHz (FM). AM/FM/USB/LSB.

Features (RDS) Radio Data System: 307 memory channels, World clock, 3 timers; LCD display, Signal strength meter, etc.

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UNIDEN BEARCAT
UBC220XLT
AM/FM hand-held scanner. 25-550MHz and 760-1300MHz.

Features: 400 memory channels, scan rate 100/300 channels/sec. 10 priority channels. headphone socket. backlit LCD display etc.

£179.95 + P&P

DC INVERTORS

12V DC IN 240V AC OUT

- 150W version 12V only (for notebook computers etc.) £39.95 + £5.00 P&P
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- 600W version 12/24 volt (for medium power tool etc.) £109.95 + £10.00 P&P
- 1000W version 12/24 volt (for large power tools etc.) £139.95 + £10.00 P&P
- 2500W version 12/24 volt (for most purposes etc.) £429.95 + £15.00 P&P

QS-200
In-car dashboard grill fitting hand-held mount to fit a mobile phone or hand-held scanner into your car.

£4.99 + P&P

Trade customers are you getting the best deal? Phone and find out!

Call Mary (M0BMH) or Dave on 0121-460 1581, 0121-457 7788 FAX: 0121-457 9009
H as DAB (Digital Audio Broadcasting) become obsolete before its really even started? For some time now I have been seeking people's opinion on the future of radio broadcasting. Initially, my thoughts were that DAB would attract all the largest radio companies allowing them to dominate the market and make it difficult for smaller broadcasters to survive in such a competitive market. However, as time has ticked by and communications technology has rapidly moved ahead, it is becoming apparent that DAB may not be the big advance it was intended to be.

At first I thought this line of thought to be somewhat over pessimistic looking at the time, money and effort that is being sunk into DAB. It is mainly the bigger broadcasters that are involved in pioneering digital radio, as they have most to gain.

The radio manufacturers on the other hand are still sitting on the fence, scared stiff of mass-producing DAB radios, even if they could make them affordable, then to find a very poor market for them. Unlike TV there is, as yet, no shut-off date for analogue radio and the internationally recognised broadcast bands will clearly live on for many years to come, so there is no artificial incentive to move to DAB.

Even if the government did force British stations to vacate m.w. and f.m. to encourage listeners to go digital, this would create a void which would be filled with foreign stations and possibly pirates. The large commercial concerns would like Britain to abandon analogue radio broadcasting by 2015, however, any decision would be political rather than technical.

The Prime Minister has done a lot to publicise the Internet and communications technology has rapidly moved ahead, it is in a competitive market. However, as time has ticked by and we short wave listeners.

Among all the SWM readers that were straining their ears to receive Radio Caroline have been forced to curtail their short wave broadcasts on 5.805MHz due to a spate of damage to their equipment. The transmitter runs on an un-mannted site, which has recently come under the spotlight. A chain of British furniture stores have removed 200 radio tuners from their shops public address systems to prevent staff playing local radio programmes or any other copyright material over them. Phonographic performance fees that are considerably cheaper than in the UK.

Sad man the Pop Pirates loved to hate, the creator of Radio One died during February. Robin Scott was 79 and had worked for the BBC since the middle of the war when he was involved in BBC French Service. In actual fact his real name was Scott, however his French colleagues had difficulties with that name so he changed it to Scott. He was the key figure behind the launch of BBC Radio 1 in 1967 and remained there for two years before replacing David Attenborough as controller of BBC 2 Television.

Local Kentish station Medway FM has been taken over by DMG, a company backed by the Daily Mail newspaper, this is yet another casualty of recently launched independent stations selling out to the highest bidder.

Radio Caroline have been billed for their near disaster on Christmas Eve when their ship the Ross Revenge broke a mooring, narrowly missing other expensive vessels and getting beached on a sandbank in the river Medway. The Ross was undamaged, however the rescue and towing charges amount to almost £10,000 less than had been anticipated. You can obtain further information from their website www.radiocaroline.co.uk They also have a supporters club at 426 Archway Road, Highgate, London N4. An interesting project.

Radio Caroline is on the air from 1800 Friday evening through to 2300 Sunday night on channel 35 of the 'Astra' Satellite.

Shops that play background music to their customers have recently come under the spotlight. A chain of British furniture stores have removed 200 radio tuners from their shops public address systems to prevent staff playing local radio programmes or any other copyright material over them. Phonographic performance fees have to be paid for these applications. However, shops that have in-house radio stations that receive their music via satellite from Holland pay the Dutch public performance fees that are considerably cheaper than in the UK.

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A study carried out for the Radiocommunications Agency in London and Leeds discovered that more f.m. frequencies are available for further extension in broadcasting. The report reveals that there is space in London for a number of community radio stations and in Leeds there is space for a station that could serve a million people. This must come as good news for small radio stations that have been denied licences due to claims that no frequencies were available.

One of these is Thames-side station The River who welcome this report as they have actually performed a frequency survey themselves in order to help facilitate their application. The station's founder Ian McGregor says, "I look forward to seeing the details, but it seems this report potentially contains the news our listeners and advertisers are waiting for". The Radio Authority confirmed that there is still an enormous demand for large and small analogue licences.

A new pirate on short wave is Radio Geronimo, which takes its name from a station that broadcast via Radio Monte Carlo during 1969 on 206m (144kHz). The original Geronimo was rather short lived due to reception difficulties, let's hope this one has better luck.

What's Happening?

Radio Free London have been forced to curtail their short wave broadcasts on 5.29MHz due to a spate of damage to their equipment. The transmitter runs on an un-mannted site, which has recently been tampered with, but nothing actually stolen. Their m.w. site has also suffered similar problems, however a supply of sufficient spares has kept the service functioning on reduced power.

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John Wilson
G3PCY
experiences waves of nostalgia with his first love - the RCA AR88D.

The more I research the history of the AR88 receiver, the more I realise that British radio enthusiasts in the period after WW2 were very fortunate to have access to one of the finest general coverage receivers the world had known. The accessibility of the AR88 was due to the fact that it seems to have been produced (according to other historians) specifically for the British government as part of the American support for them during the war, and as a consequence, few examples appear in the United States even today, whilst we in the UK can still obtain working receivers at affordable prices.

It’s a tribute to the excellence of the design and engineering of the AR88 that even after more than sixty years, a good example can still astonish by its performance. I have been fortunate in having had just such a good example in my care recently, and I feel no loss of admiration for this classic receiver, even when compared to the latest whizz-bang offerings on the current market.

Drawbacks, there are several, which I will cover later, but once again here is a receiver I shall be sorry to lose when it is returned to its owner.

The Mighty Beast

For you youngsters who may not have seen the mighty beast, the AR88D is designed to fit into a nineteen inch rack, the front panel being eleven inches high and the front to back depth also being nineteen inches. The bare receiver weighs one hundred pounds, but when fitted into the usual desk top cabinet, the weight rises to a nice comfortable hundredweight (51kg).

You can forget the idea of flat pack self assembly desks if you own an AR88D; this baby needs more than 12mm chipboard to support it. It was at the moment I tried to lift the review AR88D off the floor on to my own workbench that I suddenly realised my elderly skeleton was no longer capable of doing this kind of thing and had to call for help (I’m seeing the osteopath next week). Be sure to take a strong friend with you if you perchance purchase one of these receivers.

However, when installed in front of me I began to experience waves of nostalgia as I once again marvelled at the beautiful symmetry of the front panel and felt my fingers hovering around the mushroom profile of the main tuning knob - I couldn’t resist it; I took hold of the knob and spun it as hard as I could, then sat back and watched the main dial slickly spin across the spectrum using the stored energy in the flywheel behind the panel.

I was transported back in time to about 1950 when I saw my first AR88D installed in the station of G2FMU, with his hand made matching transmitter driver unit alongside it. They always say your first love is the best, and the AR88D was certainly mine.

Control Layout

As I have said, the front panel control layout is symmetrical, with all controls being easy to find and even easier to use. The photographs will show you the centrally placed tuning knob sitting at the perfect height above the desk top, and driving the main frequency readout (analogue) dial to the upper left, and the vernier dial immediately above the knob.

The frequency range of the AR88D from 535kHz to 32MHz is split into six bands: 0.535 to 1.6MHz, 1.57 to 4.55MHz, 4.45 to 12.15MHz, 11.9 to 16.6MHz, 16.1 to 22.7MHz and 22 to 32MHz. The other AR88 you may come across is the AR88LF which uses a different i.f. of 735kHz and tunes 73 to 205kHz, 195 to 550kHz, misses out the medium wave and then starts again at 1.48MHz to tune to 30.5MHz (not to 32MHz).

Each band on the tuning dial is very clearly marked, and an additional logging scale is provided which, in conjunction with the vernier dial above the tuning knob, allows accurate re-set to any given frequency. Because the entire tuning system is driven through a precision mechanical gearbox, the log and vernier scales remain in perfect alignment, provided that the gearbox on your own receiver has not been completely worn out by sixty years of continuous abuse - I have to say I’ve never found one in bad condition.

The vernier dial has 100 divisions with half division marking and the main logging scale 22, making it possible to reset to better than 1 in 4400 - usually more than accurate for normal use. The rather obvious opening in the panel which matches the main tuning dial but is blanked off by a maker’s name plate was intended for a signal strength meter, but such was the hurred nature of the supply contract that meters were never fitted by RCA (as far as I know), and a paragraph in the handbook illustrates the position as follows:-

“Tuning Meter. The necessary wires for connecting a tuning meter in the cathode circuit of...
the first i.f. tube have been included in the cable wiring. If and when meters become available, it will be a simple operation to install a tuning meter. A 5mA meter with zero deflection to the right is required".

Does anyone out there know if RCA ever supplied meters? Interestingly, the tuning meter paragraph does not appear in my (undated and Canadian) handbook for the AR88LF, but is in all the handbooks I have seen for the AR88D.

Along the bottom of the panel from left to right are the on/off and mode switch, the tuning range bandswitch, the r.f. and a.f. gain controls, the selectivity switch and the a.g.c./noise limiter switch. Above this row are the antenna trimmer and b.f.o. frequency adjust controls and finally the audio tone and noise limiter threshold controls.

Single Side Band?
No multi-mode operation in the AR88, you either receive a.m. or switch on the b.f.o. and receive c.w. In 1943, s.s.b. was not an option, although as a historical aside it's worth recalling that S.S.B. was in use on transatlantic telephone circuits in 1923. However, if you drive an AR88, you need to practice the technique of reducing the r.f. gain to zero, increasing the a.f. gain to maximum, switching on the b.f.o. and adjusting the b.f.o. frequency to one side or other of the i.f. passband and then 'riding the knob' of the r.f. gain control so as to get intelligible speech out of the loudspeaker. Harder to describe than to achieve, this technique actually works well and at least gives those idle hands something to do.

Reception of a.m. broadcasts is a revelation after the strange sounding audio produced by some d.s.p. equipped receivers, and the somewhat round shouldered response of the i.f. filtering lends a vintage mellow character to the audio which just makes you want to carry on listening. Tuning across a busy broadcast band makes you realise that each station is appearing and disappearing smoothly and in regular procession which just makes you want to carry on listening.

Clean Output
The local oscillator of the AR88D produces about 1W of r.f. from a classic Colpitts circuit using a 6J5 triode, and because the oscillator is always running on a fundamental frequency and loaiving along well within it's operating parameters, the output is exceptionally clean as can be seen in Fig. 1. That low noise purity is why you get a smooth 'creaminess' as you tune through an a.m. signal.

No 'monkey chatter' in this ancient mariner of a receiver, and it just laughs at my 900/909/918kHz test on the medium wave which has sometimes exposed unfortunate failings in more recent receivers. On the other hand, I have to agree that finding an s.s.b. utility channel on an AR88D is a lengthy and frustrating pastime, so I'm not entirely blind to its failings as a modern receiver.

Selectivity Settings
There are five selectivity settings having nominal 6dB bandwidths of 13kHz, 7kHz, 3kHz, 1.5kHz and 400Hz. The AR88LF bandwidths are slightly wider, probably due to the higher i.f. used in the I.F. version. If the passband plots in the manual are to believed, the shape factor for the 7kHz nominal bandwidth is about 2.5 to 1, which is pretty good even by today's standards, and perceived wisdom from experienced operators of the AR88D was that normal listening would be done in selectivity switch position 2, which is the 7kHz bandwidth.

On the three selectivity settings where the crystal filter is used, the shape factor deteriorates, but the noise selectivity is still perfect for classic c.w. reception. For s.s.b. use, the nominal 3kHz bandwidth is best (switch position 3), but the 60dB skirt bandwidth of 11kHz is wide when compared to a modern multi element crystal or mechanical filter. (But the resolved audio is lovely).

Front-end selectivity is superb, because the AR88D uses two tuned r.f. amplifiers ahead of the mixer, and thus has three sets of gang tuned...
AR88 Review

"It's a tribute to the excellence of the design and engineering of the AR88 that even after more than sixty years, a good example can still astonish by its performance"

circuits between the antenna and mixer stage. I took the opportunity of plotting the preselection performance because I wanted to see how it compared with my recent investigations and the results are a revelation.

Figure 2 shows the front-end bandwidth at 13.5 MHz, Fig. 3 at 8.5 MHz and Fig. 4 is taken at a centre frequency of 900 kHz with a -50 dB bandwidth of only 150 kHz. It's no wonder that my standard test for second order intermodulation performance produced an astonishingly good result which I will give further down the review. As far as medium wave performance goes, the AR88D has to be amongst the best receivers you could wish to use for DXing - bear this in mind if that is your particular interest.

One more point about the front-end of the AR88D is that the receiver is virtually designed with the hobby user in mind by the provision of an antenna trimmer for getting the first tuned circuits into perfect alignment with different antennas, and the ability to work with a single end-fed wire as an antenna; in fact the manual states "For general use it is recommended that a straight wire antenna between 25 and 50 feet long should be used". Isn't that what most of us can erect?

The AR88D is one of those receivers which will produce good results from a wet finger poked on to the antenna terminal, and actually caused me some difficulty when measuring sensitivity because the signals received on the short pigtail at the transition between coaxial cable and the AR88D antenna terminals was receiving signals which were louder than the less than 1 µV coming from my generator.

Back End

At the back-end of the AR88D, audio is provided by a single 6K6 (6V6 in the AR88-LF) running in Class A with an output transformer large and heavy enough to be used as an offensive missile in an anarchists' street battle. Using the matching loudspeaker, which was thoughtfully provided by the lucky owner of the receiver I was reviewing, there was more than enough audio to generate complaints from the neighbours (actually from my wife who was in the house some 50 metres away from my lab).

Driving a little Wharfedale Denton bookshelf speaker produced very smooth audio indeed, and quite stopped me returning to the formal measurements.

Here's a test for you budding historians - the Rice/Kellog loudspeaker on his HRO when operating on Top Band a.m. and marvelling at the easy on the ear quality it produced, particularly when listening to G4GM.

Sam G2BBH using what he always referred to as a Rice/Kellog loudspeaker on his HRO when operating on Top Band a.m. and marvelling at the easy on the ear quality it produced, particularly when listening to G4GM.

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Short Wave Magazine, July 2000
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10MHz-1.4GHz frequency counter with reaction tune
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- **Temp/pressure/forecast**
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- **Calender**
- **Humidity**
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10MHz-1.4GHz frequency counter with reaction tune
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**JY-838 JUMBO WALL/DESK CLOCK**
- **Wide screen/2" digit**
- **time display**
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- **Temp**
- **Auto RF synch clock from Rugby**

- **£59.95**
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Short Wave Magazine, July 2000
AR88 Review

...continued from page 18

Sensitivity Measurements

My sensitivity measurements are based on signal required (in dBm) for 12dB SINAD. For the AR88D performance I used the selectivity set to position 2, which means that the crystal filter was not in circuit. I first of all used a.m. with 50% modulation at 1kHz and then checked s.s.b. which came out 6dB more sensitive than a.m. at all frequencies. The audio tone control was set to mid position.

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Sensitivity (dBm)</th>
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<tbody>
<tr>
<td>0.909</td>
<td>105</td>
</tr>
<tr>
<td>2.0</td>
<td>116</td>
</tr>
<tr>
<td>4.0</td>
<td>115</td>
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<tr>
<td>6.0</td>
<td>115</td>
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<td>8.0</td>
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<td>27.0</td>
<td>116</td>
</tr>
<tr>
<td>30.0</td>
<td>115</td>
</tr>
</tbody>
</table>

Which you will agree is very much an up-to-date performance from a sixty year old receiver. When it came to third order intercept point based on a measured noise floor of -130dBm, the AR88D was reasonable for its age with a dynamic range of 73dB and an intercept point of -20dBm; not much to write home about you may say, but second order measurements at my standard frequencies of 6.5/7MHz showed a dynamic range of 106dB and a second order intercept point of +83dBm. Now all repeat after me; “Proper preselection produces perfect performance”.

As for oscillator purity as shown in the reciprocal mixing measurements, the AR88D was virtually identical to the Harris RF-590A and better than the Plessey PRS5230. With an i.f. bandwidth of 7kHz, I couldn’t carry out a measurement at 5kHz spacing, but with -118dBc/Hz at 10kHz falling to -157dBc/Hz at 100kHz, the AR88D is actually better than last month’s Collins 955-1. Is it any wonder that experienced operators know that the AR88 is a low noise performer?

The Down Side

As I said earlier, if your particular interest is in listening to dozens of fixed frequency s.s.b. or data channels on h.f., then the AR88D is not for you because getting on to an exact frequency when the signal is not present can be almost impossible.

Frequency stability is not as good as a typical synthesiser, and you have to remember to switch on the receiver at least half an hour before using it so as to let it achieve some measure of thermal stability. That being said, I didn’t have too much trouble in keeping the 1kHz audio centred in the notch of my HP audio analyser when doing the s.s.b. measurements.

The sheer weight of the receiver is a bit daunting, as is the potential problem of maintenance should anything go wrong and you have to find a repair man who knows anything about vintage equipment. A quick test to check such a person’s ability is to ask him to explain why the HT feed for the first audio stage appears to be feed via a 100mΩ resistor. If he is an AR88 man he will tell you that the suffix ‘M’ as used in the circuit means Kilohms, not Megohms, but I do know unsuspecting folk who changed resistors in their AR88s because they didn’t appreciate this little anomaly.

Adjacent channel selectivity is not up to today’s requirements for amateur radio use, although I listened on 20 metres with the review receiver and had no obvious problems. For c.w., should you be able to use it, the AR88 is very good indeed because you have a fully tunable b.f.o. and manual gain control.

Plus Points

Now I’m sitting here wondering what other drawbacks I can list, but honestly that’s about the lot. The plus points for having an AR88 so overwhelm the minus that I think I’d better go out and find one for my own collection.

Owning a good sixty year old AR88D is rather like owning a good ten year old Bentley car. Just sitting in front of that spacious control panel, basking in the gentle warmth from the innards and rolling your fingers around the silky smooth tuning control, the desk lit only by the yellow glow from the back-lit windows and bathed in the mellow audio from a good loudspeaker can be a truly sybaritic experience.

Whatever you use for day to day competitive listening, if you have never owned an AR88D you have missed a wonderful experience, and no radio listening enthusiast should go to that great receiver in the sky without being able to say “I remember owning an AR88”. I may sound over enthusiastic, but it really is that good.

Happy Listening

“If you have never owned an AR88D you have missed a wonderful experience”

Short Wave Magazine, July 2000
When you buy a motor car you, quite reasonably, assume that all the main controls will be pretty much in the same place in every vehicle. The pedals will all be in the same order, depending on whether the vehicle is an auto or manual transmission. There will be a steering wheel in front of you...you get my drift.

Now, equate this with radio equipment, especially with complex gear such as radio scanners or scanner/transceivers. These days even some models have volume control on an up/down switch. I recently received an E-mail from Jay who is considering selling his Yupiteru MT-7100 because the instruction book that he received with the set does not make much sense.

Jay has a degree in English and is by no means daft. It's just that the owner's manual supplied with his set does not make too much sense. Some of the '7100s have very good instruction books supplied, but it does seem that some sets are a bit lacking in that department.

Going back many years I purchased a second-hand Regency scanner from Garex. The instruction manual was so bad that Pete Longhurst of Garex had written another one in English which made good sense.

I don’t know how Jay is getting on with his radio at the moment, but do I have access to a manual for this set that makes good sense which came from Waters and Stanton so they may be able to assist you. I believe that manufacturers have got a lot better in the literature department, but it seems that there still may be some more work to be done as some instructions can be quite hilarious.

Interesting Transmissions

Moving on from the May SWM Scanning column where I mentioned the rescue services, there is a lot of fun to be had listening to the v.h.f/u.h.f. marine bands. This also applies if you live inland.

I have heard many interesting transmissions on the v.h.f. band even when I used to live in central England, as with an antenna that is high enough you are quite likely to hear the odd coastal station and vessel. Also remember that inland waterways are common in the UK and that some small boats have marine band kit aboard and use it frequently, the River Thames being an extreme example of this.

If you live near the coast or any tidal navigable river you will hear masses of traffic on this band. Also, large seagoing vessels may have a u.h.f. on-board system to talk with the crew. Cruise vessels obviously need such a system as passenger safety necessitates crew communication.

One large cruising company issue hand-helds with four channels fitted. Examining one of these radios will establish that channels one and two are on 457.525 and 457.550 receive with their transmit frequencies 10MHz higher. Channels three and four are 457.575 and 467.575, but are simplex.

In this region, there are many companies’ u.h.f. systems. Just before the collapse of the Soviet Union I was sat on the side of a sea loch in the North of Scotland, with an old pair of WW2 Zeiss binoculars, watching a large Russian ‘trawler’ which was laden with antennas. I was listening to their shipboard comms on 457MHz on an old AR800 scanner, which I still use, it was a lovely day. They were looking at me through their binoculars and actually talking about me on their u.h.f. sets. I gave them a big wave and pointed to the scanner, then they realised...

Talking of the north...in Scotland, travel to the islands in the west is via the ferry company, Caledonian MacBrayne. You will see that the crew are using hand-held sets. The frequency used is 157.550 and on occasions this may be paired with 162.150.

Obviously there will be many other companies using company frequencies in marine band and there is a mass to listen to, so don’t get all sad because digital maritime radio is on the way together with GMDSs. There will be f.m. marine transmissions for a long time yet.

TETRA

Sorry to harp on about TETRA, but if you live in the Lancashire area it seems that your police force and fire brigade will be going to the new TETRA standard within a month of you reading this article. Although the ambulance service in the area have just acquired a new analogue system, they will also participate in the new scheme.

With all the new digital systems coming on-line one must wonder whether there is much future in the scanning game. Police users in particular have been very keen to embrace TETRA due to the ease with which their day to day comms have been overheard.

With different TETRA standards being offered, it seems that ‘scannists’ may be in for a lean old time unless receiver manufacturers can tempt us with some other fare. Commercial systems will also move to digital standards and together with mobile data terminals in vehicles one can only wonder what the future holds for the hobbyist.

It will follow that at some time there will be receivers available that allow monitoring of some digital radio communications, but this may be a long way off. I know that this all sounds fairly depressing, but there is no need to despair yet.

For some time there will be a need in varying circumstances for analogue communications in the v.h.f/u.h.f. spectrum so we can continue for a while yet. Also, as anyone who has used digitally encrypted stand alone gear knows, it is by no means infallible.

I remember one occasion that we were using such equipment within two hundred yards of each other and we had to turn off the encryption and go in the clear just to hear each other. So for the sharp ‘scannist’ there may well be interesting stuff to hear for some years yet.

Accessories

Just a quick word about accessories. How often have you thought that you would like to listen to some action while on foot or in the bus but just feel a trifle conspicuous with the handy clipped to your ear with the local radio users booming out. Well, why don’t you make like those people who sit on buses with their heads rocking like zombies while plugged into personal stereos.

Just buy or acquire some cheapie personal stereo earphones, strip off the plug, join the two inner cores and the two outer together and solder the inners to the inner of a 3.5mm jack plug and the outers to the outer of the plug and bung it into the scanner. There you are. Now you can rock with the best of them.

For using the handy scanner in the vehicle pop on a small magmount antenna, plug the power into the cigar lighter. But I hear you cry that the puny speaker will not overcome the sound of the exhaust blowing. No problem. Just look out for one of those cassette gadgets that is sold as an adapter to enable portable CD players to be used through the vehicle’s sound system. They cost about a fiver. Strip off the stereo plug as per the personal headphones and again replace with a 3.5mm mono plug. Insert into car cassette player, turn on scanner and player and away you go.

The only problem with this method is that the car’s cassette motor is running all the time. A mate of mine has used this system for years but then he gets company cars and all repairs are not his worry.

That’s it for another month. Don’t forget to let me know of any news or interesting snippets that you hear. All can be treated with utmost confidence.
The Law And You!

You may be thinking this is a 'heavy' title, but as Dave Roberts has pointed out before, scanning any transmission is fraught with legal difficulties and really is an activity not to be entered into unless you are fully aware of possible minefields in which you may find yourself innocently hiking around.

It wasn't until the early seventies that hobbyist's scanners came on the market and even then the cost of these radios was somewhat prohibitive. I remember that the Bearcat range of scanners seemed tremendously expensive to me. The people who owned such scanners (and I was not one of them) generally used them to listen to aircraft and the police u.h.f. schemes. At this time the v.h.f. police networks were in the v.h.f. P2 band, which was audible on a broadcast v.h.f. receiver so no scanner was needed.

The police called their u.h.f. systems 'personal radio' and although this term referred to the fact that each officer had a portable set, many took this to mean that the system could not be overheard. Communications security, as you can imagine, was darn near non-existent. As time went on and domestic and hobby electronics became less expensive in real terms, usage of the hobby gear increased. Until these wonderful toys were in more widespread use the authorities were not too concerned. Basically they were not aware that criminals, or hobbyists for that matter, were listening into police, official or commercial systems.

Anything Heard

Then came a spate of events which brought the attention of the authorities to the fact that anything said on any radio anywhere can be heard unless it is encrypted. Police were coming across criminals who were listening to police systems and security company radios as part of their business. Arrests were made at the scene of burglaries where as part of the baddies outfit there would be a scanner.

It was usually found that the scanner had either been shoplifted from the local Tandy shop or had been stolen when a car or house was broken into. Often these sets were not accompanied by their instruction manual, so it was found that some of the frequencies entered were not exactly too useful, but often they had the local police frequencies listed.

Also, taxi companies in some towns were in dispute over business and in some locations so called 'taxi wars' erupted. Usually these phone ups started when one radio cab company would dispatch a driver to pick up a fare from the local market only to find a driver from a rival outfit had beaten him to it and was waltzing off down the High Street in the trusty Sierra with Mrs Thatcher and her shopping from the Co-Op.

This became quite a sport in one large town and it wasn't unusual to call a cab and have a whole convoy of them turn up armed with CB radios and scanners all eager for your custom. All because they were listening to each other's calls.

Legislation Called For

In a small dusty office with grimy windows a bewhiskered civil servant sat on his one legged stool. He, of course, knew that the legislation already existed in the shape of the Wireless Telegraphy Act 1949. He pointed out to all the politicians and jobsworths hollering for action that they could use the Act in the meantime and he would sort out something to keep them even happier in the long run.

All this nonsense eventually resulted in sections of laws being pertinent to the perceived threat from scannists. In addition to the W.T. Act 1949 which has several sections and parts relevant to this issue, there was also The Telecommunications Act 1984 (Sec. 79), The Interception of Communications Act 1985 (Sec 1) and The Wireless Telegraphy Apparatus (Receivers) (Exemption) Regulations 1989.

Now you listen to anything other than licensed radio amateurs and authorised broadcasters you commit an offence under the act.

You may be thinking, "What about PMR446 and other non licensed radios"? If someone is directing a message to you on that system - and you are listening on a Short Range Business Radio or PMR446 set, then obviously the transmissions are meant for you. If you were found listening to these systems on a scanner it would appear that the offence is committed.

Remember you are not supposed to listen to CB transmissions unless you are listening on a legal CB radio and have a licence. Anything else is a not allowed. No, you are not allowed to listen to aircraft or marine bands on your scanner despite there being posted frequency information at airshows.

Just by listening to anything other than legal broadcast radio or licensed amateurs on your scanner, you commit an offence. If you listen to transmissions on your own p.m.r. scheme on a scanner - no offence.

Worse to come. If you heard something that you are not authorised to receive and then told your mate/wife/colleague about it you commit another offence under the act.

If you listen to a transmission which forms any part of a public telecommunications system, e.g. cellphone, cordless 'phone or other mobile 'phone or any 'phone connected to the 'phone system, then you commit an offence under the Interception of Communications Act as well as the offence under the W.T. Act.

Also if you are suspected of committing any of these offences then the Telecommunications Act 1984 permits seizure of any scanner you possess. The court can also order forfeiture of any such equipment should you be convicted of any offence of this nature. Penalties can include fines of even jail for some offences under these acts which can be viewed as being of the same severity as illegally tapping 'phones, etc.
Should you be belting down the road in your Escort with the handy scanner Velcro fitted to the dash and the little magmount of the roof with the audio belting out of the stereo speakers (courtesy of the adapter mentioned in this month’s ‘Scanning’ column) and you see a road block ahead or are stopped by the police - what now?

Well, it is a good thing not to commit offences in the first place. That having been said, should you have inadvertently have a frequency or two loaded in the thing, it may be helpful to know what the authorities may need to prove.

Firstly, it seems likely that they will ask you who owns the equipment. They will wish to know the date and location that the equipment was first used and when and where it was last used. If the scanner is fitted in the vehicle they will want to know who fitted it, where and when. They will likely want to establish whether unauthorised frequencies can be received on the radio by manual tuning or by pre-programmed channels.

By this time they will have seized your radio, given you a receipt and a few sleepless nights. Later you will be interviewed and asked who programmed the frequencies in the radio, where it was acquired, the date of purchase if bought and how much you paid for it. They will have all the radio’s details themselves by now as it will have probably been examined by the Radio Investigation Service or a police technical unit.

The authorities will have to prove that not only have they found unauthorised frequencies in the set, but also that they were in the set when it was in your possession and that the frequencies have not been entered while it was in theirs. Authorities should be advised that they should ensure that they are able to corroborate their evidence that the set has not been tampered with after seizure.

That’s pretty much all there is to it. I have a scanner fitted in my car. It is an old 16 channel pre programmed radio and has some amateur frequencies loaded in it - that’s the lot.

Be Legal & Be Discrete

A few years ago the authorities would hold massive stop-fests on major roads. Present at these events would be the police and vehicle examiners to look for vehicle offences, the Custom and Excise who would look primarily into the diesel tanks to check for agricultural (pink) fuel in the tanks and officers from the Radio Communications Agency who would be on the lookout for illegal CB radio, scanners and the illegal 6MHz h.f. radio operators who plague that section of the airways and have done for decades. Nowadays there will be immigration officials who will be on the lookout for lorry loads of illegal immigrants.

The short message in all this is be legal and be discrete. The official who examines your scanner is not likely to know whether your radio has only amateur frequencies in it and is likely to seize first and sort it out later by which time you will have been greatly inconvenienced. The police cannot be expected to have any knowledge of radio and unless you have an amateur licence they will be highly suspicious of any communications set in your vehicle.

As an example of this, I was speaking with a sergeant from a large South Midlands police force. This chap was in a responsible position in the communications department of his force and did not know whether his force used a.m. or f.m. radios and did not have a clue what on earth frequencies were. So, don’t expect most officers to match your level of knowledge.

Discretion is therefore most important. Apart from concealing the set in your vehicle, which isn’t a bad idea anyhow in view of spiralling levels of car crime, you may wish to consider making a small antenna from aero modelling or piano wire and either mounting it in or on your vehicle.

One official agency had discrete transmitting antennas of this type mounted in small bases (such as BNC or SMA) but installed on the rear parcel shelf of the car. As such, they were virtually impossible to see. I have also seen various surplus covert antennas for sale at rallies. This can be an enjoyable part of the hobby in itself. Your imagination is your only limit in this respect. So do not despair.

Three Main Facilities

It must be said that in my opinion, there are three main facilities that governments don’t like their electorate to have access to. 1) Firearms, 2) Communications and 3) Information. Item 1 has been largely dealt with as most firearms have been banned or are about to be. Item 2 is now under control of government with the advent of cellphones and the building of the new intelligence centre to monitor E-mail, etc. at Thames House, London. It is also quite possible that the government will try and introduce legislation to curb amateur radio use and restrict frequencies available. Finally, Item 3 - information includes radio monitoring which is already illegal and will soon become technically more challenging.

Also, remember there is no point in attempting to argue finer points of law with the authorities. Do not forget that they employ high cost lawyers paid from your taxes. You have to pay for defence yourself. Be legal - be discrete. Enjoy yourself.
It's Not All Bad News

Remember the ‘Squidgygate’ and ‘Camillagate’ stories? Dave Roberts explains how some past events are connected by information coming in from scanner users listening to frequencies that are illegal to monitor.

How we all remember the press headlines a few years ago when the retired bank employee and scanner hobbyist informed the press that he had heard the, by now infamous, ‘Squidgygate’ cellphone conversation between the late Princess of Wales and a male friend. No sooner had the information been released to the world when there was the ‘Camillagate’ taped ‘phone conversation between the Prince of Wales and Mrs Parker-Bowles.

Both these revelations were aired in the press in great detail and the person or persons who eavesdropped on the conversations were always referred to as ‘radio hams’. This shows just how much the average reporter or journalist knows about the subject or cares about the truth.

I recently received a letter from a retired prison officer who, since having more time on his hands (‘scuse the phrase guy’), has taken up short wave listening and scanning as a worthwhile hobby. He wrote he was surprised to hear cellphone conversations on his scanner (yes, analogue systems are still in use) and he wonders, “Just how much crime can be laid at the door of scanning in the wrong hands?”.

Clearly criminals that use radio information are just using another tool available to them and would, no doubt, be committing crime whether they had a scanner or not, but the point is certainly valid. There is, however, a flip side to this particular coin. There have been, for many years, individual scanner users who represent the other side of the equation.

Rave Parties

In the mid eighties there was a sudden interest in so called ‘rave parties’. These pay parties were arranged in advance by entrepreneurs who sold tickets for the events. Although your memory may have faded with regard to these jollies, just to remind you, this is what would happen. A field would be hired from a farmer and then a large marquee would appear, possibly a funfair would arrive on the site together with a large number of heavies that were styled as ‘security guards’. Hot dog vans would appear having been charged an extortionate amount to be at the venue and other vendors would arrive as if beamed down on to the field.

Then customers would arrive paying up to £30 or so to attend a festival of music played on massive sound systems. This all sounds like a good hoot until you realise that there were no safety or sanitary arrangements in place and that quite a lot of the money spent at the do was, in fact, spent on illegal mind altering substances.

To witness such a party was to view a great amount of young people stoned out of their heads jumping up and down on bouncy inflatable castles and hollering sort of in time to music. When this trend started, the police felt that they had a responsibility to at least try and make such events as safe as possible and to police them in whatever way they could.

Although flyers were printed as adverts for these pay parties and were distributed to potential party goers, the security of those running the events was fairly tight. They did not want the authorities to know where the action was due to occur so that the police and planning authorities, health and safety, etc., would not step in and stop the rave.

The police were at a loss. But radio dealt them a winning hand in the guise of scanner enthusiasts. Many scanner users had, over the years, established personal contacts with either police officers or officers of other authorities. Basically this means that they had got matey with them in the pub.

The scanner users listened to information coming in was due to right thinking scanner users. You never hear of these people do you...

In addition to the pay party scene, there is the constant trade in illegal drugs. In many similar sets of circumstances offenders have been arrested and convicted, literally caught in the act, due to information provided by scanner users listening to frequencies that they should not be monitoring. Who could blame them?

Conversation Overhead

On another occasion a radio hobbyist overheard a telephone conversation on his radio which involved a national newspaper’s reporter conspiring with the wife of a prisoner to supply drugs to her husband while on a prison visit. The reporter arranged to supply the wife with a miniature camera that she would smuggle to her husband.

Now you may be wondering what the point in all this was. The reporter made it quite clear in his conversation with the
woman that the plan was to pay her to give the drugs and camera to her husband who would then photograph the other man using cannabis in prison.

The husband's cellmate was an offender who came from a well known family and was in receipt of much media attention at that time and the whole game was intended to splash headlines that this vulnerable man was using drugs while in jail and to have photographs of him using the drug in the cell on the front page of that particular national daily paper, thus making the woman and her jailbird husband some money.

Thanks to the scanner hobbyist, the prison authorities were alerted, the tape was played to them and they transferred the woman's husband to another jail many miles away that night. The actions of that radio listener, sadly now deceased, saved a vulnerable man. The actions of that radio listener, sadly now deceased, saved a vulnerable man who would then share the drugs and camera to her woman that the plan was to pay her to make the woman and her jailbird husband some money.

The above cases were not, by any means, detected just as a result of cellphone monitoring.

Not Just A Scanner

The radio hobby does not just begin and end with scanning or s.s.b. utility monitoring or aviation listening or data decoding or amateur band reception. As Dave Roberts explains, all these interests are interdependent and all equally important.

Although radio scanning is generally seen to be the reception of voice modulated radio signals from 30MHz and higher, using a frequency sweep receiver, the subject of scanning cannot be viewed as a stand alone item. Many hobbyists will use a radio scanner as part of another hobby.

The prime example of this are the many people that monitor the military and civil air bands as an integral part of their aviation interest, but to whom radio represents only a part of their pastime. They photograph aircraft or collect aviation memorabilia or even fly aircraft themselves professionally or recreationally.

Many scanners are fitted in aircraft operators offices or flying clubs where they trundle away as part of the background office sounds and are rarely, if ever, switched off. Some emergency service offices have a scanner on the shelf monitoring their own channels. This is true of many police aviation units that use scanners to monitor the police channels in their area to anticipate the deployment of their aircraft.

From the hobbyists' perspective it may be that an individual has a special interest, the enjoyment of which is enhanced by the inclusion of a radio scanner as part of their equipment. A prime example is the keen yachtsman or boater who will have a scanner on marine bands listening through the v.h.f. and u.h.f. marine sections.

It is quite possible that, as with the aviation enthusiast, there may also be an h.f. radio lurking on the shelf. In the yachtsman's case this may be tuned to 2.182 or to 5.680, or other rescue frequency, or to one of the amateur radio h.f. marine nets which operate daily giving useful and often life-saving information to small boats at sea. Keen boatmen may well be advised to visit some of the amateur radio rallies as recently I have seen quite a lot of marine v.h.f. radio gear going for extremely reasonable prices.

Emergency Services

Some people may have a very keen interest in the emergency services. Although this may partly manifest itself in monitoring their transmissions (an activity desperately illegal) it may also include collecting old or surplus equipment from the fire, ambulance or police services, some of which may be radio gear or other electronic equipment.

Remember some people actually have a very keen interest in the emergency services.
Direct keyboard entry
CTCSS & DCS mode
Voice recording
100 scan bands
Access import
* Unlimited memories
get the following exciting features.

We've created the UK's most spacious amateur radio showroom, with comfortable surroundings and plenty of space to sit down and try any radio of your choice. There are no compromises. Imagine sitting in comfort, with coffee and tea on call, and being able to play with whatever rig takes your fancy. Experience the widest range of accessories ever displayed. Browse through an amazing variety of items dedicated to radio communications. There's only one truly dedicated Ham Store!

Scancat Has Arrived!

Virtual Receiver
Control your radio from your PC. With virtual receiver (illustrated) your handheld becomes a base station communicator.There's only one truly dedicated Ham Store!

Spectrum Scope
Wide range of tuning steps from 50Hz
RS-232 port
400 memories

Scancat Gold
Logging File
Personal data base
Access import
Voice recording
(Version only)

Scancat Gold SE
Programmes for PC Windows
Send for details

DUAL VFOs
400 channel memories
Automatic store and automatic sorting, Ultra fast scan rate, LCD backlight, 300ch per sec scan rate, Data skip function, Supplied with AC adapter/charger and AA nicads.

ATS-818 Short Wave Portable
SSB AM & Broadcast
A compact portable station that will pull in signals from around the world. SSB reception will let you hear radio amateurs and aircraft from the far corners of the world. There are 54 memories in which to store your favourite stations. Power is via 6 AA cells (not supplied).

AOR-3000A Receiver
100kHz - 2036MHz

The AOR-3000A goes on air. It offers a wide frequency range at a very competitive price. Features include USB, LSB, CW, AM, FM, * Fast 50 channel per sec search, * GaAsFET RF amplifier * Wide range of tuning steps from 50Hz, "RS-232 port", "100 memories", * Built-in clock * "Channel pass feature", Back Illumination * "Remote" whip antenna etc. Ask for leaflet.

IC-R75 Receiver
30kHz - 60MHz

The IC-R75 has stood the test of time. It offers full coverage of the SSB, CW, AM range. A much improved version of the Target HF-5, it is fitted with 2.8kHz SSB filter, advanced mixer design, background display, active active antenna facility, and computer output. Included in the package is a software disk and 12V AC mains adapter. Optional self-powered active antenna £99.95.

FRG-100 Receiver
50kHz - 30MHz

The FRG-100 has stood the test of time. It offers full coverage of the short wave bands plus long wave and medium wave. It features, USB, LSB, CW, AM, FM, "100 Memories", "2 stage attenuator", "Noise Blanker", "Band Scanning", "Memory Scanning", "Dual Speed AGC", "High and low impedance antenna inputs", "Programmable steps from 10kHz", "10kHz", "Optional Narrow Filters", "PSU and FM board", "BFO reverse for CW", "Twin Clocks", Ask for leaflet.

0kHz - 32MHz AOR-7030 Receiver

This very wide range receiver offers a complete listener station in one package. Features include USB, LSB, CW, AM, FM, Video out, 9kHz step accuracy, Over 13,000 memories with 20 Alphanumeric Characters, "Noise Blanker", "Text Search", "Pass Band Tuning", "Stereo CW Reception", "Notch & Peak Filter" etc.
Here's your chance to purchase the latest scanner on the market. With features like Dual Receive, Fast scan speed, and extensive Storage, this scanner is a must-have for anyone looking to improve their listening experience.

**New ICR-3E Scanner**

- Programmable steps
- 1000 Memories in 20 banks
- 400 Memories in 20 banks
- Built-in antennae
- Rechargeable ni-cads

**Yupiteru MVT-9000EU Mk2**

- 100kHz - 1.99GHz
- 20 banks
- 500 Pass memories
- 10 Priority channels

**Yupiteru MVT-7000EX**

- 100kHz - 1.3GHz
- 500 Pass channels
- 12 Tuning steps

**AOR-8200**

- 500kHz - 2040MHz
- Rechargeable ni-cads
- Built-in antennae

**IC-R10E**

- 500kHz - 1300MHz
- Built-in antennae
- Rechargeable ni-cads

**IC-R2**

- 500kHz - 1309MHz
- Rechargeable ni-cads

**High Quality Coax Switch**

- Enjoy the benefit of selecting two antennas or feeding two receivers at the flick of a switch. Rated up to 600MHz and almost half the price of competitive models. Superior solid construction.

**W-LWB MkII Long Wire Balun**

- Just attach any length of wire and feed back to radio with coax cable. Reduces interference and improves matching to receiver.

**FSB-1 - 9 Skin Coloured Earring**

- The FBI-9 is a brand new design that is skin coloured to make it less obvious when worn. The cable and cable exits will take a strain of 12kg so it won't break in commercial applications.
collect fire engines, ambulances and police vehicles. A gentleman contacted Dave Hicks who owns the Museum of Pye Telecom and said that he was restoring a Morris 100 police car from the 1960s and wondered whether Dave could assist with some period radio gear.

Dave had the right Pye radio for the job and the chap asked him whether he could fix it so that it would receive police messages. David politely explained the situation but fitted the car radio with receive crystals for the 2m amateur repeaters and converted the Pye set to receive on amateur v.h.f. so that at least the fellow had some sound coming out of the speaker in the car. The vehicle now does the rounds of county shows and exhibitions as part of the local police display in that area. Result - everybody happy.

Other Interests
People that have an interest in military matters will probably listen to their local army base on low v.h.f. as well as monitoring the h.f. bands in attempt to learn more of troop deployments. These listeners are often likely to be ex-army types themselves. POCSAG pager traffic may be monitored for further information as to what any particular group or individual is up to.

Those that are interested in the space programme will probably want to listen to the cosmonauts on the recently reoccupied MIR space station on 145.985 amateur bands but will also want to hear them on the downlink frequency (whatever that is these days). The same listeners will want to monitor the space shuttle downlink frequencies when possible and otherwise they may be listening to WA3NAN - the amateur station from the Goddard Space Centre that rebroadcasts shuttle audio when possible if a mission is flying. Also they will have the option of listening to Cape Radio on h.f. for the booster recovery and range safety nets.

The short wave broadcast DXer widens his or her knowledge of world affairs without having the constraint of only hearing the British point of view.

Integrated Hobby
The point of this ramble is to underline the fact that the radio hobby is inseparable from it's parts. The interest does not just begin and end with scanning, or s.s.b. utility monitoring or aviation listening or data decoding or amateur band reception. All these interests are interdependent.

The amateur operator has an interest in other modes and parts of the radio spectrum. The aviation enthusiast will monitor h.f. and v.h.f. otherwise he or she will be missing out on a raft of information. The emergency services monitor is also likely to be a POCSAG user and possibly an aviation listener at v.h.f. to hear air ambulance or police aviation deployments. This has to be an integrated hobby.

Amateur radio operators must support all forms of the radio hobby because all radio communication is an extension of their interest. In Australia and New Zealand amateurs are losing part of their u.h.f. allocation. In Canada the government has prepared legislation that will make possession of digital radio scanners an offence if a licence is not in force. Now they are not going to be issuing licences and digital scanners have not even been invented yet.

These three countries are part of the British Commonwealth and have been largely populated with people from the UK. Much of their legislation is formed with the assistance and advice of the UK government. To look at some of the things happening there may well be to see the future of radio as hobby here.

Radio Traffic Monitored
There is no doubt that government of any persuasion within Britain does not like to have it's radio traffic monitored. It is not too keen to have large chunks of the radio frequency spectrum being allocated to people who do not pay millions of pounds for the privilege. Government would rather charge millions to mobile phone companies for the frequencies and then take VAT on all our calls and line rental.

Anyone who has an interest in radio communication as a listener, amateur or CB operator should be aware that we are sitting on a resource that avaricious Ministers would like to turn into financial statistics. The hobby radio fraternity must pretty well stick together and support each others interests within the overall radio camp.

We only have to look at what happened to target shooting sports in Britain. The demise of the shooting hobby was in no small means due to the fragmentation, snobbishness and self interest within their sport. Shooters felt unable to present a united opposition to daft government plans. Now the only people who shoot with up-to-date pistols and rifles here are criminals.

Radio, by it's nature, is a unifying force and as hobbyists we must share our interests and remain inclusive because, otherwise, we could end up being restricted to PMR446 communication or broadcast radio.

Sorry...ranting mode is off now.
Buyers Guide

Scanning equipment has become a whole lot cheaper, but that doesn’t make too much difference if your funds are stretched. Dave Roberts looks at the pros and cons of buying new or second-hand.

As I write this, petrol prices are headed for £4 per gallon. Taxation is spiralling and there is less money available to purchase the radio equipment advertised in the adverts in SWM and Practical Wireless. Like most of us, I find that it would be very easy to spend a fortune on the latest equipment but somehow always seem to lack the necessary funds. In real terms, scanning equipment has become a whole lot cheaper but that doesn’t make too much difference if funds are stretched.

There are other options. You could always buy second-hand. I agree that this method of acquiring radio gear may seem fraught with danger and you certainly have to be most careful what you buy and how much you pay, but nevertheless there are some good buys to be had.

First Rule

The first rule must be to know what it is that you want to buy. This sounds daft, I know, but radio manufacturers have constantly attempted to upgrade and modernise their product lines and this has left a plethora of radio equipment in circulation which is not immediately identifiable. I mean, should you see an advert offering a Yaesu FRG-9600, would you know what it was and whether that piece of gear would suit you?

I have seen one of these radios advertised recently at what seemed a reasonable price and provided that the set is in good condition it would suit many receiving applications. The radio, of course, covers between 60 and 905MHz without any gaps. Step sizes are programmable and the set was very well made indeed.

This might sound just what you are looking for, but the main drawback with this model is that it only has 100 channels. With equipment of this age you are bound to find that some points of the specification will not be as comprehensive as more modern radios. This may be more apparent when it comes to database management.

Another fine, but old, scanning receiver which I have also seen advertised for sale by private vendors is the JIL SX-400. This set was made mainly for professional use, but a large number of them found their way into private users’ hands. A very well made set but one which only covers from 26 to 520MHz. There are no gaps in coverage but potential purchasers should be aware that it only has 20 channels.

The redeeming feature is that the radio offers the option of computer control which would enhance the channels available but would, of course, tie up a computer. In the hand-held receiver range there are even more ‘out-of-date but still in service’ scanners which come on to the market regularly.

Perhaps the most prevalent of these is the AR1000 radio which must have sold in tens of thousands. They also have their drawbacks. I have never found selectivity that great and even though scanners by their nature cannot be all things to all men, I find them a bit deaf even by scanner standards. Still I have owned one since they were first sold and it still works. So I must not complain.

Another excellent little, and very old, radio is the old AR800E. A 20 channel scanner with some gaps like the Grand Canyon but still functional as a handy. If you do decide to purchase an older handheld scanner do not necessarily be put off by the fact that many of them have built-in battery packs. The NiCad pack in my old AR800E has been replaced three times (I have owned it since 1985 having bought it second-hand). These battery packs are still available from specialist battery suppliers at reasonable cost. The AR800E is, by the way, much more sensitive than the later AR1000.

Never Been Better

The range of equipment for sale, whether new or second-hand, has never been better. My first v.h.f. radio receiver was an old wartime Hallicrafters S27 receiver which covered from about 25 to 143MHz and to scan the bands meant literally tuning the dial. Weight was it’s main drawback and the S27 together with an old Marconi CR100 h.f. receiver almost brought down the ceiling in my old cottage in Oxfordshire. Then they had to go.

We have, however, come on a long way since then and now looking at the specification of radio equipment which was for sale even in the nineteen eighties will show that a tremendous amount of amateur v.h.f./u.h.f. radio equipment was expandable to receive a very long way out of amateur band. At the Donnington Show last year I saw on the ‘Bring & Buy’ counter a Standard C520 or C528 radio. They are both the same set and were supplied as 2m and 70cm amateur band radios. These sets are keypad reprogrammable and can give coverage from 127 to 175MHz v.h.f. and...
in the u.h.f. range coverage of large parts of 300, 400, 800 and 900MHz are possible. This is, of course, n.b.f.m. only. It can be programmed to have 40 channels and has CTCSS scan if the CTCSS board is fitted. The set on the ‘Bring & Buy’ was going for about £50 and seemed to work.

Looking again at hand-held radios, the Alinco DJG5 hand-held radio offers very good out-of-band reception as does the Yaesu FT-51R. Turning to larger sets for mobile or base use then there is always the ADI146 2m radio which will give very good high band v.h.f. coverage when it had been expanded including, of course, marine band.

These ADI radios are now hitting the second-hand market at very reasonable prices and if you just wanted a scanner for high band v.h.f. and 2m then this radio will do you just fine. Expansion really is a piece of cake if you have an amateur licence allowing operation on 2m then you have a cheap scanner/transceiver.

When buying you just can’t be too careful. I have bought second-hand kit on a few occasions and so far I have been lucky. If you know the vendor then he will often allow you to take the equipment away and try it prior to purchase. This is obviously the very best way to do business (from the purchaser’s point of view) but is not always possible.

Buying from the readers ads sections in magazines can be fraught with danger but generally people who are out to sell through these columns are hobbyists and tend to turn out to be decent sorts of folks. I have purchased second-hand gear through adverts in SWM and PW on several occasions and have never had any duff gear tucked into me so far.

**Words Of Advice**

A few simple words of advice. Look at the vendor and the sort of person that he or she is. I know that this sounds a bit off, but remember it’s your precious money that is at stake here. If you don’t like the look of the person or you think that they are hiding something or if they appear to be some sort of unofficial trader trying to do a few deals then my advice would be to walk away.

If the seller does not appear to share your interest in the hobby or when you arrive to view the equipment you find that he has car stereos and videos or second-hand TVs for sale as well, then I would be off down the road leaving a cloud of dust and small pebbles and no money. If you buy from a genuine vendor who shares your interest in radio then they will be able to tell you how they acquired the radio, it’s performance and why they are getting shot of it. Make sure that you do try the set and all it’s functions before you part with any money.

Don’t forget that some sets that may search, scan and seemingly appear to perform well may have lost sensitivity due to having been in close proximity to high r.f. So if you can, when you are viewing have a few frequencies jotted down for that area and load ‘em up and make sure that the radio does not have the hearing ability of a letterbox.

If buying from a dealer, then you will pay more for your second-hand set but the dealer will often have more technical info’ for the radio and there will be some sort of guarantee offered with it. Also, most dealers are quite prepared to let you sit in the shop and play with the gear for a while prior to purchase.

I remember sitting in the Lynch store for about an hour programming a second-hand set and checking it out. They were more than happy for me to sit there punching buttons and took absolutely no notice of me at all as I mucked about with the thing. I have it here and it’s still working.

So the short message here is don’t be constrained in your purchase. Don’t reject the idea of buying transmitter/receivers if the receiver specification is what you are looking for. Research older type sets, see which radios will suit your purpose and then you can scan the adverts with confidence. Check out the seller and the gear carefully and if you are not happy, leave well alone. There are always scanners for sale elsewhere.
Your Dream Scanner

Can fantasy become reality? Dave Roberts considers what would be the ultimate scanner.

I've found the perfect woman, I could not ask for more. She's deaf and dumb and oversexed, and owns a liquor store.

S

o goes the little ditty, popular about ten years ago. Well, now that the personal circumstances have been settled, what about the radio side of things? What would we like to see in a scanner? My neighbour, Geoff, and I have had a few yarns about this over the years and apart from the obvious comment that we really need to get out more, it would be interesting what your thoughts are on the subject.

OK let's start in the realms of pure fantasy. We all need scanners that will instantly decode TETRA, TETRAPOL, MASC, all other forms of encryption, oh, and frequency hopping sequences too. The only attempt that has been made so far is that one manufacturer offers audio inversion decoding.

So, Mr Yaesu, Mr Icom and Messrs. Kenwood, AOR and Alinco - listen up. That is what we really need and unless you guys come up with something in the next few years you will find that your futures may lie in the electric toothbrush market.

Back To Reality

Looking at the whole package this radio is going to have to be small enough to run in the car but big enough to have buttons that are large enough and separated from each other so that pudgy fingers built like bunches of ripe bananas don't hit about three buttons in one go. The set is going to have to be capable of computer control but is not going to need a computer permanently hooked up to it to get the best out of it.

Talking of computers, many of us use the beastly things and if there is one thing that is a real annoyance it's to have the scanner stopping on sproggiest created by the computer. (We must assume that this perfect scanner has no internal sprogs of it's own), so let's have a set with really good screening because the computers always seem to cause problems on the most important frequencies, don't they?

Filtering on this radio will be of the finest quality so that when it's scanning around in an area, we don't get to hear darn pagers all over the place. Well, not unless we are monitoring those frequencies and displaying the decoded CTCSS and FLEX paging or other data on the built-in TFT colour display anyway.

Now, we don't want to get the manufacturers too sweaty so, fellers, we are talking scanner here not h.f. radio. 30MHz to 4GHz will do nicely. That good range will ensure that any interesting video can be sent to that fine screen of yours and displayed in gorgeous crisp colour. Well there is a fair bit of interesting video at about 2.5GHz isn't there and it would be a shame to miss it. Of course, when we are all suffering from information overload we can relax with Coronation Street or the Teletubbies.

Search & Scan

This dream radio will have just the very best search and scan facilities ever. Searching will become a dream with there being the facility for separate squelch levels for each search bank. Of course, there will be separate step sizes for each search bank, likewise each search bank will be able to have one of the three antenna sockets allocated to it. Horses for courses you know.

There will be auto loading to an allocated special memory bank on a mode basis, i.e., a.m.w.b.f.m./n.b.f.m. in the voice mode and data/video modes will be saved to a data memory bank. Oh and no duplicate frequencies for each mode please. A nice lockout button is a must as is a channel void option.

Once we have saved all the frequencies, we want to be able to edit them and add alpha-numeric tags for the display. We will need to shift them around within and between banks. We shall need to view them on an all up basis or by scanning on this super screen.

There should be a sub display so that the last frequency or channel active could be displayed, even though the scan or search has resumed. Mr Manufacturer, just try you and take your eyes off the v.d.u. when you are working to grab a peek at the scanner display to see what that frequency was. Damn near impossible isn't it - you just never get there in time.

Military Standard

Construction of this gadget will be to a military standard and the thing will be pretty much shower proof. The controls, as mentioned previously, will be of a reasonable size, and there will be plenty of them, because Mr Manufacturer, users do not want to be scrolling through a menu list looking for the panel light control when they think they are missing some action.

Oh yes, that brings me to lighting. Please a completely lit panel. This is important because my neighbour Geoff gets really annoyed when this is mentioned. He has a couple of scanners and it bugs him that on his feature rich Yupiteru MVT-7100 he still has to hold the display light button. He is not normally aggressive I assure you. Why don't all scanners have as S-meter? Some have the displays that show adjacent channel usage, etc., but all scanners should have a meter.

Geoff also says we need audio processing to enable MilAir to be a little easier on the ear, this must be controllable from the front panel, of course. Also on the front, is where the infra red panel will be. The remote control and remote cordless headphones will need this won't they. There must also be line output and
Perfect for long distance reception of Aircraft, Public Services, Land Mobile and much more! Outstanding value for money:
- 66 - 512 MHz (with gaps)
- AM/FM
- 1000 memory channels
- TURBO SCAN
- 100 Channel/Second
- TURBO SEARCH
- 300 S/Second
- Alpha Numeric Display
- Automatic Store
- Frequency Transfer
- Auto Type Record
- Data Skip facility
- Programmable Search

A deluxe SW antenna using super flexweave wideband antenna
Supplied complete

10 Priority Channels
100 mems Turbo Scan - 300 steps/ sec
66 - 512 MHz (with gaps)

100 Ch/Second

TURBO SCAN 100 Ch/Second
TURBO SEARCH 300 S/Second

A stylish low profile base scanner with TWIN TURBO scan and search facility. Covers civil aviation, marine, police, cellular plus more!
- 66-88, 108-174, 406-512, 806-956 MHz
- 100 mems @ Turbo Scan - 200 steps/sec

The ULTIMATE Scanner Antenna!
High quality 16 element beam
100 - 1300 MHz
11-13 dBi
N Type connection
2100W TX

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Klingenfuss 1999/2000 Guide To World-Wide Weather Services
Classed as the most comprehensive, reliable and up-to-date manual in existence, the 1999/2000 Guide To World-Wide Weather Services covers Internet location, NAVTEX stations, RAFox stations, Radiotelex stations, Meteorological data, Satellite images, weather charts, plus hundreds of sample charts, images and web pages. All for £23.00.

Klingenfuss 2000 Guide To Utility Radio Stations
Now in its 18th edition, this is one of the most comprehensive, reliable and up-to-date manual containing 11200 frequencies, 1900 stations, meteo radiofax, radiotelex and NAVTEX schedules, digital data decoding screenshots, abbreviations, codes, frequency allocations and radio regulations. With 8900 changes since the previous edition, you'd best get yourself up-to-date and order your copy now for £30.00.

Flight Routings 2000
This 14th edition has been completely revised, with information received from airports and the airlines themselves. Flight Routings 2000 is the ideal companion for airband listeners to quickly obtain the flight details of approx. 240 airlines - scheduled, charter, freight, etc., flying to and from British and Irish airports world-wide. Also included are details of many overflights between Europe, Canada and the USA. Order your copy now for just £7.95.

Passport To Web Radio
Web radio is where f.m./a.m. stations from America and around the world now hang out. All you need is your PC and Passport To Web Radio. User friendly, Passport tells everything you need to know to enjoy the world of web radio. From how to get started, to news from hometowns everywhere, sports and every kind of music: £14.99.

Personal Computers In The Ham Shack
Whether you're a computer whiz or you've just bought your first machine, you'll want to keep this book close at hand. Personal Computers In The Ham Shack explores the many ways you can enhance your enjoyment of your favourite hobby with your other favourite hobby, computers. By reading this book you'll learn how to: choose an operating system and the computer accessories that are right for you, log and contest with easy to use software, test new antennas, use the Internet and lots more. £11.50.

The 2000 Super Frequency List On CD-ROM
The first CD-ROM worldwide that includes the latest clandestine, domestic and international short wave broadcasting schedules, plus the most up-to-date utility frequency list available world-wide. This superb software runs under Windows 3.1 and Windows 95/98. Whether you are an international radio listener, a businessman or a tourist travelling world-wide, this is the way - just a few keystrokes and you can have it all. £23.00.

Joint International & North American Call Book 2000 CD-ROM
This 2000 callbook on CD-ROM has many revised features including: more than 1,550,000 calls and more than 35000 E-mail addresses; new maps for many countries in Africa; new option to run directly from your hard drive; edit feature allowing users to input up-to-date information; bearing and distance included for most calls; print address labels or envelopes; over $4,000 QSL Managers; pinpoint on the maps, the location of each call retrieved; search information data by call, Colourful maps of most of the world. The Radio Amateur Callbook/CD-ROM contains both North American and International listings. Listings can be found quickly by name, location and call letters - even when the information is incomplete. The most accurate and extensive CD-ROM can be yours for £30.

PW UK & Eire Callsign Directory
Do you want the most up-to-date UK and Irish Radio Amateur callsign database in your shack? It's all here on PW's first Callsign CD-ROM. You can browse by callsign, name or postcode to find the address you need, and when you have found it, you can print out a postal label. In addition to the callsign database, you'll also get a special 132-page electronic interactive magazine on CD-ROM. There are pages of amateur radio and related information including international callsign prefixes, frequency band data from 136kHz to 10GHz, v.h.f. and u.h.f. repeaters, beacons on h.f. and v.h.f./microwaves and lots of other band data. There is also a complete index of the articles that have appeared in PW from 1993 right up to December 1999. Along with a complete review list and current Book Service listing. £7.50.

Shortwave Eavesdropper CD-ROM
This Windows compatible CD-ROM is a revolutionay way of monitoring shortwave utility stations. Not only does it list tens of thousands of stations world-wide, but also enables you to build your own database of stations which will work in conjunction with this CD-ROM. This CD-ROM gives you instant access to over 32000 frequencies, over 42000 callsigns, both ITU and tactical, extensive lists of aircraft and ARG SELCAL codes, audio samples of data modes and much more. £16.50.

The ARRL Handbook CD - 2000
Many radio technicians have found the ARRL Handbook an indispensable reference - now its available in a convenient, easy-to-use CD-ROM format. In addition to the complete text and all of the illustrations from the printed 2000 ARRL Handbook, this CD-ROM includes all of the Handbook template packages with PC-board etching patterns and other useful information. Also included are DOS and Windows utility programs for filter design, transmission line analysis and more. £33.00.
STOP PRESS!
ML&S Appointed Official UK distributor for JRC Ham products.
Continuing the success of ML&S for short wave & Scanning equipment in the U.K., we are proud to announce our appointment by JRC U.K. Ltd. All products purchased from ML&S will therefore be backed by the UK importer.
Internationally accepted as the benchmark receiver throughout the world, the NRD-545 is still the professional's choice.

Specifications
- Frequency Range: 1 - 29.9999MHz
- Type of reception: USB, LSB, CW, RTTY, AM, FM, WFM (When CHE-199 installed)
- Memories: 1000 channels
- Receiving system: Triple superhetodyne
- Image rejection: 70dB or more
- IF rejection: 70dB or more
- Dimensions: 320W x 130H x 285D (mm)
- Weight: Approx. 7.5kg

Features
- Digital Signal Processing by One-Chip DSP
- Wide Band 30-2000MHz
- Converter option (CHE-199)
- Remote control by PC

Icom ICR-3e
It seems Icom have done it again, with the far eastern release of the world's first handheld scanner receiver, with something extra special to keep you interested even if the waves are dead: a fully functional, built-in multi mode colour TV! This breathtaking achievement has had everyone at Northfield Avenue gasping all day, and we haven't even seen a full spec yet! However, we've managed to gather the following tidbits from our friends at Icom...

- PAL TV
  - Receive: audio and video at full scan rate!
- Wideband Scanner Receiver
- 495KHz - 2450MHz Frequency coverage.
- Full Range of accessories
- Dual Receive.

Special Package Deal
A new NRD-545 with matching Deluxe Speaker NVA-319 & optional VHFI UHF converter CHE-199 allowing coverage on AM/FM/WBFM up to 2000MHz.
Total RRP £2197.00 ML&S £1649.
Also available on finance, NO DEPOSIT & 48 payments of only £57.53 p.m

NEW YAESU VR5000
Yaesu have just announced a new base scanner. This is their first scanner since the legendary FRG9600 and looks to become another benchmark.

Features include:
- 12 volt operation
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Next Month in Practical Wireless, the magazine that brings you Amateur Radio & So Much More …..

‘phone/c.w. rig. Pick up a copy of next month’s PW to find out how.

**WIN!**

*The August PW sees the second instalment of the ‘Win An IC-756PRO’ competition in conjunction with Icom (UK) Ltd. So, pick up a copy of next month’s magazine in order to get that second, all important corner flash!

*Also in the August issue you have the chance to win a pair of the new PMR-446 radios from Entel UK - the Euro-Wave. We will also be reviewing them in this issue - so take a look - these licence-free radios have a number of very useful applications!

**BUILD**

*The Gadget MkII is an affordable and flexible system which will convert any small c.w. transceiver with a stable v.f.o. into a... and much, much more!

**REVIEWED!**

*The MFJ-414 Morse Tutor (courtesy of Waters & Stanton PLC) will be reviewed by Rob Mannion G3XFD in the August issue of PW! With Morse such a hot topic of debate at the moment, see what Rob has to say about this offering from MFJ.

Plus all your regular favourites including:

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The UK’s Best Selling Independent Amateur Radio Magazine

Short Wave Magazine, July 2000
**SCANNING SPECIAL SCANNING SPECIAL SCANNING SPECIAL**

external speaker sockets on the front please, who wants to grovel round the back of the set to hook it up to a computer sound card or tape recorder - thanks...

The back of the radio...not the most attractive bit, but this is where most of the connections will hang out, but not all of them. The two antenna sockets will be there as will the power input of course.

There will be a discriminator output here to allow more detailed data processing by computer if required. There will be a video or r.f. output socket in case the TFT screen is not big enough for some of us who have slightly less than 2020 vision, so then we can plug in a bigger monitor.

**Looking Good**

Now to the styling...somehow this radio is going to have to look good. It's going to have to appeal to the customer group that look for this type of consumer electronic item. Do you designers want to go for the military look, or the explorer/prospector market. Do you want to look sporty or give the set the civil service look?

The set must not have anything like scanner or wide band radio receiver written on it. This just means trouble trying to get in and out of some countries with a radio of this type in your hand baggage. Trust me I know.

Now this radio should have a good tough transport case with it. Not just two moulded chunks of expanded polystyrene sheathed in thin cardboard but a proper transport case tough enough to be lugged on public transport and survive. The case will have to be weatherproof and must be devoid of manufacturers markings that indicate that it is worth stealing.

The case can contain the scanner, the multi-standard power supply, a small deployable antenna, spare fuses for the power leads and any other accessories. The case will have to be weatherproof and must be devoid of manufacturers markings that indicate that it is worth stealing.

The back of the radio...not the most attractive bit, but this is where most of the connections will hang out, but not all of them. The two antenna sockets will be there as will the power input of course.

There will be a discriminator output here to allow more detailed data processing by computer if required. There will be a video or r.f. output socket in case the TFT screen is not big enough for some of us who have slightly less than 2020 vision, so then we can plug in a bigger monitor.

**Anything Forgotten?**

Now this fine radio may need a few extra functions and facilities but I reckon I've covered most of the important stuff. What have I forgotten? Please let me know, and until the scanner manufacturers get to design a radio that decodes anything it can hear I think that this set or something like it would be fairly popular.

The difficulty is that with radio systems going more and more to digital standards the time has come when we really must consider whether there will be a scanning hobby in a few years. The emergency services and many many other p.m.r. users are going to TETRA or other digital systems.

The marine bands are moving into the digital era and there are strong rumours that airband and military air could head that way. Unless the designers and manufacturers come up with some answers in the future, sales in the hobby radio market are going to take a big dive and so are some large companies.

**Oh Well**

Oh just thought of another essential item for the ultimate scanner. Draught Bass from a small tap on the front...Thank you.

---

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To provide you with a ready reference here are the contact details of all our regular authors.

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Echelon Exposed

John Locker reports on the world of communications interception by security services. Read and worry.

On 15th July 1999 the sleepy village of Capenhurst, Cheshire, had its moment of glory. It was on that day that the media exposed the existence of a secret government monitoring station, which had, for ten years, been intercepting telecommunications between the UK and the Republic of Ireland.

Had it not been for the fact that HMG had put the recently closed complex on the open market, with a price tag in the region of £20m, the general public may never have found out about the secrets the grain silo lookalike held!

Probing questions posed by investigative journalist Duncan Campbell revealed the truth.

The grain silo like listening post in the sleepy Cheshire village of Capenhurst, exposed by investigative journalist Duncan Campbell.

The Dictionary

At the centre of Echelon lies 'The Dictionary', a database of key words, names and organisations which various agencies wish to target. No-one can question the need to monitor communications for possible security and terrorist reasons, but where do the agencies draw the line?

As far as the information gathered by the UK listening posts is concerned, most of it is 'filtered' and then transmitted back to NSA headquarters in Fort Meade, USA, using their own secure circuits. There, anything which is construed as being of interest to the UK security services is siphoned back to GCHQ in the UK.

As part of his investigation, Campbell makes reference in the report to a number of industrial contracts, which were mysteriously clinched by US organisations, even though European bidders thought they had it 'in the bag'. Could the NSA be harvesting information for economic purposes?

In this special feature, I bring you extracts from the publication Development of Surveillance Technology and Risk of Abuse of Economic Information.

It should be noted that what follows is from a working document for the STOA panel. The content does not necessarily represent the views of the European parliament.

The UKUSA Alliance

The United States SIGINT System (USSS) consists of the National Security Agency (NSA), military support units collectively called the central Security Service and parts of the CIA, UKUSA relationship.

The history of the special relationship between the UK and the USA goes back more than fifty years. This is how Campbell introduces the concept of 'UKUSA'.

No Surprise

This information came as no surprise to me as for the previous six months I had been carrying out my own research into the activities of various agencies who monitor communications across the UK. The days of the overall clad 'operative' sitting at the side of the road in his red and white striped GPO tent are long gone. These days, snooping is far more hi-tech.

The rumour was that members of the European Parliament were investigating the issue of secret monitoring, and sure enough, I uncovered a startling report, prepared for them, which had been drawn up in response to their growing concern over the misuse of Communication interception techniques.

The exposure of the Capenhurst listening post only serve to confirm that the capture of communications can be monitored. Even the most sophisticated of encryption and security measures may seem somewhat paranoid, however the events of recent months involving the exposure of
The AR8200 represented a beacon when first released, technology marches forward with the NEW AR8200 SERIES-2 keeping the innovative concept and forward thinking alive and bright. It has not been easy improving on what many thought to be the ultimate, however the NEW AR8200 SERIES-2 does provide even more with nothing taken away.

A Temperature Compensated Crystal Oscillator (TCXO) now forms the heart of the NEW AR8200 SERIES-2, this ensures high stability with minimal internal spuri... the TCXO replaces a crystal reference as commonly employed in other receivers and is usually only seen in top of the range (more expensive) table-top models such as the AR5000 and AR7030. Performance too has seen the AOR R&D team fine tuning the design for best sensitivity and strong signal handling over the extremely wide coverage of 530kHz to 2040MHz (all mode receive without gaps).

The aerial has also been replaced by a telescopic whip on a swivel base, this ensures the best results, a medium wave bar aerial is also provided as standard. The design team have certainly been taking account of customers wishes, the keyboard ZERO key has been swapped in position with the DECIMAL to match the telephone layout, LCD illumination has been increased (for improved visibility) and following requests for longer operation between charges, the 4 x AA size NiCads have been increased in capacity, again reflecting improvements in modern technology.

The obvious change has been left for last... the cabinet colour has been changed from green to black!

The list of features is vast, large multi-section backlit LCD, side mounted navigation keys and rotary tuning control, alpha-numeric text comments for memory channels, banks and search. The all mode receive features Wide, Standard and Narrow AM with Wide FM, Narrow FM and Super Narrow FM bandwidths provided, tuning step sizes are programmable in all modes down to 50Hz with comprehensive step adjust and correctly implemented 8.33kHz for the new VHF airband spacing.

Connection to a computer is possible with the optional CC8200 lead/interface with free PC software available from the AOR web site. Unique optional slot cards further enhance features offering CTCSS, Tone Eliminator, Record/Playback, Voice Inverter, External Memories (backup for 4000). Other options include the RT8200 for 'reaction tune' with the Opto Scout and other compatible devices, clone lead, soft case, option lead, record interface. Even the operating manual reflects the careful design being 140 pages of ENGLISH language with plenty of illustrations.
**** AR5000+3 awarded four starts by both the authoritative Passport To World Band Radio and World Radio & TV Handbook

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

AR5000c
When making critical measurements, the frequency coherence is very important whether a single or multiple unit is employed. This involves the use of a single reference for all oscillators employed throughout the receiver. The AR5000C now provides this commercially required capability. The “C” version may be provided to order in either the standard AR5000 format or with two of the +3 additions of AFC and NB. If you are a commercial operator with this application in mind, please request the separate specification leaflet for the AR5000C.

AR5000+3 - Sync AM, AFC, NB
The “+3” version offers even more with synchronous AM (upper side band, lower side band and double side band with excellent lock range), AFC (Automatic Frequency Control for accurately tracking moving transmissions or unusual band plans) and Noise Blanker.

Passport to World Band Radio’99.
“Front-end selectivity, image rejection, IF rejection, weak-signal sensitivity, AGC threshold and frequency stability all superior”.
“Unlike virtually every other receiver we have tested over the past 21 years, the frequency readout is unfailingly accurate to the nearest Hertz. This should make the AR5000+3 of exceptional interest to broadcast engineers”.

Speaking of the AR5000+3 in conclusion... “Compared with the ICOM IC-R8500 it offers considerably more features, better strong-signal handling, wider coverage and decidedly superior filters”.

AR5000+3
✓ Wide frequency coverage 10 kHz - 2600 MHz
✓ All mode reception: USB, LSB, CW, AM, Synchronous AM, NFM, WFM with automode tuning (any mode and bandwidth on any frequency is possible)
✓ Automatic Frequency Control
✓ Noise blanker
✓ High stability TCXO reference, 1 Hz NCO tuning
✓ 1,000 memories, 10 memory banks, 20 search banks, 5 VFOs (all twice!), alpha tag, EEPROM chip storage
✓ Multiple IF bandwidth 3 kHz, 6 kHz, 15 kHz, 30 kHz, 110 kHz, 220 kHz with an option position for 500 Hz CW. (30 kHz is ideal for WEFAX)
✓ High sensitivity and excellent strong signal handling assisted by a preselected front end from 500 kHz - 1 GHz
✓ Extensive RS232 control list
✓ SDU ready with IF output for spectrum display unit

AR7030 / AR7030 PLUS
The highly acclaimed AR7030 continues to gain respect from top DX’ers. Just recently there have been a number of very positive reports following expeditions to various parts of the world, each time the operators have been amazed by the performance provided by such a compact and reasonably priced radio when compared to larger commercial units. Excellent strong signal handling, low noise local oscillator (producing extremely low reciprocal mixing figures) and excellent audio fidelity demonstrates the attention to detail carried through design and into manufacture... the analogue circuits of the AR7030 exhibit none of the strange AGC and poor audio characteristics found in other ‘higher priced’ DSP competitors. Many feel that the AR7030 is the best short wave analogue receiver ever. Receiver of the Year 1996/97 WRT4, 5-star award and editors choice Passport to World Band Radio for several successive years. Designed and built in the UK as a collaborative project between internationally acclaimed designer John Thorpe and AOR.

John Wilson (author of the SWM series “Commercially Speaking” “In My Experience” etc) often makes comparative references between high priced commercial receivers and the AR7030 demonstrating the foresight and high technology features provided by the AR7030, unique in the consumer market. Examples include:

Collins 95S-1A SWM June’2000 P24: speaking of excellent AGC characteristics...”I will take the opportunity to mention that John Thorpe designed this type of characteristic into the AR7030, so you happy owners will know one more reason for the ’0703 sounding so nice.”

Collins 95S-1A SWM June’2000 P24: speaking of independent squelch for each memory channel and attention to detail...”This is the first time I have seen this on a receiver of this type, although I will again stick my neck out and remind you that the feature was designed into the AR7030, and since the handbook for the 95S-1A suggests that it was produced long after the AR7030, one has to wonder who thought of it first - John Thorpe or Rockwell Collins?”

Collins HF-2050 SWM March’2000 P32: speaking of on-air close-in selectivity: ...”The Radio Milan signal at 900kHz is clearly visible some 30dB down on the BBC, and also visible is the 999kHz WEFAX. I tuned to this with the HF-2050 and found that I could not resolve it. Just to prove the point, and because I have succumbed to having an AR7030 around at all times, I went to 918kHz with the ’0703 and found that the signal was easily readable, although the HF-2050 still couldn’t make anything of it. No wonder AOR always get top ratings in Passport to World Band Radio.”

ARD2 portable ACARS & NAVTEX decoder & display unit, can be operated from internal batteries or external d.c. supply. An RS232 port expands capabilities, free supporting software is available from the AOR internet web site.

FOR FURTHER DETAILS, PLEASE VISIT YOUR DEALER, CALL FOR A LEAFLET OR VISIT THE AOR UK WEB SITE AT www.aoruk.com

Short Wave Magazine, July 2000
Echelon Exposed

...continued from page 43

So with the framework in place I was interested to know how the process was put into practice and how the information was collected. It seems that no means of communication is safe, there are ‘leaks’ in all the pipes.

Campbell researched the various modes, and more to the point, the methods of interception. Here are his findings.

Intercepting International Communications

It is a matter of record that foreign communications to and from, or passing through the United Kingdom and the United States have been intercepted for more than 90 years. Then and since, most International communications links have been operated by international carriers, who are usually individual national PTTs or private companies. In either case, capacity on the International or on any other communications is leased to the individual national or International organisation.

High Frequency Radio

So for direct landline connections between geographically contiguous nations, high frequency radio systems, were the most common means of international telecommunications prior to 1960, and were in use for ILC, diplomatic and military purposes. An important characteristic of h.f. radio signals is that they are reflected from the ionosphere and from the earth’s surface, providing ranges of thousands of miles. This enables both reception and interception.

High frequency radio signals are relatively easy to intercept, requiring only a suitable area of land in, ideally, a quiet radio environment. From 1945 until the early 1980s, both NSA and GCHQ operated h.f. radio interception systems tasked to collect Europe’s IILC communications in Scotland.

The most advanced type of h.f. monitoring system deployed during this period for Comint purposes was a large circular antenna array known as ANFLR-9. ANFLR-9 antennas are more than 400m in diameter. They can simultaneously intercept and determine the bearing of signals from as many directions and as many frequencies as may be desired. In 1964, ANFLR-9 receiving systems were installed at San Vito dei Marmianni, Italy; Chicksands, England and Karamursel, Turkey.

In August 1966, NSA transferred IILC collection activities from its Scottish site to Kirknewton, to Menwith Hill in England. Ten years later, this activity was again transferred to Chicksands.

During the 1970s, British Comint units on Cyprus were tasked to collect h.f. communications of all NATO nations, including Greece and Turkey. The interception took place on an ILC dish army unit at Ayias Nikolaos, eastern Cyprus. In the United States in 1975, investigations by a US Congressional Committee revealed that NSA was collecting diplomatic messages sent to and from Washington by a European Comint site at Vint Hills Farm, Virginia. The targets of this station included the United Kingdom.

Microwave Radio Relay

Microwave radio was introduced in the 1950s to provide high capacity, long distance communications for telephony, telegraphy and, later, television. Microwave radio relay communications utilise low power transmitters and parabolic dish antennas placed on towers in high positions such as on hilltops or tall buildings. The antennas are usually 1-3m in diameter. Because of the curvature of the earth, relay stations are generally required every 30-50km.

Long distance microwave radio relay links may require dozens of intermediate stations to receive and re-transmit communications. Each subsequent receiving station picks up only a tiny fraction of the original transmitted signal, the remainder passes over the horizon and on into space where satellites can collect it. These principles were exploited during the 1960s to provide Comint collection from space. The nature of microwave ‘spillage’ means that the best position for such satellites is not above the chosen target, but up to 80° of longitude away.

The first US COMINT satellite, CANYON, was launched in August 1965, followed soon by a second. The satellites were controlled from a ground station at Bad Aibling, Germany. In order to provide permanent coverage of selected targets, Canyon satellites were placed close to geostationary orbits. However, the orbits were not exact, causing the satellites to change position and obtain more datagram targets. Seven Canyon satellites were launched between 1978 and 1987.

The success of Canyon led to the design and deployment of a new class of COMINT satellites, CHALEET. The ground station chosen for the satellite system was Menwith Hill, England. Under NSA project P-285, US companies were contracted to install and assist in operating the satellite downlinks (RUNWAY) and ground processing system (SILKWORTH). The first two CHALEET satellites were launched in June 1979 and October 1979. After the name of the first satellite appeared in the press, they were renamed WORTEX. When the name WORTEX was published in 1987, the satellites were renamed MERCURY.

The expanded mission given to Menwith Hill after 1985 included MERCURY collection from the Middle East. The station received an award for support to US Naval operations in the Persian Gulf from 1987 to 1988. In 1991, a further award was given for support of the Iraqi war operations, Desert Storm and Desert Shield. Menwith Hill is now the major US site for COMINT collection against its major ally, Israel. Its staff includes linguists trained in Hebrew, Arabic and Farsi as well as European languages. Menwith Hill has recently been expanded to take ground links for a new network of SIGINT satellites launched in 1994 and 1995 (RUTLEY). The name of the new satellites remains unknown.

The CIA developed a second class of SIGINT satellite with complementary capabilities over the period from 1967 to 1985. Initially known as RHYOLITE and later AQUACADE, these satellites were operated from a remote ground station in central Australia, Pine Gap. Using a large parabolic antenna which unfolded in space, Rhyolite intercepted lower frequency signals in the v.h.f. and u.h.f. bands.

Larger, most recent satellites of this type have been named MAGNUM and then ORION. Their targets include telemetry, v.h.f. radio, cellular mobile phones, paging signals and mobile data links.

My own research indicates that the satellites used in the interception of microwave and terrestrial transmissions are of the generic ‘trumpet’ design. Large circular arrays, which are deployed and expanded once the spacecraft is in its orbital slot. The data is collected and stored onboard, then downlinked to the listening station using a 24GHz narrow beam antenna.

Submarines like USS Haddock were used in the top secret operation by Bells, tapping Soviet sub sea cables.

Credit: US Navy.
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Computer Interfaces
RS-8200
Housed in DB-25 the RS-8200 allows computer control of the AR8200 and supports both software and hardware squelch options.
£39.99

RS-2700:8000
Housed in DB-25 this interface is compatible with both the AR7200 & AR8200. Supplied with a Flat Flexible Cable for use with both these models. Now available for just £34.99.

JAV-232
Not only compatible with the AR8200 but many other receivers also including the AR8000, AR7200, Alinco DDX10, Icom IC-R10 and IC-R2 to name a few. When used with the AR8000 or AR8200 the JAV-232 also provides a squelch activated cape recording circuit and audio. The AR8000 connections also provide a FM Discriminator output for DATA decoding. The JAV-232 costs £69.99 but for connection to the AR8000 an optional OS-8200/DIN lead is now required at £15.00.

Other interfaces for the Icom IC-R2, IC-A10 Student TXK-EXRELL and Alinco DX/JX10 also available.

We are the largest stockists of both new and secondhand amateur radio equipment in the north of England - fact not fiction! Our company boasts a full time service department authorised by all the major suppliers.

When you buy from us you have Complete Peace of Mind!
Echelon Exposed

...continued from page 46...

Now, whilst radio signals floating around in the ether may seem like fair game, I had always thought that undersea cables sitting on the ocean floor were probably the most secure, however, that idea was shattered when I read about Operation 'Ivy Bells'.

The next section was of particular interest to me, as it deals with communications satellites. For some time it has been known that analogue telephone circuits on certain international geostationary satellites can be monitored. They utilise the FDM system (Frequency Division Multiplex) and using a basic short wave receiver to scan the video baseband output from the transponder, literally thousands of circuits can be located between 1 and 10MHz in s.s.b. mode.

Indeed it was Tele-Satellite International Magazine's editor Christian Maiss who first came up with the technique back in the late 1980s. Some years later, Duncan Campbell himself got into hot water by demonstrating Christian's method of interception, on commercial television. He showed how, using nothing more than a standard satellite TV system and h.f. receiver, the telephone calls could be monitored.

These days, most satellite 'phone circuits are digital and safe from the inquisitive ears of enthusiasts, (but not Uncle Sam!). There are, however, still some Middle East circuits which remain analogue. Let's take a look at how the professionals listen in!

Subsea Cables

Submarine telephone cables provided the first major reliable high capacity international communications systems. Early systems were limited to a few hundred simultaneous telephone channels. The most modern optical fibre systems carry up to 5 Gigabits per second of digital information. This is broadly equivalent to about 60,000 simultaneous channels.

Submarine cables now play a dominant role in international telecommunications, since - in contrast to the limited bandwidth available for space systems - optical media offer seemingly unlimited capacity. Save where cables terminate in countries where telecommunications operators provide COMINT access (such as the UK and the US), submarine cables appear intrinsically secure because of the nature of the ocean environment.

In October 1971, this security was shown not to exist. A US submarine, Halibut, visited the Sea of Okhotsk of the Eastern USSR and recorded communications passing on a military cable to the Khanchatsu Peninsula. Halibut was equipped with a deep diving chamber, fully in view on the submarines stern. The chamber was described by the US Navy as a 'deep submergence rescue vehicle'. The truth was that the 'rescue vehicle' was welded immovably to the submarine. Once submerged, deep sea divers exited the submarine and wrapped tapping coils around the cable.

Having proved the principle, USS Halibut returned in 1972 and laid a high capacity recording pod next to the cable. The technique involved no physical damage and was unlikely to have been readily detectable. The Okhotsk cable tapping operation continued for ten years, involving routine trips by three different specially equipped submarines to collect old pods and lay new ones, sometimes more than one pod at a time.

New targets were added in 1979. That summer a newly converted submarine called USS Parche travelled from San Francisco under the North Pole to the Barents Sea, and laid a new cable tap near Murmansk. Its crew received a presidential citation for their achievements.

The Okhotsk cable tap ended in 1982 after its location was compromised by a former NSA employee who sold information about the tap, codenamed IVY BELLS, to the Soviet Union. One of the IVY BELLS pods is now on display in the Moscow Museum of the former KGB.

The cable tap in the Barents Sea continued in operation, undetected, until tapping stopped in 1992.

USS Parche continues in operation to the present day, but the precise targets of its missions remain unknown. The Clinton administration evidently places high value on its achievements. Every year from 1994 to 1997, the submarine crew has been highly commended. The United States is the only naval power known to have deployed deep-sea technology for this purpose.

New network operators have constructed mobile 'phone systems providing unbroken global coverage using satellites in low or medium earth orbits. These systems are sometimes called satellite personal communications systems (SPCS). Because each satellite covers only a small area and moves fast, large numbers of satellites are needed to provide continuing global coverage. The satellites can relay signals directly between themselves, or to ground stations.

The first such system to be completed, Iridium, uses 66 satellites and started operations in 1998.

Iridium appears to have created particular difficulties for communications intelligence agencies, since the signals down from the Iridium and similar networks can only be received in a small area, which may be anywhere on the earth's surface.

Communications Satellites

Microwave radio signals are not reflected from the ionosphere and pass directly into space. This property has been exploited both to provide global communications, and, conversely, to intercept such communications in space and on land.

The largest constellation of communications satellites (COMSats) is operated by the International Telecommunications Satellite organisation (Intelsat), an international treaty organisation.

To provide permanent communications from point to point or for broadcasting purposes, communications satellites are placed into so-called 'geostationary' orbits such that, to the earth based observer, they appear to maintain the same position in the sky.

The first geostationary Intelsat satellites were orbited in 1967. Satellite technology developed rapidly.

The fourth generation of Intelsat satellites, introduced in 1971, provided capacity for 4,000 simultaneous telephone channels and were capable of handling all forms of communications simultaneously - telephone, telex, telegraph, television, data and facsimile.

In 1995, Intelsat operated 19 satellites of its 3th to 8th generations. The latest generation can handle the equivalent to 90,000 simultaneous calls.

Systematic collection of COMSAT ILC communications began in 1971. Two ground stations were built for this purpose. The first, undercovestown, Cornwall, England, had two 31m antennas. One intercepted communications from the Atlantic Ocean Intelsat, the other the Indian Ocean Intelsat.

The first Intelsat interception station was at Yakima, Washington in the North western United States. NSA's 'Yakima Research Station' intercepted communications passing through the Pacific Ocean Intelsat satellite.

ILC interception capability against western run communications satellites remained at this level until the late 1970s, when a second site at Sugar Grove, West Virginia was added to the network.

By 1980 its three satellite antenna had been re-assigned to the US Naval Security Group and were used for COMSAT interception.

Large scale expansion of the ILC satellite interception system took place between 1985 and 1995, in conjunction with the enlargement of the Echelon processing system. New stations were constructed in the United States, Canada, Australia and New Zealand.

Capacity at Yakima, Morvernston and Sugar Grove was expanded and continues to expand.

Based on a simple count of the number of antennas currently installed at each COMSAT interception or satellite Signals Intelligence (SIGNIT) station, it appears that the UKUSA nations are between them currently operating at least 120 satellite based collection systems.

With the recent collapse of the Iridium system, the NSA will be breathing a sigh of relief, even if only shortlived, until a new generation of satellite 'phones arrives on the scene. It's ironic that Iridium's most endearing feature was that of security!

But what of the Internet, at one time, thought by some to be one of the most secure methods of transferring encrypted data...well

Short Wave Magazine, July 2000
From the 1940s to date, NSA has undermined the effectiveness of cryptographic systems made or used in Europe.

The most important target of NSA activity was a prominent Swiss manufacturing company, Crypto AG. Crypto AG established a strong position as a supplier of code and cipher systems after the Second World War. Many governments would not trust products offered for sale by major powers. In contrast, Swiss companies in this sector benefited from Switzerland’s neutrality and image of integrity. NSA arranged to rig encryption systems sold by Crypto AG, enabling UKUSA agencies to record the coded diplomatic and military traffic of more than 130 countries. NSA’s covert intervention was arranged through the company’s owner and founder Boris Hagelin, and involved periodic visits to Switzerland by US ‘consultants’ working for NSA. One was Nora L. MacKabee, a career NSA employee.

A US newspaper obtained copies of confidential Crypto AG documents recording Ms MacKabee’s attendance at discussion meetings in 1975 to design a new Crypto AG machine. The purpose of NSA’s interventions were to ensure that while its coding systems should appear secure to other cryptologists, it was not secure. Each time a machine was sent, users would select a long numerical key, changed periodicaly. Naturally, users wished to select their own keys, unknown to NSA. If Crypto AG’s machines were to appear strong to outside testers, its coding system should work, and actually be strong. NSA’s solution to this apparent conundrum was to design the machine so that it broadcast the key it was using to listeners. To prevent other listeners recognising what was happening, the key too had also to be sent in code - a different code known only to NSA. Thus, every time NSA or GCHQ intercepted a message sent using these machines, they would first use their own coded part of the message, called the ‘halfformationen’ (help information field) and extract the key the target was using. They could then read the message itself as fast or even faster than the intended recipient!

The same technique was reused in 1995, when NSA became concerned about cryptographic security systems being built into Internet and E-mail software by Lotus. The companies agreed to adopt their software to reduce the level of security provided to users outside the United states. The case of Lotus Notes, which includes a secure E-mail system, the built-in cryptographic system uses a 64-bit encryption key. This provides a medium level of security, which might at present only be broken by NSA in months or years. Lotus built in an NSA ‘help information trapdoor’ to its notes system, as the Swedish government discovered to its embarrassment in 1997. By then the system was in daily use for confidential mail by Swedish Mps, 15,000 tax agency staff and 400,000 to 500,000 citizens.

Lotus Notes incorporates a ‘workfactor reduction field’ (WRF) into all E-mails sent by non-US users of the system. Like its predecessor the Crypto AG “help information field” this device reduces NSA difficulty in reading European and other E-mail from an almost intractable problem to a few seconds work. The WRF is encoded, using a ‘public key’ system which can only be read by NSA.

Lotus, a subsidiary of IBM, admits this, the company told Svenska Dagbladet: “The difference between the American Notes version and the export version lies in degrees of encryption. We deliver 64-bit keys to all customers, but 49-bits of those in the version that we deliver outside the United states are deposited with the American Government”.

Similar arrangements are built in to all export versions of the web ‘browsers’ manufactured by Microsoft and Netscape. Each uses a standard 128-bit key. In the export version this key is not reduced in length. Instead 88-bits of the key are broadcast with each message, 40-bits remain secret.

It follows that almost every computer in Europe has a built-in standard feature, an NSA workfactor reduction system to enable NSA (alone) to break the users codes and read secure messages.

No-one is safe from the ears and eyes of Uncle Sam, no matter what mode of communication used, and a visit to the NSA website didn’t exactly ease my mind. There in black and white is outlined their mission...

"NSA employs the country’s premier codemakers and codebreakers. It is said to be the largest employer of mathematicians in the United States and perhaps the world. Its mathematicians contribute directly to the two missions of the Agency: designing cipher systems that will protect the integrity of US information systems and searching for weaknesses in adversaries’ systems and codes".

It strikes me that the term adversaries may need clarification. Now that the ‘Cold War’ is over, perhaps the agency is looking elsewhere to practice its interception techniques.

So, there we are, next time you pick up the phone, send that FAX or E-mail, you may wish to pause a while and ponder, just who is going to be monitoring your darkest secrets!”

Reference: For your own copy of this report, in PDF form, recently updated by Duncan Campbell, log onto http://www.europarl.eu.int/dgiS/stoa/en/default.htm

Credit: With thanks to The European Parliament, Mr Dick Holdsworth, Head of STOA unit and Marcelo Soua of the STOA programme for permission to take extracts from the STOA report PE 168.414 and to Duncan Campbell - IPTV Ltd. - Edinburgh - Author of the report.

Paranoid? Me? Never!

Short Wave Magazine, July 2000

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**GRUNDIG**

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**GARMIN GPS SYSTEMS**

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**SCANNERS & TRANCEIVERS**

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<td>PSU</td>
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<td>Kenwood TK-361</td>
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<td>Cobra PMR-280</td>
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<tr>
<td>PMR-300</td>
<td>£125.00 (rechargeable battery &amp; vibracall)</td>
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<td>Handiepro</td>
<td>£320.00 for 2, rechargeable battery included</td>
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</tbody>
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**For the best prices give us a call on: 0171-637 0353**
**Problems!**

My XYL, **UR5CMM** wandered into the garden on some domestic errand and returned to announce that "the end-fd doesn't look right!" Bare wire was touching brickwork, also a joint, (soldered and sealed) looked sickly. The 'good' seal had let water, and hence electrolytic corrosion, in. The brickwork problem occurred simply because in re-erecting the trinder, I'd pulled the end-fd a bit too far. The 4mm OD wire into brickwork...!

Both the TS-440S and the v.h.f. 130cdefected on me and nowadays the nearest place for service is Castle Electronics at Halfpenny Green airport - over 96km away! But the trip gave **UR5CMM** a practice drive in the car and we were rewarded by seeing the Goodyear 'blimp' unmoor and depart.

**Events**

First, Korean Slim - the station signing HM0DXX - gives a Po Box in Chongjin, but Asian stations find their beams looking towards northern JA1 and OH2BH also reckons he doesn't sound too real. J6/KL in October 99 was another one and 1A1/A2WYF anytime after 1992. Finally, TK6PX - FX8P says this is Corsica Slim.

Chesterfield Island, TX0DX is now a DXCC entity and cards for QSOs on or after March 23 are OK - but the DXCC desk want them held until October 1.

By the time you get this, 70 Yemen will have come and gone, as will VK9 Wilkins Island and AS1/15. An interesting special in August will be EM500E throughout August - 500th anniversary of the Kazak Glorian in Ukraine.

Activity from PY0S, St Peter & St Paul Archipelago is postponed again, by the Brazilian Navy, this time until July. Longer-term ones are Jan Mayer, where JX7DFA will be there for 8 or 12 months and DZ2B for a year. Cards for the latter to W3HNK.

**Letters**

Good luck to all our RAE-candidate readers. Our anonymous correspondent is one, and pucked. If we can't predict the number of spots on the sun tomorrow, how can we confidently talk about an 11-year cycle? This puzzles RAE students every year.

Toss a penny. We can't predict which way it'll come down. History says we have something like an eleven-year cycle, but 'predictions' are intelligent guesses. Sunspots have been known for a very long time, but reliable measurements only cover about 300 years past. Over that time, cycles have varied between seven and fifteen years, with an average of a hair over eleven.

So for some c.w. Ted Trowell went on 10MHz for 5B4/UA9YAB, OY3QN, H6POLQ and to 14MHz for K7QG and BV4AH. At 18MHz 9RQGA, VU2CC, V31JZ, JA4FXK and J7RKS went in the log, while on 21MHz 701YGF, Z21GC, PY1BV, KP4T, R1ANF (49th Russian Antarctic Expedition), E29DX and 707TB. 24MHz produced 5H3RK, YV6AZC, PS5RA, leaving the big crop for 28MHz, by way of 9M2TO, JAH8HO, L47HN, L47AWP, SM2ZX, ZP6CW, FR5FD, V51AS, FG6FSR, PS5JN, V6PBQ, BP2J, PY2ZDX, Z152J, JW/DL3NRV, 5B4/GOUK, CO6FW, LV8DV, 6D2X, 3A/KOCO, ZPSKO, PY2OW and ZV1FR.

Hollywood in Oxford is home for the Goodhalls. XYL Allison presented Paul with a nice new RS800 receiver. Paul hopes next time she'll buy a tower and a beam - for 2001's birthdays and Christmas - but I wouldn't bet money on it!

Seriously, Paul's list includes all the harder bits of N and S America including VE4, J9S, VK0MM, ZL5, 6J1RLK, 8G4MD, RA9UR, 9E1C, 9K2GS, AI4KJ, V44KB, HS0K4CMH, H4APT, BR1AK, R1ANZ, 5A1A, ZS31ER, (Elephant Rock island), H1PBYS, BP59 (Pratas Is), VR2JK, EP2MKO, FK8HV and of course the usual Europeans they were working.

As for young Peter, he and Paul 'had a good bash' during the Easter holidays, and time was spent using the Getcw program in preparation for NFD. A point arises here - computers send perfect Morse, but human operators don't! Seriously, practice taking hand-written Morse and never send him a bit of competition with another candidate. If you intend taking the Morse test in due course, write in longhand, not capital letters - it's quicker.

As Morse examiners, one sees so many unreadable scripts - letter I or number 1, 6 or G and so on. Our chap alerted us by mistaking reception up to speed until we organised three different 'fists' to send Morse to him and a bit of competition with another candidate. If you intend taking the Morse test in due course, write in longhand, not capital letters - it's quicker.

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The cold Winter and a very wet April have passed us by to be replaced by a warm May, (so far), and consequently the beginning of a new Airshow season. As I write this, Mildenhall Air Fete is just over a week away with hopefully the prospect of some interesting aircraft and some fine weather. Thanks to those of you who have been in contact recently, a quiet-ish Spring has not exactly seen my post bag bulging, so don’t forget to send in all those snippets of MilAir information you pick up in your travels.

The dividing line between an aircraft spotter and MilAir enthusiast is sometimes thin as they are very closely linked. Whilst I am grateful for all correspondence, I would politely ask those of you who send me detailed lists of aircraft and their serials to send them to the aircraft enthusiasts magazines as they are much more suitable for their editorial content. I would just re-iterate that I just do not have time to answer letters personally, so please do not send in stamp addressed envelopes, it just makes me feel guilty! - thanks.

Aerobatic Teams

With the show season approaching, David L. has dropped me a line asking about the frequencies in use by the major Aerobatic Teams. I have done a quick check through those noted in the past couple of years and they are as follows: Red Arrows 243.45 is the primary frequency and was heard in use during numerous displays in 1999, 242.2 is also reported as a secondary, but I did not hear it last year and I wonder if it is still used?

The Army Air Corp Eagles, I heard them use 136.975 at two displays in 1999, but 135.975 has also been noted. This is a Dishforth AAC Operations frequency so that would tie in as a likely candidate. 380.2 was used as a Eagles u.h.f. frequency during 1998, but I have had no reports since.

The Falcons Parachute team use 255.1, no v.h.f. frequency has been monitored recently. Patrouille de France 143.1 and 242.85 were both heard last year, also I have one report of 141.925 also being used.

The Frecce Tricolori used 307.8 last year, I also have a record of 283.25 and 381.0 being used in the past but no recent reports. Lastly, the Patrouille Suisse have been using 288.55, and the Battle of Britain Memorial Flight regularly use 120.8.

Research Projects

Staying on the Airshow theme, Ken Hughes has recently written to me, he has recently retired at 55, (lucky chap), so please do not send in stamp addressed envelopes, it just makes me feel guilty! - thanks.

The book will contain stories about events and incidents at each show, complete aircraft participant listings and for the past 20 years, frequencies and callsigns where known.

The second project which Ken is working on is a history of the Military Airband in the UK since World War II. This will tell an evolving story of all aspects of the subject, including the frequency bands in use and the radio equipment used by both ground stations and the aircraft. He has so far collated a limited amount of information, much of it once again from 1975 onwards, and he would like to hear from anyone who can help with any information prior to 1975 and with any radio/equipment information, post 1975.

Alternatively, if anyone can suggest sources of information then that would be equally helpful. It sounds like an interesting project - all correspondence via me at SWM.

Frequency Focus

Catching up with some queries, snippets of information and other items regarding frequencies and callsigns all noted during the last few months. A pair of Tornado F.3s, callsign APOLLO, were noted calling Tonic Ops, (stud 16), at Coningsby on 389.05. It was during high pressure and they were heard from the top of the South Downs at Ditchling Beacon in Sussex! A pair of F-15Cs from the 1st Fighter Wing visited Lakenheath during February using the callsigns DALLAS 01/02.

From the 1st March, Royal Air Force 101 Squadron have been using the callsign LION as their primary callsign for their VC-10s. The old primary callsign TARTAN was used occasionally alongside LION during March, but since April it has not been noted and has either been withdrawn or relegated to a standby/occasional status.

On the 16th March a new, (to me), AWACS frequency was reported in use as 255.925. My correspondent stated that the AWACS, callsign MAGIC 88, used the frequency twice and on the second occasion definitely called the other party as LONDON MILITARY? Was this just a mistake, (most likely), or is it a discrete London frequency that has not been reported, (unlikely). Can anyone shed light on what this frequency is used for?

Lastly back to Mildenhall, one of the local MilAir readers reports that by early May almost all of the Ground Operations radios using frequencies in the 406-420MHz range have been digised and all the voice channels are now encoded. I presume this is some form of trunked system - can anyone enlighten me? I am off to the Air Fete in a few days so I will report back next month with hopefully some frequencies, callsigns and photographs, (and a suntan?).
Icom are proud to announce their latest radio receiver - the IC-R75. This dedicated HF+50 MHz, all-mode unit has frequency coverage stretching from 30kHz to 60MHz in USB, LSB, CW, RTTY, AM, FM and S-AM. In addition to an extremely sensitive receiver, the twin PBT, 2-level pre-amp, selectable Auto-Gain Control (AGC) and noise blanker help to capture and clean up DX signals, whilst the RF attenuator reduces interference from strong local stations. The IC-R75 also has a Synchronous AM detection circuit to prevent audio distortion while receiving AM broadcasts.

A comprehensive range of features can be found in this extremely compact radio, measuring only 241(W) x 94(H) x 229(D) mm. These small dimensions give complete installation flexibility however you choose to operate, as a base or mobile.

The user-friendly front panel has a large, clear, alphanumeric LCD display. This shows the frequency or '6+2' character channel name. The panel also has a numeric keypad to allow direct frequency entry or memory channel selection. The SQL control may also be configured to adjust RF gain and/or squelch threshold. The large, front-mounted speaker provides clear audio, even at the maximum level of 2 watts.

Other features include a bar graph-style, digital signal meter, 99 memory channels, 2 programmable scan edges, an internal clock with ON/OFF timer functions and three speed-selectable scan functions; (program scan, memory scan and priority scan).

This superb receiver is designed to suit a range of market sectors from the demanding 'decoder' to the interested SWL. The IC-R75 incorporates Icom's leading edge technology and offers a range of features that make it exceptional in many ways. It sets a new standard for performance and value, and will become a popular choice for SWL's everywhere.
Decode

Let's start with the first of a few items of new software to brighten-up your utility decoding. The first, which is not so new but nevertheless important, is the latest update to the ever popular Mscan Meteo. The latest release takes it to version 1.07 and the most important addition is the inclusion of soundcard support. This means that you just need the software and audio lead to start h.f. FAX decoding. This is by no means the first program to offer this, but it is still a very useful addition that brings the program bang up-to-date. The great thing about this option is that it makes h.f. FAX decoding very simple and readily available to anyone with an s.s.b. receiver and a modern PC. The soundcard interface makes full use of the soundcard's facilities to produce high quality images without having to buy the special interface that was required with earlier versions.

If you already have a registered copy of Mscan Meteo, don't worry, the update to include soundcard support is available free of charge. If you've not yet tried this program, then you'll be delighted to know that there's a 'Lite' version of the program available for free download from the Mscan Web site.

Other goodies in the new version include improved image rotation, which is claimed to be 25 times faster. There's also an additional bandpass filter that's used with the soundcard to improve noise suppression. Finally, there's a manual stop button and an additional IOC of 267 for those that want to try Meteosat reception.

All in all it looks like a pretty useful upgrade and well worth a try. To get the trial/Lite version pay a visit to: http://mscan.com/download/mml0d2.zip and http://mscan.com/download/mml0d1.zip and http://mscan.com/download/m107u.zip If you already have a registered version, your free update can be downloaded at: http://mscan.com/download/mmm10d2.zip

A visit to the main Mscan Web site - http://mscan.com/mscan/meteo.html - will give you full pricing details plus contact information for the UK agents.

More ALE!
Following-on from my May article on Automatic Link Establishment (ALE) decoding software, George Wooley has e-mailed with details of a very comprehensive site for those of you that want to monitor the USAF ALE links. You will recall in that article that I showed an example of an ALE message using a report from a C17. George has provided more detail as shown here:

- 96-001/008 McDonnell Douglas C-17A Lot VIII Globemaster III c/n P-33/40
- 002 is Spirit of the Air Force
- 005 is Spirit of John Levitow.
- 006 is Spirit of Berlin
- 007 is Spirit of America's Veterans
- 008 is Spirit of the Total Force

If you want to get at the full range of US serial numbers, you need to visit Jim Baugher's site which can be found at: http://home.att.net/~jbauger/usafserials.html If you come across any other interesting ALE sites please drop me a line with the details.

A number of listeners have reported coming across what sounds just like a RTTY signal which can't be decoded. Don't worry, this is very common as there are lots of signals around that sound for all the world like RTTY. There are usually a few clues within the signal to help you quickly decide not to waste time trying to resolve it.

The two most important clues are the shift and the baud rate. With the many tools available these days it is quite easy to measure these characteristics, even if you don't have a sophisticated decoder. By far the most valuable tool for this operation is a spectrogram tool. This gives a graphic display and usually provides a facility to freeze a section of the signal so you can take a few measurements.

Probably the easiest program to use is Spectrogram, which is currently at version 5.1.6 and is available from their Web site at http://www.monumental.com/rshorne/Programs/gram50.zip This latest version includes a stack of improvements including:

- Complete user control over colour scale
- Increased sensitivity to low-level signals
- New 1/3 octave processing option
- Adjustable frequency-amplitude calibration
- Automatic record triggering by signal level
- Single spectrum plot capability at any spectrogram point
- Scanning improvements allowing image printing and saving
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If you're new to this type of analysis, I'll offer some help, as the Spectrogram default settings won't deliver the type of display I've shown in the column. I suggest you start with something fairly simple like a RTTY signal of known shift and speed. A good example would be Hamburg Meteo on 4.583MHz, which sends 24hrs RTTY using a shift of 400Hz and a speed of 50baud.

For the sake of this example I'll assume you're using Windows 98 and the latest version of Spectrogram, though much of what I suggest will work with older systems. First of all you need to connect a screened lead between the audio output of your receiver and your computer soundcard. The best connections to use are from the 'line-out' or 'record-out' on the receiver to the 'line-in' on the soundcard. I say this because this gives you a relatively steady signal level that won't be affected by changes to the volume control. With this done you need to double-click on the volume control icon in the bottom right hand corner of the screen.

As most people run with SoundBlaster or equivalent cards, you should get a set of sliders shown on the screen. You need to find the record control and use the Show menu option to make sure you can select the recording source. Once you have this you need to tick the line-in as the recording source.

You can now close this down and run the Spectrogram program. You will probably find that you are presented with the Scan Input screen. If not, cancel the screen you have and go to the File menu and select Scan Input.

Now you need to set the parameters as follows: Sample Rate: 11K, Resolution: 8bit, Type: Mono, Display Type: Scroll, Scale: 60dB, Palette: CB, Time Scale (msec): 1, Cursor Offset: 0, Freq Scale: Linear, FFT Size (points) 1024, Freq Resolution (Hz): far right 107.7, Band (Hz) 250 to 3006, Spectrum Average: 1, Pitch Detector: Off, Recording Enable: Off.

I know it sounds complicated, but it's really quite easy to do. With all these settings complete you can press 'ok' and the program will start analysing everything coming in through the 'line-in'. Whilst this is all very pretty, what you really need to be able to do next is to record and store a sample of the signal so that you can freeze it and take a few readings.

To do this, go back to the File menu and select Scan Input again. Move down to the bottom right-hand corner of the screen and in the Recording Enable section click the On button. You will then be presented with the usual Windows file save menu where you can choose a file name and a destination.

I would highly recommend you set-up a special directory for these files so you can easily find them again and delete them when you have finished. With all this done, the program will again start analysing everything that comes in via the Line input.

Once you're happy that you have a good signal just hit save to start recording and stop when you're done. Using a sample rate of 11KHz mono provides a very economic method of recording data signals consuming disk space at just 330KB per minute.

With your data signal captured to disk you can now use the Analyse File option to examine your recording. Make sure you use the same settings as you used to make the recording. You can now press Stop to freeze the display at any point you like.

If you now move the cursor over the screen you will see the details of the signal under the cursor displayed in the box in the lower left corner. To measure the shift place the cursor on the upper and lower horizontal lines in the signal and note the difference between the two frequency readings - this is the shift.

Calculating the baud rate is a little more complicated, but still quite quick. First you need to take a careful look at the shape of the signal and locate the narrowest vertical section. If you've got it right, this should be a single bit in the signal stream.

All you now have to do is note the time difference between the left and right-hand sides of the section. If you've got it right and this is a 50-baud signal, the difference should be 20ms. To convert this in Baud rate you need to divide the result into 1000, e.g. Baud Rate = 1000/20 = 50. As soon as you're confident you understand the technique you can apply it to just about any data signal.

Advanced Analysis

For those of you that like to try new tools and software I've come across a powerful new analysis systems on the web. S Tools X for Windows 95/NT is produced by the Acoustic Research Department of Austrian Academy of Science. The program offers a very wide range of precision analysis options and is freely available for the Academy's web site at: http://www.kfsoeaw.ac.at I'll provide some more detail on how to get the best from the package in a later column.

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ATC 2000

Most readers of this column will probably remember that last year’s Royal Tournament at Earls Court in central London was the last one. For s.s.b. utility enthusiasts, this event was quite popular as the UK Air Training Corps (ATC) manned their h.f. network and made contact with both civil and military aircraft flying in and around the UK and Europe. Last year, they even issued QSL cards to s.w.l.s who were able to provide details of the contacts they heard. While listening to their communications I was quite surprised just how many air crew said that they were ex-ATC members, and many commented about the sad demise of this event.

The Royal Tournament has been replaced by an event known as the Royal Military Tattoo 2000 that is being held on Horseguards’ Parade in central London between 10th and 15th July. This location is quite well-known, as it is the location of the Trooping the Colours ceremony held on June 15th each year. The ATC will not be running their h.f. station from this event, but another event further ‘up country’ during the month of July will provide an alternative for listeners.

A two-week event has been organised for late July at RAF Cranwell in Lincolnshire, and it is open to all ATC units from the UK. It is known as ATC 2000, but the exact dates are not known by me as I compile this column (although the last two weeks of July seem to be the most likely). The Cadets will be able to participate in all the normal cadet activities, allowing individual cadets and Squadrons to experience those activities that they do not normally have the opportunity.

One of those activities is the chance to operate on the ATC h.f. network, and this will be of interest to h.f. listeners. As with the Royal Tournament in London the cadets are hoping to contact as many military and civil aircraft on their h.f. network frequencies, and a number of airlines have been contacted to make sure that flight crews are aware of the event.

The Royal Tournament was a bit limited in its operating times, as the cadets could only operate their station while the Tournament was open, limiting them to 1300 to 2000, but the ATC 2000 event will allow them to operate for longer periods. I can’t imagine that it will be a full 24-hour operation at ATC 2000, but I would certainly expect their h.f. network to be active from about 0800 each day. Other problems with the Royal Tournament set-up were QRMs caused by signals from the amateur radio special-events station and QRM from the air-conditioning units on the roof near to the ATC antennas. Obviously, these will not be problems at RAF Cranwell.

In the past I have mentioned the ATC h.f. network many times, but I have never given their exact frequencies. On several occasions I have also mentioned conditioning units on the roof near to the ATC antennas. I have often received requests for lists of h.f. frequencies used by various airlines around the world. The larger airlines are quite easy to find, but most of the smaller ones are quite difficult to locate; either they use non-aeronautical band frequencies, or they seldom use h.f.

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I have recently been in contact with a listener in Finland who compiles a list of aeronautical h.f. frequencies of airlines from all over the world, and he has agreed to me mentioning his list in SWM.

Risto Hirvonnen in Finland has been collecting and compiling LDOC frequency information for many years, and has been answering questions about these on the WUN list for quite some time. He works in the airline industry, and has used his contacts to find out a lot of elusive information. His Aerolist is available from his web-page in two formats, either as an ASCII text file, or as an Excel spreadsheet.

The Aerolist is simply a list of h.f. aeronautical frequencies from 2 to 30MHz with lists of users and station for each frequency. The beauty of having such a list as a computer file is the ability to quickly search for information, whether you need to find a user for a frequency, or a frequency for a user.

Jamming

The subject of Jamming just seems to run and run. This month I received an E-mail from Charlie (who omitted to tell me where he was in the UK) who commented on the item about SAR and Jamming (SWM, April 2000 issue, page 68), and that maybe I have a problem with my radio; both he and a friend have experienced similar problems. Charlie says that both he and a friend have tuned their radios to 5.680 but have not heard any interference or warbling; they have found some form of interference which they have narrowed down to their choice of radio. Charlie asks if I am using an Icom R71E receiver, and if so he offers to fix the warbling for me!

Well Charlie, there are plenty of listeners out there who have heard the jamming, buzzing, warbling and interference, and it is definitely not a problem with my radio. I have several reports from up and down the country, and even from overseas. These listeners and contacts are using a wide range of receivers and transceivers from a number of different manufacturers, so the jamming is not limited to one make of radio.

At the risk of boring those who have heard me mention this before, I use an AOR AR3030 h.f. receiver which I have had since they first appeared in this country. Charlie does quite correctly point out an error on my part when I mentioned that the BT site at Daventry is home to the MSF service and Atomic-Clock. As Charlie and several others pointed out, the Atomic-Clock system is at the National Physics laboratory in London, and the signal is sent by land-line to Daventry where it is transmitted to its audience. In my defence, my original text does say that the newspaper article said that the BT site was home to an atomic-clock, so I feel justified in passing the blame back to the original newspaper (I just wish that I’d checked my facts a bit better).
Satellite TV News

Israel, perhaps of all Middle East countries, commands more respect and interest, a vivid religious history around which much of our present society sets a standard, in recent times conflict - even with the British, the Six Day War and current ongoing friction over the Golan Heights and Palestine. A victimised race - Hitler's policies in WW2 - and resulting from that oppression a country that is now fiercely protective of its own - example the Ugandan hostage drama with Idi Amin.

I recall the haunting callsign of the Kol Yisrael s.w.l. service in the 60s on 3.009MHz in my s.w.l. days. It's a rarity sighting on satellite, there's no easily accessible source of Israeli TV, odd since every Arabic state and protectorate seems to have its service downlinking somewhere. Even Sharjah TV is available via TV. To a small dish - a well known RAF desert posting post in the post war British Empire.

And my sighting of 'BEZEQ TVRO' was to me exciting. Bezeq is the main Israeli uplinking teleport and April 1st around 2000 whilst cruising over the coordinates of Eutelsat W2, 16°E searching for any itinerant NTL downlinks, I found Israel! In fact, the picture content was confusing. The picture comprised of a large number of Jewish gentlemen in a large 'traditional' hall in a state of celebration, singing and dancing. The centre of the festivities appeared to be an elderly gent with a large white beard. Most were wearing long black coats and large round furry hats. At one point, all processed out into the Jerusalem street and eventually returned to more celebration. No commentary, but the service ident confirmed the country.

Curious, I found on an Internet Jewish website an E-mail invite to 'Ask a Rabbi' over any aspect of Jewish life. The answer returned a few days later, the celebration was to mark the Passover - it being held between Palm Sunday and Easter. Essential data - 11.1311GHz-H, SR 5632; FEC 3/4; VPID 4194; APID 4195.

Another race that is suffering modern racial persecution are the Kurds, though they can represent their views and suffer through satellite TV. Test transmissions from KURDSAT have been monitored around the 11.011-11.015GHz-H, SR 5632+3/4 on Eutelsat 2F3 @36°E with a recent ident as 'Service 1'. Programming is biased towards a country that is now fiercely protecting its own - example the Ugandan hostage drama with Idi Amin.

For Middle Eastern watchers, it's worth tapping in on 11.621GHz-H and the 5th 11.055GHz-H. The latter 'UKI-234' had been wheeled into action, all digital of course with the well worn 5632+3/4.

I caught Spain's Guadalajara teleport late April with an interesting aerial shot of the Olympic Games - 'The Racing Channel' is a subscription channel carried by Sky, yet early May over several days horse race coverage was carried in the afternoons in the clear on 2F3. However the uplinking operation was frequency hopping. On the 3rd 'SIS UKI-234' downlinked at 11.062GHz-H; the 4th 11.621GHz-H and the 5th 11.055GHz-H. The latter 'UKI-257' had been wheeled into action, all digital of course with the well worn 5632+3/4.

Unfortunately, I must report that SISLink have opted into 'encryption' for most of their programme circuits, often originating the circuit and rehearsals in the clear and then opting into scrambled mode. And it was on election day, May 5th, that several OB circuits were obviously active on 2F3 but all 'encrypted'.

A couple that were in the clear - 'RTV UKI-511 SKY NEWS' covering the Inner London Election as was 'ITN 9MHZ'. An early evening election report with a sunny Tower Bridge backdrop - 11.076GHz-H was perhaps the 'prettiest' shot of the whole election (my own sightings ended at that point as I was actually working as an election count assistant that evening - times are hard, money scarce!).

Romesy became a political hot potato over this period as we were electing a new MP following the untimely death of Michael Colvin (covered two issues ago). Two satellite trucks were in use with live reports for the BBC and Sky. The next morning as the sun rose over Romsey, the BBC SNG truck arrived in the Market Place, under the shadow of the Abbey, lifted it's telescopic mast (with its off-air terrestrial u.h.f. Yagi), aligned it's dish onto 30°E, but the downlink was too weak at home to lock up (11.088GHz-H) on my RSD receiver!

The NASA Atlantis Shuttle flight didn't 'make it' on April operating an Eclipse satellite receiver and 1.2m prime focus dish in Suffolk, laments the reduction in analogue activity - there's still analogue about, mainly in domestic programming, but there's been a mass defection to digital transponders and outside broadcast, news and corporate feeds and we've followed the trend. It's made sat-zapping much more difficult and we obviously miss many signals, but we're still catching the flavour of the month.

I caught Spelt's Guadalajara teleport late April with an analogue SNG uplink test card on Eutelsat 1C @11.578GHz-H. A few days earlier the new Sirius-3 @5°E was on analogue tests and 11.995GHz-H carried colour bars and the 'SIRIUS 3' inaudial ident.

Aircraft hijacking attempt was seen April 22nd at 1330 with pictures of a parked Quantas airliner at an airfield in a heat haze, guards around and pictures via 2F3 @36°E, 11.863GHz-H (5632+3/4, PIDS 3582/256) and the service ident IMAGENYTD1 UKI425'. Normal aircraft movements continued on the unknown airfield. No newspaper reports were seen of this event and a mystery why UK SNG serial numbered equipment, i.e. 'UKI425' is in use. No audio other than natural effects, the signal cut transmission at 1300 - the mystery remains!

More orbital hardware destined for the 36°E slot (see news following) it's likely that more sightings will be featured from this slot. During April, 36°E was very busy as ever. The continuous UK rain caused heartache for the Rugby League Cup Final, this year moved from Twickenham to Murrayfield, Edinburgh. And so we find the good ship 'UKI-234 Low Delay 8MB' feeding back into BBC Network sports reports on the state of the waterlogged ground.

The next day, April 26th, another BBC crew 'UKI-534 BBC SNG' appeared and yet more reports from the sodden turf! A few months ago we were logging 'UKI-234' in the guise of an analogue BBC SNG truck, often on Telecom 2C @5°E, now it's been digitised and back on air. One frequently seen analogue friendly SNG truck was our old friend 'UKI-49' and hopefully that too will re-appear on our screens...
26th with unfavourable wind postponing it until a later day, but full coverage of the non-event was made possible on the NSS-K 21.5°W bird via the Globecast bouquet - 11.59GHz-V; SR 20145; FEC 3/4 - taking a feed from NASA TV output. In fact, viewers saw the scaling down for the day and discharge of the nitrogen tanks, the crew exiting and precautions to prevent dust ingress into the vehicle. The sound channel commentary ended and the radio comms between main control and the shuttle launch site engineers was carried. The Globecast crew were same bird, another project the previous day on the new 11.59GHz-V frequency, SR/FEC as above this time this project is a test pattern from Venezuela - 'Uplink-1 Venevision' with inlaid title time detail. No programme material was carried.

Checking out a tip that the 'Vision of Resistance' is transmitting on Hot Bird, 13°E at 12.597 GHz-V (SR 27000; FEC 3/4) I found that signals were present on this frequency. In sequence there is MBC; Service 2 'BET International coming soon' caption; 'NITY*'; 'CNNi' (encrypted); 'Euronews' with news programming in English; the French 'Canal Rural', down on the farm programme; 'JSTV-1', encrypted; 'JSTV-2', pictures of animals, birds, street scenes but no audio. *'NITY' appears to be the 'Vision of Resistance' as noted above.

Programme language is mostly Eastern, Arabic and another and still using an Arabic type script. At 2000 a news broadcast produced the 'NI TV' logo, certainly not Arabic, but another language unknown but suggesting the Caspian Sea region! May 10th and monitoring the channel seemed to be very basic TV presentation, invited 'phone-ins and a few commercials with an English caption ident 'National Iranian TV'. The picture quality isn't wonderful, rather smudgy resembling 'VHS'.

'NITY' has also been sighted by Roy Carman (Dorking) via Telesat-12, 15°W within an eight channel package - 11.594GHz-V with an unusual SR 15000+3/4. Iranian news feeds also appear on Hot Bird, 10.922GHz-H ex Tehran, a rare catch (SR 29900+3/4).

Whereas Arabic TV programming appears over numerous satellites - most easily received Eutelsat W2 16°E and Hot Bird 28.5°E, the most comprehensive is found on the Arabsat slot @ 26°E (both analogue and digital) and NileSat 7°W. The latter can be difficult to locate and a 1cm dish would be advisable both for signal gain and interference protection from other closely positioned satellites. Unfortunately, Aramis @ 4°W has two spot beams into Central/Eastern Europe and the East Med onto Tel Aviv and consequently UK reception is marginal at best. The lower end of Telecom 2C 3°E Telecom band is very productive for sports feeds. On one evening, April 30th, Roy logged 8 channel feeds with information beyond soccer feed were also present. On the same date, Siris 3°E, the most comprehensively covered satellite, has a very active in SE Asia and the Pacific Basin. The year 2000 will offer another Olympic Games spectacular, this time in Sydney, Australia, and the EBU have already leased capacity on Intelsat 804 (64°E) and Intelsat 704 (66°E) for the carriage of 40,000 total programme hours Olympic action. Within this capacity, the EBU will carry at least 25 full time channels feeding over 30 European broadcasters and of course all transmissions will be MPEG-2 digital. The EBU are working in conjunction with Teletira, a telecoms group very active in SE Asia and the Pacific Basin.

Six of the 18 transponders can be switched into the steerable beam mode and both widebeam and spot beam are able to 'talk' to each other allowing ease of communication from Europe into India for example. SESAT will be joined shortly by Eutelsat W4 increasing still further capacity at 36°E - W4 will launch ex Cape Canaveral mid May.

The Luxembourgers own the Astra satellite fleet SES have had control of the leasing of 6 x 7230MHz-bandwidth transponders on the Feb 2001 launching Eutelsat Eurobird which will slot at 28.5°E, closely adjacent to the Astra 28.2°E slot. SES will take a 12 year lease on the 11.20-11.45GHz downlinking transponders to enhance the Astra coverage of Western Europe and particularly the UK.

This news is welcome since the hoped for late May launch of the SES Astra 28 satellite has been delayed until late July, this caused by late delivery of the bird into the testing facility company based in New York.

Another facility company based in New York.

**Orbital News**

It really looks like bad news for the Iridium LEO (low earth orbiting) fleet of 66 satellites as the telecommunications press report that Motorola are now making plans to de-orbit the fleet to burn them up in the Earth's upper layers. They had hoped to quick gain subscribers for the global mobile phone network, but after many months, only 55,000 has signed compared to the +1 million hoped for. With two other LEO projects (Globalstar and ICO) well advanced in the pipeline, things aren't looking too good.

The European Broadcasting Union (EBU) have now successfully tested their Basic Interoperable Scrambling System (BISS) which when adopted by manufacturers will allow simplified programme and news distribution across boundaries without the problem of incompatible DVB equipment in use by different broadcasters. The ITU should give the BISS its blessing late 2000.

The year 2000 will offer another Olympic Games spectacular, this time in Sydney, Australia, and the EBU have already leased capacity on Intelsat 804 (64°E) and Intelsat 704 (66°E) for the carriage of 40,000 total programme hours Olympic action. Within this capacity, the EBU will carry at least 25 full time channels feeding over 30 European broadcasters and of course all transmissions will be MPEG-2 digital. The EBU are working in conjunction with Teletira, a telecoms group very active in SE Asia and the Pacific Basin.
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WRTH 1999 Review

"Most Innovative Receiver”

WRTH 1998 Awards

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**Model Name/Number**  
**Construction of internals**

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<tr>
<th><strong>External units</strong></th>
<th><strong>Construction of externals</strong></th>
<th><strong>PCMCIA adapter (external):</strong></th>
<th><strong>Published software API</strong></th>
<th><strong>Published software API</strong></th>
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<tr>
<td><strong>WR-1000i &amp; WR-1000e</strong></td>
<td><strong>WR-10000-WR1500i-3100iDSP-internal full length ISA cards</strong></td>
<td><strong>WRTH 1999 Review</strong></td>
<td><strong>WRTH 2000 Review</strong></td>
<td><strong>WRTH 2000 Review</strong></td>
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<td><strong>WR-10000-WR1500i-3100iDSP-internal full length ISA cards</strong></td>
<td><strong>0.5-1300 MHz</strong></td>
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<td><strong>BRAND NEW DIV</strong></td>
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<tr>
<td><strong>WR-10000-WR1500i-3100iDSP-internal full length ISA cards</strong></td>
<td><strong>0.15-1500 MHz</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
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<tr>
<td><strong>AM,SSB,CW,FM-N,FM-W</strong></td>
<td><strong>AM,LSB,USB,CW,FM-N,FM-W</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
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<tr>
<td><strong>100 Hz (5 Hz BFO)</strong></td>
<td><strong>10 Hz (1 Hz for SSB and CW)</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
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<tr>
<td><strong>6 kHz (AM,SSB)</strong></td>
<td><strong>2.5 kHz(SSB,CW), 6 kHz (AM)</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
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<tr>
<td><strong>17 kHz (FM-N), 230 kHz (W)</strong></td>
<td><strong>17 kHz (FM-N), 230 kHz (W)</strong></td>
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<td><strong>BRAND NEW DIV</strong></td>
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<tr>
<td><strong>Pll-based triple-conv. superhet</strong></td>
<td><strong>PLL-based triple-conv. superhet</strong></td>
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<tr>
<td><strong>10 ch/sec (AM), 50 ch/sec (FM)</strong></td>
<td><strong>10 ch/sec (AM), 50 ch/sec (FM)</strong></td>
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<td><strong>200mW</strong></td>
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<td><strong>8 cards</strong></td>
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<td><strong>± 2 kHz</strong></td>
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<td><strong>no - use optional DS software</strong></td>
<td><strong>YES (ISA card ONLY)</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
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<tr>
<td><strong>yes</strong></td>
<td><strong>yes (ISA card ONLY)</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
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<tr>
<td><strong>yes</strong></td>
<td><strong>yes (also DSF)</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
<td><strong>BRAND NEW DIV</strong></td>
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<td><strong>£299 inc vat</strong></td>
<td><strong>£359 inc vat</strong></td>
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<td><strong>£359 inc vat</strong></td>
<td><strong>£429 inc vat</strong></td>
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Broadcasing Communication Systems, Unit B, Chelford Court, Robjohns Road, Chelmsford, Essex, CM1 3AG, United Kingdom
Hello once again and welcome to 'ShackWare' - no need for an explanation, I'm sure you all know what this column's about by now! Thanks for all your letters and kind words this time around and so without further ado, let's press on to some interesting letters detailing PCs old and newish.

Mailbag

Remarkably, the ubiquitous PC has been with us for around 20 years now in various guises. Introduced as IBM's progeny for a market it considered short-lived and unworthy of interest, the PC caught on in spectacular fashion and helped to establish the microcomputer as a sensible alternative to larger machines.

In fact, the minicomputer, the machine of choice for corporate IT buyers, went into an almost terminal decline. William McCravy, the only place you'll see them is in museums - or my shack where until recently you could have run a fingertip over a Spectrums 32020 - and now I'm looking for another minicomputer, any ideas please will help to give you a slight edge when using an older and slower machine. The commercially available interface no doubt sports a 'comparator' interface and is little more than a few diodes and an op-amp. 'comparator' interface and is little more than a few diodes and an op-amp.

"Would the Toshiba Libretto work with JVFAX and Hamcomm coupled to a Grundig Yacht Boy 400 or Sony ICF7600G, or would I have to purchase a full-sized computer?" asks Les. "I am very much a novice when it comes to decoding although I have been a short wave listener for many years. I would like to be able to decode SSVT, RTTY and C.W. Would I require a separate interface unit and do you know of a suitable one?"

Libretto Liberated!

And now from the ancient-but-useful to the relatively recent and really wonderful. About a year ago I spent the greater part of almost every instalment of 'ShackWare' raving about the Toshiba Libretto, a truly pocket-sized Pentium-based PC sporting an 850Mb hard drive, 16Mb RAM and a breathtaking TFT colour (i.e. SVGA) screen.

This computer finally filled a desire of mine to create a pocket decode station that I could take and use anywhere and it's fair to say that I probably bored my readers rigid singing its praises over many months! Well, I've resisted for a while, but when an interesting letter from Les Borthwick of Hawick, Scottish Borders, fell through the letterbox (a lovely part of the world by the way) it was welcome back, Libretto! "The Toshiba Libretto worked with JVFAX and Hamcomm coupled to a Grundy Yacht Boy 400 or Sony ICF7600G, or would I have to purchase a full-sized computer?" asks Les. "I am very much a novice when it comes to decoding although I have been a short wave listener for many years. I would like to be able to decode SSTV, RTTY and C.W. Would I require a separate interface unit and do you know of a company that supplies these units? And is the Libretto still available?"

"The Lib is perfectly suited to decoding using either program and a standard comparator interface - I know, because mine does it all the time! In fact, the Lib has an advantage over desktop machines in that the major source of electronic hash from the monitor is removed completely, the I.c.d. screen is positively transparent, because mine does it all the time! In fact, the Lib has an advantage over desktop machines in that the major source of electronic hash from the monitor is removed completely, the I.c.d. screen is positively transparent."

John Boutil G4LOM of Seaham, County Durham, is struggling with an even older beast. He writes "I have a Compaq Portable II equipped with an 80286 microprocessor, a 2.55 Mb disk drive and a 3in monitor. Unfortunately, I don't have the start-up disks 'User Diagnostics' and 'User Programs' which I believe are necessary to boot the machine'.

That Compaq Portable II was a very desirable computer indeed when it first made an appearance around fifteen years ago, though back then it came with a list price of £3879! And I'm not entirely convinced that 'portable' is the right way to describe what is little more than a suitcase with a TV shoehorned into it! Try getting that on your lap on the crowded commuter from Victoria and see how many friends you'll make - 'luggable' is probably a better description.

Mind you, so many people liked Compaq's PC compatibles that the company became the first computer manufacturer ever to outsell IBM's own PC - a quite remarkable achievement at the time. Of course, faced with a problem like this, the first thing I do is get onto the Internet and have a good rummage around. Almost invariably there'll be someone, somewhere, who has an interest in just the model of computer that you're looking to support and who can supply (via FTP downloads) all the diagnostic and other disks. And yes, there were lots of sites devoted to Compaq's early portable, some with excellent information though none that I could find with downloadable disk images.

One of the better sites however was the Obsolete Computer Museum at www.obsoletecomputermuseum.org/compaq.html which features lots of pictures, a detailed specification for the machine and links to other support sites including www.mdsbattery.co.uk/mdsold/im0214.htm which sells the correct lithium battery to keep the Compaq's internal clock and system back-up running.

Contact Morgan Computers at www.morgancomputers.co.uk

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<tr>
<th>Model</th>
<th>Description</th>
<th>£ RRP inc VAT</th>
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<tr>
<td>GPS-12</td>
<td>GPS receiver (no external antenna) 12 parallel</td>
<td>124.95</td>
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<tr>
<td>GPS-12XL</td>
<td>GPS receiver c/w carry case 4 x AA alkaline batteries 12 parallel</td>
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<td>GPS-12CX</td>
<td>GPS receiver Europe city point database 4 colour screen</td>
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<td>GPS-11PLUS</td>
<td>GPS receiver rotatable screen c/w velcro mount 12 parallel</td>
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<td>GPS-111</td>
<td>GPS receiver c/w velcro mounted international base map 12 parallel</td>
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<td>GPS-48XL</td>
<td>GPS receiver good for marine use 12 parallel</td>
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<tr>
<td>GA-26</td>
<td>Active low profile antenna c/w 8' cable BNC mag/auction for 2/2+/3/45</td>
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<td>MCX to BNC adaptor for GPS-12XL/40/...</td>
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<td>010-10117</td>
<td>Carrying case for GPS-2/2+/12/12XL/38/40</td>
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<tr>
<td>010-10051</td>
<td>PC4X/6X software &amp; PC interface cable 2/2+/3/12/12XL/38/40/45Xl</td>
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<tr>
<td>101-10048</td>
<td>Adjustable swivel/surface mount for GPS-12/12XL/38/40/45XL</td>
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<td>101-10111</td>
<td>Dash/surface mount for GPS-2/2+</td>
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<tr>
<td>101-10022</td>
<td>Bicycle/handlebar mount kit for GPS-2/2+</td>
<td>17.95</td>
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<tr>
<td>101-10156</td>
<td>Swivel mount bracket for GPS-2/2+</td>
<td>13.95</td>
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</table>

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- 300 - 470MHz
- 905 - 1000MHz
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- STEPS: 5, 6.25, 10, 12.5, 25kHz
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- BAND MEMORIES: 10 (user re-programmable)
- PRIORITY CHANNELS: 10
- SCAN/SEARCH SPEED: 30 per sec
- POWER: Requires 4 x AA batteries
- SUPPLIED WITH: Antenna, Earpiece, Carrying Strap and built-in Desk Stand

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<table>
<thead>
<tr>
<th>MAKE</th>
<th>MODEL</th>
<th>PRICE</th>
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Short Wave Magazine, July 2000
Airband

Immediately on publication of this issue, events are expected to take place at (in June) Waddington (22-25), Cranfield PFA Rally (23-25) and Weston Beach, Southampton, Seawings 2000 (24) also involving Lee-on-Solent. Before travelling to an event, make sure that it’s still on! I hope to go to Cranfield but there’s no time to make arrangements for meeting readers! If you’re there, I suggest putting out a public address announcement for me, early afternoon. Frequencies will be: hard runway 130.675, grass runway 134.925, arrival ATIS 122.85, departure ATIS 121.675MHz (see AIC 18/2000 from the CAA).

One clue as to the planning of a major event is Temporary Restricted Airspace. Dial the free number (0500) 354802 after 1900 local the night before and the recorded message will list any restrictions. If the Red Arrows are performing, they are usually mentioned. Unfortunately, some details of events are announced too late for me to forewarn you in this column. During the Midlenhall Air Fete (May), overflying aircraft contacted Lakenheath 128.9 or 264.675MHz, note this for future reference. At North Weald, the Air/Ground frequency 123.525 becomes ATIS and 121.175MHz is Tower during events, as happened at the Aerofair in June (AIC 11/2000).

Luton Visitors

Chris and I recently visited Luton Airport after a long absence. What a change! Where spectators once stood is now a cutting leading into a tunnel beneath the taxiway from Main Apron. The old spectators’ building has been given over to easyJet as their offices. Now I know that this company has a huge share of movements at Luton, but you would have thought that such an important airline could have arranged its own buildings.

Presumably easyJet have an h.f. network as an experimental depending on individual circumstances. Do let me know how you get on.

Emergency

Despite all these years studying the subject, it only occurred to me recently that the u.h.f. distress frequency (243) is the second harmonic of the v.h.f. one (121.5MHz). I must be getting slow on the uptake in my old age. Perhaps the idea is to protect the u.h.f. channel from second by harmonic multiplication, in the same way as the original h.f. amateur bands go up in harmonic multiples.

Our marine colleagues have Channel 16 (156.8MHz f.m.) as their distress (and calling) v.h.f. allocation. Air-sea rescue helicopters are also equipped with this. The adjacent channels (75 and 76, 25kHz spacing) are 156.775 and 156.825MHz and type-approved marine equipment is incapable of operating on these. They are the guard bands, preventing adjacent-channel interference from affecting Channel 16. For good measure, the next channels removed a further 25kHz either side (15 and 17, 156.75 and 156.85MHz) are restricted to low power (1W instead of 25W).

Receiver Hardware

What do you get the person who has two scanners? A second antenna? Not always a practical proposition! There might be equipment available or so that the two can be used intermittently (243)! Also, it is possible to use the necessary adapters and leads, it seemed to work quite well despite placing some attenuation in the signal path. As this was a rally one-off special, I wasn’t going to mention it. Then I saw a similar device in the latest Maplin Electronics catalogue (usually available through larger newsagents). Catalogue number BM9OX splits one antenna to two receivers (or vice-versa) over the range 5MHz to 2GHz. Cheaper than some other offerings, even when you add the cost of three F-type to BNC adapters (catalogue number FE87U).

If you do try this device, I stress that it will be experimental depending on individual circumstances. Do let me know how you get on.

ACARS

This system exchanges short bursts of data between aircraft and ground on v.h.f. It means that an aircraft can report its airborne time automatically so that the company once, for example, both the marine and air bands might be active when co-ordinating a rescue at sea, as suggested above.

If only one antenna is available, it is necessary to divide its incoming signal equally between the two receivers, not to disturb the characteristic impedance of the system, and to isolate the two receivers so that they don’t hear each other’s internal oscillators. Certainly, expensive powersplitter devices are on the market and it is also possible to make your own.

My attention was caught by a cheap little device at a rally, intended for feeding a satellite dish to multiple receivers, it was broadband enough to work at v.h.f. too. Unfortunately, the satellite industry has standardised on F-type connectors and most scanners are BNC equipped. With the necessary adapters and leads, it seemed to work quite well despite placing some attenuation in the signal path.

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DX Television

A pril was another bad month for DX reception with only Meteor-Shower snatches to save the day. There was an upturn in conditions towards the end of the month with a Sporadic-E opening signalling the start of the new season.

Reception Reports

Auroral activity on the 6th gave a spectacular visual display across the northern horizon from around 21:00. The Northern Lights were observed in the south of England by Simon Hockenhill (Bristol) and Roger Bunney (Romsey), but there was little evidence of reception in Band I. F2 activity seems to have dwindled with the m.u.f. barely clearing 30MHz, according to Simon. A few sporadic-E openings were witnessed on the 28th by Peter Barber (Coventry). At 1352 a circus appeared on Channel IA (53.760MHz) from RAIUNO, identified by the logo in the lower right of the screen. Later, an opening to Spain occurred with a feature film and adverts from TVE-1 on Channel E3.

The Mendip transmitter and its dependants were off-air on the 3rd which freed several u.h.f. frequencies. Stephen Michie (Bristol) took advantage of the situation and was able to log all Sandy Heath channels. Normally, the Siston relay occupies three of these channels except 27. All Hannington channels were receivable as the Bristol! Kings Weston relay was also off-air. When Mendip returned, the teletext displayed the BBC South region, rather than BBC West.

Slow-Scan TV

George Dowding (Birmingham) writes: "I am 75 years old and a very keen s.w.l. since the mid-thirties, having read SWM since the early fifties when it was the old format. First, a little on how I became involved with SSTV. I lost my hearing in one ear some 30 years ago, so s.w.l.s will imagine the more I turn up the sound, the worse the noise. I was about to give up s.w.l. when I came across a very informative article in a magazine dated April 1996 by John Crandon GM4NHI. Although there seems to be very little reading material available entirely devoted to the subject, the following publication is of interest: Short Wave Listeners' Guide (by Ian Poole with only a short item about SSTV); Newnes Radio Amateur & Listeners' Data Handbook (this includes a little more about SSTV); Beyond The Broadcast Bands (Radio Technology, CW/3RRI. This is very informative and a 'must' for the beginner)".

For receiving SSTV signals, a good communications receiver is advisable, covering the h.f. bands up to 30MHz and, if possible, 2m (144MHz), as there is some SSTV on this frequency. George uses an Icom R8500 receiver and also a Yaesu FRG-100.

A PC is required, at least 468 and running Window 95/98 for best results. A demodulator is required which is connected between the line input of the PC and the audio output of the receiver. The demodulator can be obtained from Perviss Ltd. as advertised in SLM, but if one has a sound card this can give better results.

After a number of years of s.w.l. inactivity, Paul Crankshaw GM7VXR (Troon) has finally discovered software for his Apple Mac. Unlike the PC, which requires an interface, the radio receiver output is plugged straight into the computer. The software Paul is using is Multimode and can be downloaded from http://www.blackcatsystems.com/softwemulti mode.html.

The shareware programme costs $89 to be registered, but it is fully operational, free of charge, although it closes down approximately every 30 minutes. Paul has received SSTV on 14.230, 21.340 and 28.680MHz. Some of Paul's 'exotic' catches are featured this month.

Hungarian FM Local Radio

László Kozari (Hungary) has sent details of local radio stations, some of which populate the former ORIT f.m. band. They may be worth keeping an ear open for during the Sporadic-E season. These as follows:-

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In addition, there is a new local f.m. station operating in East Budapest. It is on 69.63MHz and is called RAKOSMÉNTI. Its t.r.p. is 150 to 250W.

More On DAB

The DAB debate continues! Owen Partridge (Brentwood) suggests that DAB should stand for 'Dead And Buried' but the broadcasters are persevering with it, it seems. There are two main obstacles as far as the general public is concerned, the first being cost. With a cheap and cheerful analogue f.m. radio costing as little as £6, how can DAB ever hope to match this?

Secondly, the 96kb/s signal is compressed audio and is technically incompatible with other compression systems such as the Mini-disc and MPEG-3 formats. This means that you cannot record DAB broadcasts with either system without the results being very disappointing. Even if a digital link between receiver and Mini-disc or MPEG-3 is used, the problem remains. If a receiver is required as part of a home system, then uncompressed digital radio is broadcast via Sky satellite.

From purely a listening point of view, George Garden (Edinburgh) had a DAB
demonstration via the Arcam Alpha 10 Digital Radio Tuner and was quite impressed. The digital signals came from Kirk O' Shott's (the old BBC-1 405-line Channel B3 transmitter). Its e.r.p. is 10kW and this seems to be the maximum output used for digital broadcasts. Scotland has only this transmitter listed in the **Radio Listeners' Guide** 1999 Edition, although the 2000 Edition also lists Craighetta, but without e.r.p. details.

### Anyone Remember Twizzle?

In the April issue we featured the ITA tuning caption used in the London area. In those far-off 'good old days' of television, the test card was shown until almost 5pm. **Godfrey Manning G4AGLM** (SWM 'Airband' Column) has written to say that he certainly remembers the caption and recalls the announcer proudly stating 'This is the Independent Television Authority broadcasting from Croydon on Channel 9'.

Godfrey also recalls a children's programme about a little boy with a space rocket called 'Sparky' (the boy, not the rocket) and another show for younger viewers called 'Twizzle'. This apparently had a catchy song which included the lyric 'Bink, bonk, the nails go in, then I had a nut, then I had a screw'. It seems that Twizzle was a toy mender. Does anyone else remember 'Twizzle' or even 'Torchy' (the 'Little Battery Boy') with Pom Pom the poodle who liked chocolate sauce? And, of course, there were Snip and Snap to entertain us on Sunday afternoons. None of this has anything to do with DXTV, but it's all fascinating TV nostalgia!

### Service Information

**Hungary:** All v.h.f. TV transmitters will remain in operation until at least 2002, according to László Kozári (Hungary). The Channel R1 Nagykanyizza transmitter (MTV-1) is still on-air and is located on Ujudvar Hill (201m). The RTL KLUB commercial TV broadcasts on Channel R2 originate from Pecs/Misina-Teto (534m). There are many transmitters at u.h.f. operating in parallel with v.h.f. outlets.

**Latvia:** Gösta van der Linden (Netherlands) has sent a list of TV transmitters (all horizontally polarised) using channels in Bands I and II. These are as follows:-

- **Channel R1:** Kuldiga 10kW (LVT-2).
- **Channel R2:** Sabile 10kW (LVT-2), Vilanu 10kW (VILANU TV), Preili 15W (LNT), Ogre 100W (OGRES), Kraslava 8W (KRASLAVA TV).
- **Channel R3:** Riga 150kW (LVT-1), New TV transmitters: R22: Aluksne 10kW (LVT-1), R33: Jelgava 120kW (ZENGOLES TV), R43: Riga 5.6kW (TV RIGA).

### Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- Garry Smith, 17 Collingham Gardens, Derby DE22 4FS. We can also use off-air pictures stored as JPG files on PC disks and good-quality video recordings.

### Airband

**Continued from page 64**

divided society: those with and those without such electronic means. Personally, I can also see that an enthusiastic computer owner might still eschew E-mail because of the fear of viruses and other security risks. Conventional communication is still good and cheap within the UK, long may it last - it's served us well so far!

Paul wants to know the location of some reporting points and, as he obviously has access to a computer, might be interested to know that this sort of information is on the AIP on disc, page ENR 4-3 (see below). All reporting points are made up names consisting of five upper-case letters (it suits flight-planning computers, apparently!).

HAZEL is on airway R8 near Basingstoke, TIGER is on T420 between the Biggin Hill beacon and the coast. TIMBA is on Gatwick STAR procedures between the airport and Beachy Head. SANDY is on A2 and London STARS between Lydd and Dover.

### Frequency & Operational News

**GASIL 2 of 2000** from the CAA lists Liverpool's new ATIS as 124.325MHz.

**Martin Sutton** (CAA) kindly sends the AIP amendments which show a new airway, UY92 (conditional route) running along the Severn Estuary from NOSDA (new reporting point also on UG1) via BUNCE, TAMAL (also new), to EXMOR (also on UA25). I only summarise here, but if you need more detail then please write in and I'll print the information in the next available issue.

Will any future 'privatisation' of the air traffic control system have operational consequences? A respectable body of opinion fears that it will and, if you share this view, a letter to John Prescott at the Department of the Environment, Transport and the Regions is suggested by an actual air traffic controller. Thanks to Mike Riach (Kendal) who forwarded an E-mail that this controller has promulgated.

Air traffic control charges are currently directed to the operator either through the three-letter flight number (e.g. BAW for British Airways) or the aircraft registration. Makes profit-taking sound easy. However, lessons from recent rail crashes come to mind when safety is debated. Would a 49% holding, retained by the Government, be enough to ensure the safety of air traffic control?

### Information Sources

You don't need to struggle to keep up with UK aeronautical information as the **AIP** has now been released on CD-ROM. There are 13 issues per year (every 28 days) and the annual subscription is £88.13 including postage and VAT. That's one disadvantage, cost, but it's much cheaper than the old paper version and AICs are included on the disc, thus saving a separate subscription if you are interested in them too.

Also, of course, it's no good unless you have a computer. If you want to order, the CAA sales agent is Westward Documedia whose address is on Airband Factsheet. To get that, send a pre-paid self-addressed envelope (to hold two A4 sheets and marked 'Airband Factsheet Request') to the Broadstone editorial offices (not to me!). Next month I shall answer letters from Rodney Hale and E. Satyam. All other letters received up to May 10 have been answered. The next three deadlines (for topical information) are July 10, August 7 and September 12. Replies always appear in this column and it is regretted that no direct correspondence is possible.
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HONESTLY JERRY, WHEN I SAID JUST RUSTLE SOMETHING UP I WAS TALKING ABOUT DINNER!

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Dedicated to the Scanning and Shortwave Enthusiast. We're more than just software!
Info in Orbit

Most days of the week I view the pictures from GOES-east and GOES-west using my high resolution PDUS system. In between these images, a selection of encrypted - non-viewable - METEOSAT Primary Data images is displayed. GOES images always have some dramatic features, maybe a typhoon, tornado or just bad weather over the Pacific, and I never tire of looking at them.

Newer readers could be puzzled by the statement 'encrypted - non-viewable', so I should mention that METEOSAT transmits both high resolution (PD) images and low resolution (WEFAX) images in the 1690MHz band. WEFAX images are free-to-air to receive, but PD images are almost all encrypted and therefore non-viewable without a decoder.

A EUMETSAT decoder costs about 700ECUs and an additional interface unit for your computer is required. Just occasionally, things go wrong at EUMETSAT. When this happens, they temporarily stop encrypting PD images, allowing us to see full resolution pictures of Britain and Europe.

During April, encryption temporarily ceased, so I quickly fired up my PDUS system. Image after image came in, clear as a bell.

Figure 1 shows the highest resolution, full disc visible-light image transmitted, known as AV format. It is normally encrypted, yet is the only such image produced each day.

Unusually, the images remained unencrypted for about three days. I contacted EUMETSAT to find out the nature of the problem that was allowing us to view the images properly. "EUMETSAT only ever halts encryption when technical problems with the ground segment cause us to switch from nominal operations to emergency operations. In this instance, the output lasted for several days. Such emergency circumstances can, unfortunately, not be predicted. EUMETSAT does not have any intentions to alter its current data policy with respect to the encryption of HRI data. I am glad that you were able to enjoy the additional HRI data while it lasted".

A further response from a different spokesperson was received a few days later: "In response to your E-mail you sent to 'wxsat' - I would like to explain that the dissemination of unencrypted Meteosat formats is usually caused by the activation of a backup configuration in the EUMETSAT ground segment. As these instances are often resulting from failures of equipment the times cannot be announced in advance".

Is it not an irony that only under 'problem' conditions are we permitted to view the images produced by METEOSAT - a satellite paid for by European taxpayers?

Current WXSATs

All praise to NOAA! To avoid the v.h.f. conflict between transmissions on 137.50MHz from NOAA-12 and NOAA-15, a.p.t. from NOAA-12 was switched off some months back because footprints from the two satellites began to overlap, and would have caused interference. Re-activation of NOAA-12's a.p.t. was scheduled for mid-September, by which time the footprints were estimated to be sufficiently separated.

Meanwhile, high resolution transmissions continued because they are not affected in the same way. An E-mail in the 'wxsat-I' forum pointed out that the footprints had actually separated by around 10 May, and asked whether NOAA might consider bringing the date forward. Within a few hours, NOAA replied with the announcement that NOAA-12's a.p.t. transmissions would resume on 17 May. Who could ask for more?

Images from RESURS 01-N4 have been somewhat variable recently, at least as far as reception here has been concerned. Signal strength was originally consistently high, leading to good images, mostly interference-free for me.

Just a few weeks ago, I noticed that reception had degraded, and this was also reported by others on the Internet WXSAT lists. Without noticing the exact date, images recently appear to have returned to normal - as shown in this contrast expanded image - see Fig. 2.

The following pass, received at 1235UTC, was also interference-free for me. An E-mail in the 'wxsat-I' forum pointed out that the footprints had actually separated by around 10 May, and asked whether NOAA might consider bringing the date forward. Within a few hours, NOAA replied with the announcement that NOAA-12's a.p.t. transmissions would resume on 17 May. Who could ask for more?

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A further response from a different spokesperson was received a few days later: "In response to your E-mail you sent to 'wxsat' - I would like to explain that
The unit receives METEOSAT WEFAX on a 550mm dish and displays the images on a television. Erwin expressed surprise at my not having mentioned the unit before - this is because this is the first time that I have heard of it, and perhaps it is mostly advertised in Germany.

I suspect that many potential users of METEOSAT WEFAX could well be unfamiliar with non-UK producers of WEFAX/a.p.t hardware. Short Wave Magazine carries regular advertisements from precisely one UK supplier.

**George Newport** regularly provides images for this column. The early afternoon pass at 1356UTC on 29 April - see Fig. 4 - shows Britain approaching the end of another record breaking episode of monthly rain - this time April. As seen in this image, much of Europe remained under sunny skies during our daily downpours!

**Frank Flanagan** lives in Wexford, Ireland, and having been a reader of SWM for many years with an interest in scanning, recently delved into WXSAT monitoring. He found WX decoding fascinating, to the extent that he purchased a PC in February, and then a PCR1000 in March. This left Frank 'financially depleted' and without an antenna.

**Les Hamilton** (software 'guru' on the committee of the Remote Imaging Group) came to Frank's rescue, sending him a diagram for a quadrifilar helix antenna (QFH) made out of electrical conduit. It cost £12 to make, including the RG-58 feed to the PCR1000. Even without mounting this on the roof, Frank has received some "half-decent images from the clothes-line!"

Surrounded by houses on all sides, Frank sent an image - see Fig. 5 - "to give a bit of encouragement to any other beginners contemplating building their own QFH**.

Coiincidentally, Frank's picture is from the pass that followed George's. Comparison of the two shows cloud features having moved marginally during the period between the two orbits of NOAA-14.

A few days after George sent Fig. 4, he was monitoring a westerly pass of NOAA-15 during its travels over Greenland and wondered whether the iceberg indicated in the picture, was breaking off. This is an interesting observation that is carried out in earnest by America's Operational Significant Event Imagery Support Team (OSEI). http://www.osei.noaa.gov/ that monitors a variety of events, including breaking icebergs. They recently re-styled their web site and have stopped using frames in order to provide more space to show their products.

Maps have also been added to facilitate identification of regions. In mid-May they issued an E-mail noting that three massive icebergs had broken from the Ronne Ice Shelf in the Weddell Sea - see Fig. 7. The picture is a multi-channel colour composite, high resolution image of about 1.1km resolution, recorded by NOAA-14 on 7 May.

**Beginning In WXSAT Reception**

Looking at some recent correspondence convinced me that a piece on getting started should be provided a little more often than I usually do. A writer from Dudley in the West Midlands told me of his list of purchases that he had believed would get him into direct satellite reception, before he came across Short Wave Magazine.

He originally used his radios and scanner to receive transmissions from Bracknell, and these were decoded via a soundcard on his computer. These terrestrial broadcasts of selected WXSAT pictures are obtained at a UK ground station and transmitted from Bracknell. The antenna used for reception from Bracknell, need be little more than a random length wire.

The magazine that our writer had read (not SWM!) apparently claimed that pictures from the satellites themselves could be obtained by simply upgrading the antenna. He therefore bought a Qtek WSK2000137MHz antenna (I confess to not being familiar with this brand) but still found himself unable to receive any images using his PRO-25 scanner. It seems that he then bought another computer to get on the Internet (ouch!).

First, the Internet. I have been providing courses on the Internet for about five years, and if there is one thing that I have learnt from those who attend, it is that the information given by computer sellers is frequently outrageously inaccurate. Perhaps in an effort to sell more machines, a common claim is made that one requires a high speed Pentium, huge hard drive and oodles of RAM.

In practice, the main requirements are sufficient RAM to run the Windows operating system (OS) - say Windows 95 comfortably (perhaps 32Mb) and a modem. Windows 95 has sufficient features to make Internet connection a relatively easy process - though later versions are even better. Older operating systems (DOS and Windows 3.1) can still be used to make a connection, but they are more cumbersome to set up. Processor speed is not usually a factor unless you are using a 'win-type' modem. These are modems that parasitically use the processor for data transfer instead of being fitted with...
surprised to see Sicily!
I am writing a complete review of the whole system, including the tracking facility, for inclusion in the Special that is scheduled for publication in autumn.

**CD-ROMs Of Satellite Images**
As part of its mission to promote the use of satellite data, the British National Space Centre has produced two CD-ROMs, one containing educational material about satellite imagery. The material includes 14 sections of images that can be ‘zoomed’ to high detail, from satellite sensors including NOAA AVHRR - the sensors that produce h.r.p.t. and a.p.t. data, and from DMSP and some other imaging satellites.

For anyone who teaches any of the associated sciences, or for those interested in finding out more about the data, these CDs contain a wealth of information - and are free. The CDs are available from BNSC and can be requested by E-mail: Wouk2000@dtigslgov.uk or via the web at: http://www.bnsclgov.uk

Their postal address is: 'Window on the UK2000', c/o Earth Observation, BNSC, 151 Buckingham Palace Road, London SW1W 9SS.

**HRPT Reaches Peverell**
On Tuesday 9 May I received my first high resolution picture telemetry (h.r.p.t.) image from NOAA-14. Some teething problems caused the loss of this first image, so Fig. 8 shows the picture captured later, and retained. How come h.r.p.t.? It was an unexpected situation that provided an opportunity to get into this field.

My first WXSAT reception was the clip-clop of a.p.t. from NOAA-9 back in the mid-1980s. A few more bits and pieces and WEFAX reception was added. Shortly before EUMETSAT announced encryption, I acquired a PDUS system - the final frontier was crossed when I ordered the h.r.p.t. hardware. From this month onwards, each edition can carry images from the four image formats - a.p.t., h.r.p.t., WEFAX and PD.

My current project is to produce a reception profile for the tracking dish. It is positioned on the south side of my back yard where it has the best ‘horizon’. To describe its reception as ‘limited’ would be perhaps reasonable! The house is aligned north-west/south-east and the dish can receive south-through-east, with complete cut-off areas in the north, east and south-west, apart from other limitations. I was quite their own! This makes such modems cheap and therefore seemingly attractive if you are not aware of their performance limits.
I recently set up a friend’s 486 computer (32Mb RAM and Windows 95) with an Internet connection to Freeserve. During the weekend he can still visit all the WXSAT sites and spend an hour online for less than 60p!

**Kepler Elements - WXSATs, MIR and Shuttle**
If you want a computer disk file containing recent elements for the WXSATs, AMSATs and others of general interest, together with a large file holding elements for thousands of satellites please enclose 50p with a PC-formatted disk and stamped envelope. A print-out is included that identifies NASA catalogue numbers for the WXSATs. The disk file is ideal for automatic updating of tracking software.

**Frequencies**
NOAA-14 transmits a.p.t. on 137.62MHz.
NOAA-15 transmits a.p.t. on 137.50MHz.
NOAA6s transmit beacon data on 137.77 or 136.77MHz.
METEOR 3-5 uses 137.30MHz.
OKEAN-4 and SICH-1 use 137.40MHz for brief transmissions.
RESURS 01a4 transmits a.p.t. on 137.85MHz.
METEOSAT-7 (geostationary) uses 169.1 and 169.5MHz for WEFAX.
GOES-8 (western horizon) uses 1691MHz for WEFAX.

**Shuttle Launch Schedule**
STS-106 Atlantis launch 19 August for the ISS fourth flight (2A.2b) into 51.6° inclination orbit passing over Britain.
STS-92 Discovery launch 21 September for the fifth ISS flight.
A comprehensive listing of all Shuttle flights and payloads, together with associated information, is available from me at the address at the head of the column, as the Shuttle Pack. Please include £1.50 and stamped s.a.e. for the A4 booklet.

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As part of its mission to promote the use of satellite data, the British National Space Centre has produced two CD-ROMs, one containing educational material about satellite imagery. The material includes 14 sections of images that can be ‘zoomed’ to high detail, from satellite sensors including NOAA AVHRR - the sensors that produce h.r.p.t. and a.p.t. data, and from DMSP and some other imaging satellites.

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**Short Wave Magazine, July 2000**
Propagation Forecasts

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

Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50% probability of success for the path and time.

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

Good luck and happy listening.

July 2000
Circuits to London
Propagation Extra


May Data

May 2000

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

Day of the Month

Guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity. The K and AP indices are measures of geomagnetic activity. The K index ranges from zero (very quiet) to nine (severely disturbed). K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions. The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.
**For Sale**

**Antenna selector** - Howes AS48, £25. Howes a.t.u. CTU9, £35. Scanner, 100 channels, 66-965 MHz, £135. All above with manuals, boxed, as new, and half new prices. Tel: Warwicks (01920) 854556.

AOR AR3030, 30kHz to 30MHz all-mode receiver, boxed, p.s.u. and manual, £400 o.n.o. Tel: Reading 0118-972 2743.

AOR AR3030, used as second receiver, 30kHz to 30MHz, all-mode, £225. Sangean ATS-818 portable, £50. Might exchange both for laptop. A. Bell M1E1A, Biggin Hill, Kent. Tel: (01895) 571133.

**Eddystone 1650 professional radio** digital, auto scan, sweep, 100 channel mem, six filters, optional pre-selector fitted, offers. Trio R-1000, v.g.c., £160. HF-225 Europa, keypad, a.m., f.m., £95. AOR AR1000 hand-held, v.g.c., 1000 memories, £80. Tel: West London 0208-813 9193.

Global AT-2000 deluxe s.w. a.t.u., hardly used, excellent condition, £80 inc. P&P. Gordon on (01840) 662112.

**JRC NRD-525 general coverage communications receiver**, mint, in box, with manual, £450 o.n.o. FRG-9600 with h.f. adapter, manual, £250. AOR NRD-525, immaculate, boxed, used briefly, also JRC NRD-525 receiver, absolutely mint condition, boxed, £150 o.n.o. A.J. Bee, 46 Kenilworth, Warwickshire CV3 2DY.

Sony 7in spool stereo tape recorder, three speed 1x, 3x, 7x, model TC365, £54. Tel: Ledbury (01531) 836404.


JRC NRD-535 receiver, absolutely immaculate, boxed, used briefly, also Global antenna coupler AT-1000, DATONG antenna AD370 and 3-way receiving type antenna tuning unit, £50, £60. Tel: 01829 527505.

JRC NRD-535 receiver, ECSS + genuine 1kHz filter, £575. Uniden UBC9300XLT scanner, £150. Both mint, original packing, accessories, manuals, circuits, little used. Ray, Surrey. Tel: (01894) 277503.


Kenwood R-5000 hand-fitted receiver, immaculate, demo on site, £400 o.n.o. Tel: Soton (01494) 790934 or (0703) 597781 daytime.


**Lowé Modemaster v.2.0**, discs, manuals and computer connection, £40. Also available free to purchaser, Laser 386 computer with Windows 3.1, keyboard, mouse, buyer collects. John Davies, Cheshire. Tel: (01529) 250284.
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**NRD345**

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