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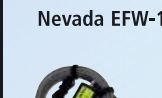
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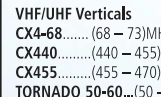
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- SY50-5..... 5 el 50MHz 10.5dBi..... £129.95
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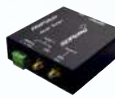
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per metre..... £4.30 price per 102m drum..... £429

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- Too many features to list here - visit our web site for more details!

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- Receives: 25-1300MHz
- SD card slot

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ALBRECHT



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ALBRECHT



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RadioUser

ISSN 1748-8117

April 2022 Vol. 17 No 4

On sale: 31 March 2022

Next issue on sale: 28 April 2022

RadioUser

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Stig Hartvig Nielsen shares the latest version of his Europe-wide compilation of Short Wave Stations. Have a listen and discover a plethora of exciting new speech and music alternatives.

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Visit the *RadioUser* bookstore to acquire all the titles we have reviewed here, and many others besides, on all aspects of radio, plus our popular archive CDs.

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22 Book Review (II)

The editor takes an in-depth look at two advanced Non-Directional Beacon (NDB) Monitoring Annuals and considers their key contents, target audiences and practical serviceability.

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7 News and Products

The WinRADIO Excelsior Ultra; Aerial Modelling with AN-SOF7; Klingenfuss Updates; HanRongDa HRD-747; DUAL Antennas and Malahit 50kHz-2000MHz DSP SDR; Runbo P5 4G; plus radio news. (See also pp.41 and 59 and www.radioenthusiast.co.uk).

24 TV and Radio, Past and Present

In their decade-by-decade inspection of the BBC's history, Keith Hamer and Garry Smith travel through the 1950s and find new transmitters, pioneering programmes and technical innovation.

28 The Reuter RFA1A Indoor Ferrite Loop

Aerials Now columnist Keith Rawlings presents the first of two reviews this month, looking at an exciting and powerful new indoor magnetic loop aerial covering 130kHz to 11MHz.

34 Emerging Issues in Radio

Chrissy Brand weighs up the present and future success of the distribution strategies, funding plans and listener profiles of some of the main international public radio broadcasters.

38 International Radio & New Media

In her second contribution this month, Chrissy has news on Ukrainian radio, looks at country waves, assesses a ground-breaking community radio concept and shares the very best listening tips.

42 Digital Radio

Kevin Ryan introduces a range of ways in which you can appreciate global radio broadcasts in the Digital Radio Mondiale (DRM) format and looks at programming details and apps.



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Welcome



46 The Moonraker/ Deshibo GA-450 Indoor Loop Aerial

The editor test-drives an easy-to-use compact indoor reception loop for the portable mobile operator, DXer and general radio enthusiast, using both traditional and hybrid/ SDR equipment.

49 The Cross Country Wireless (CCW) LAA ++ Aerial

In his second evaluation for this issue, Keith Rawlings puts the Cross Country Wireless LAA++ loop aerial through its paces and sheds some light on Numerical Electromagnetics Code (NEC).

52 Push-to-Talk

In this month's roundup of the world of Two-Way Communications, Tim Kirby finds a great radio use for a digital hotspot, reports on CB DXing and leans about an experiment involving a kite.

55 Rallies and Events

With the news that there is going to be a *National Hamfest* this year just having come out, we have the UK's most comprehensive list of Rallies, Buildathlons, Swapmeets, and many related events.

56 Radio in History

Scott Caldwell revisits the Earthquake that shook Alaska in 1964 and highlights how one brave radio host was able to make all the difference in times of national disaster.

60 Maritime Matters

Robert Connolly offers his first 2022 NDB Survey, investigates DXing and meteorological conditions, announces his new NDB Book and shows how you can log beacons, even with hearing loss.

Aerials Galore and the Value of Short Wave

Georg Wiessala
wiessala@hotmail.com

Hello and welcome to the April edition of *RadioUser*. Much has changed in a month, and I am, not for the first time, reminded of a pertinent remark by our friend Jörg Klingenfuss: "In these times of war, remember the key fact: Short Wave (HF) is the only medium for inter-national and inter-continental communication that, unlike, for instance, SATCOM, landline connections, and submarine cables, cannot be blocked, censored, or cut off. What's more, there are no call costs or monthly fees".

How true! The Russian invasion of Ukraine has brought some last-minute changes to our lineup, and I would politely direct you to our *Ukraine Appeal* elsewhere in this issue.

Chrissy Brand has the subject covered in *New Media & International Radio*, although it is more than likely that developments will soon be overtaken by the fast-moving war situation on our doorstep.

More generally, we are focusing on aerials and aerial technologies. You will see this in our feature on the 'OTH0100' Radar, as well as in our equipment reviews. First off, Keith Rawlings tries the *Reuter RFA1A Indoor Ferrite Loop* (130kHz to 11 MHz). Having evaluated Reuter equipment before, Keith was curious as to what this new piece of high-tech had to offer. You'll be surprised.

Keith also offers an assessment – from LF to HF – of the popular *Cross Country Wireless (CCW) LA++ Aerial*, which comes as a separate amplifier and loop element.

Last but not least, I am including a short, user-focused, evaluation of the small *Moonraker Deshibo GA-450* indoor loop, which struck me as an eminently handy solution for many mobile DXers and travellers.

In our regular columns, Scott Caldwell takes the chance to introduce a brilliant female US radio host, whom, I would not



mind betting, you have never heard of, and Chrissy Brand looks at funding strategies for public broadcasters. This ties in nicely with a substantial new book on the BBC, which David Harris is recommending this month.

In a slightly-expanded *Maritime Matters* theme, not only does Robert Connolly make fascinating connections between the atmosphere and NDB hunting; he also sees that, using contemporary software and apps, many who are experiencing age-related hearing loss may continue to enjoy this hobby in full.

I am taking a look, meanwhile, at the very latest 2022 NDB listings published by both Robert Connolly and Michael Oexner.

When you move on to the remaining regulars and features in this issue, you can learn about ATC at Boscombe Down, the 1950s at the BBC, community radio, and the DRM format. Plus, there are sections on what a Digital Hotspot can do for your radio enjoyment, and on how long-range CB radio works.

Expect also to find our updated *Rallies* listing – now that we know the 2022 *Hamfest* is on – as well as updates on Short Wave frequencies across Europe, books, CDs, and much more.

Enjoy this issue and stay in touch.

Georg Wiessala
Editor, *Radio User Magazine*
www.radioenthusiast.co.uk

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The image shows a stack of Radio User magazines. The top cover is for December 2021, priced at £4.99. It features a yellow banner at the top that says "WIN | This DSP Noise Cancelling In-Line Module Worth £159" with a small image of the module. The main title "Radio User" is in large, bold letters. Below it, the website "www.radioenthusiast.co.uk" is listed. The main article is titled "TECSUN H-501X" with a sub-headline "We test this highly anticipated receiver to see how practical it is on your travels". There is a "Radio User REVIEW" badge. Other articles visible include "Latest Products" and "Pages of new gear from the major manufacturers". To the right of the magazines is a yellow circular badge that says "SAVE UP TO 20%". Below the magazines is a QR code.

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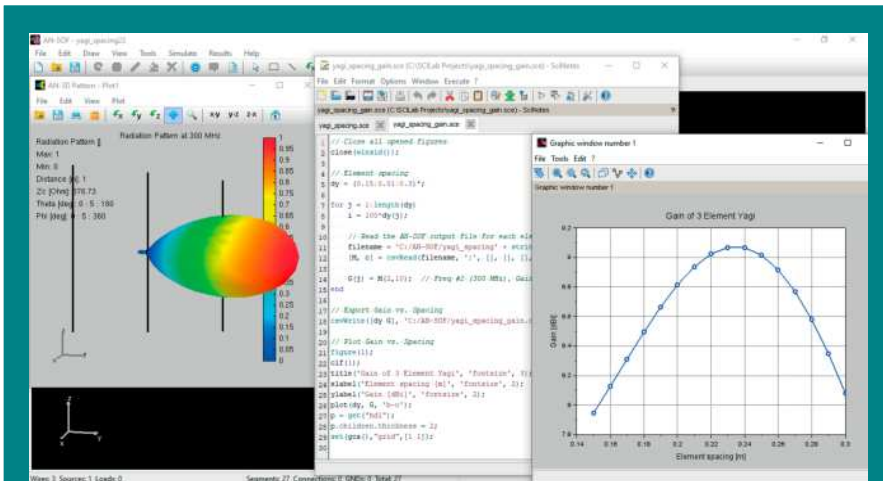
Stay up to date on all the latest equipment reviews and news throughout 2022. PLUS, read the latest issue one week before it's on sale in the shops when opting for the digital magazine! Visit bit.ly/raus-mysub22 to find out more.



*Saving is based on UK annual Direct Debit rate and is correct as of print 27.01.2022. For overseas subscription pricing visit bit.ly/raus-mysub22

Radio Currents

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



Attention Antenna Modellers: AN-SOF 7

The latest AN-SOF 7 aerial modelling software package has just been released. According to the software engineers, the main features of the program will enable you to (amongst other things): Run bulk simulations and process multiple input files with just one click. We have chosen the NEC format for the input files as it is a standard adopted by many users. Forget about running the simulations one by one, run them all at once.

Import a single input file as bulk simulation and get all the output data in one step. All computed parameters are saved as CSV files (power budget, gain, input impedance, VSWR, far and near fields). Export AN-SOF designs to Scilab format (*.sce files) and easily develop scripts that Generate multiple descriptions with varying geometric parameters.

As an example, in the link (the first one, below) you will find the instructions and scripts to get the gain of a Yagi antenna as a function of the spacing between its elements.

(SOURCE: Keith Rawlings)

https://antennasimulator.com/.../AN-SOF_Scripts_Yagi

info@antennasimulator.com

www.antennasimulator.com

Klingenfuss: News & Products

Jörg Klingenfuss reports that solar activity is increasing rapidly and provides perfect HF propagation conditions. He has included updated radiofax schedules of Athens, Funabashi, Guangzhou, Hamburg, Kagoshima, Misaki, Shanghai, and Tokyo, which can be found on the Klingenfuss website. Jörg says, "In these times of war, remember the key fact: shortwave. HF is the only medium for inter-national and inter-continental communication that, unlike e.g. SATCOM, landline connections, and submarine cables, cannot be blocked, censored, or cut off. What's more, there are no call costs or monthly fees".

(SOURCE: Jörg Klingenfuss, *Klingenfuss Publications*)

<https://www.klingenfuss.org/homepage.htm>



Artemis: The WinRADIO NG69DDC is now the Excelsior Ultra

Richard Hillier, of WinRADIO/ RADIXON, wrote in to inform us as follows: "When the development of the G69DDC started, 'Artemis' was selected as its 'strapline-name'. However, with the increasing exposure of the NASA 'Artemis' Moon Landing Programme, many other companies have started using the name. For this reason, we have decided to rename the G69DDC so that we cannot be associated with any other product or project. WinRADIO has a tradition of using 'Excalibur' for HF receivers and 'Excelsior' for HF/VHF/UHF receivers, so we have chosen to use 'Excelsior Ultra' as the new name for the G69DDC. Our website already reflects this change. A new software update (version 1.16) has also been released, which employs the new name (new desktop icons, updated help, User's Guide, and so on)."

[This new high-end SDR will be reviewed by Clint Gouveia, in the **May 2022** issue of *RadioUser* – Ed.]

(SOURCE: Richard Hillier
Radixon | WinRADIO)

<https://www.winradio.com>

<https://tinyurl.com/6wrh7hny>

richard.hillier@radixon.com

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



RadioUser
STOP PRESS!

Nevada: New 10m Mono band Beam from DUAL Antennas Serbia

With the increase in sunspots and more 10m openings now occurring, we are delighted to introduce a new high performance 10m mono-band Yagi from Goran YU1CF at DUAL Antennas Serbia. The DUAL PA28-5-6BHD is a 5 element beam covering 28 – 29 MHz with a gain of 10dBi (15.6 dBi when mounted 20m above the ground). The antenna boom is 6 metres long and designed to give a Front to back ratio of 25 dB, with power handling rated at over 1.5kW. The antenna is of heavy-duty construction and will withstand winds of more than 90 MPH. The first shipment will arrive in the UK around late March and be priced at £679. The antenna is available from UK importers Nevada:
(SOURCE: Nevada)

www.nevadaradio.co.uk



HanRongDa HRD-747

This is a Wide Frequency radio with digital tuning: It can receive FM, MW, SW, SSB, AIR, CB, VHF, UHF, UBD (user-defined) and WX (North American) National Weather Band. Thank you to Frank for sharing – via the US *SWLing Post* – an English-language manual for the HanRongDa HRD-747. This small radio has been called astonishing; a good receiving mini portable with a wide range and many features. Therefore, the manual is important,

especially because there are only a few knobs to manage all functions. The manual defines the radio as, "It is an entry-level toy product for radio lovers, and also the auxiliary product for cross-country activity lovers (VHF/UHF Station reception). It can provide flight information for those who often take planes [...]."

(SOURCES: *SWLing Post* | HanRongDa)

<https://tinyurl.com/39mfns4>

Discover Stampfl Pre-Selector Kits

This kit for an 8-speed preselector can be used universally in 'homebrew' projects, inexpensive SDRs or receivers (Hardware: Heinz Stampfl, HB9KOC; Software: Ernst Kirschbaum, DL2EBV and Rolf Hasler, HB9QN). On the board, there is a low-pass filter for the frequency range up to 41MHz, as well as switchable LC band and 3rd order low-pass filters for different sub-bands. The filter is selected electronically, using buttons on the front panel. The preselector has a bypass function but is only suitable for reception. The kit is currently on offer at CHF350 (ca. £284). The assembly instructions (in German, with clear images) can be downloaded from the Heinz Stampfl website. Among the principal technical specifications are: Frequency range: 0-30MHz; Insertion loss: 1dB; and Operating Voltage: 11-16V.

<https://tinyurl.com/2s3tc5pw>

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RadioUser
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New at Moonraker: Malahit 50kHz-2000MHz 3.5 inch DSP SDR Receiver

The Malahit 3.5" screen 50kHz-2000MHz DSP SDR receiver is now in stock at Moonraker. The SDR is self-contained. Amongst its features are a 3.5-inch capacitive screen and a 4-layer board structure, which offers higher performance than a two-layer PCB.

Demodulation modes are AM, SSB, NFM, and WFM.

At the time of writing, Moonraker specifies the radio's key parameters and functionalities as follows:

- Built on the principle of SDR the function is determined by loaded software
- Frequency range from 50 kHz to 2000 MHz
- AM, SSB, NFM, WFM; variable filter width, adaptive noise suppressor, threshold noise suppressor, for Noise Blanker, AGC, equalizer
- The powerful stm32h743 with a clock frequency of 480MHz is applied
- 3.5-inch IPS display touch screen; built-in UHF
- Controls: 2pcs; encoders with buttons and touch screen
- Consumption: 300mA when listening to headphones
- Powered by an external TYPE-C (for Huawei mobile phone) interface or battery (built-in 3000mah lithium battery), charged by TYPE-C
- Reception on a built-in telescopic or external antenna is to improve the HF reception on a telescopic aerial, and an additional board with a source follower has been developed.
- The board will be built into a standard receiver design.
- Connect to computer via USB, which can transfer CAT, IQ and audio
- 160 kHz span, with scalability
- Sensitivity: Under the condition of up to 250MHz, s/w is 0.3µV = 10dB
- Due to the characteristics of the msi001 chip used, the dynamic blocking range is about 85dB
- Backlight control and SMA female antenna socket
- Motherboard size: 100 x 70mm (without the sizes of connectors).

[Look out for a review of this exciting device in next month's issue of RadioUser - Ed.]

(Source: Moonraker)

<https://tinyurl.com/5y44dsms>

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



Runbo P5 4G DMR VHF/UHF Tablet

The Runbo P5 4G DMR VHF/UHF is described as a 'military-grade' 10" Tablet with DMR Dual Band Radio. Running Android, you can install all the available Play Store apps. This means that you can install *Zello*, *Team Speak*, *EchoLink*, and many others and use the built-in PTT button to key the transmission on such apps.

If you don't reach an EchoLink node, just use 3G, 4G or even Wi-Fi, and you are connected. Never miss a QSO again just because there isn't a nearby repeater.

(SOURCE: network-radios.com [USA])

<https://tinyurl.com/5bndww4m>

info@network-radios.com

<https://runbo.org>



RADIO CAROLINE HIRES 16-YEAR-OLD FROM COMMUNITY RADIO STATION:

Sixteen-year-old Josh Holmes-Bright, a presenter on Caroline Community Radio, has joined Radio Caroline and hosted his first show aboard the *Ross Revenge*. He was approached by the station after bosses heard his shows and thought he would be a good fit for the former pirate. "We are very impressed with Josh's presenting style and personality, not to mention his wide music tastes and knowledge, which make him a great fit for Radio Caroline," said station manager Peter Moore. "His debut shows on *Ross Revenge* received a fantastic response from listeners all around the world. It's important to encourage young talent and, like many of the DJs who started their careers on Radio Caroline over the years, I think Josh has a bright future in broadcasting." Chelmsford A-Level student Josh presented his first show from *Ross Revenge*, which is moored on the River Blackwater in Essex, and he will now be presenting the *Sunday Night Caroline Countdown Show*, which plays popular album tracks. His parents and grandparents are enthusiastic Caroline listeners and Josh has grown up listening to the station. "Joining Radio Caroline is very exciting because it's such a historic station with a great legacy," said Josh. "The support I have received from listeners has been overwhelming and I have had a very warm welcome from the Caroline team. This opportunity means the world to me!"

(SOURCE: Radio Caroline | RadioToday)

<https://tinyurl.com/3a5z77a6>

SATELLITE AND ON-THE-GROUND DATA HELP MONITOR GROUNDWATER IN INDIA:

Climate change and increasing water demand are putting stress on water resources in India. The agricultural sector is particularly stressed, as 40% of agricultural villages have already overused groundwater. Scientists estimate that by 2050, agricultural productivity will decrease by 68% in groundwater-depleted areas. In 2010, the federal government of India pioneered the idea of a nationwide water security plan through the preparation of district- and village-level water budgets to ensure more efficient use of water. Such preparation requires collecting data on rainfall and groundwater levels in the village and budgeting accordingly [...].

(SOURCE: Padmanaban, D. (2022): *Eos*, 103)

<https://doi.org/10.1029/2022EO220092>



A SENTIMENTAL JOURNEY: A new online nostalgia and easy-listening station has been launched by three radio directors. *Sentimental Radio* says it will be a companion station to *Care Radio*, the station for paid and unpaid carers, which launched last year. Hedley Finn OBE, chair of *Care Radio* and one of three people behind *Sentimental Radio* explained: "Care Radio is a station specifically for carers, whether they work for the NHS, in care homes, or in that huge army of unpaid carers who look after family and friends. With *Sentimental Radio*, we're aiming our output at the older generation who, in the main, are the ones being cared for. Care broadcasts a

weekly show called 'Sentimental Journey' aimed at an older audience, and *Sentimental Radio* is essentially a spin-off of that." Peter Milburn is the presenter of *Sentimental Journey* and one of the others behind the new service. He stated, "The reaction to my show has been really heartening. So many people enjoy listening to greats such as Ella Fitzgerald, Matt Monro and Vera Lynn, and they're rarely heard on the radio these days. I'm so pleased that through *Sentimental Radio* we'll be playing artists like that 24 hours a day." The third director of the new service is John Dash, CEO of *Care Radio*. He added: "Sentimental Radio will complement *Care Radio* so well. The feedback we've had from *Care* listeners is that they love our station – but 'how can we have something for my dad or my gran?' It's about remembering that special song you've not heard for years so that every track takes you back."

(SOURCE: *Sentimental Radio* | *Care Radio* | *Radio Today*)

www.sentimentalradio.co.uk

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SOLAR ORBITER AND MAGNETIC RECONNECTION:

The Sun is one of the billions of stars forming the Milky Way, which is, in turn, one of the billions of galaxies populating the universe. Yet to us, the Sun is not simply one of many stars. It is the most important celestial body, both sustaining life on Earth and posing persistent hazards in the form of damaging radiation. It is also the only star we have direct access to through robotic probes—or by the observations of our own eyes. Indeed, generations of scientists, since Galileo Galilei in the 16th and 17th Centuries, and even before, have used observations of the Sun to investigate a large variety of astrophysical phenomena, from the formation of stars to the origins of stars' self-sustained magnetic fields. These fields are responsible for violent, impulsive events on our star, such as flares and coronal mass ejections (CMEs), which sometimes direct bursts of high-energy ionized particles, or plasmas, toward our planet. Studying how our Sun interacts with the surrounding region it influences (the Heliosphere) has further allowed us to investigate physical processes that are ubiquitous in the universe. One such process, magnetic reconnection, involves the breaking



and rejoining of oppositely directed magnetic field lines that occur during phenomena including CMEs. They can release tremendous amounts of energy [...]. Now a new mission, *Solar*

Orbiter, is set to advance our understanding further; in fact, it is already doing so. (SOURCE: AGU | EoS 25th February 2022) <https://tinyurl.com/39rnpqyvs>

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E & O.E.



European Private Shortwave Stations

March 1st 2022

Only legal stations are included. Most stations use low power, but a few use several kW. Note that UTC is used here - not CET! Abbreviations used: D = Germany, DNK = Denmark, FIN = Finland, NL = Netherlands, NOR = Norway F.pl.: future plan, Int'l = International, Irr. = irregular, LT = Local time, 24/7 = twenty-four hours a day, seven days a week Mo = Monday, Tu = Tuesday, We = Wednesday, Th = Thursday, Fr = Friday, Sa = Saturday, Su = Sunday.

kHz	Country	Name	Transmitter site	Schedule (UTC)
3955	D	Radio Channel 292	Rohrbach Waal	Daily 0700-2000 & 2200-0600
3975	D	Shortwave Gold	Winsen	Daily 0700-2200
3985	D	Shortwaveservice	Kall-Krekel	Daily 0800-2000
3995	D	HCJB	Weenermoor	24/7
5895	NOR	The Sea / Radio Northern Star	Bergen	Silent, but renewal of license granted
5920	D	HCJB	Weenermoor	Daily 0700-1705
5930	DNK	World Music Radio	Bramming	24/7
5940	NL	Radio Piepzender	Zwolle	
5955	NL	Sunlite	Westdorpe	24/7. F.pl.: From Mar 12th: Daily 0400-2000
5970	DNK	Radio208	Hvidovre	24/7
5980	DNK	Radio OZ-Viola	Hillerød	We 2200-2300
5980	FIN	Scandinavian Weekend Radio	Virrat	1st Sa LT of the month (22-08 & 14-17)
5990	NL	Lomp Radio	Klazienaveen	F.pl.
6005	D	Shortwaveservice	Kall-Krekel	Daily 0900-1700
6005	NL	Radio Delta International	Elburg	F.pl. - from March 27th 2022 - evenings
6020	NL	Radio Delta International	Elburg	Su 0600-1500
6055	DNK	Radio OZ-Viola	Hillerød	Sa-Su 1200-1400
6070	D	Radio Channel 292	Rohrbach Waal	24/7
6085	D	Shortwaveservice	Kall-Krekel	Daily 0800-1800 (Radio MiAmigo Int'l)
6115	D	Radio SE-TA 2	Gera	Irr. (0900-1200 UTC)
6125	NL	Radio Europe	Alphen a/d Rijn	Irr. (1400-2300 UTC)
6140	NL	Radio Onda, Belgium	Borculo, NL	Irr. (mostly weekends)
6150	D	Europa 24	Datteln	Daily 0800-1605
6160	D	Shortwave Gold	Winsen	0800-1600
6170	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month (08-14 & 17-22)
6185	NL	Radio Piepzender	Zwolle	Irr.
7260	NL	Rockpower	Nijmegen	Daily 0900-1300
7270	NL	Rockpower	Nijmegen	Daily 1300-2300
7340	NL	Radio Delta International	Elburg	F.pl.
7365	D	HCJB	Weenermoor	0900-1500
7425	NL	Radio Piepzender	Zwolle	Irr. (1800-0800 UTC)
7445	NL	Radio Piepzender	Zwolle	Irr. (0800-1800 UTC)
9530	NL	Radio Onda, Belgium	Borculo, NL	Irr. (weekends)
9670	D	Radio Channel 292	Rohrbach Waal	24/7
11690	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month (08-10 & 17-22)
11720	FIN	Scandinavian Weekend Radio	Virrat	1st Sa LT of the month (22-08 & 10-17)
15700	DNK	World Music Radio	Randers	F.pl. - from March 27th 2022
15785	D	Funklust	Erlangen	DRM-modulation
25800	DNK	World Music Radio	Mårslet, Aarhus	24/7

This list is published by Hartvig Media ApS. each first day of the month - based on details supplied by the radio stations, the stations websites, monitoring observations, HFCC registrations, and some presumptions. The list is not copyrighted and may be published everywhere. Subscription by email is free of charge; write to shn@wmr.dk.

Radio News



BBC RADIO 6 MUSIC FESTIVAL: The line-up for this year's BBC Radio 6 Music Festival was announced on the station by Huw Stephens and Mary Anne Hobbs earlier. It was also revealed that Cardiff will host the festival, which will take place from Friday 1 - Sunday 2 April. There will be live performances, DJ sets, In Conversations and more across multiple venues in Wales' capital city, including St David's Hall [...]. Mary Anne Hobbs said: "The most exciting element about the 6 Music Festival is the coming together, in a physical space, of our beloved 6 Music listeners and the staff at the station, with artists we love. Lockdowns have kept us apart since 2020, so this year's gigs in Cardiff are going to feel super-charged."

(SOURCE: ontheradio | BBC Radio 6)

<https://tinyurl.com/yck44myz>
<https://tinyurl.com/33v2h7ks>

CHRIS COUNTRY: CountryLine, owners of digital station Chris Country, is re-branding the service to CountryLine Radio. Chris Country was launched in 2013 by country music fan and radio programmer Chris Stevens and purchased by CountryLine in 2020. CountryLine is a global 'Fanclub' app for country music. Its co-founder and CEO Simon Walker said, "We look forward to continuing to serve our loyal listeners as we introduce the new name, and we welcome new listeners across the UK and beyond. With the same great presenters, and programmes that have made Chris Country such a success. As the CountryLine brand grows in the UK and globally it makes sense that the radio station becomes fully integrated to the family." Chris Stevens commented: "We know that our listeners love the station, and nothing will change on air, we'll just be singing CountryLine Radio jingles instead!" The change was announced on social media and will take place from 7th March 2022.

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People are fleeing their homes and families are being separated. Many are going without food or clean water.

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The DEC Ukraine Humanitarian Appeal will support people in areas currently affected and those potentially affected in the future by the crisis. In the unlikely event that we raise more money than can be reasonably and efficiently spent, any surplus funds will be used to help us prepare for and respond to other humanitarian disasters anywhere in the world. For more information visit <https://donate.redcross.org.uk/appeal/disaster-fund>

*Texts cost £10 +1 standard message (we receive 100%). For full T&Cs visit redcross.org.uk/mobile, must be 16+.

The British Red Cross Society, incorporated by Royal Charter 1908, is a charity registered in England and Wales (220949), Scotland (SC037738), Isle of Man (0752) and Jersey (430).

David Harris
mydogisfinn@gmail.com

David Harris reviews a substantial new title about the BBC, which addresses its history against a backdrop of domestic and global events and discusses the many challenges and demands it has faced over the years.

The date of 14th November 2022 marks the 100th Anniversary of the first regular radio broadcast by the BBC. From one medium wave station in the London area, broadcasting to a limited number of people, the BBC has now grown into a vast organisation. At present, it operates 61 domestic radio stations, 10 TV channels and the BBC World Service. It also runs the fourth most popular website in the UK.

And yet, this vast global business with over 22,000 staff started up in 1922 with only three employees: John Reith, Arthur Burrow and Cecil Lewis.

In the book under review this month, Professor David Hendy offers some idea of the scale of the BBC when he estimates that in the last 100 years it has transmitted somewhere between 10-20 million programmes. He states that, "we cannot hope to understand modern Britain – its politics, its culture, its sense of itself – without understanding the role of the BBC in the life of a nation". He views the Corporation as the embodiment of public service broadcasting with a cradle-to-grave role in our domestic lives.

However, the BBC, for all its size and scope, has not generated a huge catalogue or body of publications. Hendy draws extensively on the volume by Asa Briggs, *The History of Broadcasting in the United Kingdom*.

This five-volume work, which was completed in 1995, covers the period from the early 20th Century until 1974. He also refers to some more recent books that have been reviewed in *RadioUser*, including *The BBC: The Myth of Public Service* by Tom Mills; *The War Against the BBC* by Patrick Barwise and Peter York; *Pinkoes and Traitors* by Jean Seaton; and *This New Noise* by Charlotte Higgins (see below).

The first half of this voluminous book covers in great detail the years from 1922 to 1945. The BBC comprised from 1922 until 1939 just two radio channels, the *National Service* and *Regional Programmes*. In 1939, the regional services ended and the *National Service* became the *Home Service* (now Radio 4). In 1940, the *Forces*

Cradle-to-Grave: The BBC in Our Time - and Before



The BBC: A People's History
by David Hendy.
Profile Books. 2022. 616 pp. £25. Hbk.
ISBN 9781781255254
www.profilebooks.com

Programme (Light Programme, now Radio 2) began broadcasting popular music, comedy and light entertainment to troops and factory workers. The BBC's pioneering television service which ran from 1936 to 1939, in the London area is also covered in some depth.

What Hendy illustrates in his book are the challenges facing the founding fathers of this new industry. Although public radio broadcasting had started in the USA in 1920, the BBC was determined to avoid advertising and from 1923 became funded through the licence fee. The early programme schedules were filled with classical music and talks on 'worthy' subjects. An early innovation was the concept of drama written specifically for radio. The BBC grew quickly, and, by 1924, it had 400 employees and broadcast for six hours a day. In its early years, it was

not a news and current affairs service, as the powerful newspaper lobby wanted to protect their own interests.

The BBC's relationship with the government of the day has always been fraught with difficulties, beginning in 1926 with the *General Strike*. Winston Churchill, the then Chancellor of the Exchequer, wanted to take control of the BBC, but John Reith asserted the independence of the BBC. News bulletins during the strike clearly stated which items were official government announcements. In 1927, the BBC became the *British Broadcasting Corporation*, regulated by a Royal Charter that was to last for 10 years.

This is the model under which the BBC still operates, and there are some in the current government who would like to see this radically overhauled, particularly seeking to end the licence fee.

The immediate post-war years saw the BBC restart its TV service. This was slowly rolled out across the UK. In 1946 the *Third Programme* (now *Radio 3*) was started as a cultural station with classical music, drama and discussion programmes. In 1955, ITV began the first commercial TV service in the UK, and the BBC had to face its first taste of competition.

Hendy tackles some of the difficult issues the BBC has faced, including how to meet the needs of minority groups. The first Asian-language TV programmes did not start until 1965, and the TV show, *The Black and White Minstrels* (a 'Blackface' variety show) which ran from 1958 to 1978 is not generally seen as one of the BBC's finest moments. The controversial coverage of the Suez Crisis (1956), the Falklands War (1982) and the Gulf War (1990), and the political machinations around the appointment of certain Director Generals are dealt with in a very balanced way in this book. Hendy flags up BBC successes such as *Life on Earth* and *East Enders*, as well as its failures, such as Jimmy Savile.

In conclusion, the author has done an excellent job in covering such a vast organisation in one volume. My only slight criticism is that I would have liked more in-depth coverage of radio in the post-war years.

Visit our Book Store at www.radioenthusiast.co.uk

RADIO ENTHUSIAST BOOKSHOP

The Magic Bands

Building on Don's earlier books the *6 Metre Handbook* and *Six and Four*, *The Magic Bands* adds lots lots of material on data modes operation, which has grown enormously in popularity in recent years with the advent of FT8. There is detail of the many new radios that have appeared in recent years with 6m and, increasingly, 4m capabilities. Readers will find two new antenna designs from Justin Johnson, GOKSC, of InnovAntennas especially produced for this book. There is detail of software too, not just for data modes but for remote operation, tracking of achievements and much else. There is even material highlighting the achievements of several of the leading operators on the 6m band.

The 6m band is now almost universally available across the amateur radio world, while in recent years 4m access has been granted to many more countries, often on a permanent basis. So why miss out on the 'Magic bands'? *The Magic Bands* is recommended for anyone who wants to try these bands out and is a comprehensive guide for those who are already hooked on these fascinating pieces of spectrum.



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Martin Butera
martin_butera@yahoo.com.ar

OTH 0100: A Powerful Brazilian Radar Facility

OTH, is the acronym for an ‘Over-the-Horizon’ radar facility, sometimes also called a ‘Beyond-the-Horizon’ Radar.

This is a type of system with the ability to detect targets at very long distances, typically hundreds to thousands of kilometres, beyond the horizon, which would be the range limit for an ordinary radar.

These radars tend to interfere massively in all amateur radio bands.

As an example, we can cite the Russian Container Radar (29B6), the Chinese radar, called ‘The Foghorn’, for its distinctive sound. It transmits signals with different scanning speeds that occupy 10kHz of the spectrum. There is also the radar at the UK base in the Republic of Cyprus, and others like it in Iran, Australia, North America, and Canada.

In addition to these well-known giant radar systems, here in South America, there is an OTH version of radar, that not many people have heard of.

It is the station located in Farol do Albardão, in the state of Rio Grande do Sul, in Brazil.

This radar installation is very little known, and its purpose is to monitor

Martín Butera returns to RadioUser to let us into the mystery and workings of the Brazilian Over-the-Horizon (OTH) Radar system, known as ‘OTH 0100’.

vessels up to 200 nautical miles from the coast, clearly surpassing the vision of conventional radars.

Installed in the south of Brazil, next to the Albardão lighthouse, it is the first radar on the horizon of South America (Fig. 2).

So what is there to know about this mysterious South American radar, ‘OTH 0100’?

Location and Construction

The location is remote. The coordinates are those of the Albardão lighthouse (33 ° 12’0 “S and 52 ° 42’0”).

In order to get to the place by land, it is necessary to use 4x4 trucks, since it

is very difficult to access. You then have to cross a path along the beach. The lighthouse is approximately 135 km from the nearest city.

This makes it one of the most isolated lighthouses in Brazil.

However, the area is heavily guarded, and entry is restricted to anyone who does not have authorization from the Brazilian Navy.

All the telemetry equipment necessary to ensure the working of this radar facility is accommodated on the inside of two specially-constructed trailers on the site (Figs. 3 and 4).

The construction of the radar facility was in the charge of IACIT, a Brazilian

ALL PICTURES: COURTESY IACIT

Fig. 1: 'OTH100', projecting out into the Atlantic.

Fig. 2: The remote radar facility, situated next to the *Albardão* lighthouse. Fig. 3: One of the trailers that house the telemetry equipment (far-left). Fig. 4: Inside the equipment hut: one of the sturdy racks of telemetry equipment.

Fig. 5: A schematic of how the radar facility works: a real-time graph of the radar irradiation lobe. Fig. 6: The circular antenna arrangement, consisting of 24 vertical aerials.

Fig. 7: The TX antenna.

Fig. 8: The overall facility and lighthouse.

company, founded in 1986, and based in São José dos Campos, in the interior of São Paulo (SP). This company is part of an important centre of the aerospace industry in Brazil.

The firm offers products and technological training for the development of systems applied to the control of air and maritime traffic. Its remit also encompasses defence and public security, software, meteorology, research and development (R&D), and innovation and telemetry (Figs. 3 and 4).

The operator is certified as a 'Strategic Defense Company (EED)' and is the leader amongst Brazilian national companies in the area of high technology.

To get a better idea of the company, you can watch an institutional video (in Portuguese) on *YouTube*, with a number of very eloquent images, at this URL:

<https://youtu.be/2FoXag7vOFM>

OTH 0100: Radar Performance

The radar's performance is truly impressive. Normally, it works with 'non-cooperative' vessels, that is, vessels that do not emit AIS signals (Automatic Identification System), a system that serves to identify and locate ships through the electronic exchange of data with other vessels and stations (VTS - Vessel Traffic Service).

With this facility, a 10m-long vessel can be detected and tracked at (at least) a 100 nautical miles distance.

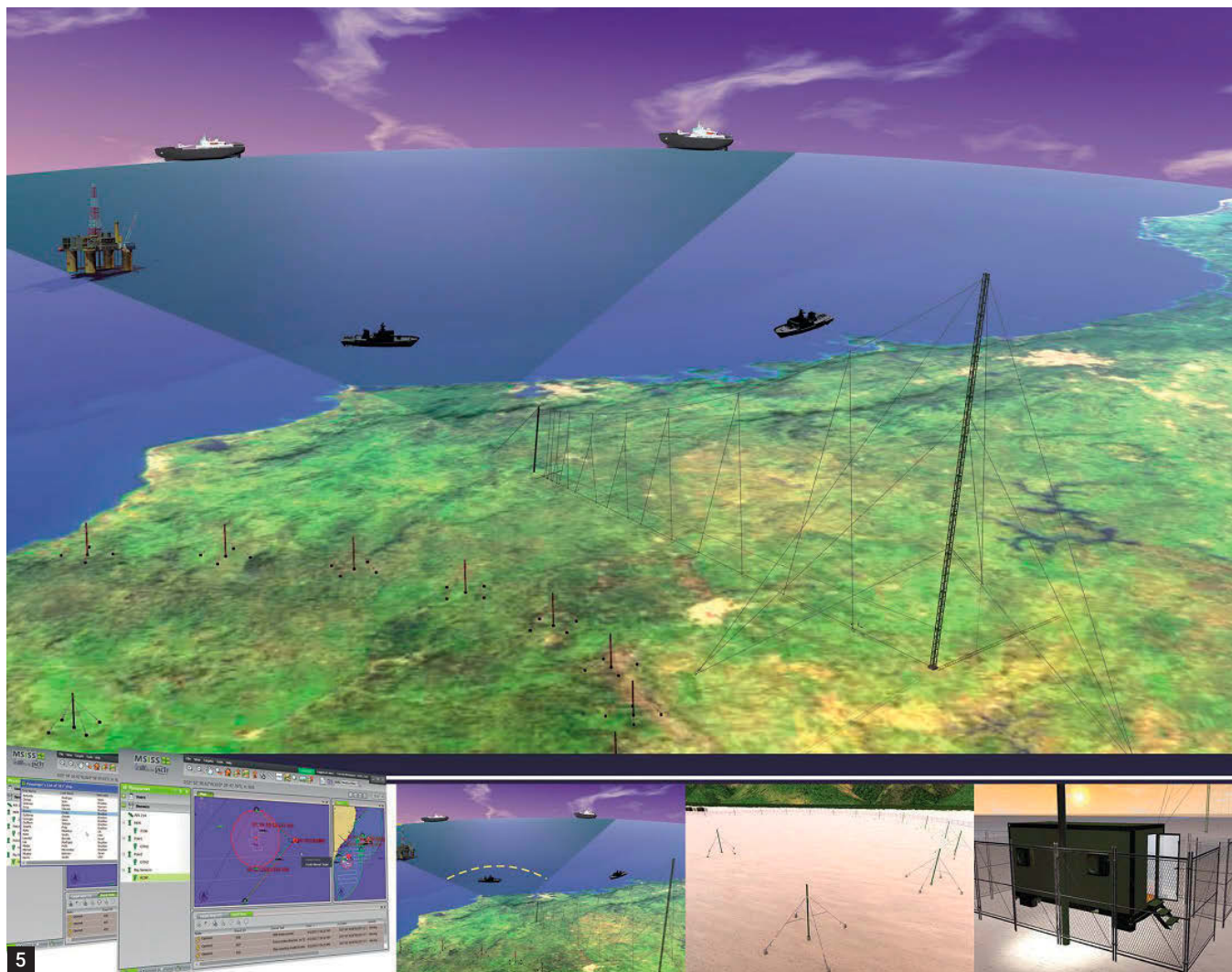
The technology the radar adopts is the OTH-HF SW (Surface Wave) concept, which propagates around the world to aid in the detection of targets. This makes it a unique and differentiated system.

This concept guarantees the traceability of a large area (approximately 143,000 km²).

Because the sensors are scanning by following the curvature of the Earth, the technique is more efficient than 'conventional' radar, which has a limited



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range, determined by direct LOS (Line-of-Sight).

Operating on the HF bands, the OTH 0100 is capable of monitoring beyond the horizon, in a maritime environment of up to 200 nautical miles, which is equivalent to 370 km.

Using Pulse-Doppler as the waveform, the angular transmission beam provides simultaneous coverage of 120° in azimuth.

The facility is used for general coastal monitoring, combating environmental crimes and illegal fishing – whether carried out by national or foreign vessels – piracy, biodiversity extraction, arms and drugs trafficking, and protection at sea.

The graphic in Fig. 1 shows a general illustration of how this radar works.

The system can automatically name the vessels, which are then allocated a number. From there, it is possible to monitor, in addition to the distance, their course, speed, latitude and longitude.

As the objective is often to check on 'non-cooperative' vessels, it is also possible to observe their behaviour, as evidenced, for instance in the navigation trail. This can often reveal a suspicious attitude.

More often than not, warships do not emit AIS signals, for obvious reasons, but due to their behaviour and even their speed – well above those usual for merchant ships – they can raise suspicions and be monitored by radar. Where appropriate, this may lead to the activation of a visual identification by an aircraft or patrol boat in the area (Fig. 5).

The Antennas

The antenna array consists of vertical transmission (TX) antenna. Reception (RX) is carried out utilizing a set of 24 vertical antennas, 23 of which are arranged in a circular manner. It is precisely this circular arrangement, combined with ADBF (Adaptive Digital Beamforming)

processing, which guarantees adequate target detection, high directivity and unique efficiency in suppressing different interferences, such as ionospheric, man-made noise and communication interference (Fig. 6).

The set of antennas needs a minimum area of 600 x 300 meters, with the minimum distance between TX and RX aeriels being 300 meters. The set is completely fenced and has a device to interrupt the operation, in case there is an inadvertent incursion of people in the area of the antennas.

The entire infrastructure is designed to withstand the most adverse conditions, including critical situations, such as a high tide that could affect the radar site. The receiving antennas employ a specific system of interference-elimination techniques, which provides reliable coverage of a wide sea area and, more importantly, regardless of the overall weather or sea conditions.

Both of these can change rapidly, significantly and unpredictably in this region. One of the big advantages of having circular receiving antennas is the ability to absorb information from the signal to monitor any vessel that may be using electronic countermeasures. It is possible to install a second antenna just to listen to the interfering signal. If the ship that is getting stuck is also in motion, it will still be possible to follow its position by triangulation, using the radiated signal, determining its coordinates.

The images in Figs. 7 and 8 show the antennas at the site, as well as a drone-image overview of the larger military installation.

Conclusion: More than a Radar

This radar and its technical components and facilities can guarantee a large monitoring range but there is more to the OTH 0100 radar. According to the publicly available company data, this system, composed of units to transmit, receive and process radio frequency signals in the HF band, also allows the measurement of marine currents, helping in the detection and mapping of their speed and direction.

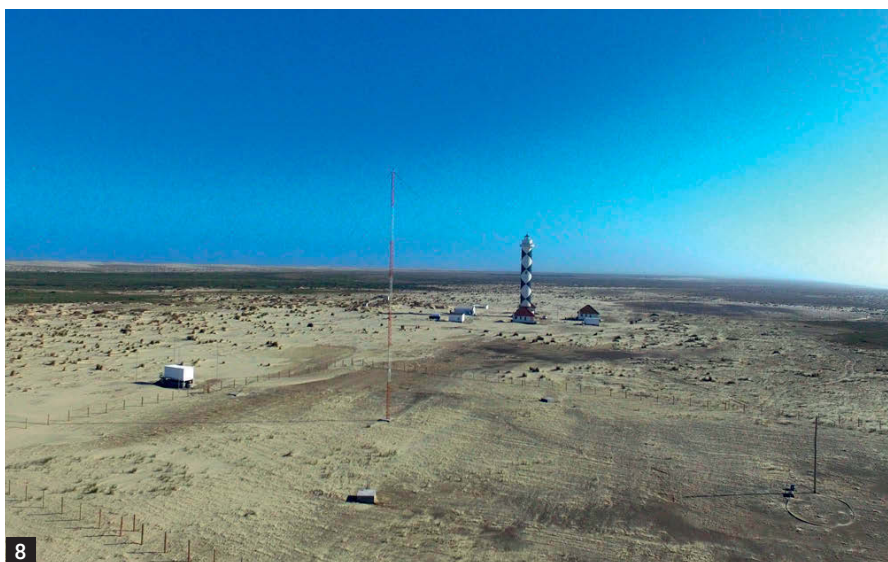
Moreover, it is effective in assisting in rescue operations, it can collect information on the speed and direction of winds near the ocean surface, it can carry out studies and surveys for ocean activities, assist in meteorological and climate forecasts, the detection of environmental hazards such as storms, coastal erosion, tsunamis, rough seas, and other natural phenomena.

In addition to this, the technology used by the radar promotes a broader coverage of the area under monitoring, making it possible to follow aircraft flying at low altitude or even a 'sea-skimmer' missile, flying close to the sea surface.

As always happens in these military bases, a bit of doubt and mystery will remain for us as to why it is located in that not very strategic place for Brazil and whether there are no other purposes behind it.

The truth is that Brazilian Ham Radio operators have already begun to notice strange noises in the frequencies coming from the far south

[The author and editor owe their thanks to Mr Gustavo Hissi (Project Director) and Henrique Nobre (General Manager of Sales and Marketing), from IACIT for assistance, permissions and data provided – Ed.]





North Atlantic Changes and Stratospheric Research

David Smith
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From 1st March 2022 onwards, Flight Level 330 and below is no longer part of the North Atlantic Organised Track Structure (OTS). This means that operators now have the flexibility to file random routes at FL330 and below when flying between Europe and North America. NATS has quoted a study which suggested every extra minute over the ocean equates to about £51, or \$70.

This might not be the most radical change, but it is a step towards further improving the efficiency for operators, and ultimately reducing fuel burn and CO² emissions. It is a spin-off from the introduction of ADS-B, which allows controllers to receive updates every 7-8 seconds instead of every 840 seconds (14 minutes). This forms part of NATS' 2030 Vision for the North Atlantic, and more improvements can be expected.

<https://tinyurl.com/58ssjzfc>
<https://tinyurl.com/bdxs9dw8>

David Smith covers a fundamental change in North Atlantic traffic handling, looks at the end of a Scottish remote towers scheme, investigates satellite comms and profiles Boscombe Down ATC.

The new procedure is not a direct result of the recent experiment in suspending the OTS during the COVID-19 pandemic reduction in traffic.

Consequently, the permanent abolition of the OTS is on hold for the moment.

Scottish Remote Towers Project Cancelled

The move to centralise air traffic control services across the Highlands and Islands region has suffered a fresh blow, with the Scottish Government confirming that a tender exercise for a remote towers project has been cancelled.

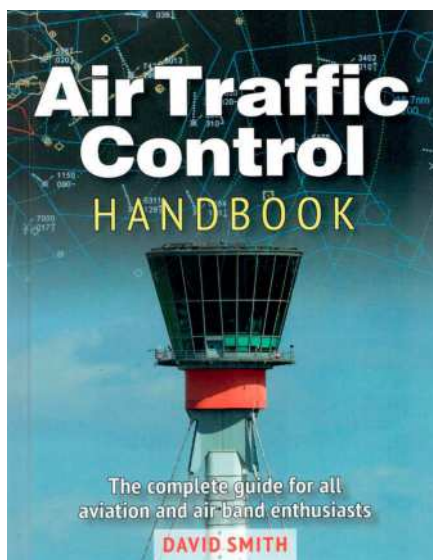
Apparently, £9 million has been spent on the controversial Highlands and Islands Airports Ltd. (HIAL) Air Traffic Management Strategy (ATMS) - of which the Remote-Towers-Plan was a central part.

It was announced last October that the tender exercise had been halted following a lack of progress in talks between HIAL and *Prospect*, the union which represents air traffic controllers.

The controllers had taken industrial action in understandable protest at the plans which proposed that controllers be removed from airports across the region, including Kirkwall in Orkney, to be replaced with a single remote tower control room in Inverness.

A HIAL spokesperson said: 'We have been clear that ATMS is the best option to maintain the long-term sustainability of air services for the Highlands and Islands. Nevertheless, we are committed to working with *Prospect* and our air traffic control colleagues to try and develop a new solution involving compromise by both sides'.

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Stratospheric Wi-Fi Project Announced

Airbus and Thales have formed a partnership with the aim of flying the latest Thales mobile satellite communications (SATCOM) system (FlytLink) in a zero-emission glider to more than twice the altitude of commercial airline flights. Known as *Perlan Mission II*, it is an initiative of *The Perlan Project*, a non-profit, international team of scientists, engineers, and aviators.

The group has already set aviation world altitude records in the experimental *Airbus Perlan 2 Glider*, which was designed, built and deployed to fly to 90,000 feet using only the wave lift from mountain ranges. Originally launched in 2015, the *Perlan 2* achieved its highest record-setting flight of above 76,000 feet in 2018.

This mission aims to conduct climate, atmospheric and aeronautical research at extremely high altitudes. Applications of this research include informing more accurate climate-change models, innovating fuel-efficient or zero-emission aviation, and even demonstrating the feasibility of using energy-efficient winged aircraft on Mars. The *Perlan 2* glider will be fitted with the *FlytLink Thales Iridium Certus based SATCOM System*.

This means that it will be possible to make a live feed available to STEM students, researchers and aviation enthusiasts while the aircraft is in flight, enabling access to real-time data downloads.

<https://tinyurl.com/4syknbsx>

This month's aircraft picture is of a *Handley Page Victor* at Yorkshire Air Museum.

RAF and MoD ATC Profiles: 12 Boscombe Down

ICAO Code: EGDM

Frequencies	(MHz)
Boscombe Approach/Radar	340.250; 292.275; 126.700; 130.000
Boscombe Zone	256.500
Boscombe Director	362.050
Boscombe Talkdown	373.150; 130.000
Boscombe Tower	369.425; 130.750
Boscombe Ground	374.450
Boscombe Ops	376.725
ATIS	
Boscombe Information	232.850
Nav aids	
Hold	ILS/DME CAT I Runway 23 TACAN BDN 108.200
Runways	
	05 (3205 x 45m)
	23 (3205 x 45m)
	17 (2092 x 45m)
	35 (2092 x 45m)
	17 North (766 x 36m)
	35 North (766 x 36m)
	Also: short grass runways 05/23 and 17/35

Notes (A-Z)

Circuit Procedures

High-intensity, multi-type, aircraft and helicopter operations occur to multiple operating surfaces as depicted on the Aerodrome Chart. All parallel runway operations are under positive ATC control. By exception, however, helicopters operating to Runway 05/23 Grass, as the only occupants of the combined circuit to the Grass and Northern, may operate to negative RT when approved by ATC. Visitors to Boscombe Down are to comply meticulously with ATC instructions and when required, are to overshoot on runway track. Southside: Multiple autonomous helicopter operations take place on the Southside, not above 500ft QFE by day and 1,000ft QFE by night. Fixed-wing aircraft are not to overfly 'Southside' below the fixed-wing circuit height without clearance from ATC.

Ground Movement

Aircraft must inform Ground before starting engines. All aircraft must receive positive clearance before taxiing from dispersal due to the differing sizes of other taxiing aircraft. After landing, visiting aircraft are to obtain permission from ATC before vacating the runway. Because of the variety of aircraft types and the possibility of two-way traffic, pilots are to exercise extreme caution when taxiing.

Helicopter Operations

Light aircraft and helicopters may be given clearance to use Heli Landing Site to the north of runway 05/23, identified as 'North Point'.

Military Aerodrome Traffic Zone (MATZ)

A circle, 5nm in radius, up to 3,000ft, with stubs aligned on Runways 05/23.

Noise Abatement

Over-flight of Amesbury below 1,000ft QFE is not permitted by an aircraft. Over-flight of villages within Boscombe Down ATZ is to be avoided.

Operational Hours

0830 - 1730, Mon - Thu; 0830 - 1630, Fri. *No. 2 Air Experience Flight* operating times Wednesday to Sunday (times vary in the summer). Operating within 20nm of Boscombe Down up to FL100.

Training

Military Test Pilot training takes place in the circuit and to the west of Boscombe Down, up to Flight Level 240.

UAV Flying

Unmanned Aerial Vehicle (UAV) flights take place at the Aerodrome within the Aerodrome Traffic Zone (ATZ) and the surrounding airspace. During the times that UAV flights are operating, the AD is not available for use by manned aircraft.

VHF-Only Aircraft

VHF-only aircraft inbound to Boscombe Down free call Boscombe Zone on 126,700MHz. If there is no reply, pilots should switch to Boscombe Tower on 130,750MHz for information on aircraft operations. No response on either frequency will mean that the ATC is closed. However, light aircraft and helicopters may still operate without ATC services. VHF-only aircraft departing Boscombe Down should contact Boscombe Tower on 130,750MHz on start-up to ascertain aircraft activity. No response will indicate that the ATC service is unavailable.

Warnings

Aircraft landing on Runway 05/23 are not to vacate the runway until cleared by ATC. When vacating Runway 23 at the end, aircraft are not to proceed past '05 North Hold' without a positive clearance from ATC. Aircraft overshooting or executing missed approaches are to maintain runway track to avoid impinging on the visual circuits to the north and also helicopter operations 'Southside'. No Dead Side. A left-hand visual circuit is to be flown at 1200ft QFE (Barometric Pressure at Aerodrome Level). All breaks are to be level breaks at 1200ft QFE. Rotary aircraft may also be operating to grass surface abeam Runway 05/23. Instrument Approach Procedures (IAP) for this aerodrome are established outside controlled airspace. Numerous Danger Areas to the north and south of the aerodrome mean that departures will be as directed by radar until clear of all Danger Areas. A pyrotechnics factory 1nm short of Runway 05 explodes waste pyrotechnics throughout the day. Crews should be aware of the detrimental effect these explosives have on electro-optic operations.

Georg Wiessala

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The editor takes a closer look at two recent publications aiming at maritime communications enthusiasts and Non-Directional Beacon (NDB) monitoring hobbyists in the UK, Continental Europe and beyond.

The choices of reliable resources for Non-Directional Beacon (NDB) hunters or 'NDB-DXers' are not exactly abundant these days. By contrast – perhaps on account of the ongoing disappearance of broadcasting stations on Medium Wave – many hobbyists have been drawn to monitoring these CW transmitters from an earlier age of navigation, especially during the winter months, and at night time.

Our very popular monthly *Maritime Matters* column shows that there are still plenty of beacons to receive, either in themselves or to aid with the prediction of propagation conditions, for example across the Irish Sea, Northern Europe and the Atlantic.

On top of that, there are also some exciting new software tools these days, which many are using to conduct overnight beacon-DXing sessions and to evaluate the results at a later stage. Both our contributors Robert Connolly and Scott Caldwell, for example, as well as former editor Andy Thomsett, have frequently written here about availing themselves of these new facilities.

[see *Maritime Matters*, elsewhere in this issue – Ed.]

Against this backdrop, the *PskovNDB 2.1a* software suite, in particular, appears to be emerging as the new tool of choice for beacon DXers. It is available to download at the following URL address:

<https://tinyurl.com/437d56cw>

Many enthusiasts might rely on the internet for background information on when to listen, and what to, but, as we all know, the majority of websites. On this and other matters are, alas, unreliable, outdated and inaccurate.

There are some exceptions to that rule, of course.

However, it is important to many to have some beacon-related information at their fingertips, which has been thoroughly researched and updated, and which is available in either hard copy or electronic (pdf) format.

In addition to our own (now twice-yearly) *Non-Directional Beacon Surveys*, the two publications under review this month fulfil those criteria.

Beacon Hunting: From Both Sides of the Channel



Non Directional Beacons of Europe (Arctic to Equator)
Connolly, Robert . 2022/23 - Edition (April 2022)
Kilkeel, NI: In-House Publishing
www.kilkeel.org.uk
gi7ivx@btinternet.com

Non Directional Beacons of Europe (Arctic to Equator), 2022/23 - Edition

by Robert Connolly GI7VX

Robert Connolly is known by many for his monthly *Maritime Matters* column here in *RadioUser*. Robert describes himself as a keen Non-Directional Beacon (NDB) & SW DXer from Northern Ireland and a licensed amateur radio operator. He is also the author of numerous articles and publications on beacons, maritime issues and wider radio topics.

Traditionally, Robert's principal beacon-focused publication is the compilation of *Non-Directional Beacons of Europe*; (Fig. 1). We have reviewed the 2019/20 edition previously in this magazine (*RadioUser*, November 2019: 15). Robert published the first edition in 1993, after finding that most information regarding NDBs at that time was limited to



The European NDB Handbook 2022 Edition (ENDBH)
Oexner, Michael
March 2022
<https://tinyurl.com/48ffptrw>
Michael.oexner@web.de

official documents and charts produced for pilots, and that was listed under the location name, rather than under a callsign or frequency.

For the DXer with only a callsign and frequency of a received NDB, it was often a matter of spending hours, or even days, pouring over aeronautical charts and aeronautical route planning documents. Compiling an NDB listing by using the frequency and callsign would make identification by the DXer much quicker and easier.

The very latest edition of this substantial guidebook is now out in electronic format (as a pdf file), and it was time to look at it again since the author kindly supplied an advance copy.

For many UK listeners, this is a conventional stalwart of the NDB world. Following the preliminary matter, such as a list of acronyms, definitions and references, the intro-

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In 1950, the BBC extended its range of programmes for very young listeners and viewers. The first edition of *Listen With Mother* took to the airwaves on 16th January 1950. One of the main presenters was Daphne Oxenford who narrated the programme between 1950 and 1971 (Fig. 1). Each programme was introduced with the immortal words, "Are you sitting comfortably? Then I'll begin". The evocative piano theme tune was the *Berceuse* from Gabriel Fauré's *Dolly Suite*. The final edition was broadcast on 10th September 1982.

A landmark event in the history of radio and TV was the formation of the European Broadcasting Union on 12th February. The BBC played a major role here (Fig. 2). The story of this organisation has been told in *RadioUser* before (*RadioUser*, February 2021: 38-41). Following the successful inauguration of the EBU, the first Outside Broadcast (OB) from the Continent took place on 27th August from Calais.

At home, on 23rd February, the UK General Election results were reported in detail on TV for the first time, and the forerunner of *John Craven's Newsround* began on Children's TV under the title *Children's Newsreel* on 23rd April (Fig. 3). Although the opening graphics were similar to the main *TV Newsreel* programmes featuring the Alexandra Palace transmitter, production had moved to the new studios at Lime Grove which opened its doors on 21st May. There can't be many *RadioUser* readers who have never seen, or heard of, *Andy Pandey*. Together with *Teddy* and *Looby Loo*, *Andy Pandey* first appeared on 11th July 1950, as part of Children's TV. Every programme ended with Andy and Teddy sitting in a basket waving goodbye.

The popular ballroom-dancing programme, *Come Dancing*, began on 29th September. The final broadcasting milestone in 1950 was the first radio and TV broadcast from the House of Commons on 26th October.

The Archers and The Third Programme

Devotees of *The Archers* will already know that the first edition was on 1st January 1951. A less famous, but important, event occurred on 8th April, when the *Daventry Third Programme* was brought into service. The first broadcast from Buckingham



BBC 100 Years: 1950-1959

Keith Hamer and **Garry Smith** continue exploring 100 years of the BBC, looking at the expanding radio and TV transmitter network and remembering some key technological advances and memorable programmes.

Palace was organised to cover the State visit of King Haakon of Norway on the 5th of June 1951. Also in June, *London Calling Asia* (in English) began.

The first TV edition of *What's My Line?* was shown on 16th July. The next major engineering development occurred on 12th October when the TV transmitter at *Holme Moss* was brought into service. The final event of any note during 1951 was the first televised party

election address. This was given by Herbert Samuel who later became leader of the Liberal Party.

Royal Charter Renewed and The Flower Pot Men

The BBC felt relieved on 1st January 1952, when the government renewed its *Royal Charter*. For some reason, however, it was only a six-month extension. The BBC had

Fig. 1: Fig. 1: Daphne Oxenford narrated *Listen With Mother* between 1950 and 1971.

Fig. 2: The European Broadcasting Union (EBU) was formed on February 12th, 1950.

Fig. 3: *Children's Newsreel* began on April 23rd, 1950.

Fig. 4: Fig. 4: *Bill and Ben*, together with *Little Weed*, debuted on December 18th, 1952.

Fig. 5: George Cowling became the first in-vision 'Weatherman' on January 11th, 1954.

Fig. 6: The BBC North Hessary Tor transmitter was completed on May 22nd, 1956 (this photograph is from 2015).

Fig. 7: Colour TV test transmissions were broadcast, after the normal closedown, from studios at Alexandra Palace, from October 1955.

to wait, perhaps rather nervously, until 1st July, to receive a full 10-year renewal. On 6th January 1952, the BBC began its *Vietnamese Service*, possibly due to government pressure, and, on February 15th, a huge radio and TV Outside Broadcast (OB) event was mounted to provide coverage of the funeral of King George VI.

The Accession to the Throne by Queen Elizabeth II was declared on 6th February – with the Her Majesty, and the Nation, celebrating her *Platinum Jubilee* 70 years later, beginning with a 41-gun Royal Salute on Monday, 7th February 2022. By Royal tradition, gun salutes are not held on a Sunday.

Moreover, still in 1952, two new main transmitters were brought into service: Kirk o' Shotts (Scotland) opened on 4th March, and Wenvoe (Wales) began on 15th August. The BBC's *Schools* TV service began as a 4-week experiment on 5th May 1952. This became so successful that, over time, the service became one of the main methods of teaching in schools. With the formation of the EBU in 1950, it became possible to broadcast programmes between the UK and Europe more regularly. The first public transmission in the UK of TV signals from Paris happened on 8th July 1952.

Apart from this, two new TV programmes took to the airways during that year. The first edition of *Animal, Vegetable, Mineral?* was shown on 23rd October. Of more interest to the authors was the weekly programme for younger viewers, the *Flower Pot Men*, starring Bill and Ben together, of course, with *Little Weed* (Fig. 4).

Network Expansion and The Quatermass Experiment

The year 1953 saw the annual Government Budget being televised for the first time. Making quite a dent in the BBC's budget was the expansion of the TV transmitter network.



The temporary and permanent stations shown in Table 1 were among those which were brought into service from the mid-1950s onwards. Moreover, viewers on May 2nd were the 'original generation' to begin the now time-honoured tradition of switching off the telly and 'brewing a cuppa' instead when the first *Party Political Broadcast* was televised! June 1953 was a busy month for engineers in the Outside Broadcast (OB) Department. The Coronation ceremony had been televised on 2nd June 1953, and the first TV relay from a ship at sea was broadcast on 15th June, during the *Royal Naval Review*.

Several new programmes began in July 1953. Long before the scary adventures of *Dr Who* (November 1963), viewers were frightened by the first episode of *The Quatermass Experiment*, which was shown on 18th July. The BBC felt it necessary to pre-warn viewers with the stern announcement: "In our opinion, the following programme is unsuitable for children and people of a nervous disposition". That was guaranteed to boost viewing figures! The much gentler programme, *The Good Old Days*, began on 20th July. The very first edition of *Panorama* was broadcast on 11th November 1953.

First In-Vision Weatherman and Eurovision

On 11th January 1954, George Cowling became the first in-vision 'Weatherman' (Fig. 5; cf.: *RadioUser*, November 2018: 20-21 and December 2018: 20-22). Table 2 illustrates several new programmes which were introduced throughout the 1950s.

The broadcast receiving licence for radio remained at £1, whereas the combined TV and radio fee was increased from £2 to £3 on 1st June. Between 6th June and 4th July 1954, the first European exchange of TV programmes via the EBU's *Eurovision* network unfolded, with eight countries taking part.

Meanwhile, the network of TV transmitters continued to gather pace with the opening of the North Hessary Tor station (Fig. 6 and Table 1). This was completed on May 22nd, 1956. The photograph, taken by the authors, is from 2015.

Experimental Colour TV and VHF Radio

Several new radio and TV programmes began in 1955. Some of the highlights included *The Grove Family* (7th January 1955), *Dixon Of Dock Green* (9th July), *The Woodentops* (9th September), and *Crackerjack* (14th September). The transmitter network was, once again, greatly expanded with, for example, the first VHF radio station at Wrotham on 2nd May 1955.

One of the main points of interest for TV aficionados was *BBC Test Card* music, from magnetic tape, for the first time. Up until then, the BBC did not trust magnetic tape machines. Previously, 78 rpm discs had been played 'live' by an engineer sitting in a control booth. All the discs were later transferred onto tape.

A lot of people in 1955 did not know about the somewhat secret *Colour TV Test Transmissions* which were broadcast after normal closedown (Fig. 7). These began on 10th October, from the studios at Alexandra Palace, with 405 lines. By the end of 1955, (monochrome) TV was available to some 95 per cent of the population.

New Programmes and Transmitters

The growth of the transmitter network continued during 1956 (Table 1). As far as programmes were concerned, there were several 'firsts' during 1956 (Table 2).

On December 18th, the Postmaster-General announced the suspension of the '14-Day Rule' for an experimental six-month period. The original regulations were forced upon the BBC because parliament decreed that debates should initially only be heard privately in the Houses of Parliament and not by the public via the airwaves.

Network Three Begins

On 7th January 1957, the 'BBC' Ident Signals (or 'Chimes') were introduced on *TV Trade Test Tapes*. They were recorded on Sunday,

- Blaenplwyf (14th October 1956)
- Brighton (5th August 1959)
- Douglas (Isle of Man, 12 December 1957)
- Dover (21st April 1958)
- Glencairn (completed at Divis on July 21st, 1955).
- Kirk o' Shotts (4 March 1952)
- Llangollen (20th December 1958)
- Londonderry (18th December 1957)
- North Hessary Tor (completed on May 22nd, 1956. see the image in Fig. 6)
- Orkney (22nd December 1958)
- Peterborough (5th October 1959)
- Pontop Pike (completed on November 15th, 1955)
- Rosemarkie (TV; 16th August 1057); Rosemarkie (Radio 12th October 1958)
- Rowridge (4th June 1957; completed on June 11th, 1956)
- Sandale (Radio; 18th August 1958)
- Thrumster (15th December 1958)
- Truleigh Hill (9th May 1953).

Table 1: New Transmitters (A-Z, 1950-1959).

- *Blue Peter* (16th October 1958)
- *Crackerjack* (14th September 1955)
- *Dixon Of Dock Green* (9th July 1955)
- *Grandstand* (11th October 1958; final: January 27th, 2007)
- *Hancock's Half-Hour* (Radio; 2nd November 1954)
- *Juke Box Jury* (1st June 1959)
- *Lenny The Lion* (15th November 1956)
- *News & Newsreel with Richard Baker* (5th July 1954; see: *RadioUser*, September 2019: 30-31)
- *Pinky And Perky* (20th October 1957)
- *Sportsview* (8th April 1954)
- *Test Match Commentary* (ball-by-ball; *Third & Light* programmes, 30th June 1957).
- *Thank You, Ally Pally* (19th March 1954)
- *The Black And White Minstrel Show* (BBC TV; 14th June 1958)
- *The Six-Five Special* (BBC TV; 16th February 1957).
- *The Sky At Night* (with Patrick Moore; 24th April 1957).
- *The Today* programme started on BBC Radio (28th October 1957)
- *The Woodentops* (9th September 1955)
- *Tonight* (BBC TV; 18th February 1957)
- *Whack-O!* - starring Jimmy Edwards (BBC TV; 4th October 1956)
- *White Heather Club from Scotland* on May 7th (BBC TV; 7th May 1958).

Table 2: Some BBC Programming Highlights (A-Z; 1950-1959).

6th January 1957 and, because BBC engineers in those days were very musical, the Ident consisted of two 'B's and one 'C', played on an instrument, which, even in 2022, cannot be identified!

Once again, a wide range of further new programmes was added to the schedules in 1957 (Table 2). The year was rounded off by *Her Majesty the Queen's Christmas Day*



Broadcast, which was televised for the first time and heard simultaneously on the radio. Several foreign-language stations were introduced by the BBC including the *Hausa Service* (13th March 1957), *Swahili Service* (27th June) and *Somali Service* (18th July).

Once again, some innovative TV and radio services were inaugurated in 1957 (Table 1).

In other events during that year, the then Prime Minister Harold Macmillan announced an indefinite suspension of the *14-Day Rule* on 25th July 1957. The combined TV and radio licence fee was raised to £4 on 1st August of that year. This included £1 to cover excise duty. In other developments, *BBC TV For Schools* began on 24th September (afternoons only); a re-organisation of radio programmes was introduced on 30th September; *Network Three* and *Regional TV News* be-

gan; the first TV broadcast made by Queen Elizabeth II went out on 14th October. Finally, some experimental UHF transmissions started in Band V, on 405 lines from Crystal Palace, on 11th November 1957.

Experimental Stereo Radio and the BBC Film Award

A breakthrough in radio technology came with the first *stereophonic* test transmissions from transmitters in the London area on January 13th and 14th, 1958. Similar tests were conducted from all UK transmitters on 11th and 17th May 1958.

Once again, a new line-up of radio and TV programmes arrived in the course of the year (Table 2). In addition to these, several very notable technological innovations occurred at this time (Table 3 and 4).



BBC Wins 1959 Film Award and Juke Box Jury Begins

The decade-long expansion of the radio and TV transmitter network slowed down in 1959, and just two new stations were brought into service (Brighton and Peterborough (cf. Table 1).

The end of the 1950s saw only one memorable new TV programme, compèred by David Jacobs. *Juke Box Jury* began voting newly released discs as either a 'Hit' or a 'Miss' on 1st June 1959 (Table 2).

On a wider scale, and in terms of technological advances, the first public demonstration of a system to broadcast films for TV by transatlantic cable happened on 17th June 1959. The first programme to use the new technology was shown on 18th June 1959 (Table 4).

The *Best Special Film* award in 1959 was the cinema premiere of *This Is The BBC*. This amazing film went behind the scenes at the BBC during a typical 24-hour day.

In Conclusion: The 1950s and the BBC

The key developments of BBC history in this decade can be summarised as follows:

Listen With Mother began; Children's Television; *Watch With Mother*; Lime Grove Studios opened; European Broadcasting Union formed, spearheaded by the BBC; the Third Programme introduced from the Daventry transmitter; first in-vision 'Weatherman'; BBC disqualified from the *Eurovision Song Contest* from Switzerland; Queen's Christmas Day broadcasts inaugurated; Schools Television; VHF radio; Test Card music; Colour Television Test Transmissions; Regional television; Stereophonic Test Transmissions; and Experimental TV transmissions started in Band V on 625 lines from Crystal Palace.

To round off the BBC's technical achievements during the 1950s, engineers at the *BBC Research & Development* department designed a new TV standards convert-



- A 'live' broadcast, from a submarine at sea (16th June 1956)
- A transmission from a helicopter (4th August 1956)
- An opera was specially commissioned by the BBC (1st February 1956)
- *Billy Cotton Band Show* (22nd May 1956)
- *Eurovision Song Contest* 'live' from Switzerland (24th May 1956).
- First OB from Eastern Europe (1st June 1957)
- First public demonstration of a system to broadcast films for TV by transatlantic cable (17 June 1959)
- First televised coverage of a Party Conference (7th October 1954)
- Prime Minister Anthony Eden made his first TV broadcast (1956).
- Starting prices were included in horse-racing results, for the first time (23rd August 1958)
- State Opening of Parliament was televised, for the first time (28th October 1958)
- Winter Olympics televised (26th January 1956).

Table 3: Notable 'Firsts' in 1950s BBC Programming.

- First 'live' demonstration of the BBC's VERA (Vision Electronic Recording Apparatus) (14th April 1958)
- New TV standards converter (European to North American formats) (the 1950s)
- Start of the *BBC Radiophonic Workshop* (14th April 1958)
- Video recording equipment designed by AMPEX was used for the first time and demonstrated 'live' (1st October 1958).

Table 4: Technological Breakthroughs in the 1950s.

er (European to North American formats; Table 4). This was used for the first time on December 19th, 1959, to produce 525-line videotapes of the *Western Summit Conference* in Paris. Table 4 points to a few more milestones, both in this decade and in general. In next month's column, we will look at the development of the BBC in the 1960s.

For some more information and a reading list with recommended titles on the history of the BBC, you may wish to take a fresh look at the *Radio Enthusiast* website.

www.radioenthusiast.co.uk

Enter our competitions at www.radioenthusiast.co.uk/competitions

Keith Rawlings

Keith.g4miu@gmail.com

We have been lucky to have had the opportunity to look at some of the innovative equipment from Reuter Elektronik of Germany before. Back in May 2018, I was able to put the excellent Reuter RDR Pocket C4 Software-Defined receiver through its paces (*RadioUser*, May 2018: 8-14). The design and performance of this little radio were excellent, and I was very reluctant to send it back!

Then, in May 2020, the editor secured another Reuter product for review. This time, it was the RLA4E Active Crossed Loop Receive Aerial with RSW4 Remote Control & Power Unit (*RadioUser*, May 2020: 18-20). With the RSW4, it became possible to remotely power the RLA4 and to steer the pattern of the loop assembly remotely to change receiving direction.

Once again, both build quality and performance of this loop were first class.

In 2021 we tested the performance of a predecessor loop (Reuter RLA3A) in the Very Low Frequency (VLF) band (*RadioUser*, August 2021: 28-30).

Therefore, when I was asked if I would like to bring you a review of the brand-new Reuter RFA1 Active Ferrite Antenna, I was naturally more than happy to do so.

RFA1A: An Introduction

The RFA1A (Figs. 1 and 2; Table 1) is a microprocessor-controlled active ferrite receiving aerial with a tuning range of 130kHz to 11MHz. It covers the LW, MW and lower part of the SW bands, when using the internal ferrite rod element.

It is also possible to connect a short rod aerial to the top of the device.

The unit is built into a sturdy ABS plastic case that has an anodised aluminium front panel. Its dimensions are 200 x 93 x 32mm, with a weight of 350g, without a battery fitted. To the rear of the case, there is a compartment for a 9V 6F22 battery, and to the right-hand side, you will find two sockets. One of them is a socket for a DC input of 5.7-15V, and the other one is a BNC socket. This is for connecting RF back to the receiver.

However, the RFA1A may also be powered, and remotely controlled, from this socket.

The front panel has an attractive look to it with printed legends and a small, two-line, LCD-display.

Below this display, there is a single SMA



Reuter RFA1A Active Ferrite Antenna & RWS4 Remote control Unit

Keith Rawlings has had an excellent month, in terms of aerials. He returns to cast his critical eye over an innovative new active HF indoor loop aerial from Reuter Elektronik.

socket for an external aerial element, such as a whip; and finally, below this, you can see the On/Off Tune control (Figs. 1 and 2).

The illuminated LCD installed on the front panel displays the frequency the unit is tuned to, the Q factor setting, and also the operating voltage.

The overall build quality looks and feels good.

The signals from the built-in, shielded, ferrite rod are amplified with a low-noise amplifier (SFET/OpAmp cascode) and fed to the 50Ω BNC connection on the side of the set.

The unit is controlled from the main tuning control and a long press of this control switches the unit on and off. The LCD backlight is switched on each time the

knob is pressed. The brightness of the display depends on the supply voltage to the device. After releasing the knob, the light remains illuminated for about 15 seconds before switching off automatically. The last used settings are saved when the unit is switched off.

A continual press and turning of the control steps the LCD cursor along the display, allowing the user to select the device's settings.

Here the step sizes of the frequency setting may be altered, the Q factor may be adjusted from 0-99% (in relative terms), and the internal rod or external aerial connection may be selected. The backlight can be turned off to reduce internal noise and save power.



The RFA1A Concept Explained

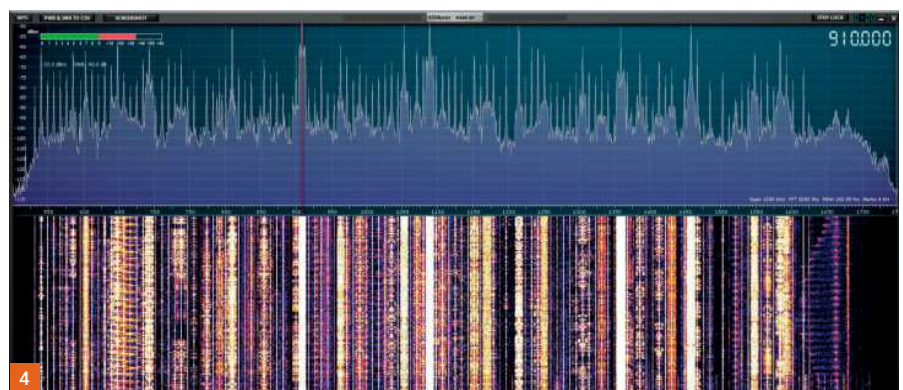
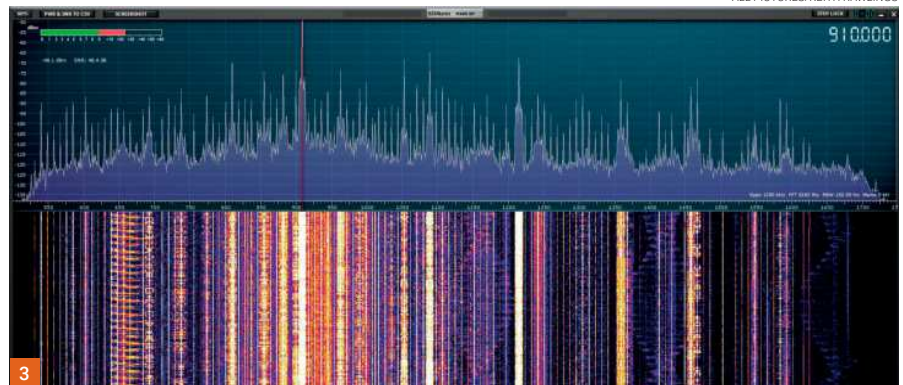
Ferrite rod aerials (often called 'Ferrite Loop' or 'Ferrite Bar') are universally used in millions of receivers the World over. Usually, these are primarily for LW and MW operation but sometimes for HF as well.

The concept of a Ferrite Aerial is simple: It consists of a 'rod' or 'bar', made from ferrite (an iron-based magnetic material) where a coil is wound around the ferrite rod. With a capacitor connected across this coil, this forms a tuned circuit. To bring the circuit to resonance, the capacitor is usually a variable type that tracks the receiver's main tuning. Incidentally, the ferrite material increases the inductance of the circuit and causes the circuit to receive the magnetic component of the signal. It also increases the 'Q' (Quality) of the circuit, which can make the tuning quite sharp. Therefore, when tuning, the capacitor used has to 'track' the frequency the radio is tuned to.

A ferrite rod aerial is directional – and, the higher the 'Q', the 'sharper' this directivity is.

Users of radios from Sangean, Tecsun, and similar brands, which all have inbuilt ferrite aerials, will know that signals can be significantly affected by altering the orientation of the radio.

Indeed there are direction finding receivers based on this same technique.



If the orientation of a ferrite rod aerial is quite sharp – and a receiver needs to track the resonance of the circuit when tuning – then ideally, a separate device such as the RLA1A must have some way to tune it, to 'match' the receiver's frequency. It would be desirable to counter directivity; otherwise, the user will have to keep finding a way to position the unit to enhance reception when tuning.

Tuning, Shielding and Directionality

The RFA1 achieves these needs. First, it does so through 'electronic switching' of variable capacitors and inductors. The user can simply tune the RFA1A to keep track of the receiver using the rotary encoder ("On/Off Tune" knob). This sends signals to the internal microprocessor to electronically adjust the tuning as required, over its entire operating range, with no physical band switching.

Second, for directionality, the RFA1A has a shielded element where directivity is minimised by the shielding coil. Another substantial feature of the RLA1A is that the 'Q' of the device may be reduced or increased, thus enabling the operator to alter the aerial's selectivity. This has two benefits: The tuning of the RFA1A is not as critical at the lower 'Q' setting; in addition to this, the gain levels presented by the

Fig. 1: The RFA1A and the RSW4 Remote Control Unit. Fig. 2: The Reuter Elektronik RFA1A Indoor Active Loop Aerial. Fig. 3: The Medium Wave Band with SDRPlay RSPdx and the RFA1.

Fig. 4: The Medium Wave Band with SDRPlay RSPdx/ SDRUno, and my 66ft end-fed aerial. Fig. 5: Reception of the Long Wave Band with SDRPlay RSPdx / SDRUno, and the RFA1.

Fig. 6: Reception of the Long Wave Band with SDRPlay RSPdx / SDRUno, and my 66ft end-fed aerial. Fig. 7: Burckhardt Reuter's website is a good source of information.

RFA1A are reduced, thus bringing down the overall noise figure.

The RFA1A is designed for indoor use and work in noisy environments.

This is where the use of a shielded element (see above) comes into its own, as it largely rejects local noise. Any directivity from the shielded loop is then mainly used to suppress local interference, such as switch-mode power supplies, LED lamps, plasma TV, and so on, with the unit orientated for minimal noise rather than maximising the receiving level of the wanted signal.

The RFA1A can be used with receivers that have no inbuilt aerial, such as most communications receivers, and it can be deployed with portable receivers that have an external 'ANT' connection. Being flexible, it can be mounted away from the

receiver and orientated in a position where reception or noise reduction is best.

Since it is lightweight and battery-operated, the unit is well suited to be taken out and about, and used with a portable station, or at a temporary location, or even when moving between rooms indoors.

Another highlight of the aerial is that it is microprocessor-controlled. Therefore, the unit offers the option to be operated remotely, using the (optional) RSW4 device, either directly or over a network, via Wi-Fi.

In conclusion for this section, the RFA1A is a very sophisticated device, and all internal circuitry is shielded to reduce internally-generated noise.

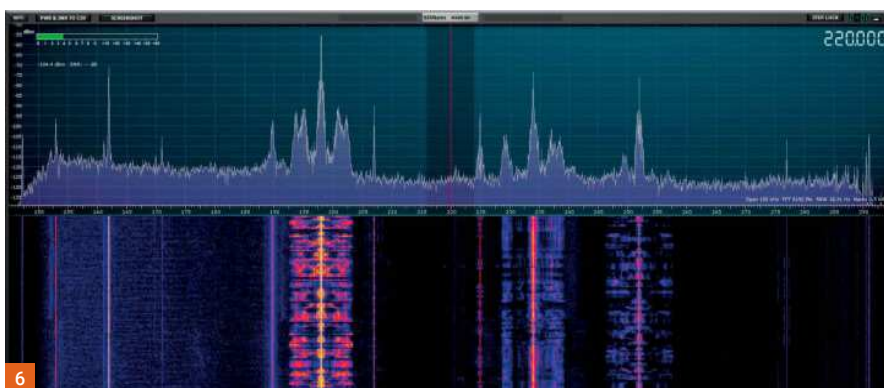
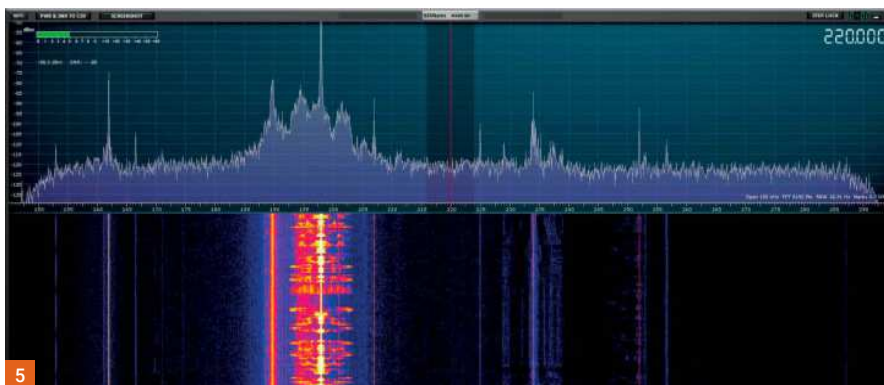
Operation and Use on HF

The unit simply connects to the aerial input on your receiver from the BNC socket on the side of the case.

I started with the RFA1A connected to my main station receiving set-up and placed the unit on my desk right by my operating position. I pressed and tuned the main control to select the correct frequency so that I could have a tune-around of the 80 m and 40 m amateur radio bands.

I noted that with the RFA1A less is more; by this, I mean that, by reducing the 'Q' setting to around 77% maximum (from 99%), the background noise levels dropped significantly, and many wanted signals became more readable. While I am rather reluctant to make comparisons with my larger 66ft end-fed mounted outside (because the two are different to each other) signals were, not surprisingly, stronger on the end-fed, but the RFA1A was able to hold it own and receive all but the weakest signals that could be heard on the end-fed on both bands – which is a good achievement.

I noted that by reducing the 'Q' factor, the bandwidth of the device significantly increased. This means that I did not have to retune when moving frequency within the band and, although this is done at the expense of gain, I noticed that the ambient noise level also decreased. A lower 'Q' setting is, therefore, often useful as this lowers noise levels, yet only minimally affects the SNR (Signal to Noise Ratio). Higher Q settings are only required if higher selectivity is needed, as, for example, in the case of a weak signal in a low-noise environment. These comments hold good for most of the aerial's HF range.



Medium and Long Wave

Moving to the Medium Wave Band, and with the unit in the same position, it was immediately clear that the RFA1A was returning excellent results. If you look at Figs. 3 and 4, you will see a screenshot from my SDRPlay RSPdx / SDR Uno, comparing the RFA1A (Fig. 3) against my end-fed (Fig. 4).

Once again, most of the signals heard on the end-fed (Fig. 4) were also audible on the RFA1A (Fig. 3).

I noted minimal effects on directivity when moving the unit.

Turning to Long Wave (Figs. 5 and 6), I noted that the band was swamped with man-made noise QRM.

The RFA1A was no more than two feet from my PC. I consequently moved it to a cabinet across the room, and the QRM largely dropped.

The results on Long Wave were very good: both during daytime and in the evening, the RFA1A (Fig. 5) was able to resolve all the signals received on the end-fed (Fig. 6) – albeit at a little lower strength, as has to be expected. Some PC-generated interference was still present, although much reduced.

I noted that there was some directivity on LW of approximately 20dB when measured against BBC R4 198kHz. To evaluate the effect of changing the

device's 'Q' setting, bandwidths were measured at an arbitrarily chosen figure of 10dB down off of the wanted frequency. Using the steady signal on 909kHz with a received signal level of -29 dBm and the 'Q' set to 99% I found that, when tuning for a signal of -39 dBm, the bandwidth was 19kHz when tuning higher in frequency, and 16kHz when tuning lower in frequency.

With the 'Q' set to 0% and a received level of -50 dBm, the -60dBm bandwidth was 219kHz higher in frequency and 150kHz lower in frequency. On Radio 4 Long Wave (198kHz), the bandwidths were much narrower, at +/- 5 kHz at 99% and +/- 10 kHz at 0%.

These figures demonstrate the unit's sensitivity and selectivity/bandwidth with the 'Q' set to maximum and minimum. They also show that, as the frequency is increased, the bandwidth of the RFA1A also increases, making the 'Q' setting less critical.

Virtually Noise-Free: Portable Receivers

I next tried the RFA1A on my veteran Sony ICF7600D. This radio has an inbuilt ferrite rod aerial, and on the LW and MW bands, it needs orientation to improve reception. Like the RFA1A, it does not like being sat near my PC on LW. I, therefore, needed to move it away from the QRM being

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Receiver and Transceiver	Antennas	Documentation (PDF)
<ul style="list-style-type: none"> Direct digitizing with 15 / 17 / 18 Bit Standalone without a PC WVGA display 800 x 480 pixels Spectrum and waterfall 0 ... 30 MHz, 6 m, 4 m, 3 m, 2 m Touch or keyboard operation Optical or magnetic detent rotary encoder 	<ul style="list-style-type: none"> Active broadband antennas Only for receiving purposes Small magnetic loop antennas Interior and outdoor versions 50 kHz ... 71 MHz Low power consumption Electronic direction switching 	<p>Current price list</p> <p>Manual RDR50/54/55</p> <p>Receiving Examples</p> <p>Manual RDR51 "Pocket"</p> <p>Manual RDR53 "sPocket"</p>

Products

7

- Dimensions (W x H x D): 1A: 200 mm x 93 mm x 32 mm (without connectors and knob)
 - 1B: 160 mm x 93 mm x 32 mm (without connectors and attachments)
 - Frequency range: 130 kHz ... 11 MHz
 - Frequency deviation: $\leq 3\%$
 - Intrinsic noise power (Q=99%): ≤ -130 dBm/Hz (at 1 MHz)
 - IP3 Out (Q=99%): $\geq +20$ dBm (2x -10 dBm measuring tone at 1 MHz)
 - Maximum output voltage: ≥ 0.7 Veff, 1 dB compression
 - Power supply voltage: +5.7 V ... +13.8 V (maximum +15.0V)
 - Power supply: max. 50 mA
 - HF output: 1A: BNC 50 ohms
 - 1B: SMA 50 ohms
 - Weight: ≤ 0.4 kg
 - Environmental conditions: 1A: 0 °C ... +40 °C ambient temperature, $\leq 90\%$ rel. humidity non condensing
 - 1B: -25 °C ... +40 °C ambient temperature, IP65
 - Compliance: CE according to DIN EN 55013, EN 55020, EN 60065
 - RoHS / WEEE Directive, ear-Reg. 27676700
- All specifications are subject to design changes.*

Table 1: Reuter Elektronik RFA1A/B.

generated. With the RFA1A positioned by a window, and running on battery power, I connected the unit to the 'Ext Ant' socket of the Sony and was immediately rewarded with virtually noise-free reception.

By experimentation, I found that with the Sony 20% was the highest I could go on the 'Q' setting without increasing the noise level too much. With the 'Q' set to minimum and the frequency set accordingly, I was able to enjoy reception over the whole LW/MW bands while sitting across the room with the Sony on my lap, and the RFA1A still by the window connected by a 5m run of RG58.

I tried out the addition of a vertical whip on the upper HF frequencies; however, owing to locally-generated noise, this was not successful. In general, though, in a reasonably quiet environment, this should be a way to increase the reception frequency of the RFA1A.

Throughout the review, I did not notice any spuriously generated signals.

In Control: The RSW4

The RSW4 is used with the RFA1A for remote control. It is also used with the RLA4 but with different firmware.

It is connected in series with the RF cable to the RFA1A. It can supply the DC voltage needed to power the RFA1A and

also the data to change frequency and 'Q' settings.

This means that the RFA1A can conveniently be controlled while it is well away from your operating position. In addition, the RSW4 has an inbuilt 2.4GHz Wi-Fi, so it can be connected and controlled via a network.

Control of the RFA1A is accomplished similarly by rotation of the main control on the RSW4 and pressing inwards to select options.

All information is displayed on a two-line OLED display

The RFA1B Version

The RFA1A is intended for indoor use but Reuter Elektronik also manufactures a unit for use outside. This is the RFA1B variant. This does not have the front panel and controls of the RFA1A but instead, it is a 'black-box'. This is remotely controlled using the RSW4. Needless to say, there are many benefits of having aerials mounted outside and possibly away from noise and interference.

In Conclusion

I very much liked the RFA1A and RSW4 combination. It is ideal for use in cases where a listener cannot put up a larger aerial. As such, I can see it appealing to those who live in flats or dwellings that

have limited facilities to mount full-sized aerials. Being mindful of the careful positioning of the unit can considerably reduce interference generated from devices in the shack, such as computers, power supplies, lighting, and so on.

This high-quality aerial works surprisingly well, especially so on lower frequencies; and because it is lightweight and compact and possesses the ability to house its own battery supply, the RFA1A will also appeal strongly to those who need an excellent additional aerial while on the move.

I used the RFA1A with my portable Sony ICF7600D, with the RFA1 positioned by a window. This setup demonstrated that the unit was ideal for use with HF/ World Band Receivers, while on holiday or otherwise away from home.

Like the previous devices I have evaluated from Reuter Elektronik, the RFA1A is a very high-quality product.

My sincere thanks to Herr Burkhard Reuter for the loan of the RFA1A and the RSW4, and also for his prompt and comprehensive replies to my questions.

Presently, the RFA1A is priced at €399 and the RSW4 Control Unit at €249.

Check out the latest developments at the Reuter Elektronik website (Fig. 7)

<https://tinyurl.com/3xfh8m9r>
<https://tinyurl.com/2zczu83y>



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Buy the TRX-1E for just

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WS1065 Desktop Radio Scanner



The Whistler WS1065 employs cutting edge technology to bring a high level of performance and innovative features. This model clearly raises the bar in the area of advanced trunking scanners. Frequency coverage is extensive including: 25-54, 108-17, 137-174, 216-512, 764-776, 795-805, 849-869, 896-960 and 1240-1300 MHz.

1800 memories are available and may be dynamically structured to bank sizes you prefer. Plus you can store 21 virtual scanners (so that is a total of 37,800 objects).

The large backlit LCD is four lines by 16 characters. The keys are also backlit. Supported trunking systems include Motorola Analog, EDACS, LTR and Digital APCO (9600 bps).

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This 300-channel scanner can be categorized into 10 separate memory banks. Plus one-touch searches of marine, air and ham Frequency Range: 29-54 VHF Low Band, 87.3-107.9, 108-137 Civil Aircraft Band Includes 833 kHz steps, 137-144 VHF, 144-148 Amateur Band 2 Meters 148-174 VHF High Band

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WS1010 Handheld Scanner

This 400-channel scanner lets you listen to FM radio bands and can be categorized into 10 separate memory banks. Also, it offers the convenience of one-touch searches of marine, air and ham

Key Features/Specifications: 200 Channel memory - plenty of memory to store all your favorite frequencies in 10 separate storage banks. Backlit Liquid Crystal Display - easy to read and program data even in low light situations.. Data Cloning - allows transfer of the programmed data to another WS1010 scanner.

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When monitoring P25 digital systems, the exclusive Automatic Adaptive Digital Tracking instantly adapts the digital decoder to the digital modulation format of the transmitted signal, then analyses the signal over 50 times each second and adapts to any subtle changes caused by multipath or fading. No cumbersome manual adjustments are required.

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Featuring wide-band AM/FM coverage from long wave, medium wave, short wave. The DSP comes as standard (Digital Signal Processing) with the unit and includes a number of features which can significantly enhance reception through improved interference rejection. For everyday portable operation, use four "AA" batteries (not included). For operation from your home, choose the supplied AC-AC power adapter. Includes Vinyl case and wind-up wire antenna. LSB and USB for the Amateur bands with Auto Bandwidth control and RF Gain control.

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- Receiving frequency: SW2.30-30MHz (main adaptive frequency)
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- Impedance: 50ohm • Gain: 20dbi • Receiving ring: ring diameter 20cm
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Chrissy Brand

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The world of radio and audio is saturated with individuals presenting podcasts, hundreds of commercial radio stations to choose from, plus countless 'vloggers' and 'influencers' to follow on social media. Having a wider choice of programmes and channels is to be wholeheartedly welcomed. It results in audio content available for everyone with an internet connection, and on whichever subject matter or causes they are interested in.

Of course, there are not enough hours in the day to listen to everything you might like to. As a result, some reliable and established public media organisations might suffer, in the long run. If fewer people listen and watch public radio and television, there inevitably comes a time when fewer people are willing to pay for the services offered.

Whether a public broadcaster is funded by licence fees or other taxes become irrelevant if large swathes of the population no longer support it. That is why focusing on relevant engagement with the younger population should be a priority for all public broadcasters. Once an organisation loses the backing of the young, then their future looks bleak. The 30-year-olds of today are, of course, tomorrow's tax-payers and movers and shakers, potentially progressing to powerful roles as leaders, opinion shapers and policymakers.

The Waves of Change

In this overcrowded field, can public radio, whether it is the BBC, NPR or each country's equivalent, stay relevant and cherished as a public institution? I would argue that they can, for as long as they continue to engage with all their potential audiences. This can be achieved by producing quality content, information and entertainment, and radio programmes and podcasts, promoted by using all of the social media tools required, from *Discord* to *Tik Tok*.

By the middle of the 20th Century, most public broadcasters around the world were 'cemented into place' as vital organs of a country's media. Many of these followed the lines set up by one of the first one – the BBC. In many cases, they are independently run, in other scenarios driven by governments. Whichever model is chosen, these broadcasters were



How Radio Stays Relevant, Today and Tomorrow

In the final part of her article on how Public Radio retains its relevance, **Chrissy Brand** examines some of the world's leading public radio broadcasters, funding models, and broadcasting strategies.

always influenced by the establishment and the governments of the day.

Public radio had a more straightforward role back then – to inform, entertain and educate, audiences, both domestic and international – over the airwaves, overland and overseas (Fig. 1). However, the role of public radio has changed in the past 30 years. SW, MW, LW, and even FM, are now of less use for transmitting to those at home or overseas.

Perhaps, commercial radio stations have an easier time: Those that are individually owned and run can engage at an appropriate level with audiences, using programmes and social media. It is more complicated when stations are part of much larger networks, owned by such giants as Bauer. Community radio

stations might be the most fortunate in this regard, working in the locality that they communicate with, and knowing the best way to maximise audience interaction.

Today, public radio has to make its funding stretch beyond the original remit of programme-making and transmission. Each programme requires instant follow-ups, Facebook posts or tweets. By contrast, replying to listeners who have written letters or requested QSL cards and promotional material now seems from a bygone era.

However, other, 'old-school' ways of interacting with listeners are still of great use. Concerts, pop-up stands, roadshows and similar public-facing events generate much energy, excitement and publicity for the radio station or programme hosting it. Another 'quick win' is operating a shop

Fig. 1: Public radio broadcasters today need more than just an on-air presence.

Fig. 2: Public spaces, such as the ORF Café in Vienna, bring listeners and stations closer.

Fig. 3: In Switzerland, voters rejected a proposal to cut licence fee funding. Fig. 4: CBC Radio 3 is one of many stations on the subscription-only SiriusXM platform. Fig. 5: A rebranding for China Radio International, as CGTN.

and information centre in a publicly accessible part of a station's headquarters. This enables the sale of associated merchandise and the dissemination of information about the station. It also overcomes the sometimes colder interactions encountered on Facebook and other social media.

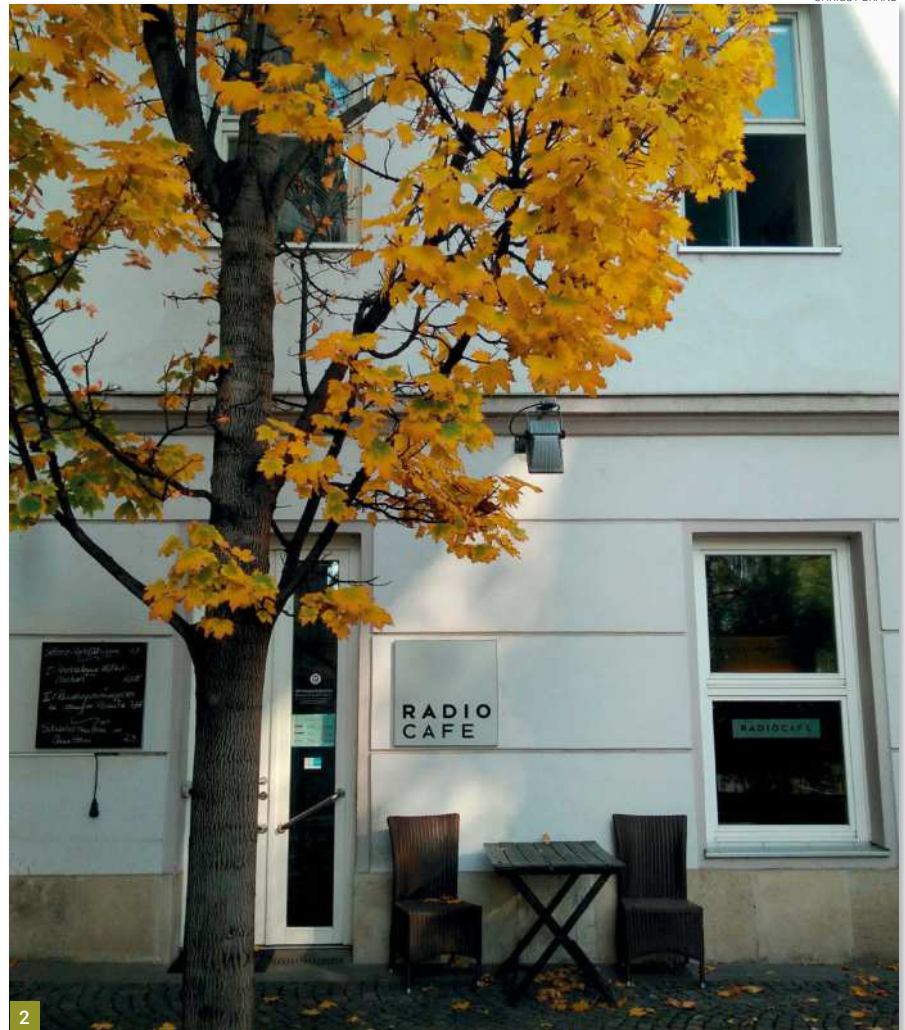
A friendly chat with a knowledgeable station employee can go on a long way in cementing the bond between individual listeners and radio stations. I can state that through personal experience, of working at the *BBC World Service Information Centre and Shop*, many decades ago.

One further way of encouraging in-person connections is through a radio station café that is open to the public and which station employees will also use. I love soaking up the atmosphere in such places, listening to a station output over the café sound system, reading a programme guide or book by a DJ. ORF (Österreichischer Rundfunk), in Vienna, is a standard example of this. Its café was open when I last visited (Fig. 2), although its shop had sadly closed.

Issues of Funding

Funding models have usually been sustained through government grants, licence fees, advertising, sponsors, or paid for by the public in other taxes (see Part One, *RadioUser*, March 2022: 34-37). And, as subscription models are now commonplace for everyone who chooses to access *Disney+*, *Sky*, *Amazon Prime*, *Netflix*, *Spotify* and other channels, it cannot be long before more public broadcasters go down this route. Many public and national media bodies are already supplemented by commercial funding. This is the case for the NBC in Namibia, SABC in South Africa, CBC and Radio-Canada, TVN in Chile, KBS in South Korea, Prasar Bharati in India, RAI in Italy, Pacific Māori TV and TVNZ in New Zealand. ORF in Austria is funded from a combination of television licence fee revenue and limited on-air advertising.

The Danish Government planned to phase out DR's (Danish Broadcasting



Corporation) media licence fee, replacing it with taxation. An inevitable result of moves like this is a huge reduction in income. The *Public Media Alliance* were amongst many who reported that, in 2018 in Switzerland, Swiss voters rejected a proposal to cut licence fee funding to public broadcasters. This came after a campaign that stirred debate about the role of public media in the digital age. The "No Billag" initiative divided Switzerland across political and generational lines (Fig. 3).

I have looked at the BBC in Part 1, last month (*RadioUser*, March 2022: 34-37). Elsewhere in the UK, Channel 4 TV is funded by advertisements, to enable it to exist as a free-to-air public-service network. It moves with the times and produces successful podcasts. These include news and current affairs, with *Ways to Change the World* with Krishnan Guru-Murthy and *The Fourcast*. There are also podcasts related to Channel 4 entertainment and educational programmes, such as *Taskmaster the Podcast* and *Time Team*.

Canada

In 2017, CBC and Radio Canada received Canadian \$750 million per annum on an ongoing basis. Government funding cuts had decimated services over previous decades. However, there was talk of reinvestment from 2019, with an extra \$150 million per annum. Most readers will have first experienced Canadian radio through the once-powerful Radio Canada International (RCI). In recent years, the easiest way to hear the many fantastic programmes offered by the rest of CBC public radio has been through streaming. The quality of content still stands out and underlines the need for every nation to possess an independent and diverse public broadcaster, to cover the needs of people living in its country and those around the world.

Catherine Tate, President and CEO of CBC/Radio-Canada since 2019, illustrated the dilemma of every public service broadcaster. She stated that it is the job of the CBC to build social cohesion in Canada

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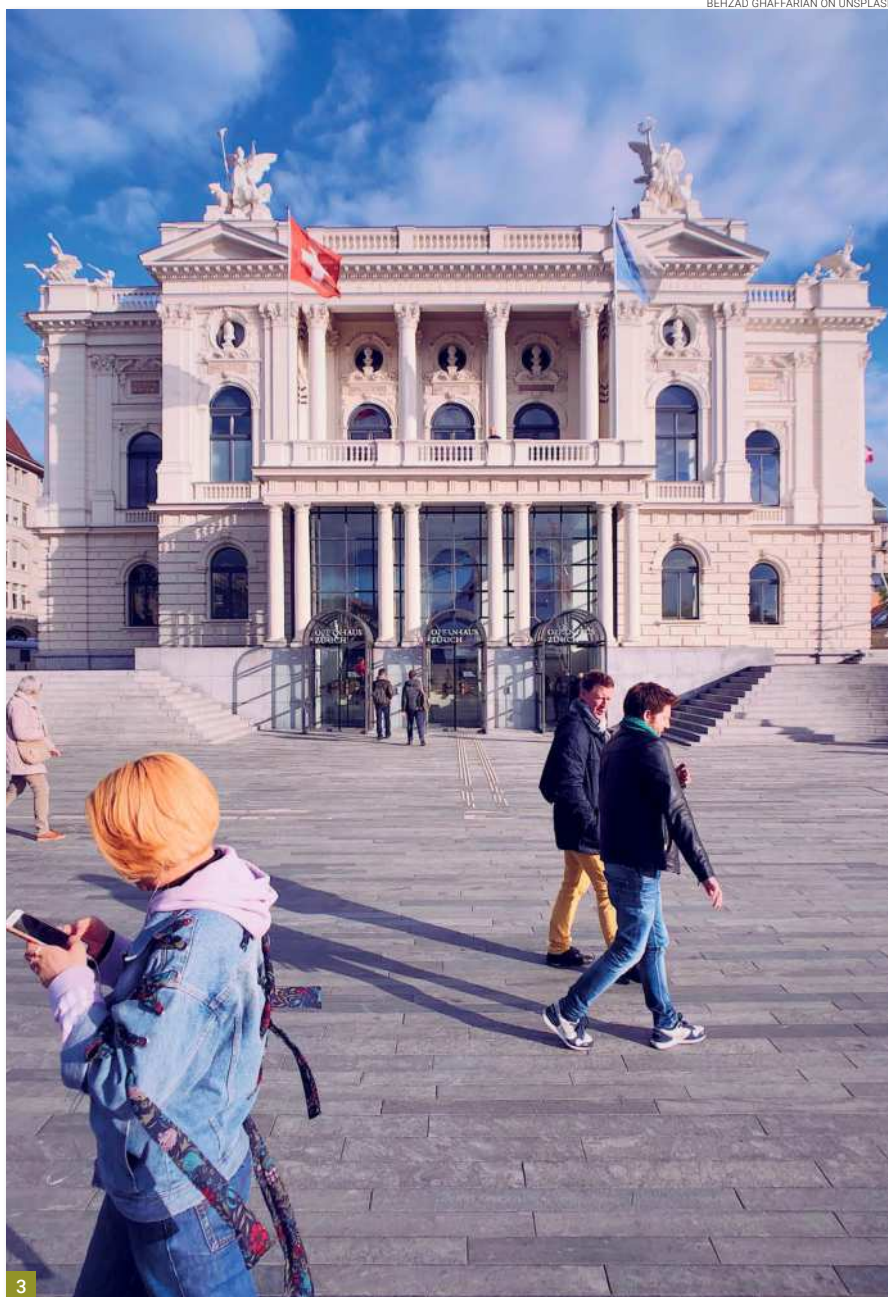
but there is also a basic requirement to run a business. She explained, *"We tell stories, and that has changed profoundly across our news organization. We have an obligation to explain to the people of Canada, and government, why it is that we are more valuable than ever."* Her predecessor, Hubert T. Lacroix, had spoken of the benefits arising from investment in public radio. The increase per capita which took place in 2017, from Canadian \$34 to \$57 per Canadian would, he said, *"create a net total GDP gain of \$488 million, a total labour income impact of \$355 million, and 7,200 additional jobs in Canada. That's good for Canadian culture and it's good for the Canadian economy."*

At that point, Canada ranked as third-lowest for public media funding among Organisation for Economic Co-operation and Development (OECD) countries. CBC has remained relevant to audiences, with CBC Radio One and *Ici Première* adapting to include different programmes for audiences who listen on SiriusXM subscriptions (Fig. 4). Online digital music channels (see below) cater for all music tastes. Under Catherine Tate, CBC has taken advantage of the digital age, focusing on the broadcaster being able to *"plug in anywhere and tell a story"*. This includes being accessible to younger audiences on smartphones.

<https://www.cbc.ca/music>
www.icimusique.ca

Germany

DW (Deutsche Welle) is the strand of Germany's public broadcasters that is best known internationally. Its radio services and programmes are amongst the best there are. DW focuses a lot on Africa and Asia, which is useful in explaining developments in those continents to everyone. Added to this are news and features, coverage of culture, environment and the ever-evolving European political landscape. I cannot live without DW podcasts and their live television news service, and I have recently enjoyed several fascinating South American travelogues from DW's *YouTube* channel. DW's presence across all the social media platforms I use seems of the highest quality, too. DW is one of the ARD broadcasters (*Arbeitsgemeinschaft der öffentlich-rechtlichen Rundfunkanstalten der Bundesrepublik Deutschland*), a joint organisation of Germany's regional public-service broadcasters. DW is funded by tax revenues, while fellow ARD broadcasters,



Deutschlandradio and ZDF (*Zweites Deutsches Fernsehen*), receive their funding via broadcasting fees. ZDF also receives funding through sponsorship and advertising. However, as a public broadcaster, there are special advertising regulations. Only 20 minutes a day of advertising is allowed from Mondays to Saturdays, with nothing permitted after 2000, or on Sundays and public holidays.

China

Chinese Radio came to the fore throughout the 1940s and after the revolution in 1949. The English service, which readers will know very well, due to its ubiquity on short

wave, began in 1950. English was one of nine language services and was named *Radio Peking*. This was changed in 1983 to *Radio Beijing* to reflect Chinese spellings. Ten years later came another rebranding, to *China Radio International*, part of the state-owned *China Media Group*. This remained in place until December 2021 when another name change came about. It is now known as CGTN, *China Global Television Network*, which is owned by state media *China Central Television*.

As you would hope would be the case with every public service broadcaster, all bases are covered: medium wave, short wave, FM, DAB, DRM, satellite, cable and



CHRISSEY BRAND



CGTN FACEBOOK

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online. Understandably, most public service radio organisations have a limited budget and have to be selective as to the platforms they use. This has resulted in the decline of short wave over the past 30 years. CGTN continues to produce a wide array of interesting programmes in its English Service.

This was highlighted by Alan Roe in his *Listening Post* column in *BDXC Communication*, in February 2022. A few CGTN programmes that stand out to me are *World Insight with Tian Wei*, an international platform for debate and intelligent discussion; *Round Table*, an insight into the minds of Chinese youth and contemporary

China; *Chat Lounge*, reactions to major events; and *China Africa Talk*, bringing a better understanding from both an African and a Chinese perspective.

Conclusion

Overall, most public media broadcasters are trusted more than commercial stations or the press, who have products to sell or are owned by wealthy individuals with their own agenda. Public radio still needs to be monitored and represented at the top by a more diverse microcosm of society. Funding models need to be found, and taxes are probably the most efficient way forward. Public Media broadcasting, on

radio television and online, is, in my view, a necessity – almost a basic human right. Every citizen has a right to be informed accurately of the full range of social, economic, political and cultural events that affect all aspects of life in the country they inhabit. Everyone also has a right to be given a clear understanding of global events from each country’s perspective. This must include voices of dissent and of those communities that are denied airtime. Only then can public service broadcasting fully play a role in enriching the world and being a catalyst for improvement and betterment. To me, CBC and DW are exemplars of public service radio, covering all platforms (on the airwaves, streaming and social media). Along with the production of entertaining and informative programmes for most audiences – presented freshly and professionally – these stations demonstrate how public broadcasting will remain relevant.

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With Ukraine very much in the news, it seemed timely to select a few English programmes about, or from, the country.

Radio Ukraine International is the state broadcaster that, in March 1992, replaced Radio Kiev. Radio Kiev had launched in 1962 on short wave in English. A German service was added four years later and a Romanian service in 1970. Today, a good choice of programmes emanate from Radio Ukraine International's English service. There is an hour each day, and programme titles include *Ukrainian Diary*, *Music from Ukraine*, *World.ua* (a press review of some of the world's press, and *Hello from Kyiv* (listeners' comments and queries).

As well as accessing the station online, Radio Ukraine International programmes are transmitted via WRMI in Florida.

www.nrcu.gov.ua/en

www.nrcu.gov.ua/en/List

Ukrainian radio is similar to that in many countries: a state, or public, broadcaster airing a range of stations, with talk, pop, jazz and classical music all quite well covered. Radio Ukraine International has three sister stations: Ukrainian Radio, which is the nation's most popular news and talk station; Radio Promin with music and talk; and Radio Culture, which is a cultural and educational station. Radio Jazz (which can be heard on FM in the cities of Kyiv, Lviv, Zaporizhzhia and Dnipro) has a broad definition of what it considers to be jazz, with the likes of Earth Wind and Fire, Italian Secret Service and Dee Dee Bridgewater all featured. Veteran US jazz singer Dee Dee Bridgewater may be familiar to radio listeners, as she presented NPR's *JazzSet* programme for over two decades. The show ended in 2014 but there are plenty of great shows in the archive to hear, with interviews, concerts and a vibe that just evokes cool nightclubs and a heady atmosphere.

<https://tinyurl.com/y3tv5rft>

If you access Ukraine's Radio Jazz via the radio player app or webpages, you have a choice of several jazz styles and channels: Ether Radio Jazz, Radio Jazz Gold, Latin, Light, Cover and Groove. An app for Ukrainian radio, sensibly called



Radio from Ukraine and a Global Community Radio

Chrissy Brand goes scientific, surveys radio from Ukraine, travels on country roads, evaluates a 'global community radio' in the US and offers her latest monthly listening recommendations for all forms of radio.

Radio Player (Fig. 2), includes Classic, Xit FM, Jazz, Melodia, Radio Roks, Kiss FM and Relax.

Several of these stations have a handful of channels to themselves, along the lines of Jazz Radio.

www.radiojazz.ua

<https://radioplayer.ua>

<https://play.tavr.media/radiojazz>

Radio Classic is on the air in Kyiv on 92.4MHz. For the rest of us, it is available online, and when I last listened, I was treated to *Harold En Italie*, *Marche des Pèlerins* by Hector Berlioz. Other stations to try out online or via the app include Radio Ritmo Latino, Radio Italiano, Radio Indie and Walk Radio, which, as I passed through, featured a rather nice tune, *On the ship muzika igraet*, by Olga Zarubina. Melodia FM offers contemporary pop and ballads from Ukrainian artists as well as some westerners, for instance,

Laura Branigan. Of course, one of the joys of music radio is that you can be entertained without needing to understand the language that the presenters or the musicians speak.

www.classicradio.com.ua

<https://play.tavr.media/classicradio>

<https://play.tavr.media/melodiafm>

There are some podcasts I wanted to mention too. *Kyiv, not Kiev* is a 'vlog cast' and can be viewed on *YouTube* and *Facebook*. It is in English and, although some dry topics are covered, such as internal political developments and the economy, there are lighter topics too, with sport (including futsal) culture and behind the scenes insights.

In case you are wondering, *Episode 25*, on November 5th, 2020, explained why the capital is called 'Kyiv', and not 'Kiev' (Fig. 1): In short, history and a lack of statehood is behind it; Kyiv is the 'an-

Fig. 1: Polina Boichuk and Tetiana Gaiduk explain why their vlog cast is called 'Kyiv', not 'Kiev'.

Fig. 2: You can stream radio from Ukraine through the Radio Player UA app.

Fig. 3: Back to the 1890s with Marion's Attic on GCR and WBCQ.

Fig. 4: UK country music star, Jade Helliwell with Luke Thomas, live at The Mill.

Fig. 5: Despite the title, *Tales of Tennessee* is actually a podcast from Essex.

glicised' version of the Ukrainian spelling, whilst Kiev is Russian.

<https://youtube.com/c/KyivNotKiev>
www.facebook.com/kyivnotkievchannel

Finally, the *Explaining Ukraine* podcast in English is an, "official podcast of *UkraineWorld*, a networking initiative aimed at bringing together key Ukrainian and international experts and journalists interested in Ukrainian issues, as well counteracting propaganda and disinformation."

<https://ukraineworld.org>

'How Does My Radio Work?'

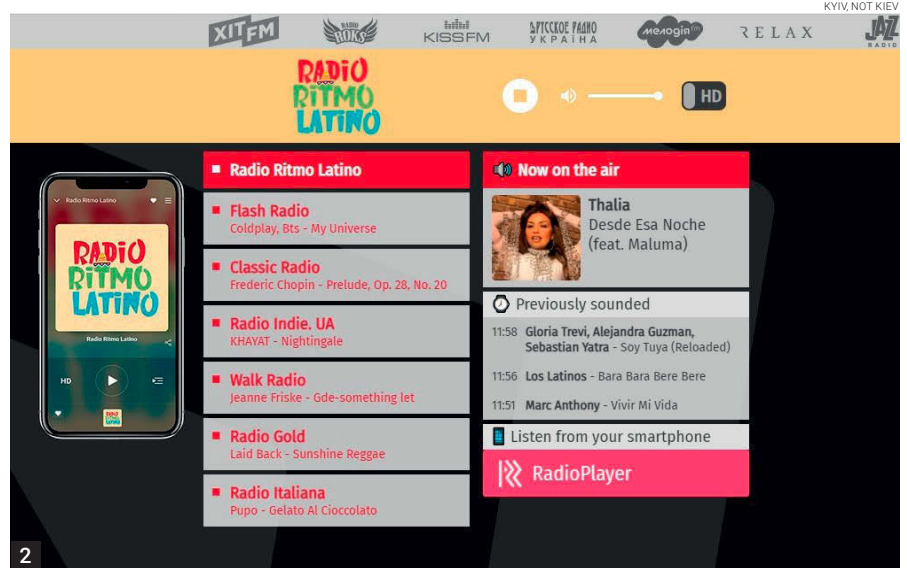
BBC World Service's *CrowdScience* programme is a revelation of astounding facts. The episode of January 31st was particularly pertinent, being titled *How does my radio work?* A listener in Sydney wanted to know the science that enables him to enjoy the atmosphere and sounds of a football match on a small budget radio.

Another listener, from New Delhi, wanted to know which sounds were recorded first. An ethnomusicologist, Patrick Feaster, spoke of his work on the First Sounds Initiative. The mission is to make humanity's earliest sound recordings available to all people. The project, "rewrote history in 2008 when we discovered and resurrected humanity's first recordings of its own voice, created in 1860 in Paris by Édouard-Léon Scott de Martinville. Since then, we have identified and played back even older recordings."

www.firstsounds.org

CrowdScience presenter Geoff Marsh went to the *BBC Radio Shack* to see how electrical signals are attached to radio waves before being sent over the airwaves. His journey continued via a speech and hearing specialist who showed how, "brains are often filling in the gaps of lower quality audio."

A professor of acoustics at Salford University then demonstrated 'object-based audio'. This is a technology that, "could enable us to create our bespoke mix of dramas and sports, such as heightening the commentary sound or choosing to hear



just the crowd, just by using the speakers many have lying around them, such as mobile phones."

Every week, *CrowdScience* teaches the world something new, that, once heard, makes you wonder how you ever survived without: Why sunshine makes us happy and healthy, why we get bored, how to keep fruit and vegetables for longer, how to make decisions. Tune in on DAB, short wave or stream from the programme's web pages.
<https://tinyurl.com/y87apz7f>
<https://tinyurl.com/mrxxtx8m>

Global Community Radio

Whichever way your traditional radio works, streaming is probably the way forward for most listeners. To this end, I have been

enjoying the programmes offered on Global Community Radio. This American-based setup is a wonderful resource, streaming plenty of international radio stations and a range of independent programmes. There are three channels, *GCR1*, *GCR2* and *GCR3*. These options cover much of what I want from a one-stop, radio channel. There are thought-provoking features, easy-to-digest science, international news from broadcasters I have trusted for decades, a good range of music, and some quirky presenters. I could happily spend the rest of the year streaming GCR, and my radio needs would pretty much be perfectly met.

There are many terrestrial and internet radio partner stations in the USA, which also put a selection of GCR programmes

Date	Time (UTC)	Station	Programme	Podcast	URL/ Stream/ Frequency
Daily	0500 to 0530 1830 to 1930	Radio Thailand World Service	News, features	https://tinyurl.com/mtv2c76z	17640 at -0500 and 7475kHz at 1830
Daily	1900 to 0900	Magic Radio	Magic at the Musicals	https://tinyurl.com/yckp9bdz	DAB, online, app, Smart speakers
Daily	24/7	Triple J Unearthed	New Australian music	www.abc.net.au/triplejuneearthed	www.abc.net.au/triplejuneearthed and Palomar City Radio app
Weekdays	1830 to 1850	Bulgarian National Radio	Bulgaria Today	https://tinyurl.com/y7nbmnas	3985kHz and www.shortwaveservice.com https://bnr.bg/en
Monday to Thursday	2303 to 2359	BBC Foyle and BBC Ulster	The Late Show with Eve Blair	BBC Sounds App	FM, DAB and www.bbc.co.uk/programmes/m0010g56
First Thursday Second Thursday	1600 to 1700 1400 to 1500	Radio Reverb	Billie Eliot Adventure Club, everyday adventuring	Online Radio app or Google Podcast app	FM, DAB, Smart speaker www.radioreverb.com/shows/billie-eliot-adventure-club
Saturday	0805 to 0950	GCR1 and ABC	Away!	https://tinyurl.com/34pcuffc	FM and https://tinyurl.com/3ztsbzbn
Saturday and Sunday	0730 to 0900	Radio Classique	Your Classic Radio Weekend with Laure Mézan	Radio Classique app	FM, DAB+ www.radioclassique.fr
Saturday Sunday	1500 to 1600 2200 to 2300	GCR2 WBCQ	Marion's Attic, Marion Webster and Kristina 78rpm records	https://marionsattic.net	https://globalcommunityradio.blogspot.com and 7490kHz
Sunday	0030 to 0050	WRMI	Postcard Panorama: A Shortwave Radio Conversation, with Tammy Walker	https://tinyurl.com/4n5eum7v	5950kHz, www.postcardpanorama.com and www.wrmi.net

Table 1. Chrissy's Top Listening Recommendations for the Month Ahead in International Radio.

out across the airwaves. Amongst these are KBOG Bandon in Oregon, KFZR Frazier Park in California;

Kutztown University Radio in Kutztown, Pennsylvania; Nashville Revolution Radio in Tennessee; and WYAP Clay in West Virginia. GCR Channel 1 includes a few familiar names from the short wave bands, along with some other quality, intelligent-sounding programmes. To whet your appetite, here is a selection: *Latin Waves*, *The Science Show*, *World Ocean Radio*, *Science Unscripted*, *The Media Project*, *Not Another Midwest Millennial Political Show*, and *Tech Nation*.

Just some of the many familiar broadcasters that you will hear include Deutsche Welle, Al Jazeera, Voice of Mongolia, Radio Sweden, Radio Tirana, Polish Radio, Radio Slovakia International, RTE, NHK World Radio Japan, KBS World Radio Korea, and All India Radio. Meanwhile, GCR2 offers mostly music programmes which include *Thrift Store Vinyl Hour*, *Lake Air*, *Retrospect 60s Garage Rock*, *Train to Skaville*, *Dancehall/Reggae Show*, and *Routes and Branches and Beyond*. GCR 3 appears to major in classical music and jazz, transmitting countless programmes. Certain programme titles entice me to hear more: *Notes From the Jazz Underground*, *Classical Guitar Alive*, *Wind and Rhythm*, *The Spanish Hour*, and *Fiesta!* What more could you ask for? With the demise of Radio360eu (short wave and streaming service) in January, a resource like GCR becomes more valuable for hearing international radio stations.

Daniel at Radio360eu wrote to a friend of mine, Nick Packham, stating, "I am afraid I

have to inform you that we just have decided to end the project Radio360.eu after nearly 14 years. We decided to do this for multiple reasons, one being that most of the stations now have their own on-demand services and the fact we haven't been able to update the site and system in the past few months as much as we should have been. Thanks for being one of our users/listeners and for expressing your interest again!" Other streaming services that include international state broadcasters include Shortwave Service in Germany. Shortwave Service offers the best of both worlds, in that it is on the air on short wave (3985, 6005 and 6085kHz), whilst also streaming live. How many interval signals can you recognise?

The World Radio Network (WRN) still streams broadcasters through its channels, now hosted by *Encompass TV*. The English channel operates different programming schedules for Europe, North America and the Caribbean, Africa and Asia. It can be heard via satellite, cable TV, at the Encompass website or through the *TuneIn* app.

<https://tinyurl.com/3ztsbzbn>
<https://tinyurl.com/yckjrfvw>
www.shortwaveservice.com
www.encompass.tv/solutions/radio

Marion's Attic (Fig. 3) is a unique programme, playing music you do not hear in many other places. It has been on short wave since 1999. Marion Webster and her sidekick Kristina play music dating from the 1890s to the 1920s, "records from her vast collection of cylinders and 78's mostly on original phonographs." Based in Coventry, Connecticut, *Marion's Attic* can be heard via WBCQ and is also streamed on GCR2.

I am yet to find an archive or listen again facility which, perhaps, makes the programme even more of a rarity to be cherished. You need to listen live as the programme is broadcast or streamed, or it is gone forever. However, there are a couple of recordings of past programmes to be found online, with one full show at *The SWling Post* from 2013, and a few minutes from 2020, on the *YouTube* channel of *Sparkyzilla85*.

<https://marionsattic.net>
<https://tinyurl.com/yckmnpjs>
https://youtu.be/Fr1BFhBK_MA

Country Roads

Country music in the UK is enjoying a period of growth and popularity. This is partially led by young musicians, producers, festival organisers and DJs, taking the genre to a new level. The scene is shaking off the country and western, 'cowboy-hat-imagery' that puts many people off, or at least makes them pigeonhole the genre unfairly.

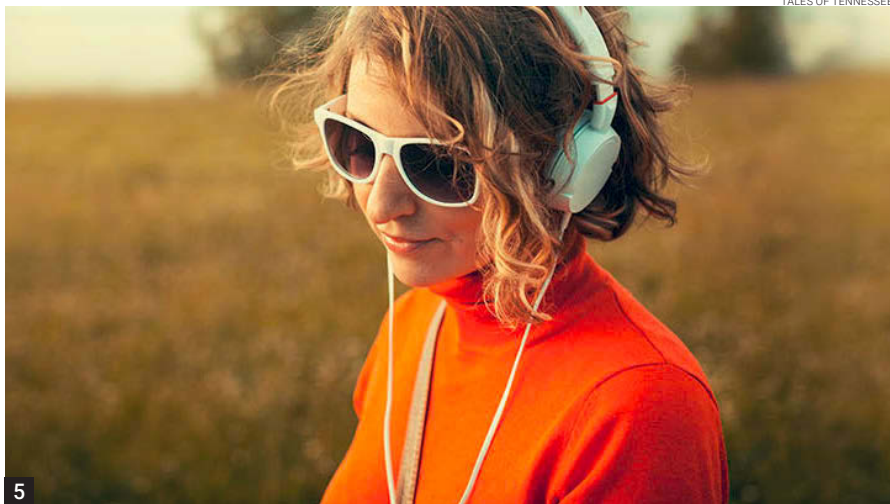
Specialist radio stations have sprung up, playing UK country along with the well-established USA acts, plus Americana, bluegrass and roots music. I surmise there are probably more musicians playing this kind of music than ever before. Specialist radio stations and programmes have come to the fore, with Country Radio UK, Chris Country, Absolute Radio Country and Smooth Radio Country leading the way in the UK.

I recently attended a gig in my local pub which featured Jade Helliwell (Fig. 4). This Yorkshire woman came to fame in 2017 when a video of her singing with a busker in Leeds went viral. It had garnered 25 million views on *Facebook* and *YouTube*, leading

CHRISSY BRAND



TALES OF TENNESSEE



to her early EP, *Forget the Night*, to re-enter the charts, reaching number one in the country charts and number eight in the official charts. Chris Country championed her 2018 EP, *Drive*, and a host of singles in 2019 got airplay on Matt Sprascklen's *Country Hits Brits* radio programme. A recent single, *Stormchaser*, was featured on Spotify's *Wild Country* playlist and was streamed 250,000 times. When I saw her perform live, Jade also sang one song that may resonate with readers, *Nothing But the Radio On*.

<https://tinyurl.com/26y7v7ct>

The *Tales of Tennessee* podcast (Fig.5) comes, somewhat unexpectedly, from Essex. It is presented by Georgie T, checking out "top tips for visiting Nashville (and Tennessee) and chatting to some of the most experienced professionals in the country music and travel industries." Episode 22 heard Georgie in conversation with Luke Thomas, a musician, promoter, manager, songwriter, and musical director. He spoke of the growth of the UK country scene.

<https://talesoftennessee.podbean.com>

Radio News

DAB: *Union JACK Radio*, *Union JACK Dance* and *Union JACK Rock* have all disappeared suddenly from the national SDL DAB multiplex. All three services are operated from Oxford by the *JACK Radio Group*, along with three local/regional stations – *JACKfm*, *JACK 2 Hits* and *JACK 3 Chill*. Both *Arqiva* (on behalf of SDL) and *JACK Radio Group* would not comment when contacted by *Radio Today* after the move at midnight yesterday. Ofcom told the *Radio Today* newsletter that it has not revoked any licence or licences relating to *Union Jack* services. *Union JACK Radio*, *Union JACK Dance* and *Union JACK Rock* are still available online. Earlier this week, three national services were put up for sale by their investor, who says they no longer wish to fund the business alone. Other services operated by the group remain on the air and are unaffected by this move. Valuation and Insolvency Agents *Williams & Partners Ltd* has been engaged to find a buyer, either individually or together. The website says the business has established its reputation amongst advertising agencies over the last three years resulting in advertising spots from some of the country's best-known businesses, as well as key Government advertising and generated sales of £168,000 (2020), £495,000 (2021). Forecasts are for in between £750,000 and £850,000 of advertising sales in the current year, all without expanding audience numbers. The three *Union JACK* services on the *Sound Digital* mux had almost a quarter of a million listeners and almost 1.1m listening hours, according to the latest RAJAR figures (March 2022).

<https://tinyurl.com/mry3sfyu>

JENNIFER SAUNDERS BRINGS OPERA TO CLASSIC FM: Comedian Jennifer Saunders is joining Classic FM to host a new Sunday series, where she introduces listeners to the world of opera. *From Couch to Opera House* (in 7 weeks), with the English National Opera, launches this Sunday, 6 March at 9 pm. This follows *Jennifer's Opera Challenge* last March, where she teamed up with the English National Opera, as one of five comedians to learn the iconic aria *Nessun Dorma* in just 24 hours and perform it live on television for charity. Across the seven programme series on Classic FM, Jennifer will demystify the genre to novice opera-goers – taking listeners by the hand from the moment they enter through the virtual opera house doors, through the foyer to finally settling in the Grand Circle for the anticipated performance.

(SOURCES: Classic FM | OnTheRadio.co.uk)

<https://tinyurl.com/2skhay69>

<https://www.classicfm.com>

Follow us on Facebook @radioenthusiasts and Twitter @REnthusiasts

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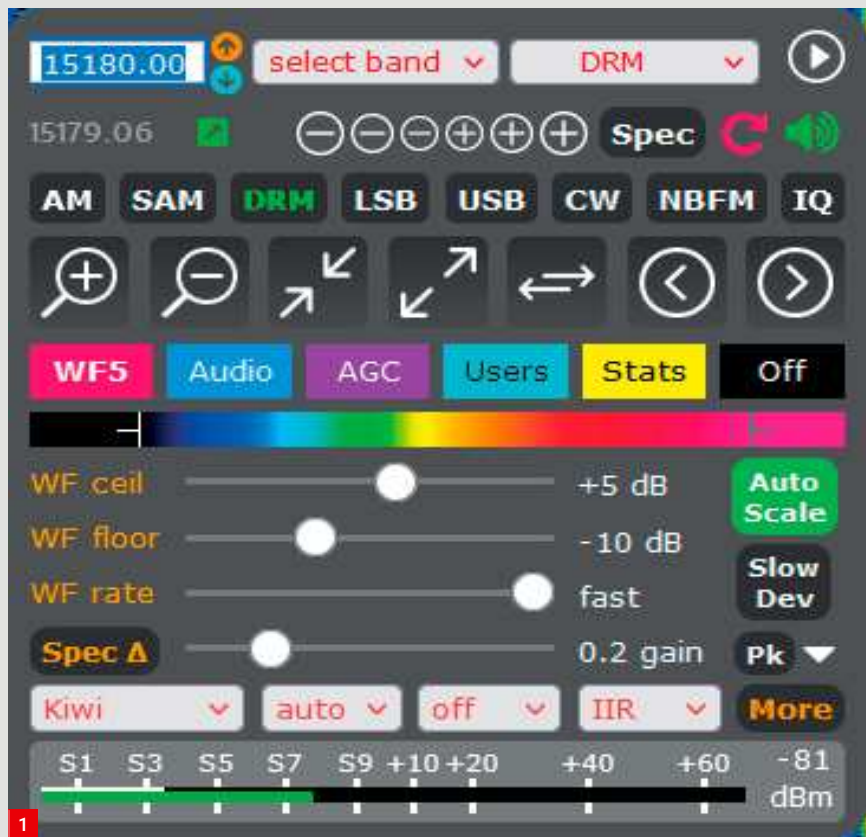
Digital Radio Mondiale, or DRM for short, first came on the scene nearly 20 years ago. Even after all this time, more widespread use of the technology is dogged by a lack of portable receivers. There aren't any receivers of any kind in regular production at the moment. Several designs exist, all waiting for a big order to get production going. Over the years small production runs of receivers were snapped up mainly by broadcasters and enthusiasts like me – if we could only get our hands on one. The big mystery is why – with countries like India, China, Russia, Brazil and Pakistan seriously committed to DRM – *not one* major manufacturer makes a DRM receiver. Sangean makes DAB and HD Radio receivers but abandoned DRM in 2005 after making some prototypes under the Sangean and Roberts names. Another anomaly is that nearly 4.5 million cars in India are now equipped with DRM, indicating that the chipsets are readily available. Finally, China has an extensive DRM service on short wave, but nobody can be listening to it because companies like Tecsun haven't made any receivers.

You Can Listen to DRM Today

It is convenient to have a DRM-capable receiver. However, in my experience, you will need a good external antenna because I've found that a telescopic antenna is not adequate to bring in the signal-to-noise level needed to get the audio decoding going. However, you can experience DRM and there are three ways to do it. I'll go through them in order of complexity to set up.

The KiwiSDR Network is by far the easiest way to access the worldwide network of Software Defined Radios (SDRs) which has been built using the *Beaglebone* SDR. There is lots of information on this online, and all you need to use these receivers is a browser such as *Chrome*, *Firefox* or *Edge*. <http://kiwisdr.com>

In December 2020, the KiwiSDR team released their *DRM Extension*, based on *DReaM 2.2.1*, an open-source AM/DRM decoder. This is a great extension, but it only decodes audio



Digital Radio Mondiale: Discover Your DRM Funklust

Kevin Ryan shows how you can listen to Digital Radio Mondiale (DRM) broadcasts, using the DRM Extension of the KiwiSDR Network, a dedicated App, the DReaM Decoder, and a selection of other software.

and not any data modes. The main KiwiSDR website lists SDRs, with the most popular ones at the top, and links to a map plotting locations. Both sites tell you whether there is the capacity to run *DRM Extension* and whether the owner has enabled this functionality. Please note that DRM decoding uses a significant amount of processing power, and some SDR owners prefer not to enable the extension. <http://kiwisdr.com/public> <http://rx.linkfanel.net>

DRM Extension: Possible Issues

Using the DRM decoder is a bit of a lottery because it is only allowed to run if there are two or fewer other users on a four-channel device or five or fewer other users on an eight-channel device. The location of the SDR may also be a problem. I have come across some noisy ones located in a city. These SDRs offer better reception during their local daylight hours.

Other Software-Defined Receivers are

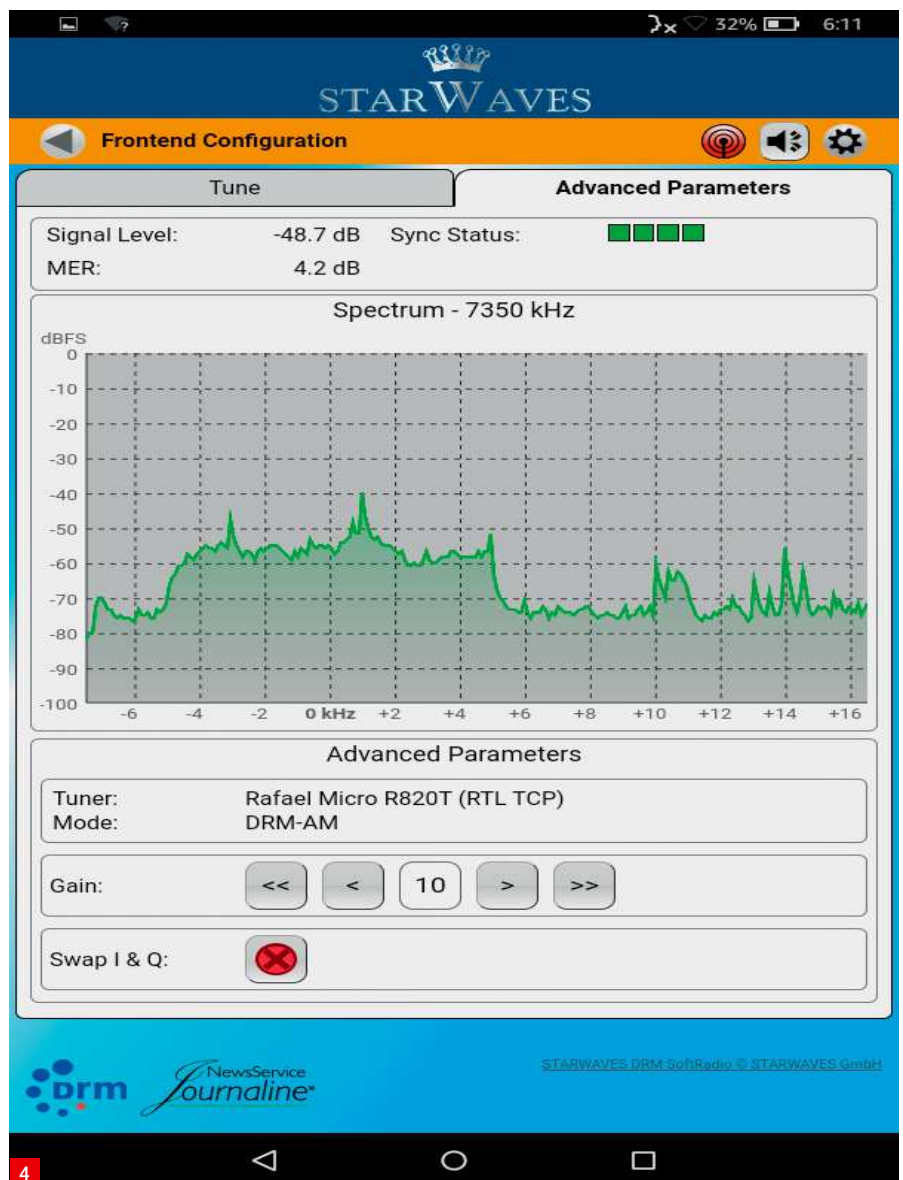


Fig. 1: Most KiwiSDRs enable the full panel, although a few remove the receiver section below the line of buttons. Either way, the *DRM Extension* should be the third from the right, with the *IQ Mode* at the far right.

Fig. 2: The *DRM Extension* launches the *Decoder* and the *Schedule* windows. Clicking on a schedule entry configures the SDR automatically.

Fig. 3: This panel opens if sufficient capacity is available to use the DRM mode. I leave the database as *drmr.org*.

Fig. 4: This app is decoding RRI in English on 7350kHz, using an *RTLSDR V3* SDR, connected to an antenna in the loft.



orientated more towards amateur ('ham') radio users, making the waterfall display less than useful for the non-amateur radio user. Another issue may be the bandwidth of the SDR. More recently, I have also seen error messages saying that the *DRM Extension* cannot run if the bandwidth is set to 20kHz.

More possible issues are that some owners do not include *DRM Extension* as an option, and some are password protected. Trans World Radio (TWR) has done this when they want exclusive access to their SDRs.

Furthermore, the SDR you happily used yesterday may be offline today.

I am not complaining about any of these issues because I am grateful to the owners who invested in the SDRs and allow the rest of us to share them for long periods. When I do encounter a problem, I try to find another SDR – hopefully in the target area – for the broadcasts I am primarily interested in.

DRM Extension is selected on the control panel (Fig. 1). If you can run the extension the decoder section opens a schedule of DRM broadcasts. Then, you need to click on an entry to tune the SDR to that frequency (Fig. 2). The latest feature is a choice of database for the on-screen schedule (Fig. 3).

This is either the reports from the KiwiSDR network or the log entries from the *DRM Reception Project*. The latter is the best choice as it is more up to date.

Enter our competitions at www.radioenthusiast.co.uk/competitions

This panel has a monitoring option to hear the DRM signal before decoding and two test signals.

www.drmtx.org

DRM Transmissions

All short wave transmissions change twice a year, at the end of March and the end of October. There are a few sources online, but I have found that none of them lists the complete DRM schedule.

<https://tinyurl.com/6mamncbc>

You can check the High-Frequency Coordinating Committee (HFCC) website and select the *Digital-Only* option to get a graphical list of broadcasts. However, this listing can be very poor.

<http://www.hfcc.org/schedule>

I also keep my own list on my digital radio website. This schedule starts at the end of March and is valid until the end of October 2022.

<https://tinyurl.com/2p8s7n63>

The next schedule will be B-22, and the first draft should appear in late August 2022.

<https://tinyurl.com/msjaem67>

DRM Apps: STARWAVES

The DRM Consortium seems to accept that physical DRM-capable radios may now never appear in significant numbers, and a second way is to use an app – which, unfortunately, does not work on iPhones. The *STARWAVES DRM SoftRadio V1.3.1* (Fig. 4), coupled with an SDR from RTL-SDR.com, works very well. The app supports both the AirSpy HF+ and SDRplay families of devices, as well as the Realtek (RTL) dongles. However, I did have some trouble using some of the RTL2832U SDR ‘clones’. I now use a branded one, from *RTL-SDR.com*. The recent update includes an improved detection of the *RTL-SDR driver* and a graphical display of the *DRM-sync* status. Moreover, the ‘default’ setting for the VHF tuner is MHz, not kHz. I have evaluated the new version on Radio Kuwait on 15110kHz and it is smoother in operation. There is a full review of this app (version 1.2) in a previous column (*RadioUser*, August 2021:). The newer version is almost identical. The app is available on the *Google Play Store* and the *Amazon App Store* and costs £4.99.

<https://tinyurl.com/2zxm4cyc>

The DReaM Decoder

This DRM decoder works on Windows, Linux and MacOS, but you will need a detailed knowledge of coding to build

Early Morning (0500-0800)

There are a few transmissions in the DRM mode to Europe in English. In the morning, BBCWS (0600-0700 local time) is on 3955kHz and Radio Romania International (0630-0700 local). RRI has other DRM transmissions between 0500 and 0730 in European languages, and RFI is on 3965kHz all day. WINB starts its test transmissions at 0700 UTC on weekdays, but it is a tough one to decode. If you then switch to a KiwiSDR in Asia, you should find Radio Kuwait in English on 11970kHz (0500-0800 UTC) and a handful of transmitters carrying China National Radio, Programme 1 (CNR 1). Transmitters use several configurations of bit rates and encodings, and I find it interesting to compare the audio quality. There are also transmissions from China Radio International directed to Australia. Finally, if you can find a free KiwiSDR in South Korea or southern Japan, you might pick up *Radio Pyongyang* on 3205kHz.

0800-1600

The BBCWS has its second daily DRM service directed to South East Asia from 0800-0900 UTC on 17720kHz. There is a good chance this will revert to the older ‘favourite’ of 15620kHz. A few CNR1 transmissions continue until 1200 UTC with one transmitter at Beijing on most of the day at 6030kHz. On Saturdays and Sundays, KTRW broadcasts to East Asia and South-East Asia. English is on Sundays on 15200kHz (alternate frequency 13800 kHz) usually with a slideshow; sometimes, a ‘mini-website’ is transmitted on the air. The services usually broadcast at this time are RFI on 3965kHz, CNR1, WINB (until 1700), and Pyongyang. Propagation will determine if you can hear any of these. Moreover, *Funklust* (rough transl.: “*The Radio Love*”) is a student radio at the *Friedrich-Alexander-Universität Erlangen-Nürnberg*. It has used DRM since 2003 when it was known as *bit eXpress*. A new transmitter and updated

DRM content server allow this station to experiment with all the features of DRM. *Funklust* operates on 15.785MHz.

1600-2359

RRI begins its evening services at 1600, with DRM to Russia. English is at 1800-1900, 2130-2200 and 2300-2359 local time. Italian, French and German are also broadcast at various times. Radio New Zealand International (RNZI) starts its DRM service to the Pacific (not Saturday) at 16.50 and continues until 2100. Local stations use this signal for local relays. All India Radio broadcasts its only international DRM service in French from 1930 to 2030 (currently on 9620 kHz). Sometimes it has another service on a second channel and often starts at 1915 when English is broadcast. CNR1 starts at 2025 from Beijing with more transmitters on air at 2200.

Night Owls

Try *Radio Purga* (‘Blizzard’, Fig. 6) This station has been testing for a while, aiming to use DRM to get audio and data into a region of Russia covered by the auroral zone. It is hard to hear it because there are no remote receivers in the target area. The Voice of Russia ceased DRM transmissions on the 1st of April 2014. When an unidentified station appeared on 12025kHz (in Russian), there was speculation that VOR might be returning to short wave. It was quickly identified as a test broadcast aimed at the Chukotka region – the part of Russia that meets Alaska. The transmitter site is *Komsomolsk-Amur*, almost directly south of the region in the strip of land between China and Japan. The broadcasts are aimed at the roughly 2,000 people who work and explore in this region and also at the northern sea route. There are plenty of transmissions from China during this time, and also from RRI in Chinese and an hour of English for India, starting at 0400 UTC, with both frequencies using DRM.

Table 1: DRM Day-By-Day

a working app from scratch. Thankfully, the team includes a complete version for Windows in the release files. The *DReaM* decoder has kept up with all the developments added to the DRM standard such as an Electronic Programme Guide (EPG), *Journaline*, slideshows, websites, and the services linking to AM stations. If you plan to try *DReaM*, my advice is to start with *version 2.1.1* and then see if that works on your device.

<https://tinyurl.com/bdn5u4dn>

Version 2.2 incorporates a free *xHE-AAC decoder* meant for Android users. Unfortunately, this version of the decoder did not launch on Windows 7 and failed to pick up the new audio encoder on Windows 10. However, these problems could be

resolved. Some knowledgeable developers came to the rescue, but the solution still has to be included in an official release from the *DReaM* development team. A modified version of *DReaM* for Windows 10 is available online. The developer could not make it work on Windows 7.

<https://tinyurl.com/2p83wf7f>

DReaM and KiwiSDR

You can use a KiwiSDR in conjunction with *DReaM* because in October 2017 an IQ extension let DRM enthusiasts output that signal. You can also record it, which is useful; you can then play the I/Q signal back (in *DReaM*) and connect it to the software using a virtual audio cable (VAC) (Fig. 5). I find that very useful for signal

Fig. 5: *DReaM* 2.2.1 on Windows 10, decoding KTWR. This was received on a KiwiSDR in Vietnam, using the IQ Mode.

Fig. 6: Radio Purga is a local radio station in Russia. Some of its audio is used for DRM tests to a remote part of the region.

analysis and viewing images and websites sent in the DRM signal.

The SodiraSDR Software Radio

This software has a basic DRM decoder for DRM on AM and FM. It works on Windows and is easy to install but you need to invest some time in learning how to use it. It offers many technical features. You can use it in the same way as *DreaM*, routing an I/Q signal to it from a separate SDR. The software supports RTLSDR type devices, as well as SDRplay RSP radios.

<http://www.dsp4swls.de/sodirasdr>

DRM Receivers Available Today

The only DRM receiver available right now is the Tecsun (Australia) TRA Q-3061. At the time of writing, the Tecsun website stated that there were 27 units in stock at the time of writing. However, I estimate it would cost no less than £425 to get one to the UK. It looks identical to the Gopell GR-216. Gopell has a range of prototypes available for bulk orders, via various wholesale websites.

<https://tinyurl.com/3nayvm9b>

<https://tinyurl.com/mryzbvvt>

<http://www.antrikshdigital.com/#>

The Avion DR-1401, manufactured in India, has had a remake recently but is now out of production. The remade version should have sold at a much cheaper price of less than \$100; perhaps the makers could not achieve this. The company did not ship the receivers outside of India, and I know of one or two DRM listeners who managed to get one through a friend in India.

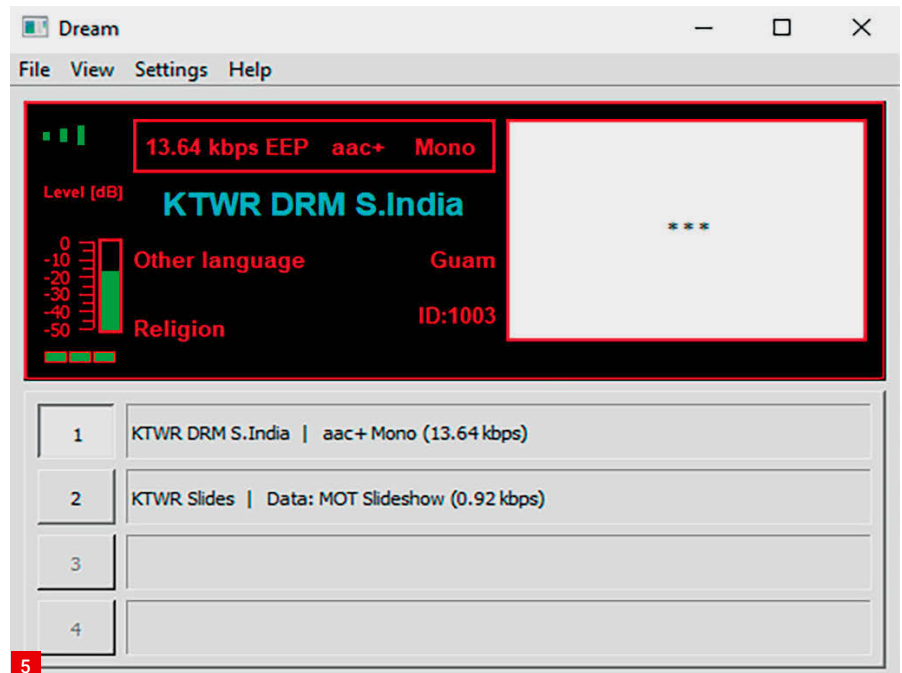
Table 1 is meant to be a *Daily Guide to DRM Broadcasts* that I have put together for you. You may also wish to consult the *2022 WRTH* (e.g. pp. 604, November 2021) and the *Klingenfuss 2022 Shortwave Frequency Guide* (e.g. p. 196), and other printed and online resources.

More Arctic Broadcasts?

TASS, the well-known news agency back in the days of the USSR, recently carried a report on a proposal to the *Arctic Council* for new broadcasts to the Arctic region in local languages.

<https://arctic-council.org>

<https://tass.com/economy/1399001>



The idea is to initially broadcast on short wave to keep costs down but then to use medium and long wave. The article mentions using Krasnoyarsk in Russia, a transmitter in Norway, and two transmitters in Alaska. The thing that made me curious was a reference that "one frequency will carry three to four channels" – one in Russian and English and the rest in Indigenous languages. Only DRM can do this technically. I wonder whether this is a practical project. I found a map on the internet that showed just how many languages there are in this region, and this would be ideal for coverage via short wave. Tests by the US Coastguard showed that DRM works very well in this auroral zone.

<https://tinyurl.com/2p8vjcu8>

Test Transmissions in 2022

In other news, TDF in France usually broadcasts a DRM test to the sailing event (*La Mini-Transat*) in the autumn. The course takes the boats from a French port via the Canary Islands, and sometimes to the Caribbean. Previous broadcasts consisted of a relay of RFI audio plus multimedia and weather forecast data.

<https://www.minitransat.fr/en>

Furthermore, the *Department of Broadcast Info-Communications and Electronic Theory* at the Budapest University of Technology is conducting these latest trials. These are on 26.060MHz and are only accessible via a couple of KiwiSDRs in Hungary. I have not spotted them recently, so the tests may be over.



However, in the past, they have disappeared for long periods.

DRM Receivers in 2022

The DRM Consortium regularly issues a PDF that includes any viable receiver project.

<https://tinyurl.com/murbv9mu>

Innot is an Indian company researching DRM on several fronts and has produced a demo receiver, which has been displayed at several conferences.

<https://tinyurl.com/5n7narm3>

Titus Radio promised to build a cheap DRM/tablet combination some years back. They still seem keen to develop a digital radio that includes apps for all the main standards in use, including HD Radio. I suspect that is the obstacle, on account of significant copyright and licensing costs. Recently they renamed their two variants *rTab* or *rTablet*, costing US\$120 and US\$150, respectively.

<https://titusradio.com>

In Europe, STARWAVES (who sell the DRM app, see above) continues to produce DRM receivers.

<https://starwaves.com/receivers>

Enter our competitions at www.radioenthusiast.co.uk/competitions

Georg Wiessala

wiessala@hotmail.com

Over the last few years of DXing and experimenting, I have returned to certain kinds of aerial again and again. Ferrite Bars, for example, exert a, well, 'magnetic attraction' on me, mostly because of their connection with the reception of signals in the Very Low Frequency (VLF) band (*RadioUser*, January 2022: 51-55 and March 2022: 38-40).

[By the way, elsewhere in this issue, our Aerials Now columnist Keith Rawlings is test-driving the new *Reuter Elektronik* RFA1A/B active magnetic indoor ferrite aerial for 130kHz-1MHz].

The second type of aerial that never fails to 'reel me in' is the loop kind. I currently have four regular loops in use in the shack, again for very different purposes: The Wellbrook ALA1530 as my outdoor HF mainstay, the UKRAA VLF Loop for VLF military-type and SFTS (Standard Frequency and Time Station) signals, the Reuter RLA3A for HF indoor (and occasional VLF) use, and some Cross Country Wireless (CCW) loops, plus the CCW Loop Antenna Amplifier (*RadioUser*, March 2020: 24, for a previous model, and see elsewhere in this issue).

<https://tinyurl.com/6uhf8vc9>

Therefore, when Moonraker – knowing of my 'loopiness' about this kind of aerial – kindly sent me the new *Moonraker/ d-SHBo* ('Deshibo') GA-450 HF Indoor Loop Aerial, I was keen to try this out straight away.

The aerial is sold as 'High-Performance Active Small Loop Antenna' for indoor reception. It is specified with a wide frequency coverage of 0-30MHz and a gain of 20dBi. The aerial arrives as a ready-assembled loop unit mounted around a small plastic box with a BNC plug, which you connect to the base unit.

The base unit sports a BNC socket, USB charge port, tuning knob and red function-LED. A USB charging cable is included, as are a BNC-to-BNC male patch lead, BNC-to-audio-input-type cable and a BNC (female) to SMA (male) adapter (Fig. 1).

The USB charging function is truly an excellent idea, and one charge lasts for many hours. Open for business then, with a good range of connectivity options.

A Versatile Mobile Companion

On account of its size, this modest loop



The Moonraker/ d-SHBo GA-450

The editor takes a look at the Moonraker/ d-SHBo ('Deshibo') GA-450, a new compact indoor loop aerial and tries it out on some radios, both traditional and of the SDR kind.

has, it would seem to me, been designed as a lightweight travel companion, so I tried it primarily on some portables here on whose displays you could see any actual gain achieved.

First up was the ATS 25 SI4732 Receiver (*RadioUser*, February 2022: 54-55). The BBC on MW 1368kHz from the Isle of Man is my 'test-reference' station for daytime MW here, and the GA-450, after using the tuning knob and rotating the loop here and

there, brought that in absolutely fine.

Other – stronger LW and MW stations too, especially when moved near the window. If you are after the *Cricket* or the *Shipping Forecast* on BBC Radio LW (198kHz), this works very well indeed. I think that the GA-450 | ATS25 combination makes for a nice, 'experimenter-friendly' setup.

On short wave (daytime) I received the stations I'd usually expect, for example,

ALL PICTURES: GEORG WIESSALA. FIG. 2 RADIO COURTESY OF WRTH/ NICHOLAS HARDYMAN; FIG. 6 RADIO COURTESY OF JON HUDSON/ SDRPLAY

Fig. 1: The Moonraker/ d-SHBo ('Deshibo') GA-450 HF Indoor Loop Aerial. **Fig. 2:** The GA-450 HF connected to an ATS 25 SI4732 Receiver: transatlantic daytime short wave reception. **Fig. 3:** With the Tecsun H-501x, you may closely observe changes in signal strength resulting from tuning and rotating the GA-450. **Fig. 4:** Basic utility signals reception is not a problem (RTTY on 7645kHz from the German Weather Service DWD). **Fig. 5:** RAF VOLMET on 5450kHz, with the GA-450, hooked up to a 'shack guestradio': the JRC NRD345. **Fig. 6:** A random screenshot of the GA-450 and SDRplay RSPduo, receiving the 19-m band at daytime (20 February 2022).

from China, the USA and Romania. Nice to be able to null-out interference, to some degree. Religious broadcasts from the USA on 15770kHz (e.g. WRMI) were a challenge, but they were there, as was Radio Free Asia on 15745 (Fig. 2).

The ATS25 nicely showed the effects of tuning and turning the loop. Maybe not an *über-accurate* method, this, but enough to make a judgment on reception.

I also found some of the stronger utility stations I often listen to, such as RAF VOLMET on 11254kHz.

These results were all more or less, repeated on short wave broadcast radio with the other radios I connected this loop to. These were a Tecsun H-501x (*RadioUser*, December 2021: 14-16) and the Sangean D-909X2 (*RadioUser*, January 2022: 28-28-29).

With the display of the Tecsun offering, in my experience, a more accurate dB measurement, it was interesting to see how the reception changed when tuning and rotating the Moonraker (Fig. 3).

Utility, Main Station Use & SDR

While I had the Sangean connected, I tried some utility signals reception and was impressed that, even standing next to my computer, and with a snowstorm raging outside (post-'Eunice'), I could resolve and display the RTTY (radio teletype) signals on 7645kHz from the German Weather Service (DWD; Fig. 4) quite well.

Not bad at all, especially if you might take your laptop for a mobile, caravan or hotel station somewhere. Make sure your soundcard is decent, though.

And, last but not least, what happens when you hook this up to one of the 'Big Boys'? Well, of course, I tried it, using the patch lead to link the GA-450 to a JRC



2



3



4

NRD345, which (temporarily) lives in the editor's shack here, until sold on.

Well, I tuned to 5450kHz USB, for the RAF VOLMET rotated the loop, and there it was (Fig. 5). Once again, the stronger broadcast stations on HF could be received too, such as 15640kHz (R. Azadi Kuwait/ USA). However, it is here that the GA-450 eventually reaches its limits.

Still, if you need a secondary, 'prepper's' or emergency aerial for your main receiver, it will more than do.

The only thing that remained for me to do then, was to hook the GA-450 up to an SDR, to see what it could do. I used an

SDRplay RSPduo for that purpose, with my thanks to Jon Hudson at SDRplay.

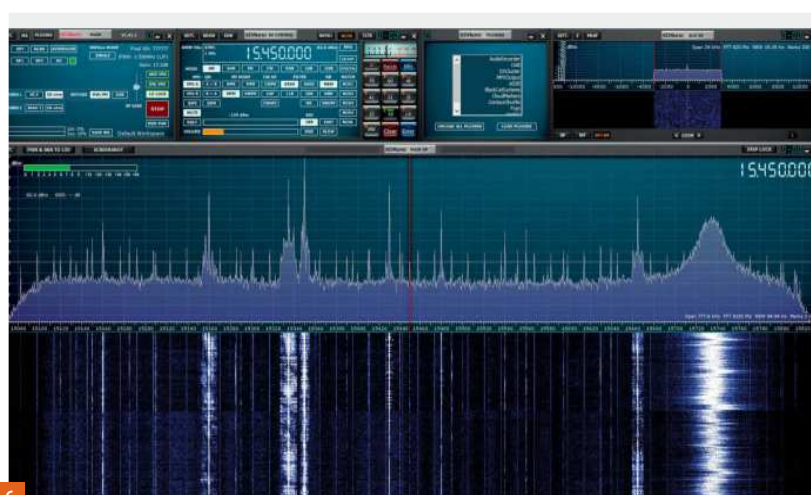
The image in Fig. 6 is a screenshot of the 19 m band during daytime. Once again, it was fascinating to see, after adjusting the SDR, how the reception changed visibly when tuning and/ or rotating the GA-450.

In Conclusion

I was well impressed with this little indoor loop . Above all, it was fun to use and experiment with. It is no Wellbrook loop, of course not, but it did pull in everything I am normally interested in, in at least acceptable quality and strength – often



5



6

more than that. And, if you separate the loop coil away from the receiver with a patch lead, you can move this little antenna to the best possible place in your shack. The curtain rail by the window worked spiffingly for me.

If I had any suggestions for improvement at all, I'd propose using some thicker patch cables for the BNC connection. Plus, the loop easily bends over backwards in its little box, but these are very small niggles.

The GA-450 works best with smaller mobile world band receivers. You ought to try it out in case you seek a significant improvement over – or an alternative to – the reception with the usual telescopic antennas. It can sometimes, but not always, make a

difference for the better here.

It is not going to deliver you that outstanding DX result, but it makes for an excellent all-around aerial, which is lightweight, compact and has a number of useful connectivity options.

It is also great as an educational tool, to learn about the directivity of aerials and propagation phenomena, and I can see this finding its way into many a school project, as well as keeping radio experimenters, world travellers, campers and enthusiasts busy for some time.

The GA-450 is available from Moonraker, currently priced at £89.99.

Many thanks to Moonraker for the loan of the review model.

<https://tinyurl.com/2ya2vek>

PRACTICAL WIRELESS

A monthly magazine aimed at the licensed radio amateur that caters for the amateur radio hobby.



Inside the April 2022 issue:

BUILD THE PW PASTON, PART 3: Mark Tuttle GOTMT moves this month on to the VFO board of the 40m transceiver project.

VALVE & VINTAGE: Philip Moss takes a look at the Hallicrafters S20R Sky Champion Communications receiver.

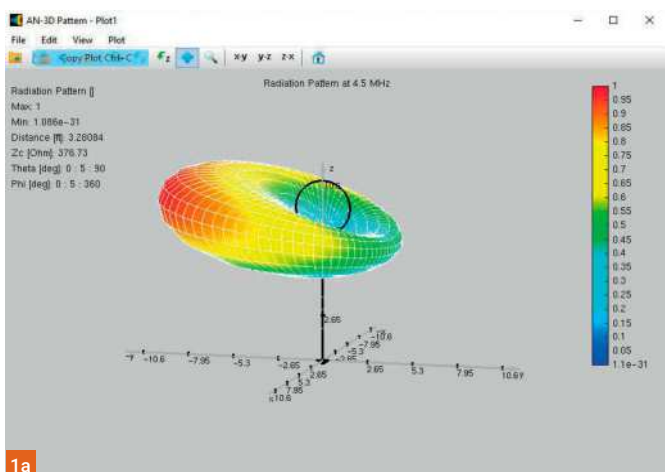
HOW TO CHECK PROPAGATION USING FT8: James Stevens MOJCQ explains how to use FT8 as an aid to understanding propagation and chasing DX.

USING THE NANOVNA AS AN ANTENNA ANALYSER: The NanoVNA costs a fraction of the amount of even the cheapest antenna analyser. Although it's a bit fiddly to do so, Steve Telenius-Lowe PJ4DX explains how this diminutive device can be used to measure an antenna's SWR.

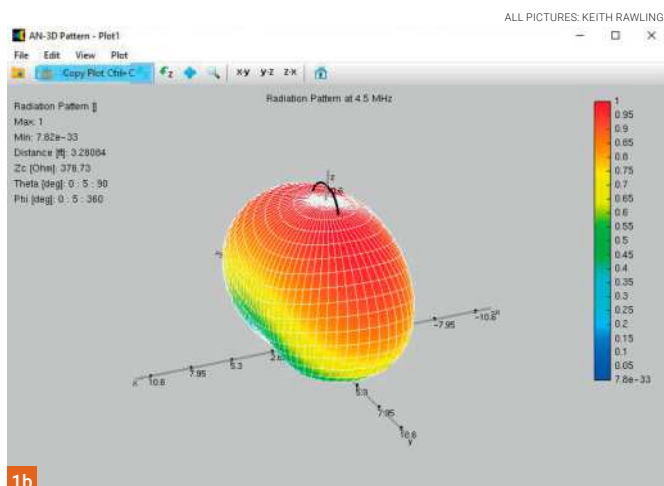
There are all your other regular columns too, including HF Highlights, The Morse Mode, World of VHF, What Next and Data Modes.



Find out more at:
bit.ly/pawi-subs22



1a



1b

Keith Rawlings
Keith.g4miu@gmail.com

The CCW LAA++ Loop

Keith Rawlings reviews the Cross Country Wireless (CCW) LAA++ Loop, explains Numerical Electromagnetics Code (NEC) and enjoys the most recent updates in some of the top aerial modelling software packages.

Back in 2020 (*RadioUser*, March 2020: 44-46), I had the opportunity to review two of the Cross Country Wireless (CCW) small receiving loop amplifiers. One variety of these – the ‘active loop’ kind of amplifiers – covered the VLF/HF bands, and the other one the MF/HF and VHF bands, up to 150MHz.

Since then, Chris at CCW has worked to develop the product. He currently produces a single-loop amplifier, the LAA++, which has augmented performance over the previous two models and receives over the frequency range of 5kHz to 150MHz.

In 2021, I did buy an LAA++ kit, which I subsequently reviewed in the 2022 edition of the *World Radio TV Handbook* (WRTH 2022: pp. 18-19). Since that time, I have been able to further experiment with the amplifier. I will describe here my findings when using a small solid loop element, rather than the supplied wire.

<https://www.wrth.com>

The Small Loop

Small loops are usually considered to be less than 0.1λ in size and are also called Magnetic Loops, as, by their nature, they ‘couple’ to the magnetic component of a radio wave. Therefore, arrangements for coupling the feeder to the loop, and for tuning the loop to resonance are required. A small coupling loop can be used at the base of the main loop; alternatively, an inductive or capacitive tap may be used. Tuning is usually achieved through a variable capacitor fitted in series with the loop element often, but not always, at the apex.

Whatever method is deployed, these loops are essentially very narrow-band

devices; they effectively form a tuned circuit, and retuning will be required after moving only a few kHz off of the set frequency. For this reason, the loops have to be very well constructed to avoid losses, especially when used for transmitting, since RF currents can be very high. It is also not practical to cover the whole of the MF/HF spectrum with a single loop.

Nevertheless, loops provide a compact aerial system. Moreover, due to their ‘magnetic’ operation, they can also reduce electrical noise. Being bi-directional, they may be rotated to further reduce local noise. This is because, in the case of *small* loops, the maximum signal is off the ends of the loop with a null off the ‘face’. Another advantage is that the loop is *selective* in rejecting signals out of its passband (see above, in Figs. 1a and 1b).

Peaks, Troughs, & Constructions

This is a tuneable aerial. Therefore, signals may be ‘peaked’ by adjusting the loop to resonance. As described above, the tuning bandwidth is very narrow; signals will be down in strength, compared to, for example, a full-sized dipole. For purposes of reception, one way to get around the narrow bandwidth is to do away with the capacitor and couple the loop to the feeder by using a wideband matching transformer. This is an effective technique,

which also seems to be used in the popular ‘YouLoop’ model.

The loop will now be wide-band. However, signal strength, compared to a ‘full-sized aerial’, will still be much reduced. With modern highly sensitive receivers this may not be an issue. Where more gain is desired, an active loop is the next choice. The addition of a suitably-designed amplifier will increase the received signal strength, and it will help with matching the loop to the feeder over a wide frequency range. A good design is needed that will provide adequate gain to make up for the low loop output.

At the same time, it must be electronically robust so it will not be overloaded by strong transmissions. The latter may result in ‘spurious signals’ being received, often caused by IMD (Inter-Modulation Distortion). The loop amplifier is almost always located at the base of the loop element and is powered, more often than not, by a device called a Bias-T which safely injects electrical power, nominally 12V DC, into the loops feeder while isolating the RF path to the receiver front end.

Loops such as the well-known Wellbrook models come supplied with a Bias-T and have the loop element mechanically built into the amplifier assembly. This is ideal for a user that just wants to have a loop they can put straight to use.

Fig. 1a: AN-SOF simulation of CCW's cardioid (heart-shaped) loop modification.

Fig. 1b: An AN-SOF simulation of the radiation pattern of a 1-meter diagonal loop aerial at 4.5MHz. It is more pronounced near the end.

Fig. 2: The CCW LAA++ Loop kit.

Fig. 3: The Head Unit has been fitted to the loop element and taped for support.

Fig. 4: The CCW LAA++ is mounted on a timber support. Fig. 5: The CCW LAA++ in use.

Fig. 6: This screenshot shows a demonstration of EZNEC Pro/2+, configured to use the NEC 5 engine.

The CCW Approach

CCW take a different route. Here, the loop amplifier and the loop element are separate items (Fig. 2). The Bias-T module may be purchased with the loop amplifier or left out if it is not required, thus saving money.

This provides a great deal of scope, allowing an experimenter to try various loop elements. But this does not mean you have to be an experimenter to use the LAA++. A length of wire is provided to form a basic loop just leaving the purchaser to mount the assembly in their preferred fashion and this was the format used in my 2022 WRTH review (see above).

<https://www.wrth.com>

To quote CCW: "The Loop Antenna Amplifier ++ contains all the electronics needed for home DIY construction of an active loop (magnetic loop) low noise receiving antenna." The LAA++ amplifier, or head-unit, is built into a good-quality polycarbonate box for outside use. The loop element is wired to the box using stainless steel M6 studs and wing nuts, and the RF connection is employing a BNC socket. The companion Bias-T has two BNC sockets to feed the receiver and loop amplifier and also a DC socket with a DC lead supplied. The Bias-T unit is not enclosed.

Users will need to supply an RF patch lead from the Bias-T to the receiver and a suitable run of coaxial cable to the head unit. I used a run of 20ft RG58 for my evaluations. For this review, I installed a homemade solid aluminium loop of some 900mm diameter with an element thickness of 8mm. For the test, the loop was mounted at about 6ft above the ground and attached to a piece of timber with a clip that held it at the top. The head unit was simply taped into position for the duration (Figs. 3-5).

The receiver used for this evaluation was an SDR; the SDRplay RSPdx.



From LF to HF

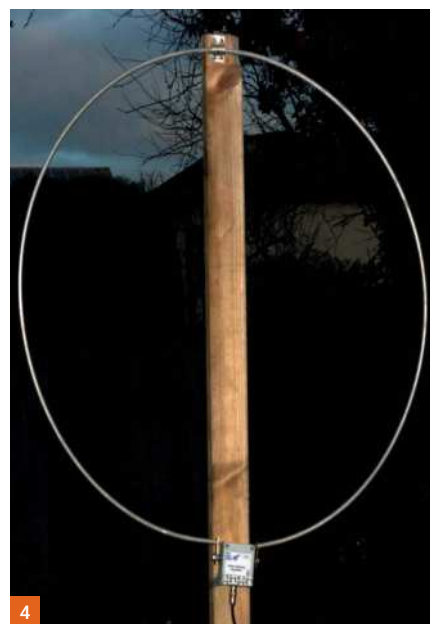
I started my evaluation by checking the relative directivity of the 900mm loop on the LF bands during the day.

To this end, I simply turned the loop by hand and observed the readings of the signal strength and SNR meter on the SDRuno display. On rotation, I could achieve a 15dB signal difference on MSF 60kHz and 7dB on DCF77 77.5kHz. On paper, these seem to be relatively poor figures but the limiting factor here was the high noise floor.

On the other hand, when turning the loop on DDH 47 147.3 kHz, I achieved just under 20dB between maximum and minimum. On BBC R4 (198kHz) and also BBC R5 (909kHz) the loop showed a 30 dB difference between maximum and minimum. I found that, when tuning for minimum signal, the 'null' point was quite sharp, probably due to the relatively small size of the loop element diameter. I found that it was often possible to hear stations that were otherwise buried underneath stronger signals.

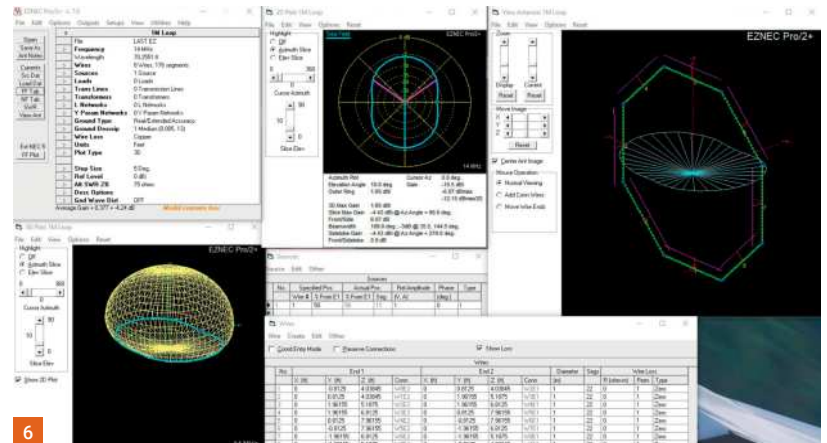
This setup worked well over the Long and Medium Wave bands.

On HF (Short Wave), signal strength – compared to a 66ft Inverted-L – could be some 10-20 dB down in some cases. However, in terms of SNR the LAA++, this was not far behind the game and returned very good results, especially





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against locally-generated noise. Here, it could be turned to minimise this and yet have a minimal effect on wanted signals, by nature of the angle of arrival of these signals at the loop.

I tried the loop on VHF Airband, where it worked reasonably well, providing some directivity of about 2 S-points and a fair signal improvement over a 'rubber duck' when used on my Bearcat UBC125XLT.

The CCW website demonstrates a loop design that achieves a cardioid pattern with just the addition of a couple of resistors, and by grounding one leg of the loop. I will try this out and report back.

Conclusion

The LAA++ provides excellent performance at a reasonable price. It allows a user to experiment with differing loop types if they wish to do.

Alternatively, it can just be installed, using the wire provided, and put on the air straight away. Signal strengths could have been improved, I am sure if, I had used a larger loop diameter, although perhaps some with some reduction of the sharpness of the 'null' point.

As well as being suitable for permanent installation, the LAA++ can easily be used as a temporary or portable aerial, and it may be possible to mount it away from sources of interference. In both this review and my one in WRTH I found that the LAA++ compares well against some much more expensive designs.

Currently, the price of the complete LAA++ kit is £55.20, plus VAT.

[Many thanks to Chris Moulding at CCW for the supply of the review items – Ed.]

<https://tinyurl.com/538vzvdu>

EZNEC/NEC5: News

In aerial modelling terms, 'NEC' stands for 'Numerical Electromagnetics Code'. This

is specific software, which simulates the electromagnetic response of aerials and their structures. NEC was created in the 1970s by Gerald Burke, Andrew Poggio and Edmund Miller of the Lawrence Livermore National Laboratory in the USA and has undergone several updates over the years. The NEC2 version has been freely available to use for many years.

The more capable NEC4 has also been available but at some cost. Shortly before he sadly passed away, Gerald Burke had updated NEC to V5. It was found, however, that there were some bugs in this updated version and it was thought that these would now not be resolved and would have to be lived with.

Therefore, I was pleasantly surprised to receive an email from LLNL, informing me that there has been an update to NEC5 which was issued on 22/01/2022. The latest version appears to be NEC5_X11 and is available in Windows x32 and x64 versions.

Some bugs have been corrected. Interestingly, credit for the updates was given to Roy Lewallen W7EL (the author of EZNEC) and Dan Maquire AC6LA (the writers of AutoEZ). The latest details of the update are available on the LLNL website.

<https://tinyurl.com/286uypfy>

In other aerial modelling news, EZNEC Pro/2+ (V7; Fig. 6) has now been released. As promised, it offers the ability to run external NEC 4.2 and NEC 5 calculating engines. The user can now easily select between the internal NEC2 engine and, if available, the NEC 4.2 or 5 engines from the Options/External-Calculating menu.

NEC 5 does things differently from previous versions and the user will have to be cautious when switching between them. For example, older versions of NEC place 'insertion objects' (sources, loads,

transformers, and so on) on segment centres, whereas NEC 5 places these at segment junctions. Previously, a source would be placed on a wire with uneven segments, but NEC 5 requires wires with even numbers of segments.

Consequently, some models will need modifying. I have already found that I need to keep my modified NEC 5 models in a separate folder so I don't get them mixed up, should I wish to use the internal NEC 2 engine at any time. Early tests show that Pro/2+ works well with both the NEC 2 and 5 engines.

<https://www.ez nec.com>

Last but not least, AN-SOF has announced that they will include a 'Live-Chat' link in the next release of the software (V7) for subscribers who can send "any type of query, from technical questions to licensing". The chat will be mainly available from Monday to Friday from 6 am to 3 pm CST. Messages can be left outside these hours and will be replied to as soon as possible.

Chris Moulding, at **Cross Country Wireless**, added: "We have started supplying the bias tee board in an ABS box. There is a change to the label on the LAA++ amplifier to include the UKAS certification. The EZNEC simulation of the cardioid loop ties in with the measurements made on our prototype cardioid loop. We now supply a 2.5m antenna wire rather than a 3m one. This gives better performance on the 10m amateur band, and it is resonant as a full-wave loop in the VHF aircraft band."

chrism@crosscountrywireless.net

<http://www.crosscountrywireless.net>

See also the recent review of this aerial on the SWLing Post website ("The CCW LAA++ Amplifier Rocks")- Ed.]

<https://tinyurl.com/8yu4kcp2>

ALL PICTURES: TIM KIRBY, EXCEPT FIG. 4: JOHN L



Tim Kirby
tim@livingland.wales

Hotspot Radio

Newcomers to Amateur Radio these days have a great deal of choice concerning the type of operation they wish to take part in. For some, making voice contacts on a worldwide basis is something that they would love to do. To do that on short wave can require a lot of space for aerials.

What if you have no garden or very limited space? Armed with a handheld radio, a digital hotspot and an internet connection, fortunately, it is all possible. This will get you on the air and talking to radio amateurs around the globe. But how does it work? The key item for this is a 'digital radio hotspot'.

A 'hotspot' (Fig. 1) is a low power transmitter and receiver, capable of operating on either VHF or UHF or both. The hotspot will be connected to a small computer such as a Raspberry Pi, running special software. In turn, the computer will be connected to the Internet using Wi-Fi (generally) or a wired Ethernet connection.

Using a handheld transceiver, operating on the same frequency as the hotspot and using one of the several digital voice modes that the hotspot is capable of,

This month **Tim Kirby** uses a Digital Hotspot to make connections around the world, finds that long-distance contacts are being established regularly on CB and hears about a 'kite-assisted' signal across the English Channel

you can connect to different digital radio networks around the globe and speak to other radio amateurs. Some hotspots allow you to use your computer's speaker and microphone to connect to the digital radio networks, so you do not even need a separate handheld transceiver. An example of this is the *DV-Mega DvStick30*. This might be a good way to find out whether Digital Voice communication interests you. If it does, then you might decide to invest in a digital voice handheld and a hotspot.

Setup and Operation

Let us look into the handheld/hotspot setup a little more. In general, suitable hotspots come ready-built or as kits. Some kits will require you to buy a separate computer (generally a low-cost Raspberry

Pi type device). The price of hotspots varies hugely. Some very cheap devices can be obtained on eBay, but reliability can vary! For a beginner not yet experienced in digital radio, buying a cheaper hotspot could be frustrating as you will not necessarily know what is 'normal' behaviour and what is not!

You could look at more expensive hotspots marketed under names such as *Openspot*, *Zumspot* or *DV-Mega*, which will be better documented and hopefully more reliable. If you are looking for your first hotspot, then I would recommend paying a little more so that the support is there, should you need it. Except for the *Openspot* devices, the majority of hotspots will run the *Pi-Star* software (Fig. 2). You can read more about that at this URL:

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

<https://www.pistar.uk/index.php>

Pi-Star manages the operation of the hotspot, allowing you to configure it to use the digital voice modes that you want to work with, and to have it connect to the digital networks you have chosen. Although - on the face of it - it is quite complicated, and there are lots of clever options that you can set up, getting it going at a simple level is not too difficult. Fortunately, there are a lot of videos that show how to set up Pi-Star.

A good example is here:

https://youtu.be/DDZMY_6qjil

However, searching for 'YouTube Pi-Star setup' will also offer you plenty of alternatives. A hotspot running Pi-Star can process a number of the digital modes used by radio amateurs. Among those, DMR, D-STAR, and Fusion (C4FM) are the most common, but NXDN and P25 can also be used. The Pi-Star-enabled hotspot can convert between DMR and Fusion, so if you have a DMR handheld radio, you can use the hotspot to connect to both DMR and Fusion networks and similarly, if you have a Fusion radio, you can use that and the hotspot to connect to both DMR and Fusion networks.

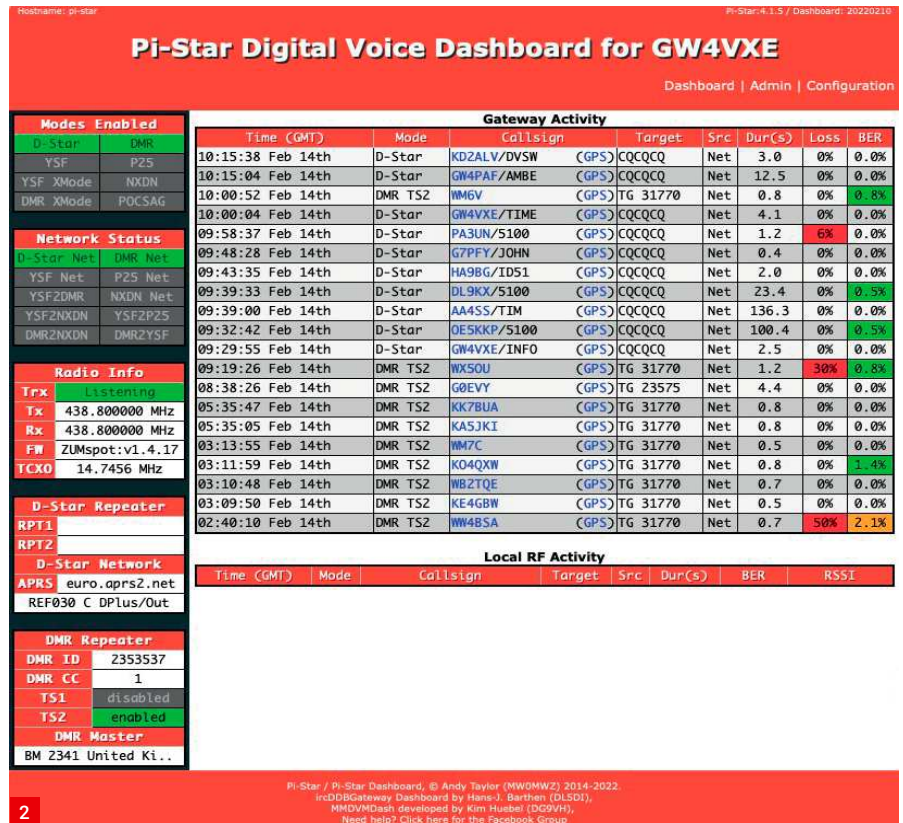
A D-STAR radio can generally only connect to D-STAR networks (as well as some multi-protocol networks – although this may be a little beyond the scope of this article). But note that, if you do have an *Openspot 3* type hotspot, then your D-STAR radio can talk to D-STAR networks as well as DMR and Fusion networks.

You are probably getting to see that this can get complicated. It does not need to though, and you can keep it simple, and that is, arguably, the best way to start.

A Choice of Transmitters

The choice of the kind of handheld radio (transmitter, Fig. 3) you should choose depends entirely on your level of experience. DMR handhelds can be obtained quite cheaply. However, the nature of DMR is that quite a lot of programming of the radio can be required. This is known as 'codeplug-programming', and if you listen to any DMR network for a fairly short time, you are bound to hear 'codeplugs' mentioned! Some retailers will supply a radio complete with a codeplug.

If you do buy a DMR handheld cheaply from eBay or Amazon, you will have to supply your own codeplug. If you are used to DMR and codeplug programming this is not a problem and might even be described as 'fun', but for a beginner, there



is considerable scope for frustration. A simpler way, although not providing as much flexibility, is to use a Fusion-enabled handheld to connect to the hotspot. You can then enable the YSF2DMR (Fusion to DMR translation) on the hotspot and use the hotspot's control software to connect to whichever DMR network you would like to operate on. It works well, but you can only have the hotspot configured to 'listen' to one talkgroup at a time.

Using a DMR handheld, you can have the hotspot configured to 'listen' to several talkgroups at a time and to transmit whichever one is active which can provide more interest. The downside of this approach is that Fusion-enabled handhelds are more expensive than DMR handhelds! At the time of writing the cheapest Fusion enabled handheld is the Yaesu FT-70DE, which retails at around £170. By comparison, a new TYT-MD380, a very solid reliable single band DMR transceiver can be had for around £85.

Registration and Operation

Your approach should depend on your level of experience and expertise with computers and software, and perhaps also on the people that are around who may be able to support you. If you are a member of a club, which has some digital experts

Fig. 1: A digital radio hotspot is small and does not take much power. A USB powerbank will power a hotspot for many hours. Fig. 2: The dashboard of a Pi-Star-enabled digital hotspot, showing transmissions received and made.

Fig. 3: Some digital radio systems allow you to transmit your position derived from a GPS in your radio. Fig. 4: Reader John L operating on CB radio from a high spot on Dartmoor.

as members, you may be able to persuade them to help you set up your hotspot and get on the air. There are plenty of YouTube videos that show many aspects of digital radio setup and operation which can be very helpful. Forums and Facebook groups tend to vary in quality. Some are great – some are plain unhelpful!

If you are planning to use either D-STAR or DMR networks, you will need to obtain a 7-digit Radio ID Number.

Do not be tempted to make one up! It's a straightforward process. Go to this website and register:

<https://radioid.net>

You will have to upload a copy of your amateur radio licence document for verification. After a few hours, you will receive an e-mail with your ID number, which will then need to be programmed into your radio, if you are using a DMR radio and your hotspot, for use on DMR and

D-STAR. Once you are up and running, the world is your oyster! Some of the popular digital networks have people connecting from around the world. *Brandmeister Talkgroup 91*, for instance, is a very busy one and you will hear, depending on the time of day, people talking from Australia, the Far East, Africa, Europe, South America and of course, North America.

They tend to be largely 'hello/goodbye' sort of contacts.

If you are a *Fusion* user, the 'America Link' room on *Fusion* (also available on *Brandmeister DMR Talkgroup 31656*) can be busy. Although activity is primarily in the USA, many others connect there too.

On D-STAR, the *REF001C* and *REF030C Reflectors* are busy and can be interesting to listen to. More in-depth and thoughtful conversations can be had on some of the less active talkgroups, rooms and reflectors, perhaps those with a geographical or special interest type focus. These can be less 'hello/goodbye', and discussions may last much longer. Depending on your interests, you will probably discover these 'places' over time. As you get to know people, you will find out where they listen and participate.

Of course, if you are learning a language, there are some great opportunities – with groups of amateurs speaking in all sorts of different languages. It can be great to listen to!

People sometimes ask what sort of internet connection is needed to make this work. I have had successful digital radio hotspot contacts using a 3G mobile signal for connectivity. It would also work on pretty much any speed of ADSL internet connection you have at home, so you do not need to worry if you lack bandwidth.

Setting up a digital radio and hotspot is not without its challenges, but once you have done so, it can be satisfying and could prove a very interesting part of a communications hobby for you. I regularly speak with people who have become good friends using digital radio technology and of course, the quality is generally excellent and is not dependent on those pesky sunspots.

CB: Improved Solar Conditions

Talking about sunspots – with an upswing in solar conditions, the short wave bands are improving again, and quite rapidly. With the CB allocations lying towards the top of what we would regard as 'short wave bands', it takes a little while before the CB bands are affected and long-distance

contacts are possible regularly once again. Over the last few months though, since the autumn, this is exactly what has been happening.

One of our readers, **John L** from Devon (Fig. 4) has been reporting some excellent contacts. On the UK FM allocation, John made a contact with another CB operator in Australia in early February, which is excellent on FM (typically SSB as a narrow band mode is better than FM or AM for long-distance working). John has also heard FM signals from the Far East, as well as making SSB contacts into Trinidad. I asked John what aerial he used and whether it was a beam, but in fact, he uses a homemade 5/8 wave vertical which is made from wire, attached to a tall tree. As well as operating from home, John goes out mobile onto the hills of Dartmoor and says that he very often makes contacts all around the UK from up there.

I welcome news from any other readers about the contacts that they are making on the CB band, FM or SSB.

PMR 446 Across the Channel

I asked Ed Spicer from East Sussex if he'd heard anything interesting on the PMR446 band recently and he replied as follows: "I did manage to speak to around half-a-dozen people in France on PMR446 on the evening of 13th January 2022, during a very strong tropo opening across the Channel. As ever, I suspect that most of them were using antennas that are not legal on the band, and their antennas were doing most of the work. The one real 'odddity' I heard was a French voice on Channel 8 (446.09375MHz). The voice claimed that he was running a crossband repeater held aloft by a kite! Assuming he wasn't pulling everybody's leg, he said that he had a TYT radio (handheld presumably) up in the air. I don't know what VHF frequency he was using for crossbanding, but the 149MHz Freetnet channels seem the obvious suspects. Those frequencies are legal in Germany but nowhere else! People were obviously complaining about 'monopolising' Channel 8, as his output frequency, although I couldn't actually hear them. This prompted him to comment several times that he could not move away from channel 8 because his arms were nowhere near long enough to reach the radio up in his kite!! I tried calling him on channel 8 and I think he did hear me, but there was so much QRM and noise on that channel that I'm not entirely sure."

In this context, Ed mentions the German *Freetnet* channels. These are only available



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in Germany, but if you travel to Germany you may be interested to listen there. The channels are 149.025, 149.0375, 149.0500, 149.0875, 149.100, and 149.1125MHz. Handheld transceivers with a maximum effective radiated power of 1W are allowed. Only approved and licenced transceivers may be used and the user is not allowed to modify the transceiver. As I understand it, *Freetnet* transceivers are quite expensive, so the service has not been used extensively, although some German users have (illegally) used Baofeng and similar handhelds, programmed with the *Freetnet* channels.

That's it for this month. *Push To Talk* will be back in the June issue. See you then!

Rallies & Events

All information published here reflects the situation up to and including 21st March 2022. Readers are advised to check carefully with the organisers of any rally or event, before setting out for a visit. The Radio Enthusiast website will have updates, please check here regularly. To get your event onto this list, please, e-mail full details as early as possible: wiessala@hotmail.com

9 April

YEOVIL ARS: The Digby Hall, Sherborne, Dorset, DT9 3AA (Car parking charges apply on Saturdays). Doors are open from 09:30 am to 2:00 pm; Admission is £3 (regrettably, no dogs except guide dogs. (BB | TS | Club Stalls). Supported by RSGB, RAFARS & BYLARA. Regrettably, there will be no talks this year, due to Covid-19. <https://tinyurl.com/fyj9vtca>

24 April

ANDOVER RADIO CLUB SPRING BOOT SALE: Wildhern Village Hall, SP11 0JE. (just north of Andover). Open for sellers at 9 am; buyers: 10 am. The cost is £8 per boot and £2 for buyers. Tables in the Hall £10. Organised by The Andover Radio Amateur Club: arac@arac.org.uk <http://www.arac.org.uk>

24 April

CAMBRIDGE REPEATER GROUP RALLY: Foxton Village Hall, Hardman Road, Foxton, Cambridge, Cambs CB22 6RN; Doors open at 9.30 am for the public (7.30 am for traders). Admission is £3. (BB, CBS, CR, TI, TBS). **Lawrence, M0LCM: 07941-972724** rally2022@cambridgerepeaters.net www.cambridgerepeaters.net

24 April

NARSA (NORTHERN AMATEUR RADIO SOCIETIES ASSOCIATION) EXHIBITION: Norbreck Castle Exhibition Centre, Blackpool FY2 9AA **Dave M00BW: 01270 761 608** dwilson@btinternet.com www.narsa.org.uk

1 May

THORPE CAMP VISITOR CENTRE, RADIO AMATEUR (HAMFEST) RALLY: Thorpe Camp, Tattershall, Thorpe, Lincolnshire, Open to the public from 9 am to 1 pm; open to traders at 6.30 am. Entry £4 per person, under 12 Free. Hot and cold food on-site and car parking inside the grounds. **Anthony Freeman: Tel: 07956 654481**

2 May

DARTMOOR RADIO RALLY (BANK HOLIDAY MONDAY): The Yelverton War Memorial Hall, Meavy Lane, Yelverton, Devon, PL20 6AL. Doors open at 10 am and admission is £2.50 (BB | CR | FP | TS). **Roger, Tel: 07854 088882** 2e0rph@gmail.com

7 May

CDXC DX CONVENTION 2022 (LOUGHBOROUGH) <http://www.cdxc.org.uk> <https://tinyurl.com/3tfetch5>

8 May

LOUGH ERNE AMATEUR RADIO CLUB ANNUAL RALLY 2022: Arena @ Share Discovery Village; 221 Lisnaskea Road; Lisnaskea, Co. Fermanagh, BT92 0JZ; Northern Ireland. Opening at 11.30 am (9.30 am for traders). Facilities are available on-site for breakfast, tea, coffee and lunches. For those wishing to stay in the area for the weekend, there may be some Châteaux available on-site. Please contact Reception directly at: www.sharevillage.org Traders wishing to attend should contact Alan R Gault Chairman at: alan.r.gault@btinternet.com <https://tinyurl.com/4end75em>

14 May

BARRY ARS RALLY: Sully Sports & Social Club, South Road, Sully nr Barry CF64 5SP. Open to traders from 7.30 am and to the public from 9.30 am. Admission is £2.50 (FP).

20-22 May

DAYTON HAMVENTION <https://hamvention.org>

22 May

DUNSTABLE DOWNS RADIO CLUB: Annual National Amateur Radio Car Boot Sale. Stockwood Park, Luton. This is the 37th year without a break (bar Covid-19) that this event has been run. All the usual facilities will be there. Further details: Phil@magstripe.co.uk www.ddrcbootsale.org

11 June

ROCHDALE & DISTRICT AMATEUR RADIO SOCIETY SUMMER RALLY: St Vincent de Paul's, Caldershaw Road, off Edenfield Road (A680), Norden, Rochdale OL12 7QR. Doors will be open to the public at 10.15 am; disabled visitors 15 minutes earlier. **Robert M0NVQ** **Tel: 0777 811 3333** m0nvq@outlook.com

12 June

SNADARC JUNCTION 28 RADIO RALLY: Alfreton and District Amateur Radio

Club, South Normanton. Alfreton Leisure Centre, DE55 7BD. Tables still £10 and Admission £3. Everything is indoors with a meeting room, bar, refreshments and full Café onsite. Opening at 10:15, traders will have access from 08:00.

Alan Jones M0OLT **Tel: 01332 679913** secretary@snadarc.com www.snadarc.com

12 June

MENDIPS RALLY: Farrington Gurney Memorial Hall, Church Lane, Farrington Gurney, Somerset, BS39 6TY. Open 9.30 am (traders 7:30 am). Entrance £3 (FP). Indoor & Field pitches. Tables: inside £8 | outside £5.

Luke Kelly, 2E0VHV **Tel: 07870 168 197** mendipsrally@hotmail.com

19 June

EAST SUFFOLK WIRELESS REVIVAL (IPSWICH RALLY): 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. Trade tables are from £10. (BB | CBS | CR | FP | RSGB | SIG | TS | GB4SWR HF station).

Kevin G8MXV **Tel: 07710 046 846** www.eswr.org.uk

24-26 June

HAM RADIO FRIEDRICHSHAFEN <https://tinyurl.com/2p8up2rc>

25 June

GI-QRP CONVENTION: Tandragee Golf Club, 11 Markethill Road, Tandragee, Craigavon BT62 2ER. The venue has ample parking and disabled access. Doors open at 9 am. Presentations start at 10 am.

As well as this being the first-ever QRP convention in GI, there will be an opportunity to work the GQRP Club callsign GI5LOW for the first time in the week leading up to the Convention and the weekend of the Convention. The Convention is being held in association with the GQRP Club. (BA | CR | L | LB | RF | SIG | TS). **Philip M10MSO** **Tel: 078 4902 5760** r8.giqrp@gmail.com

26 June

NEWBURY RADIO RALLY: Following two years of postponement due to COVID re-

NATIONAL HAMFEST

Please note that the National Hamfest is due to take place on **Friday 14th and Saturday 15th October** this year. Further details will appear in RadioUser over the coming months.

strictions, the Newbury rally is now back. It will take place at Newbury Showground, Priors Court Road, Hermitage, Thatcham, Berks. RG18 9QZ (Next to J13 of the M4). The is organised and run by the Newbury And District Amateur Radio Society (NADARS) and attracts visitors from all over the country.

<https://www.nadars.org.uk/rally.asp> <http://www.nadars.org.uk>

3 July

CORNISH RAC RALLY: Penair School, St Clement, Truro, Cornwall TR1 1TN. Doors open at 10 am. Admission is £2. (BB | CR | DTS | Local Club Stands).

Ken Tarry G0FIC 01209 821073 pennennis38@btinternet.com www.gx4crc.com

17 July

MCMICHAEL RALLY: The McMichael Rally begins at 09:30 am, with car boot setup from 8:30 am. The location is: Reading Rugby Club, Sonning Lane (B4446) – just off the A4 at Sonning, east of Reading, Berkshire. Postcode: RG4 6ST, NGR SU 753 747. Admission: £3 per person. Car boot sale: £10 per pitch, no booking required. Sorry but no dogs are allowed, except for assistance dogs (site rule) (CBS | FP | SIG).

<https://mcmichaelrally.org.uk> rally@radarc.org traders@radarc.org

24 July

FINNINGLEY ARS RALLY: Car-boot style rally. Food bar. Near J2 M180, Doncaster.

www.g0ghk.com

31 July

WILTSHIRE RADIO RALLY, ELECTRONICS FAIR & CAR BOOT: Kington Langley Village Hall and Playing Field, Kington Langley, Wiltshire SN15 5NJ. 9 am to 3 pm. Admission free. Traders Welcome (CA | Covid-19 safe).

Brian, G6HUI rally@chippenhamsradio.club

BA Buildathon BB Bring-and-Buy CBS Car Boot Sale CR Catering/Refreshments D Disabled visitors FP Free Parking LB Licensed Bar L Lectures RF Raffle RSGB (RSGB) Book Stall RU/PW RadioUser/PW attendance SIG Special-Interest Groups TI Talk-In (Channel) TS Trade Stalls

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Scott Caldwell

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The 1964 'Great Alaska Earthquake' (Fig. 1) occurred on Good Friday, March 1964, at 17:36 hrs (local time). It was the largest geo-tectonic event in the United States since 1700, with a recorded magnitude of 9.2. The quake was so powerful that the tsunami that followed caused widespread destruction in Oregon and California. Alaska would experience 52 separate aftershocks, with 11 of them being greater than 6 on the Richter scale.

Interestingly – and unbeknownst to many – the quake also acted as a catalyst for change in the US commercial radio sector: because of the actions of one female radio presenter, the catastrophe, and the way it was dealt with, led to many more women pursuing careers in commercial radio broadcasting.

How did this happen?

Well, it turns out that radio host Genie Chance (1927-1998, Figs. 2 and 4) was the voice that galvanised and united the State of Alaska in that time of unprecedented peril.

A Genie Out Of The Radio

Scott Caldwell investigates the role of radio in the history of natural disasters, looking, in particular, at the 'Great Alaska Earthquake' of 1964, and the role and actions of one very special radio presenter.

The Early Life of Genie Chance

Genie's father was Albert Sidney Broadfoot, a high-profile Texas state representative and judge. Her mother was Jessie Butler Broadcast of Bonham, Texas. In 1946, she obtained an undergraduate degree in Speech from the North Texas Teachers College (now named the University of North Texas). The foundations for her remarkable career in broadcast radio were thus laid with a solid and grounded education.

The further graduate studies Genie pursued at Baylor University facilitated a subsequent, rewarding, career in

academia. Between 1946 to 1949, she obtained an academic position at North Texas State University, where she lectured in a range of diverse disciplines, ranging from speech, radio English, and government. In 1959, she relocated from Texas to Anchorage, Alaska, a place that she would ultimately become synonymous with. This new start did not solve her husband's money problems, Winston Cash Chance was a struggling used car salesman. However, he was convinced that Alaska was a land of opportunity, where anyone willing to work could become financially prosperous.

Fig. 1: A map of Alaska. Fig. 2: Genie Chance, a voice of hope and comfort at a difficult time. Fig. 3: 650 KENI – Alaska's News Talk Radio. Fig. 4: A recent biography of Genie Chance and the Story of the 1964 Earthquake. Fig. 5: The 'Great Alaskan Earthquake' of 1964.

Genie Chance – The Voice of Hope and Comfort

Genie Chance was a trailblazer, one of Alaska's first female radio news reporters. However, soon the Chance family was in a precarious financial position and were struggling to pay the rent and bills. Despite Winston's belief in his abilities to provide for his family, Chance was worried. She later recalled her feelings on the matter: *"And this is what a good wife is supposed to do? Just wait at home for her man to bring money in to pay the bills and feed the family? If other wives, do it all the time, why can't I learn to relax and let it happen?"*

She went to Winston weeping and he calmly told her, *'Get out there and get a job'*. Initially, Genie was speechless. She soon recovered her composure and two weeks later she obtained employment at the local radio station KENI (Fig. 3). The rest, as they say, is history.

It turned out that, for many years, Genie had suffered psychological and physical abuse at the hands of Winston. This intensified as her success and popularity grew. Eventually, she could take no more and filed for divorce. She simply said to Winston *"Don't show up, don't come out, Don't start caring about me now"*.

She was now a working mother at the local radio station, KENI. Her position was part-time, while her dedication and determination were at full throttle. Many locals recalled seeing her race round to the police station and courthouse to report on the latest crime and punishment news story.

Daring Missions

Even more remarkable was her willingness to be hands-on: to fly with the air patrol on wilderness rescue missions, to follow army units on Arctic training exercises, to record the harsh working life on a crab fishing boat, and to witness death on some nuclear test sites. On one occasion, she had to be dissuaded from climbing a fire ladder while reporting, as she was still recovering from a bout of pneumonia.

In her one-and-a-half years at KENI, Chance had transformed her career (Figs. 2 and 3). She had become an industrious roving reporter, specialising in local crime



and the state's legal system. One of her colleagues remarked *'when something happens, their Genie will be right there telling them all about it'*. Many male colleagues dismissed her as being 'stuck-up' or 'dramatic'. She did her best to defuse their resentment; for example, at the end of a dogsled race, she signed off by thanking her two male colleagues, *"for allowing this 'little gal' to be part of the broadcast crew"*. The New York Times famously called her, *"an Alaskan housewife and mother who does the job of a man with a microphone"*. Such was the prejudice of the times.

Chance enthusiastically championed equal employment rights. She became an active member of the *Alaskan Press Women Organisation*. In 1967, the organisation changed its name to the Alaska Professional Communicators, and she served as its first President.

Broadcasting at KENI

In times of panic, many people now naturally turned to Chance for reassurance. This quality to remain calm under pressure was displayed during the great Alaska Earthquake of 1964:

Within minutes of the earthquake, she was on the streets compiling first-hand reports. She would later remark that, *"I was responsible for reassuring Alaskans that the world had not come to an end"*.

The radio station at the centre of this story (KENI, Table 1) commenced broadcasting on May 2nd, 1948, on the frequency of 550kHz, with a full-time output power of 5KW. It was originally owned and operated by the Midnight Sun Broadcasting Company. KENI was considered the 'flagship' of Alaska's largest radio network. The broadcaster served a city that was still in the progress of inventing its own identity.

Anchorage, in Alaska (Fig. 1) had been established in 1915 when workers arrived to construct the *Alaska Railroad*. By early 1964, Anchorage's population had grown to nearly 100,000, nearly half of Alaska's total.

One listener described KENI (Fig. 3) as, "Our only beacon of light in a night of terror". KENI and its competitors had promoted the new medium of television throughout Alaska. However, radio had managed to retain its relevance throughout the more remote parts of the state. In 1964, many people inhabited far-flung settlements that possessed just a limited integrated infrastructure.

KENI's transmitter was housed in a small building, three miles away from the main studio. It was universally known to locals as *Bootlegger's Cove*. The antenna was a massive 300 ft structure that was anchored into the wetland. When engineers finally managed to access the site, they were in despair. The top 40ft of the antenna had snapped off and was hanging precariously upside down, adjacent to the intact section.

News anchor, Ty Clark was in the station's mobile studio parked outside. He watched spellbound as the signal power went up and the microphone became live. He just about managed to regain his composure and announced over the classical music being played at the time: "This is KENI, 550 on your dial. Returning to the air on an emergency basis". The state had found its voice.

A Date with Destiny

Chance was busy composing a letter when her son, Winston Jr appeared at her bedroom door. He needed a lift to the local bookstore to buy a Red Cross life-saving manual for his swimming class. The bookstore closed at 6 pm, and they needed to hurry as traffic in Anchorage was always busy.

All was quiet in the city centre. Most people had already finished and were looking forward to the long Easter weekend holiday. They had just approached the intersection of C Street and Ninth. At the traffic lights, she began to brake, and the car responded very unusually by bucking and Genie at first believed that they had a flat tyre. For a few seconds, they bounced around violently.

Then without any warning, a forceful and heaving jolt seemed to make the earth move from under their feet.

In a few minutes of the ensuing, devastating, earthquake, thousands of people were made homeless, 114 lives were tragically lost, and the economy of the

entire state was disrupted due to the ruined industrial infrastructure.

Reassurance Amidst Chaos

To offer much-needed comfort to the people of Alaska, Chance began broadcasting from the Alaska Public Safety Building straight away, with the aid of emergency power generators. She performed a dual public service by reporting on the extensive damage caused by the earthquake.

However, almost simultaneously, she delivered personal messages from families who were desperately searching for their missing loved ones: "John Doran of 1557 Eight Street is trying to contact Genevieve Moffitt of Palmer".

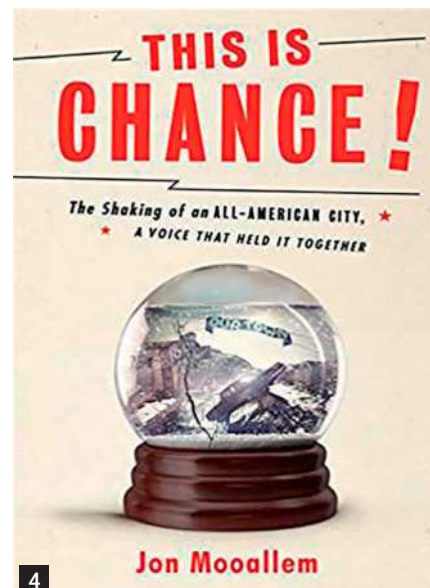
In the aftermath of the seismic shocks, she would enhance the role of her public service radio broadcasts by offering practical help on such topics as how to purify snow for drinking, cooking, and cleaning. The integrated water supply had immediately been cut off, and Genie pleaded with local convenience stores to extend their opening times. Moreover, she asked that people should not hoard essential commodities, facilitating a just and fair approach that cut across social boundaries.

Genie also acted as a kind of filter: she carefully scrutinised each new report that reached her. Her selectivity was based on one simple criterion: *was it knowledge the public could handle, or would it generate mass panic?* Chance would spend the next 59 hours coordinating the rescue and response efforts, connecting the disparate emergency services. This form of coordination involved directing resources to the immediate needs of the local community, disseminating vital information regarding shelter accessibility and food rations.

After 30 hours of continuous broadcasting, she took her first two-hour break in order to get some much-needed sleep. She would need all her strength and composure to broadcast the list of the dead and missing. The city's isolation was finally broken when Charlie Gray, KENI's chief engineer checked on the operational status of the *Alaska Communication System (ACS)*. This military installation connected Anchorage to other cities in Alaska and the outside world. Amazingly, the system was still functioning, and the fixed line connecting KENI's downtown studio to the ACS building was still intact. This enabled the engineers to relay KENI's night-time programmes to their sister station in Fairbanks, Alaska (Fig. 1).



3



4

Personal Impact

On one occasion, Chance recalled her feelings and concerns in a letter to her mother: "I must admit that during that first dark, cold night, as I began to understand the tremendous scope of the problems that would be facing us in the months and years to come, I toyed with the idea of sending the children out on a plane to stay with you until everything settled down. Working there in the headquarters, where the reports were coming in from the survey teams throughout the city, I realised that there could possibly be a real health hazard for some time to come.

"I realised that the schools might not be able to resume for an indefinite period of time. It looked for a few hours as if the damage had been so extensive to all utilities and streets that even a semblance of normal life could not be resumed for weeks or months. But this was just a fleeting thought in a weary mind. I would have been ashamed of myself had it not been for the next thought that came so swiftly: We must be together... That night I saw strain, heavy hearts, and fear in people separated from their loved ones by the sudden disaster. As long as we are together, we are confident of the future. That Good Friday night, I knew that we had survived miraculously. And for this reason, there must be a purpose to our lives. Apparently, the children must sense this, too. For they have remained calm. They have



been fully aware of the emergency, but they have not feared. We are proud that they are such dependable, responsible youngsters. I would not undermine their confidence in the future – in themselves – by sending them away for safety.

“What is safety, anyway? How can you predict where or when tragedy will occur? You can only learn to live with it and make the best of it when it happens. These children have learned this – and they are all the better for it. They were in the midst of devastation. And they feel that they are a part of the tremendous task ahead in rebuilding this land we love... The children are not afraid. Their father and I are not afraid. Please, don't you fear for us.”

Foundations of a Political Career

Genie Chance received numerous national awards in recognition of her actions during and after the deadly earthquake. She utilised her newfound status to campaign for change in American society. A request to the management of KENI to increase her salary would act as the catalyst for yet another career change.

The station refused to grant this request. She resigned shortly afterwards, and, in 1968, she was elected to the Alaska House of Representatives, serving as a State Representative from 1969 to 1975.

In this capacity, she later sponsored more progressive legislation that focused on issues close to her heart, for instance, education reform and women's rights. In another example, in 1970, Chance actively supported a bill to decriminalise abortion in Alaska.

Coverage Area	South Central Alaska
Frequency	650 kHz (Since 1998)
Branding	News Radio 650
Format	News/ Talk
Owner	iHeart Media Inc
Sister Radio Stations	KASH-FM, KBFX, KGOT, KTZN, KYMG
Established	1948
Former Call Sign	KYMK (1967-1998).

Table 1: KENI: A Station Portrait.

Further Reading

- Hansen, W.R. Eckel, E.B. Scheem, W.E. Lyle, R.E. George, W. and Chance, G., (1966). *US Geological Survey: Paper No. 541*
- Mooulllem, J. (2021) *This is Chance!* Random House Publishing Group (Fig. 4).

Conclusion

The Great Alaskan Earthquake of 1964 highlighted the unique capabilities of broadcast radio to coordinate and support humanitarian relief in the aftermath of an unprecedented disaster. In that regard, nothing has changed since that time. Despite the devastated city's infrastructure, the technicians at KENI managed to get a transmitter online to carry the messages of hope and love. This once again reminds us that in the event of Internet failure, radio communication offers a robust alternative that requires limited technological support. In 1998, one of the voices of calmness and reason from that time was lost forever when Genie died at the age of 71 due to dementia.

Radio News

CYPHER MACHINES AND CRYPTOLOGY

WEBSITE HAS MOVED: Dirk Rijmenants writes in the *SWLing Post* that, “the *Cipher Machines and Cryptology* website moved to a new location. The website now also supports hppts (SSL/TLS) so that you can visit securely and anonymously. The reason for the change of server and domain was due to the old provider decided to stop all their user web spaces. More about the move is found on our latest blog post [...]”

www.ciphermachinesandcryptology.com

MAGNETIC FIELD MEASUREMENTS: Most people think about the Earth's magnetism only when they need to find their way in the wilderness. When we look at a compass, the earth's magnetic field appears to be a steady guide. But in reality, the Magnetic Field is anything but stable.

Ephemeral undulations, called micro-pulsations, ripple about the ionosphere and generate magnetic disturbances that reach down to ground level. Although they are common and sometimes last from seconds to minutes, these magnetic disturbances are hard to detect, having barely one ten-thousandth the strength of the earth's average magnetism.

For decades, the high cost of sensitive magnetometers has made tracking these signals the exclusive privilege of professionals. But thanks to the creative genius of Roger Baker, a gifted amateur scientist in Austin, Texas, anyone can easily study magnetic micro-pulsations. Baker's Magnetometer Project from 1999 cost less than US\$50, yet it can easily capture those tiny pulsations - as well as the occasional dramatic effects - of a magnetic storm high in the Earth's ionosphere.

(SOURCE: Bob Houlston G4PVB) Society for Amateur Scientists, USA)

www.tinyurl.com/mvk3kfrn
<http://web2.thesphere.com/SAS/WebX.cgi>

RADIO ASTRONOMY: Astronomers around the world use radio telescopes to observe the naturally occurring radio waves that come from stars, planets, galaxies, clouds of dust, and molecules of gas. Most of us are familiar with visible-light astronomy and what it reveals about these objects. Visible “light” – also known as optical light – is what we see with our eyes, however, visible light doesn't tell the whole story about an object. To get a complete understanding of a distant quasar or a planet, for example, astronomers study it in as many wavelengths as possible, including the radio range.

(SOURCE: NRAO | NSF (USA) via Bob Houlston)

<https://tinyurl.com/syrjxjvv>
www.tinyurl.com/bdemns2w

Robert Connolly

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As I was preparing this column, some breaking news just came in regarding the rescue helicopter service of the Irish Coast Guard (*Garda C6sta na hEireann*). Currently, the service contract is held by CHC, you may recall that CHC, who was also the provider of the UK service before Bristow won the contract. A number of the CHC UK rescue helicopters have been transferred to Ireland to upgrade the service. Now the Irish helicopter SAR contract is up for renewal. At present, CHC operates four rescue helicopter bases in Ireland; Shannon, Sligo, Dublin, and Waterford (technically, Waterford is classed as a 'daylight-only' service). The new Irish €800 million contract is for a minimum of three helicopter bases and one fixed-wing aircraft until at least 2032, with a possible three-year extension option.

Given the minimum provision of three SAR helicopter bases, this has caused fears in the southeast of Ireland area relating to the possible closure of the Waterford station. A campaign seeks to keep it open now that ferry traffic out of the port of Rosslare has more than trebled since 'Brexit'. There is a concern amongst Irish politicians that, under the new contract, some helicopters and aircraft may be based in England. I assume this pertains to *Excel Aviation* – who currently have a fixed-wing and drone contract with the UK Coastguard. However, following pressure from Waterford groups and politicians, there will now be a minimum of four helicopter bases in Ireland.

Ireland: <https://tinyurl.com/nhjw7dev>

UK: <https://tinyurl.com/wsk78ccr>

NDB Reception, Equipment and Weather

This month's main focus is on the Seasonal Non-Directional Beacon (NDB) DXing season. I have been using an SDR receiver for a couple of years now, initially the SDRplay RSP1A; early last year, I purchased an SDRplay RSPdx. As some of you may recall, I used to work with an old Pentium 2 laptop for decoding NAVTEX received on my JRC NRD 525 receiver. However, this was incapable of handling SDR receivers.

Therefore, decoding signals from those radios had to be carried out using my main desktop computer. In early December 2021, I purchased a refurbished Windows

Non-Directional Beacon Survey 2022 (Pt 1)

Robert Connolly shares some SAR news, engages with atmospheric pressure and Beacon DXing, shows how you can hunt NDBs despite hearing loss, announces his new NDB Guide and offers his first RU 2022 NDB Survey.

10 desktop PC for SDR decoding and other tasks.

As I now possess two desktop PCs able to handle *SDRuno* and *SDR Console*, along with both of my SDR receivers, I thought it would be interesting to pitch them against one another to compare the results in terms of NDB reception. I connected my RSPdx was connected to my 'new' computer, while the RSP1A was linked to my main desktop. Both were running *SDR Console*, with identical settings and recording parameters.

At times, both were also sharing my PA0RDT mini-whip aerial. The recording was set to begin just before midnight on New Year's Eve for 12 minutes. I would then use *PSKOV* to study the NDB signals. As it turned out, New Year's Eve night was to prove a very interesting night. Before I looked at my recordings, on New Year's Day, I downloaded the synoptic weather data for midnight on New Year's Eve and ran it through my *Digital Atmosphere (DA)* software.

This will produce the two types of weather charts I normally use to predict potential sources of propagation and DXing conditions: one of them shows the isobars and the high- and low-pressure areas (Fig. 1); the other chart displays atmospheric pressure *tendency* (the *pressure change* from the previous three hours). This pressure tendency chart indicates to me possible areas of propagation enhancement that would show up as improved reception of NDBs from that area.

The image in Fig. 2 shows a typical pressure tendency chart that DA generates. Often, there are pressure changes across Europe in approximately three-hour intervals. The chart would then show areas of *rising* and *falling* pressure. The pressure tendency chart produced for midnight New Year's Eve took me by surprise:

There were no indicated pressure changes across the whole of Europe (Fig.

3), which was very unusual! The only area showing any pressure change was to the west of Greenland.

NDB DXing and Hearing Loss: SDRs to the Rescue

In terms of NDB reception, this could mean two possible scenarios: virtually no DX or signals appearing from anywhere in Europe. The only way to find out was to look at the results of signals received during the 12-minute recorded session. As the saying goes: let the games begin!

As expected, the RSPdx produced a larger number of NDB reception hits, compared to the RSP1A. However, what was interesting, given that the same antenna and recording times were used, was that the RSP1A reception logs included several NDBs that were not received by the RSPdx. These beacons were mainly from France and were on frequencies where no signals were captured by the RSPdx.

Some of you will be aware that for several years I have suffered from *tinnitus* in both ears; an absolute pain so to speak, resulting in making radio listening difficult at times, particularly when it comes to listening for weak NDB signals. Having said that, on the plus side, the combination of NDB signals and background static did a lot to alleviate the tinnitus enough to be able to get a decent night's sleep.

On the negative side, I had to use a wider filter setting on my NRD 525 receiver to hear the NDBs more easily. The other problem I experienced with NDB reception on the NRD 525 was large amounts of QRM generated by a neighbour's sodium security light until it switched off at 0000 GMT. However, using my SDR receivers, I can record the NDB segment of the band in the early hours and analyse it later the following day at my leisure. I have been experimenting with narrowing filtering for my NDB reception using my SDR receivers and have noticed that they seem to be less

ALL PICTURES: ROBERT CONNOLLY

- Fig. 1: A *Digital Atmosphere* weather chart showing isobars, high- and low-pressure areas.
- Fig. 2: A typical pressure tendency chart generated by *Digital Atmosphere*.
- Fig. 3: A pressure tendency chart for 31st December 2022 (*Digital Atmosphere*).
- Fig. 4: The synoptic data for my 0200 recording; pressure tendency chart for Europe (*Digital Atmosphere*).
- Fig. 5: The synoptic data for my 0200 recording on a North Atlantic chart (*Digital Atmosphere*).
- Fig. 6: The Ro-Ro vessel *Celtic Star*.

prone to the QRM generated by that pesky light.

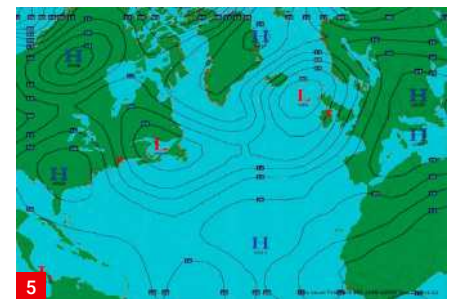
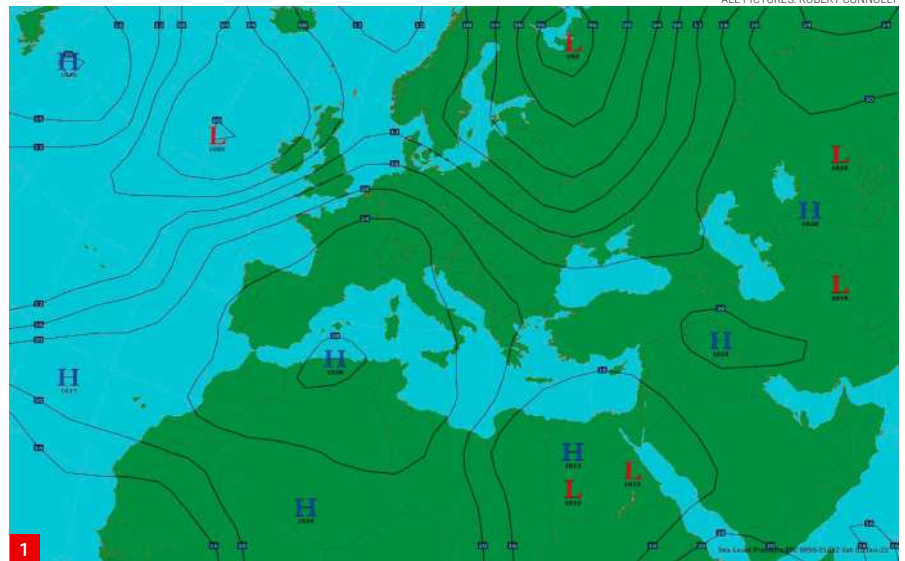
Over the years I have received communications from listeners who were telling me that they had to give up their hobby, particularly NDB DXing, due to hearing difficulties that they had developed. Often the hearing issue was *tinnitus*, and my advice was always to say that they should continue NDB DXing *before they went to bed*, as this might help to reduce the annoyance and make it easier to get to sleep.

A New Way of Using PskovNDB 2.1a

Having used an SDR receiver for a couple of years now, and the *PskovNDB* software package for several months, I have concluded that you could actually be deaf and you would now be able to DX radio navigation beacons just as well as a person who has perfect hearing, thanks to the facility of SDR software to record the NDB band: Just produce a file covering the NDB band using *Spectrum Builder* functionality of *PskovNDB* and load this into *PskovNDB*.

There is no requirement to *hear* any CW signals, as they are visually displayed for each frequency using the software. For all of us, it also means that any usual background noises, for example, vacuum cleaners, washing machines, and so on, do not create a problem while trying to hear weak signals.

Over the winter period, I have been using Ivan Monogarov's impressive and unique *PskovNDB 2.1a* software, to see and evaluate received NDB signals. Like everything else, this method requires a little practice to get the optimum results. However, it does show NDB signals that one would otherwise be unable to identify using the proverbial *mark one ear hole*. This method helps to decode the weakest of NDB signals and offers a whole new aspect to the NDB hobby. It has certainly enabled Andy Thomsett and me to log quite a wealth



of NDBs received for the first time we both logged well over 40 beacons.

[The list is available on Radio Enthusiast, see also below -Ed.]

The *PskovNDB 2.1a* suite is available to download at this URL:

<https://tinyurl.com/437d56cw>

In mid-January 2022, I decided to carry out a second experiment: this time, I scheduled several recordings with my RSPdx for one night and compared the reception results. All in all, I set up four sessions, at 0040, 0240, 0440 and 0640 UTC. All recordings were created using *SDR Console* with each one of a ten-minute duration. Again, I used *PskovNDB* to check the received files and log the results. While this could have been done using my NRD 525 receiver by listening 'live', it would have

involved the loss of a night's sleep.

The following morning, I downloaded the synoptic data for 0200 and produced my usual pressure tendency charts for Europe (Fig. 4) and the North Atlantic (Fig. 5) using *Digital Atmosphere*.

The North Atlantic pressure tendency chart was generated because I found a Greenland NDB in the results for the 0640 session. As you can see (Table 2), this would indicate that the DX quality diminished through the night. Some NDBs were received in one session and not another, indicating possible propagation condition changes during the night. The 0640 session was selected in an attempt to receive some grey-line propagation. Greyline propagation appears during that short period, of 20 to 30 minutes, between

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daylight and darkness at dusk and dawn. In this scenario, propagation changes may also have accounted for the reduction in received beacons as the night progressed. I would need to carry out further experiments to determine if this was the case. Based on my reception results, the best winter DX occurs until approximately 0200 UTC.

When using the 'Spectrum Builder' component of *PskovNDB*, I work with the following settings:

- DX Viewing or DX Skimming; Int 16. *Blackman Harris* windows function.
- Limit frequency range of the .wav recording to 220-530kHz.
- De-select 'save-only' area; opt for 'save-to', in the same folder *PskovNDB* is in.
- Use a visible bandwidth of 10 or 20kHz and a zoom setting of either 2 or 4.

I use this latter zoom setting as I prefer to visually decode the ident rather than use the spectrum display, useful as the latter may be as an aid for weak signals. Andy Thomsett advised that he also prefers to use the visual-decode method, although he works with slightly different settings in *PskovNDB*. Using the smaller zoom selection gives just over a minute of display, and Level 2 gives just over 30 seconds. Therefore, if you have a ten-minute recording, you must remember to use the scroll button on the right side of the display to ensure that you have checked that frequency for its full recorded time. This is

important because propagation changes can allow some beacons to appear briefly during the recorded time allocation.

Beacon Closures and Online SDR Receivers

While on propagation, the closure of Canadian beacons continues. This winter may have been the last one for possible beacon DX reception from Canada. That said, this could open those frequencies to other weaker beacons, and the next winter will provide some indication of this. More on the Canadian NDB closures may be found at this URL:

<https://tinyurl.com/3ae679v7>

There are many *online SDR* receivers available on the internet that would allow you to listen for NDBs from a different location. As an example, a person from the UK might use an online SDR receiver located in Finland to listen to NDBs. However, would any beacon heard using this method still qualify as a 'log' for your location? I believe that to log an NDB as received at your location the basic requirement should be that the actual receiver the beacon is heard on is *physically located* at your location.

But certainly, you could keep a record of the beacons received by the online receiver at its location in Finland, but this should not become part of your actual logs, I think. [N.B.: All the NDB logs referred to in this column (Table 1) and the RSP1A/RSPdx comparison table (Table 2) will be available

on the Radio Enthusiast website - Ed.]. www.radioenthusiast.co.uk

Last but not least, the newest edition of my beacon guide, *Non-Directional Beacons of Europe (2022 Edition)*, should become available in early April 2022. Again, this will only be available as a pdf file.

[see the editor's review of this publication, elsewhere in this issue - Ed.].

Please see my website, below, for ordering details. This month's photo (Fig. 6) shows the Ro-Ro vessel *Celtic Star*.

Until next month "Fair Winds". www.kilkeel.org.uk

Equipment used by Andy Thomsett, Southwest England was: Airspy HF+ Discovery and PA0RDT Mini-Whip or Elad FDM-DUOr, a homebrew 9-pole elliptical low-pass filter (based on the design by John Andrews W1TAG) and a WellGood loop antenna. The W1TAG 9-pole elliptical low-pass filter is designed to have a -6dB breakpoint at 518kHz. Andy tells me the breakpoint for his is a bit higher in frequency (nearer to 560kHz). Equipment used by **Robert Connolly** in his Co. Down location was: RSP1A and RSPdx SDR receivers with a PA0RDT MiniWhip antenna at approximately 21 feet above ground level, and the SDR Console software.

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Elad Companion Speaker SP1 for FDM-Duo. £134.95



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www.HamRadio.co.uk/ardv1

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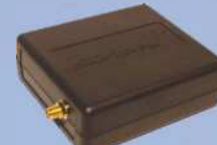
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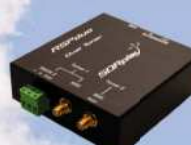


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Diamond D-777

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RRP: £83.94
ML&S ONLY: £66.95

AOR DA1500

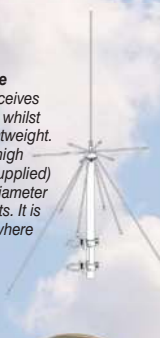
DA1500 is a multi-purpose wideband antenna that receives 70 to 1500MHz continuous whilst being small in size and lightweight. The antenna is only 92cm high and attaches to any (non-supplied) mast from 25 to 50mm in diameter with the two supplied V-bolts. It is recommended for places where space is limited.

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