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FIRST LOOK | The Boxchip S900A+ Hybrid Android Radio



AOR 5700D

We review the digital wideband receiver everyone is talking about



Future of DXing

Radio in the age of streaming & podcasting



Tokyo Rose

Wartime propaganda broadcasts from Japan

Non-Directional Beacon Survey

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Time, frequency and propagation (Part I)

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The Radio Family

Hello and welcome to the April issue of RadioUser. As I write this editorial, some news is coming in about how the Coronavirus (COVID-19) outbreak affects radio stations, both around the world and locally. On the one hand, on an international scale, short wave (and amateur radio, for that matter) have come to the fore in the crisis, as it did for extreme weather events and other disasters before.

The medium has been adopted by some broadcasters for global outreach, for better and for worse.

On the other hand, my local community radio station, for example, is currently considering closing temporarily, and going over to automatic transmission, to protect its presenters. Others may follow suit.

Notwithstanding this, the issue in front of you is, once again, full to the brim with news, articles, columns and reviews. Staying with the latter, we have the first in-depth assessment, by Tim Kirby, of the AOR AR5700D digital and analogue wideband receiver. Moreover, I have had a quick look at the brand-new NES10-2 MK4 noise-cancelling speaker from the bhi stable. Later in this issue, I am sharing a few ideas about how to use this if you are a DXer or broadcast listener. Furthermore, as a follow-up to his column last month, Keith Rawlings reviews another item from Cross Country Wireless – the CCW loop amplifier modification kit.

Chris Rolinson introduces the Radio Network, a Network Radio (excuse the play on words) initiative brought into being and led by the inspiring and indefatigable Sarah Hynes, who is now a regular at many radio rallies.

Two-way radio, she finds, can make strangers into a radio family. Quite.

Plus, my radios are part of my family too, keeping me company – is that strange?

Apart from this, we have three book reviews this month, one of which, by David Harris, sets the scene for a bit of a theme over the next few issues: the role of radio, and radio propaganda, in war.



Meanwhile, in Airband News, David Smith reviews a unique history book, and I am looking at an exciting new publication by a young American hobbyist.

Elsewhere, Clint Gouveia, closes his popular series on Portable DXing, including some hints and tips as to what to pack for an international DXpedition, and Chrissy Brand has the final part of her fascinating series on the role of radio in effectively addressing social and economic issues and disparities.

Last, and most certainly least, I am starting a two-part series on standard frequency and time signal stations, and on the interconnectedness of time, propagation and frequency.

In other columns this month, you will learn about what the latest RAJAR figures are saying about the present and future of radio, delve into the shady world of Tokyo Rose in World War Two, and appreciate the many short wave broadcasts that Radio Romania International (RRI) has on offer at present.

There is also the first instalment this year of Robert Connolly's Non-Directional Beacon (NDB) survey, please visit the Radio Enthusiast website for his very comprehensive listing of beacon loggings. www.radioenthusiast.co.uk

Do check in on the website, for my latest musings, product updates and radio news.

Enjoy this issue and stay in touch.

Georg Wiessala

Editor, Radio User Magazine

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What's New

Have you got something new to tell our readers about? If so, then drop a line to wiessala@hotmail.com

Boxchip S900A+

SMART VIDEO RADIO
Everything is under control, maps, locations, voice, text messages, pictures, videos.

LTE+DMR ALL IN ONE RADIO
More intelligent than 'wo-way' radio. More reliable than PoC.

This mobile phone/transceiver is a hybrid android radio that allows 100% coverage: via 3G, 4G, LTE, Wi-Fi, VHF or UHF FM analogue and DMR Tier II. The device offers a smartphone, walkie-talkie, gateway and body camera. It is being advertised as 'more intelligent than two-way radio – more reliable than PoC'. The presence of a gateway obviates the need to mess around with cables, crosslink boxes or complicated setups. The device will find all the nearby repeaters in the fraction of a second and can connect to the **Brandmeister** DMR master server.

<https://tinyurl.com/vtxlqmt>

WHAT IS PUBLIC SERVICE ON COMMERCIAL RADIO: Audio Content Fund independent funding panel member David Lloyd writes about public service broadcasting and the Audio Content Fund: "Just as on the BBC, not all public service content has to be devoted to a cause – it's simply high-quality, memorable content, that makes me do, think, feel or understand something. Those who work hard in commercial radio can become understandably a little sensitive when they're judged not to be providing any public service, simply because they don't have a BBC lanyard dangling around their neck. Alongside the everyday news and informational

content, witness the effort on stations large and small invested in charity appeals and accompanying content. Think of the millions who heard the appeal following the disaster in Mozambique. Remember too the engagement when a breakfast presenter opens-up about a personal challenge – or the hours spent visiting schools, attending events, replying to emails from students and devising work placements or training. Consider too the programming which may not be demanded by Ofcom, but stations simply believe in. In my programming days, however, I recall scurrying around each day toiling with the

usual blend of fascinating characters, animated meetings and a dollop of crisis-management. Sadly, we'd not the capacity to handle as much extra-curricular activity as we wished – despite honourable intentions. Then we'd eyeball the hordes of shrieking talented folk climbing to the podium at awards ceremonies and sigh that we'd win more awards if we had that many folks working for us. If only there were a 'money tree' to fund our 'would be nice to do' list." Find the remainder of David Lloyd's comments here: **(SOURCE:** David Lloyd, ACF, Radio Today) <https://tinyurl.com/r6bpz34>

For the latest news and product reviews, visit www.radioenthusiast.co.uk



IC-M73PLUS Professional VHF Marine Transceiver

The IC-M73PLUS builds on many of the features that made the IC-M71 the choice of many maritime professionals across the globe but also incorporates two new important features; a new voice recording function and Icom's Active Noise Cancelling Technology. The radio offers Last Call Voice Recording, Active Noise Cancelling Technology, Bass Boost Function, and a BTL (bridge-tied load) amplifier that doubles the audio output. The radio has been tested to survive after being submersed in 1.5m (4.9ft) depth of water for 30 minutes. Use this radio in the rain, snow or any other severe weather conditions! The IC-M73PLUS has a stylish, ergonomic design. A durable and rugged body provides for user-friendly operation and long life. A wide viewing angle, high-intensity LCD offers bright, easy-to-read characters. The AquaQuake water draining function ejects water from the speaker grille with low-frequency sound.

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SIGINT Equipment: Talon[®] RTR 2654

US firm Pentek Inc. recently announced the RTR 2654 26.5 GHz RF Sentinel™ Intelligent Signal Scanning rackmount recorder. The RTR 2654 combines the power of a Pentek Talon Recording System with a 25.6 GHz RF tuner and Pentek's Sentinel intelligent signal scanning software. The RTR 2654 automatically scans the RF spectrum from 800 MHz to 26.5 GHz for signals of interest and monitor or record bandwidths up to 500 MHz wide, making it very suitable for military, security and government intelligence (SIGINT, COMINT and ELINT) applications. A Pentek Model 78141 Jade® transceiver module serves as the data-acquisition engine of the Talon RTR 2654. One of its dual 3.2 GS/sec 12-bit A/D converters is operated at a sample rate of 2.8 GS/sec.

The Model 78141 is coupled to the 500 MHz bandwidth IF output signal of a 6 GHz RF tuner front end with excellent dynamic range across its entire spectrum. A digital downconverter (DDC) in the Model 78141 provides frequency zooming for signal bandwidth steps of 500, 280 or 140 MHz. "The RTR 2654 Sentinel recorder greatly expands the scanning spectrum over previous Pentek products to 26.5 GHz, covering the vast majority of popular RF signal bands," said Rodger Hosking, vice-president of Pentek. The Sentinel recorder provides automated signal monitoring and detection. The user specifies a 'start' and 'stop' frequency for the scan, covering any range between 800 MHz and 26.5 GHz. The RF tuner and DDC step across the scan range in consecutive bands, each programmable up to 500 MHz in width. Threshold RF energy in each band can be detected to trigger the creation of a waterfall spectrum display over the entire scan.

Any band can be selected for continuous real-time monitoring and/or recording. In addition to manual band selection, a recording can be automatically started during a scan by configuring signal strength threshold levels to trigger a recording of the detected band. Once a signal of interest is detected, the real-time recorder can capture and store hundreds of terabytes of data to disk, allowing users to store data spanning multiple days. Sentinel recorders



are built on a Windows® workstation with an Intel Core i7 processor and provide both a GUI (graphical user interface) and API (Application Programmer's Interface) to control the system. Systems are fully supported with Pentek's SystemFlow® software for system control and turn-key operation. The SystemFlow software has been enhanced to include intelligent scanning and integrated control of the RF tuner and optional RF upconverter.

The software provides a GUI with point-and-click configuration management and can store custom configurations for single-click setup. It also includes a virtual oscilloscope, spectrum analyser and spectrogram to monitor signals before, during and after data collection. Post-processing and analysis software tools like Matlab can be installed on the Talon RTR 2654 platform. Data files are recorded to the Windows native NTFS file system, which allows operators immediate access to recordings without the need for any file format conversion. The Talon RTR 2654 is packaged in a 4U 19" rack-mountable chassis, with front panel removable and hot-swappable Solid State Drives (SSDs), front panel USB ports and I/O connectors on the rear panel. The SSDs are available in 7.6 to 245.7 TB configurations, supporting RAID levels 0, 5 or 6. Options include GPS time and position stamping and 10GbE or 40GbE offload facilities. The Talon RTR 2654 starts at US\$125,000. Delivery is 16 weeks ARO for all models.

<https://tinyurl.com/r48xxda>

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Radio News

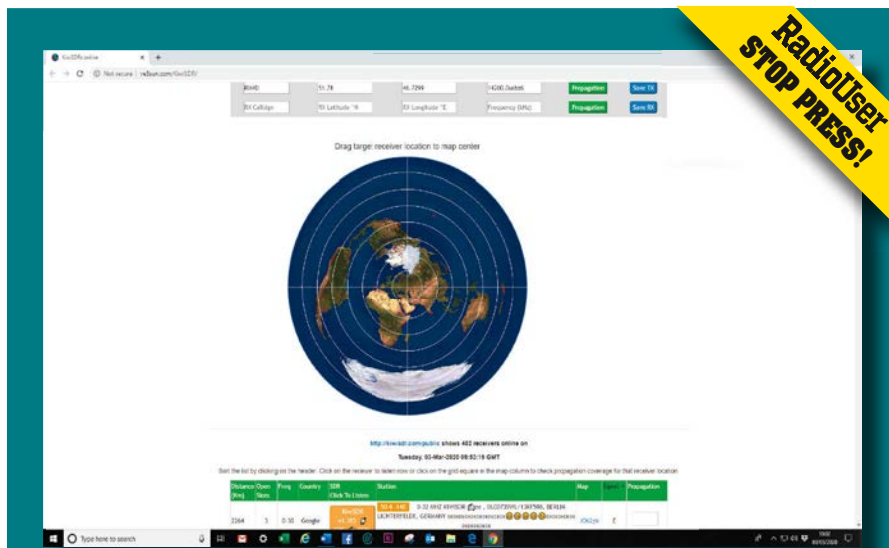
ADVERTISING TERMS & CONDITIONS TO END:

Radiocentre has published the new *Financial Conduct Authority (FCA) Confirmed Industry Guidance*, which will help reduce long terms & conditions on radio ads. It will help advertisers execute more concise terms and conditions in radio adverts while complying with regulatory obligations. The guidance forms part of a wider campaign by the industry in both the UK and Europe. Under the new guidance, Ts&Cs will still be carried, but they will be shorter and more concise, meaning the average listener is more likely to take them in. Examples of Ts&Cs that are not always required, but often used, include phrases like 'subject to status', 'over 18s only', and 'you will not own the vehicle'. Research demonstrates that the inclusion of the lengthy information reduces the effectiveness of Ts&Cs – only 4% of listeners say they can recall any salient facts, as listener attention plummets when they are broadcast. The same research shows long and complicated information often diminishes listener trust in radio advertising.

Many listeners wrongly believe Ts&Cs are there to protect the advertiser or the media brand, rather than the consumer. The motor sector is one of the biggest radio spenders (spending £106m in 2019), but often faces the biggest hurdles when it comes to releasing ads with Ts&Cs that are easy to understand and aren't longer than the original creative segment.

Radiocentre says some advertisers are put off using radio because they often believe more Ts&Cs are needed than is the case under FCA regulation. In general, Ts&Cs are estimated to cost industry £120 million a year through a combination of lost revenue, airtime costs and reduced return on investment. Financial promotions, whether on the radio or any other medium, influence consumers at the start of their decision-making journey, which is why brands must provide accurate and balanced information that can be easily understood and recalled by the consumer.

Siobhan Kenny, Radiocentre CEO, said: "Shorter, punchier terms and conditions are proven to be more effective as there is a greater chance that the listeners will recall the relevant and most important details at the right time. This new guidance will help advertisers get their message across in a way that is clear, fair and not misleading and will simultaneously relieve the nations' ears by improving the radio listening experience. The UK wants to lead the way in the best consumer protection on the radio and we hope this will usher in a new era of more comprehensible Ts&Cs." Paul Philpott, President & CEO of Kia



News from Klingenfuss

Jörg Klingenfuss has been in touch to let RU know about his new and updated radio publications. The books and linked website now offer up-to-date weather facsimile (WXFAX) information, and hundreds of new digital data decoder screenshots have been uploaded to the 'hot frequencies' page. New information also covers High-Frequency Data Link (HF DL) and Controller-Pilot Data Link Communications (CPDLC) messages, new acronyms and abbreviations, tutorials, and news on the more than 500 Kiwi-SDRs worldwide.

<http://ve3sun.com/KiwiSDR/>

(Source: Jörg Klingenfuss)

Motors (UK), said his company welcomed the move and added: "I believe the motor industry will welcome this new FCA approved guidance as they will allow us to streamline the terms and conditions we need to quote when we advertise on radio." The new guidance is also welcomed by advertising agencies. Trevor Robinson OBE, Executive Creative Director and Founder of Quiet Storm added: "I've always felt that radio is an underutilised medium and the Ts&Cs have been a large part of the problem. Hopefully, this change will give more space for creative work to shine through and enhance the credibility of radio ads." Radiocentre will be hosting workshops and seminars to introduce the guidance to in-house legal teams, who steer the Ts&Cs in advertising. (SOURCE: RadioToday, National Press) <https://tinyurl.com/waoo3po>

BBC – WHERE DOES THE FUTURE LIE: Check out this perceptive and up-to-date blog by David Lloyd. He writes, "Lord Reith, in making a 1925 submission about the future of the BBC, was highlighting that what is good for the BBC is not always the same as what is good for broadcasting. It remains a fair point today. If the BBC is not seen to serve everyone in exchange for its licence fees, then it worries it cannot

justify the licence fee - and the BBC in its current form. That is probably true - and if you wanted to sustain the BBC in all it does - and your job - you'd make damn sure that you proved that everyone derives value and do all you could to fill in any gaps. That might help preserve the BBC - but is that the appropriate objective?" Read on at the URL below:

<https://tinyurl.com/wd94sog>

CORONAVIRUS: A new program aired via IRRS-Shortwave is called *War Room Pandemic*. It presents the latest news and opinions on the effects of the coronavirus around the world. *War Room Pandemic* can be heard in new (daily) time slots, as of Feb. 21, 2020 (with 150kW power to Europe and Africa and 250kW to Asia). The frequencies are 9640 kHz (1400-1500 UTC) to Asia and the Middle East; 7295 kHz (1800-2000 UTC) to Europe (updated frequency as of March 9, 2020); and 9660 kHz (2000-2100 UTC) to Africa. On AM/medium wave, programmes are on 594kHz (2100-2200 UTC or: 2200-2300 CET) to Northern Italy and Southern/Central Europe (10 kW from 22-23 CET).

(SOURCE: NEXUS International Broadcasting Association, via Chrissy Brand)

<https://www.nexus.org/coronavirus-qs/>

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Moonraker: Deluxe Uniden Scanner Pack

In time for the beginning of the new Airshow Season, Moonraker offers a new package deal for scanner enthusiasts. The package consists of the UBC-125XLT scanner complete with case, enhanced airband antenna, and earphone. The radio is pre-programmed with a comprehensive UK airband database. Quote 'RadioUser', and Moonraker will provide free shipping for the UK for this item. Other new products from Moonraker include the Micro CB kit, an SDR scanning aerial for SDR receivers (with SMA fitting), and a new dedicated Airband magnetic aerial.

<https://tinyurl.com/subbjgb>
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<http://www.moonraker.eu>

CARRY ON STREAMING: Streaming was 55% of Germany's Music Market in 2019. Germany's recorded music revenue returned to growth in 2019, reversing a small decline from its results in 2018. During last year, trade body BVMI reported 8.2% growth for revenue of €1.623 billion (\$1.82 billion) on a retail basis. It was a big year for streaming among German listeners. Audio streaming saw a 27% jump in revenue, and those sources generated more than half of the year's revenue with a 55.1% market share. Streaming revenue in the country totalled €894 million (\$1.003 billion). Digital sources were 64.4% of the German music revenue total. Digital downloads were just a 6.2% share of the overall market.

Physical formats, which were long the dominant force in Germany, reported a decline of 8.9% in 2019 revenue. They now represent just over a third of the market with a 35.6% share. CD sales fell 10.5% and accounted for a 29% share of Germany's market. Vinyl was the positive segment for physical formats thanks to a 13.3% jump in sales. "The digital market has been successfully developed and lead to growth in recent years without losing sight of the physical product: The CD remains an important and not to be underestimated market segment with almost one-third of total sales, while vinyl continues to grow in its niche," said BVMI Chairman & CEO Dr Florian Drück. He added, "Incidentally, video streaming has also grown significantly, albeit from a very low starting level: 31 per cent additional revenues from premium and advertising-financed offers still only contribute 2.9 per cent to industry revenues."

(SOURCE: Radio and Internet News, 27th February 2020)

<https://tinyurl.com/svkufld>

PROPAGATION DOWN UNDER: The Australian Short Wave Radio Journal currently has an interesting article on propagation. It is a summary of frequency occupancy across the period from 3 - 4 am on 3rd February 2020, on 49 and 31 metres, represented by a flurry of Asian transmitters. This is an example of the 'Daytime Asian Propagation Mode'. The DAPM often occurs in South Eastern Australia during the summer months, marked by sudden appearances of signals from the Far East, East Africa and Pacific, on daylight paths. The title of the report is HF Monitoring Research - Spectacular Daytime Event - 7,9MHz. There is also the latest *Australian DX Report*.

(SOURCE: ASRJ, March 2020)

<http://swwaus.blogspot.com>

POWER OF RADIO HIGHLIGHTED AT BBC

RADIO CORNWALL: A listener to a BBC local radio station has been found dead in her home after a presenter asked police to check in on her. Journalist Jo Twist from BBC Radio Cornwall raised the alarm after regular contact from the listener stopped. Police visited her address and the lady was found on the floor of her home, thought to have been undiscovered for 10 days. Donna Birrell blogged about the heart-breaking experience, referring to the listener as 'Clara'. She said: "I thought I would let you know of a heart-breaking story, but one which I think shows the absolute value of Local Radio and how important it is to communities." Picking up the story, Donna writes: "At the end of January, Jo told Clara she was going away so would speak when she returned. However, on Jo's first weekend back, there was no call from 'Clara' at 0810. Jo



was concerned and called her, but again no reply. Because Clara had been such a regular feature of Weekend mornings, Jo was very concerned at the lack of contact and on her day off on Monday, she tried to call her again and when there was still no reply, she called the police and gave them Clara's address." Stephanie Marshall, head of the BBC in the West and South West, added, "This is a sad story, and I'd like to send deepest condolences to the family of 'Clara' from everyone at BBC Radio Cornwall. I'm glad that the station had such a big impact on Clara's life, particularly in her later years which can be isolating for many. Our listeners have always been and will always be the most important part of our radio stations. This is a great example of the importance of BBC local radio stations to the communities they serve, and the unique value they offer to listeners."

(SOURCE: Radio Today, BBC Radio Cornwall, National Press, eRADIO with Broadcast Bionics)



Wolfwave reviews

Richard G3CWI, of SOTAMEAMS, wrote in to say, "our WOLF WAVE advanced audio processor has been a great success. It does make a huge difference to many radios, and the age-related hearing correction is very popular. Thus, I was excited to hear that QST published a review of our WOLF WAVE advanced audio processor in their March 2020 edition. Lots of people purchased them based on the very positive things they said. Our US agent, DX Engineering, has stock. Funkamateur (Radio Amateur) magazine in Germany also published a review in March 2020, and our agent in Germany is WiMo."

<https://www.sotabeams.co.uk>
<https://tinyurl.com/tvslegj>
<https://www.funkamateur.de>

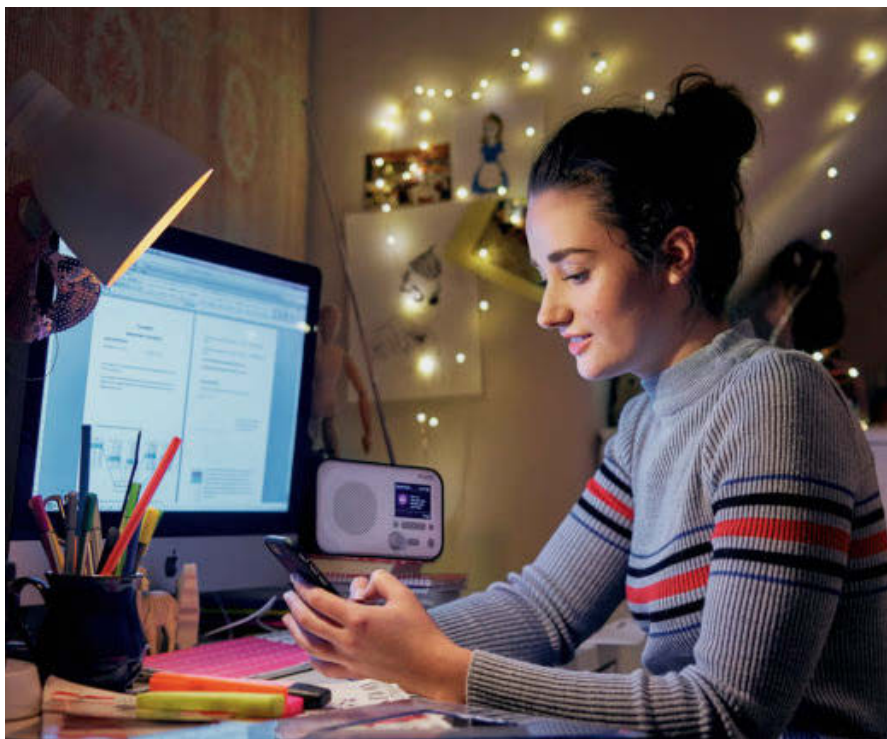
Radio News

EURAO NEWSLETTER: The European Radio Amateurs' Organisation (EURAO) reports in its February 2020 Newsletter, that the popular log software, Swisslog, includes (from version 5.99e25/12/2019) information on whether a callsign is a EURAO member or a EuroBureauQSL-affiliated organisation. This info, as a result of an online query in XML, facilitates and optimizes the QSL exchange between radio amateurs. For this reason, it is especially important to keep the EURAO membership database up to date by member associations and clubs. So, don't be late! (SOURCE: EURAO News 02/20) <https://tinyurl.com/szh3py2> <https://tinyurl.com/wu2jdg>

SEE RADIO DIFFERENTLY: Radiocentre's Chief Executive Siobhan Kenny has looked back on the industry body's overarching strategy, See Radio Differently. He said, "When I joined the radio industry almost 6 years ago now, one of the first things I wanted to tackle was its image. It was pretty clear that either we stepped up our efforts to tell our own story, or others would quickly seize the narrative and do it for us. It had already started happening. Last week I went to Dublin, a guest of Radio Days Ireland, to present the results of our long term positioning See Radio Differently. There is always more to do, of course, but creating this presentation five years into the strategy was a good opportunity to review progress.

"The best way to illustrate the lazy depiction of radio is the profusion of [insert medium] killed the radio star' headlines atop stories about radio, accompanied by black and white pictures of 1930s families huddled around Bakelite radio sets. This epitomises the challenge that has been damaging radio's image among advertisers and agencies – some of whom happily bought into the old-fashioned stereotype. The truth couldn't be more different: radio is at the heart of the audio revolution – podcasts, new digital stations and audio tech are proliferating and 35m people in the UK tune into commercial radio every week.

"A disruptive strategy, See Radio Differently, which juxtaposed the visual with the aural, was ushered in to challenge advertisers and others to reappraise their concept of radio. The See Radio Differently banner covers all areas of Radiocentre's activity and can be summarised under three headings: Storytelling, Getting Regulation Right and Forging the Future. To emphasise the powerful success story of radio in the 21st century, we gave a thorough overhaul to all our external communication, branding and advertising cementing radio's place at the heart of the audio revolution. The tone of voice is massively important – it's commercial radio after



all, not the United Nations – which means we can afford to have fun [...]." Read the full story at the URL below:

(SOURCE: Radiocentre, Radio Today, National Press)

<https://tinyurl.com/sdh994e>

RADIODAYS EUROPE 2020 POSTPONED:

Radiodays Europe has been postponed, due to the increasing health risks in many countries associated with Coronavirus COVID-19. The decision comes after extensive consultation carried out by the event to ensure the health and safety of participants, speakers, commercial partners and staff. Organisers say: "As the global Coronavirus crisis escalates and concerns regarding travel, large gatherings etc increase, it makes it impossible for Radiodays Europe to hold an event at this time. We are aware of the impact of this decision and acknowledge and express our thanks for all the support of our participants and partners throughout the years that have made Radiodays Europe the meeting place for the world of radio and audio and the largest event of its kind

in Europe." Further details on the new dates for Radiodays Europe will be released at a later date. (SOURCE: RadioDays Europe 2020)

<https://www.radiodayseurope.com>

RADIO WORLD NEWSLETTER: The Radio World (International Edition) March 2020 Newsletter has been published. With three national and several local DAB+ multiplexes on the air today in Italy, about 83% of the Italian population can receive DAB+ broadcasts. The March issue takes a look at how one of the national services, DAB Italia, is working hard to expand the country's digital services. This month, RWI also visits BR Verkehr in Germany and detail how the station is making use of an integrated newsroom system to help ensure the broadcast of timely traffic alerts. Read the March issue of Radio World International here!

(SOURCE: Radio World International issue)

<https://tinyurl.com/tr9duwz>

SWISS COMMUNITY RADIO CANNOT AFFORD DAB RADIO:

Government subsidies for the FM-DAB transition in Switzerland are to be discontinued. Community radio station Country Radio Switzerland will drop DAB broadcasting at the end of the year because state funding will gradually be reduced, starting in 2020. This is 'DAB-Death', says CEO David Bolli. Before the (Communications Authority) BAKOM grant, only a few stations could be received on DAB+.

(SOURCE: Digital Radio Insider, 27th February 2020)

<https://tinyurl.com/ujglan7>



For the latest news and product reviews, visit www.radioenthusiast.co.uk

Radio News



BYE-BYE TO PRESTON: Red Rose Radio staff, including those who worked at Rock FM and Red Rose Gold / Magic 999 / Rock FM 2 / Greatest Hits Radio from 1982 to today have reunited to say goodbye to the iconic station building. Bauer is selling the building – a historic Church in St Paul's Square Preston – and moving staff to a new unit elsewhere in the city. Only one programme is now broadcast for Lancashire on Rock FM which is now made in Manchester. The second (Soundcloud URL) points to the Farewell to St. Paul's podcast.

(SOURCE: eRADIO with Broadcast Bionics, Radio Today, Local and National Press, Radio Kurier, March 2020:7)

<https://tinyurl.com/qsegrid>

<https://tinyurl.com/tlcp7yv>

NEW SEASON AT THE MILITARY WIRELESS MUSEUM:

It's a new season for the Military Wireless Museum in Kidderminster Worcestershire. Housing military sets from around the world, from crystal sets to ex SAS manpack transceivers, and from Australian to Yugoslavian equipment. The museum's callsign, GB0MWM can be operated by licensed visitors from 160m through to the new geo-stationary Oscar 100 satellite. The museum welcomes individuals or groups by prior arrangement. Full details, and many pictures, can be found on the museum's website.

(SOURCE: Bernard Nock, G4BXD)

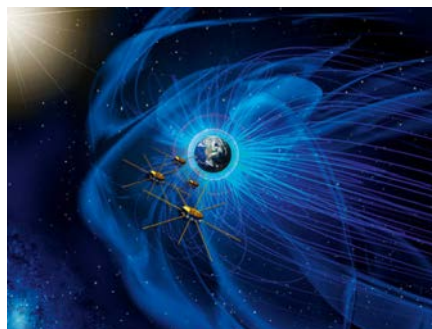
www.militarywirelessmuseum.co.uk

DECIPHERING ELECTRON SIGNATURES IN EARTH'S MAGNETIC TAIL:

Space envelops our planet entirely, but when it comes to space weather, a few regions are particularly important. One of these regions is in Earth's magnetotail roughly 160,000km above the planet's nightside, where the planetary magnetic field is blown back by the solar wind and its field lines are stretched until they cross each other again. During geomagnetic storms, these field lines

break and reconnect, releasing the energy stored in the magnetic field like a rubber band snapping. These magnetic explosions blast the nightside of the Earth with radiation and charged particles, which can threaten infrastructure, like satellites and power grids. Now Li et al. have analysed unique spacecraft measurements taken right at the tip of Earth's magnetotail during a reconnection event. The data were collected in August 2017 by the Magnetospheric Multiscale (MMS) mission, a quartet of NASA spacecraft orbiting Earth. During this event, MMS flew through the reconnection region travelling northward, a trajectory that gave the craft a prime view of a phenomenon known as electron meandering. In an unruffled, purely uniform magnetic field, the motion of electrons should be simple and symmetric: spiralling along magnetic field lines like beads spinning on a string. But according to MMS data returned since its launch in 2015, electrons near reconnection sites often drift to one side of the magnetic field lines, leading to crescent-shaped electron distributions. Scientists have sought to understand the cause of this crescent signature—whether it's related to magnetic fields or possibly a combination of magnetic and electric fields. In the new study, the researchers found electron crescents just above and below the reconnection site, which they say are partly explained by the twisting of the magnetic field during reconnection. However, this asymmetric electron motion was found farther from the midplane of this region of the magnetotail than expected for high-energy electrons, suggesting that another mechanism is at play. The authors single out a likely culprit: Electric fields that are induced by flowing electrons in the presence of a magnetic field. This effect—known as the Hall effect—is thought to enhance magnetic reconnection. Indeed, the stronger the electric field readings collected by MMS were, the more pronounced the crescent signature became. This finding suggests that electron crescents observed in the magnetotail are caused by a combination of magnetic and electric fields. (SOURCE: EoS, Geophysical Research Letters, March 2019)

<https://doi.org/10.1029/2019GL085014>



Wheatstone mixer at PRECO

A new Audio over Internet Protocol (AoIP)-enhanced console mixer with built-in Ethernet switch is bringing intelligent routing and control to stations on a budget; it is available in either 8 or 16 fader versions.

The new DMX digital-console-technology will be marketed under the Audioarts Engineering brand and become *WheatNet-IP* audio-network-compatible. It is available from PRECO in the UK. The DMX console's mix engine provides connectivity into the *WheatNet-IP* audio network, a complete ecosystem of consoles, talent stations, I/O units, accessories and virtual tools used in radio stations around the globe. "Adding *WheatNet-IP* to this console effectively brings Wheatstone's Intelligent Network routing and control to stations on a budget, allowing them to automate functions they couldn't approach before. This enables them to run leaner, more efficient operations overall, and opens a pathway to the new world of AES67 interoperability," commented Jay Tyler, Wheatstone's Director of Sales. The console's mix engine includes a built-in 5-port Ethernet switch. No external switch is required to create or join an existing *WheatNet-IP* system, making DMX one of the more affordable entry-level IP audio networked consoles on the market. Other features include a local microphone, analogue and digital inputs and outputs, EQ and dynamics, an 'any-source-on-any-fader' feature, and Audio over Internet Protocol (AoIP). Audio inputs and outputs can be extended by adding more Razor I/O modules to the AoIP network.

<https://tinyurl.com/srereyf>

ON THERADIO: Do you like listening to the radio as well as being on it? The website *On The Radio*.co.uk has a weekly email each Monday morning with suggestions on upcoming radio shows to listen to, and even more news about what's happening on the radio. Go here to subscribe: <https://ontheradio.co.uk/subscribe>

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Specifications and designs are subject to change without notice or obligation.
 As per FCC rules, the US consumer versions have cellular frequencies blocked and the analog voice descrambler function deactivated by hardware.
 These restrictions are final and cannot be reversed by firmware change nor command input.
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More details at www.aorja.com

Receivers	Antennas	Accessories



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 call: 01702 204965 email: sales@wspc.com
www.hamradiostore.co.uk

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GEORG WIESSALA



Review: AOR AR5700D Digital Wideband Receiver



This month **Tim Kirby** is lucky enough to try the new wideband receiver from AOR, the AR5700D. Here, he offers his in-depth review of this radio.

Tim Kirby
longworthtim@gmail.com

This month, I am taking an in-depth look at the new AOR AR5700D receiver (Figs. 1 and 2). When I was sent the review unit, and upon unboxing it, it was quickly very apparent that this was a serious bit of kit.

The build quality, finish and general presence of the unit suggested something to be reckoned with, without even switching it on and hearing signals.

It was at this stage that I thought I'd better do a quick bit of research and find out some basics, including the price. At a price tag of £4595, this is not your average scanner/receiver. I poured myself a coffee (well away from the receiver, I might add) – before beginning the review.

So, what makes the AOR5700D so special?

First of all, Table 1 shows the main points and specifications, according to the manufacturer.

Not Batting an Eyelid

Two features caught my eye immediately – the first one was the very wide range of the receiver – from VLF going well up into the microwave region at 3.7GHz. The second was the wide range of modes that can be demodulated, including pretty much all the digital voice modes (Mototrbo, DMR, D-STAR, C4FM etc) that you can shake a stick at.

My first (local) test was to unbox the receiver, hook-up the supplied 12V power supply and switch on – you have an option to set the date and time. I tuned the receiver to the output of my amateur radio

digital hotspot, which can transmit in a variety of digital modes. I set the mode on the AR5700D to DALL.

DALL means 'Digital All' – the receiver will look at the content of the data stream and work out what type of transmission it is receiving. It will then change to the appropriate mode and decode it.

I set my digital hotspot to DMR, and sure enough, the AR5700D quite happily received that, as well as showing data about the transmission, such as the timeslot and colour code of what was being received.

C4FM (Yaesu's digital voice offering, sometimes known as 'Fusion' was no problem either.

How about D-STAR? That was fine too, and the display showed the callsign of the station transmitting, as well as the reflector in use. The data displayed when a digital transmission is being received varies from mode to mode. It was great to find that the receiver did all these modes without batting an eyelid, as it were.

It'll do much more as well, although those will be the main digital voice modes you'll find in use on the amateur bands

(mostly, though not exclusively, in the 430MHz band). TETRA (both Direct and Traffic Channels) will get the attention of many listeners, but of course, although the receiver is capable of receiving the mode, you won't be able to listen to encrypted transmissions, of which there are of course some here in the UK.

You'll find Mototrbo in use in various parts of the spectrum – often between 450 and 460MHz.

On the Bands

Audio quality from the receiver was pleasant to listen to – the inbuilt speaker sounded decent enough. There's an extension speaker socket if you want to feed the audio into an external audio system.

With a VHF/UHF antenna available – I thought I'd take a listen on the Marine and Air bands, as these tend to be the busiest in this part of the world. This gave me a chance to get used to entering frequencies and selecting the appropriate bandwidth for the various modes – of which there is a comprehensive selection.

If you wish to look at this in detail, grab yourself a copy of the instruction manual at this URL:

<https://tinyurl.com/s5xha8a>

I also had to play with the step function to be able to get to all the frequencies I wanted to try. Step frequencies available are 0.001, 0.010, 0.050, 0.100, 0.500, 1.000, 5.000, 6.250, 9.000, 10.000, 12.500, 20.000, 25.000, 30.000, 50.000, 100.000, and 500.000 kHz. You can also enter your own values for the step frequency – so you could create an 8.33kHz step to be used in the airband, for example.

I quickly dialled up the local VOR beacon 'STU'. This, as you would expect, came in nicely; it is not much more than a mile away. A feature of the receiver I noted and enjoyed at this stage was the analogue signal strength meter and movement, which worked beautifully. Other civil aviation traffic was noted in the airband, as well as signals while listening to Channel 16 on the Marine band.

The sensitivity of the receiver seemed in line with what I would expect in the VHF/UHF ranges. I also tried out the AR5700D in FM Stereo mode (FMST) with 100 and 200kHz bandwidths available – which sounded good. You'll only get the benefit of stereo if you plug headphones in though.

Onto HF

Of course, I wanted to try the receiver on

HF as well. My first stop was some of the Shanwick HF channels, which came in nicely.

Later, I tuned to the 14MHz amateur band to try some CW (Morse code), and I was very pleased to find that the narrow filter worked very well indeed, with no ringing.

After that, I had a quick tune around the broadcast bands – where the receiver was a delight to use.

Much as I love the SDR receivers I use on a regular basis, the AR5700D did have an 'old school' feel to it, but with SDR performance.

I wish I'd had the opportunity to try the receiver with a very low noise antenna such as a loop – I bet the results would have been stunning.

There are five separate VFOs, so you can leave a VFO 'parked' in different parts of the spectrum and switch between them as needed.

The receiver has two antenna inputs, both N-sockets. An N connector is a good choice especially as the receiver is specified to perform well into the microwave region. I was going to say that not all hobby radio enthusiasts will have N connectors or adapters in their shack, but I suspect that the serious enthusiasts or professional users that the AR5700D will attract will be well equipped with the appropriate connectors and adapters.

Parallel Listening and Recording

The AR5700D has the ability to listen to two different frequencies at the same time (in some cases three!). You can use Dual-band reception (one frequency below 25MHz and one above) – you'll need to use a separate antenna socket for each of these, although I guess there is nothing to stop you splitting the antenna feed to the two different sockets if you wanted to.

There's Offset reception, with a main and sub frequency within 5MHz of the main frequency (Offset reception is only available above 25MHz). Finally, there's Triple Reception which allows a combination of the two – in other words, one HF frequency and two VHF/UHF frequencies set up in Offset mode.

With headphones or line out – you'll find the Main frequency on the left-hand stereo channel and the Sub frequency on the right-hand stereo channel. For FM modes with 100/200kHz bandwidth, they are audible as a mono source.

You'll see a standard-sized SD card slot on the AR5700D. You can use this for re-

The build quality, finish and general presence of the unit suggested something to be reckoned with

The AR5700D is a high-end table-top receiver with wideband coverage between 9kHz and 3.7GHz. It supports a variety of digital, as well as analogue modes. Some of its outstanding features are as follows:

Digital Signal Processing (DSP): Input signals after the 45.05MHz IF are converted from analogue to digital by a DSP processor. There is no AGC in the analogue processing unit, as all processing, including AGC, is done by DSP.

High-Performance Analogue Front-End: Analog signal processing is performed by a computer-simulated, high-performance distribution constant filter.

DDS Local Oscillator: Instead of the conventional PLL method, the first local frequency is produced by direct digital synthesis. That method allows frequency-switching at high speed.

IF Output: An analogue IF of 15MHz (+/-7.5MHz) bandwidth is output.

Digital I/Q Output: Digital I/Q signal of 0.9MHz is output via a USB 2.0 interface.

High-Precision Frequency Reference: 0.01ppm frequency stability of the 10MHz internal master oscillator is achieved when using the optional GPS receiver unit.

FFT Analyser: Thanks to the onboard FFT processor, 10MHz wide spectrum data can be output at high speed via serial.

Multi-mode Digital Voice (DV) Demodulation: D-STAR, YAESU, ALINCO, D-CR, NXDN, P25, dPMR, DMR, Mototrbo, TETRA. (Mode dependent restrictions apply).

Video Demodulation: By connecting an external TV monitor, it is possible to demodulate the signal of FM modulation security cameras and analogue TV broadcasts. When you connect the TV monitor, you can check the demodulated video. Not compatible with digital terrestrial television.

Simultaneous Monitoring: 2-band reception, offset reception, triple reception (restrictions apply).

SD Card Slot: You can record the received audio, analogue and decoded digital, as well as logs.

12kHz Analog I/Q Output: Allows DRM broadcasts decoding via a PC and dedicated 3rd party software.

HF Direct Sampling: When receiving HF signals, the signals are converted directly to digital without entering the mixer. This allows very good linearity characteristics.

Table 1: The AOR AR5700D: The Specifications.

	AR-DV1	AR5700D	COMMENTS
Frequency Range	100kHz-1.3GHz	9kHz-3.7GHz	
Fpga Signal Processing	1 CORE	3 CORES	Parallel processing of digital demodulation.
DSP	1 CORE	4 CORES	More cores allow faster digital signal detection.
Frequency Accuracy	2.5ppm	0.1/0.01ppm	0.01ppm with optional GPS unit.
I/Q Output	✗	✓	AR-IQ-III software made by Microtelecom s.r.l. supplied as standard.
Analog If	✗	15MHz wide	To connect to external IF recorders, signal and spectrum analysers.
10mhz Reference Input	✗	✓	
Simultaneous Reception	✗	3	Dual-band, offset and triple reception modes (limitations apply).
Rec To Sd	Audio only	Audio + logs	Access logs and playback related audio files with the special PC utility
Agc (Hardware)	Automatic	✗	Not needed as excellent IIP3 figures provide very high linearity.
Signal Strength Reading	Only relative values due to AGC	Direct antenna reading	
Local Oscillator	VCO+PLL	DDS	High-speed frequency switching, thanks to excellent C/N characteristics.

Table 2 The AOR AT-DV1 and AR5700D In Comparison (AOR Japan).

Recording audio from the receiver, as well as backing up and restoring configuration data. The SD Card slot will take up to a 32GB card, formatted as either FAT or FAT32 and records in WAV format, 16bit mono at a sample rate of 17578khz. Recordings are saved with file names such as 00000001.wav, 00000002.wav, which increment by one for each recording. The manual also states that: "Logs of audio recordings are also written into the wav file; however, those logs cannot be accessed via the receiver. You need to use a dedicated LOGEXTRACT PC utility to access the logs, playback related audio files on your PC and save export the logs in CSV format. Details at: www.aor.co.jp/receiver/product/ar5700d."

You can record about 8 hours' worth of audio per Gb – so a 32GB card will record 256 hours of audio (it equates to about 2Mb a minute). You can play the audio files back through the receiver, rather than having to do it through a computer with an SD card slot/adapter.

Memories, Searching and Scanning

Of course, you can save frequencies into memories for scanning. The AR5700D can store 2000 memories in 40 memory banks of 50 channels. This is probably sufficient. However, given the wide range of the receiver, have a think about how you plan to use the memories and check that the capacity is sufficient for your needs. As you'd probably expect, you can scan multiple memory banks at a time. There's also a 'Select Scan' operation, which allows you to tag up to 100 channels across different memory banks to provide a 'super list'. You can link memory banks together for scanning if you wish.

The AR5700D provides different meth-

ods of searching for signals. For example, searching between two frequency limits as defined by 'VFO-A' and 'VFO-B'. You can have the search pause for up to 9.9 seconds, as well as make it stop only on frequencies on which a voice is detected.

You can also create up to 40 'Search Banks', with upper and lower frequency limits, a defined step and IF bandwidth. You can group 'Search Banks' together into 'Search Groups' (up to 20).

This will be most effective on the VHF/UHF/SHF bands. Although it works on lower frequencies too, as the manual notes, this is less likely to be successful, owing to the relatively high noise floor. There's an Auto-Store feature available, which stores the first 50 active frequencies found into Bank 39 for further analysis.

There's an RCA socket on the back panel, which allows you to take the output of a demodulated analogue video signal and put it into a video monitor. You won't be able to use this for digital terrestrial TV, of course. There's an IF output (BNC socket) which allows you to take the 45.05MHz IF (a bandwidth of +/- 7.5MHz) – you could use that as input to a panadapter, for example.

Computer Control: AOR-IQ-III

All this and we haven't even covered the computer control aspects. Because the receiver is an SDR design, you can do a huge amount if you connect the AR5700D to your computer and use the AOR-IQ-III software suite (Figs. 3 to 5). You'll need a reasonably capable machine – the suggestion is for an i7 CPU, 16GHz RAM an HDMI monitor, plenty of hard disk for recordings and three USB ports (one for the IQ stream, one for receiver control and one for the licence dongle). Windows 7, 8.1 and 10 are supported.

The manual helpfully notes that – if you notice any 'audio stuttering', due to insufficient PC resources, you can adjust the software's *Buffer Reads/Interval*.

There are more details on this in the *Advanced Parameters* chapter of the manual.

On first reading, I was a bit disappointed to see that a USB dongle was required to run the software.

However, on the positive side, all the licensing, drivers and software you need to run AOR-IQ-III are included on the dongle. Recording onto it is not advisable, for two reasons (1) because the I/Q data size would very quickly fill the USB memory, and (2) because the USB memory speed would probably be a 'bottleneck' for larger files and create 'stuttering'.

In line with much modern equipment software, upgrades will be available from the factory as downloads.

For the moment, you will need to install the IQ drivers and the receiver control drivers (the receiver control drivers should install automatically) before you try and start to run the AOR-IQ-III software.

On its first run, AOR-IQ-III will ask you for the USB Serial Port number of the receiver. If you're not sure which port number it is, use *Device Manager* in *Windows Control Panel*.

Verify the port number by unplugging and then reinserting the receiver control connection – you'll see the port 'vanish' and 'reappear', which should confirm the one to choose in the setup dialogue box.

I thought the interface quite well designed and attractive, but your opinion may be different! The interface is well described in the manual – at least enough to get you started with confidence.

What did become apparent (thanks to

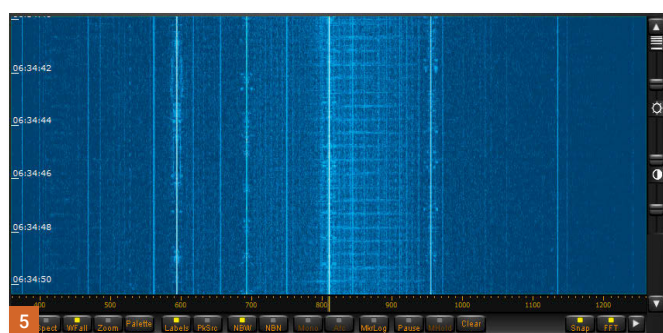
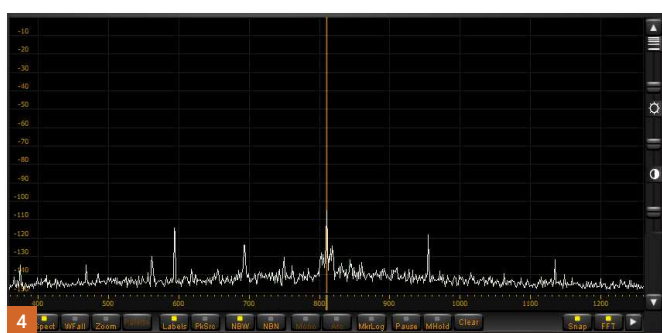


Fig. 1: The front of the AOR AR5700D.

Fig. 2: The back of the AOR AR5700D.

Fig. 3: The AOR-IQ-III Interface.

Fig. 4: AOR-IQ-III Main Spectrum.

Fig. 5: AOR-IQ-III Waterfall Display.

Peter Hegan, for pointing this out) is that the software does *not* provide any method of entering memories or search bank limits. The key purpose of AR-IQ III, according to AOR Japan, is basic control, I/Q recording and playback.

At a later time, a free AOR utility will be available for memory management. A few commercial, third-party software (control and database) solutions will also be available in the future.

Whether you choose to use the control software, of course, is up to you – I think it's fair to say that you can do everything you are likely to want to do from the control panel of the receiver. If you like SDR programs as I do, you'll probably find it easier to do it all from the software, but it's a very personal choice.

If you decide to record the spectrum, the IQ data is recorded as WAV files, but you'll only be able to play the data back using the AOR-IQ-III software (Figs. 3 to 5). No other SDR programs will be able to read the data.

Concluding Remarks

I have reached the end of my allotted space,

but I feel I've barely scratched the surface of the AOR5700D. I would have liked to spend more time looking at HF and SHF capabilities, but I decided it was better to give a general overview of the receiver. It really is a fascinating piece of kit.

The price reflects the performance and capability of this receiver, which is likely to be targeted at – and will find wide appeal in – the professional and governmental market.

Nevertheless, I am sure that a few hobbyists will be attracted to this receiver too.

Overall, the receiver performance is good, highly flexible and configurable.

Having a receiver that can be entirely controlled from the front panel rather than a computer is unusual these days, but the AR5700D scores highly here.

The AR5700D really does well if you are interested in seamless decoding of digital modes and/or in a receiver which can be used in the microwave region. The AR5700D goes much higher in frequency than the majority of SDR receivers.

In addition to this, it provides demodulation of the majority of modes without the need for additional software or licence keys.

Computer interfacing is proprietary (Microtelecom in Italy) – as it stands now, you can't use any other SDR software with

The AR5700D goes much higher in frequency than the majority of SDR receivers

the AOR5700D. However, the interfacing of all AOR receivers has always been open, and the complete PC command lists are available for download on the AOR website. According to AOR, the command list for the AR5700D is in preparation now and will be on the AOR website soon.

Table 2 shows the main differences between the smaller (and cheaper) AOR-DV1 receiver and the more expensive AR5700D.

If you're tempted by the AOR5700D, I suggest a trip to your friendly dealer, get them to put it on some aerials, HF and VHF/UHF and SHF if they can! Spend an hour or two playing and see how you get on.

If you're going to spend on the receiver, any dealer will be happy to spend time with you.

The AOR AR 5700D retails at £45995.

Very many thanks to Waters and Stanton for the loan of the AOR5700D – I really enjoyed having the opportunity to try it out.

See you next month when it'll be the next in the series of *Signals from Space*.

SIGINT & the Role of the Radio Security Service

David Harris

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David Harris returns to the fascinating topic of radio in war, by examining a new title on the role, personnel and activities of the Radio Security Service (RSS) – a subject rarely, if ever, discussed before.

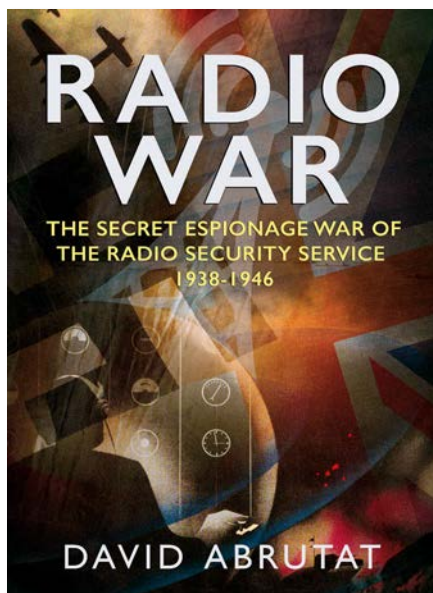
There have been many books published about Bletchley Park, Alan Turing, Enigma machines and the role of Signals Intelligence (SIGINT) during the Second World War. *Radio War* breaks new ground by studying the role of the Radio Security Service (RSS). The RSS monitored enemy communications during the Second World War. It was founded in March 1939 and comprised 2,000 civilian and military personnel, and 1,200 volunteers who systematically listened to and transcribed coded messages sent by the German military and by enemy agents. Without the thousands of RSS radio operators skilled at receiving Morse code, the decryption staff at Bletchley Park would have had no data to decode.

Most of the volunteers were licenced radio amateurs, many of whom had day jobs carrying out essential war work, and then spent three to four hours in the evening listening to specific frequencies in the 3-12MHz range. The Radio Society of Great Britain (RSGB), founded in 1913, was an important source of recruitment. The volunteers kept meticulous logbooks, which were sent to regional centres for analysis and, if suitable, to Bletchley Park for decoding. It is interesting to think that many of these people would have been readers of *The Short Wave Magazine* which was first published in 1937 and was the predecessor of *RadioUser*.

Early copies of this magazine are now available online at

<https://tinyurl.com/yb6q4ceu>

One of the key roles of RSS was to monitor transmissions from German agents who had secretly landed in the UK during the war. Apparently, around 100 secret agents arrived either by parachute, small boat or by disguising themselves as refugees. Those that were caught were given the choice of being 'turned' into double agents or to be



Radio War. The Secret Espionage War of the Radio Security Service 1938-1946 by David Abrutat. Fonthill Media. 2019. £25. 192 pp. Hbk. ISBN 9781781557594 www.fonthillmedia.com

executed as spies. The author estimates that, of the 23 German agents sent to the UK in 1941, five were caught through the efforts of RSS monitoring.

When the UK entered the Second World War, all amateur radio licences were withdrawn, but amateurs were allowed to keep their receivers. The civilian and military members of RSS who were located in various centres around the UK used a variety of equipment, including the American National HRO receiver.

This was a nine-valve single conversion receiver with coverage from 1.7 to 30MHz, which received AM/CW/MCW signals. It was manufactured from 1935 to 1946 and weighed 23 kg.

The radios cost US\$168 to US\$329.

Another radio used by RSS monitors was the Hallicrafters Sky Champion S-20R.

This radio was made in the USA from 1939 to 1945 and covered 550kHz to 40 MHz. The cost in the USA was \$60.

In addition to monitoring stations for their content, the RSS was also involved in Direction Finding (DF) to locate the posi-

tion of enemy military stations and – more importantly – the whereabouts of enemy agents in the UK. The Post Office already had detector vans, which were used to monitor sources of radio interference and unauthorised transmissions. These were brought into war use, and the fleet expanded.

There were also a number of DF stations manned by RSS staff around the UK. The RSS designed antenna layouts, switching systems and amplifiers for the listening stations. DF stations were located around the UK: In Belfast; Thurso, Scotland; Lydd, Kent; Bristol; Wymondham, Norfolk; Cupar, Scotland; St Erth, Cornwall, and Bridgewater, Somerset.

As the war progressed, the RSS had units operating in Gibraltar, the Middle East and North America. It is estimated that one million RSS intercepted radio messages were sent to Bletchley Park for decryption during the war. Around 50,000 people were employed in all aspects of SIGINT during the conflict.

This hardback book also has 32 pages of illustrations, including photos of key personnel, radios, detector vans, and buildings. There are numerous maps and diagrams of RSS stations, organisational structures, and wartime documents. The book has a comprehensive bibliography, index and footnotes, and it benefits from a 22-page appendix. The latter lists more than 800 volunteer RSS staff and provides their amateur radio callsigns, the unit to which they were attached and the location in which they served. Of great interest in this context is the reprinting of a secret document, *Notes of Detection of Illicit Wireless 1940*. It is a fascinating guide to how the recruitment and running of the RSS were conducted.

This is a very well written and highly readable book about an aspect of SIGINT and the Second World War which had previously gone unrecorded. It will be of great interest to war historians as well as to radio enthusiasts who want to learn more about how radio was used in the Second World War.



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- DMR / C4FMx2 / AMBE+2 Tier 1 and Tier 2 only
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A History Lesson & Norwich Airport

David Smith

dj.daviator@btinternet.com

David Smith features a letter from a very enthusiastic lady airband listener, reviews a book on a piece of aeronautical history and presents a sketch of ATC operations at Norwich Airport.

A History of Birdlip Aeronautical Communication Complex

Anne Reed (2E1GKY), who was very supportive of the book reviewed below, wrote to me recently.

[...and to the editor, see RadioUser, March 2020: p. 60 - Ed].

Anne said, "Although I am a licensed radio amateur, I have always been an aviation person, taking all the monthly magazines over a long period of time. You will be very interested to know I always bought your Air Band Radio Handbooks, and have editions 3, 4, 5, 6 and 7 on my shack bookcase, as well as a 1986 AirBand Radio Handheld with a Signal R532 receiver on the front. I had an R532 and an R535, which I now regret parting with. I used to follow Concorde when it left Heathrow and across the Atlantic, and I did

the plotting, recording it if I was not around.

"I used to use AirNav with the small antenna and even a special 1050MHz antenna outside, but again I seemed to trade this in with my very favourite Waters and Stanton (I miss Mark and Jeff very much).

"I also used to test some of their scanners. Jeff brought me back a Sony Wave Hawk from one of his America visits and let me buy it. I also have the mini Signal R537S with two crystals, one being for 133.600MHz, and I would not want to part with this either.

"Over the years, I have had many scanners and done too much trading in!! Yupiteru 7100, Uniden (various models) – you name it, I have done it. I have been an ISWL member for many years and a dedicated Committee member of the Gloucester Amateur Radio and Electronics Society. www.g4aym.org.uk

"I was an exam secretary for the RSGB too. 'Dedicated' is putting it mildly, and I look forward to my Mondays at club meetings. Mainly for Airband, I use the Watson W.50. It is very sensitive and works well on 2m and 70cm vertical. I also have a dedicated aviation antenna designed here in Cheltenham

by a radio amateur. It looks like a Discone but radials are cut to the civil and military frequencies.

I am familiar with the AirNav RadarBox, of course, and I must have a look at the ADS-B Exchange tool you mentioned recently in your column."

<https://www.radarbox24.com>

<https://www.adsbexchange.com>

Book Review

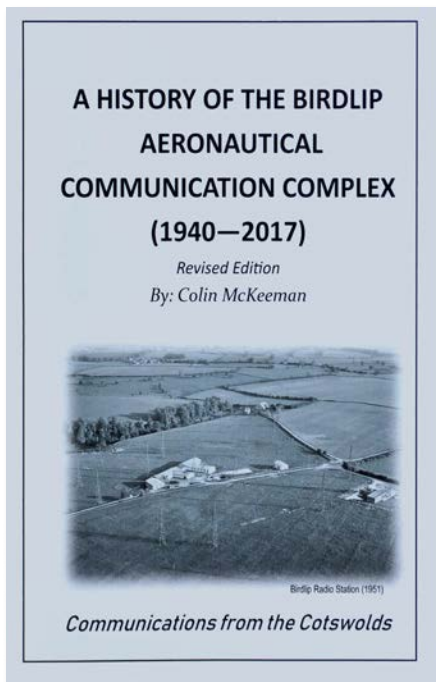
McKeeman, Colin: *A History of the Birdlip Aeronautical Communication Complex (1940-2017)*

Rev. ed., 2019; Lettertec [Self Publish Books] Carrigtwohill, Co. Cork, Ireland.

The book under review is a revised edition of an already incredibly detailed volume, first published by the same author in 2016, and reviewed in this column before (RadioUser, September 2016: 36-37).

The author subsequently received what he describes as 'exceptional feedback'; so much so, in fact, that he was prompted to publish a very much enlarged edition. Compared with the original's 329 pages and 172 photographs and diagrams, the new book features 470 pages, plus 255 photographs and diagrams.

He sets the scene with an introduction, stating that, "Birdlip is probably a location not familiar to many, except of course for those that live in the district of this sleepy English village in the picturesque Cotswolds, some ten miles east of



Gloucester. Furthermore, to discover that this was part of a key aeronautical communications centre, serving much of the globe for over 30 years, may come as a considerable surprise."

Birdlip had an associated transmitter site at Winstone, a few miles to the south-east, and this is also covered in detail. The author has delved into official records, researched newspaper reports, technical manuals, and museum extracts. Most importantly, he has gathered individuals' recollections of their own and family-related experiences while working at either station.

There is a lot of technical content here that is likely to appeal to the radio enthusiast. Much of it has been explained in layman's terms, in order to appeal to the non-technical reader as well. HF airband listeners will be fascinated by the comprehensive coverage of the early days of transatlantic communications. The book is available direct from the author via this URL: downrange@eircom.net

Some fascinating historical photographs related to the book can be accessed here: <https://tinyurl.com/uwx9bn5>

Samples of the author's aeronautical activity logged in those early years can be found on his HF blog <https://tinyurl.com/r5axa6k>

The book is on offer at a reduced cost of £25.00 (including postage and packing) to *RadioUser* readers.

My aircraft photo of the month shows a German Navy (*Bundesmarine*) Westland Super Lynx at the 2019 Cosford Airshow.

ATC Profiles 21: Norwich Airport

ICAO Code: EGSN IATA Code: NWI

Frequencies	(MHz)	Hours of Operation
Norwich Approach/Radar	119.355	06:30-21:30
		Lower Airspace Radar Service is provided during Radar opening hours to a range of 30nm
Norwich Director	128.330	When instructed by ATC
Norwich Tower	124.255	
ATIS		
Norwich Information	128.630	
Norwich Fire (non-ATC)	121.600	Fire vehicles attending aircraft on the ground
Nav aids		
	ILS CAT I Runway 27	
	NDB NWI 342.500kHz	
Runways		
	09 -- 1841m x 45m	
	27 -- 1841m x 45m	
Hold		
	NWI NDB	

NOTES (A-Z)

AIR TESTS

Any aircraft requiring an air test, and which will be climbing to FL 190 or higher, must have each individual flight approved by London Military. Pre-notification to London Military is required 24 hours prior to the flight taking place, and it is the responsibility of the aircraft operator to ensure compliance with this requirement. If pre-notification is not completed, start clearance may be delayed or withheld. All air tests must have a correctly filed flight plan, which states clearly and unambiguously the nature and requirements of the flight, and which must include London Military as one of the addressees.

CAT II/III OPERATIONS

The airport is not equipped for CATII/III operations.

GROUND MOVEMENT

Push-backs: Jet-powered aircraft over 45,000kg all-up-weight on Stands 4, 5 or 6 will be pushed back and forward, as part of the pre-taxi manoeuvre. Due to jet blast safety distances, engine start is not to commence until instructed by the ground crew. This will normally be during the pull forward phase of the procedure. The Western Apron is only to be used by resident operators and their authorised visitors. Visiting aircraft must park under marshaller instruction. There are three helispots on the Western Apron. Spot 22 on the western half at the northern end of the Western Apron is for use by the Air Ambulance only. Aircraft, when operating on and off aprons and taxiing to/from hold point Papa, must use minimum thrust/idle power to avoid jet blast risk in the vicinity.

HANDLING AGENTS

Norwich Handling: frequency 131.855 MHz. Saxon Air is the preferred handling agent for GA and Business aviation.

HELICOPTER OPERATIONS

Light helicopters are not required to use the runways, but arrivals and departures should be operated in such a way as to avoid overflying of and to minimise the disturbance to, local residential areas. Air taxiing on the main apron is not permitted, except with the approval of ATC and under the guidance of a marshaller. Departures direct from the Saxon Air Apron and associated stands are prohibited.

Low-Visibility Operations are in force when Met visibility is 1500m or less. If the Instrumented Runway Visual Range is 400m or less, entry to the runway will be via A2 and C2 only. For all other departures, a 'Follow-Me' vehicle will be provided.

NOISE ABATEMENT

When taking off, aircraft shall climb as steeply as minimum engine noise settings allow, and, when approaching to land, without the assistance of ILS, shall follow a descent path, which will not result in their being at any time lower than the normal 3° glide path. Arrivals: Pilots of arriving jet aircraft and turboprop aircraft, and aircraft in excess of 5700kg, should arrange their flights to be established on final approach to a runway not below 1500ft. Departures: All aircraft other than IFR helicopters to the Southern North Sea: On departure from any runway, all aircraft are to climb straight ahead to 1000 FT Above Aerodrome Level (AAL) before turning, unless instructed otherwise by ATC. Departing aircraft less than 5700 kg all-up-weight may be permitted to make a turn to the north of the aerodrome at 500ft Above Aerodrome Level.

TRAINING

Circuit and instrument training is only available by prior arrangement with ATC and subject to local traffic and the runway in use. Normal circuit heights are 1000ft for aircraft up to 5700kg, and 1500ft for aircraft over 5700kg.

USE OF RUNWAYS

Variable circuits in operation. Normally no overhead joins are permitted.

VISUAL FLIGHT RULES (VFR) FLIGHTS

VFR flights may be given routing instructions and/or altitude restrictions in order to integrate VFR flights with other traffic. Pilots should anticipate routing instructions in relation to the Visual Reference Points (VRPs) detailed below. Pilots of VFR flights are reminded of the requirement to remain in VMC at all times and to advise ATC if at any time they are unable to comply with the clearances as issued.

VISUAL REFERENCE POINTS (VRP)

Attlebridge; Aylsham; Brundall; Coltishall Disused (aerodrome); Hethel Disused (aerodrome); Keswick Roundabout; Lenwade Lakes; Norfolk Showground; Stoke Holy Cross; Thorpe.

WARNINGS

Use of this airport by aircraft not able to communicate with ATC by radio (subject to prior permission) aircraft towing banners, or non-powered gliders may not land at or depart from the airport. Flying takes place by light aircraft and microlights from Felthorpe aerodrome, 4 miles north-west, occasionally throughout the year with increased activity during the summer months. At both ends of Runway 09/27, its width is twice that of the associated edge lights, due to extra pavement at one side. Aircraft backtracking the runway and conducting a 180-degree turn must ensure on completion of the turn, that correct alignment with the runway centre-line is achieved. During Low Visibility Procedures, one fire engine is positioned west of Hold Bravo 1, and another fire engine is positioned west of Hold Delta 1. Helicopter winch training is conducted on the north side of the aerodrome. Wind shear and turbulence can occur on final approach to Runway 27 during periods of strong southerly or south-westerly winds.

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Engaging Young Enthusiasts

Georg Wiessala

wiessala@hotmail.com

The editor takes a closer look at a book on radio communications aimed at the absolute beginner and written by an enthusiastic young American student and hobbyist.

As editors and publishers of magazines on the radio hobby, we are often sensitive to the challenge of keeping the radio hobby fresh for the next generation. If you are an educator, or a radio club or association, you will, no doubt, have thought about this. Maybe you offer a number of activities directed at the younger membership; you may visit schools, in order to introduce students to amateur radio, or to the joys of making contact with the International Space Station (ISS).

I have heard about many UK Listeners' Associations and ARCs who come up with Makers' Fairs, 'Buildathlons' or general educational activities aimed at the younger operator or enthusiast.

It was through one of these clubs (CQ Scotland, incorporating Hamilton Electronics Group), that I first heard about Alex Wulff and his book. David Searle, of CQ Scotland, wrote to me that, "since setting up two community projects ZL3 Buildathon and CQ Scotland, I've been searching for one book that should spark an interest in modern radio in its broadest sense, and excite everyone to take up ham radio now – This book does that, very, very, well."

<https://www.cqscotland.com>

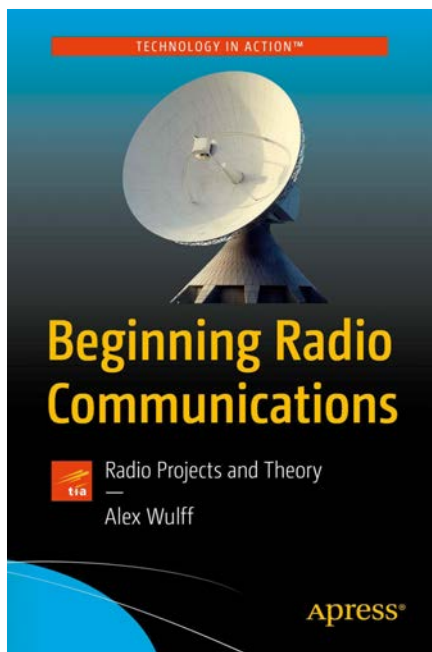
This aroused my curiosity, and when David kindly sent me a copy, I agreed to review it for *RadioUser*.

Alex Wulff is a 20-year old 'maker' and a student of electrical engineering at Harvard University. He describes himself as someone who loves to share his enthusiasm with the maker community, and this is evident from his website:

<https://www.alexwulff.com>

This is his first book. It is obviously written for the US American market, but most chapters can find ready application among UK 'homebrewers', trainee amateur radio operators, and general readers.

Alex covers two different, but converging, constituencies in his book; those who like to 'put things together', experiment, 'tinker',



Wulff, Alex: *Beginning Radio Communications: Radio Projects and Theory*
Apress Media LLC/ Springer
ISBN-13 (pbk): 978-1-4842-5301-4
ISBN-13 (electronic): 978-1-4842-5302-1
<https://doi.org/10.1007/978-1-4842-5302-1>
www.AlexWulff.com/go

'homebrew' and make things; and those who need a general, *ab initio* introduction to radio communications, theory and technology. The author combines those two strands admirably and thus produces a unique text that will have massive appeal to its intended audience.

The book is subdivided into ten chapters and – significantly – is interwoven with a number of practical projects to build. The projects are about capturing satellite images, microcontrollers and radio modules, handheld transceivers, and dual-band satellite aerials. They are introduced in the first Chapter and taken up again in later chapters.

Chapter One also lays the foundations for the understanding of key concepts essential in today's connected world, such as Wi-Fi, Bluetooth, GSP, marine and amateur radio, broadcasting and TV. Chapter Two surveys the areas of propagation and the EM Spectrum, while the third section looks more closely at aerials and their properties.

Following the 'Project-Chapter' (Chapter Four), the next parts of the title cover analogue and digital signals, modulation, including advanced issues like Quadrature Amplitude Modulation, in an easy-to-grasp manner.

Following another project-focused chapter (Chapter Six), involving coding and the Arduino Uno device, Wulff covers amateur radio (Chapter Seven) and handheld transceivers and repeaters (Chapter Eight), again, with one eye on the absolute beginner. The final two chapters (Chapters Nine and Ten) are on amateur radio satellites, radio astronomy, amateur radio networks, volunteering and educational outreach, and on a miscellany of related radio topics, such as LoRa (long-range) data transmission.

The book has a useful, short, index, and the areas introduced here are supported by and link in to, the author's website (see above). There are some structural issue here, where the material might, arguably, have been organised in a more logical and coherent manner, but this is, ultimately, the author's choice.

The lack of referencing, however, weighs a little more heavily. The only backup-references here are either from general websites, or 'product links' from the author's own website.

Other than that, there is no information on the sources the author might have consulted to compile this text, no bibliography, and no pointers to further reading and resources. Given that this is meant to be a beginners' title, this seems more than a little remiss.

Nevertheless, I think this title will find its niche among makers' communities, and it will almost certainly be used in many radio clubs and associations, to draw younger members into the hobby, through its unique combination of radio theory, practical projects and coding exercises.

It will give a younger audience new skills needed in today's world, and it will remind the rest of us of the ability of radio to astound us and the flexibility of the medium into the future.

I have two copies of this book to give away for free. If you work with young radio amateurs, please write to me. The first two clubs to write in will receive a copy for their libraries.

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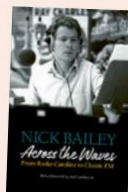
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Across the Waves

This autobiography gives a count of Nick Bailey's life with Radio Caroline, other radio stations and finally with Classic FM. Reviewed in September's RadioUser, this is "an extremely entertaining and very readable book..."

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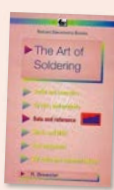
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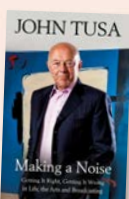
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Making a Noise

John Tusa looks back over a long and varied career in radio, television and the arts. In this autobiography, Etched with candour, this is an entertaining memoir of Tusa's life.

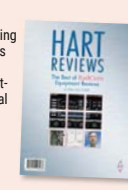
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Hart Reviews

For 35 years Peter has been writing amateur radio equipment reviews for the RSGB's journal RadCom. These reviews are real world testing of performance and analytical reporting of how amateur radio antennas, radios, amplifiers, etc. really work.

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DXing on the Move (Pt III)

In the third, and final, part of his mini-series on DXing on the road, **Clint Gouveia** casts his DX nets wider still and wider, and he provides key advice for those who wish to explore DXing when travelling abroad.

Clint Gouveia

clintgouveia@scientificmagnetics.co.uk

Iwish I could travel internationally, simply for the purposes of conducting a DXpedition. This way I would get to choose the location, based on what I wanted to copy. Right now, that would be Cape Verde, off the West African coast. With the many HF broadcast and utility signals - and MW signals of interest, this would keep me occupied for weeks, probably. However, life isn't like that - well not yet anyway!

However, I am fortunate enough to have a job that takes me abroad and sometimes to interesting places - Brazil, for example (Fig. 1), North America (Fig. 2), and all over Europe.

Holidays are another excuse for a DXpedition, and for the past couple of years, that destination has usually been somewhere in Florida.

Now that SDR technology has decreased in price and increased in portability and performance, having a fixed location in another country for a period of time allows DXing to be undertaken on two fronts. One of them is with a good portable radio. My international adventures with radio feature heavily on my *Oxford Shortwave Log YouTube* channel.

<https://tinyurl.com/hwtmoka>

When it comes to international DXpeditions, there are two questions my subscribers ask time and time again: (1) What is the best radio/antenna to travel with; and (2) How do you avoid aggravation (often well-meaning) officials at airport security?

There is definitely a fear from would-be international DXers that somehow they would be pulled up and have their equipment confiscated. Nothing could be further from the truth - and I know because I've been through it more than

once. However, it is important to note at this juncture that I have no problem at all if airport security should decide to pull my backpack apart. Their actions are completely justified and make flying as safe as it possibly can be.

Thorough Preparation

Preparation is key to a successful international DXpedition. It is particularly important how you pack your equipment in your backpack/ travel bag. I know from first-hand experience that simply throwing a couple of radios into your backpack, along with coils of coaxial cables, antenna components etc. is going to flag up potential issues on the airport X-Ray machine.

This happened to me on a trip to Corfu. I had probably been in a rush to pack my gear. Therefore, into the backpack, at speed, went my Eton Satellit portable, the Bonito Boni Whip radiator, amplifier and power inserter, a homebrew battery pack containing ten AA batteries, spare batteries, coaxial cables of various lengths, a reel of equipment wire and numerous connectors, crocodile clips etc..

Upon arriving at the airport it became obvious very quickly that check-in and

Fig. 1: I often sacrifice myself to find suitable DXing locations for *RadioUser*. This is in Brazil. **Fig. 2:** DXing in Treasure Island, Florida: Radio Helliniki Radiophonia. **Fig. 3:** Attempting to repair my XHDATA DX-808 in Brazil. **Fig. 4:** The SDRPlay RSPduo in Houston, Texas.

security were very busy. No bother, we just stood in the queue and waited. Finally, we reached the X-Ray machine and my other half's bag went through with no problem. However, upon re-emerging, my backpack was quickly manoeuvred into a 'siding' for further inspection. At this point, my other half started to get quite annoyed which further added to the stress of the situation!

Fortunately, the security official was very nice and simply said he needed to take a look at the electronics in my backpack. I asked him if it was obvious what I had been carrying to which he responded by turning his computer screen around. There was the X-Ray scan of my backpack with the electronic components overlaid in red and the cables clearly marked in green!! Anyway, after a quick search and explanation from yours truly that I'm a radio ham (seemed a simpler explanation to a layman) all was well and I was on my way.

Two days later, I'm lying by the pool, thinking about how to avoid hassle at the airport on the way home and on future DXpeditions. I managed to come up with a strategy that has never failed – and by never failed I mean I have never been stopped at airport security since my flight out to Corfu.

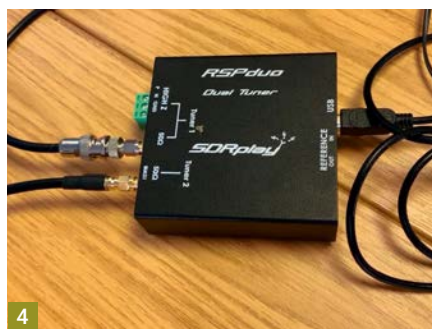
Careful Packing

Firstly, pack all your electronics, power supplies, batteries and antenna components, neatly together *in one box*. It doesn't have to be anything particularly fancy. I used the cardboard box my Bonito Boni Whip antenna was supplied in. I packed my coaxial and other cables into my suitcase, which I checked in at the airport.

As simple as that - and I have never been bothered since.

A couple of other tips: if, like me, you're slightly paranoid about the airline losing your suitcase, carry two sets of cables. I always carry a longer set in my suitcase and a shorter set in my backpack, tightly (and neatly) coiled. Thus, in the event of losing your luggage, you're not dead in the water with regard to your DXpedition at least! You might have to listen in dirty clothes though!

The other tip is to *test all* of your equipment *before* you travel. This avoids trouble on the ground and (hopefully) removes the necessity to travel with a soldering iron!



Radios to Take

Basically, it's possible to travel with any radio you can reasonably carry and power up. However, I would definitely avoid taking a large or heavy radio. Wandering around an airport with 20kg on your back is not pleasant, and with modern cheap HF portables available aplenty, not actually necessary either.

One important point I would make here is to avoid travelling with a radio you've not used previously. There are various reasons for this. Firstly, you may not have a good understanding of its performance in general, or on a particular band. Secondly, it may not be reliable and again, I know from personal experience what a total pain it is when you're out in the middle of nowhere – as I was when my XHDATA D-808 failed on me (Fig. 3).

Better to travel with a tried-and-tested

SDRPlay RSP 1A: supremely portable full-blown SDR receiver that can be powered by 5V USB. Very small form-factor and ultra-light; perfect for an international DXpedition.

SDRPlay RSP DUO (Fig. 4): similarly portable via USB power, this radio has two receivers offering the option of travelling with two antennas – which I have done several times. The casing on the DUO is metal rather than plastic and so it's heavier than the RSP 1A, however not prohibitively so. I have used mine in Europe, Brazil and the United States.

SDRPlay RSPdx: identical portability to the RSO DUO but with a single receiver that benefits from HDR (High Dynamic Range) mode delivering ground-breaking sensitivity below 2 MHz as a function of cost.

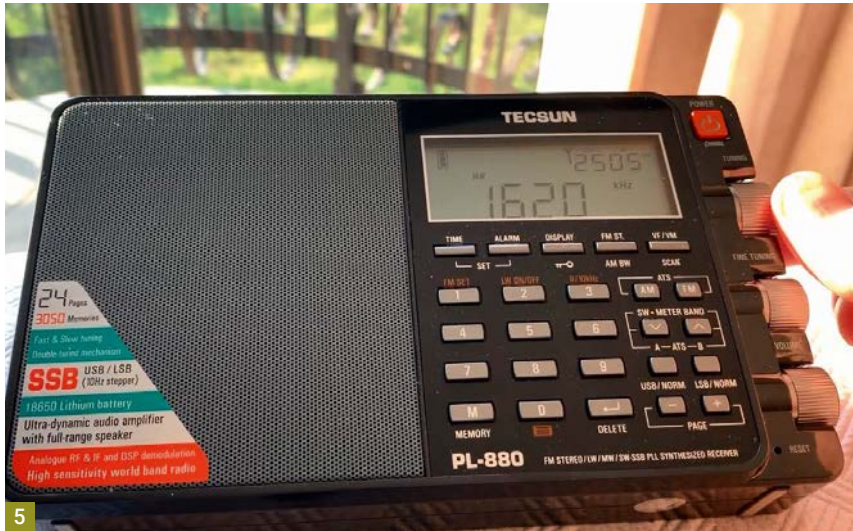
Eton Satellit: This portable offers excellent sensitivity/selectivity and an excellent work-horse radio during my travels. Small form-factor and lightweight. Mine has been all over the world with me.

Tecsun PL-880 (Fig. 5): The radio has superb all-round performance, can handle a large antenna, back-lit display for use at night and really excellent ergonomics. Recently had the pleasure of operating one in Asilomar, California.

Sony ICF-7600GR: no longer manufactured, but late models still available online and every now and then brand new examples come up for sale. Excellent sensitivity and selectivity that benefits from a synchronous detection circuit that actually works. It is the size of a paperback book, so throw it in your backpack. It is a radio that works on an international DXpedition, on every level.

A final word on the XHDATA D-808: superbly sensitive on the whip, excellent selectivity – essentially a cheaper version of the Satellit. I travelled extensively with mine until it failed in Brazil last year.

Table 1: Some suggestions for portable radios to take.



5

Fig. 5: My Tecsun PL 880.



6

Fig. 6: The Bonito MegaLoop FX in action.

radio or SDR that you know performs well and has proven to be reliable. Also, give some thought to the robustness of your radio. For example, I would never have travelled with my Eton E1. Despite superlative performance for a portable (probably the finest performing portable radio of all time), it would not have stood up to the rigours of spending many hours in my backpack I'm sure.

Finally, it may sound obvious, but I would never travel with a vintage portable unless I had a modern back-up. A case in point was my first trip to Brazil: I took my Sony ICF-SW100 ultra-compact portable and a Tecsun PL-680. Bearing all of this in mind and of course, the issue of weight, the list in Table 1 contains some reasonable (and proven) suggestions:

Operating from Hotels or Apartments

I usually travel with an SDR and a portable radio when staying in hotels etc.. I always set up the SDR first, in order to (1) confirm everything is working correctly, and (2) to see what the local QRM looks like, from LW through MW and into the HF bands. Nothing better for this than looking at a real-time spectrum.

The bad news is that most hotels and other types of similar accommodation are quite noisy. Expect most of your noise floor to be around -100 to -110dB. It's important therefore to actively search out those bands with the lowest noise floor and focus on those frequencies. I remember at a very nice hotel in the centre of Dublin, it was impossible to copy anything on LW or MW,

but the HF bands above 80 metres were relatively clear.

Always try to use a magnetic loop if you're DXing indoors or on a balcony. I have never stayed anywhere where an E-field antenna would deliver a noise-free signal, let alone DX.

If possible, try to plan your hotel or apartment whilst taking into consideration your listening activities. I always try to find a hotel with a minimum of a balcony. This allows you to set up your antenna (preferably a magnetic loop) outside and away from the obvious sources of electrical noise. Better still, a room with a larger outdoor space such as a terrace is another option that might cost a little more but will provide an even quieter location for your antenna. A larger space also gives you the option of being able to adjust the orientation of your antenna whilst reviewing the noise on your SDR spectrum.

On a balcony, there are limited options for hanging a wire over the handrail or draping your loop on a corner to adjust the azimuth by somewhere in the region of 45 to 90 degrees.

Aerials and Accessories

Here it's all about weight, size and obtaining the best possible signal-to-noise in inherently noisy environments. Table 2 illustrates the factors you ought to take into account.

What else do you need for an international DXpedition that you won't already be carrying? Not much really: First, some spare cables and connectors (I always carry two sets – one in my backpack, the other in my checked-in suitcase); second, mains socket adaptor/s for the country you're visiting; and third, a window jumper cable (ribbon

cables that can be used to pass a coaxial cable through a window when it is closed.

A great idea in hot countries to keep the temperature in your room down, cold countries for the same but opposite reason and tropical climates where the local insect life will eat you alive given the opportunity!

Finally, over the past three or four years I have embarked on many DXpeditions, from locations only a mile or so down the road to those in more exotic regions, several thousands of miles away. I've driven for miles through the Brazilian jungle to reach my destination; and for 5 minutes to the local (QRM-free) wood!

Whatever your destination, a little planning, and choosing the right equipment for the environment you will be listening in, should result in a very enjoyable experience and if you're lucky, you might catch a rare signal – even if it's only rare to you.

<p>A Length of wire: potentially useful if you can get outdoors, but of limited use in a hotel – even if you can hang it out of a window or balcony, the improvement in signal-to-noise over the whip antenna is likely to be marginal.</p> <p>E-field antennas: only carry one if you know you can get away from the hotel/apartment to an electrically-quiet environment. Otherwise, it will just be 'dead weight'.</p> <p>The Bonito MegaLoop FX (Fig. 6): This is now my 'mainstay-antenna' for international DXpeditions. Lightweight, very compact and will run off batteries or a USB power brick. Not guaranteed to deliver DX in a hotel or other noisy environment, but in my experience will always provide something interesting to listen to.</p>

Table 2: Some hints and tips on aerials.

Feedback

Have you got something new to tell our readers? If so, then drop a line to wiessala@hotmail.com

Regular contributor **Bob Houlston G4PVB** has had a great time this month. He wrote, "... next to a radio and aerial, the most important thing for the SWL is time. Not time to enjoy hobby radio but time as in GMT/UTC. We are likely familiar with GMT Greenwich Mean Time, but UTC Universal Time Coordinated is for most practical purposes the same. Here in the UK things are relatively simple. Our Wintertime is UTC and our Summer daylight saving time is UTC plus one hour. Spring forward Fall (Autumn) back. But we can set our PC, via its clock, to Reykjavik time. This will ensure we can determine UTC anywhere at any time of the year. No need for Summer daylight saving time in Iceland. If you are operating your radio remotely from your PC and want to know UTC then listen to HF broadcast stations e.g. BBC World Service, Voice Of America & Radio Australia as they will likely announce the time on the hour and possibly during a programme. To receive some amateur radio data transmissions your PC clock needs to be accurate to within two seconds. If your PC is not equipped for the Internet, you may have to enter time manually e.g. from above broadcast stations or in the UK typically BBC Radio 4 on-the-hour signal. Local & national broadcast radio on FM is always on the same frequency and time, and it is, therefore, predictable. HF broadcast stations must change their schedule often to accommodate changes in propagation as the likely results of solar activity and changing seasons. These schedules may be listed on the Internet but are also presented in the World Radio TV Handbook which carries all you are likely to need about every radio broadcast station throughout the world. So to conclude we know that kHz represents one thousand cycles per second. But most importantly note that only lowercase 'k' is used. The upper case 'K' refers to the Kelvin standard of temperature so beware of confusion and keep to the small 'k'. Here is a calculator. Enter the city/town of your choice in the search box at the top of the page and it will display their current time further down [...]."

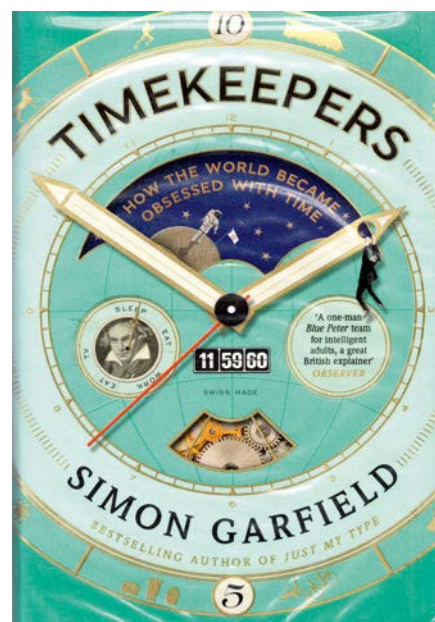
<https://tinyurl.com/yb7g44nq>

Many thanks, Bob, as you can see in this issue (pp. 28-31, to be continued in the next issue),



'time' is an endlessly fascinating topic for me. Time signal stations, on VLF, MF, and HF are still essential resources, even more so in the age of DAB. I think you'll find Simon Garfield's book *Timekeepers* very interesting, given your e-mail (see picture). The other images show a special aerial for receiving European time signals, and a screenshot of the MSF time signal at 60kHz (small 'k' noted!) from up here in Cumbria – officially the 'Northern Time Powerhouse'. The *World Radio TV Handbook* is, indeed, an excellent resource in this context, as is the *Klingenfuss Utility Guide 2019/20*, reviewed in RU recently. Look out for next month's Part Two of my article, and please do not forget to get in touch (as if you would!) with any news about time signals. Best wishes – GW.

Martin 2E0MPR recently wrote to our *Digital Radio* columnist, Kevin Ryan. Martin said, "I was interested to read that you are having a problem with installing Wavefinder. I am not familiar with the Wavefinder but I have had problems when attempting to install older software on newer PCs. I have had some success using the 'Compatibility' tab, in 'Properties'. When Windows starts to load, and it starts to moan that it's not compatible at this stage, I have right-clicked on the setup file gone to properties and then 'fiddled' (there's no other word) going through each Windows version, until I find one that works. Hope this helps."



Kevin replied, "Hi Martin, my apologies for my late reply. I tried the compatibility-mode, but it only goes back to Windows XP SP2, and I need just Windows XP compatibility; this Microsoft won't provide because the USB system had many security issues. Unfortunately, my Wavefinder has to go back into the loft. I won't get rid of it because it is a piece of DAB history and I'm a bit of a hoarder! Thanks for your feedback, and hopefully you will continue to read my column." KR/GW

Why not visit our new online bookshop at www.radioenthusiast.co.uk/store

Time Signals: Thoughts on Time, Frequency and Propagation (Part I)

Georg Wiessala

wiessala@hotmail.com

It is now a few years ago, that I first looked at time signal stations and propagation for this magazine – then as a fascinated reader (*RadioUser*, October 2012: 9-13; February 2015: 52-56).

In those earlier articles, my focus was quite narrow. I surveyed sunspots and the Magnetosphere, looked at different kinds of time (Atomic Time, TAI [*Temps Atomique International*], UTC, world time zones, time standardisation) and suggested some tools for propagation prediction, from simple grids to more sophisticated software. Following this, I discussed a number of time signals stations, from VLF to LW and HF.

Table 1 summarises different sources of time signals you may wish to try.

And there are lesser-known, coded, forms of transmission I can only touch upon, such as the METEOTIME/ METEOTEST/ DCF77 signals (Fig. 1).

<https://www.meteotime.com>

Now and Then

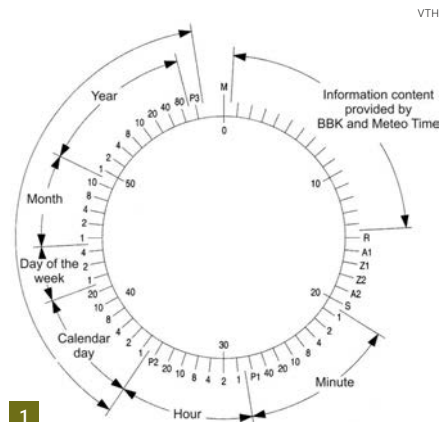
In 2012 and 2015, I also suggested some equipment to use for the reception of time signals, although, looking back at what I use now, this is definitely the area where things have moved on fastest, technologically-speaking. Software-defined technology was only just emerging then (e.g. *HDSDR*, the *RF Space SDR-IQ*, *Spectra Vue*, *COAA Radio Clock*, *Spectrum Lab*).

Many national and global time services have since disappeared, and the few books published about time signal stations (e.g. Fig. 2) are now largely of historical and technical interest only.

By contrast, the *2019/20 Guide to Utility Radio Stations* is, as always, a reliable source of updated information. At the time of writing, it still lists, for example, CHU (National Research Council of Canada, 1.155 per cent share of TAI), on 3330 (3kW), 7850 (5kW) and 14670kHz (5kW).

In addition, there are the time beacons from Russia (RWM: 4996 and 9996 kHz; 1.071 per cent of TAI), ATA (Delhi, India), BPM (Xi'an, China), HLA (Daejeon, South Korea), and some others.

The editor revisits time signals and looks at the intricate relationship between accurate timekeeping, frequency, and radio wave propagation.



The image in Fig. 3 shows an unprecedented recording of RWM on three separate frequencies, kindly sent to me by our friend and occasional contributor Nils Schiffhauer.

The list also includes PPE (Brazil) and RTA (Russia) on 10MHz (Klingenfuss, 2019/20, pp. 45, 97, 168).

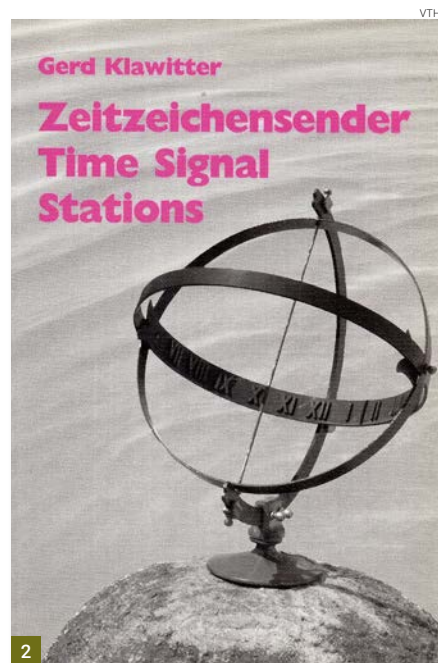
Despite recent news about future budget threats, there are still US Government-funded time beacons: WWV, WWVB and WWVH, from the National Institute of Standards and Technology (NIST), transmit on 2.5, 5, 10, 15, and 20 MHz (all with 2.5kW, except 5MHz, at 1kW). WWV recently celebrated its 100th Anniversary (Nelson, 2019). It is the oldest continually operating radio station in the United States (Reitz, 2019: 59/60).

<https://www.nist.gov>

Time's Arrow

In the history of the measurement of time, the discovery of radioactivity and radio technology are but blips – as brief as the famous *six time-pips* on the radio.

Nevertheless, this is a fascinating history which contained some of the Big Questions of the past; think of finding a date for Easter, or for determining the actual age of the Earth.



There have been both visual time signals and other measuring devices (e.g. Semaphore, The *Greenwich Time Ball*), an array of audible signals (clocks, sirens); and lately, of course, radio broadcasts (for example from the Eiffel Tower in 1922).

<https://tinyurl.com/yzsyp4bm>

One of the first links between the temporal and spacial dimensions of our lives, which most people have heard about was established by the marine chronometer of John Harrison (1693-1776). With this, time became navigation – location and latitude.

Empire, the Railways and Industrial Revolution necessitated time standardisation; for instance, spare a thought for the young Einstein, whose first job it was to synchronise the clocks of Bern in Switzerland.

Approaching our own age, the new global interconnectivity demanded time zones and time management. The 1884 *International*

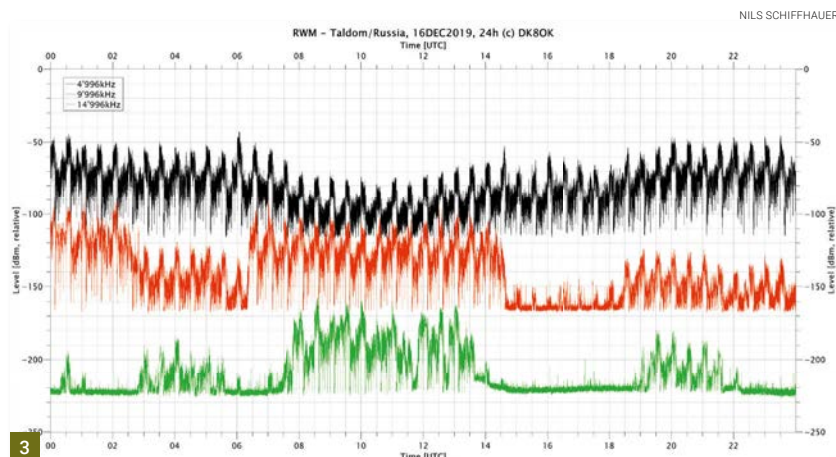


Fig. 1: The METEOR data, embedded in the time code from DCF77 (77.5kHz) (see also Fig. 10). Fig. 2: This used to be a standard reference work regarding time signal stations. Fig. 3: Time signal station TWM in Russia, recorded on three different frequencies. Fig. 4: The MFJ-890 DX Beacon Monitor. Fig. 5: The PropLab Pro HF propagation prediction suite. Fig. 6: My Lowe HF-150 HF receiver. Fig. 7: Receives from 0kHz: The AOR AR7030 HF receiver.

Meridian Conference in Washington, DC decreed Greenwich as the location of the Prime Meridian and brought GMT (recast as Universal Time (UT) in 1928).

In the 21st Century, time has been atomised – how else could it all work? GPS satellites, space probes, global financial trading, utility companies (the 50kHz mains), metrology (time measurement), geodesy, transport and navigation, telecommunications, radio astronomy – all demand über-precision, 24/7/365.

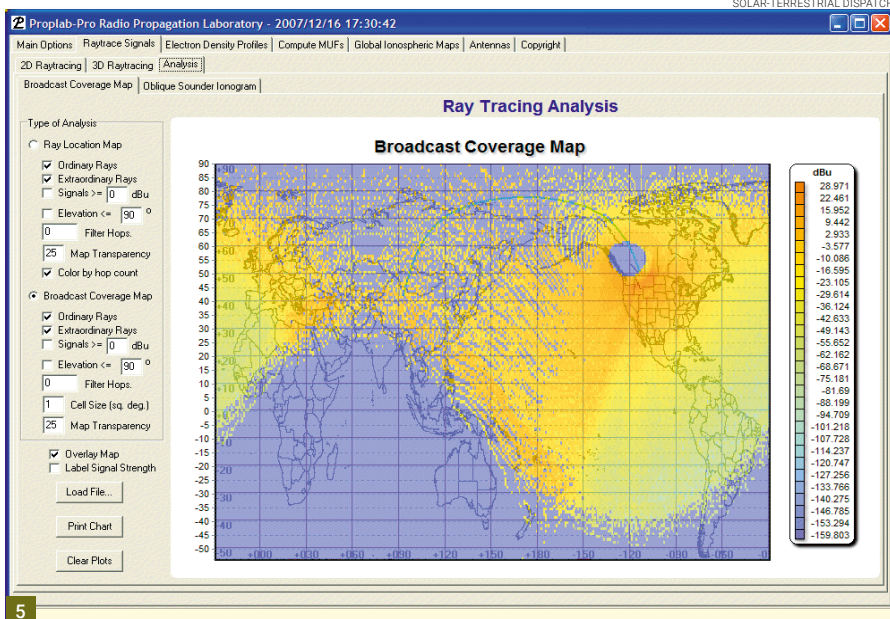
In 1967, the International Committee for Weights and Measures (CIPM) defined the second as 9,192,631,770 oscillations of an atom of caesium-133 and it is currently realised (at the NPL) to an accuracy of one second in 15 million years – using caesium beam atomic clocks.

For a History of Time (-Measurement), check out the reading list at the end of Part Two and have a listen to the episode of the *In Our Time* programme at this URL. <https://tinyurl.com/wzmtwbu>

Where Satellites Cannot Go

Against this background, it is necessary to better understand the relationship between time signals, waves, accuracy, geo-location and frequency.

Mike Goldsmith explains the basics most succinctly (2018: 3): "If we consider again a ball floating on a wave-covered sea, we will soon see that it repeats its cyclic motion



over and over again, always talking the same time to return to any selected point, such as from peak to trough, and back to peak again. This time is called the period of the wave.

It is often easier to measure the frequency of a wave, rather than its period. If a cycle has a period of one-tenth of a second, its frequency is ten cycles per second, or ten Hertz (mathematically, 'frequency' is the reciprocal of 'period'.

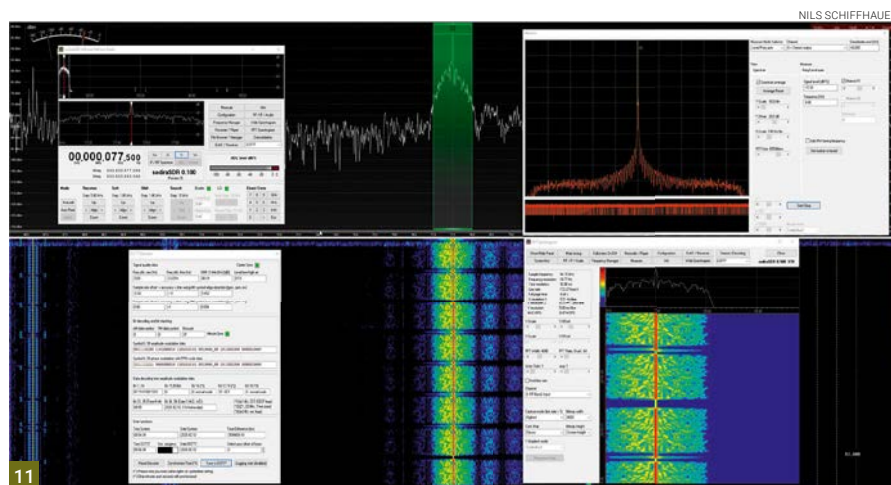
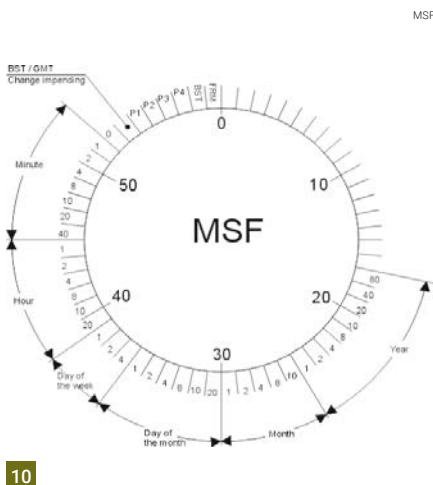
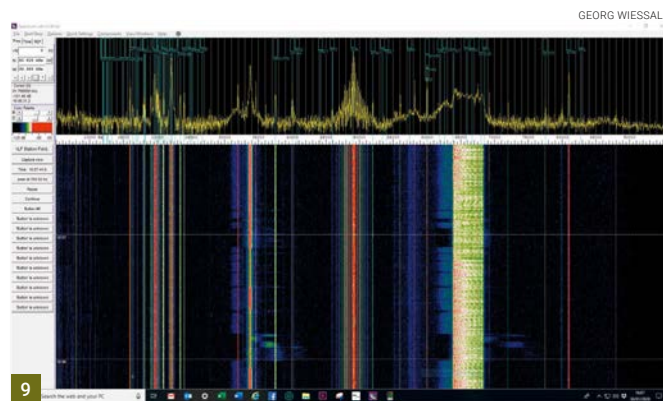
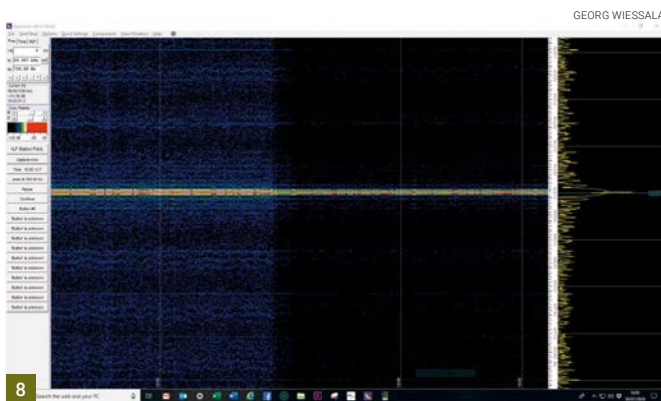
Frequency (in Hertz) is also the number of wave peaks that pass a point in a second."

Less mathematically, there is a nifty device that can help you see time and frequency in action: This is the MFJ Beacon Monitor I recently acquired, with my thanks, from Waters and Stanton (Fig. 4).

On the other end of the technology-scale, I also downloaded the new version of the PropLab Pro HF propagation prediction suite, from the Solar-Terrestrial Dispatch website (Fig. 5).

There are many other ways to visualise





and forecast propagation on HF, and numerous software tools for that purpose. However, as Ken Reitz rightly states (*The Spectrum Monitor*, November 2019: 58), “While such colourful and informative displays are no doubt useful, and certainly lend visual excitement to a radio-related website, there can be no substitute for actually listening.” Couldn’t agree more, Ken.

<https://tinyurl.com/t7bjvhs>
<http://shop.spacew.com>

Both these purchases have made me think about beacon stations, which transmit time signals, on both a continuous and permanent basis. These time signal stations have ongoing relevance for propagation prediction, and for a range of other uses, where GPS satellite signals cannot reach.

As I gaze at my Beacon Monitor, in one of its test-modes, linking up with MSJ on 60kHz, I notice that, eventually, all LEDs are flashing in synch with MSF. It is only after the synching process that I can use the device accurately, to gauge global HF propagation conditions on 14100, 18110, 21150, 24930, and 28200kHz.

More on the *International Beacon Network* and the MFJ-890 Beacon Monitor later.

In short, a time signal station, such as MSF, gives me four things – *interval-measurement, synchronicity, frequency and geographical information*, all three translating into potentially accurate propagation prediction, in conjunction with my radios (currently a Lowe HF150 – in timeless white, Fig. 6).

‘Time interval’ equals ‘frequency’, of course, and vice versa. You can see the link (Goldsmith, 2018).

Digging Out the Signals

Time signal stations have been dedicated distributors of standard time for well over 100 years.

But not all time signals are obvious, or created equal: yes, some make things flash, like the LEDs on my Beacon Clock, or they appear as traces on my waterfall diagram. Some are hidden inside other signals, as time codes; yet others are radio signals used for synchronisation by means of the comparative measurements of signal paths.

Conversely, time signals can hide other signals, such as the DCF77 bleeps, which contain both metrological (time-measurement) and meteorological (weather) data. And the ERF (*Europäische*

Fig. 8: MSF on 60kHz in a Spectrum Lab screenshot. Fig. 9: Both MSF and DCF77 appear on this wider screenshot (10-90kHz). Fig. 10: The MSF Time Signal Coding Scheme. Fig. 11: Decoding DCF77 with sodiraSDR Software Radio.

Funkrundsteuerung, EFR DCF49) system is used for radio ‘ripple control’, aimed at remotely controlling and smart metering user units within energy networks.

<https://www.efr.de>

Television signals can also bring time signals, derived from a global web of atomic clocks and rubidium oscillators.

Some Practicalities and DCF77

I know that I am just scratching the surface here, but, in the remainder of this article, I’d like to offer you some diverse ways of receiving and visualising time signals:

If you have an AOR AR7030 or Lowe HF150 HF receiver (Figs. 6 and 7), or a similar legacy-radio that goes down to VLF, you can listen to both MSF (60kHz) and DCF77 (77.5kHz) for yourself; the ‘CW’ or ‘Data’ modes work best in my experience, sometimes also ‘AM’. Hook your traditional radio up to your PC and download a piece of software like DL4YHF’s *Spectrum Lab*, or *Spectran* to visualise the signals.

Radio World e-Book



The term 'automation' has come to mean so much more in 2020. Radio World asked the sponsors of its new automation trends eBook to share their views on the state of their sector. Radio World invited respondents

to comment on what they are thinking about now and for systems in the future. How far along are the radio and audio industries in moving automation to the 'Cloud', and what are the next steps? What are the new most relevant features and capabilities that these systems are bringing to radio operations? How can you reduce your risk from ransomware? How are systems from various ecosystems working together? Will 'The Cloud' replace brick-and-mortar studios? You can read how they answered in this new Radio World e-Book.

<https://tinyurl.com/qm77f5c>

Local Radio: Past and Future

A new television documentary featuring contributions from local radio broadcasters across the UK has been broadcast on the BBC News Channel. The programme, created by BBC Solent's Richard Latto, includes rare archive, much of which hasn't been seen since its original transmission. Contributors include Johnnie Walker, Kid Jensen and Bob Harris who reflect on their opinions in 1973, in an archive piece recorded just before the start of local commercial radio in the UK. Five decades later they have a chance to reassess their previous discussion, which includes the idea that "one day there might be as many as six stations across London. There are also new interviews with Les Ross (BRMB), Martin Kelner (BBC Radio Leeds), Louise Churchill (Plymouth Sound), Tony Gillham (Black Cat Radio), Duncan Warren (Goldmine) and Chris Burns (BBC Local Radio). Producer Richard Latto says: "This isn't a definitive history of local radio, it's a flavour of local radio and a chance to reflect on how it has changed and evolved over the years. With all the recent changes, especially in the commercial sector, local radio has generated a lot of discussion from both industry insiders and listeners, who have heard it evolve at a great pace."

<https://tinyurl.com/v9bl6np>
<https://tinyurl.com/u4hb33q>

<https://tinyurl.com/qoyz333>

<https://www.qsl.net/dl4yh/>

If you use a Software-defined receiver (SDR), you can use the waterfall display to do the same. The new *SDRPlay RSPdx*, for example, can resolve VLF signals.

Alternatively, you can always use a (192kHz) sound card as a VLF receiver and feed the spectrum into *Spectrum Lab*, or a similar program.

The screenshot in Fig. 8 is of MSF on 60kHz on *Spectrum Lab*, suitably enlarged.

Furthermore, the image in Fig. 9 shows the wider VLF signal environment, from 10 to 90kHz, as received here in Lancashire. MSF and DCF77 are both visible here.

DCF77 has a 50kW long wave transmitter in Mainflingen, near Frankfurt ('F') and ranges over some 1,300 miles (2,100 kilometres). It is run by T-Systems Media Broadcast on behalf of the German *Physikalisch-Technische Bundesanstalt* (PTB). With Germany being Germany, the availability of the service is guaranteed by a piece of legislation, the Time-Law (*Zeitgesetz*).

The Mainflingen site also hosts DCF49 (100kW) on 129.1kHz.

Figs. 1 and 10 show the present time coding schemes for both the MSF and DCF77 time beacons.

The (free) software *sodiraSDR Software Radio* (v. 0.100) has a decoder for DCF77, which analyses the phase modulation of the signal (Fig. 11). You can download the decoder from here (*Vielen Dank*, once again, to Nils Schiffhauer for this information).

<https://tinyurl.com/yxd6roud>

MSF: The UK's Civil Time

In the case of MSF (60kHz), it was Rugby that was once the site of the time signal (1927-2007). Its former manager, Malcolm Hancock, has compiled the definitive history of Rugby Radio Station, from the times of GBR on 16kHz to MSF (now on 60kHz). His *The History of Rugby Radio Station* makes for a fascinating read and looks at the political and diplomatic pressures, among other things, of having an official time signal.

<http://rugbyradiostation.co.uk>

Alan Melia and Paul M. Hawkins have also written very lucidly about Rugby and its background.

Now located in Anthorn (Cumbria), after 57 years at Rugby, Babcock International operates the transmitter, under contract to the National Physical Laboratory (NPL) in Teddington.

1. Broadcast Radio (e.g. BBC LW 198kHz, Greenwich Time Signal, 'pips')
2. COAA Radio Clock
<https://www.coaa.co.uk/radioclock.htm>
3. DAB Radio
4. DCF77 (77.5kHz)
5. GBZ (19.6kHz)
6. GPS Navigation Satellites
7. Gude Expert Time Mouse
<https://tinyurl.com/wb7laxt>
8. Meinberg MSF Radio Clock
<https://tinyurl.com/ycxr3ntd>
9. MSF Cumbria (60kHz)
10. Radio Data System (RDS) in Radios
11. RWM (4996 and 9996kHz).
12. Telephone (The Speaking Clock)
13. The Network Time Protocol
14. Time Signal Stations (TSS) on short wave (WWW, WWVB and WWVH from the USA (2.5, 5, 10, 15 and 20MHz)
15. TSS on VLF (GBZ on 99.6kHz; 25kHz: RJH69, RJH77, RJH63, RJH999, RJH66, RAB99, Belarus, Russia) Kyrgyzstan)
16. TVs with Text functions and/ or Electronic Programme Guide (EPG)
17. Radio Reloj (Cuba: 570, 790, 820, 830, 850, 860, and 950 kHz (Havana), or 1020kHz
<https://tinyurl.com/ur76zgm>
18. Mobile Phones, of course.

Table 1: Many Ways of Receiving Time Signals.

<https://www.npl.co.uk>

Moreover, Anthorn also has a VLF submarine transmitter (GBZ on 19.6kHz) and an enhanced long-range navigation (e-Loran) transmitter (*Chain Lessay*, GRI 6731).

<https://www.npl.co.uk/msf-signal>

The MSF time signal represents a 1.295 per cent share in International Atomic Time (TAI), whereas DCF77 contributes 2.764 per cent (Klawitter, 2009: 30-32).

For a fun, alternative, RX method, get yourself a *Meinberg MSF Radio Clock* to resolve time signals.

<https://tinyurl.com/ycxr3ntd>

In Part Two

In the second part of this short series about time-keeping, radio and propagation, I will be looking at the NCDXF/IARU International Beacon Network and offer some hints and tips for the reception of these ppropagation-indicating beacons, including the popular FAROS software.

Suggestions for further reading and a shortlist of some relevant and informative websites will appear at the end of Part Two of this article in a future issue of RU.

Moonraker UK Limited, Cranfield Road, Woburn Sands, Bucks MK17 8UR Open Monday-Friday 9:00-5:00pm

ICOM



Icom have been building radio receivers and scanners for a variety of applications for many years, enabling professionals and Amateur enthusiasts to monitor an increasing number of broadcasts. Icom's receiver and scanner range includes models that connect to your home PC, desktop or base-station receivers,

Handheld

- IC-R6 100 kHz-1300 MHz AM/FM/WFM 13000 memory analogue scanner **£199.95**
- IC-R30 100 kHz-3300 MHz All mode professional digital scanner... **£569.95**

Base

IC-R8600 is a super wideband communication receiver that covers the radio spectrum from 10 kHz to 3 GHz. It also has the capability to decode selected digital communication signals including, D-STAR, NXDN, dPMR and P25..... **£2499.95**

Accessories

- BC-194 drop in charger for IC-R6 **£21.95**
- CP-18E cigar lighter cable **£24.95**
- CS-R6 cloning software for IC-R6 **£34.99**
- SP-27 clear acoustic earpiece **£24.95**
- BC-223 rapid charger for IC-R30 **£59.95**
- BP-287 hi capacity 3280 mAh replacement battery for IC-R30..... **£77.95**
- BP-293 dry cell case (3x AA) for IC-R30 **£35.95**
- CS-R30 programming software for IC-R30..... **£59.95**
- LC-189 soft case for IC-R30..... **£24.95**
- CS-R8600 software for IC-R8600..... **£72.95**
- RS-R8600 remote control software for IC-R8600..... **£99.95**
- RC-28 remote control system for IC-R8600 **£279.95**
- SP-38 desk top speaker for IC-R8600..... **£149.95**
- SP-39AD external speaker with DC power supply for IC-R8600 **£199.99**
- AH-8000 100-3300 MHz professional discone receiving antenna..

Uniden



Uniden is the best known manufacturer of scanner radios in the world. Under its renowned "Bearcat" brand name, Uniden scanners are at the cutting edge of design and technology. Their high-end scanner radios, while complex, are used by radio hobbyists, media, businesses and at all levels of government and their lower end versions are beautifully designed and easy-to-use

PRE-LOADED UBC-125 DELUXE AIR BAND KIT WITH ACCESSORIES JUST £199.95

Handheld

- EZI-33XLT 78-174/406-512 MHz 180 channel analogue scanner **£64.99**
- UBC-75XLT 25-512 MHz 300 channel analogue scanner... **£99.95**
- UBC-125XLT (best seller) 25-960 MHz 500 channel analogue scanner **£129.95**
- UBCD-3600XLT (NXDN Version) 25-1300 MHz Digital & Analogue scanner **£479.99**
- SDS-100 Advanced 25-1300 MHz Digital & Analogue scanner..... **£589.95**

Mobile/Base

- UCB-355CLT 25-960 MHz 300 channel analogue scanner. **£84.95**
- UBC-370CLT 25-960 MHz 500 channel analogue scanner **£119.95**
- BCT-15X GPS enabled 25-1300 MHz 9000 channel analogue scanner **£249.95**
- SDS-200E Activated DMR+NXDN+ProVoice 25-1300 MHz Digital & Analogue..... **£779.99**

Accessories

- UBCD3600XLT soft leather case **£29.95**
- UBC-125/75 soft leather case..... **£24.95**
- ARC-536 pro software for UBCD-3600XLT **£49.99**
- ARC-536 basic software for UBCD-3600XLT **£29.99**

WHISTLER



The Whistlers Scanners are USA designed and built to last - The TRX-1 & TRX-2 are our best-selling digital versions with sales 10-1 against any other brand. We have worked with Whistler to customise a UK band plan for these scanners! This ensures the radios cover UK bands in the correct steps and the correct mode. When a user does a service scan it will search in the correct steps for the selected band ensuring maximum received stations.

Handheld

- WS1010 25-512MHz 200 channel analogue scanner **£89.95**
- WS1040 25-1300 MHz storage for 1800 frequencies analogue scanner..... **£299.95**
- TRX-1E 25-1300 MHz best-selling Digital & Analogue scanner **£419.95**

Mobile/Base

- WS1025 29-512 MHz 200 channel analogue scanner **£89.99**
- WS1065 25-1300 MHz storage for 1800 frequencies analogue scanner **£279.95**
- TRX-2E 25-1300 MHz best-selling Digital & Analogue scanner **£479.95**

Accessories

- MRW-TRX3 Triple hand held replacement antenna pack to increase performance **£39.95**
- TRX-1 or TRX-2 SD Card - preprogrammed with Airband, Marine, 446, FM/DMR/NXDN/25 Repeaters + FM/DMR simplex **£19.99**

bhi Noise Cancellation Products

bhi design & manufacture a range of DSP noise cancelling products that remove unwanted background noise & interference from noisy voice & radio communication channels to leave clear speech. Aimed at a number of different radio related & voice communication markets, our products incorporate unique Digital Signal Processing technology to enable clear communications from within noisy environments.



NES10-2 MK4 Noise Eliminating Speaker replaces the MK3 version and removes unwanted background noise, hiss, hash, QRM, QRN, computer hash, plasma TV interference, white noise etc from speech, so that you can hear more clearly and listen stress free. Works across all radio bands and is also suitable for shortwave listening and for use in radio base stations. **£119.95**

DIAMOND ANTENNA

Based in Japan, Diamond Antenna manufactures a wide range of antennas and accessories for both hobby radio and commercial use. They are well known products that meet the highest standards in quality.



Scanner Antennas

- D777 is a VHF/UHF civilian and Military air band receiving antenna. It has a gain of 3.4dB on VHF (120MHz) and 5.5 dB UHF (300MHz) with a length of 1.7m and SO239 socket for easy connection **£64.99**
- D-190 is a high performance wideband discone antenna covering 100-1500 MHz including 10m RG58 terminated in PL259 **£89.99**
- D-130M is a Discone antenna with wide frequency coverage on receive 25 to 1300MHz and covers 6m (20W) and 2m (200W) when used with a transmitter. This model is supplied with 15m RG58A/U and 2 x PL259 plugs **£119.95**

FlightAware Live Flight Tracking



FlightAware has revolutionized the world of USB SDR ADS-B Receivers with the FlightAware Pro Stick and Pro Stick Plus, high-performance USB R820T2 software defined radios (SDR) with a built-in RF amp for maximum ADS-B/MLAT performance. The first of its kind, FlightAware's Pro Stick is compatible with PiAware or any other device that supports USB RTLSDR receivers, and is less expensive than any other RTLSDR USB receiver in the world. The Pro Stick Plus adds a built-in 1090 MHz bandpass filter for increased performance and range of reception in areas with moderate RF noise as is typically experienced in most urban areas.

- Flightaware Prostick Plus **£29.99**
- Flightaware Prostick **£25.00**
- FlightAware ADSB 1090MHz Band-pass SMA Filter..... **£16.99**

WE HAVE ALL BRANDS - IF WE ADVERTISE IT - WE STOCK IT
ORDERS SHIPPED SAME DAY - SAT/SUN DELIVERY JUST £10!



Airspy is a line of super popular Software-Defined Radio (SDR) receivers developed to achieve high performance at an affordable price using innovative combinations of DSP and RF techniques. The goal is to satisfy the most demanding telecommunications professionals and radio enthusiasts while being a serious alternative to both cost sensitive and higher end receivers. Airspy Radios feature world class reception quality and ease of use thanks to the tight integration with the de facto standard free SDR# software for signal acquisition, analysis and demodulation.



- HF+ Discovery 0.5kHz – 31MHz VHF 60-260MHz SDR receiver £199.95
- R2 VHF/UHF 24-1800MHz SDR receiver £209.95
- MINI VHF/UHF 24-1700MHz SDR dongle £119.95

TECSUN

Teccsun is a world famous manufacturer of AM, FM and shortwave radios. They offer a great range of portable options from just £44.95



Portable

- PL-360 This pocket world band radio, with AM & FM reception, keeps you in with the action from Long Wave , Shortwave(2.3-21.95MHz), FM (87-108MHz)..... £44.95
- PL-380 is a portable FM Stereo/LW/SW/MW DSP Receiver FM 87-108 MHz (Russia 64-108 MHz MW 531-1602kHz AM 522-1620 kHz SW 2300-21950 kHz LW153-513 kHz £44.95
- PL-606 is a DSP-based portable LW/MW/FM/SW (2.3-21.95MHz) shortwave radio..... 44.95
- PL-310ET is a portable multi band radio covering FM 76-108 AM 522-1620 kHz SW 2300-21950 kHz LW 153-513 kHz..... £49.99
- PL-680 is a fully featured world band portable radio with SSB covering FM 87-108 MHz MW 522-1620 kHz SW 1711-29999kHz LW 100-519 kHz AIR 118-137 MHz..... £149.95
- PL-880 is the flagship portable radio fitted with analogue Hi-IF circuit, multi conversion , & DSP decoding technology, which greatly enhances the sensitivity, selectivity and reduces interference from close by stations. Covering FM 87-108 MHz, SW 1.711 – 29.999 MHz, MW 522 – 1620 kHz, LW 100 – 519 kHz..... £189.95

MFJ



MFJ Enterprises, founded in 1972 by Martin F. Jue, is a manufacturer of a broad range of products for the hobby radio market. They specialise in station accessories, such as antenna tuners and antenna accessories. MFJ manufactures more amateur radio products than any other company in the world.

Receiving Products

- MFJ-1022 300 kHz – 200 MHz active antenna covers the HF to VHF bands. It easily plugs into your general coverage receiver or scanner £94.95
- MFJ-1020C 300kHz to 30 MHz tuned indoor active antenna system performs as well if not better than a long wire ten metres long. Tuned circuitry minimises intermod, improves selectivity and reduces noise. You can also use it as a tuned preselector with an external antenna £129.95
- MFJ-1024 50 kHz – 30 MHz active antenna complete with control unit, 15m coax and external antenna £197.99
- MFJ-1025 1.5-30 MHz noise canceller (alternative to the MFJ-1026) without the built-in Active Antenna. Plug your station antenna into the MFJ-1025 and your antenna system turns into a directional receiving array! £219.95
- MFJ-1026 This unit is designed to eliminate local electrical noise even before it reaches the antenna socket of the receiver – it covers 1.8-30MHz – great just to only here the wanted signal in the clear £279.95



The Bonito brand defines over 38 years of reliable software in the field of worldwide weather data reception on board and of course Ham radio. Bonito is one of the leading software manufacturers for receiving weather information via shortwave radio, such as WeatherFax, Navtex, RTTY, CW and Synop as well as Satellite Fax Images from NOAA, Goes, ESA / EUMETSAT Meteosat. As well in Ham radio Software, SDR-Receiver and active Antennas and many more ham radio and DXer products.



- Boni-Whip 20 kHz-300 MHz portable (17cm length) active wideband antenna..... £109.95
- MA305FT MegActiv 9 kHz -300 MHz portable (30cm length) active wideband antenna..... £179.95
- POLORAN 200 9kHz – 200 MHz broadband passive loop antenna..... £179.95
- GA3005 GigActiv 9 kHz–3000 MHz portable (19cm length) active wideband antenna..... £379.95
- MEGALOOP FX 9 kHz – 180 MHz indoor/outdoor flexible loop antenna..... £349.95
- MD3000X Mega Dipole 9 kHz–180 MHz active wire antenna..... £389.95

ALINCO



Alinco is a Japanese manufacturer of radio equipment, established in 1938 in Osaka, Japan and has been a trusted source for radio scanners for years.

Handheld

- DJ-X3ED 100 kHz – 1300 MHz AM/FM/WFM 700 channel analogue scanner..... £109.95
- DJ-X11E 500 kHz – 1300 MHz All mode 1200 channel analogue scanner..... £299.95

Base

- DX-R8E 150 kHz – 35 kHz all mode 600 channel receiver £469.95

Accessories

- ERW8 USB Interface cable for DJ-X11 scanner £39.95
- ESC50 soft case for DJ-X11 scanner £23.95
- EBP74 replacement 1800mAh battery for DJ-X11..... £34.95
- EDH36 spare dry cell case for DJ-x11 £17.95
- EME26 curly cord earphone £10.95
- EME6 straight cord earphone..... £10.95
- EPB54N high power battery for DJ-x3..... £29.95
- EDC105 drop in charger for DJ-X3..... £14.95
- EDC43 DC power cable for DJ-X3..... £12.95
- EDC37 12v DC cable for Alinco scanners £9.95
- EDS17 remote head fitting for DX-SR8..... £39.95
- ERW7 USB computer interface cable for DX-R8E £39.95

SDRplay

The people behind SDRplay are a small group of engineers based in the UK with strong connections to the UK Wireless Chip Industry. They have both software and hardware expertise and the RSP was designed by them here in the UK.



- RSPDUO is a dual-tuner wideband full featured 14-bit SDR which covers the entire RF spectrum from 1kHz to 2GHz giving 10MHz of spectrum visibility..... £239.99
- RSPDX covers all frequencies from 1kHz through VLF, LF, MW, HF, VHF, UHF and L-band to 2GHz, with no gaps £194.95
- RSP-1A it is a powerful wideband full featured 14-bit SDR which covers the RF spectrum from 1kHz to 2GHz. All it needs is a PC and an antenna to provide excellent communications receiver functionality..... £99.95

AOR



AOR, LTD is a renowned Japanese communications equipment manufacturer established in 1978, headquartered in Tokyo, Japan, serves the monitoring enthusiasts, communication professionals, amateur radio operators and electronics industries throughout the world

Handheld

- AR-8200MK3 super wide band 100 kHz-3000 MHz 1000 channels analogue scanner..... £459.95
- AR-8200D same as AR-8200-MKIII with the following added features. * APC025 Decoding * Voice Recording * MicroSD Card Slot * 4GB MicroSD card Included * USB Port * CTCSS built-in * Voice Inversion built-in £669.95
- AR-DV10 100 kHz-1300 MHz Digital scanner with TETRA DMR. NXDN. dPMR. APC025. D-STAR £899.95

Mobile/Base

- AR-8600 MKII 100 kHz-3000 MHz all mode analogue scanner..... £599.95
- AR-DV1 100 kHz -1300MHz Multi mode digital base scanner..... £1199.00
- AR-5700D 9 kHz – 3700 MHz Advanced digital communications receiver £4595.00

Accessories

- DA-3200 25-3000 MHz professional discone antenna £169.95
- DA-5000 700-3000 MHz professional compact discone antenna... £269.95
- LA-400 10kHz – 500 MHz Magnetic receiving loop £399.95

MOONRAKER

We were established in 1978 and are the largest manufacturer of Amateur, CB and Scanner antennas and accessories in the UK.

Scanner Antennas

SKYSCAN MOBILE is a great all-round scanning antenna, which should enhance the reception capability of any radio scanner. Each of the nest of four different length antenna that make up the Sky Scan are designed to pick up a specific frequency range, this method has proven to work extremely well and delivers great results over 25-2000 MHz £24.95



SKYSCAN DESKTOP This is the best all round wideband desktop scanner antenna on the current market. Keeping within the famous discone design but smaller for internal use has proved wonders for indoor reception. The antenna covers 25-2000 MHz and comes complete with a heavy 125mm base 4m RG58 coax and terminated in BNC ... £59.95 NOW £49.95

G.SCAN II 25-2000 MHz mobile scanner antenna with 90mm base 4m RG58 terminated in BNC £24.95

ROYAL DISCONE 2000 generally regarded as the best all round discone antenna. Not only does it cover 25-2000MHz on receive you can also transmit on 6/2/70 & 23cm £59.95

HF DISCONE Great antenna for all HF/VHF and UHF! Ideal for listeners wanting shortwave but do not have the space for a long wire. Centre radiator includes helical trapped wire encapsulated in fibreglass to receive all HF bands. Covers 0.05-2000MHz with 5 star reviews on our website £69.95

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Activism & Internet Radio (Part II)

Chrissy Brand examines programmes on a wide range of global campaigns in pursuit of social and economic injustice, citing examples and putting into context the key role of radio in this area.

Chrissy Brand
chrissylb@hotmail.co.uk

Concluding our look at how internet radio and podcasts can allow opposition and activists around the world to express their voices and mobilise support, I feel it would be healthy to look beyond the mainstream media and radio news bulletins, which seem to prefer to keep things simple with their reporting and analysis. There have been worrying patterns emerging recently, making it even more likely and necessary for campaigners and activists in the UK and beyond to create their own radio stations and podcasts as tools to get information out to the public.

This can be an effective way to 'bypass' the mainstream media, which often ignore or demonise them.

The recent *UK Counter-Terrorism Policing* document, for example, distributed to medical staff and teachers as part of anti-extremism briefings shockingly labelled anti-war, climate change and other activists as 'terrorists'.

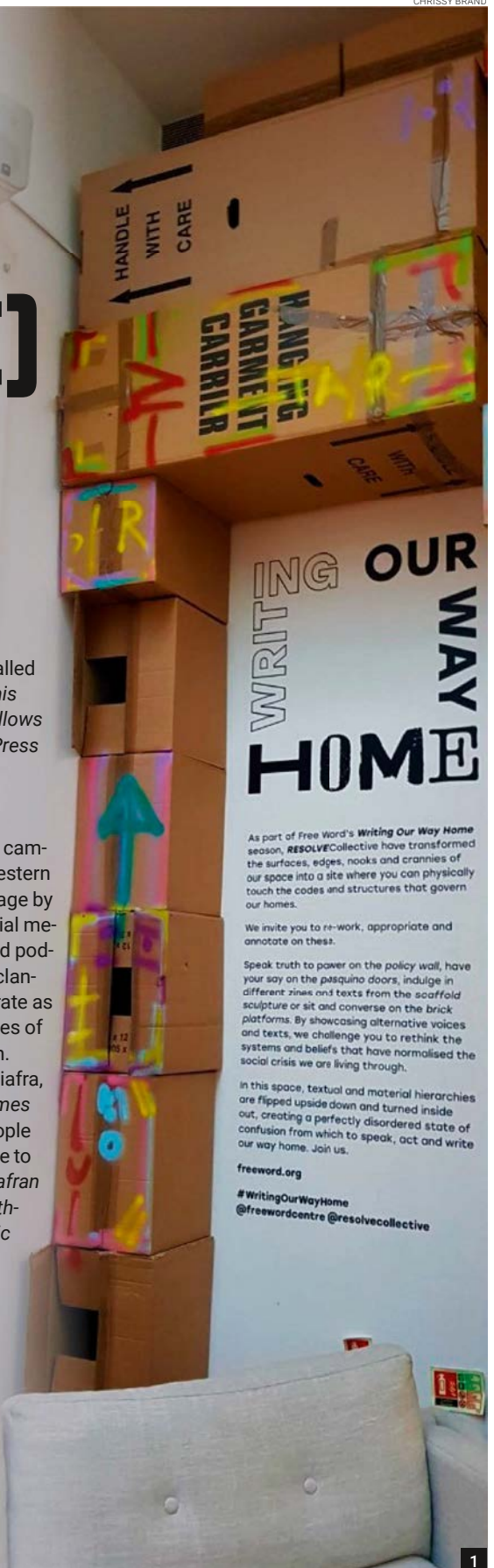
Prime Minister Johnson's banning of certain journalists from press conferences (e.g. on February 3rd 2020), is another reminder of how easily countries can easily slide from a democracy to an oppressive state, where voices of dissent against the establishment can result in harassment and censorship.

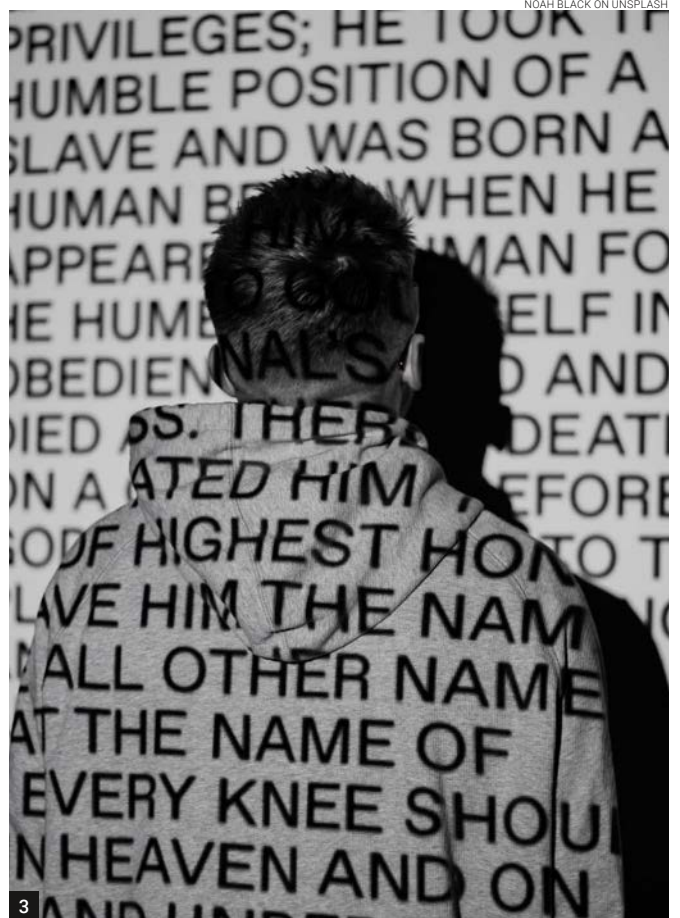
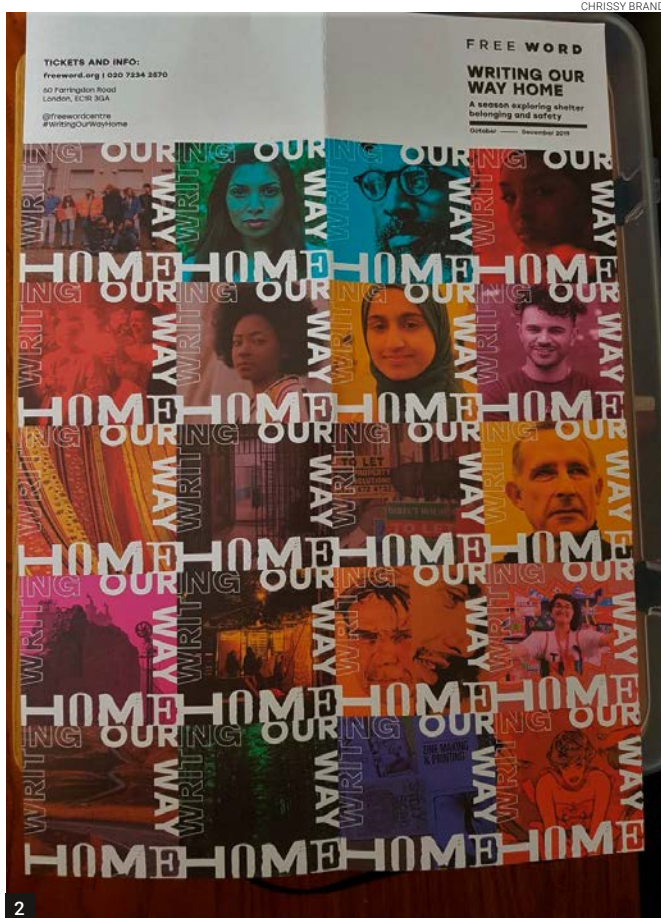
Reporters Without Borders called for, "an immediate reversal of this alarming trend before the UK follows the US further down the *World Press Freedom Index*."

Clandestine Radio

Against this background, most campaigners and activists in the western world today spread their message by means of public meetings, social media, petitions, crowdfunding and podcasts. Elsewhere in the world, clandestine radio stations still operate as a method of delivering the voices of resistance to a wide population.

A current example is Radio Biafra, in Nigeria. Last April, *The LA Times* reported on the Indigenous People of Biafra's aims and the struggle to be heard, "The supporters of Biafran independence are from the south-east, mostly from the Igbo ethnic group, which numbers about 29 million people, or about 14% of the country's population. Many Igbo people feel marginalized by the government far away in the capital, Abuja, and resent the heavy military presence in the region. In 2016, *Amnesty International* accused the Nigerian military of embarking on a 'chilling campaign of extrajudicial executions and





violence' resulting in the death of at least 150 peaceful pro-Biafra protesters over the course of a year.

"Activists say people caught listening to the station have been arrested or beaten. But many residents here say they are willing to take the risk."

A clandestine station's long term persistence can pay off. The *Voice of the Broad Masses of Eritrea*, for instance, has been broadcasting for the past 40 years, starting off as an opposition clandestine station, but becoming part of the Eritrean State Broadcasting Organisation when independence was won in 1993.

It is not just in 'distant lands' that clandestine stations operate, of course. The *Voice of Nuclear Disarmament* was a pirate station in the 1960s, with links to CND. It broadcast on the TV sound channel after the BBC had closed down, as pointed out by Mike Barraclough on *The Free Radio Forum*.

Furthermore, in 2016, there was a refugee radio station in Calais. *Jungala Radio* broadcast from a tent to the 6,000 refugees at the Calais Jungle Camp. *The Christian Science Monitor* reported that there were, "around 30 camp residents participating in Jungala Radio [...]. Relying

on a crowdfunding campaign and a growing listener base on Soundcloud and Facebook, the initiative joins a host of other refugee-run radio stations around the world working to give a voice to the voiceless and letting refugees have control over what is said about them."

The annual UNESCO World Radio Day (February 13th, see last month's *RadioUser*) is a leading example of encouraging radio (in all its forms) as a means to give minority, oppressed and lesser-heard voices a more equal say in the world, expressing wider views and celebrating our rich diversity.

Poetry as Protest

The spoken word has long been a powerful form of protest. A recent example of this was on show in December at *Free Word* in London. *Generation Rent* is a protest movement fighting against the UK housing crisis, stating that, "Priced out of their homes and unable to secure permanent housing, *Generation Rent* are unable to put down roots in their communities. Change is long overdue."

Poetry was performed live and recorded for a podcast called *With Love (And Rage)*, *Generation Rent*. "Listen

Fig. 1 *Writing Our Way Home*, at *Free Word* in London. Fig. 2: *The Free Word Writing Our Way Home* season. Fig. 3: The power of words...

back to an incendiary night of poetry and reflection from *Spread the Word Young People's Laureate Theresa Lola*, poets *Amaal Said* and *Seraphima Kennedy* and illustrator *Olivia Twist*."

<https://tinyurl.com/ujk9vwh>

Free Word is an arts organisation focused on the power and politics of words, based in Clerkenwell, London. The *Free Word* Soundcloud channel expresses its ethos and actions, in audio form (Fig. 1).

Their *Writing Our Way Home* season, which ended last December explored shelter, belonging and safety, with contributions from many big-name campaigners such as *Lowkey* and *Faiza Shaheen*, plus organisations including *Shelter*, *London Renters Union* and *Reporters Without Borders* (Fig. 2).

<https://soundcloud.com/free-word>

The Poetry Foundation's *Poetry Off the Shelf* is a podcast in which producer *Helena de Groot* explores the diverse world of contemporary poetry, and where nothing is off-limits. On February 4th, *Jericho Brown*

Further Resources

Revolt on the Air, Radio

Activism and French Politics

<https://tinyurl.com/u4evpe8>

BBC Radio 1Xtra Talks, Should We

All Be Activists?

<https://tinyurl.com/rneb568>

Low Power to the People - Pirates, Protest,

and Politics in FM Radio Activism

By Christina Dunbar-Hester

<https://tinyurl.com/yy9jgncl>

Twitter or Radio Revolutions. The Central

Role of Açık Radyo in the Gezi Protests of

2013 By Tiziano Bonini

<https://tinyurl.com/vxyrfh3>

Activist Radio, The Progressive

Podcast Network

<https://tinyurl.com/t2dx4b3>

Protesting Through Poetry, NPR

Morning Edition

<https://tinyurl.com/wz4w83t>

UMFM (CJUM) University of Manitoba,

Vegan Activist Radio

<https://tinyurl.com/tz7ze8x>

Radio Events

March 27th

Young Audio Awards, London

March 29th to 31st

Radiodays Europe, Lisbon, Portugal

April 15th to 17th

Student Radio Conference, Salford.

talked about making rebellious art in *The Truth Sometimes Rhymes*.

Also in the USA and part of *The Poetry Foundation*, American Public Media's *The Slowdown* offers a different way to see the world. Tracy K Smith, US Poet Laureate from 2017 to 2019, presents a short poetry programme every weekday. The podcast is beautifully produced with a gentle sound bed and thought-provoking messages. On February 4th, poet Jenny Xie presented the show and reflected on her Mandarin roots, growing up in immigrant enclaves in central New Jersey, with an experience of 'doubleness'. (Fig. 3)

<https://tinyurl.com/wllmuww>

www.slowdownshow.org

EU Euphoria

There are hundreds of thousands, if not millions, of activists now trying to get the UK to rejoin the EU. There is also a cam-

paigned by *Stay Europe*, for individual membership of the EU, which had garnered over 100,000 signatories in February. Despite the Downing Street directive to ban foreign office staff from using the terms 'Brexit', 'No Deal' and 'Implementation Period' (*The Guardian*, February 4th), the dispute, divide and the terminology are not going away.

Anyone who thought simply signing a document to leave in January 31st meant the end of the matter, is in for a shock. A number of podcasts reflect the remain sentiment and similar campaigns. *Remain and Reform* is run by socialist Labour activists, while Dr Michaela Benson hosts the *Brexit Brits Abroad* podcast and has also appeared on Talk Radio Europe. She is part of the biggest research team looking at how expats are reacting to Brexit. *The New European Brexit Podcast* is another but the most well-known is probably *Another Europe Is Possible*.

There have been more than 50 editions of the *Another Europe Is Possible* podcasts (Fig. 4). The most recent one I heard discussed the existential crisis facing Ulster unionism. "*Brexit has been a rough ride for the people of Northern Ireland. Having never voted to leave the EU, it felt like a colonial act of English nationalism. But it also has created a new spirit of hope that the north of Ireland's deep sectarian divisions might be overcome. Whereas the English left were thrown into mourning the day after the general election, in Northern Ireland, much like Scotland, there was a different atmosphere. A historic breakthrough for the cross-community Alliance Party, winning 17% of the vote, was matched by Unionist parties returning fewer seats than the Nationalist parties for the first time ever.*"

<https://tinyurl.com/rkzken4>

<https://brexitbritsabroad.org/podcast>

www.anothereurope.org/podcast

On the day that the UK left the EU, *RadioUser* reader, Edmund Spicer M0MNG, recorded some radio output from his collection and edited them together as a YouTube video. It makes for a fascinating twenty minutes covering EU moments from 1973 to 2020.

<https://tinyurl.com/rkzken4>

Black Lives Matter

Many issues, such as racism, highlighted by the *Black Lives Matter* movement in the USA, tend to move from initial grassroots activism into more widely conveyed messages (Fig. 5).

It is not just about protests on the streets, positive as they can be. Broadening the

message, so that it is discussed by as many people as possible, is a key objective. At the *Werk It Women's Podcast Festival* in LA last year, many women of colour spoke about their podcasts, which were affirmative positive examples of how to challenge racism. On *Truth Be Told* on station KQED, Tonya Mosley answers listeners' questions on what it means to, "*not just survive, but thrive, as a person of color in our country*".

Brooklyn Radio is another example of the wider processes of awareness-raising. The station began in 2006 and showcases an eclectic music mix. It also dips a toe into social matters.

www.mixcloud.com/brooklynradio

<https://tinyurl.com/ve48a2p>

Mainstream radio can also be valuable of course. *Code Switch* (on NPR) is presented by journalists of colour and addresses those conversations about race and identity where people sometimes get stuck.

Continuing Campaigns with Radio

The anti-fracking campaigns that have sprung up in recent years have won some notable victories, through protests and sit-ins. Sharing information about the earthquakes and pollution caused by fracking has raised awareness and increased activism amongst the general public. From Lancashire to Colorado, the fracking industry is being exposed, thanks to tireless work by activist volunteers and community groups from all walks of life.

Unsurprisingly, radio coverage and podcasts have helped build the movement. In the USA, *Frack You Very Much* combines music with environmental and health experts to discuss developments. A recent podcast consisted of readings from the *Sixth Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction)*, by Concerned Health Professionals of New York and *Physicians for Social Responsibility*.

www.frackyouverymuch.com

The Fully Charged Show is a UK based podcast covering a wide range of interesting and pertinent developments. These include electric vehicles in motorsport, solar panels, fracking and building a zero-carbon energy system.

In a similar vein, *Maddie Goes Electric* follows Maddie as she tries out an electric car and investigates clean energy suppliers.

<https://fullycharged.show/podcasts>

www.youtube.com/user/fullychargedshow

The anti-arms trade and anti-war move-



Fig. 4: Another Europe is Possible protests during September's unlawful proroguing of Parliament.
Fig. 5: The USA Black Lives Matter movement generates many radio and podcast programmes.

ments consist of many groups and organisations all over the UK, indeed globally, For further insight into these activities, university lecturers and other experts are a worthy source.

There is much to be found and heard online, from a 2011 Oxford University presentation of the effect of the arms trade in Africa to a 2019 *Warrior Nation Forces Watch* programme where, "In the wake of the Court of Appeal ruling that UK arms sales to Saudi Arabia are illegal given war crimes in Yemen, we talk to expert Andrew Feinstein about his life exposing the global sale of arms. We pull apart the nature of this trade, discuss some little-known facts about it and consider how it is perceived and portrayed in British society."

<https://tinyurl.com/usgofmn>
www.buzzsprout.com/374801/1312504

The list of injustices is, sadly, endless, so it cannot be covered fully in these pages. However, a search on social media and your preferred podcast app will unearth many campaigns to support and activists to link up with.

At the very least, it will enable people to stay informed, from the grassroots perspective – a view which is widely ignored in the mainstream media.

Just a few of the campaigns and organisations hitting the alternative headlines at present, and which can be followed on podcasts and internet radio stations, include the following: Extinction Rebellion, People's Assembly Against Austerity,



Campaign Against the Arms Trade, and Hunt Saboteurs.

There are also radio-assisted campaigns on anti-plastic, anti-flights, slave labour and fashion, movements to free Julian Assange and Chelsea Manning, the Palestinian Solidarity Campaign, and initiatives regarding veganism and animal rights. Last but not least, there are campaigns on Justice for Grenfell, LGBTQIA issues, the Republic campaign to abolish the monarchy, and in regard to indigenous rights, such as in the case of the Maori in New Zealand.

Concluding Thoughts

What I have highlighted in the course of this two-part article illustrates how, through podcasts and internet radio the 99%, can

fight back against the 1%, raising awareness and defeating global injustices, making the world a better place.

It seems to me that a positive next step would be for a web portal and a radio show to promote all of these regional, national and international campaigns. A radio show, perhaps on a community station, as well as a podcast, with spoken word, music and interviews could be entertaining, diverse and educational.

Maybe, one day, I might be given an opportunity to do this!

[Anyone reading this and thinking along similar lines should contact Chrissy Brand directly, or get in touch with the editor. The views expressed in this article are those of the author – Ed.]

Times Radio, RAJAR News, and DRM in the USA

Kevin Ryan

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Kevin Ryan introduces Times Radio, analyses the most recent RAJAR figures, and shares the very latest DAB, DRM and HDRadio news from across the globe.

A new, ad-free, digital radio station focusing on current affairs is on the way this spring. It might actually be on the air by the time you read this edition of *RadioUser*.

Times Radio is an extension of The Times newspaper and is developed in cooperation with the Wireless Group, also owned by News Corps UK.

News Corps UK already owns talkRADIO that I believe is yet to make a profit, so it was at risk of being absorbed into the new radio station. I would be sorry to lose talkRADIO because I particularly enjoy the breakfast show and the late-night Sunday show called *The Unexplained*.

There are strong indications that both stations will operate in parallel because they will serve different audiences. Thus, talkRADIO is going head-to-head mainly with LBC, rather than LBC News. Moreover, talkRADIO attracts around 433,000 listeners a week, while LBC's audience has grown to reach 2.72 million.

The LBC network has two stations, and I don't know exactly how many listeners LBC News contributes to the overall figures. Using some of the other charts, I estimate that LBC has about 1.9 million listeners, giving talkRADIO quite a challenge.

Times Radio is to be a direct competitor to BBC Radio 4. Listeners can expect them to have an equivalent to the *Today* and *PM* programmes. The station will broadcast nationally on DAB and online. The two national multiplexes have no obvious space, but I can see a way to fit Times Radio in.

The talkRADIO station is on the SDL multiplex in mono DAB (64kbps) and broadcasting the two stations in DAB+ would use the same data capacity.

Times Radio will be free of advertising breaks, but the station is looking for sponsors for some of their programmes.



The schedule hasn't been announced. Nevertheless, it is safe to assume that there will be news, analysis and commentary. The Times produces several podcasts now (Fig. 1) and I'm sure they will feature on the new station. There is a selection on their website.

<https://tinyurl.com/uxvvcnv>

More UK DAB

For some reason – possibly to offset the closure of some of their medium wave transmitters – talkSPORT is back on the Aberdeen and Central Scotland multiplexes. The Ofcom notice for February reversed the removal of the station from the same two multiplexes issued in January.

Ofcom lists it as talkSPORT (Scotland) with opt-outs for local opt-outs for adverts. As far as I'm aware, there aren't any opt-outs for commentary on Scottish Football. However, broadcasting the same content via both the D1 national multiplex and the two local multiplexes doesn't make sense

and could be a temporary thing.

Virgin Radio Grove is now available via the Ayr local multiplex.

My local multiplex, Berkshire and North Hampshire has a new service called Radio 210 (Fig. 2), the original name for our local commercial station from way back. It is operated by Glow Broadcasting and plays music from the 80s and 90s.

The station was in 'test-mode' when I checked this in early February.

<https://www.radio210.com>

DRM in the USA

I find this a strange move by the DRM consortium but maybe it is trying to capitalise on the dissatisfaction with HD Radio on AM. DRM is allowed in the USA on the HF bands as we know from the ongoing tests by WINB and KTWR in that mode.

The relevant submission said, "[...] while you (The FCC) are recommending now pure digital HD, based on the NAB tests and WWFD's (not completely convincing) trial, we would urge the FCC to consider opening the straightjacket of 2002 and allow DRM to be used as a sure, tested, efficient way of digitizing the AM band. Therefore, we urge the FCC to take a wide view and consider all options including DRM, if AM is worth future-proofing in the USA."

The proposal from the DRM consortium lists the advantages of DRM over analogue AM radio but doesn't really compare DRM against the all-digital mode in HD Radio.

I've dropped some of the more dubious claims on interference rejection and fading and features that are also possible in HDRadio.

Some of the advantages of DRM over HDRadio are that it can broadcast stereo and 5.1 surround sound, different types of multimedia content including small-scale video, an Electronic Programme Guide (EPG) showing what's on now and next. Users can schedule recordings and access a slideshow from the EPG.

Of course, there is also the *Journaline* advanced text application to provide news and something called 'geo-awareness', allowing targeted advertising. However, many of those advantages come crashing down because there aren't really any DRM



4

Fig. 1: The Times newspaper produces several podcasts.

Fig. 2: Radio 210 was the name of the first Independent Local Radio (ILR) station.

Fig. 3: The CSA interactive map does not contain any multiplex information.

Fig. 4: A HiFi separate with digital radio is rare these days. There is also a CD version.

capable receivers in the market.

HD Radio was trying to make inroads into the DRM space in India because those driving this initiative reckoned that the car radios could be easily enabled to receive HD Radio. Perhaps the reverse is true in the USA, and their car radios can be easily enabled for DRM?

I don't know for sure, but I think that the FCC will reject this proposal.

While refreshing my knowledge of HDRadio, it struck me that I couldn't find any reference to it broadcasting in stereo. I didn't expect to find it for AM, but surely stereo audio is a must for FM.

Here are some links to the relevant documents I have just discussed.

<https://tinyurl.com/r8hls0y>
<https://tinyurl.com/wdyxwo>

All-Digital AM USA

The comments are rolling in on the proposal to allow stations on the AM band to operate the all-digital mode, instead of the hybrid one. I think that the AM station owners are in favour of this relaxation of the rules, while avid AM listeners are against it. In a country where the radio is all commercial, stations that go all-digital will either thrive or go out of business. Provided interference issues are managed I can't see any reason to block the proposal.

RAJAR UK

There are some interesting facts in the latest figures published by RAJAR. A DAB radio is now fitted in 95% of new cars and 64% of commercial vehicles. However, there was no increase above 65% from 2018 in the number of homes that own a DAB radio. 58.5% of listening

is now digital and DAB accounts for 41%, DTV 5% and online/apps the remaining 12.5%. With the ownership of DAB radios static, it will be interesting to see if digital listening will plateau as well. Check out the latest RAJAR figures and their amazing infographics here:

<https://www.rajar.co.uk>

France DAB+

There is an interactive map on the *Conseil supérieur de l'audiovisuel* (CSA, France's Ofcom) website (Fig. 3).

<https://www.csa.fr>

I had hoped that this would help me identify DAB multiplexes when there is a lift in propagation, but unfortunately, it mainly shows just coverage. You can drill down to individual towns to get a list of stations available. Sadly, there is no multiplex information. Nevertheless, it provides a useful reference to DAB expansion in France.

<https://www.csa.fr/Ma-radio-DAB-Plus>

Irish DAB Pirates

Legally these are pirate multiplexes in that they are not authorized by the Broadcast Authority of Ireland (BAI).

<https://www.bai.ie/en>

According to the FreeDAB website, there are multiplexes on-air in Cork, Donegal, Dublin, Dundalk, Sligo and Waterford. There is an experimental portal online, which their support team probably uses to monitor their transmitters. The portal does not include Waterford, even though it is on the air.

<https://tinyurl.com/rhh6ggr>

The multiplexes typically use 100W and broadcast on channel 5A. I think Cork may be running a couple of transmitters in a Single Frequency Network. They have a Facebook page where they post information on new multiplex launches.

<https://tinyurl.com/wrzjgkq>

dB Digital Ireland

FreeDAB is certainly sparking interest in DAB broadcasting. More quietly a company

called dB Digital is calling for expressions of interest from stations who want to broadcast to the main cities (Dublin, Cork, Limerick, Waterford and Galway) and the Dublin commuter belt. This development is authorized by the BAI.

The multiplex plans to carry just ten stations in both DAB and DAB+ and hopes that the limit will encourage stations to join, at the expense of their competitors. DAB radios will be mandatory in all new cars by the end of this year. The latest research shows that 20% of households own a DAB radio.

<http://dbdb.ie/multiplex>

France DAB+ Overseas

Like the UK, France has overseas territories, the so-called 'DOM-TOMS' (*Départements d'outre-mer, Territoires d'outre-mer*). The French have a plan to deploy DAB+ services over the next three years. The number of multiplexes will be determined by the current number of FM services.

Guadeloupe, Martinique, Mayotte and Réunion will get up to two national multiplexes, or a single national one and a number of regional ones.

Guyana is to have two local multiplexes in the cities of Cayenne and Kourou and possibly some regional ones. The same plan is envisaged for French Polynesia. New Caledonia and a handful of other islands will have a single multiplex. Test transmission may happen before regular services begin.

The regions are on the CSA interactive map but there is little information other than this is out for public consultation.

Technisat HiFi Separate

I was always pleased with my Technisat Multiradio DRM receiver, and now they are one of the few manufacturers to produce a hi-fi separate with phone audio connectors on the rear.

The Digital Radio 143 CD (Fig. 4) provides has a variety of radio, music and streaming functions. The tuner covers VHF (with RDS) DAB+ and internet radio, via Wi-Fi or

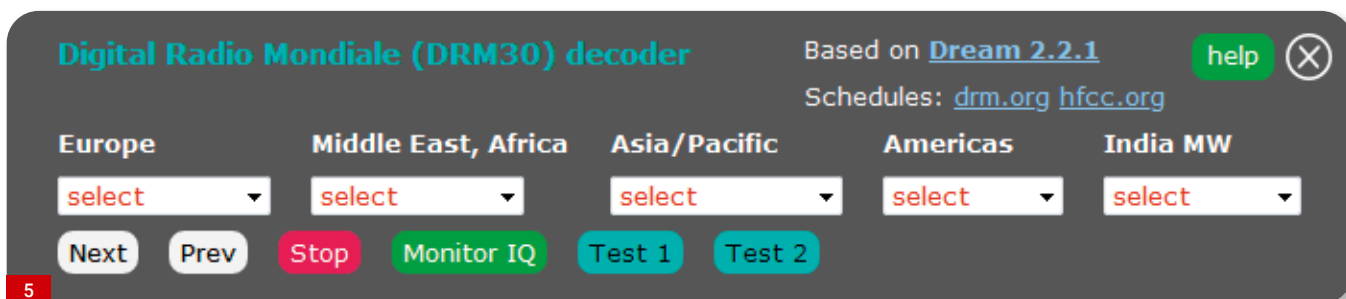


Fig. 5: This DRM extension has a few minor improvements but major updates will be needed for *Journaline* and image/file decoding.

Fig. 6: This dual-channel test carried Radio Marti in Spanish and the Voice of America in English.

Ethernet. The integrated CD player also reads MP3 files.

The CD version of the unit costs €229 direct (plus shipping) from Technisat.

The manual and some data sheets can be found on the website.

<https://www.technisat.com/en>

KTWR DRM Tests

KTWR in Guam started another series of DRM tests at the end of January 2020. There is a single broadcast on a Wednesday at 1026 to 1056 UTC on 9910kHz, aimed at Japan, Korea and China. I guess they are disappointed with the response from other areas and that most of the responses are from hobbyists. I picked up the broadcast using the KiwiSDR in Nanning in China.

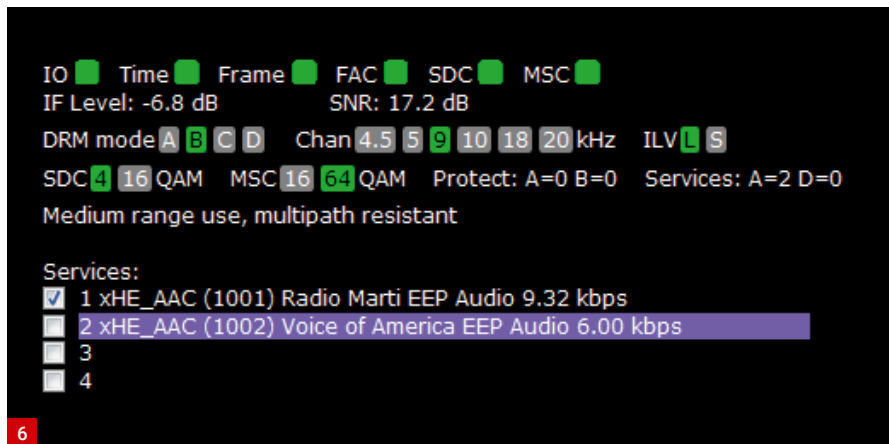
The DRM extension is very stable now, and I look forward to the developments that will add *Journaline* and the MOT slideshow decoding. There are two new buttons on the lower control panel (Fig. 5). One of them is to start/stop the DRM decoding, and the other one lets you monitor the I/Q signal.

DRM has a rhythm; you can often detect interference that is not obvious from the decoded audio.

A20 Broadcasting Season

The new short wave broadcast season for the period March to October 2020 starts as this edition of *RadioUser* reaches the newsstands. The details should be on the HFCC website, and DRM transmissions have an N (for *numérique*) in the listing, in the *A20all00.txt* file (in the zip file *a20all00.zip*).

<http://www.hfcc.org/data/a20>



BES Expo 2020

The Broadcast Engineering Society (BES) of India holds their annual conference each February, and DRM plays a significant part in the meeting. There is a promise of new receivers. Gopell Digital Technologies will be expected to give us more details on the GR-22 receiver, which they announced at the IBC last September. Innot Technologies may have something new to share, although the focus of the meeting this year seems to be on DRM+ used on FM broadcasting.

<https://www.besindia.co.in>

AIR Pure DRM

All India Radio increased the number of hours they allow its medium wave transmitters to use the *pure* DRM mode, rather than the *hybrid* AM/DRM mode. The new hours are 0330-0530 UTC and 0930-1230 UTC.

DRM from Greenville

Greenville is an iconic short wave station that now broadcasts Radio Marti to Cuba and several programme segments to Africa. I logged them in DRM mode (Fig. 6) on the 5th of February on 7345kHz, via a KiwiSDR in the Caribbean. It was

broadcasting Radio Marti in Spanish and the Voice of America in English, using xHE-AAC. The schedule is 1700 to 0200 and I didn't get a strong enough signal until 2100 UTC.

Operators have re-purposed an old Continental 617-A 50 kW ISB (independent Sideband) transmitter that puts out about 5kW in the DRM mode. The transmission is beamed at 174°. Various modes are planned to be tried. I am not sure how long the tests will last, and whether this is another of the various projects the engineering team at Greenville start from time to time.

A Cheap DRM Module

A technology company in Cambridge, England reckons it can produce a receiver module for US\$10, which is able to receive and (I hope) decode DRM. Prototypes will be available this year. It is good news that DRM is getting known outside of Asia, and this is a very low price. However, who will make an actual radio? There are a handful of modules and chipsets on the market, but radio manufacturers are not rushing receivers to market.

All available information can be found on the Cambridge Consultants website.

HAVE YOU TRIED THE DIGITAL EDITION?



Radio Network: A Family within the Hobby

Chris Rolinson talks channel customisation and introduces Radio Network, another successful group of Network Radio channel users, run by Sarah Hynes.

Chris Rolinson
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It is noticeable that some of the larger players in the mobile phone scene are beginning to take on board the concept of PTT for some of their devices.

Samsung recently announced the Galaxy XCover Pro – this is designed for what they call ‘frontline workers’ in industry. Being a highly rugged device built to military specifications, it builds on the Galaxy brand of premium features but with the ability to use bespoke software for industrial use, if indeed that is required.

Since Microsoft Teams has recently announced Walkie Talkie capability, this device takes advantage of that. In a first for

Samsung, the XCover Pro has that all-important dedicated Push-to-Talk (PTT) button (Fig. 1). Expect UK pricing to be around or just below £500. More information here...

<https://tinyurl.com/t9f9pk3>

Channel Proliferation

In my December 2019 column (*RadioUser*, December 2019: 28-30), I shared a few thoughts about channel creation and fragmentation in the network radio hobby. I pointed out then that the numbers seemingly declining on larger channels is to some extent in the nature of the beast; once people find out what the NR systems can do, there is an inevitable tendency for people to then create their own channel suites that are more specific to their radio ‘needs’.

As a result, we have seen such innova-

tions as 4x4 Rescue suites (sometimes quite local, geographically-speaking), Radio Club suites, *Scoutsnet* (for Scouting usage), RF cross-linked suites for radio hams like the Southern Ireland Repeater Network, and so on. The great news is that people continue to innovate, develop and use software like *Zello* in highly creative ways.

However this month I want to take a look at one group of NR channels on *Zello* doing things differently yet again. And in this case, their suite of channels almost created itself!

The Radio Network

I recently got to spend a little time with Sarah Hynes (Fig. 2) who lives in Mid-Wales with her husband Stephen. Many will already know Sarah’s distinctive Scouse accent and her sense of fun. It gave me the

Sign up to our FREE email newsletter at www.radioenthusiast.co.uk

opportunity to ask her about the suite of channels she is closely involved with and how things have evolved for them.

'Radio Network' began life as a private channel just for Sarah and her husband – it was in order for them to keep more closely in touch while Sarah spends time in hospital – Sarah has a few health issues and sadly spends more time in hospital than anyone should reasonably have to.

Due to the nature of her illnesses, Sarah's memory is sometimes affected and so the name Radio Network was chosen as it was simply 'Network Radio' backwards and would be easy for Sarah to remember in a moment of 'brain-fog'.

Gaining Confidence

Sarah got interested in NR via her husband – Stephen is more interested in the radio side of things, and CB had been a common interest for them both for many years.

What attracted Sarah was the way in which people could talk about anything they wished. At first, she was somewhat shy and hesitant about using the systems that were available in the earlier days – most were frequented by radio amateurs who seemed to want to talk more about technical stuff, whereas Sarah just wanted to chat about everyday things.

She then got involved in a ladies-only channel, which she tells me gave her more self-assurance to talk more freely and to also speak with gentlemen without feeling they might 'come on' to her.

I think it is easy to forget that the male-dominated nature of the radio hobby makes it difficult for a lot of ladies to feel 'comfortable' on air. It took a while but she learned some of the radio protocols and once more gained in confidence.

Sarah learned that actually, not everyone who seems to be a technical expert on radio perhaps is as much of one as they might think! But in return, she also introduced a lot of the men on the channel to talking about things *other* than radio, so it worked as a *quid pro quo*.

Sadly, for various reasons, Sarah found herself isolated from the channel group she had been using and retreated back onto her private channel with Stephen. However, she started getting messages from people asking where she had disappeared to and could they have a place where they could continue to talk and keep in touch with her?

Since 'Radio Network' already existed as a channel, Sarah invited her new NR friends to join that and sure enough, they joined in. That initially made a group of about eight



people, but the channel continued to grow and attracted like-minded people who enjoyed chatting first and technical things second. Over time, this developed into a family-friendly way of working, and numbers were exceeding the 100-mark.

The Current Setup

Today this has evolved into 6 channels – Radio Network 1 to 4, the RN 'Home' Channel, and the CW Channel.

The four chat channels are for general use, and people call on any one of them for a natter.

The Home Channel is used for their special evenings, more of which in a moment, while the CW channel is frequented just occasionally by those who still enjoy Morse Code as a means of communication.

Fig. 1: The Samsung Galaxy XCover Pro.

Fig.2: Sarah Hynes of Radio Network.

Strong on the Social Side

Sarah used to work in the entertainment side of the pub trade and has put her social skills to good use on the channels. A regular Saturday Night on-air quiz was introduced on the Home channel and inevitably attracted more members. Prizes have even been donated by Chris Taylor at Moonraker. <https://www.moonraker.eu>

There is, it appears, a friendly but fierce competition to win them.

Sarah tells me that channel users love the quizzes – to the extent they now do a large version that lasts about 2 months in a 'knockout' format, whittling people down until they have a winner. Quizzes come in

various formats too – some have been done ‘Family Fortunes’ style and Sarah is always open to innovation.

Last year, a user by the name of ‘Scottish Pete’ won an Inrico T199 hand portable Network Radio; and, prior to last year’s Hamfest another user, ‘Galloping Major’, won an Inrico TM-8 Mobile, both again prizes donated by Moonraker (Fig. 3).

The group also has printed ‘Radio Network’ T-shirts and gives those away as quiz prizes - you may well see people adorned with them at the various Hamfests across the year (Figs. 3-5).

Philosophy

The thinking behind the RN channels is based on the nature of the conversations people have. Because people talk less about technical hobby issues and more about themselves, it makes for a more intensely personal experience. People get more involved in each other’s lives, as Sarah pointed out:

“We are like a family really - we know a lot about each other! We have a very good group of people. We call each other family and friends - we work together to help each other out. Rather like the old days of CB in the 1970s and 1980s, if someone is ill, we help if we can - we have even helped to get someone into a hospital when one of our users fell ill and another user lived nearby and was able to go round and help call for the ambulance. I think we are what CB should have been, but without the nastiness...”

They are also open to using other forms of social media alongside Zello, but it is kept under tighter moderation: Sarah adds, *“We have a Facebook group - only I post there, but anyone can comment - that helps keep the FB nastiness away. That’s been going for a year now and we have not had nasty comments at all. People really respect the wishes of the channel and the way its run. Same with the FB group.”*

Moderation

Moderation inevitably is key to the success of the suite. Sarah says that everyone is asked to self-moderate, as they don’t really want to have too many mods, though there is an understanding that there has to be some.

There are currently 8 moderators. They can mute people and can revoke trusted status but Sarah is the only person who can ultimately remove someone from the channels. She explained, *“It just means any blame comes to me - people cannot blame the mods. If someone is reprimanded, they*

Fig. 3: Chris Taylor presents quiz prizes to RN winners. Fig. 4: Some of the Radio Network Ladies at the last Newark National Hamfest. Fig. 5: The RN T-Shirts on display in Public.

are given a message similar to ‘you are muted until you can speak to Sarah’ and I make any decisions that need making. I take the responsibility - I’ve never had any nasty come-back and to be honest, we rarely have to remove people.”

“There was one person I did remove recently - he used a few nasty words about blind people - he claimed it was a joke but he had been warned earlier. On the channels, we may have people with illnesses and mental issues. Others might have, for example, Asperger’s Syndrome, maybe physical issues, some are visually impaired - so we are very sensitive to discrimination of any sort - jokes like that are in poor taste! Bizarrely this person actually worked in the disability arena too - you couldn’t make it up!”

A Positive Gender Balance

Of the 8 mods, interestingly 6 are married couples and there is a good ratio of women to men generally on the suite (Fig. 5).

“We have tried to keep a gender balance but we actually joke that the women run the channels! There are about 10 ladies - maybe more? Some of us are VERY active talkers! Without sounding weird, the men seem to love it! Not in a flirtatious way... They also like the general chat - the men actually now feel comfortable that they don’t have to talk technical but can just talk like human beings!”

There are a lot of Hams on the suite nonetheless – Sarah estimates it is about 50/50 Hams to non-Hams - but they don’t use amateur protocols or even callsigns. Instead, they simply use names or nicknames – members can have an RN number if they wish, but people generally don’t use them.

Hard Work?

I had to ask Sarah if she felt any pressure in running all of this. She said, *“Not really - I don’t have a lot to do – for the quizzes, I get sent questions by some friends who are regular pub quiz types. Being the channel owner, even when I was ill and off for a month or so, the channels ran absolutely fine without me - the other mods just ran with it. I only had to come on once to deal with an issue.”*

Plans for the Future?

Sarah already arranges social meet-ups and meals together for users. At the National Hamfest last year, 18 RN folk met up to go out for a meal on the Saturday evening. In



December, they met up at a central venue for a Christmas dinner. Last summer, Sarah and Stephen hosted a Barbecue, which attracted users from around the country from as far away as Leeds.

This year they hope to do a day trip to Blackpool pleasure beach and there is now talk of users going on holiday together somewhere in the UK, possibly at a holiday park. Clearly, the RN Network is not like an ordinary channel suite!

I will leave the final word to Sarah though... *“It’s not quite like traditional radio really - we talk about everything and we try to care about each other as a family would.”*

My thanks to Sarah for her time in meeting up to chat about Radio Network.

Bye for Now

And that’s it for April – please keep in touch and let me know of any innovations going on in your corner of the Networking world. It’s always great to hear from you.

Dancing Devils and a Cross Country Wireless Mod Kit

Keith Rawlings responds to readers' correspondence regarding antenna problems and Post Office No. 1 connectors and takes a look at a new Cross Country Wireless Loop Amplifier Modification Kit.



Keith Rawlings

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Welcome to this month's *Aerials Now!* Let's dive straight in and open this month's column with some reader feedback:

Peter Jay from Suffolk e-mailed me in mid-January to ask if I thought he had bought a faulty aerial.

Just before the Christmas holidays, he had obtained a discone on eBay, a mounting bracket and a short length of RG8 cable so that during the break he could put the aerial on his chimney and run the cable into his upstairs spare room shack.

It was hoped that this would be a great improvement over his indoor window sill mounted mobile whip that was being used with an AOR AR3000. However, when Peter got up the ladder, he had second thoughts about the bracket as the chimney bricks looked a bit unstable. He opted to buy a lashing kit from a local TV aerial installer instead. The discone was then fitted in place on the chimney the next day, the feeder run under a tile and down into the shack. Peter soldered on a PL259 plug to the cable and connected this to his AR3000 via a SO239/BNC adaptor.

At first, everything seemed good.

Living not too far from Felixstowe and Harwich, Peter was immensely pleased with the improvement he gained on the Marine band. He found that he was receiving considerably further out than before, hearing French and Dutch Coastguard stations, and he also saw that the 2m band was busy with Dutch, French and Belgian amateurs. The band around 165 to 166MHz was full of signals too, with taxis working in the London area and what sounded like taxi drivers in Kent.

This all lasted for a couple of days; then something seemed to go wrong, fewer signals could be heard, and those that were heard were just a little stronger than be-



ALAN GORDON G3XOI

fore. The connections at the receiver were checked and the ladder came out again so that the connection to the discone could be also examined.

There was continuity on both the inner and the outer of the feeder, so the cable was in order.

After a few e-mail exchanges, we established that the AR3000 was probably fine, as it was receiving as well as it had been previously when hooked up again to the mobile whip. We also established that the AOR attenuator was switched out, that the discone was receiving signals and that it was still an improvement compared to the mobile whip.

To cut things short, just when I wasn't thinking about it, the penny dropped!

I e-mailed Peter to ask what date the aerial was installed, was it at the end of December, more specifically around the 29th? The reply came back as "yes, the lashing kit was obtained on the Saturday", which was the 28th. I had remembered there had been a tropospheric 'Lift' on the VHF and UHF bands, and this had coincided with Peter's new aerial going up! So the discone

is working fine and the suspected 'fault' was nothing more than conditions dropping back to normal.

In other correspondence, Alan Gordon G3XOI e-mailed me some information on Post Office No. 1 Connectors (Fig. 1). Alan said, "I worked, at one time, at STC, and 'dumpster-diving' produced many useful bits. One, which I made good use of, was Post Office No 1 connectors. These were designed for up to 2MHz and a few watts. However, being metal, they were too thick to know this and I successfully used them in my shack for HF, 400W, and 2m at 10W."

I also have a few of this type of connector, mixed in with a large bag of patch leads I obtained a few years ago. There is nothing I have that uses them so they are in the 'must-surely-come-in-handy-one-day' category!

The Matter of Grounding

I occasionally get asked why I have not discussed the issue of grounding in any detail. The main reason for this is that this can be a can of worms, in relation to wiring regulations and electrical safety. This is due to many household systems in the UK using PME (Protective Multiple Earth), where earth is bonded to the neutral. If this neutral is broken, all/any electrical appliances, radiators etc., could end up floating at mains potential if there is a fault.

This is not an issue where everything floats together; the problem arises when a piece of equipment is not at that same potential, for example, an item of radio equipment with its own ground.

Touching, say a radiator bonded to the house earth, and a radio with its own earth could result in electric shock. Also, all of the earth currents in the house – or indeed neighbouring houses that are on the same circuit – could find a path through this radio earth, which may then cause a fire.

I have mentioned this before, and I refer readers to the documents on the RSGB website and to seek advice from a compe-

Fig. 1: A Post Office No. 1 Connector.**Fig. 2a: Tree resting on a cable.****Fig. 2b: Cable repaired.**

tent electrician. Also always, bear the above in mind when looking at content on the internet, the electrical systems in other countries may be different, or the webmaster may be ignoring the dangers.

Apart from readers correspondence, why have I brought this up again? Well, Storm Brendan felled a tree in my vicinity. When it came down, it rested on a power cable, stretching it. This event caused cables to be shredded between poles further down the lane.

They were at ordinary mains voltage running to houses in a small hamlet, and I found out that one of the phases and a neutral had been severed.

This is another case where I have known the neutral to be broken – so it does happen (Figs. 2a and b).

In the top image, you may just discern the stretched cable with the tree on it; below that is the tree the next morning with a promptly replaced cable in place above it.

More information can be found at these websites:

<https://tinyurl.com/qskejwbn>

<https://tinyurl.com/yxxgm3g4>

<https://tinyurl.com/uhuazps>

The CCW Loops Revisited

Last month (*RadioUser*, March 2020: 44-46) I looked at the two Loop amplifiers from Cross Country Wireless.

<http://www.crosscountrywireless.net>

One of them was designed to cover VLF and HF, and the other one for HF and VHF.

My on-air tests found that, while the VLF/HF amplifier gave good results on the lower frequencies, it was not at its best on the HF bands.

Just after my review was submitted to the editor Chris Moulding of CCW advised us that there was a modification kit available, which improved the HF performance of the VLF/HF amplifier, albeit at a slight reduction of performance at VLF.

I was more than happy to try out the modified amplifier, and we agreed that Chris should send a kit out to me. It quickly arrived in the post; on opening, I found that the kit consisted of a new transformer, two 82pf capacitors, and a 1000uf capacitor.

The photograph in Fig. 3 shows the unmodified amp to the left; to the right is a photograph of the kit of parts.

To assist new owners, Chris has placed an informative video on his website describ-



ing how to undertake the modification. In this context, the first thing to do is to establish what type of boards you have.

Those I reviewed used the later boards, so in my case, I only had to change the transformer in the head unit and add the 1000uf cap to the base unit. Earlier models need to have the 82pf caps added to each board, as described in the video. Wisely, Chris advises that the board should be removed from the head unit to undertake the soldering.

As I only had to replace the transformer on the amp I had I chose to do it in place, however, be warned that if you touch the

sides of the case with your soldering iron it may well burn the plastic and ruin the water integrity of the box.

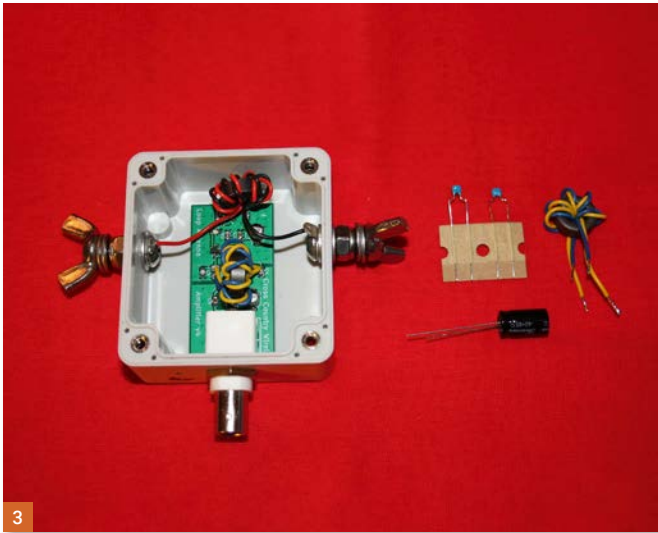
I then turned to the 1000uf cap on the base unit. Soldering it into place, the procedure was simplicity in itself, as in the case of changing the transformer.

It is understood that some owners will not have the equipment or desire to modify their own amps.

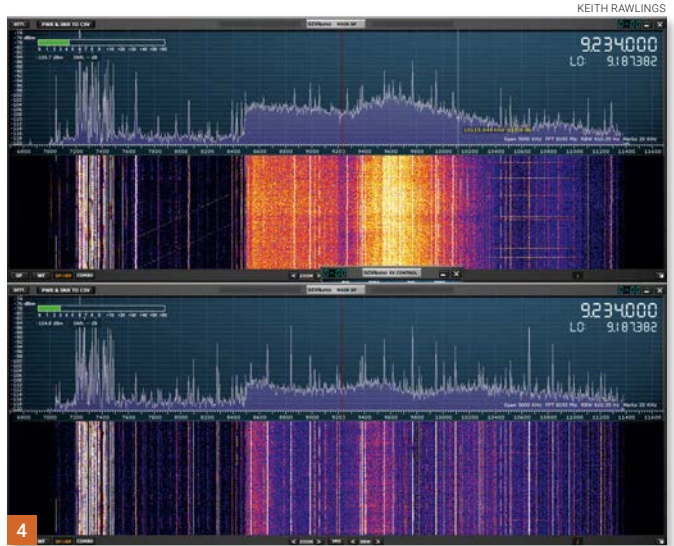
With this in mind, Chris is happy to undertake the mod for owners for just the cost of return postage.

Once the modifications were completed, I screwed the lid back in the head unit

KEITH RAWLINGS/CCW

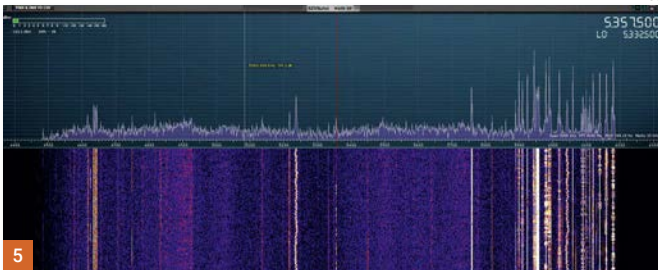


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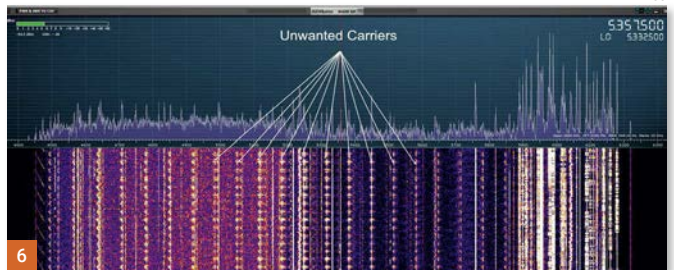


4

KEITH RAWLINGS



5



6

Fig. 3: The CCW unmodified loop amplifier and modification kit.

Fig. 4: Some useful reductions in VDSL QRM.

Fig. 5: 'Dancing Devils', nulled with the loop.

Fig. 6: 'Dancing Devils' on my end-fed aerial.

and I set the loop amp up in the same manner as before.

I initially started using my RSP2 and laptop.

I could see immediately that this mod had done the trick. Where before I found that above about 4MHz the spectrum was devoid of all but the strongest of signals, it was now full of them.

However, my first look was at the VLF end of the band to see if there was any effect on the low-frequency performance. I found that while signal strengths from MSF and DCF77 (60 and 77.5 kHz) varied around 1 S-Point lower than in my previous notes they were both fully readable, as were a number of the continuous data transmissions found in that part of the band.

Performance on LF-MF still seemed pretty good and the loop still demonstrated excellent directional properties on the long and medium wave bands.

It was at HF where a huge difference could be found.

Here, signals were now *much* stronger, and I was also able to experiment with re-

jecting local noise. I found that I could get excellent nulls to reduce QRM (Fig. 4).

The annoying interference I get from a nearby Sky-Q system, which seems to have its PLT turned permanently on, can be effectively nulled out. In addition, since just before Christmas, I have been plagued with what I have termed the 'Dancing Devils' (Figs. 5 and 6).

These consist of unstable carriers, which quickly vary in frequency and amplitude, along with the noise floor (hence my term 'Dancing Devils!'). They range from 1.6MHz to just over 8.400MHz, where they promptly stop.

I had hoped they were caused by something like Christmas lights. However, sadly they are still present as of the end of January. I can null them out using noise cancelling but I found I could do equally as well using the loop. As the null on the loop is quite sharp – and because of the fact that I found that both these and the PLT QRM are effectively reduced on the same positioning of the loop – I am thinking that they are likely coming from the same location.

On the lower frequencies, and during the day, turning the loop did mean the reduction or loss of some signals but at night this was not as noticeable.

On the higher frequencies, QRM was reduced, with little or no effect to

the wanted signal.

I also noted that with this modification the loop's directivity seemed to be more symmetrical, although I did not investigate this further for the time being.

Conclusion.

The modified loop amp now works well on HF, and it still seems to work well on VLF.

A short NDB hunting session one evening, with the loop fixed in a south-easterly to north-westerly direction, (see Robert Connolly's column, *Maritime Matters*, in this issue), resulted in eight new beacons logged, with a noticeably lower background noise level than on my PA0RDT MiniWhip.

On HF, I was able to reduce *specific* QRM to a satisfactory level, while still receiving good signals on the Amateur, Utility and Broadcast bands.

I would say the amplifier is returning results on HF similar to the HF/VHF version, although that model does have more gain, especially towards the upper HF range.

This modification makes the VLF/HF model an excellent all-round performer.

It is worth serious consideration for those looking to own a good performing wide-band loop for a modest outlay.

Until next month, good listening.

<https://tinyurl.com/rvs6tjz>

<http://www.radioenthusiast.co.uk>

Non-Directional Beacon (NDB) Survey 1/2020

Robert Connolly
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This month it is time to have a look at Non-Directional Beacons (NDB) DXing over the early winter season. Winter, with its dark nights and fewer thunderstorms, is the main season for DXing NDBs. One of the European NDB DXers aims to receive NDB from across the Atlantic. This is something that becomes slightly more difficult every year due to US and Canadian beacons being closed down.

However, there are still some to be received on this side of the 'Pond'.

Regular readers will recall that my DX season came to an early and abrupt halt when my Datong AD370 active aerial failed. With the repaired Datong now my reserve aerial, I was keen to see how my PA0RDT mini-whip would perform during the main winter DXing season. I was not disappointed, successfully receiving several North American beacons here.

Also, last winter, you may recall, that I was experimenting with various temporary aerial setups and reception using dedicated hand-held radio direction finders. This year, I have again been experimenting, this time in a different direction.

As many of you are aware, I have been, and still am, a traditionalist when it comes to NDB DXing, using my excellent JVC NRD 525 general coverage receiver. This winter, I took the decision to dip my proverbial toe into the world of SDR and purchased an SDRplay RSP1A. I was interested to see how this would compare to my NRD 525 receiver.

I have been using two software suites, *SDRuno* and *SDR Console* (not at the same time) to compare SDR NDB reception (Figs. 1 and 2). The latter seemed to produce slightly more gain, compared with the *SDRuno* software.

On the other hand, I felt that the SDRuno software offered better filtering for NDB listening. The RSP1A reception logs shown for this period were obtained using *SDRuno* software.

Robert Connolly trawls the beacon bands for his first overview this year, of NDB catches. He also takes the opportunity to explain the purpose and technology of calibration beacons.



SDR Beacon Hunt

I found that the RSP1A was capable of pulling in a number of NDBs from across Europe, including the strong night-time Greenland NDB Prins Christian Sund OZN on 372kHz, and the Norwegian beacon Odderøya (ODR) that is on the same frequency. With regard to OZN, while preparing this column around the end of January 2020, it was received here using the RSP1A at 1940UTC; probably one of the earliest evening-catches of it that I have had – not bad for an entry-level SDR! (Fig. 3).

By comparison, the same aerial, my mini-whip, was used. Although the RSP1A pulled in quite a few DX NDBs during darkness I found that it fell well short of the number received by my NRD 525. Having said that, as the lowest priced SDRplay receiver it was certainly not a total dead loss for NDB DXing and would work well for a novice to begin their entry to the world of NDB listening.

To a degree, it is difficult to run an exact

comparison unless SDR and conventional receivers are running at the same time and on the same frequency. Ideally, this would require them to be on separate aerials.

Running one at a particular time, and then the other one generates another variable in the form of propagation. However, with my checks, there was quite a difference in the number of received beacons, with the RSP1A receiving less than half the number of NDBs that I can receive on my conventional receiver.

To put this in context, one problem I face here is QRM generated by the RTÉ long wave 252kHz transmitter, located just over 40 miles away, as the proverbial crow flies.

I found that the RSP1A was more sensitive to this QRM, even with the *SDRuno* medium wave notch filter selected, and especially at the lower end of the NDB band.

I also detected that using the medium wave notch filter reduced the possibility of receiving weaker NDBs. As a result, I found the best option for NDB reception was *not* to select the medium wave notch filter but

to reduce the RF gain to a point where the 252kHz was minimised, roughly around the '3' mark on the scale.

I normally use either USB or LSB modes, as I find that these allow for easier detection of weaker beacon signals, especially when those signals are on the same frequency as a more powerful NDB. This is a personal choice, partially due to partial loss of hearing in one ear.

Consequently, QRM is less noticeable when using the CW mode or even the narrower SSB filter modes. When using my general coverage receiver, I would also employ the use of my Timewave DSP-9+ filter and the 10db attenuator on the NRD525.

More on QRM

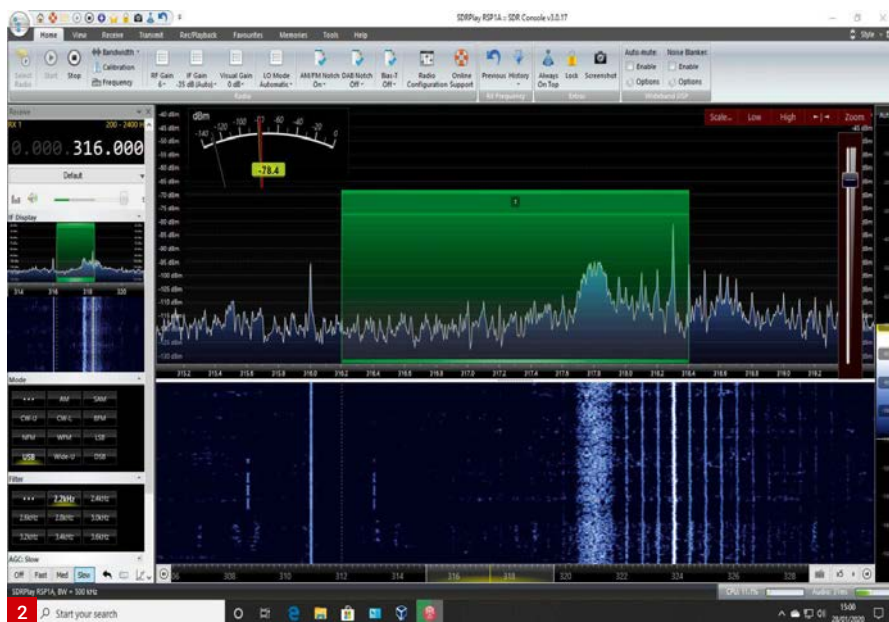
Winter is the main NDB DXing season, with its long hours of darkness and, usually, much lower noise levels in the form of static crashes. Unfortunately, winter can also produce increased levels of man-made noise (QRM) generated from electronic devices, streetlights and many other sources.

The period around Christmas is probably the worst time for man-made interference being generated by the many Christmas lights in homes. As a result, I normally tend to begin my night-time NDB listening sessions after 2300UTC. A thorough check of the whole NDB band will take me well over two hours, depending on propagation conditions. Often, the early hours of the morning have arrived before I retire to bed.

One of the reasons for purchasing an SDR receiver was to allow me to record sessions during the night and then analyse the results at my leisure during daytime hours. While I have not done this yet for various reasons – mainly due to me still experimenting with the SDR receiver to discover how it performs – this facility will allow me to run an automatic recording in the early hours, when QRM would be at its lowest and while I am tucked up in a warm bed. Many other SDR operators now use the same method.

No, my dedication to NDB DXing is not waning but, unfortunately, my advancing years require me to take more sleep time. Based on NDB reception results I have seen from others using higher-end SDRs, I may, at some stage down the line, move up to a more expensive SDR receiver. In the meantime, I still have my excellent, trusty, JRC NRD 525 conventional receiver to fill in monitoring gaps with 'live' sessions.

Transatlantic Reception and



Some History

Winter DXing of NDB signals from North America requires both Europe and the Eastern Seaboard of North America to be in darkness, with the result that winter is the only time when this trans-Atlantic reception can occur. By the time we reach mid-winter, and the longest hours of darkness in late December, any possible NDB signals from North America will be heard in Europe from approximately 2330 UTC onwards.

Reception of North American NDBs in Europe also depends on suitable propagation conditions. Therefore, reception of US and Canadian NDBs will not happen every night. Incidentally, a number of the stronger European NDBs are often received by DXers located on the East coast of Canada.

Calibration Beacons

Now for a bit of interesting maritime NDB history: When DXing NDBs these days, it is commonplace just to refer to their working frequencies. Prior to the Millennium, when most marine NDBs were closed down, the marine section of the NDB band was officially 'channelised', beginning with CH 0 (283.5kHz) and running to CH 63 (315kHz), with channels spaced 500Hz apart. While the majority of marine NDBs were for use by ships, to help establish their position. There were also a limited number of very low-powered NDBs that were available to use on request by ships, in order for them to be able to calibrate their radio direction finding equipment.

Typically, these special marine calibration NDBs had an operational range of five

Fig. 1: Screenshot of the SDRuno software.

Fig. 2: Screenshot of the SDR Console software.

Fig. 3: A Pressure Chart for 21/22 January.

nautical miles. In addition, calibration could only be carried out during daylight hours with the vessel concerned being within visual range of the calibration station, but far enough away to avoid a broad null in the receiver when taking a bearing.

Vessels were required to be in sea-going condition, with derricks housed and – where required – aerials, other than the RDF one, discontinued from an Earth.

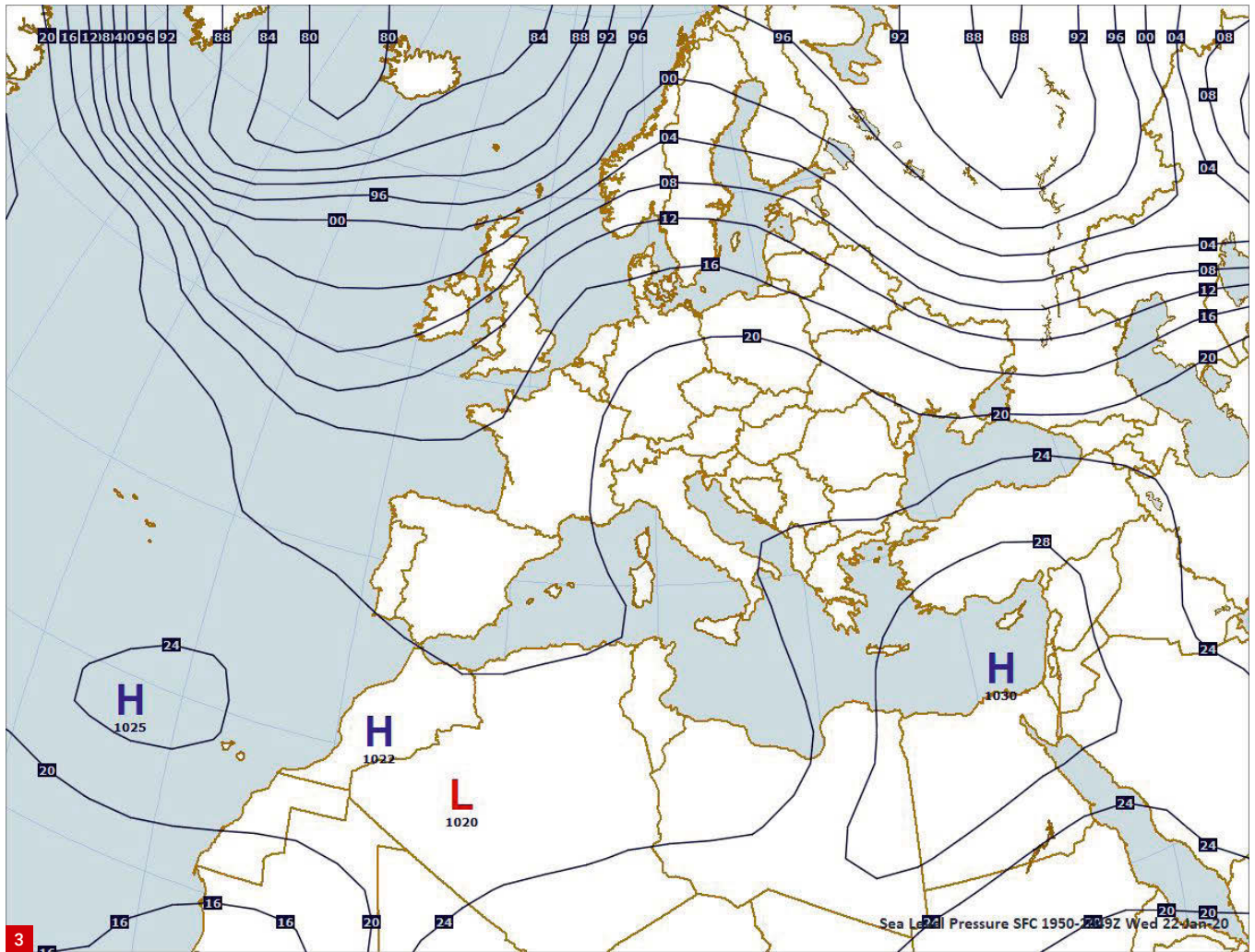
On arrival off the calibration station, the ship would give three long blasts on its horn, followed by three short blasts. It would hoist a black ball up to its masthead. Once the ship had identified itself and had been acknowledged by the calibration station, the transmission of the calibration radio NDB began.

The NDB transmitted for up to two hours unless it was notified by the ship that the vessel had completed calibration. This happened by giving three short blasts, followed by three long blasts, on its horn.

An extension for a further two hours could be requested by the ship if required. The calibration signal from the land-based radio beacon station would operate on a different frequency to the normal NDB transmitted from that station. In some cases, a different identification was used by the calibration NDB.

The joy of the Hunt

When propagation conditions are good, I do enjoy the hunt for NDBs that I have not



previously received. Sometimes, you can go for weeks without receiving any NDB for the first time; then propagation conditions change and newly-received beacons come along like London buses. With my PA0RDT mini-whip proving to be much better than my Datong AD370, I have been fortunate to receive several NDBs for the first time here in recent months: 319kHz ECV Colmenar Spain, 322kHz London City, 378kHz WSN Weser Germany, 397kHz LM Borlange Sweden, and 412kHz SIG Sigonella Sicily. In late January, Prins Christian Sund OZN 372kHz Greenland was still audible at my location until after 1000 UTC, two hours after local daybreak.

In the UK the following NDBs have now permanently closed: NGY 399kHz New Galloway and FOS 348kHz Fairoaks. The NDB CBL 380kHz Campbelltown, Scotland, a regular with me, was off the air from 20 January to 6 March for maintenance.

If you are interested in finding out the official range of UK NDBs you can visit this website:

<https://tinyurl.com/rddq2kp>

While the list is not fully up to date, it does provide a quick reference guide to the official usable range for UK aeronautical beacons and is free. Official aviation documents, for example, *Aerad*, used by private and commercial pilots, also carry this information but, of course, they come at a cost.

<https://www.afeonline.com/shop/aerad>

Last but not least, just a quick reminder that my own beacon guide, reviewed in *RadioUser* recently (*RadioUser*, November 2019: 15) is still available, please see my website for details:

www.kilkeel.org.uk

This NDB review carries a bumper crop of NDB logs: my own logs using the SdrplayRSP1A are indicated as (A); Listings under (B) are my logs using my NRD 525 with my Timewave S9+ filter.

The aerial used for both was my PA0RDT mini-whip.

David Mappin (C), from North Yorkshire, using a Yaesu FRG-100 with an indoors (ground-floor) Wellbrook ALA 1530 loop

aerial, kindly submitted his recent logs. Our regular NDB contributor, Andy Thomsett (D) from South West England, used an Airspy HF+ and a PA0RDT Mini-Whip. There was also Keith Rawlings (E) from Essex. Keith tells me that he was using an SDRplay RSP2 Pro with a 500kHz low pass filter and a Cross Country Wireless (CCW) loop amplifier he had been evaluating (*RadioUser*, March 2020: 44-46).

However, most of the beacons were received on his inverted-L aerial.

As usual, NDBs received during daylight are marked by an asterisk (*).

Due to the size of these logs, they will be available on the *RadioUser* website:

www.radioenthusiast.co.uk/articles

Next month, I will be back with my 'normal' *Maritime Matters* column. In it, I will share more performance information regarding my SDRplay RSP1A reception in the MF/HF marine bands, discuss fishing vessel communications outside the marine bands, and present more maritime communications updates. Until then, *Fair Winds*.



NHK & the Flower of the Pacific

In this month's radio history column, **Scott Caldwell** tells the story of the myth and reality of 'Tokyo Rose', in the context of World War Two propaganda broadcasting.

Scott Caldwell

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Have you heard of 'Tokyo Rose'? Well, to begin with, the very concept of 'Tokyo Rose' is mythical. There was never actually a single presenter named 'Tokyo Rose'. The moniker was given to the various female presenters, by the American servicemen who regularly listened to these wartime broadcasts from Japan.

The US Office of War Information agreed in the conclusion to a report from August 1945: *"There is no 'Tokyo Rose'; the name is strictly a GI invention. The name has been applied to at least two lilting Japanese voices on the Japanese radio. Government monitors listening in 24 hours a day have never heard the words 'Tokyo Rose' over a Japanese controlled Far-Eastern radio".*

And, indeed, by the spring of 1944, intelligence reports confirmed that a number of other 'Roses' had sprung up

across the occupied Pacific islands, most noticeably in Manila, Indonesia, Java, and Shanghai. No presenter ever introduced themselves directly as 'Tokyo Rose'. In the minds of the American GIs, there was little doubt that the infamous Tokyo Rose did, in fact, exist.

Japanese Propaganda Broadcasts

The Japanese Empire intended the broadcasts by 'Tokyo Rose' to serve as morale-sapping propaganda, which would greatly

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affect the Allies' desire to fight. However, this was not the case as many American servicemen regularly huddled around a radio receiver, listening to the seductive, yet sinister, tones of the infamous *Zero Hour* (ゼロ・アワー, *Zero awā*) programme.

<https://tinyurl.com/wnyrtd>

Radio propaganda can only be deemed as successful if the listeners believe it as truthful and factual knowledge. Propaganda consists of two formats: 'White' and 'Black' propaganda, as defined by its content and dissemination. It is extremely difficult to define 'propaganda' in generic terms, resulting in a variety of definitions that cover many diverse sub-disciplines. Overall, 'propaganda' is regarded as a technique of psychological influence, combined with techniques of organisation and the 'envelopment' of people, *with the intention of sparking action*. The method of delivery, in this case, could, perhaps, be termed as 'sweet propaganda' – designed to demoralise listeners, inducing homesickness, and offering the occasional insult.

Zero Hour and Tokyo Rose

A typical *Zero Hour* programme consisted of content as listed in Table 1.

Iva Toguri D' Aquino (née Toguri) (1916-2006, Fig. 1) is better known by his-tory as the infamous 'Tokyo Rose' (or 'Orphan Anne'). Toguri was born on (US) Independence Day (4th July 1916) in Los Angeles, California. In many respects, Toguri was torn between two countries, two cultures, and two political ideologies.

Her parents, Jun and Fumi Toguri were first-generation Japanese Americans who embraced the culture and traditions of the 'American Dream'. They were collectively known as *nisei* amongst the immigrant Japanese community. Her father was adamant that his family should adopt an 'American' outlook, in terms of culture, religion and politics, in order to become fully integrated into society.

Jun and Fumi Toguri's children were actively discouraged from writing or speaking in their native tongue. This was later reflected in Iva's schooling, which was a thoroughly 'American' experience. Her successful integration into American society was further demonstrated by Iva's active role in the Methodist Church and enrolment in the Girl Scouts Movement. In later life, it is claimed that she was a keen supporter of the Republican Party, voting for Wendell Willkie (1892-1944) over Franklin Roosevelt (1882-1945) in the 1940 Presidential Election. Witnesses who were interviewed after WWII

later revealed a character that was completely different from the one presented by the Federal Government.

In 1941, her life took a dramatic turn when her parents offered her a graduation gift in recognition of the successful completion of her undergraduate degree in Zoology from UCLA. The gift was travel tickets to Japan, although their motives were diverse, June and Fumi also wished her to assist Iva in the care of an ailing aunt.

NHK and Propaganda Broadcasting

The atmosphere at NHK (Japan's national and international broadcaster, Fig. 2) was unique in a society that was, at the time, completely dominated by the military. It was viewed as being rather liberal and democratic.

The broadcasting of propaganda by Nazi Germany was very influential on the Japanese Government and they were very impressed with Adolf Hitler's (1889 – 1945) energetic, and powerful delivery of his political-ideological speeches. This feeling was not universally-shared by the management of NHK, of course, some of whom felt revulsion towards the Nazis arrogant, high-handed and coercive propaganda.

Against this background, the policy advocated by NHK towards its overseas broadcasts attempted to arouse war-weariness in the heart and minds of the American soldiers, while achieving sympathy for the *New Order* in the occupied areas of the Pacific who had suffered from European imperialism. As NHK's military significance increased, there was much internal conflict between the various governmental ministries for control of its organisation: The Communications Ministry was initially in overall command, but the Home Ministry, which controlled the police and maintained political-ideological orthodoxy, represented a powerful challenge to the Japanese broadcasting *status quo*.

Major Charles Hughes Cousens

Australia was a divided nation, in terms of an assessment of the conduct of Major Charles Hughes Cousens (1903-1964). His supporters claimed that he was simply a forced-labour prisoner-or-war (POW).

<https://tinyurl.com/wt7ojhu>

On the one hand, many said that he had to comply with Japanese demands that he collaborate with NHK in writing and broadcasting treasonable scripts for Radio Tokyo.

But on the other hand, many claimed that he was a willing tool of the Japanese and



led a very comfortable life in Tokyo. His subsequent trial was sensational and received a considerable amount of Australian press coverage. This was largely in relation to his pre-war popularity as one of Australia's most famous and liked radio presenters. His mellifluous voice and perfect English diction made him a star of Radio 2GB in the 1930s.

Cousens presented some prime-time programmes, most noticeably *Radio Newspaper of the Air*, a show primarily aimed at younger listeners. By 1944, the Japanese finally embarked on a campaign to eliminate the perceived subterfuge of Cousens and his staff, initially focused on reducing the creativity of the scripts.

Later, Cousens simply changed his programming strategy and began to systematically insert a number of 'mechanical intonations' into their broadcasts. The increased 'vocal sterility' of these broadcasts achieved the desired result and provided a clear indication to the monitoring Japanese military that changes had indeed been made at Radio Tokyo. Working conditions at Radio Tokyo were far from glamorous, Toguri earned only 150 Yen (US\$7) per month – a paltry sum even in the economic deprivation of wartime Japan.

A Personal Dynamic

The pressure on Cousens was immense, and it led to a heart attack. This forced his withdrawal from Radio Tokyo and also led to Toguri's behaviour becoming more erratic. It seemed that Toguri had depended on Cousens to steady her confidence during broadcasting and guide the token 'passive resistance' movement.

She was routinely reported as absent from her scheduled Radio Tokyo appointments, frequently disappearing for up to three weeks at a time. Remarkably, this did not cause alarm or concern, as her programming segments were relatively easy to

cover. This contrasts with the view put forward at her trial that she was a willing servant of the Japanese military regime. Despite facing charges of treason, Cousens took to the witness stand in defence of Toguri, confirming that he had written the scripts and coached her delivery, with the intention of subverting the broadcasts and making them useless implements of pro-Japanese propaganda. In many respects, Cousens was quite fortunate that the Japanese decided to utilise his unique radio presentation abilities, and he did not follow his unit to Burma, where they were forced to construct the Thailand-Burma railway.

Cousens still had to appear a willing assistant to his Japanese guards, especially when he became a senior POW at the Bunka Camp, demanding almost daily negotiations in an attempt to safeguard the welfare of the other 25 POWs, as conditions deteriorated along with the failing Japanese war effort.

Although 1945 was quite a bleak year for Toguri, in terms of witnessing the horrors of war and the birth of the atomic age, she still managed to marry Felipe D'Aquiro. This was the catalyst for further changes to her life. It was underpinned by her conversion from the Protestant Methodist to the Catholic faith. In many respects, this was in tune with her new husband's Portuguese heritage.

Identifying Tokyo Rose

Despite the strong conclusion obtained by United States military intelligence organisations that 'Tokyo Rose' as a singular person did not exist, the nation's press had become determined to obtain definite evidence that proved otherwise. This desire arose partly in response to the wartime years of strict censorship, which had constrained their journalistic creativity.

Two journalists (Clark Lee and Harry Brundidge) were dispatched on behalf of the newspaper magnate William Randolph to try and oust former Radio Tokyo presenters who possessed any likely resemblance. To that end, they began a prolonged search, in an attempt to publish their scoop in Hearst's *Cosmopolitan* magazine. They decided to offer a financial bounty of US\$250 to any Radio Tokyo employee who would come forward with the identity of the infamous Tokyo Rose. With such a significant offer, they were soon inundated with names and other bits of information, mostly half-truths and outright fiction.

The most likely candidate was put forward by Leslie Nakashima, who singled out



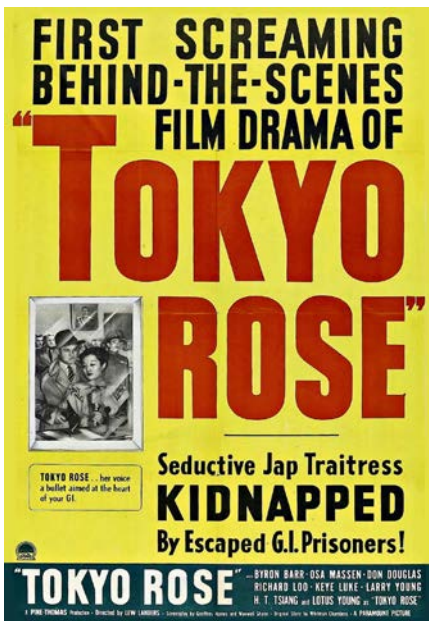
the Japanese - American citizen Toguri. Initially, they found Toguri to be very uncooperative, and she vehemently denied any knowledge of the name Tokyo Rose. By now, both Lee and Brundidge had become exasperated with the situation, and they decided to raise the financial stakes. They now offered the remarkable figure of US\$2,000 for an exclusive interview, provided that

she remained silent and did not discuss the matter with anybody else.

Subsequently, some misguided advice from her husband led to Toguri signing legal documentation that confirmed outright that she was, in fact, the infamous Tokyo Rose.

Arrest and Postwar Trial

On October 17th, 1945, the American mili-



tary police felt compelled to act. They arrested Toguri at her apartment. In retrospect, it remains a mystery why they decided to act, given the initial findings of the first investigation into the identity of 'the real Tokyo Rose'. One reason for this was, perhaps, the opinion of the American public who followed the search by reading the detailed reports in the media and demanded legal action against this alleged traitor.

The next six months were extremely traumatic for Toguri, as she was incarcerated in *Sugamo Prison*, becoming somewhat of a 'living exhibition' for passing visitors, either military or civilian. Prison guards supplemented their wages by advertising specific hours when she could be 'gawked at' by civilian visitors.

In order to force her compliance, her light was routinely left on at night, limiting her sleep and relaxation. Her final humiliation occurred when a US Congressman watched her shower. Her naiveté is quite remarkable and placed into the hands of the guards and journalists; she even began to use the signature of 'Tokyo Rose'.

She simply presumed that journalists were concerned admirers who only had her best interests at heart.

An Anti-American Figure?

Some modern historians imply that she was being 'groomed', to fit the anti-American figure portrayed by McCarthyism politics. By the time Toguri realised that her situation had become precarious, it was too late: The mixed responses and messages, from both the civilian and military population, were very confusing and in-

timidating. Approximately six months after her arrest, the occupying 8th Army, under the jurisdiction of their legal section, declared that there was no evidence to suggest that Toguri disclosed military intelligence to the Japanese Empire. Finally, on October 5th, 1946, Toguri was finally released from prison.

Unfortunately, while she was in captivity, her mother had died, and her remaining family had relocated to Chicago in an attempt to escape the media spotlight. The matter was still pursued by the ambitious and ruthless Director of the FBI, J Edgar Hoover, who instructed his agents to move the case forward with concrete proof of Toguri's identification as Tokyo Rose. This finally happened in 1949, when Toguri signed further documentation confirming her identity as Tokyo Rose, once again the press misled her into believing that her return to the US would be expedited by this action.

A Presidential Pardon

In 1977, Toguri received a Presidential Pardon, in relation to her 1949 conviction, by a federal jury in San Francisco. The sentence handed down had been 10 years imprisonment and a US\$10,000 fine – not to mention the stigma of being classified as a traitor to her country of birth.

The federal hearing was a massive logistical undertaking: It lasted for 13 consecutive weeks, with an estimated cost of US\$750,000. Post-war American society was gripped by the fear of Communism and of 'traitors'. This led to regular claims by Senator Joseph McCarthy (1908-1957), who attempted to denounce perceived security threats in society and in the government. At the time, US society was very unforgiving in respect of any form of 'treason' against the nation, especially during the recent conflict in the Pacific and Asia region. Toguri was only the seventh American citizen to be sentenced as a traitor.

The end of Toguri's career in radio propaganda came very abruptly when the United States dropped two atom bombs on Hiroshima and Nagasaki in early August 1945. It initially appears that Toguri's wartime radio career would slip into historical obscurity. However, society and the media needed an outlet for their anger against the Japanese Empire. Toguri – maybe through her naiveté – fitted the bill of the 'all-American traitor'.

The road to rebuilding her reputation was a long and protracted legal and political process.

Further Reading

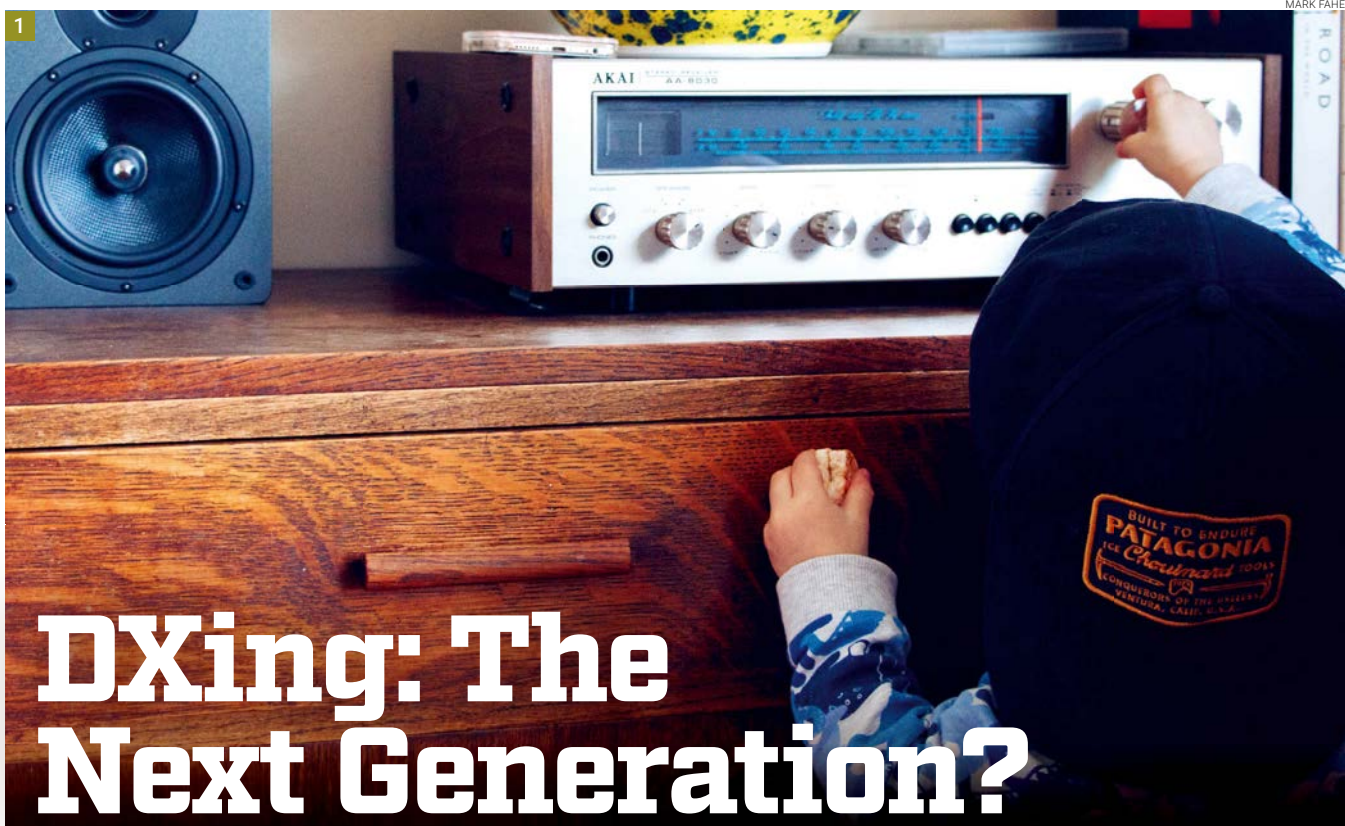
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Websites

- A Theatrical Take <https://tinyurl.com/ttx8su2>
- A Tokyo Rose Broadcast from 1945 <https://tinyurl.com/rbfcawj>
- FBI (General) <https://tinyurl.com/thawg2k>
- FBI (TR Case Records) <https://tinyurl.com/up3nlwo>
- The Guardian (Obituary) <https://tinyurl.com/tb2vw3z>

- Loud opening musical number, similar to Strike up the Band by the Boston Pops Orchestra.
- Messages from Prisoners of War (POWs), e.g.: "Hi Mom, this is Corporal X we are ok, but we need socks and food".
- The Orphan Annie Show was 20 minutes of high-quality American Jazz and semi-classical records introduced by Annie.
- American Home Front News consisted of tidbits of news received by Japanese monitoring stations.
- Juke Box was 15 to 20 minutes of popular Jazz music.
- Ted's News provided more international news received from international short wave broadcasts.
- A News Summary was occasionally read by Charles Yoshi, known as the 'Japanese Lord Haw-Haw', followed by military marches.

Table 1: A Typical 'Zero Hour' Programme.



DXing: The Next Generation?

Chrissy Brand shows that there is still plenty of life left in the DX hobby. Whether we operate SDRs online or sit in a shack hunched over an analogue receiver, we can all see that radio still rules the waves.

Chrissy Brand
chrissylb@hotmail.co.uk

There are many online SDRs which enable you to take control of a receiver and experience DX conditions, just as a local would. Perhaps the best known of these is the University of Twente receiver in The Netherlands. Other online SDRs can be found in dozens of locations, including New Zealand, Hungary, Brazil, and the USA. There is even an Arctic SDR, which is located in Kongsfjord, Norway.

www.websdr.org

DXing Online

Online SDRs are fun and can also be very useful. They enhance your enjoyment of DXing, enabling you to pull in signals that cannot be received at your regular base. It is akin to a 'DXpedition', but from the comfort of your radio shack, hotel room,

or even when you are walking or travelling on public transport.

Operating a remote communications receiver online is not as recent a phenomenon as you might think. Back in 1995, Jeff in Washington DC set up his Drake R8 for web users around the world. There weren't that many of us back then! It is still in use today, at a recently upgraded website. The remote Drake R8 works best when using the *Microsoft Edge* web browser.

www.chilton.com/R8
<https://tinyurl.com/s3zgtkc>

If you struggle with local conditions, whether it is a temporary propagation issue or a semi-permanent result of electrical interference, turning to an online receiver is a great option. If, like me, you set aside an occasional evening to trawl the short wave bands on your trusty radio receiver, but are immediately thwarted by local interference caused by the neighbours' Wi-Fi or heating sys-

tem, turning to an online SDR can be a near-perfect solution.

I often check out remote receivers through the web browser on my smartphone. To access all of that DXing capability through a tiny device in the palm of my hands is a powerful feeling.

I believe that online SDR DXing is also an exciting and positive way to introduce new people to the DX hobby. Almost anyone with an internet connection can experiment and experience the thrill of hearing a faraway signal, a voice in an unknown language, a style of music completely alien to their ears, or simply a news item that they would never hear about from domestic media.

These 'newcomers' might then be tempted to purchase a quality radio of their own and become a welcome addition to the global DX community. Imagine if we all recruited or inspired a young person to DXing this way (Fig. 1). We could soon double the number of DXers in the world and create twice the amount of fun!

Readers' Reports

An example of an SDR installed on your own computer comes from Scott Caldwell, who wrote, "So far, January has been remarkable for DXing on medium

Fig. 1: Start them early. Fig. 2: An All India Radio (AIR) QSL card for a DRM transmission. Fig. 3: A QSL card from an EDXC Radio transmission in 2017. Fig. 4: The mast of the Czech Liblice transmitter is enclosed in a cage of wire conductors.

wave. This represents my best ever reception of North American stations. I purchased an external 2TB hard drive that enables me to hold nearly a month's worth of recordings. I can keep revisiting them at different times. It also enables a longer analysis of the recordings and provides a good comparison. The best reception was noted around the start of January. However, there are still long periods of signals fading in and out, requiring the utilisation of the playback function on the SDR. SDR does make DXing a lot easier."

A selection of Scott's logs is featured this month. WLW News Radio 700 in Cincinnati hosted a phone-in programme stating that listeners could talk about anything. WWL in New Orleans identified as News Radio WWL and carried an advert for the National Football League Network. WXYT in Detroit also carried a sports commentary while WHO, on 1040kHz in Des Moines, is another news-format station. WHO is part of the iHeart stable, an organisation that underwent restructuring, which resulted in job losses across the USA at the start of 2020.

Scott also made a tentative log on 1000kHz of KOMO in Seattle, with ABC news and music, and a weak signal. KOMO was also heard in October on the *BDXC Sheigra DXpedition*.

<http://bdxc.org.uk/sheigra19.pdf>

Continuing with Stateside matters, Jack Jones wrote of an opportunity to be part of 'pirate radio history'. David Goren's *Brooklyn Pirate Radio Sound Map* is planning to expand this year but depends on crowdfunding.

The *Sound Map* is the first phase of a multimedia documentary project, which launched in 2017. It is an interactive, online, sound map containing archive pirate station recordings. It also contains essays tracing the development of Brooklyn pirate radio through interviews and sound recordings.

The map was initially funded by the Brooklyn Arts Council. Future funding would enable more research, bring new features to the map and "expand the map to the other pirate radio neighborhoods of Queens, the Bronx and suburban New Jersey"

I feel it would be great to see a similar project take off in Europe, don't you?

<https://tinyurl.com/serotw4>



<https://map.pirateradiomap.com>

Lionel Clyne wrote, "Most of my logs are confirmed by consulting the *short-wave.info* website. I find this a most useful site; the text is in large type and is easily accessible. Moreover, stations can be searched and identified in many ways; these include references to *metre-band-page*, or by directly typing in the frequency in question. Other searches include the *language-specific page* and the *station-specific page*."

"However, I would like to point out that there is not always concordance between these pages. For example, *Radio Thailand* was listed as broadcasting in English on the *metre-band-page*, but in Thai on the *specific frequency-page*, something that could lead to misidentification of the station."

"Similarly, I recently was about to log a station on the *wave-band page* but was reluctant because it was listed as off-air at 2000 UTC. However, it continued to broadcast beyond this time. When I typed in the frequency, this page indicated it would be broadcasting until 2200 UTC. I would be most interested to learn if other readers have encountered this anomaly."

<https://short-wave.info>

Another useful tip from Lionel was that the website is updated with all the new schedules within a few days. The A20 season started on March 29th and hopefully, *Short Wave Info* will reflect all the changes.

All India Radio can always be relied upon for some esoteric entertainment. The station issued QSL cards for analogue and DRM transmissions (Fig. 2). I have waxed lyrical about All India Radio in these pages before and at my *DX International* blog.

<https://tinyurl.com/vm2x46t>

Lionel tuned to AIR on 6140kHz at 1908 UTC and heard a broadcast in Urdu from Bengaluru. He amusingly summed it up as, "Quite enchanting music that you are not likely to hear while eating your Tandoori mixed grill at your local restaurant."

Last August, Lionel heard Manara Radio International at 1605 UTC on 15285kHz, broadcasting in Hausa from Issoudun in France. He first heard this station many years ago on 17765kHz. Transmissions are targeted at Nigeria.

Radio Northern Star returned to 1314kHz

Short Wave Logs

UTC	kHz	Station and Location	Language	SINPO	Initials
1211	6180	Deutscher Wetterdienst (DWD)	German	45544	GS
1212	6150	Radio Marabu	German	35544	GS
1247	21690	Radio France International, Talata-Volonondry	French	35222	LC
1250	21580	Radio France International, Issoudun	French	35222	LC
1252	21505	BSKSA, Riyadh	Arabic	45222	LC
1431	11530	Denge Welat, Kishinev Grigoriopol	Kurdish	43433	LC
1511	9840	WHRI, Cypress Creek	English	45333	LC
1552	9765	Reach Beyond Australia, Kununurra	Korean	45344	LC
1559	7485	BBC World Service, Kranji	English	45444	LC, OR
1604	7475	Radio Free Europe/Radio Liberty, Udon Thani	Tajik	45344	LC
1849	9885	Voice of America, Selebi-Phikwe	French	45444	LC
1857	9460	TRT Voice of Turkey, Emiler	Turkish	45444	LC
1908	9370	Voice of Vietnam, Hanoi-Sontay	English	35433	LC, OR
1908	6140	All India Radio, Bengaluru	Urdu	45444	LC
1911	9420	Voice of Greece, Avliss	Greek	45444	LC, NT
1914	5950	Voice of the Tigray Revolution, Addis Ababa	Tigrinya Afar	45233	LC
1921	7585	Radio Farda, Udon-Thani	Persian	35444	LC
1924	7475	Radio Thailand, Udon-Thani	English	45444	LC, NT
1934	6165	KBS World Radio, Woofferton	French	45333	LC
1939	6130	Trans World Radio, Manzini, Swaziland	Portuguese	45333	LC
2027	12095	BBC World Service, Ascension Island	English	35222	LC, OR
2035	6195	Voice of America, Selebi-Phikwe	English	35344	LC, NT
2043	7590	North Korea Reform Radio, Tashkent	Korean	35222	LC
2048	7590	Radio Romania International, Galbeni	Romanian	45555	LC

(with 700W) in late December. The station broadcasts what it refers to as *“the best classic pop and rock from both sides of the Atlantic, over LLE-2 Bergen Kringkaster.”*

Northern Star was heard quite well throughout Scandinavia and parts of Northern Europe coverage, although interference was anticipated from Radio Oltenia and RNE 5 in Spain. Reception reports should be sent by email.

1000@northernstar.no

Graham Smith, like me, lamented the loss of Europe 1 on 183kHz at the turn of the year. He surmised that at least it might now be easier to hear Iceland on 189kHz.

His other observations included Sro 3 Radio Devin (a Slovak station in Nitra) on 1098kHz, with classical music from 1700 to 0500 UTC and Hungarian during the day.

Meanwhile, Bretagne 5 on 1593kHz seemed weaker (and disappeared in late January), making it easier to Radio România Actualități on the same frequency, starting at 0400 UTC.

The medium wave frequency of 1476kHz, once used by Austria, may host a new station called Museumradio AM 1476. The licence applicant, Reinhard Pirnbacher OE5TPM, plans to play music from his collection of 100,000 records, covering many languages and genres. The station will also be online.

www.plattenkiste.net

Romanian Resilience

The European DX Council 2020 conference will be held in the Romanian

LOG CONTRIBUTORS: GS = Graham Smith, Bury St. Edmunds, Suffolk. Sony ICF-SW600 and a telescopic antenna. LC = Lionel Clyne, Faversham, Kent. Lowe HF-150, random wire or homemade loop. OR = Owen Rutherford, London. Lowe HF-150 and a Wellbrook loop. NT = Nicky Tesla, Sheffield. XHDATA-D808. SC = Scott Caldwell, Warrington, Cheshire. Sony ICF 2001D, Lowe HF225, and a Wellbrook loop.

capital, Bucharest, from September 10th to September 14th. A visit to Radio Romania International is planned, along with presentations, sight-seeing and the traditional Saturday night banquet. After the conference, an optional tour to Brasov is being arranged.

<https://edxcnews.wordpress.com>

At the 50th anniversary conference in Finland in 2017, which was held with the Finnish DX Association’s annual summer meeting, EDXC Radio took to the air, on 9290 and 9270 kHz. A commemorative QSL card was issued for the broadcasts (Fig. 3).

In January, a Radio Romania International employee confirmed that there will be a QSL card series this year but it will be delayed. This is a knock-on result of cuts in 2017 to the licence fee. DXers are encouraged to be patient. You can send reception reports online

www.rri.ro/en_gb/pages/receptie

Other Romanian stations heard in Europe are the state broadcaster’s domestic services. A list is shown in Table 1. As well as talks and features in Romanian (and minority languages including Bulgarian and Hungarian), you will hear a lot of music. Alongside enchanting Romanian folk and pop sounds, rather surprising hits from 1970s British and German can also appear. Classical music is also a mainstay.

www.romania-actualitati.ro

- **Radio România Actualități, several sites**
Romanian, 153, 567 and 603kHz
- **Radio Romania Timisoara**,
Bulg./ Hung./Germ./ Romanian, 630kHz
- **Radio România Actualități**
Sighetu, Romanian, 711kHz
- **Radio România Actualități**
Lugoj, Romanian, 756kHz
- **Radio România Actualități**
Tancabesti, Romanian, 855kHz
- **Radio România Actualități**
Cluj, Romanian, 1152 and 1593kHz
- **Radio România Actualități**
Galbeni, Romanian, 1179kHz
- **Radio România Actualități**
Galati, Romanian, 1332kHz
- **Radio România Actualități**
Sighetu, Romanian, 1404kHz
- **Radio România Actualități**
Râmnicu Vâlcea, Romanian, 1422kHz
- **Radio Romania International**
In 13 languages, short wave (see website).

Table 1: A selection of Romanian Radio Stations heard in the UK.

www.radio-timisoara.ro

www.rri.ro

www.radioromania.ro

Radio Timisoara airs news and features; a photo of the station studio featured on the RRI QSL card for November 2013.

Meanwhile, in the Czech Republic, Radio Prague International’s QSL cards for 2020 are on the theme of radio transmitters, a good choice! (Fig. 4).

www.radio.cz/en/static/qs/qs-cards

Transatlantic Medium Wave Logs

kHz	UTC	Station and location	Language	SINPO	Initials
680	0600	CJOB, Winnipeg, MB, Canada	English	22222	SC
570	0458	CFCB, Corner Brook, NL, Canada	English	33222	SC
580	0558	CFRA, Ottawa, ON, Canada	English	33222	SC
590	0400	VOCM, St John's, NL, Canada	English	33333	SC
620	0600	CKCM, Grand Falls-Windsor, NL, Canada	English	22222	SC
680	0400	WRKO, Boston, MA, USA	English	22222	SC
700	0559	WLW, Cincinnati, OH, USA	English	32222	SC
710	0400	WOR, New York, NY, USA	English	32222	SC
730	0559	CKAC, Montreal, QC, Canada	English	32222	SC
780	0359	WBBM, Chicago, IL, USA	English	22222	SC
820	0600	WBAP, Fort Worth, TX, USA	English	22222	SC
840	0359	WHAS, Louisville, KY, USA	English	32222	SC
860	0359	CJBC, Toronto, ON, Canada	French	22222	SC
870	0255	WWL, New Orleans, LA, USA	English	22222	SC
880	0459	WCBS, New York, NY, USA	English	22222	SC
930	0522	CJYQ, St. John's, NL, Canada	English	32222	SC
1020	0500	KDKA, Pittsburgh, PA, USA	English	22222	SC
1030	0255	WBZ, Boston, MA, USA	English	32222	SC
1040	0359	WHO, Des Moines, IA, USA	English	22222	SC
1130	0214	WBBR, New York, NY, USA	English	33333	SC
1140	0534	CBI, Sydney, NS, Canada	English	22222	SC
1160	0400	WYLL, Chicago, IL, USA	English	32222	SC
1270	0401	WXYZ, Detroit, MI, USA	English	22222	SC
1510	0400	WWBC, Cocoa, FL, USA	English	22222	SC
1520	0259	WWKB, Buffalo, NY, USA	English	22222	SC
1580	0358	CKDO, Oshawa, ON, Canada	English	32332	SC
1620	0307	Radio Rebelde, Cuba	Spanish	32332	SC
1690	0400	WPTX, Lexington Park, MD, USA	English	22222	SC

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www.bhi-ltd.com





The bhi NES10-2 MK4 Noise Cancelling Speaker

The editor has had the new bhi NES10-2 MK4 Noise Cancelling Speaker at his listening post, and he relates his impressions of this very practical shack accessory.

Georg Wiessala
wiessala@hotmail.com

I have owned a number of bhi noise cancelling products before, among them a previous model of this speaker, as well as a few of bhi's external noise cancelling units, such as the Compact In-Line and Dual-In-Line Noise Eliminating Modules, and the desktop 10W DSP Noise Cancelling Base Station speaker. I have always found this kind of technology extremely useful.

<https://www.bhi-ltd.com>

The bhi DSP noise cancelling technology is unique, because it actually identifies the speech signal first, after

which more or less noise can be passed through with the speech signals.

Bhi also offers the ParaPro EQ20 Parametric Equaliser. This unit is similar to the NES10-2 MK4 speaker, in that it has parametric equalization. However, the significant difference is that the EQ20 offers stereo amplified DSP noise cancelling, combined with parametric equalization.

If you own or are constructing, homebrew DSP *audio* filters, keep in mind that these are different from DSP *noise cancelling* audio filters; the latter is specifically what bhi does.

I am not a good homebrewer (except when it comes to beer, naturally); most

of what I put together blows up or melts down. Therefore, I am always grateful for some ready-made DSP technology.

Noise Suppression Without Tears

So far, my main practice of DSP / noise suppression technology has been inside radios already equipped with it, e.g. the JRC NRD 545 DSP, which I owned for many years.

A more recent alternative is the use of Software-Defined Radio, such as (currently) the SDRPlay RSPdx and AirSpy HF+ 'Discovery' devices, if you prefer this way of operating.

More often than not, though, I follow Clint Gouveia's advice in our current series on *Portable DXing*, and I take a suitable radio on the road, for some, more or less, extreme listening, for example on a Cumbrian fell. Here, and, of course, at home in the shack, I am using the bhi units for a whole range of purposes.



(1) Clearing up noise in the Very Low Frequency (VLF) band, to be able to visualise (and, sometimes, hear) sounds and signals. Time signals, for example (see my short article in another part of this month's issue). Using the NES10-2 MK4 Noise Cancelling Speaker while checking out the MSF time signal on 60kHz, for instance, is very much more comfortable with the technology, because I can cut out background hiss and adjust the tone of the signal to a non-offensive pitch level.

(2) On long wave and medium wave, the main advantage of the NES10-2 MK4 has been evident when listening to broadcast radio stations in this band; especially French ones. When I listen to Radio Monte Carlo (216kHz) or RTL (234kHz), having the NES10-2 MK4 on level 3-4 noise reduction, makes the difference between 'mash' and complete intelligibility. I have relatives in France, and I try to keep in touch with the language via those favourite radio

stations of mine. They are also online, of course, if I fancy switching technology.

(3) In terms of utility (voice) signals, my interest is in maritime and aeronautical. Shannon (e.g. 5504kHz) and RAF (5450kHz) VOLMETS, for example, once again, benefit enormously from switching the speaker in line; the noise disappears, you'll soon find your own balance between general output level (on top of the speaker) and noise cancellation intensity (at the back).

(4) Talking about Airband, the speaker does a fine job 'upgrading' voice signals on Airband from my vintage Signal Communications R-535 Receiver. The words 'life', 'lease of', and 'new' spring to mind since the inbuilt speaker is tired.

(5) Many of you will consider buying the NES10-2 MK4 for amateur radio, of course, and this is, arguably, the major 'mainstream' application of the device. It works extremely well on the ham bands. If like me, you are, perhaps, beginning to suffer a bit from age-related hearing

Unless your interest is more scientific or commercial, you will be very well served with this new incarnation

loss, you will find it a very useful shack accessory indeed.

The images on this page are not part of a full review of the bhi NES10-2 MK4, but they aim to give you an impression of how you can put this speaker to use if your interest does not primarily lie in ham radio.

Unless your interest is more scientific or commercial, you will be very well served with this new incarnation of what is a very successful product from the bhi stable.

My thanks to Graham Somerville of bhi Ltd., for the loan of the speaker.

<https://www.bhi-ltd.com>

Feedback

Have you got something new to tell our readers? If so, then drop a line to wiessala@hotmail.com



Bernard Nock, of the Military Wireless Museum, wrote in, in response to Scott Caldwell's *Radio History* column on the *Challenger* Space Shuttle disaster (*RadioUser*, March 2020: 50-55). Bernard said, "Very rarely do I feel moved to tears. Standing in a Commonwealth cemetery in a foreign land, listening to a sublime piece of classical music and now reading the transcript of the last seconds of the Shuttle crew on their last decent as detailed in the March 2020 issue article. It's heartbreaking to imagine what the crew must have been going through and not realising the legacy they would leave to the world on the cockpit voice recorder. I can only imagine what the technicians at the laboratory must have felt when they first pulled the voices off that damaged tape and slowly typed those words onto paper, having to replay it several times to get it as accurate as possible. A job like no other. I thank Scott Caldwell for that article." Bernard, I'd like to add my thanks to Scott to yours; rarely has one of our articles had such an effect. I think the sensitive handling of the inclusion of the 'direct' voices, as it were, of the victims of the tragedy made the article stand out. Thank you very much for your kind words of feedback – **GW**.

Peter McQuarry wrote in from California, in connection with his contribution on 'Green Scanning' in the February 2020 issue (*RadioUser*, February 2020: 18). He said, "Hello Georg, Thank you for publishing my ar-

ticle in *RadioUser*, it means much to see my work in print."

Many thanks for your letter, Peter, the subject of pursuing our hobby while also saving the planet has struck a chord with many of our readers, and your piece has inspired many to think about more sustainable ways of providing electricity for our equipment. I have been experimenting with using *TalentCell* 12V Lithium-ion batteries with my short wave radios (www.talencell.com). They run my shack for days, following a full charge, and they have the additional advantage of cutting down any noise from PSUs. I shall investigate solar power next. What are other readers doing? Let me and the readers know what you are up to next, please – **GW**.

Our regular contributor, **Chrissy Brand**, reports on a very interesting event, called *Canterbury Tales: UK International Radio Drama Festival*, from 23rd to 27th March 2020. We'll take this up again next month, but for now, Chrissy reports, "The annual UK International Radio Drama Festival is free to the public. It takes place in Canterbury, Kent, from Monday, March 23rd to Friday, March 27th. For anyone with an interest in radio drama, it is well worth your attending a day or two. You can follow the scripts on your e-reader, meet fellow radio drama fans and get a good idea of the amazing variety and high-quality drama output that there is around the world. 'For All Beneath the Moon' is this year's enticing and poetic theme,



and there are over 50 audio dramas lined up for 2020. It all looks good to me, but here are five of the many plays that I want to hear more about: *Munch and Munch*, *Croatian TV and Radio*; *Radio Amateur*, *Polskie Radio*; *Doubt is Our Product*, *Joseph Graceffo, USA*; *The Day the Internet Stood Still*, *Daniel Johnson, UK*; and *Fly Me Raté*, *Radio France*."

Thanks, as always, Chrissy, and this is a good reminder for all to regularly check our website, to stay up-to-date with news and events, reader feedback and new products – **GW**.
<https://radiodramafestival.org.uk>

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DealerGuide

For Sale

CHECK OUT OUR WEBSITE! Windows 10 ready CAT and programming cables, latest version SDR USB sticks, replacement microphones, cables and PTTs for studio microphones, linear switching cables and much more.
technofix.uk or www.technofix.co.uk

Wanted

VINTAGE FIREWORK COLLECTOR
Do not light the blue touch paper and burn British heritage. Private collector will pay cash and collect from anywhere. Licensed explosive storage. Call **Tony on 07956 506300**

TradingPost

FOR SALE

INNOVANTENNA 2M 10 EL OWL ANTENNAS X 4. Only erected for a short time so in new condition. Complete with Ecoflex 10 feeders and ferrite ring baluns. Low noise and good gain. Excellent G/T figures. These will make a superb EME system or a potent tropo or contest array. I will only sell all four antennas together and buyer must collect. Full spec on Innovaantenna's website. **£475. GW4ZHI bryn@howellpryce.com. 01974 261180 ABERYSTWYTH**

EDDYSTONE 990S UHF RECEIVER, in good mechanical and cosmetic condition. This has had a new tuning gearbox, I have received signals on it. It covers 250 to 850MHz. **£100ovno. Tel: 01629 540810**

WOXUN KG-UV9D(PLUS) LIMITED EDITION PACK. Original box, all complete and almost unused. Some repeaters put into memories. Cheap at £90 but no offers. Collection preferred but can post for £12.00 extra.
Phone David (G8FMX). 01775 841877 NR SPALDING, SOUTH Lincs

MARCONI TF2370 SPECTRUM ANALYSER for sale on behalf of widow of a very old friend. Unknown value so sensible offers please. Collect only. **Neil G3RIR. neil.g3rir@gmail.com SOUTH LEICS**

BANTEX EX-SHOP BASE MOUNTING VERTICAL HF AERIAL. 3x9 foot sections. Aerial or flagpole? £95. Flex 1500 SDR radio. As new. **£300. Tel: 01302 391030 DONCASTER**

HEATHKIT HW-100 HF TRANSCEIVER and SB-600 PSU Speaker - for parts only £100 Icom IC-R7000 scanner receiver - £100 Buyer collects **Please contact John Norris G4JEN. john.e.norris@talk21.Com HEMEL HEMPSTEAD**

WANTED

OLD HALF INCH FERRITE RODS. Must be half inch 12.7mm in diameter and be six inches long or more. Will pay good money for the old half inch ferrite rods. **Contact Peter Tankard on 0114 2316321 or email me at: peter.tankard@gmail.com SHEFFIELD**

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(subscribers free) and will also be published in Practical Wireless unless requested otherwise.

BY EMAIL Firstly email your advert's wording to kristina.green@warnersgroup.co.uk and then call **01778 392096** to make your payment. **BY POST** Your order form can be downloaded from bit.ly/tradingpostform

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Please help us to help you by preparing your advert carefully. Any advert which contains ?? marks indicates that the advertising dept. could not read/interpret the wording.

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You should state clearly in your advert whether equipment is professionally built, home-brewed or modified. The Publishers of Radio User also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

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Rallies & Events

Plan your visits with our list of forthcoming events. Warners [RadioUser & Practical Wireless] will be attending events marked with an asterisk [*]. Club secretaries/ event organisers: Please send full and accurate details of your events, affiliations and clubs as early as possible, if you would like to be mentioned here: wieessala@hotmail.com

March 15th (Sunday)

WYTHALL RADIO CLUB HAMFEST:

The 35th Wythall Radio Club Hamfest will take place at the Club HQ, Wythall House, Silver Street, Wythall B47 6LZ. Doors open at 9.45 am (9.30 am for disabled visitors). Free on-site parking. Admission £4. Four halls of traders, including a bring-and-buy and a club stand. A selection of refreshments will be available all day, and there will be bar facilities within Wythall House from midday.

01386 839 655

wrc4hallsradio@outlook.com

www.wythallradioclub.co.uk

March 22nd (Sunday)

CW BOOT CAMP: Stirling and District ARS, Unit 68, Banded Industrial Estate, Throsk FK7 7NP. GMDX. In conjunction with Stirling & District ARS are running a CW Boot Camp in Stirling. Great opportunity to improve your CW skills, registration open to all. Further information:

<https://www.gmdx.org.uk/cwbootcamp>

March 29th (Sunday)

CALLINGTON ARS RADIO RALLY: This year's Callington Rally is at Callington Town Hall, Callington, Cornwall PL17 7BD. Doors will be open from 10 am to 1 pm; admittance is £2. There will be a bring-and-buy (10% commission) and trade stands. Catering is available on site. Ample free parking can be found in the adjacent carpark. The rally is organised jointly by the Devon & Cornwall Repeater Group and the Callington Amateur Radio Society.

07854 088 882

2e0rph@gmail.com

March 29th (Sunday)

DOVER ARC HAMZILLA RADIO FEST AND ELECTRONICS FAIR: The Dover Amateur Radio Club (CARC) Rally will be taking place, once again, at last year's wonderful venue of Discovery Park, Sandwich Kent CT13 9FF. There will be offers, talks and demonstrations. Admission, (Early Bird 9:30 am) is £5; general & disabled (10:00 am) is £3; under 16s and carers for disabled visitors go for free. Hot and cold drinks and food will be on sale. Lots of big-name traders already booked. RSGB-licenced exam venue, exams are

available on the day. Find us, buy tickets or book a table here:

<https://www.hamzilla.uk>

<https://darc.online>

April 4th (Saturday)

23RD ANNUAL GMDX CONVENTION:

The Convention of Scotland's DX Association will take place at the King Robert Hotel, Whins of Milton, Stirling FK7 0LJ. GMDX AGM, lectures and card checking.

www.gmdx.org.uk

April 5th (Sunday)

HACK GREEN BUNKER RALLY: The rally takes place at the Hack Green Secret Nuclear Bunker, Nantwich, Cheshire CW5 8AL. Sale of electronic equipment, amateur gear, components, military radio items and vehicle spares. Doors open 10 am.

01270 623 353

coldwar@hackgreen.co.uk

www.hackgreen.co.uk

April 5th (Sunday)

YEOVIL ARC QRP CONVENTION: The Digby Hall, Sherborne, Dorset DT9 3AA. Doors open 9.30 am to 2 pm, admission is £3 (regrettably no dogs please, except guide dogs). The event is supported by the RSGB, RAFARS and BYLARA. There will be club stands as well as new and 2nd hand stalls. Two talks are scheduled during the day; Getting Aerials to Radiate Well, by Rob, G3MYM (10.30 am), and The Hentenna by Dave, G3ZXX (12.00 noon). Refreshments will be available on site.

wjh069@gmail.com

secretary@yeovil-arc.com

<http://Yeovil-arc.com>

April 11th (Saturday)

MFARS SURPLUS SALE & RADIO MEET:

The event is at Linkwood View, 3 Thornhill Drive, New Elgin, IV30 6GQ. Doors open 10 am; sale from 12 noon. Refreshments available, and there will be a large meeting-up area. Free car parking. Tables £10.

mfars.secretary@gmail.com

www.mfars.club

April 19th (Sunday)

WEST LONDON RADIO & ELECTRONICS SHOW (KEMPTON RALLY): The West London Radio and

Electronics Show will take place at Kempton Park Racecourse, Staines Road East, Sunbury on Thames, TW16 5AQ. A talk-in station will be on air. Car parking is free, and doors open at 10 am, with disabled visitors gaining access 10 minutes earlier. There will be trade stands and a bring-and-buy, as well as special-interest groups and lectures. Catering is available on site.

08451 650 351

info@radiofairs.co.uk

www.radiofairs.co.uk

April 26th (Sunday)

ANDOVER RADIO CLUB RADIO & COMPUTER BOOT SALE:

Sellers 9 am - Buyers 10 am. Organised by The Andover Radio Amateur Club. Tables in the hall £10. £8 per Boot & £2 Buyers. Postcode for your Satnav: SP11 0JE.

arac@arac.org.uk

www.arac.org.uk

April 26th (Sunday)

CAMBRIDGE REPEATER GROUP RALLY:

The event takes place at Foxton Village Hall, Hardman Road, Foxton, Cambridge CB22 6RN. Car parking is free. Doors open 9.30 am for public entry and 7.30 am for traders. Entry is £3. There will be a talk-in station. You will see traders a Bring-and-Buy and an RSGB bookstall. There will be a car boot sale area. Catering is available on site (burger van has been booked).

Tel: 07941 972 724

rally2019@cambridgerepeaters.net

www.cambridgerepeaters.net

April 26th (Sunday)

NARSA - NORTHERN AMATEUR RADIO SOCIETIES ASSOCIATION EXHIBITION (BLACKPOOL RALLY):

The NARSA (Blackpool) Rally will take place at its usual venue, The Norbreck Castle Exhibition Centre, Queens Promenade, Blackpool FY2 9AA. Doors open 10:30 am (10:15 for disabled visitors). Free on-site parking. Admission £5 (under 14's free). Food and beverages available all day. Usual traders, club- and special-interest groups, and an RSGB book stand. There is also a construction-competition and a club stand competition.

01270 761 608

dwilson@btinternet.com

www.narsa.org.uk

May 2nd (Saturday)

CDXC CONVENTION, AGM & DINNER:

This UK DX Foundation event is at the Link Hotel, Loughborough. Non-members are welcome, and there will be a partners' programme. Four DX & technical talks. Costs vary. Full details in January's CDXC Digest.

Chris@G3SVL.com

www.cdxc.org.uk

May 3rd (Sunday)

THORPE CAMP HAMFEST:

The Hamfest is at the Thorpe Camp Visitor Centre, Tattershall Thorpe, LN4 4PL. Open for traders from 6.30 am and to the public from 9 am. Entry is £4, with children under 12 going free. Hot and cold refreshments are available on site. Car parking within the grounds.

0795 665 4481

May 8th (Friday)

DARTMOOR RADIO CLUB RALLY

: This event is at The Butchers Hall, Pannier Market, Tavistock PL19 0AL. Doors open at 10 am. Admission is £2.50. There will be traders and a bring-and-buy. Refreshments will be available.

07854 088 882

2e0rph@gmail.com

May 15th to 17th (Friday to Sunday)

DAYTON HAMVENTION 2020: Greene County Fairgrounds and Expo Center, Dayton, Ohio, USA.

<https://hamvention.org>

May 16th (Saturday)

READING DX MEETING: The Reading International Radio Group meets from 2.30 to 5 pm in Room 3 at Reading International Solidarity Centre (RISC), 35-39 London Street, Reading RG1 4PS. Meetings are an opportunity to get together for anyone interested in listening to broadcast stations from around the world on the short wave, medium wave and FM bands. All meetings include a well-researched talk and tea break.

barraclough.mike@gmail.com

www.bdx.org.uk/diary.html

May 31st (Sunday)

DURHAM DISTRICT ARS RADIO RALLY:

The show is at the Bowburn Community Association, Durham Road, Bowburn, Co. Durham DH6 5AT Doors

open 10.10 am to 2.30 am with disabled visitors gaining access at 10 am. Admittance is £2. There will be traders, a Bring-and-Buy, as well as an RSGB bookstall and Special Interest Groups. Catering and a licensed bar are on site.
07826 924 1192
dadars@gmx.com.

June 6th (Saturday)
ROCHDALE & DISTRICT ARS SUMMER RALLY: The rally is at St Vincent de Paul's, Caldershaw Road, off Edenfield Road, Norden, Rochdale, OL12 7QR. Doors open to the public at 10.15 am, with disabled visitors gaining access 15 minutes earlier. Admission is £2.50, under 12s go free. Pitches are £5 if you have your own table or £10 with a table provided. Refreshments are available.
0777 811 3333
m0nvq@outlook.com

June 7th (Sunday)
SPALDING DARS ANNUAL RALLY: The rally will take place at the Holbeach Community Sports Academy, Pennyhill Lane, Holbeach PE12 7PR. Doors are open at 9.30 am, and admittance is £3. The venue offers easy access from the A17, large area for boot traders, and a modern hall for indoor traders. Please note this is the same venue as last year. There will be a Car Boot Sale, RSGB Book Stall, Special Interest Groups and trade stands. Catering is available on site and there will be a prize draw/raffle.
07754 619 701
rallysecretary@sdars.org.uk

June 14th (Sunday)
ASRA SCOTTISH RADIO AND ELECTRONICS CONVENTION: The convention is at GTG Glasgow, 1330 South Street, Glasgow G14 0BJ. Doors open from 10 am to 4 pm. There will be traders, an RSGB bookstall and talks on the day. Catering is available on site. Bookings via the website:
www.asrarally.com

June 14th (Sunday)
EAST SUFFOLK WIRELESS RALLY (IPSWICH RADIO RALLY): The 2020 FDARS rally is at the Kirton Recreation Ground, Back Road, Kirton IP10 0PW (just off the A14). Doors open at 9.30 am, and the entry fee for visitors is £2. The venue has free car parking. Trade tables cost from £10.
 There will be trade stands, a car boot sale, a bring-and-buy, special-interest groups, GB4SWR HF station, and an RSGB bookstall. Catering is available on site.
07710 046 846
www.eswr.org.uk

June 14th (Sunday)
JUNCTION 28 RADIO RALLY: The event is at the Alfreton Leisure Centre Bowls Hall, Church Street, Alfreton DE55 7BD. Promoted by South Normanton Alfreton and District Amateur Radio Club. NB: This is not at club QTH. Doors are open 10.15 am (Traders 8 am). Tables are £12.00. Admission is £3.00. There will be around 100 tables, all indoors.
 Bar/refreshments in hall and full café in the main sports centre. Dealers & private traders, RSGB stall, local and national clubs. New and used rigs, vintage, antennas, components, spares, books and magazines. Full disabled access, free parking.
snadarcsec@gmail.com
www.snadarc.com

June 21st (Sunday)
17TH WEST OF ENGLAND RADIO RALLY: The 17th West of England Rally will take place at the Cheese & Grain venue, Market Yard, Bridge Street, Frome, Somerset BA11 1BE. Doors open from 10 am to 2 pm. Adult admission £3, accompanied children under 14 are free. There will be inside and outside trade stalls and an RSGB bookstall. A café serving hot & cold food will be available.
01225 873 098
rallymanager@westrally.org.uk
www.westrally.org.uk

June 28th (Sunday)
33RD NEWBURY RADIO RALLY: Newbury Showground, next to M4 J13, RG18 9QZ. There is free car parking. Traders can gain access as 8 am and visitors at 9 am. Admissions will be £2.50. Car boot sale pitches are £12.50. The show will have a huge selling area with a display area of an amateur radio station, exhibits, special interest groups, clubs and societies. NADARS training instruction will be available to discuss courses for Foundation and Intermediate exams. Catering is available on site. Advance bookings.
www.nadars.org.uk/rally.asp
NewburyRally@nadars.org.uk
www.nadars.org.uk

July 4th (Saturday)
STOCKPORT RS RALLY: New Venue: Bridgehall Community Centre, Siddington Avenue, Stockport SK3 8LX. The new venue is ground floor only. Doors open 9.30 am (traders from 7 am). Admittance is £2.50 with under 16s free. There will be trade stands (tables cost £10 each), special interest groups and an RSGB Bookstall. Catering is available on site and locally. The venue is accessible by bus from Stockport town centre and mainline rail.
07506 904 422
info@g8srs.co.uk
www.g8srs.co.uk

July 5th (Sunday)
CORNISH RADIO AMATEUR CLUB RALLY: The meeting is at Penair School, St Clements, Truro TR1 1TN. Doors are open at 10.30 am. There will be trade stands, club/special interest groups, and a bring-and-buy stall.
01209 821 073.
http://gx4crc.com

July 5th (Sunday)
BARFORD NORFOLK RADIO RALLY: The meeting is at Barford Village Hall & Green, Barford, Norwich, NR9 4AB. Opens 9 AM (traders from 8 AM), with Talk-in on S22; featuring trade stands,

car boot sales, bring-and-buy, raffle, repeater groups, catering, and free car parking. Entry £2.00 per person / under 16's free. Pitches £8.
radio@dcpmicr.com
www.norfolkamateurradio.org

July 12th (Sunday)
MCMICHAEL RADIO RALLY AND BOOT SALE: Reading Rugby Football Club, Sonning Lane, Sonning on Thames, Reading RG4 6ST. Talk-in station on 145.550MHz. Doors open 9.30 am (traders can set up from 7.30 am), admission £3 with under 16s free. Car boot sale pitches £10 (with two passes). There will be trade stands and exhibition displays. Catering is available on site as well as a bar.
https://mcmichaelrally.radarc.org

July 18th (Saturday)
READING DX MEETING: The Reading International Radio Group meets from 2.30 to 5 pm in Room 3 at Reading International Solidarity Centre (RISC), 35-39 London Street, Reading RG1 4PS. Meetings are an opportunity to get together for anyone interested in listening to broadcast stations from around the world on the short wave, medium wave and FM bands. All meetings include a well-researched talk and tea break.
barracough.mike@gmail.com
www.bdx.co.uk/diary.html

July 19th (Sunday)
FINNINGLEY AMATEUR RADIO SOCIETY RALLY: The FARS rally is at the Hurst Communications Centre, Belton Road, Sandtoft, Doncaster DN8 5SX. Doors are open at 9.30 am. Free off-road parking. Massive indoor and outdoor trader's area. Hot food and drinks all day. Major traders and club stalls, from microwave components to QRP kits. All on one level. Admission £3.
07831 614 640
Kevin.Avery@tunstall.com
07966 479 195
martin.m0hom@gmail.com

In next month's RadioUser

- First UK Review: Reuter RLA4E active loop
- Time Signal Stations (Part Two)
- Update: Farmers Voice Radio in Africa
- Named Storms and Signals from Space

Plus all your favourite regular features and columns
The May issue is on sale on the 23rd April 2020





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SDRplay

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The Antenna Jet AAS300



A USB powered antenna splitter designed to work between 9kHz and 300MHz. Now you can use your one antenna with up to 3 receivers simultaneously. Finally, you can listen to marine band traffic, The Archers on Radio 4 and the air band at the same time (provided your antenna will cover it all!) **Only £234.95**

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A USB controlled antenna switch and mixer. It can be used as a simple switch, or can be used to switch in more than one antenna, to aid receiving to an optimum performance.



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GigActiv GA3005
 A portable active antenna capable of covering 9kHz to 3GHz. Perfect if you are say on holiday and want to have a listen to the bands. You'll need to provide it with 5V via a USB cable (included) and some coax but it is just ready to go.
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WHISTLER TRX-1 DIGITAL SCANNER

The Whistler TRX-1 Handheld Scanner is a multi-system adaptive digital trunking scanner with Motorola P25 Phase I, X2-TDMA, Phase II and DMR making it capable of monitoring unencrypted channels/systems.



£419.95



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ICOM IC-R30 SCANNER



The Icom IC-R30 has extremely wide coverage and supports all of the usual analogue modes (FM, AM, SSB, CW) as well as a few digital modes including NXDN, P25, DPMR and DSTAR. A worthy upgrade over the older IC-R20.

ML&S: £569.95

AOR AR-DV1 Communications Receiver

ML&S: £1199.95



Covers 100kHz to 1300MHz in traditional analogue modes (SSB, CW, AM, FM, S-FM, W-FM) as well as various digital modes. In fact, we know of no other radio in this category that can decode Icom's D-STAR mode, Yaesu's new C4FM mode, Alinco's digital mode, NXDN (note: 6.25kHz only), P25 Phase 1, etc. Plus lots of interesting features! www.HamRadio.co.uk/ardv1

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New digital TruckTracker V Professional Scanner Receiver, covers 25-1300MHz wideband frequencies.

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Communications handheld receiver. While retaining basic features of its popular predecessor the IC-R5, the IC-R6 contains many improvements including 100 channel per second scanning speed, 1,300 memory channels, 15 hours of continuous receive capability, optional drop-in charger stand and voice control squelch.



ML&S: £199.95

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Wideband SDR Receiver. 150kHz-1.9GHz incl SAW Filters.

www.HamRadio.co.uk/funcube **ML&S: £149.95**



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ONLY £339.95



EXPERT ELECTRONICS COLIBRI NANO

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