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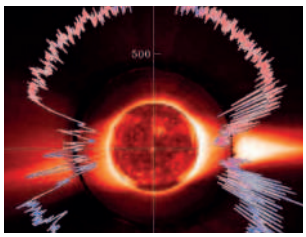

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Pocket sized Scanning Receiver

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Cover Story


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Welcome

Automation, Propagation and Innovation

Hello and welcome to the October issue of *RadioUser*. A special welcome to you if you are a new reader. If you wish to stay with us – and I hope that you do – have a look at our great subscription offers on page six in this issue. Irrespective of how long you have been with us, I hope that, once again, you will find the issue in front of you both varied and interesting.

Against the background of the ongoing Coronavirus situation, radio in all its forms has never been as vital to keep people in touch as it is now. You will notice that, therefore, we are bringing CB Radio back into the *RadioUser* family, in the shape of two articles by Tim Kirby first, then, in 2021, as a regular column. I hope you will enjoy the equipment reviews and article to come in this area.

Our main features this time span an exciting variety of topics, and there are a few more features than usual in this issue. To begin with, Robert Gulley offers us a useful explanation of those ubiquitous propagation forecast diagrams we find in so many publications and websites. Our Dutch friend Marco C. van der Hoeven makes us aware of how microphones have not just captured voices but made history too, having been present at key events across the world.

Later in this issue, Scott Caldwell explores the role of both two-way radio communications and wider broadcasting in the crash of the zeppelin *Hindenburg* in 1937. On a less catastrophic footing, Tony Smith looks at a statue of the painter (and inventor) Samuel F.B. Morse, who still looms large over the radio hobby.

Last, but by no means least, Keith Hamer and Garry Smith have had the fantastic opportunity to talk to the people behind the *Talking Pictures TV* channel, and they have some amazing stories to share with you here.

In our many regular sections this month, you will learn more about the steady progression of radio-controlled automation in both maritime communications and airborne systems, the *Radio Garden* app and the future of radio-themed events and conferences, details of EWE aerials, and cyber-attacks in Network radio.

Moreover, our team of experts bring you their indispensable recommendations for where to go for global radio listening this month. Furthermore, we review portable DAB radios, nifty NAVTEX receivers and worry-free weather stations for the shack.

Our *News and Products* column focuses on SDRPlay innovation and new SDR models this month, and our two book reviews cover new titles about the work of radio pioneer and former RSGB President Oliver Lodge, German news media control, and the amazing history and development of the transistor.

Enjoy this issue of *RadioUser*, in both print and online, stay in touch and, as always, stay safe.

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

What's New

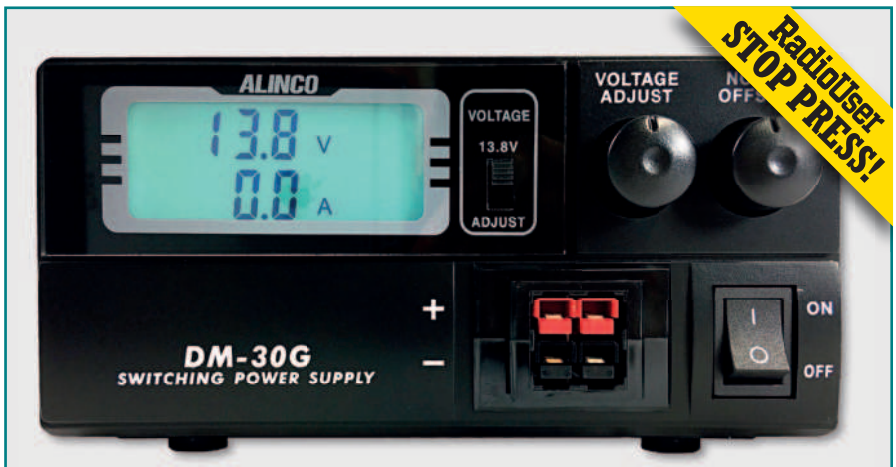
Have you got something new to tell our readers about? If so, then drop a line to **wiessala@hotmail.com**

RX888 SDR

Some early reviewers have noted that the RX666 and RX888 SDRs are commercial implementations of the excellent (and open-source) BBRF103 receiver. The BBRF103 is the creation of talented Italian designer Oscar Steila IK1XPV. The receiver should work with HDSDR after the correct additional files are added to the HDSDR folder, as does the similar RX666 model. Cypress USB drivers also need installation on the host computer. One concern, in the view of early adopters, is operating the LNA (low noise amplifier) on the RX888, which the RX666 lacks. This may take a different EXTIO .dll file than the one intended for the earlier RX666. Reviewers have indicated that they are aware of the developer of another popular SDR program who will almost certainly add support for the RX888/RX666 to his software. The RX666 & RX888 (see last month's RadioUser) could turn out to be amazing performers for the price.
(Source: *SWLing.com, RadioUser, FB Groups*)
https://tinyurl.com/yydlwwpk
https://dk8ok.org

Moonraker: OPEK HCS-100

The OPEK HCS-100 is a 26-31MHz high-gain 3-section commercial-grade 10/11m fibreglass omnidirectional base antenna. It is water- and weatherproof, a must in saltwater areas. The durable construction can withstand 90 mph (40m/sec.) wind speed Significantly reduced precipitate static and lower background noise. Excellent insulation; less interference from rain; sleet and snow. The key features and specifications are as follows:
• Insulation voltage: 14;500 Volts Max./span>
• 3-section 5.72-meter (18.8 ft) overall length; for easy installation • Mast diameter accepted: 30~62φmm (1-3/16"~ 2-7/16") • No ground plane design • Retractable adjusting of the whip length for working between 26-31MHz (without cutting the whip) • Easy fine-tuning with 2 built-in tuning rings • Built-in super-durable aluminium extrusion mounting bracket.
https://tinyurl.com/y393pgxo



Nevada: Alinco DM30G

Nevada is pleased to announce the Alinco DM30G, a new 30A (peak) switch-mode power supply. The Alinco DM30G is fitted with two pairs of Anderson 5A Power pole sockets on the front panel, as a handy way to feed ancillary equipment. For the main 30A connection, a pair of standard terminals are mounted on the back panel. The power supply features a large clear digital display of Voltage and Current, a fixed 13.8V switch or a variable voltage control and short-circuits protection. The DM30G is ideal for powering an HF transceiver, as it is reasonably low noise, but with a variable noise offset control, if required. The Alinco DM30G sells for £109.95 and is available from Alinco UK distributors Nevada Radio.
Tel: 02392 313 090
www.nevadaradio.co.uk

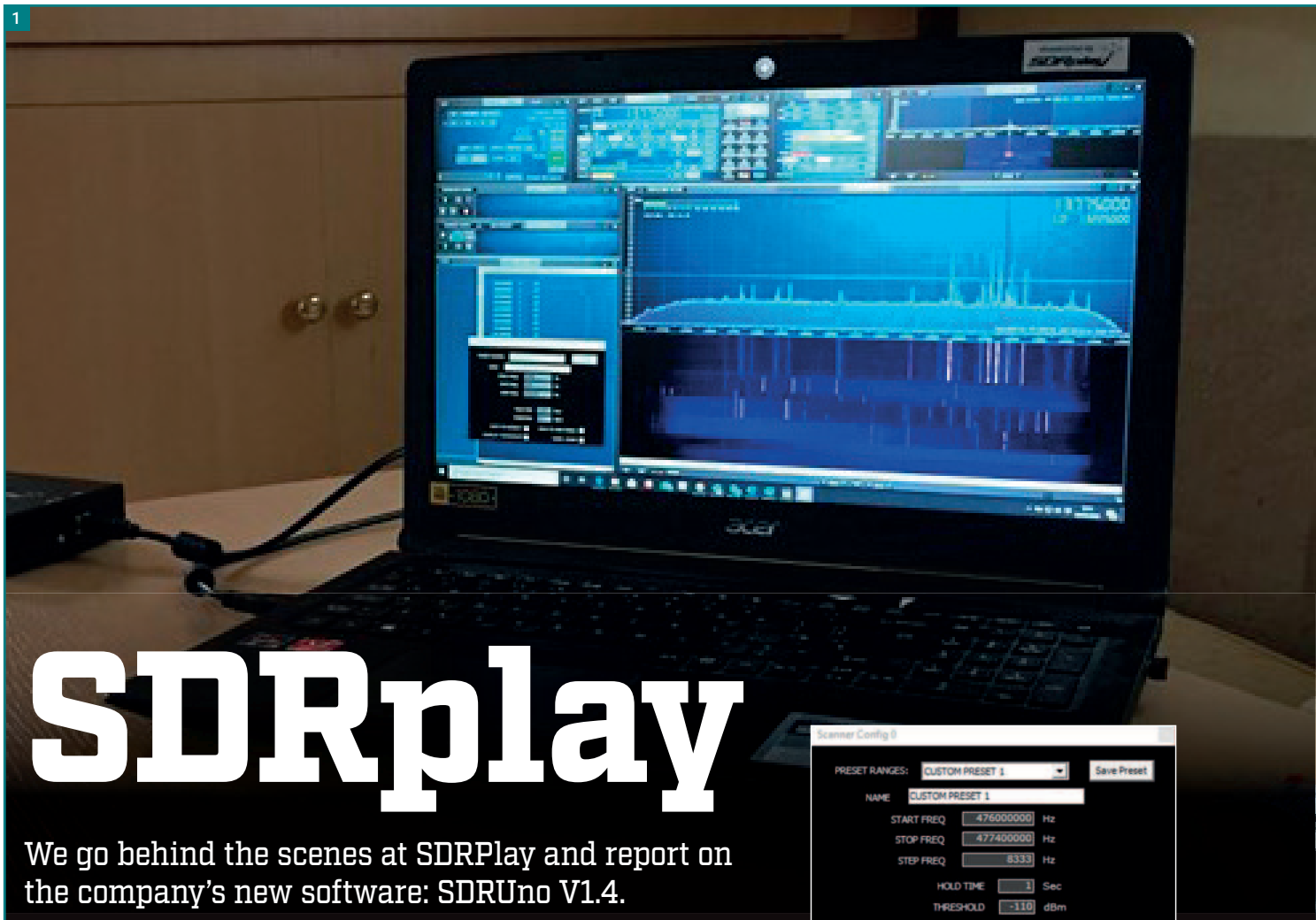
ML&S: RF Explorer WSUB1G+

The RF Explorer WSUB1G+ is a powerful, high-performance digital spectrum analyser covering the 1GHz frequency range starting at 50KHz. The new SLIM model offers outstanding and robust design, a more convenient USB connector on the side and larger internal battery capacity. Its main features and specifications are listed on the ML&S website.
https://tinyurl.com/y6koaop3
https://tinyurl.com/y523l5pj
www.HamRadio.co.uk

Wouxun KG-UV9D Mate

The new Wouxun KG-UV9D Mate is a '+rugge-dized' 2/70 Dual Band handie, in bright orange, is aimed at Raynet and other emergency services operators. A massive 8W output on both bands will make sure your signal is heard above the noise. The unit is in stock at ML&S, at £139.95.
websales@mlands.co.uk

1



SDRplay

We go behind the scenes at SDRPlay and report on the company's new software: SDRUno V1.4.

2

Radio Spectrum Processors

When SDRplay introduced its first SDR receiver, the RSP1, back in 2014, they could not have imagined how popular it would become (Fig. 1). Their new customers, especially the shortwave listening community turned out to be very vocal and before long an independent Facebook Group emerged as a lively forum for people to exchange candid comments about what they liked and didn't like about this first product.

Because the RSP (standing for "Radio Spectrum Processor") was deliberately setting out to be a wideband general coverage receiver it was a bit like a Swiss army knife in that it needed to perform adequately across such a massive span of the frequency spectrum and variety of signal types and propagation conditions. Inevitably, the first design included some design trade-offs, based on assumptions which turned out to be different from how the serious listeners were wanting to use the device in practice.

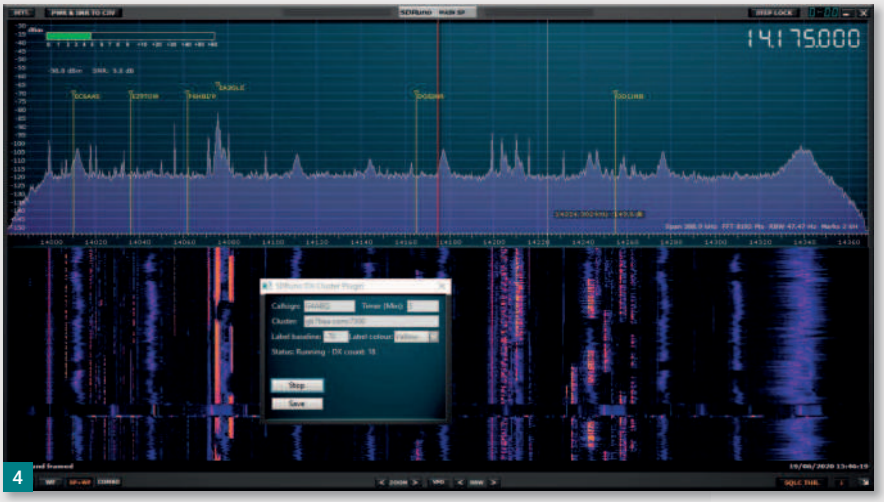
The development team took the learning from this to tweak the specs and add features and capabilities to the subsequent hardware releases.

Meanwhile, it also became clear that they could not just rely on other people's software such as SDR Console and HDSDR. That was why in 2016, SDRplay acquired the highly-acclaimed Studio-1 Software from Sandro Sfregola and adapted it to become SDRUno. Having its own SDR software means that the company could tailor it to the hardware for optimum performance. SDRUno could now provide access to special hardware features specific to SDRplay's radios, such as the HDR (High Dynamic Range) mode of the RSPdx, or diversity tuning in the case of the dual tuner RSPduo.

In 2019, SDRUno was upgraded to include a fully integrated scanning function for all its RSPs (Fig. 2). The scanner has 2 modes; it can scan an arbitrary frequency range with a defined raster or it can scan through a list of frequencies from the memory panel. It can store found signals, has a number of built-in presets (including the marine and air-bands) and has the ability to both wait on signal and hold for some time on a signal. Creating, sharing and storing your own preferred set of frequencies for scanning is also possible.

Software and Plugins

Now SDRplay has released SDRUno V1.4. The significant new capability here is in the introduction of a system for plugins (Fig. 3). Plugins are a way for existing software developers to integrate the power of SDRUno within their existing applications, thereby reducing the dependency on interfaces like Virtual Audio Cable (VAC). The new plugin system also gives anyone with some C++ coding knowledge, the ability to create exciting new interactive applications for radio



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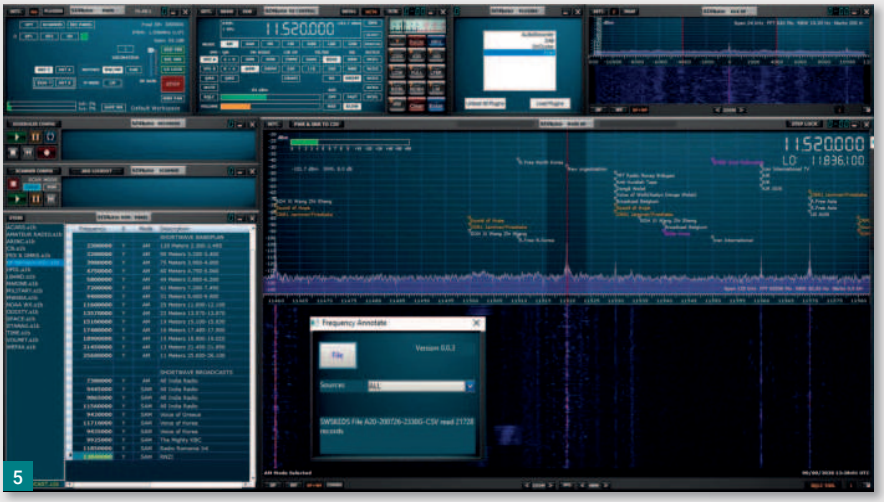


5

6

Key specifications and highlights	RSP1A	RSPdx	RSPduo
Continuous coverage from 1kHz to 2GHz	✓	✓	✓
Up to 10MHz visible bandwidth	✓	✓	✓
14-bit ADC silicon technology plus multiple high-performance input filters	✓	✓	✓
Software selectable AM/FM & DAB broadcast band notch filters	✓	✓	✓
4.7V Bias-T for powering external remote antenna amplifier	✓	✓	✓
Powers over the USB cable with a simple type B socket	✓	✓	✓
SDD SMA antenna input(s) for 1kHz to 2GHz operation (software	1	2	2
Additional software selectable Hi-Z input for up to 30MHz operation		✓	✓
Additional software selectable 50Ω BNC input for up to 200MHz operation		✓	
Additional LF/VLF filter for below 500kHz		✓	
24MHz Reference clock input (+ output on RSPduo)		✓	✓
Dual tuners enabling reception on 2 totally independent 2MHz ranges			✓
Dual tuners enabling diversity reception using SDRuno			✓
Robust and strong plastic case (with internal RF shielding layer)	✓		
Rugged black painted steel case		✓	✓
Overall performance below 2MHz for MW and LF	Good	Best	Good
...e simultaneous applications	Good	Good	Best
...mance in challenging fading conditions (*using diversity tuning)	Good	Good	Best*

7

reception (e.g. decoding, display, demodulators, custom signal annotation and so on). More about the plugin developers kit can be found on the SDRplay website Plugins page:

https://www.sdrplay.com/plugins

SDRUno Version 1.4 brings you access to some pre-installed plugins for DAB radio reception (Fig. 4), DX Clusters (Fig. 5) and a new audio recorder which supports recording both WAV and MP3 formats.

The Plugins are accessed via a plugin control panel in SDRUno. Moreover, the new DX Cluster Plugin (Fig. 5) displays amateur radio callsigns on the SDRUno spectrum display.

SDRUno already provided band buttons whereby you can press say '20m' (Fig. 6) and the software takes care of all the settings needed to present you with exactly 1.0 to 14.35MHz fitting in the main spectrum display window. Now, with the new plugin, you can overlay the DX cluster callsigns as they pop up. There's a choice of how long you let them display and you can control how they appear.

Already, third-party plugins for SDRUno are becoming available. As well as a controller for the Contour Shuttle Express jog-wheel, there's a Frequency Annotation Plugin (Fig. 5; known as 'FRAN'). This can read SWSKEDS or .s1b memory bank files and display the active stations from the files on the main spectrum window in SDRUno.

If you are asking yourself which RSP is right for you, take a look at the SDRPLay comparison table in Fig. 7. Remember that all the RSPs cover the radio spectrum from 1kHz to 2GHz with up to 10MHz spectrum visibility.

The RSP family of SDR receivers are available directly from SDRPlay Limited, Martin Lynch &Sons, Moonraker, Nevada, Radioworld, SDR-Kits and Waters & Stanton.

SDRplay: How It Began

In 2014, some engineers from chip company Mirics teamed up with others including Jon Hudson recently retired from Cambridge Silicon Radio to create a joint venture and SDRplay was formed. Mirics had already pioneered SDR receiver technology for PCs and mobile phones – remember the days when phones had FM receivers? In Japan they even had terrestrial TV reception on their phones - at one point it looked like phones for a global market would need to pick up all sorts of broadcast signals ranging from long wave through to L-band. The demanding requirements of a smartphone meant having the worst possible antenna and power constraints but having the advantage of a powerful processor available for free.

The resulting SDR silicon chip technology from Mirics was thus extremely well-engineered and flexible. This came to the attention of radio hobbyists who were already experimenting with the first generation of TV dongles to pick up wide chunks of radio spectrum.

So the SDRplay engineers set about the design of the first RSP1 radio, paying particular attention to offering the maximum range of frequencies while also minimising the problems of phantom signals so prevalent in the cheaper 8-bit dongles.

The company was also keen to manufacture in the UK and started working with Walkbury Electronics in Peterborough to map out a way to best use their manufacturing and test expertise to build the radios. It was a team effort, replicated later with TT Electronics in Hartlepool.

Forming a strong collaborative relationship with both these companies has resulted in high-quality products with very few failures. During the COVID-19 crisis, so far both companies have done an outstanding job of keeping SDRplay and their network of resellers supplied.

SDRplay employees all work from home – and while each has a speciality (hardware, software, architectural design, operations, finance, sales and marketing) – decisions are taken together as a group. Jon Hudson commented *"We all get a real buzz out of seeing our products being used by such an enthusiastic community and are always looking to go that extra mile to ensure our customers are well supported both now and in the future"*

www.SDRplay.com

ALL PICTURES: DAVID SMITH

1

Rescue Drones, Autonomous Flights and ATC Interference

David Smith
dj.daviator@btinternet.com

David Smith has news of a search-and-rescue drone operation in North Wales, Airbus's testing of automatic aircraft systems, and an interesting Ofcom investigation. He also outlines ATC operations at Oxford Airport.

After three months of testing based at Caernarfon Airport in Gwynedd, drones are to start operational missions for the first time in the UK to assist search and rescue helicopters. The remotely controlled aircraft will provide safety flight patrols over North Wales. Initially, the drones will fly at weekends only, allowing Coastguard teams to watch live incidents from the air. The drones - also called unmanned aerial vehicles or UAVs - are built by Austrian firm Schiebel. https://schiebel.net

They have a range of around 100 miles and are flown by a pilot using digital control and imaging technology to allow them to see through the eyes of its onboard cameras.

They can operate at a height of up to 18,000ft, staying airborne for about 10 hours, and they can beam live footage back to their control room day or night, even in adverse weather conditions.

"UAV technology has advanced to the stage where its deployment significantly enhances the capability of air search and rescue operations, improving the reach of the service and reducing risk for the public and our crews," said Russ Torbet, the director of search and rescue operations for Bristow Helicopters, which runs the service on behalf of the Coastguard. He continued, *"These systems provide us with an option to keep our Sikorsky S92 helicopter crew at Caernarfon on standby for lifesaving events, while the unmanned aircraft are tasked with providing safety overwatch and monitoring, which those manned aircraft would otherwise have been sent to carry out."*

The North Wales operation completed 270 missions last year, with half of those in the hills and mountains of Snowdonia. The UK government said it expected unmanned aircraft to fulfil an increasingly important role in search and rescue when it awards a new contract for the service in 2022.

Airbus Concludes Fully Autonomous Flight Tests

Following an extensive two-year flight test programme, Airbus has successfully concluded its Autonomous Taxi, Take-Off and Landing (ATTOL) project. In completing this project, Airbus has achieved autonomous taxiing, take-off and landing of a commercial aircraft through fully automatic vision-based flight tests, using onboard image recognition technology - a world-first in aviation.

In total, over 500 test flights were conducted. Pilots were on board, of course, to monitor the operation. Approximately 450 of those flights were dedicated to gathering raw video data, to support and fine-tune algorithms, while a series of six test flights, each one including five take-offs and landings per run, were used to test autonomous flight capabilities.

The ATTOL project was initiated by Airbus to explore how autonomous technologies, including the use of machine learning algorithms and automated tools for data labelling, processing and model generation, could help pilots.

They could then focus less on aircraft operations and more on strategic decision-making and mission management. Airbus is now able to analyse the potential of these technologies for enhancing future aircraft operations, all the while improving aircraft safety.

2

Ofcom Engineers Solve an ATC Interference Problem

Ofcom's spectrum assurance team recently solved an interference case that took more than a little detective work to crack. The team were contacted by NATS to report that aircraft flying in and out of Glasgow airport were being affected by interference when they were between 6,000 and 10,000ft.

The interference was affecting voice communications between the controllers on the ground and the aircraft. Whenever the aircraft were in the vicinity of the interference, the crew would not hear any ATC messages as the signal was swamped by interference.

Using flight tracking software, the engineers were able to create an 'area of probability' on a map, in which they could focus the search for the source. A ground-level investigation followed, using vehicle-mounted receivers and driving in the suspected area until the interference was heard. The source was eventually traced to a private address and four 'vintage' light bulbs that the homeowner had recently bought online. Due to the construction of the bulbs, they were found to be radiating a 'noise' when they were switched on that affected a wide range of spectrum, rather than just one frequency. The house was directly underneath the flight path of the aircraft. Therefore every time an aircraft passed and the bulbs were in use, the crew suffered the interference.

The light bulbs were unscrewed and checks were made with NATS and aircraft operators to confirm that the area was now free of interference. A follow-up case was made to ensure that the suppliers did not sell bulbs to any more unsuspecting customers!

This month's images are of a Socata TBM-700 N700GY at Shoreham (Fig. 1) and an Aero Spacelines Super Guppy (Fig. 2) – a radical conversion from a Boeing Stratocruiser, seen at Bruntingthorpe, Leicestershire.

ATC Profiles 24: Oxford Airport

ICAO Code: EGTK IATA Code: OXF

Frequencies	(MHz)	Hours of Operation
Oxford Approach/Radar	125.090	0630-2230
Oxford Director	119.980	As directed by ATC
Oxford Tower	133.430	As above
Oxford Ground	121.955	When notified on ATIS
ATIS		
Oxford Information	136.230	
Oxford Fire (non-ATC)	121.600	Fire vehicles attending aircraft on the ground

NAVAIDS
ILS Cat I on Runway 19
OX NDB 367.500kHz

RUNWAYS
01 1552 x 30m
19 1552 x 30m

NOTES (A-Z)

ATS Service Provision
The standard service provision at Oxford during the promulgated radar hours is a traffic service due to intense GA and glider flying within the vicinity of the aerodrome. Aircraft requiring a deconfliction service must inform Oxford Radar, on their first contact when inbound, and before taxiing when outbound. Outside radar hours, Oxford Approach will provide procedural and basic services.

Cat II/III Operations
Oxford is not equipped for Cat II/III operations, however, Low-Visibility Procedures are used to protect Cat I operations. Runway 19 is not suitable for lower than Category I operations. Safeguarding, in anticipation of poor weather, will commence when the reported meteorological visibility is less than 1,500m. Low-Visibility Procedures (LVP) commence when the reported meteorological visibility is less than 1,000m or the reported cloud ceiling is 300ft or less. A Follow-Me vehicle may be provided as instructed by ATC.

Circuit Procedures
Helicopter Training Area 1 is parallel to and to the west of Runway 01/19 outside the runway strip. Circuit training is suspended when the cloud base is less than 1,000ft above ground level.

Handling
A nominated handling agent is mandatory for all visiting aircraft over 2.3 tonnes. Handling for corporate or general aviation is provided by Oxfordjet. Aircraft to call Oxford Ops on Frequency: 131.640 MHz, 15 minutes prior to arrival.

Ground Movement
All aircraft parked on the main apron above the size of a Bombardier Learjet 45 shall only commence start-up when in the presence of a marshaller. All aircraft must obtain airfield information from the ATIS before starting. Aircraft unable to receive the ATIS due to radio limitations are to advise ATC when requesting start. Helicopters and aircraft parking on the main apron and south aprons will be marshalled.

Helicopters
Standard Arrival: Enter via the fixed-wing circuit unless otherwise instructed by ATC; then route to the North East Grass or Area 1 as directed. Standard Departure: wheeled helicopters must depart from the runway. Other helicopters must depart parallel to the runway under noise abatement regulations. A Heli Aiming Point is situated to the west of the mid-point to Runway 19/01 'Heli West'. All approaches from the west of the aerodrome are to be flown to this point via left/right base in parallel with the main runway.

Frequency Monitoring Code
Pilots operating in the vicinity of Oxford Airport and maintaining a listening watch only on the Oxford Approach frequency (125.090MHz) are encouraged to select SSR code 4517. Selection of 4517 does not imply the receipt of an ATC service. Aircraft displaying the code are not expected to contact ATC under normal circumstances, remain responsible for their navigation, separation, terrain clearance and are expected to remain clear of controlled airspace at all times. Whilst squawking 4517, pilots should be aware that Oxford Approach may make blind transmissions to ascertain a particular aircraft's intentions/route. When a pilot ceases to maintain a listening watch, code 4517 must be deselected. Pilots operating in this area, but within 5nm of the edge of the Brize Norton Control Zone, may choose to maintain a listening watch on Brize Zone frequency (119.000MHz) and select SSR code 3727.

Radar Service Provision
During the hours of radar operation, inbound Instrument Flight Rules (IFR) arrivals will be notified to Oxford Radar by the appropriate London Control sector. Oxford Radar will allocate an acceptance level, and airways will pass that level to the pilot. The pilot will be instructed to contact Oxford Radar (either Radar 125.090MHz or Director 119.980MHz). Traffic will be tactically radar-vectored to the ILS/NDB (as required) or instructed to route to the NDB OX. When radar is not available, London Control will inform Brize Norton ATC of the estimate and Brize Radar will co-ordinate the arrival with Oxford ATC. Dependent on traffic, the aircraft may be sent straight to Oxford for a procedural service. During the hours of Brize Lower Airspace Radar Service operation, a radar service may be provided by Brize Radar.

Use of Runways
Landing: At times intense circuit flying takes place, pilots must vacate the runway in an expeditious manner. ATC may request 'minimum time on the runway' to facilitate the following approaches. Runway 19 is the preferred runway at Oxford and will be selected as the runway in use with up to a 5kt tailwind. Requests for other runways for arrival/departure should be made to ATC as early as possible.

Warnings
When the RVR is below 400m, departures are not permitted unless operators have less restrictive state-authorised take-off minima. Operators of non-public transport aircraft are advised that there is no runway centre-line lighting, and departure in RVR conditions of less than 400m is at the pilot's discretion. Take-off will not be permitted if the RVR is less than 350m. Danger Area EG D129 is notified as permanently active and is located 4.5 nautical miles north-east of the aerodrome. Tactical activity details are available from ATC upon request.

Information-Warfare and the Political Economy of Media

David Harris
mydogisfinn@gmail.com

David Harris takes a closer look at how successive governments in Germany from 1900 onwards sought to exercise control over the reporting of the news from Germany in both print and broadcast media.

In the introduction to this book, the author makes it clear that 'information-warfare' is nothing new. We now live in an age of 'fake news' but were things ever really that different? *News for Germany* is a study of the role of German news agencies in shaping the type of news that was published in newspapers around the world from 1900 -1945. Press agencies emerged in the mid-19th Century to enable newspapers to publish foreign news.

Very few papers could afford to have 'foreign correspondents'; therefore, the agencies, who charged a subscription fee for their services, filled this role. The author makes the distinction in that press agencies were like "*wholesalers*" and newspapers the "*retailers*" of news.

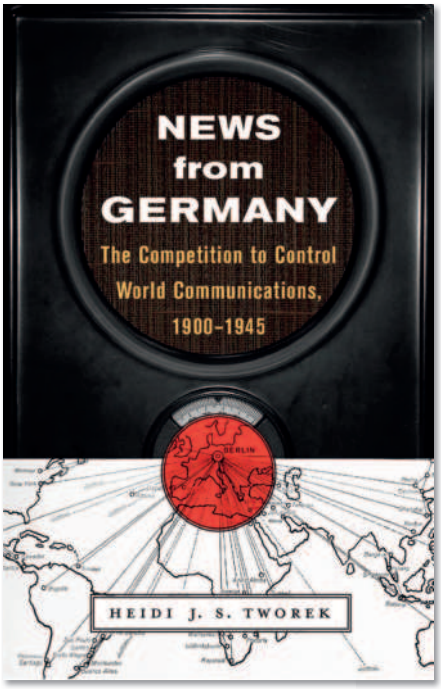
Germany at the beginning of the 20th Century wanted to be a world power. It was already a major industrial nation but was not a significant player in the supply of news. British agency Reuters, US agency Associated Press (AP) and French agency Havas dominated the foreign news coverage of newspapers around the world. In Germany, the main agency was WTB (*Wolff's Telegraphisches Bureau*) whose main selling point was that they acted as the official conduit for news issued by the German government.

What the author stresses in the book is the link between the expanding German economy, Germany's political ambition and the role that news played in promoting both German industry and politics.

Germany had been connected to most parts of the world via submarine cables but these were vulnerable to be cut in the event of a war – which is what happened when World War 1 commenced. Germany had anticipated this, and the German state had part-funded Telefunken to create a wireless network that could compete with the British-based Marconi Company.

The German Navy (*Marine*) used Telefunken equipment, and, by 1914, Germany had radio links to its colonies, such as there were, in Africa and the Pacific.

German news was disseminated to newspapers around the world mainly by radio links, with the content sent in Morse code. Germany tried to influence politics in the USA through the press agency Transocean which supplied over 20,000 articles printed by US papers in the period from 1915 to 1917.



News from Germany. The Competition to Control World Communications 1900-1945 (2019)
by Tworek, Heidi
Harvard University Press. Hbk. 333pp. £23.95.
ISBN 9780674988408
www.hup.harvard.edu

After Germany's defeat in the First World War, the Wolff news agency still had a prominent role in promoting news stories from the government of the short-lived Weimar Republic (1919-1933).

In 1920 the German Foreign Office started its own agency *Eildienst* (Swift Service) which sent out mainly economic news. By 1924, the first AM broadcast stations were licenced in Germany, and radio was seen as a way of unifying the nation. When the Nazis came to power in 1933, Joseph Goebbels (1897-1945) grasped the importance of broadcasting as a way of spreading Nazi propaganda.

The author also examines the role of the Telegraphic Union news agency, which promoted right-wing, nationalist views and was owned by the key industrialist Alfred Hugenberg (1865-1951).

Hugenberg saw that what mattered was the speed at which news was reported, rather than its accuracy. In 1934, after the Nazis had come to power the old Wolff agency was merged with Telegraph Union to create DNB (*Deutsches Nachrichtenbüro*).

Technology was also changing in the world of press agencies. The invention of the ticker tape machine, which could print 300 characters a minute, was mainly used for the sending of financial information, such as stock prices. In Germany, in 1929 the Hellschreiber radio teletype machine was patented by Rudolf Hell. This was a fax-based device, which was less complex that a teleprinter.

News agencies continued during the Second World War (1939-1945) and the first official news of the Allied invasion of France (D-Day) came not from the Allies but the German Transocean news agency. The Nazis used MW and SW broadcasts as a way of spreading their propaganda across the world. By 1940, they were broadcasting in 31 languages.

The book concludes with the observation that news is still controlled by various governments. For example, Qatari-funded Al Jazeera TV and Russian funded RT TV ensure that these countries have a channel to promote their world views.

This is a very extensively researched book, which has 70 pages of notes and acknowledges research carried out at archives in Austria, France and eight different locations in Germany.

Dr Tworek is Assistant Professor of History at the University of British Columbia. This is her first book, but she has authored a considerable number of academic papers.

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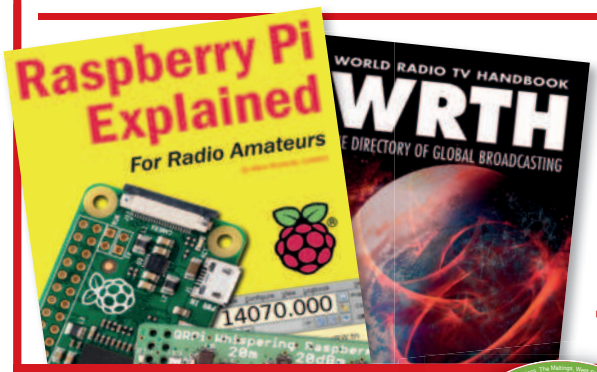

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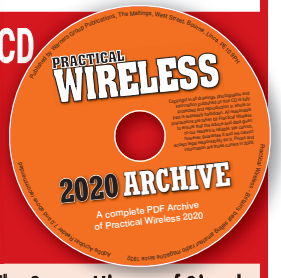

World TV Handbook

This is the 74th edition of World Radio TV Handbook and this great directory continues to offer the most comprehensive guide to broadcasting on the planet.

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Aiming to answer frequently-asked questions that the editor has fielded on the telephone while working for the RSGB.

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Many illustrations are included in this title to help demonstrate the correct procedures. Also featuring some practical exercises so as to help learn to solder correctly.

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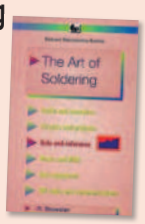

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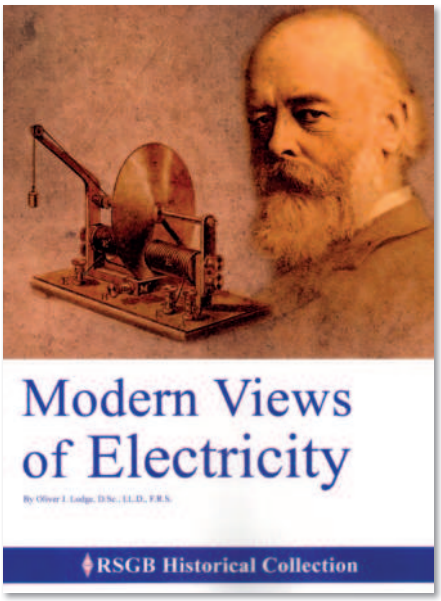
A Focus on Radio Pioneers

Georg Wiessala
wiessala@hotmail.com

The editor looks at the latest intriguing contribution to the RSGB's Historical Collection and a short historical primer on the impact of the humble transistor, and its not-so-humble impact on radio and electronics.



Modern Views of Electricity
Lodge, O. (D.Sc., LL.D., F.R.S.) (1899/2020)
(MacMillan & Co./RSGB)
ISBN 9781 9101 9388 4
www.rsgb.org

A Transistor Treasure Trove
Evans, G. (2016)
(Redwoods Publishing)
ISBN 978-0-9547455-5-4
www.redwoodspublishing.com

Modern Views of Electricity

A new title in the *Historical Collection* of the Radio Society of Great Britain ((RSGB) is always a cause for celebration, and this text is no exception.

The book is a reprint of a key work by Oliver Lodge, *Modern Views of Electricity*, first published in 1889 when Oliver Lodge (1851-1940) was the Professor of Experimental Physics at University College Liverpool. In 1925, Lodge also became the President of the RSGB.

The four constituent parts of the text have their origin in a series of lectures by Lodge; they deal with *Introduction and Electrostatics, Conduction, Magnetism*, and *Radiation,* respectively. Oliver Lodge's writings are a fascinating mirror of the state of knowledge in the areas of radio, electronics and, in a wider sense, electricity, at that time. Lodge's writings also allow us to draw some conclusions as to how the great man built on the achievements of Faraday, Cavendish, Maxwell, and many others. This is setting the context for the debates about the natural philosophy of the day, and on such topics as electrical 'charge', 'induction', 'radiation', 'current', 'light', and others.

Among the highlights of this book, for me, were the chapters on the *Nature of Magnetism*, including examples of the kind of scientific equipment in use at this time for the exploration of this 'mysterious' and unseen phenomenon, known since before William Gilbert wrote *De Magnete* in 1600.

Oliver Lodge, like many of his contemporaries, spent much time investigating the 'ether', the medium through which, as it was believed at the time, electric waves must propagate. This is reflected in several sections of this book, as are his findings surrounding electrical radiation as 'light'.

The title contains a large number of fascinating illustrations of both concepts and instruments in circulation at the end of the 19th Century, and it should be a part of the shack-library of anyone interested in the historical dimension of our great hobby. I feel that a few general chapters – to 'frame' the book and shed light on the contemporary debates of its time for the modern reader -- would not have gone amiss, neither would an index, which would render this publication much more useful to the 'uninitiated' reader.

Overall, this is a vital resource for sure, not just because it allows us to see the life and work of a genius of the time, but also because it provides a key to the wider technical and philosophical debates about waves and electricity in the very early days of radio. I am looking forward to more contributions in this series. Highly recommended.

The Transistor

This little book by Geoffrey Evans was published in 2016, but it was only recently sent to me, via the office of our Publishers, Warners. As a matter of fact, I have grown to like it a lot (the book, not the office). On just 158 pages, and very richly-illustrated, it recounts, not only a wonderfully concise and relevant story of the key role of this 'grain of sand that changed the world', but it also offers a neat summary of the history of radio, sound recording, product design, television and video, including a look at the major (and many minor) personalities in these areas.

The 'solid-state-revolution' sketched out here takes in applications from military and medical, to computers, telescopes, materials science, the internet, big data and much, much more. The illustrations and pictures of old equipment are a joy to behold and will bring back memories for many.

I particularly liked how the author makes this text 'interactive' by inviting us to speculate on our likely technical future – through a well-thought-out list of predictions to fill in. It is not a brand-new publication, and the editing and structure are, at times, idiosyncratic, but that does not seem to matter, because you learn so much from the text and the many text-boxes, enlarging one aspect or another.

An idiosyncratic compilation to add to the shack, and to dip into when the bands are a little quiet.

[Geoffrey Evans was an electronic systems engineer and project manager with *Murphy Radio, British Aerospace, Plessey* and *Elliott Automation*.

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- RS232 PC interface fitted as standard

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AR-8200D
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Higher spec than the AR-8200 with additional features:

- APCO25 decoding
- Voice recording
- MicroSD card slot
- 4GB MicroSD card included USB port
- CTCSS built-in
- Voice inversion built-in

~~£679.95~~ **£659.95**

AOR AR-5700D
Professional Digital Communications Receiver

- Frequency range: 9 kHz - 3.7GHz
- Analog modes: FM, AM, SSB, CW, FM video, analogue I/Q
- Huge range of digital modes
- There is little that the AR-5700D cannot decode!
- Too many amazing features to list here, check out the spec on our website

£4595.00

Icom IC-R8600
Wideband Communications Receiver

- Coverage: 0.01-3000MHz
- Decodes D-STAR, NXDN, dPMR and APCO P25
- Large 4.3 inch TFT colour touch screen display

£2499.99

AR-DV10
Digital Handheld Receiver

The AR-DV10 is the most advanced digital handheld receiver covering covering 100kHz - 1.3GHz. The latests firmware upgrade now adds comprehensive trunk monitoring.

IPX5 water resistant

£939.95

Tecsun PL-680

Portable world band receiver with SSB and full frequency coverage including VHF Airband.

- FM, MW, SW, LW, Civil Air band 118 - 137MHz
- Dual conversion
- SW Single Side Band (SSB) with BFO control
- 1900 station memories
- Multi-tuning methods
- Built-in charging system

£149.95

Tecsun PL-880

This new Flagship SSB portable radio uses multi-conversion & DSP decoding technology

- FM, MW, SW, LW
- 3050 station memories
- Low / Mid / High sensitivity switch
- Alarm clock with snooze function
- Treble / Bass Tone selection
- Built-in charging system

£189.95

AR-DV1
Digital and Analogue wideband communications receiver

Multimode digital demodulation receiver featuring wideband reception, D-STAR, Yaesu Fusion, DMR and much more.

- 100kHz-1300MHz wide band reception
- Multi-mode digital demodulation
- All mode analogue reception.
- Memory Scan
- NR, notch, digi-data display.
- Built in SD card reader (audio recording, timer recording, CSV memory data upload/download, firmware updates) + 4Gb SD card included
- Clock, calendar (sleep timer, alarm, timer recording, reception logging on SD)
- 178W x 50H x 215D mm

£1199.95

IC-R30

The brand new IC-R30 covers 100kHz to 3.3GHz and as well as the analogue modes, also decodes D-Star. A lovely big screen with loads of memory capability, built in recorder and long battery life with USB charging facility.

£569.95

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CHRISSY BRAND

A Fertile Radio Garden

Chrissy Brand revisits the astonishing Radio Garden app – where everything is rosy. She also catches up on how the broadcasting conferences industry is coping right now.

Chrissy Brand
chrissyLB@hotmail.co.uk

The *Radio Garden* app first came onto the scene in 2016, after three years of development as part of a research project. The app was acclaimed by radio fans but also by those who were not regular radio listeners. The app's ability to reach the latter, more fickle, demographic provides a useful and important insight into the potential for the continued health, sustainability and income in the wider radio industry.

Radio Garden is fun, user-friendly and one of those enticing but rare apps that instantly caught the public imagination. For those that need a reminder, it comprises an interactive globe where you find a location and any radio stations you find there can be streamed.

Radio Garden's Harvest

I previously wrote about Radio Garden three years ago (*RadioUser*, March 2017: 56 and April 2017: 44).

It seems timely to visit the site again because an updated version was released in March 2020.

I am sure that this coincidental timing was a blessing for many of us going into lockdown. Radio Garden offers another way of keeping people informed about the ever-changing world situation, and it certainly enables the user to garner news, information and music enjoyably.

Scrolling around the screen and zooming in, whether it be on a laptop, tablet or smartphone, is akin to tuning an old-fashioned radio dial. Back then, the few dozen exotic place names that were displayed on your grandparents' radio were limited to the likes of Allouis, Hilversum, Moscow, Beromunster and Minsk. With Radio Garden, the world has expanded. Open the app, wait for the 'planting seeds' notification to complete, then off you go. You are seconds away from the audio delights of Amauta Radio 91.9 FM playing classical music from Ica in Peru, Nuxalk Radio in Bella Coola, Canada with programmes of music and news for the indigenous population, or Storm 88.9 Fm in Geita, Tanzania.

It is mind-blowing and, in my mind,

Fig. 1: Open-air entertainment in Prato, home to Radio Toscana. Fig. 2: Robots with a heart on the *Tech Humanist Show*.

passes for a killer app. Anyone, from aged three to 103, can surely derive some pleasure from Radio Garden.

Several people spoke to me about the app across the summer. I have been using it myself a lot this year, and it seems to have had another justifiable boost or renaissance in the public consciousness.

As a further example of the seemingly endless station choice, I randomly stumbled across WPR NPR, with news and classical music from Kenosha, Wisconsin. It was also surprisingly interesting to listen to updates from the Bay Area Rapid Transit network in Oakland, California. Besides, on my radar in recent weeks have been Europa Radio FM 100.0 in Sátoraljaújhely in northern Hungary and Ralita FM in Pamekasan, Indonesia.

The world is at your fingertips with this app. I have faith in Radio Garden and enjoy it so much that, for the first time, I didn't take a radio away with my when I went to Tuscany in July (although taking hand luggage-only was also a factor in my decision-making).

While in Italy, my host, who is a sports journalist and political commentator, told me how he uses Radio Garden in place of a traditional radio; thanks to that and streaming radio stations from their respective websites, he no longer has a radio set in his house. Italian stations RAI Radio Radicale and Radio Toscana are his favourites.

He agreed with me that Radio Parlamento, which covers the Italian Parliament, was generally rather dull. Although he did observe that there are times when fights break out in parliament, which make it more interesting, but that is lost in the radio coverage!

Relying on Radio Garden (and an internet connection) for my radio content while I was away, I was not disappointed. I enjoyed Radio Toscana's classical music programmes, and I visited Prato, a city where its studios are based (Fig. 1).

The Radio Garden app evolved from a European-funded research project on global community radio.

The original research project was undertaken at the Netherlands Institute for Sound and Vision, by the *Transnational Radio Knowledge Platform* and five European universities.

You can discover more at Wikipedia and by using the app itself.

https://tinyurl.com/y5zzdypx
http://radio.garden

TECH HUMANIST SHOW

2

Online Radio Talk

A number of radio and podcast conferences have reconfigured their formats in light of the Coronavirus pandemic. It is a shrewd move, with the unpleasant alternative being to cancel the event altogether.

On July 15th, the *Voice of the World* conference gave its virtual attendees a chance to "*discover and learn about great podcasts and network with enthusiasts.*" There were many high-profile speakers booked for the event. These included podcasters Dan Snow from the UK (*History Hit*) George Mpanga from the UK and Uganda (*Have you Heard George's Podcast?)* Ning Yan from China (*A Thousand Whys*), Lory Martinez from Colombia and the US (*Mija Podcast*) and Amit Varma from India (*The Seen and the Unseen*).

I followed the event through Twitter, after it had finished (I couldn't attend the virtual conference as I was on the road). I related to a couple of tweets in particular. Martin Feld in Wollongong (host of the *Lounge Ruminator* podcast, which reflects on technology and media, from Martin's sofa) liked the idea that Joe Rogan's podcast is actually, *"a TV show that is also in audio form"*. Martin noted that having cameras present does change the nature of production.

Meanwhile, author and filmmaker Minter Dial agreed that, "*The major benefit of podcasting is that you can consume a podcast while doing other things*", as discussed with radio futurologist James Cridland and Futurist keynote speaker Andrew Grill. The latter hosts *The Practical Futurist Podcast*, which, *"looks at what's new and what's next, providing practical and actionable advice in each bi-weekly episode.*

To discover how the event went, check out the Twitter hashtag *#podfestlive*.

https://tinyurl.com/yydddf2n
https://loungeruminator.net
https://andrew.london/podcast

Zoom has become most people's go-to video conferencing app of choice since Covid-19 changed the way we interact. There are others as well of course; I used a platform called Streamyard, as part of a community group activity in the spring. Broadcasters and other professionals, and countless individuals of all ages and backgrounds seem to have adapted to this further use of technology.

With events being held online rather than in person, there may come a time when radio enthusiasts can access broadcasting conferences that have previously been the exclusive domain of the professionals. A reduced rate and online access would be a nice step and solution for those who do not have the time or resource to attend, and I imagine many radio listeners would appreciate the opportunity.

A forward-thinking events team could set up sessions especially to include such listeners, enabling them to put questions to broadcasting experts and strategists.

CHRISSY BRAND

Fig. 3: Copenhagen coffee break at *The Organic Boho*, during Podcast Day 2018. Fig. 4: Marconi's influence lingers at the *Museo della Radio*. Fig. 5: The radio museum in Poppi is closed due to Covid-19.

The organisation behind the streaming of the *Voice of the World* conference are called Hopin. It started up in 2018 and now boast one million users of their professional video conferencing events. Additional features include polls, comments, Q and As and a blog, as well as support. Hopin is clearly doing something right, as the average turnout rate for events they run is 77% of the total people who have registered. The average webinar attendance for other apps, amongst those who have pre-registered, is much lower, at 35 to 45%.

Author, speaker and CEO Kate O'Neill sang Hopin's praises, stating it as being, "*hands-down the best digital conference platform I've experienced so far.*" Kate is someone who knows about such matters because she runs the *Tech Humanist* podcast (Fig. 2). It explores how data and technology shape human experiences, "*advocating for data and tech solutions that empower the most people with the best futures.*"

www.thetechhumanist.com
https://tinyurl.com/y56ag38w

Ever since 1967, thousands have gathered for the IBC Conference, which has now found a home in Amsterdam. Except this year, of course. This year's conference took place, virtually, from September 8th to 11th, with the theme of "*Empowering Content Everywhere*". Three core components were planned: an exhibitor showcase, a sponsored programme of presentations, and discussions and comprehensive coverage of product launches, via the online IBC *Daily News* website.

www.ibc.org/ibcdaily

In A Radio Daze

Radiodays Europe's 4th annual Podcast Day (Fig. 3) was rescheduled from London in June to October 26th, the hope and expectation being that people could meet in person by the autumn. Sadly, that is not the case. Instead, there will be Podcast Day Online held on October 26th, with a reduced early bird registration fee of €25 (plus Danish tax) (Fig. 3). The main, in-person, conference has been postponed until 2021.

www.podcastdayonline.com

Meanwhile, Radiodays Europe's 2020 conference is still scheduled for December in Lisbon but, if people are unable to travel, presumably has a virtual event as a back-up plan.

In the meantime, the always innovative Radiodays have announced *"The Coronavirus Radio Ideas Awards"*. This is in partnership with Benztown (a global leader in radio imaging, voiceover, programming and jingles) and P1 Media Group (research, strategies and consulting to radio stations).

There are many categories which include *Best Station Promo, Best Community Service, Best Virtual Event, Best Covid-19 Podcast* and *Best Covid-19 Reporting*, with winners announced and, hopefully, presented in person, at the Lisbon conference.

https://tinyurl.com/yy2u86mb
https://tinyurl.com/y47we7fy

Future-Proofing Radio Museums

Radio museums are an important place for people to appreciate the industry's heritage and also to be inspired and learn for the future. However, a question to be asked since the pandemic struck is whether such places can survive financially? Government grants and handouts, along with community support and involvement will be required.

There is also surely scope for some of the radio museums, or parts of exhibitions therein, to attract sponsorship. This might come from wealthier organisations and parts of the radio and industries.

Although this might not be considered ideal and could affect the integrity and independence of museums, I think it is one solution to ensure that museums can remain open and viable for visitors, be they in person or online.

As I have stated before, there is so much

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to appreciate and learn from the past, and any media or design graduate entering the broadcasting professions would do well to avail themselves with maximum knowledge of what has gone before them.

In July, whilst I was in an Italian medieval hilltop town called Poppi, I had hoped to visit the Museo della Radio *"La soffitta di Marconi" (Marconi's attic)*. However, it was closed due to Covid-19. There are over 200 radios inside, but I will return next year to have a look. (Figs 4 and 5). There is also a Museo della Radio in Verona.

https://tinyurl.com/yxlabpa3

Another museum that I failed to visit in the summer was in Seaford. Housed in a Martello Tower since 1979, the museum includes 1,000 radios, or so I am told.

From the Republic of Ireland, via the Irish Radio Transmitters Society, comes news of the Hurdy Gurdy Museum of Vintage Radio. It was set up in 2003, also in a Martello Tower, in Howth, Co. Dublin by Pat Herbert. An amateur radio station EI0MAR was also operational in the tower, facilitated by Tony EI5EM.

Pat sadly passed away in June but his son Simon will ensure the continuing legacy of the museum. It consists of many radios from Pat's 1950s' collection and will reopen once Covid-19 guidelines deem it is safe to do so.

https://tinyurl.com/y6x5ljhc

The practice of displaying vintage radios as pieces of art or good design is long-established and can look quite dramatic. I have seen displays of British Bakelite beasts and Catalin-created US radios sharing pride of place with modern-day promotional material at conference exhibition stands and in the receptions of radio studios throughout Europe.

Design classics retain their style and impact, often used as symbols of retro-chic in bars, cafes and hotels. Many a meal or coffee has been brightened up for me by gazing at German valve radios adorning a Heidelberg hotel breakfast room and in backstreet bars in Bucine.

There are some late 20th Century and 21st Century classic radio designs as well, of course, such as the South African Barlow Wadley, the Pure Evoke and Wayne Hemmingway's Bug and Bug Too DAB radios. But perhaps many of the communications receivers of the past seventy years look best in a military or spy museum rather than in one celebrating domestic design.

Converting vintage radios so that they are fit for a modern-day usage is also popular. Vintage shops and online organisation often sell these. It is a trend combining great product design with current-day technology, blending the two to give the best of both worlds.

There are also many vintage radios being revamped and sold with Bluetooth connections. One of my local vintage shops in St Leonards-on-Sea, called Calneva, is just one of many enterprising businesses doing this. It seems a fine way to save and celebrate impressive mid-century radios and give them a new lease of life, interfacing with current-day radio and internet technologies.

[N.B.: We are updating the popular RadioUser List of National and International Radio Museums *regularly, on the* Radio Enthusiast *website – **Ed**.]:*

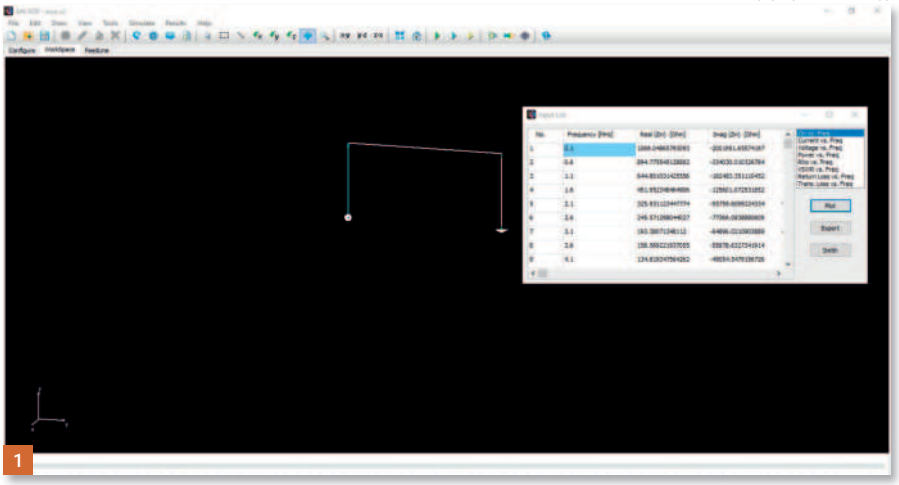
https://tinyurl.com/yybdhmhv

AN-SOF Antenna Simulation

Keith Rawlings
Keith.g4miu@gmail.com

Keith Rawlings continues with the description of the AN-SOF aerial modelling software package, explains the main functions of this software and offers advice on modelling a simple EWE aerial.

ALL PICTURES: KEITH RAWLINGS



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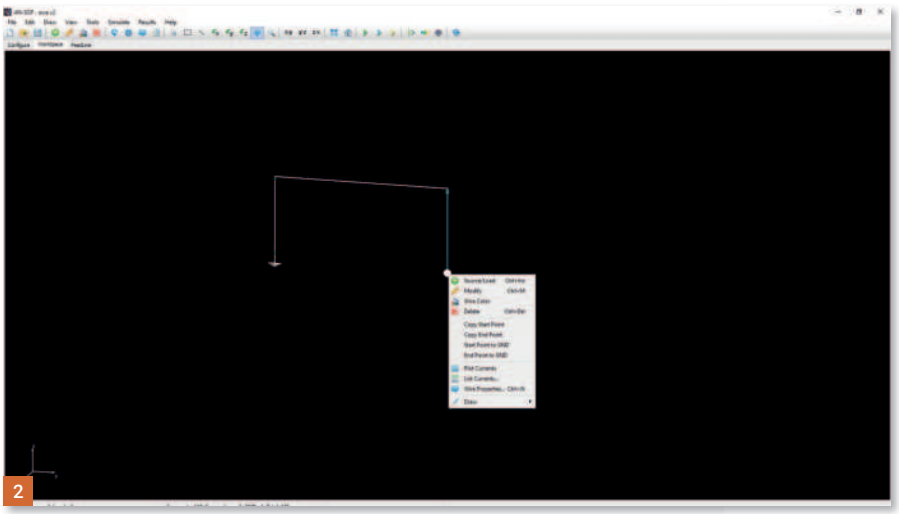


2

A quick recap: AN-SOF software will run simulations from ELF to microwave frequencies. It is paid-for software, for which there are various options. A trial version is available. This is fully featured and does not expire, but it is limited to 100 segments. This is enough to model a fair number of designs (see below). Like similar packages, AN-SOF comes with some sample designs. Some of these are quite complex, and may not run on the trial version. Full details, including a presentation and a helpful *User Guide*, may be found here:
https://www.antennasimulator.com

I recommend that readers to download the user manual and explore the website as there is not enough space here to cover but a fraction of the capabilities of this software.

General Overview

Being used to EZNEC, it took me a bit of time to get to know AN-SOF. However, once I got to grips with the way the software works, I found I could build up relatively complex designs relatively quickly. For example, to edit a wire during the design stage, it is only necessary to click on it, and an edit box will come up with the relevant dimensions for that wire. This is easier and quicker, especially with a complex design than searching through a spreadsheet to find it.

Data entry with AN-SOF is different from the spreadsheet-style of some packages. It uses this single window where the coordinates for a single wire are entered or edited. Moreover, on opening, the software the user is presented with is the more familiar Windows presentation of drop-down menus and icons.

Initially, the work area will be blank so the first thing to do is to select the *Preferences* menu to configure such things as the units you want to work with (Hz, kHz, mm, cm, in, ft, and so on).

The modelling can be undertaken in various unit systems (um, cm, mm, m, in, ft) as well as units for inductance (pH, nH, uH, mH, H) and capacitance (pF, nF, uF, mF, F).

Configuration and Workspace

Next, you will need to select the *Configure* Tab sheet, to set the parameters to be used during the simulation.

This will consist of setting the frequency (either a single frequency or a swept range with frequency steps), ground type, and settings for Far and Near Field evaluation.

Once everything has been set up, the user selects the *Workspace* tab sheet (Fig. 1).

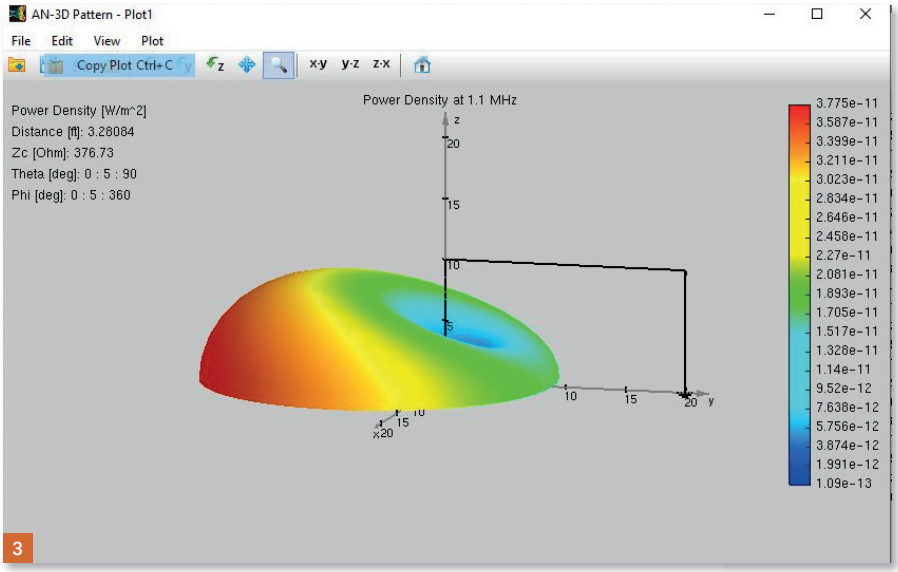
You can now begin the design. Start by either selecting *Draw* from the drop-down menu, or by right-clicking on the desktop, where you are presented with several options.

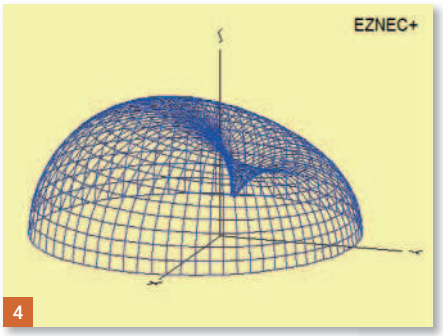
If you select *Line*, the 'edit' box will pop up. You can then enter the 'X','Y', and 'Z' dimensions of your design in the two rows of boxes in a point-to-point format. You will then have to enter the *Cross-Section* of your wire, for instance 'circular', 'square', and so on, and also the dimension of the cross-section.

Furthermore, the required number of segments for the simulation and the wire material/resistivity have to be recorded, along with details of the wire coating, if any.

This does sound rather complex but in reality, it is quite easy because the software remembers the last coordinates and other details. You pretty much just enter the dimensions of your design and build it up.

The position of a Source is placed on the design by right-clicking on the wire required and then selecting *Source/Load.* A slider then appears at the bottom of the screen. This is dragged along until the source is in position. The source can be seen *graphically* on the screen as it is dragged along the wire,





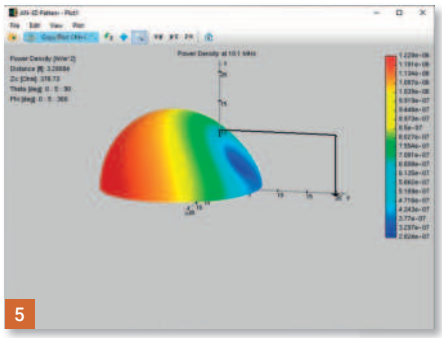


Fig.1: The AN-SOF Workspace Input List. Fig. 2: AN-SOF Workspace with EWE Design and Modify Box. Fig. 3: Predicted 3D Plot of EWE at 1.1MHz. Fig. 4: Comparison with the predicted plot of Fig. 3, generated in EZNEC. Fig. 5: Predicted EWE at 10.1MHz. Note the change of patterns. Fig. 6: The Configure Tabs sheet in AN-SOF.

and also *textually* on the bottom-right of the display, shown as a percentage of position.

The segment onto which the sources is placed is also shown.

Furthermore, loads can be placed on a design from this selection.

The Simulation Stage

Once a design has been made and the sources placed, the model can be simulated.

You should, however, save it first!

It is now time to run the simulation, by selecting *Simulate Currents, Currents and Near-Field, Currents and Far-Field* and *Run All,* which does just that – it runs all fields.

Note that more complex designs can take some more time to run.

Once the simulation is complete it is time to look at the computed data, and there is plenty of it!

Selecting '*Results'* from the drop-down menu, will list some different parameters that have been calculated. Once a parameter has been selected, the user is then often presented with further options to display the information. Selecting the *List Currents* command, by right-clicking on a wire, brings up a pop-up menu which shows the *List Currents* toolbar.

This allows the designer to select an individual wire segment, so that its *current-versus-frequency* may be read. Also, where the selected segment has a source or load, the lists of input impedances, admittances, voltages, power, reflection-coefficient, VSWR, return and transmission losses can be displayed.

A Big Draw: Colour Plots

One of AN-SOF's great features is the graphical demonstration of 3D colour-plots (Fig. 3). These are generated and opened in separate windows. They remain open until closed, so you can have quite a collection of plotted images to compare and save as you run through a design.

Incidentally, these plots stay active even if the AN-SOF software suite has been shut down.

- In *Preferences,* set dimensions as 'feet'.
- In *Configure,* for 'frequency', enter *Sweep*.
- In *Start* enter 0.5 MHz, Step .5MHz, Stop 30MHz.
- For *Ground*, select *Perfect* and you should be able to leave everything else 'as is' for this example.
- Go to *Workspace,* left click and select *Line*.
- In the *popup edit box,* enter: 'From point' X1:0,Y1:0,Z1:0.1 'To point' X2:0,Y2:0,Z2;10
- In *attributes*, enter '33' for Number of Segments, Cross Section as 'Circular' and use 1mm for the cross-section.
- In *Materials*, enter 1.74E-8 for copper.
- Select *Line* once again and enter: X1:0,Y1:0, Z1:10 'to point' X2: -25 ,Y2:0,Z2:10.
- Once again, select *Line* and enter: X1: -25, Y1:0, Z1:10 'to point' X2: -25, Y2:0, Z2:0, remembering to set the attributes as before.
- Right-click on the first wire and select *Source/Load.*
- Click on the *Add Source* circle that appears in the bottom of the window. This selects *Source*.
- In *Impedance* add *Resistance* as 50Ω.
- Leave position at 0% and Click the red 'X'
- Do the same for the third wire; this time select *Load* (this is the little rectangle with 'ZI' above it).
- Enter 850 in the 'Ohm' box; drag the slider to around 90%.
- Again click the red 'X'.
- Now *save* the design and then press *F10* to 'Run All'. (see also Figs. 5 and 6).

Table 1: Designing a EWE Aerial with AN-SOF.

As well as graphically, AN-SOF can present its data in textual format too. For example, if a simulation is run from 6-8MHz in 100kHz steps AN-SOF can list the currents at each 100kHz step over the range displaying *Real Part, Imaginary Part, Amplitude* and *Phase.*

Another very useful feature of AN-SOF is the ability to excite a design by utilising an *Incident Field.*

Set (in the *Configure* window) the *Direction of Arrival* of a signal, and its polarization to the model can be specified and modelled. When the *3D View* button is selected, a dialogue box appears into which the axis of the wave can be entered.

This can then be graphically viewed on the screen.

A new feature in AN-SOF V5.01 – and one that I have not yet fully explored – is the embedded transmission line calculator.

Some Points to Consider

AN-SOF has many strengths that make it very versatile but, like other packages, it also places some responsibility on the designer. For example, it is possible to specify different materials within a design.

In AN-SOF, the properties of each wire have to be defined by the user. This is not a problem, as values for resistivity for various materials can be found online and common ones, such as those for *copper* (1.74E-8), 6061-T6 *aluminium* (4E-8), *tin* (1.14E-7) and *zinc* (6E-8), are listed in the manual.

Material cross-sections of *circular, square, flat, elliptical* and *rectangular* may also be selected, along with their respective dimensional sizes.

For wire coating, the user may enter the *relative permittivity, relative permeability* and *thickness.*

The latter can be set to '0' when no coating is used.

The same applies to *Ground*. Like other packages, AN-SOF can model in *free space, over perfect ground and real ground*, where parameters are entered by the user.

To simulate things like flat strip lines for modelling planar aerials and PCBs, a *substrate* may be specified.

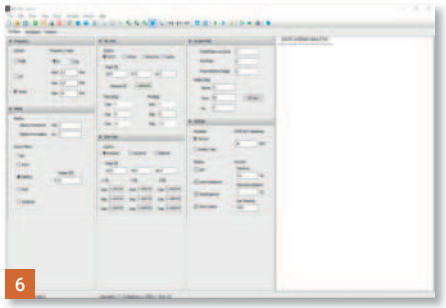
Please note that, while data for wires is entered or modified via the *Modify* dialogue box, in a *Workspace* window, the settings for *Media* (Ground Type), wire resistance and wire coating ('enabled' or not) is set from the *Configure* window.

For more complex designs the software has built-in routines to calculate, *arcs, circles, helixes, spirals, plates, patches, discs, cones, cylinders, spheres, parabolas* and other varieties.

A Practical EWE Design

A simple aerial to practice a model of with this program is the popular 'EWE' aerial: **https://tinyurl.com/y2qn2xqy**

Here, I will use a design for 10ft in height and 25ft long (Fig. 2). This model should run under the *Demo* version. Table 1 shows the steps to follow.


6

There will be a lot of data available but for now go to *Results, Plot Far-Field Pattern,3D Plot* (or select this from the toolbar) and then select what frequency you want the 3D Plot for. At a frequency of 1MHz, you should see something like Fig. 3. Compare this with an EZNEC plot (Figs. 4-6).

Have fun and play with different frequencies and views and try some simple designs of your own.

Table 2 contains a glossary of some of the key terms used in this article.

Admittance: Is the 'Dual' (or Reciprocal) of 'Impedance'; in electronic terms, it is a measurement of how easily a circuit or device will allow a current to flow. The term is attributed to Oliver Heaviside.
Amplitude: In terms of aerial design can be taken as the strength of the wave.
Capacitance: Ability of a component or circuit to collect and store energy as an electrical charge.
Current(s): Flow of electric charge through a material.
Current-v.-Frequency: Flow of electric charge at a particular frequency.
Excite a Design: A design in AN-SOF can be simulated with power being applied at the source on the design itself, or by simulating a passing wave from a remote source.
Flat Strip Lines: A *strip-line* circuit can be a *flat strip* of metal, sandwiched between two parallel ground planes, such as a PCB.
Free Space: In modelling terms, this means there is no ground to affect the design.
Imaginary Part: See 'Real Part'.
Impedance: Has various uses. Can be said as the effective resistance of an electric circuit alternating current caused by the combined effects of ohmic resistance and reactance. Can be taken as the resistance to an electrical signal in an antenna. The impedance of the aerial, the transmission line and the equipment should match, otherwise, losses occur.
Incident Wave: Or 'forward wave', is a wave moving from the transmitter.
Inductance: The ability of an inductor to store energy in the form of a magnetic field created by the flow of electrical current.
Load: In aerial simulation is the positioning of a component that places an electrical load on the design, such as an inductor, capacitor or resistor.
Perfect Ground: In modelling terms is perfectly conducting, with no loss, and it is perfectly flat.
Phase: Can relate to several things, for example, in AN-SOF, 'phase' can be an expression of the relative displacement between waves having the same frequency.
Planar Aerials: Usually a two-dimensional aerial whose elements are all in one plane, i.e. side-by-side.
Power: AN-SOF can calculate estimated radiated power at a selected part of a design based on the input level entered by the designer.
Real Ground: Used for simulating real-world earth ground where ground media has to be specified.
Real Part: The real part of the impedance is called 'resistance', where the imaginary part is called 'reactance'.
Reflection coefficient: See: VSWR.
Relative permeability: In AN-SOF, it is used as the magnetic permeability of the coating material relative to the permeability of vacuum when declaring a wire coating.
Relative Permittivity: In AN-SOF, this is used as the permittivity or dielectric constant of the coating material relative to the permittivity of vacuum when declaring a wire coating.
Resistivity: Is the electrical resistance of a conductors cross-sectional area and unit length. High resistivity indicates a poor conductor.
Return/Transmission Losses: Relationship between the reflection coefficient and the standing wave ratio (cf. VSWR).
Segment: In modelling, wires are broken into segments for calculation.
Source: In modelling, a source is placed at the point where the feeder or feeders are connected.
Substrate: Used in AN-SOF when modelling the ground plane for microstrip aerials and printed circuit boards.
Transmission Line Calculator Facility: In AN-SOF, this is used for the calculation of transmission line parameters.
Voltages: Here: Levels of calculated voltages at a point on a design.
VSWR: VSWR stands for *Voltage Standing Wave Ratio* or *Standing Wave Ratio (SWR)*; a function of the reflection coefficient, describing the power reflected from the antenna.
Wire: In modelling terms, an element-part of an design. It could be a literal wire or of larger: section, such as an aluminium tube.
More information on these terms and values can be found here:

https://tinyurl.com/y5qoggpx
https://tinyurl.com/y7xnwmap
https://www.antennasimulator.com
https://www.antennasimulator.com/Feedline

Table 2: Glossary

Tim Kirby
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1

Teenage Kicks to Lockdown Resurgence

Tim Kirby relives his early experience with CB radio, looks at its history and is intrigued by the contemporary renaissance of this form of radio communication.

Like many radio enthusiasts of my age, CB Radio holds a special place in my heart. And, unlike a few, I'm quite happy to admit it! I was in my late teens when the CB craze of the late 1970s and early 1980s was at its height. I had been short wave listening on both the broadcast bands and the amateur bands for some time, but the idea of actually transmitting seemed a very special one.

My First Set

My first CB set was a Cybernet Beta 1000, which (I think) cost around £60 from a high street electrical store in the town. For an aerial, I had a DV27 whip on a ground plane kit, in the loft.

With the aerial in the loft, it was simple enough to have contacts around the town and sometimes as far away as Gloucester! My little CB set had a really sensitive receiver, and I could sometimes hear people in Hereford or out on the Welsh hills. Contacts with Birmingham, I seem to remember, were considered 'DX' achievements.

Later, various aerial improvements took place, although I remember one antenna, the 'Wotpole', proved a retrograde step compared to the DV27 in the loft.

Fortunately, my disappointment was short-lived as I then managed to persuade my long-suffering father to allow me to put up a Thunderpole vertical on the side of the house. Because of the pitch of the roof, it had to go up quite high so that the radials cleared the roof and I kept going back to the local CB shop, where I was by that stage well known, for more poles.

The new aerial worked very well indeed and on several occasions, I was accused of running more than the 4W allowed (I wouldn't have dared!) and contacts well beyond the boundaries of the town were now possible. The summer season (I now know as the Sporadic E season) was particularly interesting, with stations from Scotland and Northern England being heard and occasionally from continental Europe being available. Another 'discovery' I remember is, noting when an aircraft flew over the house, on its way into the local airport, I would notice a 'chuff-chuff' on local signals which changed in pitch as the aircraft passed by. I now know that was a lovely demonstration of the Doppler-shift phenomenon on signals reflected from aircraft.

What Was Your Handle?

There was a great camaraderie between many CB enthusiasts of the time (I understand the same had been true of the AM days too, perhaps even more so, as the operation had to be more undercover). On Facebook, I belong to a group which reminisces about my old home town, Cheltenham and it's fun to see that now and again, someone raises the subject of CB – *"what was your handle?"*. From that, a discussion may ensue and I've ended up swapping messages with people I've not spoken to in many years.

This was all on the legal FM band. As I say, I wouldn't have dared operate

ALL PICTURES: TIM KIRBY

Fig. 1: An Amstrad CB901. Fig. 2: A Hygain portable CB. Fig. 3: The Mustang CB1000. Fig.4: A Realistic Mini-Twenty-Three AM CB radio from Canada. Fig. 5: A Midland Port-A-Pak.

elsewhere. At the time, there was also legal CB on 934MHz FM. I do remember wanting to try that out, but never did and rather regret that now, as I hear tales of fascinating contacts being made. By 1983, I had gained enough confidence in my ability to pass the *Radio Amateur's Examination*.

The Legalisation

Wind forward almost 30 years, and by 2012 or so, I was aware that there were moves afoot to legalise AM and SSB CB in the UK. I was very enthusiastic about this, as I had never tried AM or SSB on 27MHz, although I had started to listen on those modes, using the Anytone AT-5555 rig which I had in my car. I used this on the 28MHz amateur band.

I would often listen to the US *Superbowl* channel 27.025MHz AM, hearing stations fading in and out, as I drove home from the station to our home. If transatlantic propagation conditions were bad, I would listen to the Italian AM *Superbowl* channel on 27.465MHz. It was often audible when not much else seemed to be happening.

AM/SSB CB was still not allowed and I kept checking on the progress of the legislation to legalise these modes. It was very tempting to transmit, but I was well-behaved. Having been fairly active on the amateur bands over the years, I felt my voice was easily recognised and I did not want to have 'those' discussions if someone had heard me!

Finally, on the 27th June 2014, AM and SSB modes were legalised on the CEPT CB radio channels.

The CEPT CB Band

On the first morning of legal SSB CB radio, I excitedly set out for work, wound the power on my Anytone back a bit (yes, I know it isn't an approved radio) and called CQ on 27.275MHz USB and was delighted after a while, when someone called me back. It turned out he was in Sweden!

During the summer of 2014, I spent quite a bit of time on my commutes listening and making contacts on the CEPT CB band, mostly on SSB but with the occasional FM and AM contact as well. It was all very enjoyable, and I encountered many people who shared the fascination of radio in the same way that I do.

In recent years I have operated rather less as I now spend a lot less time in the car, as well as a change of car making fitting 10m radios more challenging! Nevertheless, my Anytone is currently installed in the shack, and when things are quiet, I often listen on the 27.555MHz calling channel (only listen, mind you, as this is not a legal frequency in the UK) to see what is coming through.

Early Social Media and a Recent Resurgence

CB radio is not, of course, all about making contacts over long distances. It can be, just as it was in the late 1970s and early 1980s about allowing communities to converse with each other. You could, I suppose, describe it as an early example of 'Social Media', before the term was invented.

In recent months, during the lockdown, CB radio has enjoyed something of a resurgence, with many dealers reporting increased sales as people find ways to keep in touch with each other. Take, for

example, the *Channel 35 Club,* which is mostly based around the south-east of the UK. The idea is to get as many people as possible around the country on Channel 35 (UK) (27.94125MHz). The group holds nets around the country.

So, if you do have an old CB set knocking about in the loft or on a shelf, why not dust it off, find or make an aerial and see if you can hear anyone! The group suggest Channel 19 as a calling channel. There's a Facebook group too, which helps to co-ordinate activity. Other regular activity takes place on 27.305MHz USB (CEPT Channel 30) which may well be worth monitoring or calling on.

Other groups use CB on 27MHz; farmers for communication around the farms and local countryside as well as 4x4 groups. Some people collect CB radios! To accompany this article I've included a few pictures of rigs. The pictures have been sent to me on Twitter from collectors across the world.

Other Communications and the Future

The 27MHz section is not, of course, the only choice for un-licenced radio communication. Since 1999, the UK has had the PMR446 band available. This was aimed at short-distance use, over a mile or so maximum. Use of the band was targeted at communication between families or groups – perhaps a way for parents to keep in touch with their children, groups on a walk, motorcyclists travelling together and so on. It is less about switching on, having a tune around and finding someone to talk to.

Chris Taylor (of Moonraker Ltd.) tells me that he hears a lot of PMR 446 activity on the motorways, with truck drivers using the units to speak to each other over short distances. Even out here in rural West Wales, PMR 446 finds plenty of use around campsites, beaches and farms. Radio enthusiasts enjoy PMR446 too, and there are several DX nets for people who enjoy trying to find out just how far their transmissions will go.

Some enthusiasts use 'legal' unmodified handsets, whereas others use higher powers and larger aerials, which of course, does not conform to the agreed specification of the PMR446 system and must be considered illegal.

As a radio enthusiast I find there is always something interesting in whatever form of radio I am looking at, be it CB radio, amateur radio, shortwave listening, scanning, network radio, and so on.

However, one of the appeals of CB radio is, I think, that it is open to all without barriers to experience. That can be a double-edged sword at times, depending on the level and type of usage in your locality, and I know that an urban experience of the UK 40 CB band is going to be very different to a rural one. However, there are other possibilities such as SSB on the CEPT band which will provide a different experience again.

CB radio can be an excellent route into the wider hobby of radio, and I can only hope that you have as much fun on CB as I've done over the years.

We will see more about CB radio over the coming months in *RadioUser*.

If you are an experienced CB enthusiast and would like to write for this magazine, please don't be shy – drop our editor an e-mail without delay!

5

Resources

- *CB Radio*: **http://ukspec.tripod.com/rf/cb**
- *History of CB Radio* (UK 4x4 Centre): **www.cbradio.co.uk/history-of-cb-radio.html**
- *History of CB Radio in the UK* (The Breakers Yard): **https://tinyurl.com/ung5ehd**
- *History of UK CB Radio* (Thunderpole): **www.thunderpole.co.uk/cb-radio-history.html**
- Ogg, D. (2020) '*The CB Renaissance*', RadioUser, January 2020: 32-35
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- Scherrer, T. (2020) *Crashed the Gate Doing Ninety-Eight – Citizens Band Radio and American Culture* (lulu.com)
- Titlow, D. and Hogan, W. (2017) *Eyeball Cards - The Art of British CB Radio Culture* (Four Corners Irregulars).

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Sentinels, Vapourware, Hacks and Yellow Frogs

Chris Rolinson takes a look at the very latest network radio models, reports on a cyber-attack on Zello, assesses Moonraker's new network radio initiative, and offers news and resources aplenty.

After many months of speculation, NR manufacturer Boxchip has finally begun to ship their Sentinel A1 device. The radio is available now from sellers in the UK, though, anecdotally, it is said that it is in short supply.
https://tinyurl.com/yyof6kwe

Adam Lowery posted one of the first photos of the device on the *Network Radios Facebook Group*, to the surprise of many who had previously believed the radio to be 'vapourware' (Fig. 1).

Adam, who is a seller of Network devices himself, proclaimed the device as "*awesome*" and commented that he "*really liked it*". A good sign from someone who sees these devices every day.

The Sentinel features a 2.4" screen, front and rear cameras and a *real* channel-change knob. It runs Android 7.1 and has a number-pad design so it can work well as a phone.

There is almost 3Ah of battery for long life and the whole thing is encased in an IP65-rated waterproof and dustproof case, which looks very nicely crafted to fit the hand. GPS is standard, as is Bluetooth and Wi-Fi.

However, sadly, there appears to be no 5GHz Wi-Fi.

With space for two SIM cards, it should also pack a punch in the audio department with its 2W rated loudspeaker. Hopefully, I will be able to get one of these for review before too long. It is an interesting competitor to the Hytera PNC380 which I reviewed in the August 2020 issue and it looks like it may be priced cheaper than that device. Who doesn't like a bargain as we get closer to the Festive Season?

Hack Attack

Something of which I have not heard before took place recently; Zello's servers suffered a malicious attack, to the extent that it triggered a rare public response. The company, which provides the software most popular with Network Radio users, posted a security notice on the last day of July stating that they had discovered 'unusual activity' on one of their servers earlier that month.

An investigation was triggered, and law enforcement authorities were notified; the company also brought in a forensics team to help find out what had happened. During the investigation, it transpired that e-mail addresses belonging to Zello users may have been accessed, along with a 'hashed' (encrypted) version of their password. No evidence was found that user accounts were accessed, however.

It seems that because Zello requires a username *and* password for access and since usernames were not impacted by the incident, the attackers could not get into people's accounts to use them for nefarious purposes. All users have been asked to reset their Zello app passwords as a precautionary measure. If you have not used Zello for a while, it may be worth accessing the app and doing this asap.

A Yellow Frog

No, this column is not becoming the concern of biological oddities! Yellow Frog is the name of a new Network Radio style initiative from UK-based retailer Moonraker.

Simply put, Moonraker has started offering their own nationwide coverage PTT service but aimed more specifically at the community, hobbyist and radio club market. The amber amphibian offering allows users to access both community-based shared channels as well as having your own dedicated private channels. Moonraker says there is a *"rich selection of features and service capabilities for your own activities"*. Some of the features available include location tracking, real-time device location, a dispatcher software system, lone worker

BOXCHIP

1

and status codes, alarm activation, contacts address book, and so on. All these are paid for add-ons to the basic service.

Yellow Frog does not appear to work with your usual provider – it would seem that you need to get hold of a Yellow Frog SIM card. The easiest way to get involved is to purchase your next NR from Moonraker, where there are deals on both radio & Yellow Frog combinations. At the time of writing, the basic annual subscription to the service comes out at just under £80 – it's certainly worth looking at!

https://www.moonraker.eu

goTenna Products

It was good to hear from Richard Nosworthy, who got in touch recently to alert me to the goTenna range of products. He advised me to visit their website at this URL:

www.gotenna.com

It transpires that goTenna is an American company specialising in the provision of mobile mesh networks to enable off-grid communications when the cellular network, Wi-Fi, or even satellites, are unavailable. Regular readers will recall I looked at Hairy Paul, MM7WAB's home-brew implementation of a Mesh network in the May 2020 NR column (*RadioUser*, May 2020: 40-42).

This firm's offerings include goTenna Pro. This is a smaller and lighter version than other mesh systems, so the firm claims. It sounds ideal for groups of Network Radio users, especially those who like going portable in remote locations. Other products include the beefier goTenna Pro-X (Fig. 2), along with deployment kits and an embedded module for developers to integrate goTenna's mesh protocols into their bespoke hardware or software solutions. Looking more closely at the goTenna Pro, it appears to have a VHF (or UHF) radio paired with the goTenna smartphone app (iOS and Android are both available).

Once set up, the system allows for person tracking, collaborative mapping and encrypted chat messaging, whenever you are off your main network. Even when not paired to a Network device, the Pro can still serve as a mesh relay for other Pro devices within range, thus reducing the need for dependency on a nearby repeater or base station.

Since this is off-grid comms, the protocol goTenna uses is data only, so voice comms is not available to the system, though whether it's possible to circumvent this remains to be seen. Voice comms takes up more bandwidth and power, so 'data' is the preferred mode for being off-grid. This is reflected in the long battery life (9 hours per charge) and that's including VHF (or UHF) output of up to 5W.

GOTENNA

2

The whole system sounds fascinating and, as Richard commented to me in our original e-mail exchange, it seems right on the edge of legality in the UK. With some discounts currently available for non-profit organisations, it may be worth getting in touch to see what they can offer your group or organisation.

Network News

Vodafone has become the first UK network to showcase 'Standalone 5G', according to the news section of the 5G Website:

https://tinyurl.com/yykbu9x9

The telecoms company has built the standalone network at Coventry University. As the name implies, the network uses 5G alone, rather than a mixture of 4G and 5G technology, even if you are using a 5G device. The benefits are seen in the speed, which is much faster, the reliability of connection, improvements to the Internet of Things (IoT) and, most interestingly for NR users, a lower latency. Using a 5G standalone system will allow companies to guarantee performance. With fast response times, more advanced technologies will be possible, such as augmented reality applications.

It will be some time before even the first 5G system covers enough of the country for us to perceive the benefits it can bring, but the standalone network gives a glimpse into the future possibilities that true 5G could bring, especially to hobbyists. As James Rogerson, the article's author notes, *"...not bad for just one year of 5G connectivity, especially when you consider that Vodafone has also brought 5G to 44 UK towns and cities in that time, as well being the only UK network to offer 5G roaming."*

You can access James' article here:

https://tinyurl.com/y4wo8l7g

Staying Connected During COVID-19

UK regulator Ofcom recently published a useful set of guidelines to help all of us stay connected during the current health pandemic:

https://tinyurl.com/wlu5n5a

There are seven excellent tips here on

OFCOM

3

G7DDN

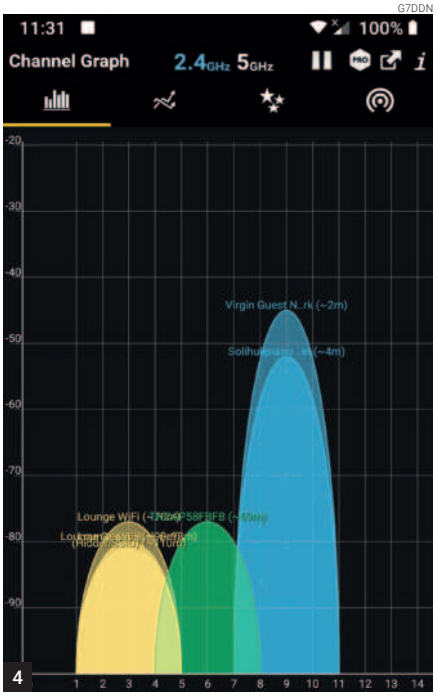

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Fig. 1: The Boxchip Sentinel A1. Fig. 2: The goTenna Pro-X. Fig. 3: Testing in a typical Ofcom lab. Fig. 4: A typical Android Wi-Fi Sniffer app.

keeping your network connection alive during these difficult times. Some of what is there could be considered "common sense", but it never hurts to have such steps spelt out – and there is always the likelihood that you might not have thought of all the steps mentioned!

The website has more details, but in summary, the key points are as follows:

1. Test the speed on your broadband line.
2. Use your landline or Wi-Fi calls if you can.
3. Move your router clear of other devices.
4. Lower the demands on your connection.
5. Try wired, rather than wireless.
6. Plug your router directly into your main phone socket.
7. Get advice from your broadband provider.

I would endorse all of these, with the caveat that number six does rather depend on how your provider supplies your network connection. If I were to add to this list, I think that I would recommend some kind of Wi-Fi 'channel sniffer' app – there are plenty on the *Google Play Store*. These enable you to see what Wi-Fi networks exist in your vicinity and whether there is some unusual channel sharing going on (Fig. 4).

Many's the time I have successfully resolved slow Wi-Fi issues at home by using such an app, only to find that my neighbours' Wi-Fi has (probably thanks to poor router DCHP) hopped on to the same channel that mine is using. The two routers then 'fight' for the strongest connection, with the net result that neither is anywhere near as efficient as it should be.

The other 'trick' I would offer is to use 5GHz Wi-Fi channels, instead of 2.4GHz ones, if you can. Many 'non-technical' folk tend to stick with their router defaults (usually 2.4GHz) and shun using the higher frequency band. However the bandwidth is greater on 5GHz and though the range is shorter, speed is much faster, latency is reduced and co-channel interference less likely. I keep all my Wi-Fi devices on 5GHz unless I have a good reason not to.

More from Ofcom

It's been a while that I have been able to report on the latest news from the UK regulator. The big news has been the publication of Ofcom's annual report and accounts. And the top story here is that the regulator has been impressed with how well the UK's mobile and broadband networks have stood up to the numbers of people using them during the Covid-19 pandemic. More people working from home, more people video-calling each other and yes, more people using Network Radio apps, all add to the demands on the systems.

To date at least, they have held up remarkably well.

Ofcom also highlighted a few areas where they have been especially busy in the last year, two of which are particularly of interest to NR users and are headed, *"Better broadband and mobile… wherever you are"* and *"Strong, secure networks"*.

You can read more for yourself at this address:
https://tinyurl.com/yyhegxvy

More on 5G EMFs

Following my piece in last month's column (*RadioUser*, September 2020: 59-61) on the 'dangers' (or otherwise) of 5G, it is interesting to note that earlier this year, Ofcom published a report of actual EMF measurements that they had taken near to selected cellular base stations (Fig. 3).

Unsurprisingly, at 22 locations across 10 cities where they tested, they measured only small fractions (1.5% being the highest) of levels identified in the International Commission on Non-Ionising Radiation Protection (ICNIRP) guidelines – and those levels were for 3G and 4G signals. 5G signals were actually at 0.039% of the levels allowed for in the guidelines, at their very highest.

Read more here:
https://tinyurl.com/ycwr7fw3

Is your Home Wi-Fi set for a boost?

Last but not least, Network Radio users across the UK could soon experience faster and more reliable Wi-Fi to help with their hobby. Following a consultation earlier in the year, Ofcom is now making sections between 5925GHz and 6425GHz available for Wi-Fi services without the need for a licence.

They claim the changes will allow for innovative new uses, for example, virtual-reality headsets and smart glasses, which connect to other devices, (maybe future hi-tech Network Radios) through Wi-Fi.

Ofcom is claiming these alterations will assist low power outdoor usage of Wi-Fi enabled devices – again this will interest many users.

Catch more in the documents here:
https://tinyurl.com/y6fry7m2

I will catch up with you in November's issue.

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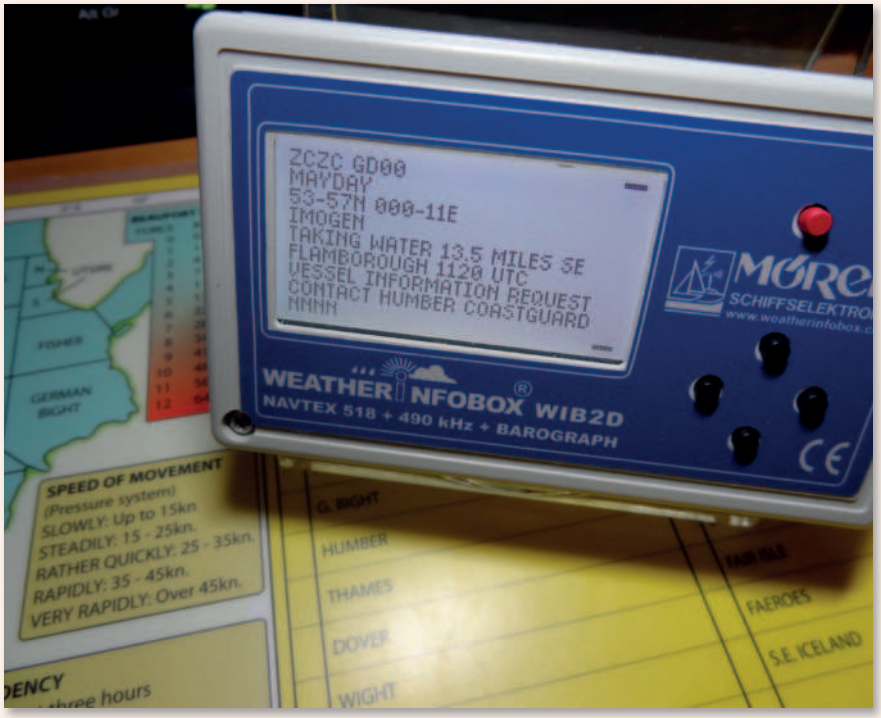

A NAVTEX Receiver and a Weather Station

The editor takes a look at accessories to enhance your shack with the Mörer Weather Infobox WIB2D stand-alone NAVTEX receiver and the Watson WS-8683 Wireless Weather Station

Looking through past issues, I found that I have mentioned this handy NAVTEX (NAVigational TEleX) receiver here before, both in previous articles about weather and radio and on our companion website, *Radio Enthusiast*.

https://tinyurl.com/y4chuhdj
https://tinyurl.com/y7ldmltf

A recent listen to the wonderful and enigmatic choral work *Shipping Forecast* by British composer Cecilia McDowall (Fig. 1) reminded me to do what I had long wanted to and give this nifty little *Weather Info Box* a little more attention. The WIB2D is a small, lightweight, box with rather an impact belying its size and weight.

It is one item in a range of marine radio products from the range of *Mörer Schiffselektronik* (marine electronics) in Germany. The firm offers everything you might need, in terms of maritime communications, as well as weather radio devices receiving RTTY, radio facsimile (Weatherfax), synoptic messages, and much more.

www.moerer.de

For UK enthusiasts, there are some UK-based dealers and eBay sellers who stock this product; occasionally, one pops up on a well-known global online auction site named after a river in South America.

I have always been interested in marine (and other) weather monitoring, and those of you who are regular readers will know that I do occasionally write about this in the pages of this magazine and elsewhere.

There are many ways to check on the weather with your radio. However, for this article, I am concentrating on NAVTEX, a mode also frequently covered by our *Maritime Matters* columnist Robert Connolly.

I have owned a variety of NAVTEX receivers, most recently the NASA BT-3.

https://tinyurl.com/y6pzf6uc

I was attracted to the WIB2D Weather Info Box because it is so compact (103 x 62 x 26.5 mm, 105 g), and it offers total freedom of operation onboard your boat, at home or during a long, legal, lockdown walk on the coast.

Technical Details and Practical Use

The WIB2D is a very sensitive digital receiver for 490 and 518Khz, the international NAVTEX frequencies, which it receives simultaneously, 518kHz in English and 490kHz in any national languages of the location it is used in. The receiver has an inbuilt ferrite-bar aerial and monochrome LC Display at 128x64 pixels resolution.

It is stand-alone, in that it is not tethered to anything (except when charging) and it automatically decodes and sorts messages it receives. The radio offers the user the facility to customize and filter what kind of messages to receive (see Robert Connolly's article in this issue, especially Tables 1 and 2).

In addition to this, the device has a rudimentary onboard barometer with a resolution of 0.1hPa, updated once every minute, which displays air pressure trends over the last 48 hours and stores the previous seven days' values, which is handy when at sea. For data transfer (only) to a PC, there is a USB connection.

The inbuilt ferrite bar aerial is directional (Fig. 2, from WIB2D Manual, page 11), and the three NiMH AAA 800mAh batteries inside recharge from a USB port of portable lithium-ion battery (like the one made by TalentCell, Fig. 2, not included) – most likely the latter when you are underway.

I use these for nearly all my radio equipment to cut down on noise.

With or without the backup power supply, the WIB2D is very sensitive. I live in the Ribble Valley, not exactly the hub for UK maritime NAVTEX, but not too far from the Coast at Blackpool and St. Anne's either, or around 40 minutes' drive from Liverpool. So far, I had received my NAVTEX stationary, in the shack, and through a selection of hardware receivers and software packages such as SeaTTY, YAND ('*Yet Another NAVTEC Decoder*') and Zorns Lemma 11.42. You do

Read on Here

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- Jefferson, P. (2011) *And Now the Shipping Forecast*
- Moore, P. (2016) The Weather Experiment: The Pioneers Who Sought to See the Future (Vintage)
- NAVTEX Live: **http://www.navtex.lv/navtex/MainTable**
- NAVTEX Receivers (Yachtbits): **https://www.yachtbits.com/navtex**
- Richards, M. (2012) *Maritime Weather Broadcasts* (*RadioUser*, May 2012: 34)
- The Weather Window: **https://tinyurl.com/y4so3n6o**
- Wiessala, G. (2012) *My Weather Day* (*RadioUser*, May 2012: 52).

so on your boat, if you fancy lugging everything around, or if you have things installed permanently on a bigger vessel.

However, now and again, it is nice to be completely untethered, and this is where this receiver comes in. As well as for your holiday cottage near the sea, of course, or your coastal walks, if you are not a boater.

Recently, I have been using the device from home, and I have just left it to run all week, just occasionally topping up the charge, roughly every four days. It sits in my bedroom, away from the shack and just works away in the distance. It is fascinating to see how quickly the messages pile up.

When you leave the unit on like this, you will soon be able to access hundreds of messages; old ones are deleted and overwritten after two days. The unit always shows you whether the item you are interested in is *'new'*, *'rollback'* (repeated) or *'read'*.

I have not chosen to filter anything, so I am receiving all kinds of messages from all stations within range. On the other hand, I could choose, in the receiver's settings, to just evaluate navigational warning messages from Niton, Cullercoats, Portpatrick and Malin Head, for example, the radio is fully customisable in that way.

For me, the navigational warnings and weather forecasts are the main draw, but you may choose to look at Search-and-Rescue (SAR) transmissions or the rarer pilot service messages, for example.

In general, the receiver is easy to use, the menu system is intuitive, and *it does* – as they say – *what it says on the tin*. Message IDs are very clear and easily readable. The time display is a little idiosyncratic: '172128UTCAUGUST', for example, really means a timestamp of '21:28 UTC, on the 17th of August'.

The picture on page 48 (left) aims to convey just a basic impression of the variety and source of messages I have received here over the last few weeks.

www.wetterinfobox.com

Watson WS-8683 Wireless Weather Station

Following my review of the Watson W-8686 Wi-Fi Weather Station in last month's issue (*RadioUser*, August 2020: 56-59), I have received many requests to continue the weather-theme in *RadioUser* for a while.

Many of you, it seems are indeed combining the radio hobby with an interest in weather – I hinted at the reasons for this the last time. Therefore, I am taking up the thread to look at the WS-8686's smaller brother, the WS-8683 this time (Figs. 10 – 13). This device has no outdoor array of sensors, like the WS-8686, but it does have one outdoor remote sensor unit for temperature and humidity – a 'weatherproof thermo-hygrometer sensor', as the manual terms it. Place this in the garden, or wherever else you need it outdoors, but keep it in the shade or on a North-facing wall if you can.

The main unit is, once again, both stylish, useful and functional, William Morris would be pleased. It is controlled by DCF77 in Germany, which means you may have to manually correct time settings for the UK.

The compact unit displays a range of values, such as humidity and temperature, inside and out, data on minima and maxima, dew point, and a range of weather forecast icons for 'sunny', 'partly cloudy', 'cloudy', and 'rainy', the key setting for the North West! The animated forecast arrows are driven by the relationship between current relative pressure and the pressure changes in the preceding six hours. There are also alarm and storm-warning settings.

The four keys at the bottom of the WS-8683 indoor unit are for 'settings', 'alarm', and 'minima and maxima'.

There is also a 'snooze' style button on top of the unit temporarily illuminates the display.

When a pre-set weather-alarm condition has been reached (e.g. high temperature), the alarm will sound and flash for 20 seconds.

Overall, I found this to be a very useful and attractive weather station for use in the shack, and elsewhere. My thanks to Waters and Stanton / Nevada for the loan of the test unit.

https://hamradiostore.co.uk.
https://www.nevadaradio.co.uk

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ICOM

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

Handheld

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

Base

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

Accessories

BC-194 drop in charger for IC-R6 ..... **£21.95**
CP-18E cigar lighter cable **£24.95**
CS-R6 cloning software for IC-R6 ..... **£34.99**
SP-27 clear acoustic earpiece **£24.95**
BC-223 rapid charger for IC-R30 ..... **£59.95**
BP-287 hi capacity 3280 mAh replacement battery for IC-R30 ..... **£77.95**
BP-293 dry cell case (3x AA) for IC-R30 ..... **NOW £34.99**
CS-R30 programming software for IC-R30 ..... **£59.95**
LC-189 soft case for IC-R30 ..... **£24.95**
CS-R8600 software for IC-R8600 ..... **£72.95**
RS-R8600 remote control software for IC-R8600 ..... **£99.95**
RC-28 remote control system for IC-R8600 ..... **£279.95**
SP-38 desk top speaker for IC-R8600 ..... **£149.95**
SP-39AD external speaker with DC power supply for IC-R8600 ..... **£199.99**
AH-8000 100-3300 MHz professional discone receiving antenna ..... **NOW £209.95**

bhi Noise Cancellation Products

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

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

Uniden

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

PRE-LOADED UBC-125 DELUXE AIR BAND KIT WITH ACCESSORIES JUST £219.95

Handheld

EZI-33XLT 78-174/406-512 MHz 180 channel analogue scanner **£64.99**
UBC-75XLT 25-512 MHz 300 channel analogue scanner **£99.95**
UBC-125XLT (best seller) 25-960 MHz 500 channel analogue scanner **£139.95**
UBCD-3600XLT (NXDN Version) 25-1300 MHz Digital & Analogue scanner **£479.99**
SDS-100 Advanced 25-1300 MHz Digital & Analogue scanner **£589.95**

Mobile/Base

UCB-355CLT 25-960 MHz 300 channel analogue scanner **£89.99**
UBC-370CLT 25-960 MHz 500 channel analogue scanner **£119.95**
BCT-15X GPS enabled 25-1300 MHz 9000 channel analogue scanner **£249.95**
SDS-200E Activated DMR+NXDN+ProVoice 25-1300 MHz Digital & Analogue **£779.99**

Accessories

UBCD3600XLT soft leather case **£29.95**
UBC-125/75 soft leather case **£24.95**
ARC-536 pro software for UBCD-3600XLT **£49.99**
ARC-536 basic software for UBCD-3600XLT **£29.99**
ARC-370 software for UBC-370CLT **£24.95**

DIAMOND ANTENNA

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

Scanner Antennas

D777 is a VHF/UHF civilian and Military air band receiving antenna. It has a gain of 3.4dB on VHF (120MHz) and 5.5 dB UHF (300MHz) with a length of 1.7m and SO239 socket for easy connection **£64.99**

D-190 is a high performance wideband discone antenna covering 100-1500 MHz including 10m RG58 terminated in PL259 ..... **£99.95**

D-130M is a Discone antenna with wide frequency coverage on receive 25 to 1300MHz and covers 6m (20W) and 2m (200W) when used with a transmitter. This model is supplied with 15m RG58A/U and 2 x PL259 plugs **£129.95**

WHISTLER

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

Handheld

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

Mobile/Base

WS1025 29-512 MHz 200 channel analogue scanner **£99.95**
WS1065 25-1300 MHz storage for 1800 frequencies analogue scanner **£279.95**
TRX-2E 25-1300 MHz best-selling Digital & Analogue scanner **£499.95**

Accessories

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

NEW IN! **LEATHER CASE for TRX-1 £29.95**

FlightAware

Live Flight Tracking

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

Flightaware Prostick Plus **£29.99**
Flightaware Prostick **£24.95**
FlightAware ADSB 1090MHz Band-pass SMA Filter **£17.99**

AIRSPY

Redefining The Radio Experience.

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

HF+ Discovery 0.5kHz – 31MHz VHF 60-260MHz SDR receiver ... **£199.95**
R2 VHF/UHF 24-1800MHz SDR receiver ... **£209.95**
MINI VHF/UHF 24-1700MHz SDR dongle ... **£119.95**
Spyverter R2 extend your AIRSPY coverage ... **£59.99**

TECSUN

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

Portable

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

MFJ

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

Receiving Products

MFJ-1022 300 kHz – 200 MHz active antenna covers the HF to VHF bands. It easily plugs into your general coverage receiver or scanner ... **£94.95**
MFJ-1020C 300kHz to 30 MHz tuned indoor active antenna system performs as well if not better than a long wire ten metres long. Tuned circuitry minimises intermod, improves selectivity and reduces noise. You can also use it as a tuned preselector with an external antenna ... **£129.95**
MFJ-1024 50 kHz – 30 MHz active antenna complete with control unit, 15m coax and external antenna ... **£197.99**
MFJ-1025 1.5-30 MHz noise canceller (alternative to the MFJ-1026) without the built-in Active Antenna. Plug your station antenna into the MFJ-1025 and your antenna system turns into a directional receiving array! ... **£269.99**
MFJ-1026 This unit is designed to eliminate local electrical noise even before it reaches the antenna socket of the receiver – it covers 1.8-30MHz – great just to only here the wanted signal in the clear. ... **£279.95**

Bonito

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

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

ALINCO

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

Handheld

DJ-X3ED 100 kHz – 1300 MHz AM/FM/WFM 700 channel analogue scanner ... **£119.95**
DJ-X11E 500 kHz – 1300 MHz All mode 1200 channel analogue scanner ... **£349.95**

Base

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

Accessories

ERW-7 USB computer interface cable for DX-R8E ... **£39.95**
ERW-8 USB Interface cable for DJ-X11scanner ... **£39.95**
ESC-50 soft case for DJ-X11 scanner ... **£23.95**
EBP-74 replacement 1800mAh battery for DJ-X11 ... **£34.95**
EDH-36 spare dry cell case for DJ-x11 ... **£17.95**
EME-26 curly cord earphone ... **£10.95**
EME-6 straight cord earphone ... **£10.95**
EPB-54N high power battery for DJ-x3 ... **£29.95**
EDC-105 drop in charger for DJ-X3 ... **£14.95**
EDC-43 DC power cable for DJ-X3 ... **£12.95**
EDC-37 12v DC cable for Alinco scanners ... **£9.95**
EDS-17 remote head fitting for DX-SR8 ... **£49.95**

SDRplay

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

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

AOR

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

Handheld

AR-8200MK3 super wide band 100 kHz-3000 MHz 1000 channels analogue scanner ... **£459.00**
AR-8200D same as AR-8200-MKIII with the following added features. * APCO25 Decoding * Voice Recording * MicroSD Card Slot * 4GB MicroSD card Included * USB Port * CTCSS built-in * Voice Inversion built-in ... **£669.95**
AR-DV10 100 kHz-1300 MHz Digital scanner with TETRA DMR. NXDN. dPMR. APCO25. D-STAR ... **£939.95**

Mobile/Base

AR-8600 MKII 100 kHz-3000 MHz all mode analogue scanner **£649.95**
AR-DV1 100 kHz -1300MHz Multi mode digital base scanner **£1199.00**
AR-5700D 9 kHz – 3700 MHz Advanced digital communications receiver ... **£4595.00**

Accessories

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

MOONRAKER

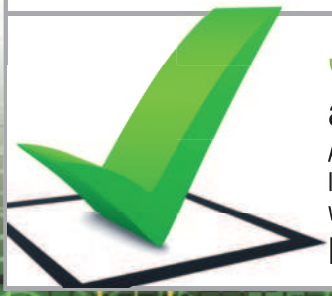
We were established in 1978 and are the largest manufacturer of Amateur, CB and Scanner antennas and accessories in the UK.

Scanner Antennas

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

NEW IN!

MRW-125 Super Gainer Scanner Handheld Antenna
Designed to improve weak signals of the Uniden UBC-125XLT Massive 52cm long helping to pick out those long distance aircraft ... **£24.95**



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1

Programmes, Podcasts and Personalities

Chrissy Brand
chrissyLB@hotmail.co.uk

Chrissy Brand tunes in to some soul music radio, recommends a Guatemalan cellist, enjoys surrealist poetry and highlights programmes hosted by some fascinating personalities.

My 'staycation' radio road-trip explorations of coastal Kent in the summer led to some interesting radio station and programme discoveries. For example, there is Shoreline FM. This is a community station for the Thanet area. It started broadcasting in January 2020 and transmits on 107.8MHz from Ramsgate and 105.9MHz from Folkestone.

The mainstay music for the station is 1950s rock and roll, whilst covering the 1940s and 1960s as well. I was regaled by recordings of Roberto Inglez and his Orchestra from the Savoy Hotel, London playing *Dancing in the Dark*.

The evenings between 1700 and 1800 UTC sees *The Soul and Motown Hour*, an enjoyable switch to a vibrant mix which included *Ame' Cherie* by Jr. Walker and The All-Stars, *Voodoo Woman* by Curtis Knight, *Taking My Time* by Marvin Gaye and *Gotta Have Money* by James Conwell (Fig. 1).

Bizarrely, the station appears to have no website nor any social media presence. This means there is no online listening available, which is a great shame, as well as a serious oversight. Perhaps there is something in the pipeline that has been delayed due to the pandemic?

All I could find online about Shoreline FM were some basic details from Ofcom, including an email address (Retrocadia@gmail.com), and few comments from Ivychurch Parish Council.

I wonder if this is an intentional part of the 1950s, pre-internet, ethos, a buy-in to a bygone era where parishioners politely offer cucumber sandwiches and ask, *"More tea, vicar?"*

Soulful Music Radio

If Motown or soul is your kind of thing, then you will already be a fan of Tony Blackburn's Sunday evening show on BBC local radio. When I tuned in to *Soul on Sunday* at 1700 UTC on BBC Radio Kent, it seemed to concentrate on Tony's favourite era - the 1960s. However, it must be said that the 77-year-old DJ still has plenty of enthusiasm and energy, along with a loyal audience.

Further music which spans this wide musical genre can be heard on *Grooveline* (Fig. 2). Stephen Howie has been presenting the show since 1998, and it has been aired on dozens of stations across Europe and beyond. Tune in for a weekly diet of soul, jazz-funk and soulful house, with tunes from the 1970s to the current day.

The list of stations that Grooveline can be heard on is impressive and includes Paisley FM, Radio Angel Family in Dresden, Ubiquity Radio in Johannesburg, Groove City FX in Jacksonville, Florida and OneLuvFM in Paris. Check the website for full details, listen again facilities, social media links and other news.

www.groovelineonline.com

Fig. 1: Shoreline FM specialises in vintage music. Fig. 2: Grooveline, soul music heard on stations around the world. Fig. 3: Some of the BBC World Service's *Music Life* team.

Academy FM from Ramsgate on 107.8MHz is celebrating its 10th Anniversary this year. It is a typical community radio station, playing a selection of golden oldies, albeit with some occasionally odd juxtapositions. That can work well though, with Kool and the Gang's sing-along disco music suddenly sounding edgy when played next to *London Calling* by The Clash.

Music on French radio is always worth hearing. That may be something of a generalisation but the truth is that I am rarely disappointed when tuned to music stations on French FM. Delta FM on 107.0MHz is a regular for me with its format of contemporary pop, R&B, and a decent smattering of French musicians.

Radio France Inter, meanwhile, can be heard on 104.7 and 103.3MHz on the south coast of England and online. It provided me with an early evening's companionship and entertainment in the form of intelligent conversation about music and the arts. This was *Blockbusters*, at 1500 UTC, on weekdays.

Presenter Frederick Sigrist included some nice music, such as Bonnie Banane's *La Lune et Le Soleil* (*The Moon and The Sun*) in between chatting about popular culture from the recent past. Subjects covered in the programme in the summer included Xena the Warrior Princess, Dungeons and Dragons and other role-playing games, The Spice Girls, and Hirohiko Araki's manga *Jojo's Bizarre Adventure*.

Manga is Japanese graphic novels or comics, a globally popular art form with origins in ancient Japanese history).

On Fridays, Saturdays and Sundays, at 1600 UTC, *The Weekend Summer Mag* is hosted by Emilie Blon Metzinger, although presumably will be coming to an end of its run by late September.

There was a discussion on a vintage classic film from 1951, *The African Queen*, which made me wish I understood more of the French language. However, I got the gist of what was said, singing the praises of the lead star, Humphrey Bogart. It also covered the visit to the film set in what was then the Belgian Congo, of Bogart's wife, another Hollywood legend, Lauren Bacall. There was a musical motif popping up throughout the programme, which was more chic and sophisticated than an old school jingle. *Stop this Flame* by Celeste was one of the many musical pieces I heard.

In between these Radio France Inter offerings, came a programme about short-lived 19th Century poet Arthur Rimbaud, who died aged 37. He created enough quality in his poems, however, for his work to live on and influence the Symbolism, Dadaism and Surrealism movements. Most Radio France Inter programmes can be heard again via the station's website or in Apple Podcasts.

www.franceinter.fr
www.franceinter.fr/emissions/blockbuster

Despite being known primarily as a news and features radio station, the BBC World Service still finds enough of its budget to produce some outstanding music and arts programmes.

Of these, I would go as far as to say that *Music Life* is one of the best and most innovative music programmes on the radio. It consists of music that you have probably never heard before, presented by a range of global musicians. A July programme heard saxophonist, MC and poet Soweto Kinch talking to Charlotte Adigéry and Jordan Rakei about pop music inspirations, writing to fit in a genre, and the role ego plays in their art.

The station website also hosts a series of playlists compiled by international musicians. In June, this came in the form of Mabe Fratti's easy-going and electronic playlist. She is a Guatemalan cellist, who chose a selection of songs by artists doing unique things with technology.

Every week provides an engaging listen. I first got hooked back in March when *Music Life* covered *Delving into the Subconscious.* Four of today's most exciting electronic musicians, Jon Hopkins, Anna Meredith, Holly Herndon and Max Cooper discussed composing, creativity and the subconscious (Fig. 3).

Listen to *Music Life* on the BBC World Service (DAB, short wave and online) on Sundays from 1906 to 2000 UTC. There is also an archive of over 50 episodes.

www.bbc.co.uk/programmes/w13xttxd

Personality Programmes

Personalities who become experts in their field can sometimes be 'natural broadcasters', and a good radio presenter should also be an insightful interviewer. This month, I would like to suggest six personalities who produce content worth listening to.

Katie Piper is a writer, activist and broadcaster, and *Katie Piper's Extraordinary People* is an enthralling, human-interest, podcast where she chats with inspirational people who have turned adversity into powerful positivity.

There are around fifty episodes to hear. Participants include 17-year old Freya Lewis, who raised £60,000 for a hospital, TV presenter and woodworker EJ Osborne, Bake Off winner and author Nadiya Hussain, and Jono Lancaster. Jono was born with Treacher Collins Syndrome and experienced bullying for the way he looked, resulting in setting up the *Love Me,*

GROOVELINE

2

Love My Face Foundation.

https://play.acast.com/s/katiepiper

Broadcaster Rhod Sharpe left the BBC this year but now hosts his own independent podcast series. It goes by the clever name of *The Rhodcasts*, a title that was dreamt up when he was chatting with friends in Cambridge. Interviews with people in the fields of music and theatre were the opening focus. Granted, it is a long way from the BBC Five Live *Up All Night* programme, which *The Washington Post* called, *"arguably the best night-time show in the world"*, but it is good to hear Rhod regularly once more.

www.rhodsharp.com

Another personality with a voice to hear is Reni Eddo-Lodge. She came to prominence with her excellent 2018 book, *Why I'm No Longer Talking to White People About Race*. Reni also hosts a podcast, *About Race*, looking at black history and the effects of it on today's society.

www.aboutracepodcast.com

Broadcaster and travel writer Simon Calder is known as the UK's prominent travel expert and is often on the radio, on television programmes and the *Escape Podcast*. The interviews and masterclasses, bargains and weekend breaks that were a large part of his podcast stopped abruptly during the lockdown.

Of course, 2020 has seen a change in travel patterns for everyone and Simon adapted admirably, offering popular daily video talks on his Instagram feed. In one of these, we witnessed his side of an interview on BBC Radio Wales, where he contributed to Eleri Siôn's afternoon programme.

On Instagram, listeners' travel questions were fielded from wherever Simon happens to be and sometimes that may well be in a field. This summer, he also streamed live on a bicycle in Norwich, a bus in Northern Ireland and walking in Provence in France.

www.simoncalder.co.uk/podcasts
www.instagram.com/simon_calder

Whilst he was stuck at home, Louis Theroux used lockdown to track down some high-profile people he was longing to talk to, from all walks of life and on both sides of the Atlantic.

Date	Time (UTC)	Station	Programme	Podcast	URL/ Stream/ Frequency
Daily	1800-1900 1930-2030	Radio Belarus (English Service)	Music, travel	http://radiobelarus.by/en	https://tinyurl.com/y5q9nbpe6005 and 3985kHz
Daily	1900-1930	Voice of Vietnam (English Service)	News, features	https://tinyurl.com/y5sn2qyr	https://vovworld.vn 7280 and 9730kHz
Monday Thursday	0900-1100 0400-0500	Radio Blue Mountains	Stories Around the World with Lisa Finn Powell and Fran Cane	https://tinyurl.com/yyle2lba	www.rbm.org.au/shows/brad-diedrich-5/
Saturday	1705-1800	BBC Radio Ulster & Foyle	The Culture Café	BBC Sounds	www.bbc.co.uk/programmes/m0009tl0
Saturday	2003-2100	BBC Radio Ulster & Foyle	Jazz World with Linley Hamilton	BBC Sounds	www.bbc.co.uk/programmes/b05mpjy4
Saturday	2000-2300	BBC Cymru	Ffion Emyr (contemporary music)	BBC Sounds	www.bbc.co.uk/programmes/m0003j3f
Sunday	1000-1100	Wythenshawe FM	That's Entertainment with Bill Platt	Not available	https://tinyurl.com/y3ekmryp and 97.2MHz

Table 1. Top listening recommendations for the month ahead in international radio.

Guests he spoke to on his BBC Radio 4 series *Grounded*, include actor Miriam Margoyles, musician Boy George, Watford footballer and mental health advocate Troy Deeney and model and presenter Gail Porter.

www.bbc.co.uk/programmes/p089sfrz

I also enjoyed a six-part series from the National Trust, hosted by Clare Balding in 2017: *Prejudice and Pride* explores hidden stories and important figures in LGBT history. From creative retreats to ancient history, set in the context of National Trust properties and places.

https://tinyurl.com/yxm3sdpl
https://tinyurl.com/y5n6nkbo

Clare is better known as a BBC sports broadcaster. Her July 2020 BBC World Service *The Documentary: The most important, least important thing* used anthropology, philosophy and human behaviour to unwrap why experiencing sport is so meaningful to society.

She also hosted *Sport and the British* (a 30-episode series from 2018) on BBC radio, covering globalisation, golden girls, broadcasting to the nation and many other topics.

www.bbc.co.uk/programmes/w3ct0wkh
https://tinyurl.com/y648u56l

On Short Wave

NHK is *Nippon Hōsō Kyōkai* (日本放送 協), or World Radio Japan. The station recently made a minor change to its English short wave schedule for the A20 season, which is in operation until October 25th. It can be heard on weekdays at 0430 UTC, while weekend broadcasts are still at 0500 UTC, using 5975, 7245 and 11970kHz. Programmes can also be heard on podcast apps, with a fifteen-minute news bulletin in English daily at 1100 UTC.

There has been a change in the format of how Japanese people's names are announced on NHK World's English website, radio and television channels. Now, the surname comes first, followed by the given name, under Japanese language standard practice. As well as being culturally appropriate and useful to know, the change is in plenty of time for the rearranged 2020 Olympic Games, which will hopefully commence in Tokyo on July 23rd 2021.

MUSIC LIFE

3

Lionel Clyne logged TRT Radio Recip at 1521 UTC on 11530kHz broadcasting in Turkish from Emirler. Despite some research, he was unable to discover the relationship between TRT Radio Recip and TRT The Voice of Turkey. Looking in the High-Frequency Logs section of BDXC *Communication*, I was able to unearth that it is a Turkish jammer, jamming Dengê Welat via Moldova in Kurdish, also on 13730 and 15170kHz.

Lionel noted an old log on his computer of the Voice of Mesopotamia on the same frequency (11530kHz). An audio recording of this station, made by Emanuele Pelicioli in Italy back in 2007, can be heard at the Short Wave Archive.

https://tinyurl.com/y5dghfht

We head to Greece next (Fig. 5), where Greek station *Helliniki Radiophonia* was heard from 1840 UTC on 9420kHz by Lionel. It was broadcasting in Greek from Avliss, with a good signal (a SINPO of 45555). He heard the, *"... usual delightful presentation of Greek music that I always find quite beguiling. I was glad to hear of this station's continued existence as it seems to have had a very chequered history: it was shut down in 2013 having been accused by the then Greek government of being 'a thorough waste of money'. Remarkably, it was taken over by the redundant employees and it was not until 2015 that it was officially re-funded by the Greek government. Since then its presence seems to have been somewhat unpredictable."*

Greek music also features on at least one station in the UK. Have a listen to London Greek Radio on DAB, 103.3MHz and online.

www.lgr.co.uk

Finally, for now, a DX blog called *The Girl with the Radio* covers QSL cards and DX catches. It is great to see a twenty-something woman (who is from the UK) being active in the DXing world.

https://tgwtr.xyz

DAB Portables, Log-Periodic Arrays & Global Digital News

Kevin Ryan
kevin@kpr-web.co.uk

Kevin Ryan reviews two personal DAB radios, compares Yagi and log periodic DAB aerials and shares the very latest digital radio news from across the globe.

I have been comparing the Majority Petersfield Go to the VQ Blighty, both of which cost me around £30; they now retail for £35 and £50, respectively.

There are now very many other personal DAB radios available; most of them include FM, such as the Roberts Sports DAB 5 (£60), the Pure Move R3 (£90), refurbished versions of discontinued models from Bush and Goodmans, and relatively unknown brands found on eBay and Amazon. I can only advise that you buy with care, especially as the UK embraces DAB+ more and more.

My Evaluation

The Petersfield and the Blighty are similar in size (Fig. 1) but the latter is a bit heavier. The external connections of 5V USB in and a headphone/aerial socket are the same as are the control buttons of *Mode, Menu/Info, Select/OK, Forward, Back, Up* and *Down* for audio volume; the three-line displays are identical too.

The main differences lie in the construction and the layout of the control buttons. The buttons on the Petersfield are large and easy to operate, especially in poor lighting, and the device has a clip so that you can attach it to your belt, making sure that the earphone/aerial cable is stretched out. The buttons have a good feel to them, and there is a solid response to your key presses. The unit has a pinhole-type *reset* button on the rear that I have not had to use.

The Blighty's buttons, apart from *Mode* and *Menu* are all grouped in a joystick type mini keypad with *OK* at the centre. I found them quite fiddly to operate, especially when the unit's processor was struggling to establish decoding of a station and the radio did not respond to key-presses for several seconds.

The main menu on both radios consists of *Full Scan, Manual Scan, Dynamic Range Control (DRC), Prune*, and *System/Settings*. *Prune* sets the radios off on a new full scan to update the station list, something that I have not noticed on other DAB radios, which rather seemed to delete any station in the list whose name had a question mark in front of it.

In addition to *Backlight, Factory Reset,* and the software version, the settings submenu on the Petersfield allows you to set the date and time update method and format, pick your language (English or German) and choose a brightness level from high to off. I did not test the 'off' setting – just in case I could not see enough to change it back to high again.

There was not much to choose between them regarding sensitivity, which was very good. Both radios were consistently picking up 71 DAB. Now and again, they were finding eight stations on the Surrey multiplex that would not decode when I tried to tune them in.

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Fig.1: Similar in size and ability to pick up DAB signals, I think the Majority wins on grounds of ergonomics and stability.
Fig. 2: This log-periodic array is lightweight, value for money and comes with clear assembly instructions.
Fig. 3: The end-piece links the two booms together electrically. You will need an F-type connector for the downlead. It will be difficult to remove the end-piece if there is a problem.
Fig. 4: I think this is a great resource for holiday travel or in identifying DAB multiplexes during a lift in conditions.

I prefer the Petersfield Go because I like the large keys and can wear the radio attached to my belt. I have not experienced any 'mini-lockups', like the ones on the VQ Blighty.

VQ may have now addressed this issue in a newer model.

DAB Aerials

In my search for another DAB aerial, I found a gap: There is the range of Yagi aerials, with plenty of 3-element types available. Then there is nothing bigger until the consider the 8+ element units from the specialist suppliers. I nearly settled for a 4-element Yagi but then spotted and purchased a log-periodic aerial (or 'array', sometimes (wrongly) 'antenna' LPA) – with a slightly higher gain of 8dB.

A Yagi aerial has a narrower main (forward) beam but will pull signal from stations aligned with the rear of the aerial. The LPA has a wider main beam but tends to reject signals behind the aerial that sounds ideal for me to monitor the new DAB services that I expect to start in the middle of next year.

At first glance, an LPA looks very similar to a Yagi because they both consist of dipoles mounted on a support boom. The Yagi has only a single element that receives the signal; the others serve as either *directors* (in front of the receiving dipole) or *reflectors*.

Technically they are known as 'parasitic' elements because they re-radiate any signal falling on them.

The log-periodic dipole array consists of several dipole elements. These progressively reduce in size from the back to the front. However, there is only a slight variation in length on a DAB aerial, which covers, as it does, a relatively narrow band of frequencies. I measured the length of the dipoles on the array, and they varied from 650 to 460mm. I measured the length of the rod sticking up from the boom and doubled it. Using a simple half-wave dipole calculator online, this would mean the aerial likely covers 219 to 310MHz.

However, I am sure that there are other factors I should not ignore.

The DAB6 (Fig. 2) aerial consists of two parallel central support booms, which also function as the transmission line, mounting the dipoles on the alternate booms.

https://tinyurl.com/y3z87u59
https://tinyurl.com/y4vcqoxf

I followed the instructions carefully, including pushing the feed cable down the middle of one of the booms, terminating it in an F-type connector and attaching it to the end-adaptor (Fig. 3). This I then pushed (I needed a final tap home with a wooden mallet) into the open ends of the twin booms to complete the joining of the two halves of the aerial.

How LPAs Work

The theory of an LPA states that the 'active' region of the aerial providing reception varies with frequency and that typically only three dipoles will be active at any one time. In very simple terms, this makes the aerial similar to a series of three-element Yagi aerials. Here, the dipole closest to being resonant at the operating frequency acts as the receiving dipole and the two adjacent elements either side as a reflector and director.

However, the system is somewhat more complex than that, and all the elements contribute to some degree, so the gain for any given frequency is higher than a Yagi of the same dimensions or as any one section of the log-periodic array. However, a Yagi aerial with the same number of elements as a log-periodic one would have a *far* higher gain, as all of those elements improve the gain of a single driven element.

The element at the back of the array, where the elements are the largest, is a half-wavelength at the lowest frequency of operation – the longest element acts as a half-wave dipole at the lowest frequency. The element spacing also decreases towards the front of the array, where the smallest elements are located. The upper frequency is a function of the length of the shortest element.

The end effect is due to a decrease in inductance and an increase in capacitance near the end of the conductor, which effectively lengthens the aerial. End effect increases with frequency and varies with different installations. A rule of thumb for Band III indicates that the actual length of a half-wave radiator is in the order of 5% less than predicted by the theory.

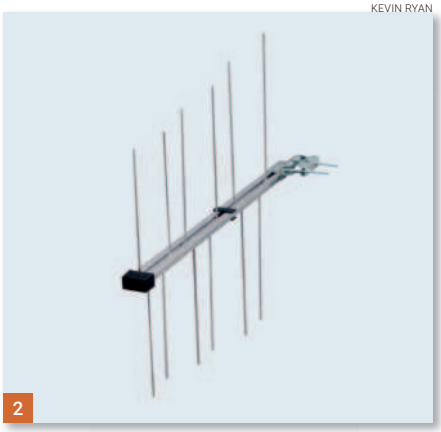
The diameter of the conductor also affects its electrical and physical length.

In practice, the presence of supporting insulators, feed systems, and surrounding objects, such as the earth and other elements have an aggregate effect upon the electrical length, which may even exceed that predicted by the end effect. This makes the unknown length difficult, if not impossible, to predict under practical conditions. Therefore, the usual procedure is to cut or adjust the radiator to a length equal to, or slightly less than, the correct free-space physical length, check the characteristics of the aerial experimentally, and alter the physical length, as necessary.

DAB Updates

Ofcom agreed on the following multiplex changes, among some others I covered last month. Hot Radio and Serenade Radio, one of the few stations aimed at the over 65s market, join the Bournemouth multiplex. Liverpool Live, a new local station for the Merseyside area, joins the North East Wales and West Cheshire multiplex along with The Breeze. Mearns FM, operated by Stonehaven Community Radio, joined the Aberdeen multiplex using mono DAB.

KEVIN RYAN



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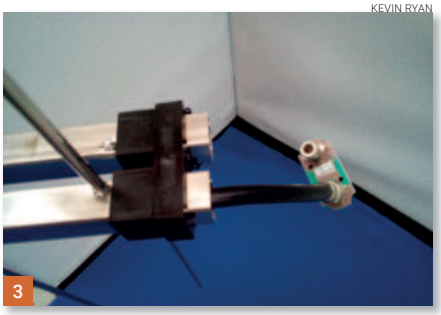
KEVIN RYAN



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Their website (below) has two coverage maps showing how DAB expands its reach from the coastal area to cover most of Aberdeenshire.

https://mearnsfm.org.uk/how-to-listen

France DAB+

I found this useful guide (Fig. 4) to DAB+ multiplexes across France, where the expansion of the network continues.

https://www.dabplus.fr/par-ville

South Africa

The authorities in South Africa issued a policy on the introduction of digital sound broadcasting using multi-standard receivers, to allow for the continued use of analogue FM alongside DAB+ and DRM+.

DRM is to complement AM sound broadcasting service in the AM band (535.5 - 1606.5kHz); DRM+ will complement FM sound broadcasting services in the FM band (87.5 -108MHz) and the allocated VHF sound broadcasting band (214 - 230MHz).

Meanwhile, DAB+ is to supplement VHF sound broadcasting services in the allocated VHF band (214 - 230MHz). Band III could have a mix of DRM+ and DAB+ signals, which has never happened before.

Digital Switchovers in Europe

Norway was the first country in the world to switch off its FM networks (some local FM stations are still on air), and DAB covers the whole country. Radio listeners have adapted

KEVIN RYAN

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to the switchover, either by buying DAB + receivers or by using the internet.

There are one national multiplex and seven regional and seven local ones.

I believe that there are only three other countries actively considering following Norway. Switzerland is edging closer to a total digital switchover, ahead of the FM shutoff date set for the end of 2024. At the moment DAB + is the most popular method of listening to the radio, but not by much. A report by the Digital Migration Working Group states that just 15% of listeners only use FM and another 30% use apps or the internet. Over 3 million cars are not yet able to receive DAB signals.

In Belgium, over 95% of the population can receive DAB + radio programmes, and the Flemish Government has decided to switch off FM radio two years after digital listening reaches 50%. The French-speaking area has not issued any statement on switchover.

DAB coverage for national networks is at a similar level in the Netherlands. The government there seems content to add another national network and build out the local/regional networks before announcing a strategy on switching off the FM network.

Last but not least, Denmark has set a similar policy, and the Danish parliament has indicated that FM broadcasts will cease as soon as the percentage of digital radio reception reaches 50% (currently 28%).

China xHE-AAC

China National Radio has the largest DRM network on short wave in the world. I monitor their transmitters regularly and noticed that 11995 and 17770kHz now use the new xHE-AAC audio encoder daily. In DAB terms, this is like moving from DAB to DAB+.

I have seen a report that China Radio International is testing DRM on the 25, 22, 16 and 19 meter bands, directed towards Oceania. I logged the transmission on 17790kHz at 0835 UTC, then on 15745kHz later in the day. The on-screen station label was the same as the national network CNR.

I agree that this test transmission is not a domestic one. I have not heard a station announcement, and sometimes the audio is so that it is almost impossible to detect it.

From my records, CRI was last active on DRM in 2004/2005 from the (then) new transmitter site at Kashgar/Kashi.

North Korea DRM

I logged Radio Pyongyang (assumed) on 3205kHz on many occasions with a station label of 'Dream Test'. Occasionally, when this service goes off the air, a DRM station with a label of 'BBEF', a Chinese transmitter manufacturer, pops up on 3560kHz, a long-established frequency used by North Korea. The programme on 3205kHz (which I decoded via a remote SDR in China) sounded like Korean, but I am no expert. It was not carrying the same programme as the Pyongyang Broadcasting Station on AM 3320kHz.

HDRadio

Radio World carried an interesting article on how radio stations in the USA and Mexico used the multimedia functions in HDRadio to provide public health messages, by way of on-screen text messages and graphics.

However, I do not think that any broadcaster in the UK thought about using the features built into DAB to do a similar thing.

https://tinyurl.com/y3nfpuuz

Radio Round-up

ANN MITCHELL (1922-2020): A sad loss was the death, on 11th May 2020, of Ann Mitchell, who was a mathematician and codebreaker at Bletchley Park. She was closely involved in the breaking of the German Enigma ciphers. Among her key tasks was the programming of Alan Turing's Bombe machines. In a world of male mathematician in Hut 6, Ann could not even divulge her job to her parents. It was in the 'machine room', close to the Enigma machines, that Mitchell devised the instructions for the *Bombes* – demanding and complex work, undertaken in close liaison with the Women's Auxiliary Air Force and the Women's Royal Naval Service. Once told that Maths was not 'a ladylike subject' by a teacher, Ann Mitchell later worked for a wartime member of MI5; she became a social scientist and marriage guidance councillor after World War Two, with a range of books to her credit. *RadioUser* has carried several articles about the wartime codebreaking activities at Bletchley Park and continues to publish a series about *Spies and Radio* at the moment (see the June and August 2020 issues). (Source: The Guardian, 13 June 2020)

https://tinyurl.com/y4e84459

AUSTRALIAN RADIO AND COVID-19: From remote working to budget cuts, the Coronavirus (COVID-19) pandemic has had a major impact on radio, and the wider media industry at large. So it's a good thing that radio managers have spent years adapting to changing listener habits and 'competition for ears' with new technology. Social distancing and lockdowns across Australia have ultimately changed the way radio shows are produced, and Telum Media's virtual conference, The Battle For Breakfast, took in the perspectives of show producers from different stations around the country. Siobhan McDonnell, Breakfast EP for B105's Stav, Abby & Matt, RN Breakfast EP Julia Holman, and 2GB Breakfast EP Zac McLean shared their recent experiences on how their shows have been forced to change and adapt since COVID-19. Having three different presenters working from three different locations instead of the studio was a significant adjustment, explained B105 executive producer McDonnell: "*That was a very big change for us […]. I was in the studio but trying to manage three presenters in three places," she said. "It was really different because our show is based on our listeners and their personalities. The beauty and joy of the show [lies also in] the dynamic [of the presenters]. The team as a whole has been working together for five years […]; so to then split them up and have them in separate rooms and adjust to remove broadcasting was a challenge. It became the norm quickly.*" You can read the complete version of this insightful article at the URL below.
(Source: Zanda Wilson, RadioToday)

https://tinyurl.com/yxkax43b

ALL PICTURES: PUBLIC DOMAIN

1

Active, Proximate & Real: The Hindenburg Disaster

Scott Caldwell looks at the role radio played in the Hindenburg disaster, both in terms of the radio officers on the airship, and through the eyes of one radio reporter who was present at the scene.

Scott Caldwell
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By the 1930s, radio broadcasting was popular, commercialised, and an important facet of everyday life in the United States of America. It provided a constant stream of current affairs and popular entertainment, in an often turbulent, violent, and politically unstable decade. The coverage of extraordinary events served to enhance its dynamic capability of forming vivid images in the mind's eyes of the listeners.

In this world, the radio officers of the zeppelin (airship) *Hindenburg* (LZ-129; Tables 1 and 2 and Fig. 4) provided vital and continuous wireless services. The zeppelins were named after the German inventor and aristocrat Count Ferdinand von Zeppelin (1838-1917).

The radio officers travelling on these iconic rigid airships spent the majority of their time transmitting messages from affluent passengers who wished to send greetings to both friends, relatives, and business associates. The *Hindenburg* was designed to cater for the German, European, and US social élites who wished to travel across the Atlantic Ocean with speed and style, and in luxury.

WLS Radio Chicago

On 6th May 1937, Herbert Oglevee

Fig. 1: The Tragic End of the *Hindenburg*.
Fig. 2: Herbert Oglevee Morrison.
Fig. 3: The ill-fated airship.
Fig. 4: Internal Layout of the *Hindenburg*.

Morrison (1905-1989, Fig. 2) of the broadcaster WLS Radio Chicago was busy testing new recording equipment. He put a *Presto* direct disc recorder through its paces, at the scheduled landing terminal of the *Hindenburg*. This took his mind off the rain soaking through his slick black hair. Morrison was preoccupied with last-minute adjustments to the disc recorder.

He had managed to convince his superiors that this would be an ideal test of this equipment, even though this was already the *Hindenburg's* 17th crossing of the Atlantic Ocean, after one year's service.

The *Hindenburg* offered a good standard of luxury, with well-appointed staterooms, although they were rather small when compared to the express ocean liners. Passengers had access to a reading and writing room where they could write letters on official *Hindenburg* stationary or write a radio message for onward transmission to the United States or Europe.

Thankfully, for history, Morrison was the only radio reporter on-site at Lakehurst Naval Air Station in New Jersey. Before his test recording exercise, he recalled his routine journey to the naval base: *"We both flew down from Chicago yesterday afternoon aboard one of the giant new 21-passenger flagships of American Airlines. It took us only 3 hours, 55 minutes to fly nonstop from Chicago to New York. When we landed at Newark, we found another flagship of American Airlines waiting to take us to Lakehurst with our equipment when we were ready to go".*

Oh, the Humanity!

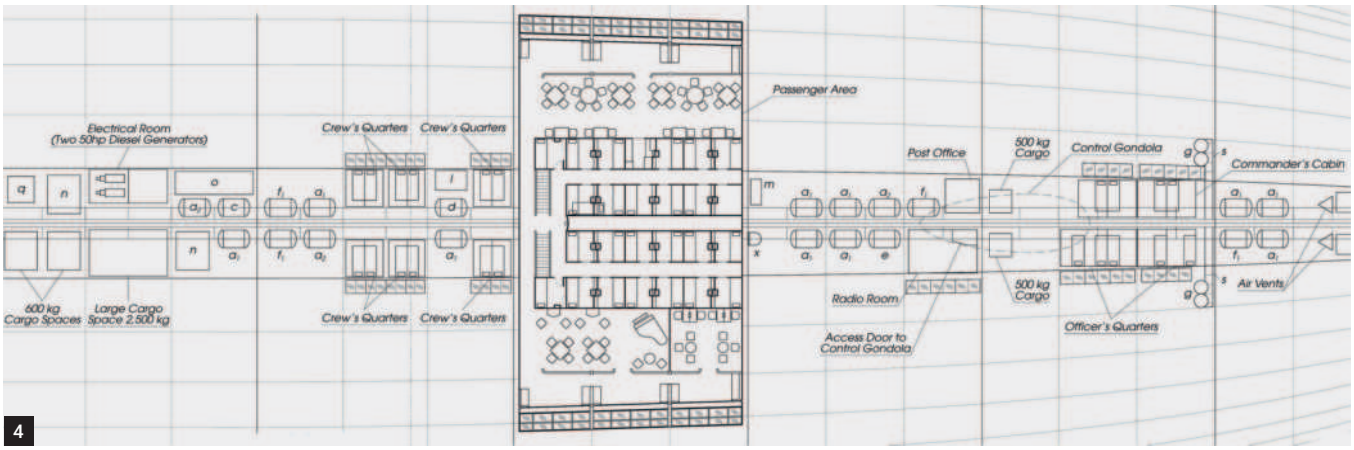
His broadcast was not intended for transmission, and it has since become an iconic document in American history. WLS stands for the 'World's Largest Store' and reflects that the station was originally owned by the Sears Roebuck & Company. The intensive narrative of Morrison's commentary was subsequently dubbed onto silent newsreel footage, increasing its worldwide circulation to a shocked and disbelieving audience.

Morrison selected a good vantage point in a small aircraft hangar next to the main Hanger Number 1, its large windows offered a clear view of the *Hindenburg's* final landing approach. His words are now perhaps amongst the most famous in the history of radio – immediate, emotional, dramatic, and unexpected. His was the ultimate first-hand view of the disaster: *"It burst into flames! Get out of the way! Get out of the way! Get this Charley! Get this Charley! It's burning and it's crashing! It's crashing terrible! Oh my, get out of the way, please. It's burning, bursting into flames and it's... and it's falling on the mooring mast and all the folks agree that this is terrible. This is one of the worst catastrophes in the world. Oh, the humanity".*

Morrison sounds very distressed, and at times he chokes up and starts sobbing. He even apologises and falls into stunned silence only to regain his composure and returns moments later to describe the horrific details of the catastrophe. Morrison's famous phrase *"Oh the humanity"* has now become a cultural idiom in modern language. Local radio stations began breaking news of the disaster after the event, but none had the personal impact of *'are you there'* testimony of the report filed by Morrison.

The German terminal operators tried to impound the recording equipment as they were concerned that the catastrophe may damage the international prestige of Nazi Germany. While playing back the audio, it became apparent to Morrison that the Presto Direct Disco Recorder had been calibrated at the wrong speed, making his famously deep voice sound higher than it naturally was. The initial explosion of the *Hindenburg* caused the recorders stylus to momentarily lift and skip on the disc. However, sound engineer, Charlie Hehlson acted very promptly; he replaced it and continued to record Morrison's emotional commentary. Morrison's coverage of the *Hindenburg* disaster lasted approximately 40 minutes and filled several discs.

Initially, the National Broadcasting Company (NBC) had a strict operating policy that prohibited the airing of recordings on their network. It was a policy they relaxed to accommodate Morrison's remarkable eyewitness commentary. The lasting effects of Morrison's recording were remarkable: Suddenly radio recordings had almost become active, proximate, and real. The distance between the event and



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the listener was reduced forever, a step towards the live and remote recording of many subsequent significant events.

Morrison served in the US Army Air Corps during the Second World War (1939-1945). He later returned to his radio broadcasting career and was appointed as a news reporter before he was promoted to the role of first news director at WTAE Pittsburgh. Prior to his retirement, he worked for the Public Relations Department at the University of West Virginia, by coordinating its radio and television activities.

The Radio and Electrical Rooms

The area along the *Hindenburg's* keel (Fig. 4), heading towards the bow, included the Radio Room, Electrical Room, and the sleeping accommodation for the officers and crew.

The *Hindenburg* operated under the call sign DEKKA on the following frequencies: 5280, 10290, 10335, 10500, 11040, and 12550kHz. It was licensed as a 'non-broadcast aero-nautical station', although it was given a measure of self-regulation. Communications with the United States were processed by the coastal station at Cape Cod, Massachusetts.

The German short wave radio station at Zeesen provided communication with the *Hindenburg*. The Zeesen transmitter was a 70-metre-high radio transmission mast constructed in 1931. It consisted of a lattice tower of pitch pine timbers and was one of Germany's first short wave broadcasting transmitters. It offered a comprehensive service that operated on 12 different frequencies between 6 and 17MHz.

The low-frequency transmitter operated on any frequency between 111 and 525 kHz. The functionality of plate modulation allowed the output of 200W in CW mode.

Hindenburg LZ - 129	
Length O/A	245 Metres (804 ft)
Beam	41.2 Metres (135.1ft)
Power-Plant	4 Daimler-Benz 16 Cylinder LOF 6 (DB6 602) Diesels
Maximum Speed	135 Km (84 MPH)
Service Speed	126 Km (78 MPH)
Gas Capacity	200,000 Cubic Metres/ 7,062,000 Cubic ft
Crew Members	40 Flight Officers 10 – 12 Stewards and Cooks
Passenger Accommodation	50 Sleeping Berths (1936) 72 Sleeping Berths (1937)
First Flight	4th March 1936
Final Flight	6th May 1937

Table 1: The Hindenburg: Vital Statistics.

Name	Date of Birth	Date of Death	Position	Nationality	Age	Fate	Location at Time of Fire
Willy Speck	1st July 1892	8th May 1937	Chief Radio Officer	German (Frankfurt)	46	Died	Control Car, Aft Observation Room
Herbert Dowe	6th July 1905	26th March 1985	Radio Officer	German (Arnswalde)	31	Survived	Radio Room, Above the Control Car
Franz Eichelmann	28th April 1911	6th May 1937	Radio Officer	German (Frankfurt)	26	Died	B-Deck, Foyer to Crew's Mess
Egon Schweikard	?	?	Radio Officer	German (Frankfurt)	36	Survived	Radio Room, Above the Control Car

Table 2: The Hindenburg's Radio Officers.

The short wave transmitter had the same power as the low-frequency unit and operated on any desired frequency between 4880 and 17700kHz.

The three direction finders (DF) aided the science of navigation. They could tune from 175 to 1000kHz. This spectrum covered the beacon bands and also the frequencies utilised by the powerful medium wave broadcasters from both sides of the Atlantic.

The Hindenburg had a 120-meter long trailing aerial connected to the long wave transmitter, it could be deployed or retracted by an electrical power winch system. The short wave transmitter had a 26-meter trailing aerial that relied on manual deployment. A fixed aerial was connected to the Hindenburg's receivers, and this measured 26 metres in length.

A radio direction finding set was also installed in the *Hindenburg's* control car.

Assistant Radio Officer Herbert Dowe was born on 6th July 1905 (Table 2) and had considerable experience of operating long-distance wireless equipment, having

Total Passengers & Crew	97
Total Survived	62
Total Fatalities Crew Passengers Ground Crew	36 22 13 1

Table 3: Crew and Passenger Statistics.

served with the Hamburg-American Steamship Company from 1925 onwards. He joined the *Zeppelin* company in 1935 and originally served as Chief Radio Officer on the *LZ-127 Graf Zeppelin* throughout 1936.

The electrical power supply for the Hindenburg was maintained by two 50 – 65 hp Daimler-Benz OM-65 diesel engines that were connected up to a Siemens generator, located in the confines of the Electrical Room.

In the event of either an electrical or radio malfunction, there was the option of an emergency radio receiver, located in the Hindenburg's bow. It had a unique source of electrical power – generated by a small stationary bicycle

The Death of a Dream

On seeing the airfield, Chief Radio Officer Speck ordered the transmission of a final message to Germany at approximately at 06:00hrs. It confirmed that the *Hindenburg* was preparing to land: *"Ready for landing, bad weather"*. This message was misinterpreted by operators at Radio Quickborn (Germany) who erroneously advised Frankfurt that the Hindenburg had landed safely.

However, the zeppelin had crashed down to Earth in flames (Fig. 1).

Speck was considered as an 'older statesman' of the Zeppelin family, having worked on them since 1912. Many younger crew members regarded Speck as a kind of 'father-figure', and he commanded their respect.

He also had a brief spell in the management of *Luftschiffbau*, *Zeppelin's* ground-based radio division.

In 1916 he had been conscripted into military service, when the demand for manpower increased, due to the slaughter on the Western and Eastern Fronts of the First World War. He served in a field communications detachment that was attached to a cavalry regiment. In 1924, he served onboard the 'reparations airship', which was ceded to the US in October 1924.

Speck had extensive experience of the wireless equipment onboard the airship *LZ-127 Graf Zeppelin*, including her historic round-the-world flight of 1929. His knowledge was vital in the early voyages of the *Hindenburg* when the equipment was subjected to extensive tests.

Speck was dragged from the wreckage of the *Hindenburg's* control car section and rushed to Paul Kimball Hospital. He had sustained significant injuries, after being struck on the back of the head and lay in a semi-conscious state. In an act of remarkable bravery, his old friend, Captain Max Pruss raced back to the wreckage to drag him out.

At first, Pruss had sustained only minor burns. Unfortunately, whilst rescuing Speck, he suffered from significant burns and smoke inhalation.

Speck did not survive his extensive injuries and died in the early hours of Saturday 8t May 1937, despite the efforts of the medical team at the Presbyterian Hospital in New York City who worked hard to try and save his life.

His body was repatriated to Germany and laid to rest at the *Hauptfriedhof* cemetery in Frankfurt. Before the landing, Chief Radio Operator Speck ordered both Dowe and Schweikard to shut off the transmitters and the generator.

After they completed Speck's order, both remained in the radio room to watch the ground crew through the small window in the floor.

Schweikard sailed home to Germany on board the steamship *Bremen*, remarkably just two weeks after the *Hindenburg* disaster. Dowe later recalled that the *Hindenburg's* radio equipment was very modern and in perfect working order during the last fateful flight.

Dowe had a rather lucky escape, as he jumped out of the confines of the radio room just as the gondola hit the sandy ground for a second time. The heat and flames were so intense that he could not stand it any longer. Rather than continuing struggling forward, he simply fell to the ground and instinctively covered his head, face, and hands with the soothing qualities of the wet sand.

There he waited until the body of the *Hindenburg* had completely burned off (Fig. 1). Then he staggered to his feet and enjoyed the simple sensation of breathing the air that was still mixed with heat and debris of the once-mighty airship. Cautiously, he managed to navigate his way through the glowing framework to relative safety. Amazingly, he suffered only minor burns from his near-death ordeal. Dowe was rushed to the Fitkin Memorial Hospital (New Jersey) where he spent a total of 6 weeks, recovering from his burns. He managed to testify from a wheelchair to members of the Board of Inquiry on 26th May.

The day after the catastrophe, President Franklin D. Roosevelt (1882 – 1945) received a wireless telegram from Adolf Hitler (1889 – 1945) who now had become both 'Führer' and Chancellor, thanking him for his sincere expression of sympathy to the German people.

Conclusion

One of the largest surviving, undamaged, *Hindenburg* artefacts in existence is the radio operator's chair. The chair survived the initial explosion and subsequent fire due to its fireproof insulation that surrounded the radio room. Designers had sealed and insulated the room as the switchboard posed an electrical fire risk.

This may have saved the lives of Dowe and Schweikard.

Radio's greatest strength is taking care of the local communities it serves on the local level. This is demonstrated by the sympathetic broadcasting of Herbert Morrison who captured the tragedy in words.

This conclusion provides further proof that traditional radio is still vital in times of disaster and catastrophe as reflected by its role throughout history.

Further Reading

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Candlesticks, Apples & Biscuits

Marco C. van der Hoeven introduces us to the fascinating history of the microphone, explaining, via his new book, how microphones can both make history, and be witnesses to events of the past.

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The history of radio spans a hundred years and has brought about a tremendous change to the world. News from everywhere now reaches us in an instant. Our 'global village' would be inconceivable without microphones – the instruments that convert sound waves into electrical signals.

In the 1920s, they were named 'transmitters', although the word 'microphone' already existed, and later 'microphone' became the general term.

Microphones transformed from terrifying monoliths into beautiful *Art Deco* objects. From stylish 1950s space-age design to modern shapes that rest comfortably in the hands of pop stars and karaoke singers.

Here then, is a summary of their rise and influence, from early radio to their use today; journalists rely on 50-year-old microphones, and recording studios still use vintage microphones, on account of their superb sound quality. Their iconic shapes are as familiar as the Model-T Ford cars and Levi's 501 jeans.

Early Microphones

Those first 'transmitters' were of the 'candlestick' type (Fig. 1). They were, essentially, telephones with the earpieces removed. These 'carbon microphones' had a capsule in which loose carbon grains between a thin metal front plate (diaphragm) and thicker backplate were compressed by sound waves. When a constant current flowed through it, the change in resistance could be converted into an electrical signal.

The sound quality of these early carbon microphones was good enough for the spoken word, but not for music, because the current flowing through the carbon granules produced an audible hiss.

In Europe, in the Netherlands, in November 1918, radio manufacturer Hendrik Schotanus Idzerda used such a telephone to broadcast the first of several pre-advertised musical radio programs from his studio in The Hague. He is considered to have been the first European radio broadcaster.

The transmissions even reached enthusiasts in the UK.

When good-quality radio stations came about in the mid-1920s, the need for better microphones arose. Within ten years, all the kinds of microphones were developed; they are still in use today.

Carbon microphones were improved in the US. In 1923, in Germany, Eugen Reisz presented an even better variant: the Reisz microphone. Here, grains of carbon were contained in a marble block with two electrodes and sealed off by a thin rubber membrane. The sound quality was much better, and the Reisz microphone became the choice of radio stations emerging all over Europe.

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German radio started in Berlin the same year, and the program consisted of reading the news. However, an early gymnastics instructor once caused a scandal, by urging people to exercise naked, in front of an open window. In England, Marconi obtained a license to build Reisz microphones. They were given a different appearance. The Reisz microphones were rectangular marble blocks, and the Marconi ones were octagonal.

King George V himself was presented with an early 'royal' specimen.

The Recording Era

From 1925, electrical recording became the standard and offered a great improvement. Previously, recordings had been made with acoustic horns with a needle at the end to etch the sound directly into the grooves. Therefore, only loud instruments and voices could be captured. The new electric system and more sensitive microphones allowed recording softer voices and instruments, like guitars and double basses.

The new medium of film also used the new recording technique: *The Jazz Singer*, from 1927, starring Al Jolson, was the first film with synchronous sound, and audiences loved it. Within a few years, sound films ruled, and silent films had reached a dead-end, although not everyone was convinced. Charlie Chaplin, for instance, did not make his first 'talkie' (*The Great Dictator*) until 1940. His speech at the end of the film, in which he called for peace and tolerance, was impressive and is still relevant today.

Some film actors' careers came to an early end because their voices did not match their 'image', but all who spoke in front of the microphone were uncomfortable. It was like an

ALL PICTURES: MARCO C. VAN DER HOEVEN

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Fig. 1: A Candlestick & Reisz M 109 microphone. Fig. 2: A Siemens & Halske ELM 25 and a Neumann CMV. 3. Fig. 3: The STC 4021 VIE microphones. Fig. 4: The STC 4033 and the Shure 55 E model. Fig. 5: A BBC type A and an STC 4104 mic. Fig. 6: The Sennheiser MD 421 and MD 21 dynamics microphones. Fig. 7: The author's book, *Witnesses of Words - How 20th Century Microphones Made History*.

all-seeing eye looking down upon the speaker, who often broke a sweat, realizing that countless people at home were listening. To accommodate speakers and singers, the microphones were hidden, often under a lampshade. Actors spoke in costume, like in the theatre. It was especially difficult for comedians since there was no response to the jokes they made.

To solve this, audiences were brought into the studio.

Once singers were familiar with the microphone, they developed a new technique called 'crooning'. Softly singing close to the microphone, the crooners sounded romantic and intimate. This was a revolutionary change. The singer seemed to sing right into your ear, especially for you. This new style brought huge popularity, and an audience of millions, to stars like Bing Crosby and Frank Sinatra.

The microphones used for music and film were condensers, and their operating principle is as follows: capacity changes due to air pressure in a capacitor are converted into an electrical signal and pre-amplified by tubes. Originally conceived as a test tool, condensers turned out to deliver much better sound quality than carbon microphones, but they were fragile and prone to failure. In Germany, this American invention was studied closely. In 1928, Georg Neumann in Berlin began serial production of his improved version, the Neumann CMV 3 (Fig. 2).

PA Systems and Propaganda

A closely-related new invention was the public address (or PA) system. It could deliver amplified sound,
to make speakers heard at large public meetings. In this way, it created the means of addressing immense crowds. The earliest user was US President Woodrow Wilson: In 1919, a sound system was set up at San Diego Stadium to address 50.000 people, for the first commemoration of Armistice Day.

Now that a speaker behind the microphone could reach large crowds, dictators like Mussolini in Italy would make use of the new medium. When he seized power in 1922, he used propaganda in media like cinema and radio broadcasts, to reach the entire Italian population, 28% of which were illiterate.

Hitler was another avid user of the microphone; since the Führer was often seen in front of the Neumann CMV3, it was nicknamed the 'Hitler Bottle'. His speeches in front of large crowds were enhanced by an extra Neumann near his feet to amplify his stomping boots. The vile voice of his propaganda minister Goebbels turned out to be better suited for radio, than his master's.

Like in Italy, cheap radios were distributed to the population.

Ribbon and Moving Coil Microphones

The third type of microphone had been invented in Germany in 1924 – the ribbon microphone. In this type, a thin strip of aluminium stretched between two magnet poles, produced a small voltage when sound waves reached it. The sound was very natural, and the symmetrical design, sensitive to sound from both sides, produced a 'figure-of-eight' recording pattern.

Until then, all microphones had actually had an omnidirectional pick-up pattern; the ribbon design allowed use from the front and back, for instance, situated between an interviewer and interviewee. Because pick up from the sides was minimal, these microphones were great for film; next to a noisy mechanical camera, they registered only the action in front of them.

In the US, the ribbon microphone was further developed at RCA (Radio Corporation of America). Their RCA 'Velocity' microphones, would dominate the US market until about 1960. In 1933, the BBC introduced its Type A ribbon microphone, based on the RCA 44A design. The latter was a quality microphone

but far too expensive, with a price of £130. The BBC version, built by Marconi, cost £9 (currently about £400), It became the standard microphone for broadcasting in the studio, and its angular shape remains an icon. However, ribbon microphones were not fit for outside use: a gust of wind could destroy the vulnerable ribbon.

A different type of microphone was the moving-coil dynamic microphone. With this device, the sound hits a diaphragm and moves an attached coil suspended in a magnetic field; this generates an output voltage – like a loudspeaker in reverse. The first dynamic microphones were developed in the US, by Western Electric. The WE 618 was introduced in 1931. In the UK, it was made (as the 'STC 4017') from 1933 onwards.

Leaders' Broadcasts and Wartime

It was not just dictators who would use microphones to their advantage: US President Roosevelt held 30 'Fireside-Chats', on radio between 1933 and 1944, to encourage listeners during the economical crises and the Second World War. It was the first time a leader directly addressed a large part of the population, and it increased his popularity enormously.

In 1935 a successor to this dynamic microphone was introduced. The smaller Western Electric 630 'Eightball' (in the UK version the STC 4021, Fig. 3) was nicknamed 'the Apple and Biscuit'. The 'apple' (the circular housing) interferes with the sound waves as little as possible, the 'biscuit' (the disc at the top) is an acoustic filter for balanced frequency response. Its size was only 2,5 inch, the weight was 383g, almost one-third of that of the bulky STC 4017. The electrical symbol for a microphone is based on the STC 4021 shape.

These microphones contributed significantly to air defence during WW2. Alan Blumlein, the famous English audio pioneer and inventor of 'Stereophonic Sound', had devised the 'Virtual Impact Equipment System', using two STC 4021s to locate enemy aircraft by the noise their engines made. Coupled with a strong searchlight, British artillery could now target and destroy German aircraft.

Since amplification of omnidirectional microphones through PA systems inevitably led to the dreaded 'howling' sound of feedback, solutions were needed to solve this problem. At WE's Bell Labs it was discovered that by combining the pick-up patterns of a ribbon and a dynamic transducer a directive signal was obtained. The model in which these two capsules were combined was the Western Electric 639 'Birdcage', from 1939 (Its UK equivalent was the STC 4033, Fig. 4). These microphones would be indispensable in the next 25 years, for film, studio work and PA purposes.

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Later, the Shure company presented their Unidyne 55 the same year (Fig. 4). This model was a directional microphone, containing just a dynamic element. It was easier to produce and thus cheaper. This 'Fatboy' was widely used – in the US Congress, by the US military, but also in Sun Studios, for the hit recordings of Elvis, Johnny Cash, Roy Orbison, and many others. Its iconic design was inspired by the grill of a 1937 Oldsmobile.

Europe was heading towards a new war, which finally broke out in 1939, after the invasion of Poland by Nazi Germany. All countries involved in the war used radio as a propaganda tool. On May 13, 1940, UK prime minister Winston Churchill, held his famous *"I have nothing to offer but blood, toil, tears and sweat"* radio speech, to inspire the nation. The BBC gave governments in exile – like the 'Free French' and the Dutch – the means to broadcast encouragement to their countrymen in occupied Europe.

Postwar Developments

After World War Two, the (West) German Neumann company became the major manufacturer of quality condenser microphones and is still the number one brand. The top model was the U 47, from 1949 (a modernised CMV 3). This device is still used to record number one hits in the most expensive studios and costs more than £20,000 secondhand. Frank Sinatra refused to record with any other microphone, and Bono is a user too. However, to most people, Neumann might be better known for his invention of the rechargeable nickel-cadmium (Ni-Cad) battery.

In 1951, the BBC issued an improved close-distance commentator's ribbon lip microphone, the STC 4104 (Fig. 5). It was suitable for outside work, in situations with high background noise. After 70 years, these are still sold and used today. For example, at the 2010 FIFA World Cup in South Africa, they were indispensable for avoiding the nerve-wracking noise of vuvuzelas.

Sound Engineers and Spies

Movie sound engineers frequently needed to record sound from further away. For radio, and in concert halls, use had been made of parabolic reflectors, with a microphone directed at the dish. In America, Electro-Voice made an improved microphone for the film industry: the EV 642. This 'shotgun' directional dynamic microphone could pick up sound from a great distance. In 1952, RCA produced

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the BK 1 'Ice-Cone'; a revolutionary design because it was the first axial type. Before this, all microphones had been side-addressed models. It was the (US) 'Presidential' microphone until the end of the Sixties.

In post-war West Germany, Sennheiser produced two extremely successful dynamic models: The MD 21 omni from 1953, and the directional MD 421 ('The Razor', Fig. 6) from 1960. Both remain popular for use in live events and the studio, and they keep selling in large numbers.

Spies and secret agents, of course, used special microphones ('bugs'). Many were mobile, hidden in a watch, with a small, tucked-away wire recorder, others were stationary, concealed, for instance, in a flower vase or behind a painting. In 1960, in the US Embassy in Moscow, it was discovered that the Great Seal, which was hung over the ambassador's desk, had been converted to function as a bug. The walls really did have ears!

Wireless Freedom

So far in our story, microphones had always been fixed on stands. However, performers like Elvis Presley dragged them all over the stage. At the end of the 1950s, the Austrian firm AKG built the first handheld dynamic cardioid microphones (D 19 and D 24). Singers used them casually, sitting on a stool, or walking across the stage. The D 19 is a collector's item: it was the Beatles overhead drum microphone at Abbey Road studios. Another Beatles-related microphone was made in the UK, by the Reslo company. Their small ribbon model RBT is sought because it was used as Beatles vocal microphone, at the *Cavern Club*.

In 1965, Sony introduced the first transistorized condenser studio microphone: the C 38 FET. FETs are now the studio standard. For live pop music, rugged dynamics were used. Among the best-known ones are the Shure SM 57 and SM 58 – hundreds of thousands of these have been sold. Even though they date from 1965 and 1966, they are still popular and remain in production. The SM 57 has been the (US) Presidential microphone for every US president since Lyndon B. Johnson in 1965.

Whatever Boris Johnson and others say in British Parliament is picked up by an AKG D222 dynamic, dating from 1968. Perhaps 'Brexit' will lead to its replacement by modern UK alternatives, like Extinct Audio's 'Black Ops' model, made to withstand loud shouting.

Around 1980, Sennheiser presented mini microphones with wireless transmitters, for TV and theatre, and they are also still used today. Wireless microphones brought the last major change, by freeing artists in their movements. Head-worn models even offer the opportunity to dance and sing at the same time, as Madonna and Beyonce do so well.

Therefore, vintage microphones have a great past and future – they are definitely here to stay.

If you are interested in learning more, check out my book *Witnesses of Words - How 20th Century Microphones Made History* (Fig. 7) at the URL below. I would like to think that this is a unique book, showcasing fascinating stories about the famous and infamous people behind the microphones of the day, and of the words they spoke. There are photos of over 400 microphones and many illustrations. The price is £25, plus postage.

www.witnessesofwords.com
vintagemicworld.com

*[Marco C. van der Hoeven is a Dutch sound engineer, former musician – and microphone collector – **Ed.**].*

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ALL PICTURES: KEITH HAMER+GARRY SMITH, EXCEPT FIGS. 3 AND 4: TALKING PICTURES TV

1

A Breath of Vintage Air

Keith Hamer and **Garry Smith** take an unashamedly nostalgic look at the early days of cinema and TV and offer an intimate portrait of the Talking Pictures TV channel.

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If you are currently struggling with the vicissitudes of life (and who isn't with the Coronavirus pandemic?), then cast your mind back to earlier, more tranquil days. Readers of a 'certain age' (that's a gentle euphemism meaning you're entitled to a bus pass, like the authors!) may find solace by thinking about their early visits to the cinema or 'the pictures', also known colloquially as 'the flicks'.

In the Twenties, as a child (please note, this is long before the authors' days!), you could go to the local 'Picturehouse' and pay 1½d entrance charge (around ½p in today's money). Alternatively, you could sneak in while the commissionaire was not looking. Here in Derby, we had around 20 grand, and not so grand, cinemas with names which will be familiar with many *RadioUser* readers throughout the UK.

These included The *Regal*, complete with a theatre organ and organist, majestically rising in front of the screen (it later became The ABC), The *Gaumont* (which, over the years, morphed into The *Odeon*, until it became a pub, restaurant and a nightclub), The *Coliseum* (which was converted into a pub, then ultimately part of a shopping centre), The *Essoldo* (which was transformed into a bingo hall before being demolished), and The *Cameo* (which closed in 1959. Today, it is a restaurant).

There seems to be a common theme running throughout the history of cinemas, at least in the authors' home town. They all closed and became pubs, bingo halls, or were simply demolished.

In Derby, there was also The *Cosy* in the Twenties where Keith's Mum spent many happy hours sitting in the plush seats together with "a ha'penny bag" (½d) as it was known.

This was a small selection of sweets from a local shop. The rest of 'the gang' would turn up and everyone would eagerly wait for the film to snap so they could all boo loudly, with great delight, at the projectionist! One particular favourite film of Keith's Mum was the 1931 classic featuring sinister organ music, *The Galloping Ghost*.

Stepping into Another World

In those days, few homes had a television set and even fewer - if any - boasted the kind of luxury that greeted cinema-goers, such as central heating, bright lights, chandeliers and luxurious carpets.

For most, this was like stepping into another world.

Fig.1: Talking Pictures TV's very own 'Intermission' screen. Fig. 2: The Regal Cinema in Derby, next door to Wigfalls.

As kids, the authors often went to the pictures in the early Sixties, armed with packets of *Wagon Wheels* (which were much bigger in those days) and enough pocket money to buy a carton of the all-important soft drink, Kia-Ora, made from fruit concentrate! The usherette promptly escorted us to our seats using her red torch. Care had to be taken to make sure the spring-loaded plush seats folded properly; then it was time to settle down and, perhaps, watch the last ten minutes of the main feature film which was probably a Western. In those days, you could walk in and leave at any time. Indeed, film-goers could stop there all day if they wished. Of course, children were ushered out long before the X-rated offerings flickered onto the silver screen.

After the main feature film came the relaxing 'Intermission' (Fig. 1). The lights were slowly turned up, the silk-like curtains glided automatically to form a veil across the huge screen, bouncy light music emanated from the high-quality loudspeaker system and usherettes magically appeared from nowhere bristling with tempting drinks, including the aforementioned *Kia-Ora*, and *Lyons Maid* ice-cream in small tubs – *Lolly Gobble Choc Bomb* wasn't on offer in those halcyon days! Then the music faded to be replaced by a selection of short, professionally-made glossy advertisements from *Pearl & Dean* (together with some not so professional or high-quality local commercials), followed Pathé News films, then a series of exciting promotional snippets to entice viewers to return next week for more thrilling entertainment. After all that, it was time to endure the B-film. In the evenings, at the end of the adults' entertainment, there was always a mad scramble to vacate seats as soon as the credits declared *"The End"*. Yes, it was time for the National Anthem to be played and the last bus home!

Film-goers felt as though they were sinking into pure luxury as they settled down in their plush, upholstered cinema seats. Unfortunately, this was not always true in reality. One of the authors (Keith) was a GPO (later, BT) telecommunications engineer in Derby. He was also seconded to the Public Relations department as a reporter and photographer for the staff magazine, Link-Up. A fellow engineer worked as a cinema projectionist in his spare time and the editor wanted a story for the magazine.

Duly armed with a notebook, pen and camera, Keith went to The *Regal*, whilst the cinema was closed for a few hours. The original glowing impression of the sumptuous seats experienced in the darkened theatre of yesteryear soon evaporated into a state of horror in the full glare of the house lights. Instead of taking his reporting equipment, Keith should have taken a pair of thick Marigolds and a bottle of Dettol!

The state of the seats was horrendous. The cinema was located in East Street, right next door to *Wigfalls*, a mainly north of England company for which our other author, Garry, worked as a radio and television engineer (Fig. 2). Many traditional cinemas throughout the country had disappeared by the mid-Eighties. In 1985, the first UK multiplex cinema opened its doors at The Point in Milton Keynes. Multiplex cinemas soon sprang up all over the country. Alas, the bubble of enthusiasm did not last too long, and there has been a sharp decline in their popularity over recent years. Some small traditional-style independent cinema chains have opened in recent years such as Picturehouse, Everyman and Curzon, but these are far and few between.

Fortunately for lovers of well-produced vintage films, there is now a television channel available, which positively oozes with sprocket holes, clapperboards and chinagraph pencils from days gone by!

Talking Pictures TV Begins

Seeing a potential niche market, a family in Hertfordshire, rooted to its core in film history, decided to start their own television company. Talking Pictures TV celebrated its Fifth Birthday in 2020.

The station, launched on May 26th, 2015, broadcasts an around-the-clock service. It was founded by former film producer and editor, Noel Cronin (Fig. 3) and is run by his daughter, Sarah Cronin-Stanley (Fig. 3), together with her husband, Neill Stanley.

Whereas the BBC may require countless sprawling buildings and around £3.5-billion each year from licence-payers to survive, by contrast, Talking Pictures TV is certainly not a 'big-budget' organisation. It is run from an ordinary house in a normal street in a village near Watford. The station operates from a house extension in the garden, and that is about it!

Noel began his career six decades ago in the post-room of a well-known British film studio. You know the one - they used a big muscular guy bashing an over-size dinner gong as their symbol!

Sarah, a former actor, is Managing

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Director and owner of the station with a passion for vintage TV. Neill makes sure that they comply with all the strict broadcasting regulations and also produces podcasts and the fascinating weekly newsletter.

Sarah@talkingpicturestv.co.uk

It soon becomes apparent, after settling down with a mug of Horlicks (or maybe something stronger!) to watch a film, that the station is extremely attentive about showing warning captions. It seems as though there would be such a dire warning ahead of even a *Mickey Mouse* cartoon.

Vintage Film Today

There is, however, a very good reason for this. The station's love of showing vintage films with language and certain themes from a bygone era caused a spot of bother with the media regulator, Ofcom. It pounced on

the station in 2018 for broadcasting several films which, in their opinion, included racist language.

Since then, any film with even the mildest of offensive content is trailed appropriately. It is a pity Ofcom does not show such vigour with mainstream television broadcasters as well as BBC Radio 4!

Another niche channel, Forces TV, started showing advisory captions towards the end of June 2020. Meanwhile, Sarah and Neill's 10-year-old son, Archie loves Laurel and Hardy, which never needs a warning caption (Fig. 4).

The daily schedules include films in multiple genres, such as comedy, drama,

Fig. 3: Noel Cronin together with daughter, Sarah Cronin-Stanley. Fig. 4: Noel (right), Sarah, Neill, and their ten-year-old son, Archie, outside the bijou headquarters of Talking Pictures TV. Fig. 5: A rare breakdown apology caption, captured by the authors. Fig. 6: A promotional poster featuring the ever-present actor, Sam Kydd. Fig. 7: The Gaumont-Kalee cinema projector.

thrillers, and horror. Noel personally plans the schedules and writes them out every week.

The station has recently revamped its fare to include classics such as Up the Junction (starring Dennis Waterman), *The Spy Who Came In From The Cold* (a thriller starring Claire Bloom and Richard Burton), *The Go-Between* (Julie Christie), and the late 1970's television series, *Quatermass* (featuring John Mills).

Fortunately, breakdowns seldom happen on Talking Pictures TV, but the authors did manage to capture one such rare event (Fig. 5).

In-house productions are also broadcast with films from the family's own back-catalogue, as well as various series from the long-since defunct television station, Southern TV, which held the ITV broadcasting franchise for the south and south-east of England from August 30th, 1958, until its closure on December 31st, 1981. The channel, with headquarters in Southampton and Dover, was broadcast from the main transmitters located at Rowridge (Isle of Wight), Dover, Hannington, Midhurst, Whitehawk Hill, Heathfield and Chillerton Down, plus their associated relay stations.

The authors were privileged to have a private look around the Southampton Studios in 1974 with tour guide and well-known TV DXer, Roger Bunney. Talking Pictures TV also shows early American television productions.

Material is normally copied onto video directly from film reels, and damaged films from the back-catalogue are occasionally replaced by licensed productions supplied from archive film libraries.

A British Cinema History Treasure Trove

The original idea of setting up the company dates back to 2007. One of the main aims of the founders was to maintain the history of British cinema. In earlier years, older films, including those made in the 'good-old-days' of black-and-white were often transmitted regularly by terrestrial stations, such as the BBC and Channel 4.

Sadly, such offerings had declined drastically by the end of the Nineties with only the best-known classic films being occasionally aired. Sarah said in 2016, *"People were interested in the big titles but my father, Noel, wanted to save the smaller, more obscure titles, from getting lost."* Unfortunately, television networks rejected the idea of showing less well-known films, unconvinced that the format would be popular with viewers. Not to be deterred, the family decided to set up their own channel.

Sarah later explained that the channel would specialise in *"the things people have forgotten"*.

For over two decades, Sarah and Noel have been patrons of a DVD membership society, The *Renown Film Club*, for fans of B-film classics. Noel joined the Rank Organisation in 1962, aged 14, delivering post at their film-processing laboratories in Park Royal, west London. He distinctly remembers the unique smell of the Guinness factory and the characteristic chimneys. He then progressed to film cutting rooms in Mayfair and bought the rights to several libraries that owned films which are now shown on their channel, including most of the Southern Television library.

DVDs

Many of the films shown on Talking Pictures TV are available for purchase on DVD. They are often sold as compilations under different genres, via the distributing company, both on-line and through the *Renown's* telephone service. Each DVD set is full of films produced between the 1930s and 1960s and these are sold at the extremely attractive price of just £20, including UK postage and packing.

The bargain discs also include special features, such as interviews and background history. A varied selection of other merchandise is also sold via the website including mugs, clothing, biographies, and calendars, not forgetting some popular Joan Collins and Diana Dors compact mirrors!

The first 3-CD compilation set from *Renown* was released in the spring of 2019. Called *Hits From The Flicks*, the discs featured songs from musicals and

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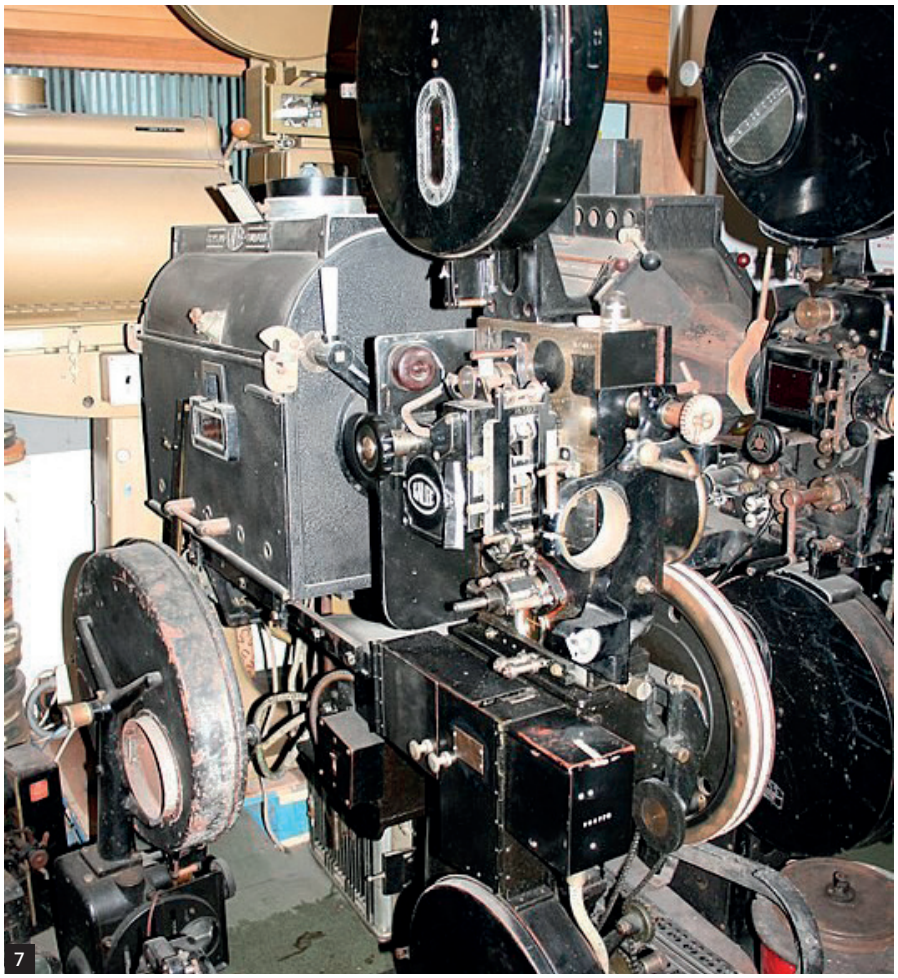
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films with pop song theme tunes that had been shown on the channel. This catchy compilation is still being promoted at the bargain-basement price of £20. As the announcer with a pleasing, well-modulated voice says: *"Don't delay, order today!"*

Just in case you are wondering, no, unfortunately, we are not acting as agents for *Renown*!

Annual Film Festival

To celebrate classic British films, the channel's producers have also created the *Renown Film Festival*. This is an annual all-day spectacular and usually takes place in February at an impressive theatre somewhere in

Hertfordshire, such as St. Albans. The events feature guest appearances by actors whose films have been broadcast, as well as interviews with film historians.

There are also screenings of epics that were once considered lost, together with memorabilia available for purchase and autographed by the actors. There was normally just one festival each year but in October

2019, due to its overwhelming popularity, a second event was held at the very impressive Stockport Plaza. This was the *Renown Film's Sixth Festival of Film*. Although tickets soon sold out for the St. Albans 2020 Festival, sadly, it had to be cancelled, due to the Coronavirus pandemic.

Glimpses of Education

In addition to the normal feature films, there is also an interesting strand called *Glimpses*. This features short educational films (of typically 20 minutes duration), mainly from the Forties and Fifties. There has been a fascinating selection of subjects in recent months. The films have covered, in amazing detail, topics such as how early television worked, buses and general transport, film production, Lambretta scooters, and home-made trick photography using a ciné camera and mirrors!

It has been estimated that during the Coronavirus pandemic, weekly audience figures shot up to a staggering six million viewers. The station certainly receives many telephone calls of support, plus an amazing amount of fan mail from avid and extremely loyal followers.

It is rumoured that even the Queen occasionally tunes in!

Talking Pictures TV was originally launched on the Sky Television platform. Since 2015, the channel has expanded to become available free-to-air via Freeview (channel 81) and Freesat (channel 306) in addition to cable television. Readers are encouraged by the station owners to contact them for a chat.

https://talkingpicturestv.co.uk

The channel's operators are always interested to know what viewers like and dislike, particularly their favourite actors. One actor who continually pops up in vintage films and is never far from the silver screen (or the 16:9 version!) is Sam Kydd, and his photograph was used for a recent promotional poster (Fig. 6).

If you are agonising about the titles of the jaunty little ditties used between films, sit back and relax. After hours of searching through literally thousands of our library music recordings, we can reveal that they are called *Opening Night* and *Fly-Past*. Incidentally, the Continuity Announcer with the golden voice is Martin Cox.

Finally, if you are wondering about the type of cinema projector shown briefly in the short trailer sequences, it was a Gaumont-Kalee (Fig. 7).

That, however, is a fascinating topic all of its own, as we found out during our research. It is amazing what you learn by reading *RadioUser*!

Understanding a Typical Common Propagation Banner

Robert Gulley K4PKM
ak3q@ak3q.com

Can you tell your Solar Flux Index from your X-Ray Intensity Value? Your K-Index from your 304A Measurement? Robert Gulley unlocks the wealth of information contained in those ubiquitous propagation diagrams.

Propagation banners are both prolific and cryptic. Many radio websites contain these banners, and the numbers and abbreviations contained therein are often more than a bit confusing. Sadly, most of us do not take advantage of the wealth of information provided by these banners. In this article, I am providing some brief information on each category, in the hope that these reports will become more understandable, as well as more useful.

There are numerous variations of banners, but many of these have data sourced from just one or two reliable locations. The most common banners are usually the product of Paul Herrman, N0NBH (such as those found on the RSGB website:

https://tinyurl.com/y3luwnx3

All the images from his site are used with his permission (Fig. 1).

Another great propagation site is *Make More Miles on VHF:*

https://www.mmmonvhf.de

And for a fascinating look at Solar Conditions, check out the Space Weather Services website, maintained by the Australian Government

http://www.sws.bom.gov.au

Commonly found on amateur radio sites, these banners are not just useful for amateur radio operators, however, but are of great interest to short wave radio listeners, utility monitoring folks, and a whole host of other radio-related hobbyists and professionals.

Unfortunately, most amateur and short wave radio folks only look at one or two numbers to determine propagation conditions. This practice yields a less than accurate understanding of solar and atmospheric conditions, as these numbers can tell us so much more.

Now, I admit to being one of those who used to be looking at the K and A indices only for many years.

I was just interested to see mainly which bands were listed as possibilities for some activity.

However, one day my curiosity got the best of me, and I started trying to learn what all the other numbers meant. Now I am by no means a propagation expert, but what I discovered has been quite helpful in understanding current conditions, as well as indicating possible future conditions. I hope the following explanations will help you as well.

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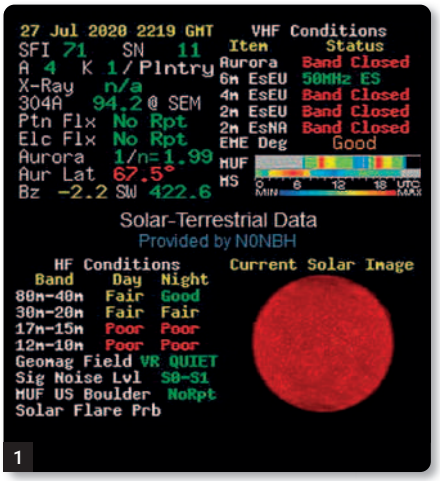


Fig. 1: A sample common propagation banner.
Fig. 2: The characteristic 'teardrop-shape' of the Earth's Magnetosphere.

The Solar Flux Index (SFI)

Let us begin with the Solar Flux Index. This is one of the most common numbers appearing on these banners, along with the Sunspot Number (see below). This index helps us measure the level of atmospheric radiation arriving from the Sun.

The SFI is considered a reasonably good indicator of the F-layer ionization level, although it does not tell the whole story. There are many other factors which affect propagation, and a high or low number does not always reflect actual conditions, as we will see.

The 2.8 GHz measurement (sometimes called the '10.7 cm Flux') is measured daily with typical ranges between 60-300. Higher numbers usually indicate higher MUFs (Maximum Usable Frequency), and therefore higher bands for DXing. This number should be seen more in terms of a *pattern*, rather than a specific daily indicator.

A high Solar Flux Index on any given day does not mean conditions will necessarily be great; however, several days of a high SFI can mean that favourable conditions have developed, which will offer good DXing on some of the higher bands.

The Sunspot Number

Sunspot numbers indicate overall sunspot activity, and the size/quality of the sunspot groups (not just the number of individual sunspots, as I used to assume!). These can range from '0' to '250', with higher numbers indicating more upper-level ionization. Folks start talking about them on the ham bands when the sunspot numbers are up because they are a particularly useful indicator of when upper bands might allow some serious DXing. Of course, the same is true for short wave reception.

For example, an SFI of 126 is respectable (and this would be so welcome in our current solar minimum!). This might indicate possible upper-level ionization, but we may also notice a rather low sunspot number, say 49. The SFI may indicate strong solar activity. However, with a low sunspot number, we will see moderate band predictions.

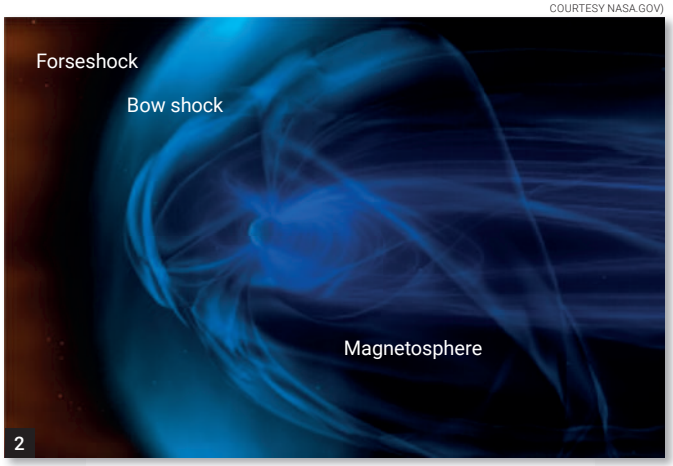
Sunspot numbers are averaged monthly over 12 months. The 12-month average gives the best correlation for propagation activity, but it does not account for unusual sunspot activity. (And unusual solar activity may not be immediately reflected in other indices as well, if at all. One just cannot contain nature in a tight little box!)

The A and K Indices

The A and K indices are the other two most commonly read indicators of ionosphere conditions, and folks will often refer to the K index as an explanation for good or bad propagation conditions.

The A Index is an averaged number, meaning it is based on the previous day's readings. The A index is a scaled value in the range of 0-400. The K index is based on the latest average of eight readings taken every three hours from around the world. The K index is a logarithmic value, 0–9, with levels of 4 or more indicating a geomagnetic storm. A high level of geomagnetic activity can lead to HF radio blackouts

COURTESY NASA.GOV)



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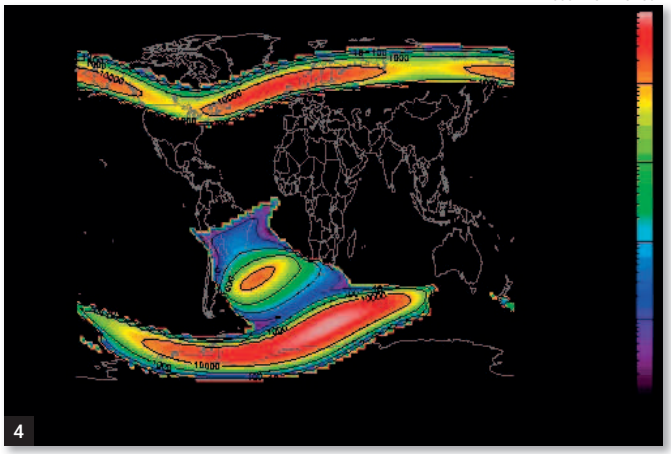


K Index Ranges
K0=Inactive
K1=Very quiet
K2=Quiet
K3=Unsettled
K4=Active
K5=Minor storm
K6=Major storm
K7=Severe storm
K8=Very severe storm
K9=Extremely severe storm

A Index Ranges
A0 - A7 = quiet
A8 - A15 = unsettled
A16 - A29 = active
A30 - A49 = minor storm
A50 - A99 = major storm
A100 - A400 = severe storm

X-Ray Intensity (XRY)

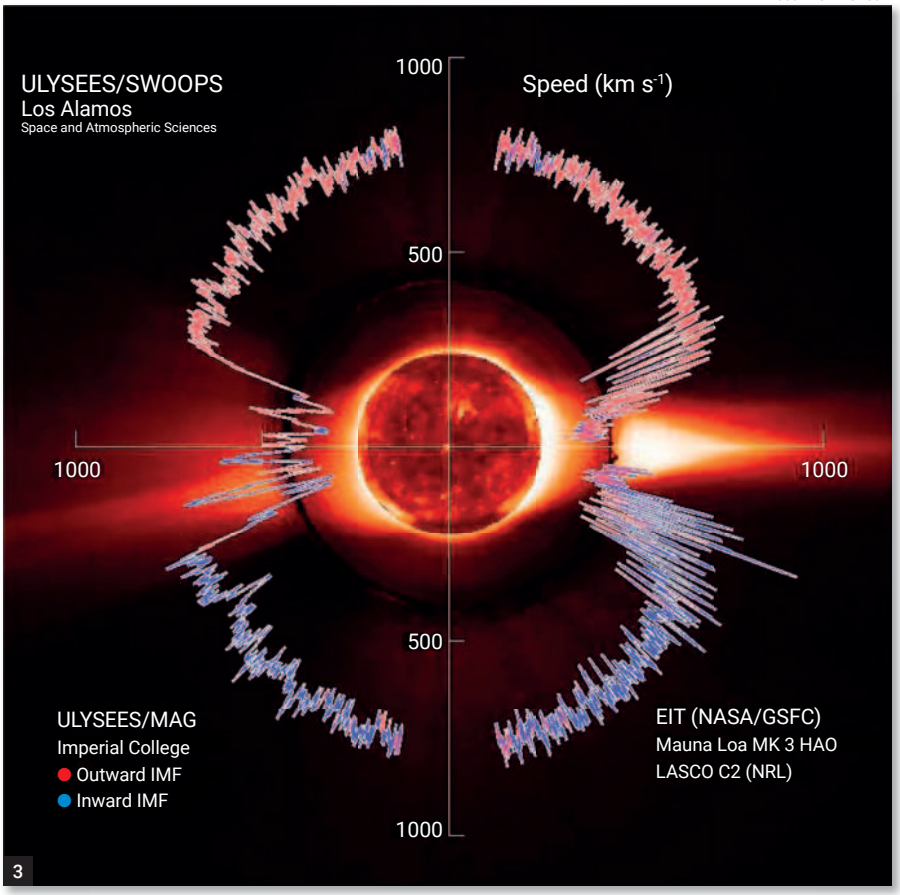
The XRY reading is a measure of the X-ray intensity of X-rays hitting the atmosphere. 'B' and 'C' readings indicate the lowest levels of activity, while readings of 'M' and 'X' indicate possible blackout conditions for Regions 1-2, and Regions 3-5 respectively.

More useful is the indication this number/classification gives for the D-layer activity. The D-layer is the layer responsible for blocking signals from the broadcast band up to 4-5 MHz during daylight hours.

If the X-ray level is high enough, the absorption effect of the D-layer is greatly increased, potentially reaching up through the entire HF band. This means that signals from earth never make it through to the F-layer, and therefore would not be reflected/refracted back to earth.

The X-ray intensity varies greatly with solar activities, such as solar flares and CMEs (Coronal Mass Ejections). X-ray intensity increases based solely on the strength of the solar flare. E-layer activity is directly affected by X-ray flux, whereas

COURTESY NASA.GOV



F-layer activity is more affected by the UV flux.

The 304A Value

This category refers to the solar radiation level measured in the ultraviolet light range of 304 angstroms (Å) produced by ionized helium in the sun's photosphere. Radiation in the ultraviolet spectrum creates much of the F-layer ionization, reflecting/refracting RF signals back to earth.

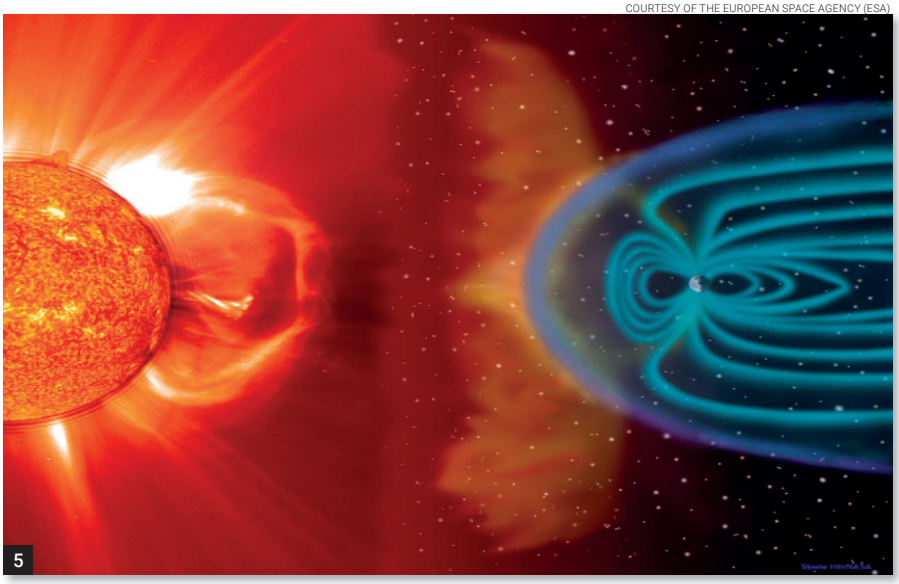
Two different measuring stations are used – one here on earth and the other comes from the SOHO satellite. The range is '0' to 'Infinity'. This number rises with increases in the solar flux index (SFI).

Fig. 3: Graphic showing the pattern of the solar winds. Fig. 4: Model of Electron Flux coverage based on NASA modelling.

The Interplanetary Magnetic Field Value (Bz)

The value for the Interplanetary Magnetic Field (Bz, Fig. 2) indicates a positive or negative 'pull' – with or against the Earth's geomagnetic field. The solar winds are responsible for carrying the interplanetary magnetic

COURTESY OF THE EUROPEAN SPACE AGENCY (ESA)



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COURTESY NASA.GOV

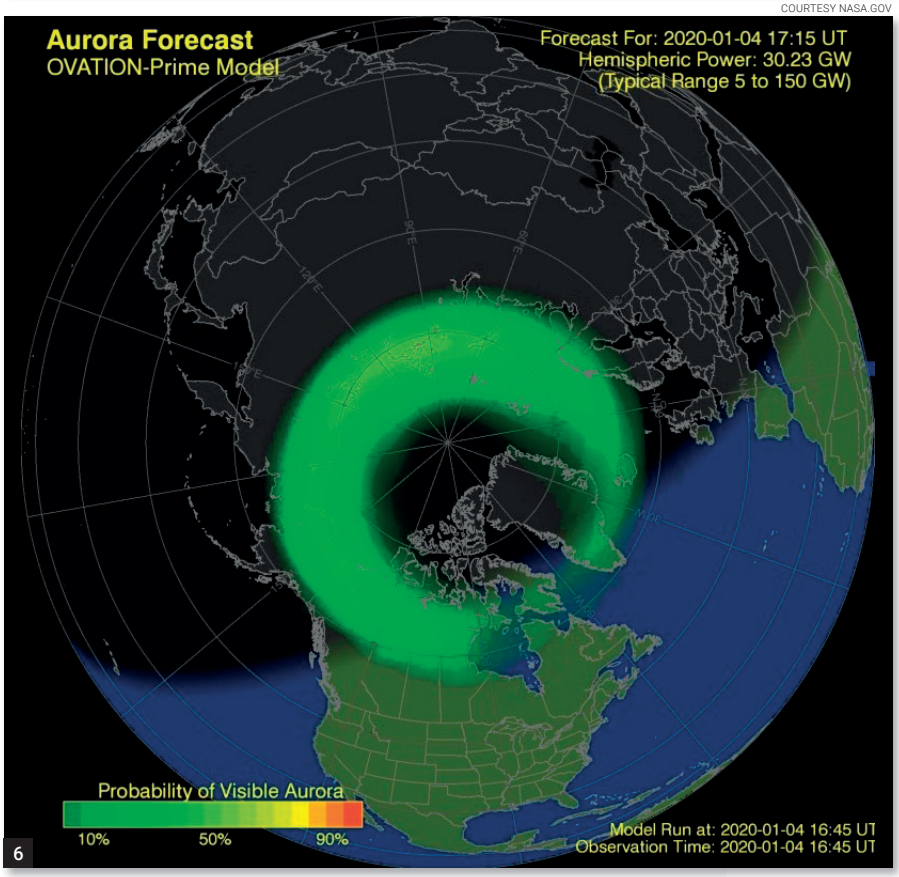

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Fig. 5: Image of Coronal Mass Ejection.
Fig. 6: - Example of an Auroral Oval.
Fig. 7: A Maximum Usable Frequency (MUF) map for VHF.
Fig. 8: A VHF DXCluster screenshot.
Fig. 9:– A Graphical representation of the current X-ray and Proton Flux numbers and geomagnetic activity.

field through space.

A positive value indicates the interplanetary field is *working with, or oriented in the same direction as*, the Earth's field. Negative numbers mean it is *pulling or distorting the earth's magnetic field* and therefore increasing the effect of geomagnetic disturbances. These effects are seen most readily when using weak-signal software, such as WSJT-X.

In effect, the shielding of the earth's magnetic field is reduced when the readings are negative. The geomagnetic field is a teardrop shape pattern giving us the north and south magnetic poles. The field helps direct ionization flow around the atmosphere. Fig. 2 shows a representation of the field, including the tail, which faces away from the Sun, and the Bow-Shock created by the resistance of the Earth's magnetic forces encountering the Sun's radiation forces. The magnetic field traps charged particles, which might cause a great deal of damage if they were to reach Earth's surface, as well as greatly influencing the shape and direction of radio signals.

The geomagnetic field is weakest near the polar regions and strongest near-equatorial regions, and on the night side of the Earth opposite the Sun. The variations in the geomagnetic field are much of what these forecasts are designed to predict because they are the most likely to affect day-to-day HF propagation.

This field, along with the Solar Wind measurement (see next section) are two of the most useful numbers I have found to explain varying propagation effects daily. If the magnetic field is negative along with a high Solar Wind count, conditions will be erratic or 'choppy'.

Solar Wind (SW)

The SW reading (Fig. 3) is a measure of the solar wind speed, ranging from '0' to '2000' km/s, with readings typically well under 500. If the speed increases to more than 500, there is increased pressure on the ionosphere, weakening it, and causing disturbances to the F-layer.

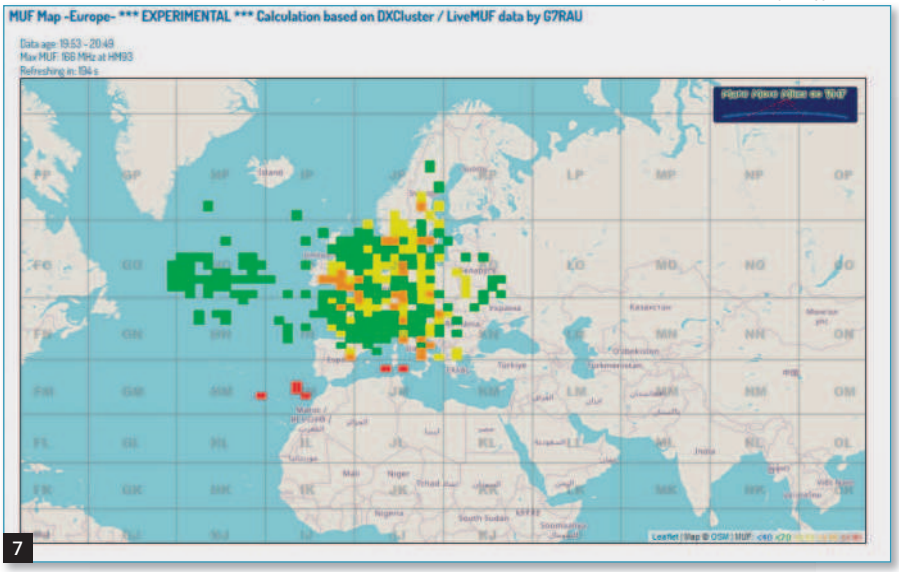
The solar wind contains charged particles and magnetic fields. Stronger winds will create a more distorted shape to the Earth's magnetic field—in effect 'flattening' it. This further reduces the magnetic strength at the poles, as well as causing the tail to extend even further behind the Earth.

The movement of the solar wind (or plasma) is outward from the sun. It fills an area known as the Heliosphere. The Heliosphere is a bubble-like region in space emanating from the Sun and expanding outward into the solar system. Galactic cosmic rays are partially blocked or reduced by the effects of the Heliosphere.

The Proton Flux (0-unknown)

The Proton Flux (PF) is a measurement indicating the density of protons in the magnetic field of the Earth, particularly along the polar magnetic lines. Solar flares and CMEs can cause proton storms, which allow for a greater influx of protons to penetrate the magnetic field, which in turn, causes a rise in the E-layer of the atmosphere.

ROBERT GULLEY K4PKM



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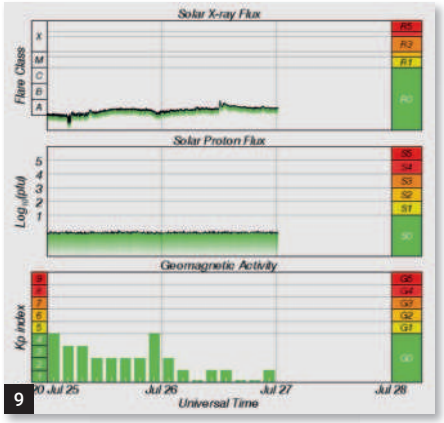
TOMAS HOOD



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This increase in activity can reduce or completely block signals from getting beyond the E-layer, effectively shutting down HF signals until the magnetic field stabilizes.

The protons are drawn into the Earth's magnetic field toward the poles, meaning they do not typically penetrate the lower latitudes. The increased levels can cause geosynchronous satellites to be interfered with, as well as Polar Cap Absorption events, or PCAs. Proton Flux levels must exceed 10 PFUs before this occurs. However, as long as levels remain this high, communication will be disrupted.

In addition to disrupting communications, extreme proton storms have been known to interfere with spacecraft equipment and optics, and some astronauts have reported seeing 'streaks' or flashes of light. This coincides with optical imagery issues experienced by cameras monitoring solar events.

Electron Flux (0-Unknown)

A similar measurement reported on solar banners is the Electron Flux (Fig. 4). Like the Proton Flux, an Electron Flux reading indicates the density of electrons in the magnetic field of the Earth. Increased numbers indicate potential interference with communications. Solar flares can dramatically increase electron density, affecting the E-layer of the atmosphere. Both Proton and Electron Flux are measured hourly.

Maximum Usable Frequency

The Maximum Usable Frequency (MUF BDR) is a measurement of the MUF at the given time from Boulder Colorado. MUFs are measured at various locations around the world, and each location will be different. Keep in mind that any MUF reading is *only a guide*, nothing is set in stone! The MUF may be quite low at night – and still, signals might come through on 19 or 22 m, for example.

Moreover, this reading is reflective of measurements taken from a specific area, so the MUF will be different at each location, as well as different at various times of the day. In all of this, to say it again, the MUF is only an indication; very often, signals will go beyond the reported/estimated MUFs in any given area.

EME Degradation

The Earth-Moon-Earth Degradation is a measure of expected EME conditions, based on signal attenuation for a given day, and dependent upon the sky noise temperature and the astronomical sky, along with the Moon's location in the sky. The measurements are from 'Very Poor' to 'Excellent', meaning an attenuation of >5.5 dB to <1.5 dB, respectively. For more information on EME and meteor scatter propagation, you can visit this URL:

http://www.mmmonvhf.de

Band Conditions Forecast

Many solar banners will include the band forecast for both day and night conditions. These are determined using the Solar Flux Index and the Sunspot Number. Again, these are only suggestions and are not necessarily accurate for any given location.

Many times, I have found good propagation conditions to prevail, when bands were reported likely to be poor, as well as encountering the reverse situation. This is why the more we understand all the resources available to us, the more accurately we can predict propagation conditions.

As an aside, when conditions seem to run counter to the general predictions, this is the very time to pay closer attention to the various numbers and their contribution to the whole.

The more focus we give to various individual indices, the more the significance of each category will become evident as one sees patterns emerge.

As an example, the aforementioned Solar Wind Indicator and direction of the winds (positive or negative), have taught me that a negative direction increases the chances for poor propagation more than might be indicated by the typical 'A' or 'K' indices.

The Geomagnetic Field

This indicator offers an indication of the level of disturbance to the geomagnetic field. This is based on the K Index value, ranging from 'Inactive' to 'Extreme Storm' over nine levels. The last three levels, 'Major', 'Severe' and 'Extreme' usually indicate blackout potential as well as high Auroral activity.

Signal Noise Level

The signal noise level is an indication of the interaction of the solar winds with the Earth's magnetic field. Increased solar wind activity means more signal noise (measured in S-units), and this number is updated every ½ hour. Following any strong geomagnetic

activity, the signal noise level may be very quiet, presenting a good opportunity to work on the lower bands.

Likewise, right after a solar flare, the MUF will be raised, but noise levels will be lower; therefore, daytime propagation will usually be better. This is because while the noise burst during a flare is significant, as soon as the flare is over noise levels drop considerably, *but the ionization levels are still high*.

Two to three days after a solar flare, there will be an impact from the shock wave of the flare. This can cause a geomagnetic storm. Again, after this storm subsides, noise levels can be quite low. Keep an eye on the noise levels during and after a solar event to make the best use of these opportunities.

Coronal Mass Ejection (CME)

The CME (Coronal Mass Ejection, Fig. 5) reading is a prediction of *when* the next CME is likely to occur. Unless there is a reason for NOAA to think that a CME is headed to earth, this reading is not updated. The colour code signifies the 'threat-level', with green being 'mild', yellow 'moderate', and red 'severe'.

Auroral Activity

Two additional categories are the Aurora and the Aurora Latitude Indicators. The Aurora number comes within a range from '1' to '10', with higher numbers indicating an expansion of the auroral oval (Fig. 6).

The aurora oval is an elliptical band around each geomagnetic pole. It normally ranges from about 75 degrees magnetic latitude at noon to about 67 degrees magnetic latitude at midnight. As greater amounts of energy strike the geomagnetic field at the poles, the auroral oval increases, meaning it moves to lower latitudes. This has the benefit of increasing VHF communications, at the expense of HF communications.

When the Northern and Southern lights are at their brightest – as a result of heightened auroral activity – there is the possibility of polar blackouts. The Aurora Latitude Measurement is the expected lowest latitude at which to find the auroral oval. The text is also colour-coded according to activity, with red being 'low activity', yellow 'high-latitude activity', and green 'mid-latitude activity'.

Some Additional Information

Other N0NBH banners may show some additional information, representative of some of the different styles of banners available on his site. This can include VHF propagation condition predictions, as well as a solar flare prediction category, similar to the CME prediction.

The VHF propagation tool is particularly useful during periods of expected E-skip and solar flare activity when VHF propagation is likely to increase dramatically. One of the lessons learned from studying the solar banners is that when HF conditions worsen, VHF conditions often improve, even if only for a few hours.

Some banners will give indications for the MUF specifically as it relates to VHF, while others will show the probability of E-skip conditions in various parts of the world.

As an example, the colour coding for E-skip Europe is Band Closed (Red) = No Sporadic E (ES) activity; High MUF (Green) (2M only) = Conditions support 2M ES; 50/70/144MHz ES = the respective band is open. There is also a meteor scatter colour-coded bar on the same banners, which indicates the probability of meteor scatter activity (from 'Min' to 'Max') and measured by the hour (UTC).

For more in-depth VHF coverage, I have found the following URL to be a very informative and comprehensive site.

https://www.mmmonvhf.de/index.php

In addition to propagation information, there are VHF DX Clusters, Forums, News relating specifically to VHF contacts, as well as Tropospheric Ducting meters, E-skip maps, and more. There is a wealth of information here, and it should be a regular stop when exploring propagation (Fig. 7).

A related site is VHFDX.eu, which shows VHF spots (Fig. 8). You can also check the VHF MUF, the current Sun/Moon Altitude and Azimuth values (ALT/AZI), as well as search for specific stations:

https://vhfdx.eu

Do not forget to check out *SunSpotWatch*, by former *RadioUser* propagation contributor Tomas Hood (Fig. 9). Here, you can view great solar images, study sunspot numbers and evaluate solar propagation predictions.

http://sunspotwatch.com

More than Meets the Eye

There is a wealth of information to be garnered, just upon a casual glance at one of these banners. However, as always, the greater benefit accrues from studying them in some more depth, discovering patterns, and applying the information in the real world, whether you are a radio amateur, SWL, or utility aficionado.

But do not forget that no amount of propagation information will help us make or log contacts unless we turn our radios on and use them! Propagation maps and banners like these can be a help or a hindrance depending upon how they are used. They can be a challenge or an excuse!

The study of propagation can be an enjoyable, life-long pursuit. Whether you are a beginning radio hobbyist or a seasoned veteran of all things radio, there will always be more to learn and patterns to recognize in the pursuit of propagation.

The resources list below will open up to you a wealth of background information on the subject of radio wave propagation and ionospheric studies for radio enthusiasts. I hope you will enjoy the ride!

[N.B.: The resources above are just an indication of the wealth of materials available in print and online, in the area of ionospheric studies and radio wave propagation. For more background, I would point you to our former column on Propagation *by Tomas Hood, and the* Radio Enthusiast *website, where I will put a longer reading list – **Ed**.]*

Further Reading

- Devi, I. et al (2008) VLF '*Propagation Characteristics in the Earth-Ionosphere Waveguide'; Earth-Planets-Space,* 60, 737-741
- Gulley, R. (2020) '*Radio Propagation Banners Explained*'; The Spectrum Monitor, May 2020: 21-24
- Hood, T. (2015) '*The Ionosphere*'; The Spectrum Monitor, February 2015: 62
- Hunsucker, R.D. (1991/2011): *Radio Techniques for Monitoring the Terrestrial Ionosphere* (Springer)
- Melia, A. (2009) '*Understanding LF Propagation*'; Radcom, September 2009: 32; October 2009: 22; November 2009: 32
- Moldwin, M. (2008) *An Introduction to Space Weather* (Cambridge: CUP)
- Poole, I. (2004, reprinted 2007) *Radio Propagation – Principles and Practice* (RSGB)
- Richards, J. A. (2008) *Radio Wave Propagation* (Berlin-Heidelberg: Springer)

Selected Websites

- ADDX Propagation Prognosis (Radio Kurier): **http://www.addx.de/Funkp/fp.php**
- ARRL (National Association for Amateur Radio, USA): **http://www.arrl.org/home**
- Australian Ionospheric Prediction Service: **http://www.ips.gov.au**
- Belgian Royal Observatory (Brussels): **http://sidc.oma.be**
- British Astronomy Association (Radio Astronomy Group): **https://tinyurl.com/y69vlfn7**
- Earth's Ionosphere (Stanford Solar Center): **https://tinyurl.com/q6mews9.**

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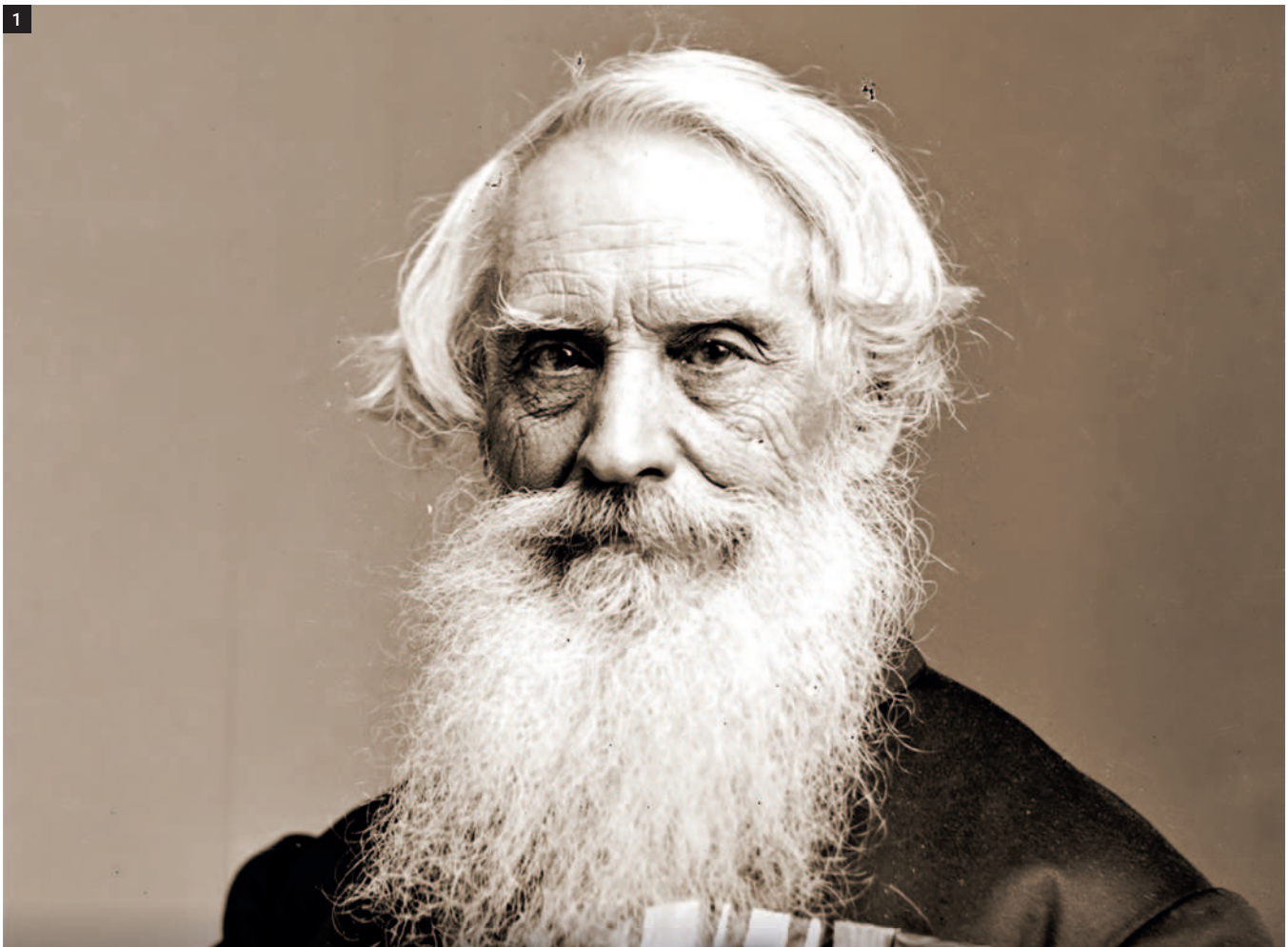

Tony Smith G4FAI
g4fai@btinternet.com

Now You See It, Now You Don't

Tony Smith offers an object lesson in radio lore, taking as his point of departure, the statue of Samuel Finley Breese Morse in New York, erected in a specific historical context.

Last year my grandson, when visiting New York, made a special visit to Central Park on my behalf to photograph the statue of the great American painter and inventor Samuel F.B. Morse (1791-1872, Fig. 1). Disappointingly for both of us, the statue was missing (Fig. 2). There was just the plinth with an adjacent notice saying that the statue had been removed for extensive conservation. On reflection, however, it was not too disappointing. This important historic statue had been standing in the park for 158 years and must have needed quite a lot of attention if it were to continue to commemorate and honour its subject for many more years to come.

Celebrations

The bronze statue (Fig. 3) depicts Morse standing with one hand resting on the original telegraph register (receiver) designed by his partner, Alfred Vail, while the other one holds a scroll bearing the American Morse code. It stands at Inventor's Gate, on Fifth Avenue and 72nd Street and is one of just two statues in the Park that relate to the profession of a named gate. It was erected in 1871 in honour of Morse's 80th birthday and was paid for by donations from the telegraph fraternity throughout the USA and Canada. Due to unavoidable delays, the celebrations were deferred from 27th April, Morse's birthday, to the 10th of June of that year.

Last Message

According to the *New York Tribune*, some 10,000 people, including many telegraphers with their families, came to Central Park for the unveiling (Fig. 4). Morse felt it inappropriate to be present for the ceremony, but that evening he attended a

TONY SMITH

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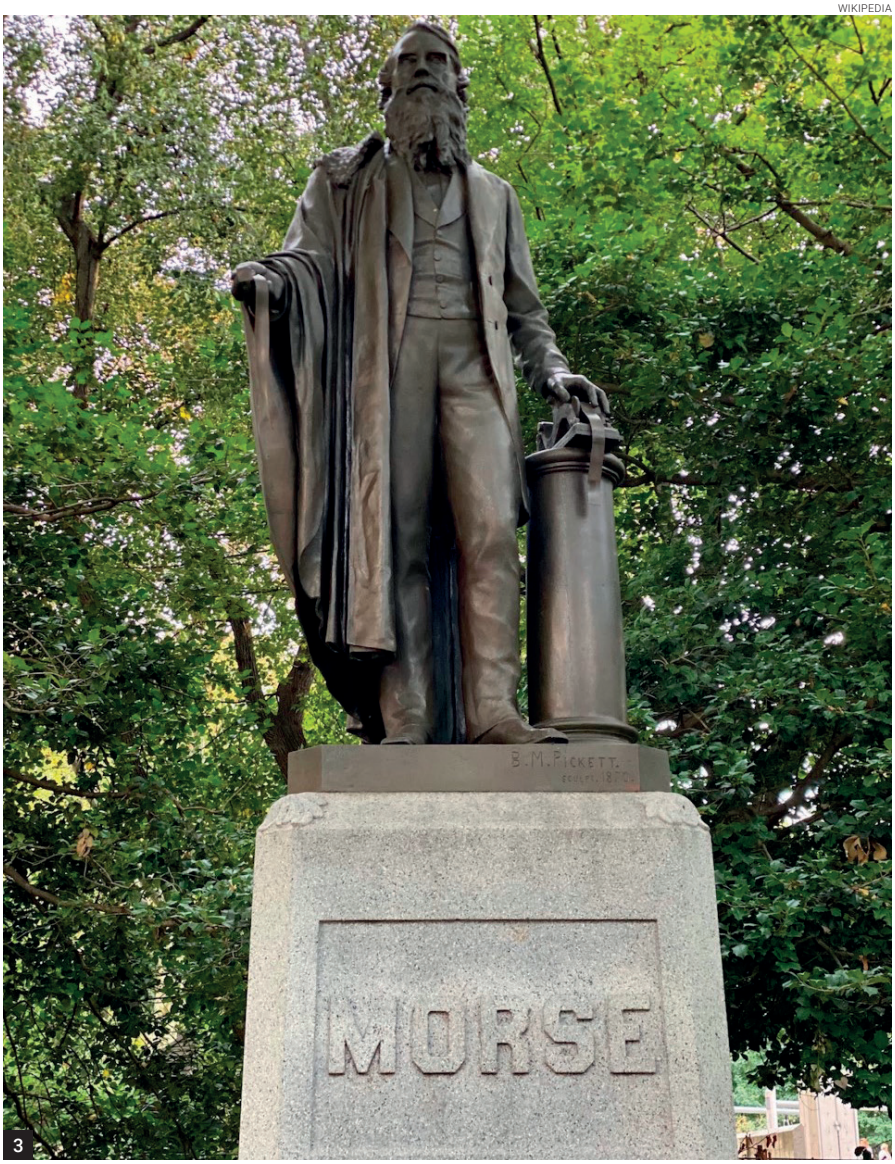
WIKIPEDIA



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packed meeting at the Academy of Music in New York to hear speeches paying tribute to his achievements. Western Union then cleared the lines to all principal telegraph offices in North America and many others overseas. On the stage, and using an original telegraph key from the first Morse line of 1844, a young lady telegraphist, Miss Sadie Cromwell (Fig. 5), keyed a special message to the fraternity from the man they were honouring. "*Greetings and thanks to the Telegraph Fraternity throughout the world. Glory to God in the highest, on earth peace, goodwill to men.*"

The Early Struggles

Morse took his place at the table to key his name at the end of the message and was overcome with emotion as he received a standing ovation from the assembly. By return, congratulatory messages flooded in, direct from American and Canadian offices and relayed from overseas stations. Morse concluded the evening with a speech recalling his early struggles and paying tribute by name to all, and especially Alfred Vail, who had helped him bring his dream to reality. He died less than a year later, on 2nd April 1872. As a measure of the regard in which he was held, James Reid, Editor of the Journal of the *Telegraph*, wrote: "*Professor Morse, the father of the American Telegraph system, our own beloved friend and father, has gone to his rest. The telegraph, the child of his own brain, has long since whispered to every home in all the civilized world that the great inventor has passed away. Men, as they pass each other on the street, say, with the subdued voice of personal sorrow, 'Morse is dead.' Yet to us he lives. If he is dead, it is only to those who did not know him.*"

Some Compensation

In 1858, having previously failed to obtain patents in any European country, Morse had received an award of 400,000 francs (approximately US$60,000) from Austria, Belgium, France, the Netherlands, the Papal States, Piedmont, Russia, Sweden, Turkey, and Tuscany, in recognition of the use of his invention in those countries without his consent. Each country paid 311.55 francs for every Morse telegraph instrument it had in use. At first sight, this seemed to be a generous award but, after disbursements to his partners and Vail's widow, Morse's share was only $19,000. Although somewhat disappointed at the outcome, he accepted it with dignity. However, his business agent, Amos Kendall, was indignant, writing to Morse: "*… I had set the sum at half a million dollars as the least that they could feel to be at all compatible with their dignity. I hope you will acknowledge it more as a tribute to the merits of your invention than as an adequate reward for it…*", and in a further letter he wrote: "*…As an indemnity, it is niggardly and mean.*"

Fig. 1: The artist Samuel F.B. Morse (1791-1872). Fig. 2: The sign near the temporarily removed statue. Fig. 3: The inventor's statue where it should be: In New York's Central Park.

High Honours

Morse was also awarded several high honours, including the French Legion of Honour; The Scientific Gold Medal of Prussia; The Scientific Gold Medal of Austria; and similar awards from Spain,

Fig. 4: The original unveiling of the monument, on 10th June 1871. Fig. 5: A celebratory message, 10 June 1871. Fig. 6: The *Congressional Record* of 27th April 1991, recognising Morse's achievements on the 200th Anniversary of his birth.

Portugal, Italy, Würrtemberg, Turkey, and Denmark; he was also made a member of the Royal Academy of Sciences of Sweden and the Institute of France. He had now received the international recognition that he fully deserved. His telegraph was now in widespread use across Europe, using variations of a German version of his code devised by Friedrich Clemens Gerke (1801-1888) who, in 1848, had set up and managed the first Morse line on the continent, linking the cities of Hamburg and Cuxhaven.

Eight years later, a slightly modified version of that code, renamed the *International Morse Code*, was formally adopted by the International Telegraph Union for use in all countries for cross border telegraphic communication; dispensing with the various national versions of the code previously used. However, despite having received international recognition and the accolades of the worldwide telegraph fraternity, there was no formal recognition of his achievements by the United States government.

Finally, on the 200th anniversary of his birth, on 27th April 1991, the *Congressional Record* (Fig. 6), the official record of the proceedings and debates of the United States Congress, placed on record a formal recognition of, *"his role in the revolutionary early development of electrical communication and his momentous contributions to the economic, social and industrial development of the United States."*

Experiments in 'Wireless' Telegraphy

Morse saw his electro-magnetic telegraph grow from a primitive home-made instrument into a sophisticated system of communication spanning the world by landline or undersea cable. He also conducted experiments in short distance inductive 'wire-less' telegraphy across water, but he did not live to see the even greater achievements that were made possible following the subsequent invention of radio.

He would surely have been delighted that his landline telegraph led on to a professional radio telegraph system with an amateur radio system evolving parallel with it, both using the international version of his code. Professional radiotelegraphy died in 1999 when maritime radio was abolished, but Morse telegraphy is still kept alive by radio amateurs around the world, keeping not only the code but the memory of its founder alive. Long may they do so!

The Statue is Back!

On a further visit to New York, my grandson found that the statue was now back on its plinth, looking refreshed and as new. The original sponsors would have been pleased with the outcome, as are today's amateur enthusiasts who still keep Morse's code alive. His statue can continue now as a lasting memorial to the Father of the Telegraph.

WIKIPEDIA

4

Further Reading

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- Metropolitan Museum: **https://tinyurl.com/y6ksb32a**
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- Samuel Morse: **http://www.samuelmorse.net**
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WIKIPEDIA

5

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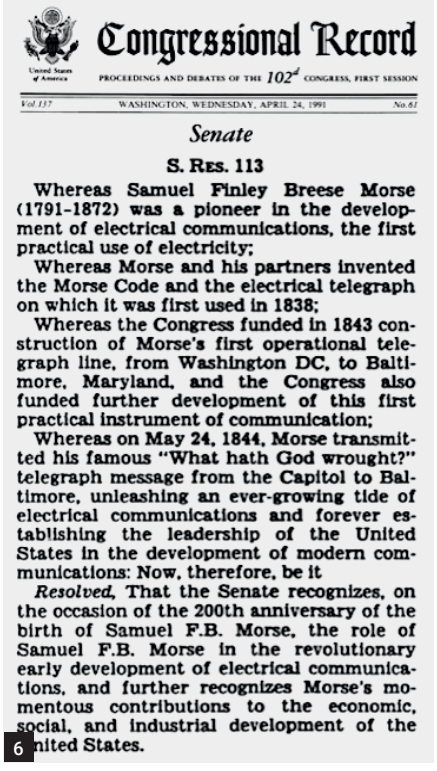

Congressional Record

PROCEEDINGS AND DEBATES OF THE 102d CONGRESS, FIRST SESSION

Vol. 137 WASHINGTON, WEDNESDAY, APRIL 24, 1991 No. 61

Senate

S. Res. 113

Whereas Samuel Finley Breese Morse (1791-1872) was a pioneer in the development of electrical communications, the first practical use of electricity;

Whereas Morse and his partners invented the Morse Code and the electrical telegraph on which it was first used in 1838;

Whereas the Congress funded in 1843 construction of Morse's first operational telegraph line, from Washington DC, to Baltimore, Maryland, and the Congress also funded further development of this first practical instrument of communication;

Whereas on May 24, 1844, Morse transmitted his famous "What hath God wrought?" telegraph message from the Capitol to Baltimore, unleashing an ever-growing tide of electrical communications and forever establishing the leadership of the United States in the development of modern communications: Now, therefore, be it

Resolved, That the Senate recognizes, on the occasion of the 200th anniversary of the birth of Samuel F.B. Morse, the role of Samuel F.B. Morse in the revolutionary early development of electrical communications, and further recognizes Morse's momentous contributions to the economic, social, and industrial development of the United States.

6

BRISTOWS GROUP

1

Close Encounters of a Maritime Kind

Robert Connolly
gi7ivx@btinternet.com

Robert Connolly reports on safety drones in maritime search-and-rescue, seasonal problems in our coastal resorts, the latest rescue statistics, and a second-generation emergency system.

The effects of the Covid-19 pandemic are still impinging on shipping, particularly affecting the cruise and ferry markets. Cruise ships have been (re-)laid up around various parts of the UK and the rest of the world, while many are trying to re-configure their ships to maintain passenger social distancing. On some ships, crew members were forced to remain on board well after their contracts expired, due to a lack of available flights and closed borders to not only get them home but also get replacement crew members to the ship.

Ferries too have brought in Covid protection procedures, and many have introduced the compulsory wearing of face masks by passengers. Stena Line cancelled all their day trips between Belfast and Scotland until October at the earliest.

Narrow Misses and Unmanned Bridges

Normally when a vessel is in transit, there is at least one crew member on watch on the bridge. This entails not only monitoring navigation electronics, including the ship's autopilot, radio communications (VHF and MF/HF if fitted) along with the vessel's radar/AIS display, but also keeping a visual lookout through the window for potential hazards.

Cross channel ferries normally have several crew members on the bridge keeping a lookout. On one occasion, some years ago, I was on a ferry crossing in the North Channel from Scotland to Northern Ireland. It was a nice evening, and I was sitting out on deck just relaxing and listening to CH 16 (156.800MHz) on my scanner via an earpiece. Ferry crew members are always quite vigilant on this route, due to other traffic on passage to or from the Irish Sea to the Clyde or Atlantic.

This time, a coaster was steaming north on a track that, if unaltered could cause a potential collision. As it drew closer, there was no sign of the coaster altering course. The ferry hailed the coaster several times with no response. The coaster was still not changing course, so the ferry sounded its horn several times. Again, this had no effect and the ferry had to make a very sharp turn to avoid a collision. As the coaster passed close by it was clear to see that it had nobody on the bridge.

While such incidents are rare, avoiding a collision with another surface vessel does require vigilance on the part of those on the bridge keeping watch. The size of a surface vessel, be it a super-tanker or small yacht, does make it easier to see. But what about a small object that becomes visible and reveals a bigger issue, such as a large submarine at periscope depth? That kind of hazard can be much more difficult to spot.

It was due to the vigilance of the bridge crew of a passenger ferry transiting between Northern Ireland and Scotland that a serious collision with a military submarine was narrowly avoided in November 2018. The submerged submarine came within less than one hundred yards of the ferry carrying almost three hundred passengers and crew. Fortunately, one of the bridge crew on the fer-

Fig. 1: An unmanned safety drone, launched from Caernarfon, North Wales. Fig. 2: The cruise ship *Brilliance of the Seas* in Belfast.

ry spotted the submarine's periscope allowing the ferry, that was travelling at 21 knots, to take evasive action.

The recently released *Marine Accident Investigation Branch* report into this incident stated that the submarine was on a crew training exercise operating south of the normal ferry track. However, the ferry had previously taken action to navigate around a cargo vessel putting itself south of its normal track. Although the ferry was spotted by the submarine's periscope, its closing speed was miscalculated by the submarine crew resulting in the close encounter. A full report of the incident may be downloaded from this URL: https://tinyurl.com/yynlnyoj

Summer Problems

Just before writing this column, I was chatting to a couple of friends; one was one of our retained firemen and the other was an RNLI lifeboat crew member. Both were concerned at the difficulties of part-time volunteer emergency personnel, lifeboat, coastguard and fire service, getting to their station in a hurry after their pager had gone off during the busy summer months when the town was virtually gridlocked with holidaymaker traffic. They felt that the delays in getting to their station could potentially cost lives.

There have been occasions during the summer months here when they have had to assemble on the edge of town and get police assistance to fight their way through the traffic.

Summer always generates an increase in callouts of local coastguard and lifeboat volunteers, and this summer was no different. The populations in our coastal towns dramatically increase during the summer, as holidaymakers move into caravan parks etc. For local businesses, this provides a welcome boost to the local economy, with many traders relying on making enough money during the summer to tide them over the leaner winter months. This year was no exception, especially with the problems associated with foreign holidays and Covid-19. However, while the local economy booms, residents can, at times, suffer in silence. Voluntary members of the local coastguard, lifeboat and retained fire service struggle trying to get to their stations for call-outs, due to the increased holiday traffic. In the 'good old days', in my hometown, the retained firemen were summoned not just by pager, but also by the activation of a fire siren.

The siren served as a warning to locals that retained firemen would be rushing to get to the fire station and, certainly in my hometown would be driving through with their headlights and hazard warning lights switched on. As the fire siren had gone off, locals knew to move out of the way of these vehicles to allow the volunteer firemen to get to their station and potentially save somebody's life.

For lifeboat callouts, they used to fire off a maroon, as well as activating the crews' pagers. A maroon is a type of rocket which makes a loud banging noise and creates a bright flash. Like the fire siren, the maroon served two purposes. It was a secondary means to alert volunteers and a further notification to locals that volunteers would be rushing to the station so local drivers could make way for them to ensure their transit was as fast as possible.

Health and Safety

Later, the use of maroons was deemed too hazardous and noisy, and the fire service siren was also deemed to create a loud environment. The powers that were felt that a pager activation for their crews was sufficient notification. However, what many failed to realise was the fact that the sirens and maroons gave other locals and visitors a warning that crews would be rushing to their station and that they might have to be prepared to move out of the way to speed up the emergency response.

Relying just on pagers is fine during the winter months, as locals know to move out of the way when a car with headlights and hazards indicators appears behind. However, in mid-summer, when the town is virtually gridlocked with visitors and local residents' cars, the volunteers often struggle to get to their station on a callout. This is something that affects not just my own town but every coastal town in the UK that has a volunteer lifeboat, coastguard and/or fire service personnel.

It seems that the problem becomes worse year on year, as more vehicles are on the road and more people visit the seaside, either for day trips or holidays. Unfortunately, many of the visitors think that it is just an impatient or potential road rage driver that is behind them and will not move out of the way.

Emergency Regulations

Under the relevant regulations, as summarised by and taken from the URLs below, there is no provision for rotating or flashing beacons for these volunteers.

www.ukemergency.co.uk/blue-light-use
https://tinyurl.com/y4ov2xg3

Blue lights are reserved for vehicles designated as emergency vehicles but cannot be used by volunteers rushing to their station because they are private vehicles. Green lights are reserved for doctors on an emergency. Yellow lights are for vehicles on airfields, and, of course, amber lights are used for slow-moving vehicles or abnormal loads.

It is permissible for volunteer responders to place a visible sign in their windscreen, such as *Lifeboat* or *Fire*, which indicates they are en route to a callout. Legally they must drive within normal highway code regulations, unlike designated emergency vehicles that may transit with caution through red traffic lights, and so on.

In summary, if you are holidaying in one of our beautiful coastal resorts, please be aware of potential vehicles belonging to emergency service volunteers trying to get to their station as quickly as possible and help them to do so as safely as possible. Somebody's life, perhaps even a relative of yours, might well be saved by those extra few seconds they can be gained while getting to their station on a callout.

Safety Drone Trials and Rescue Statistics

Emergency service drones used by police and fire crews seems to be increasing. I noticed the use of police drones over the 2020 Easter period and during the Covid-19 lockdowns. The authorities were checking our various popular beaches and green spaces for possible breaches of regulations regarding social distancing and group gathering.

Now Her Majesty's Coastguard is also trialling the use of drones. At the end of July 2020, it began to trial an unmanned aircraft (Fig. 1) launched from Caernarfon, North Wales, to carry out safety patrols across beaches from Conwy Bay to Llandudno, and across Snowdonia.

The drones transmit footage of incidents to enable staff to select the most suitable response and to allow their rescue helicopter to remain on the ground until needed. The drones were developed by the Bristow Group, and they are expected to play a key role when UKSAR2G, the second-generation of search and rescue service is due to begin operations in 2024.

UKSAR2G is the second-generation programme that will take account of how the current UKSAR helicopter service has evolved. The initiative will seek to understand other emergency services' requirements and needs to shape a highly collaborative and innovative solution. It will work from first principles to develop a more tailored and modern means of delivering vital search and rescue capa-

bilities in a more cost-efficient and innovative way. More information is available at this website:
https://tinyurl.com/y2wjetgx

Official figures recently released indicate the UK coastguard rescue helicopters rescued 268 people during the period from January to March this year. This compares to 286 people during the same period last year.

The Prestwick-based helicopter carried out the most taskings (74) during this period. This can be broken down as follows: 9 beaches/cliff, 20 mountain, 44 other, and 1 vessel. Inverness ranked second with 63 taskings.

The figures for other bases were as follows: Lee on Solent 61, St Athan 47, Lydd 47, Caernarfon 41, Newquay 38, Sumburgh 33, Stornoway 27, and Humberside 26.

Portishead Radio

This year marks the centenary of the former Portishead maritime radio station GKA. It began as Devizes Wireless Station in 1920 before becoming Portishead Radio five years later. It remained operational until 2000.

At 1200 UTC on Sunday 30 April 2000, witnessed by over two hundred ex-staff and media reporters, the last broadcast from the station was transmitted:
CQ CQ CQ DE GKB2/4/5/6 =
THIS IS THE LAST BROADCAST FROM PORTISHEAD RADIO. FOR 81 YEARS WE HAVE SERVED THE
MARITIME COMMUNITY. WE SAY THANK YOU TO ALL THOSE WHO HAVE SUPPORTED AND USED
OUR STATION. WE PAY TRIBUTE TO MARCONI WHO MADE IT ALL POSSIBLE. HIS FIRST
TRANSMISSIONS ACROSS WATER WERE MADE FROM NEARBY HERE AND SO STARTED THE
RADIO ERA. WE ARE PROUD TO HAVE BEEN PART OF THAT ERA. AS THIS HISTORIC TIME IN THE
COMMERCIAL MESSAGING WORLD COMES TO A CLOSE THE MANAGER AND RADIO OFFICERS

ROBERT CONNOLLY

WISH YOU FAREWELL FROM PORTISHEAD RADIO/GKB + VA.

Apparently within minutes of the final message engineers began to dismantle the consoles. This website details its interesting history:
https://tinyurl.com/1245tyui12

Larry Bennett's interesting commemorative book, *"Portishead Radio - A Friendly Voice On Many A Dark Night"* is now available.

*[The August issue (*RadioUser, August 2020: 16*) carried a review of this book, as did* Practical Wireless, *September 2020: 50-51 –* ***Ed****.].*

Other Stations

Portishead was not the oldest marine wireless station that operated in the British Isles. Valentia Radio in the Southwest of Ireland has been continuously operational since 1914. However, perhaps the 'granddaddy' of them all is Malin Head radio station in the northwest of Ireland.

It began continuous operation in 1902, initially as a Lloyds station, before being taken over by the Post Office on 31 December 1909.

More information on Valentia radio station may be found here:
https://tinyurl.com/y44mdxne

You can find out about Malin Head radio station at this URL:
https://tinyurl.com/y4572jay

Both stations are still operational.

This month's picture (Fig. 2) shows the cruise ship *Brilliance of the Seas* in Belfast. If you look closely, you can see one of its lifeboats in the water (midships) carrying out an exercise. When in port, and at a time when many of the passengers are ashore, the crew of cruise ships routinely carry out training exercises ranging from fire-fighting to various lifeboat drills.

That is all for this month, until next time, *Fair Winds*!

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HP8591A SPECTRUM ANALYSER with tracking generator, manuals £750 Kenwood 570D, £465, ICOM IC-756pro £550, both one owner from new and original boxes. All in vgc, inspect and collect. **Terry, M0CLH, 07842 812188, m0clh@tiscali.co.uk**

WANTED

ST5 RTTY Terminal Unit for teleprinter Creed 444.
Tel: 01376 340317
Email: jim-godcr@hotmail.com

RACAL RA-1795 USER MANUAL required. Will pay a realistic price for an original or a photocopy plus all your costs. **Please email anthony.r.watkiss@gmail.com with details.**

WILL ONLY SWAP for a superlative condition, unmodified octal valve HRO receiver the R106 or 5T. I have a 1938 Torn Eb receiver. Fine example, untouched, works perfectly. Not for sale.
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ML&S: £2499.95

Includes an Icom AD-55 PSU worth £49.95!

UNIDEN SDS200E

Desk Top/Mobile Scanner Receiver

Same high-performance features as the handheld SDS100 scanner plus much more. Larger base. Increased frequency range. True I/Q receiver, TrunkTracker X technology which provides the best digital decode performance in the scanner industry.

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AR-5700D RECEIVER

Advanced digital communications.

Frequency range 9kHz-3.7GHz. Tuning steps 1Hz-999.999kHz.

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A Receive-only Version of the famous FDM-DUO!

10kHz-54MHz Direct Conversion SDR Receiver.

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AOR AR-DV1

Communications Receiver

Covers 100kHz to 1300MHz in traditional analogue modes (SSB, CW, AM, FM, S-FM, W-FM) as well as various digital modes. In fact, we know of no other radio in this category that can decode Icom's D-STAR mode, Yaesu's new C4FM mode, Alinco's digital mode, NXDN (note: 6.25kHz only), P25 Phase 1, etc. Plus lots of interesting features! www.HamRadio.co.uk/ardv1

ML&S: £1199.95

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New Mid-range SDRplay Radio.

Complete redesign of the popular mid-range RSP2pro 1kHz–2GHz.

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Simultaneously monitor 2 separate 2MHz bands of spectrum between 1kHz and 2GHz. 3 software selectable antenna inputs, & clocking features ideally suited to industrial, scientific, Ham & educational applications. Windows 10.

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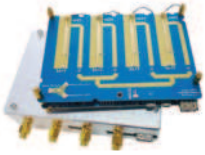
Wideband SDR Receiver.
150kHz-1.9GHz incl SAW Filters.

ML&S: £149.95

KerberosSDR

A Coherent RTL-SDR with 4x Channels.



For direction finding, passive radar, beam forming, or just as four RTL-SDRs!

ML&S: £179.95

HackRF One

HackRF One from Great Scott Gadgets is a Software Defined Radio peripheral capable of transmission or reception of radio signals from 1MHz to 6GHz.

ML&S: £219.95

DIGITAL & ANALOGUE

UNIDEN UBCD3600XLT

New digital TruckTracker V Professional Scanner Receiver, covers 25-1300MHz wideband frequencies.

The TruckTracker V operation allows this scanner to scan APCO 25 Phase 1 and Phase 2, DMR, Motorola, EDACS, LTR Trucked Systems as well as conventional analog and P25 digital channels.

ML&S: £449.95

ICOM IC-R6E

The 100 Ch/Sec Wideband Signal "Search Machine"

Communications handheld receiver. While retaining basic features of its popular predecessor the IC-R5, the IC-R6 contains many improvements including 100 channel per second scanning speed, 1,300 memory channels, 15 hours of continuous receive capability, optional drop-in charger stand and voice control squelch.

ML&S: £199.95

WHISTLER TRX-1 DIGITAL SCANNER

The Whistler TRX-1 Handheld Scanner is a multi-system adaptive digital trunking scanner with Motorola P25 Phase I, X2-TDMA, Phase II and DMR making it capable of monitoring unencrypted channels/systems.

ML&S: £419.95

AR-DV10

The ULTIMATE all mode all band scanner.

100kHz-1300MHz Analogue & Digital Modes.

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ICOM IC-R30 SCANNER

The Icom IC-R30 has extremely wide coverage and supports all of the usual analogue modes (FM, AM, SSB, CW) as well a a few digital modes including NXDN, P25, DPMR and DSTAR. A worthy upgrade over the older IC-R20.

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A portable active antenna capable of covering 9kHz to 3GHz. Perfect if you are say on holiday and want to have a listen to the bands. You'll need to provide it with 5V via a USB cable (included) and some coax but it is just ready to go.

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You can order from ML&S for delivery on a Saturday or Sunday! Order before 2.00pm as late as Friday.

Web purchases: Just select Saturday or Sunday at the check-out or call to place your order for Saturday or Sunday delivery on **0345 2300 599**

ML&S can deliver your new purchase to your local "Access Point" whether it is a small corner store, petrol station or other location suitable for you. If you are at work all day and want to collect at a time suitable for you, just check "UPS Access Point" on check-out on our website.

EXPRESS DELIVERY NOW AVAILABLE VIA OUR WEBSITE

UPS DPD