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Getting to grips with the ATS-20 SI4732 receiver

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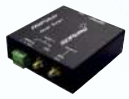

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A Bumper Review Issue for Christmas

Georg Wiessala
wiessala@hotmail.com

Hello and welcome to the December issue of *RadioUser*. With Christmas fast approaching, this issue is particularly full of news, new products and reviews to give you some gift ideas for the 2021 Festive Season, and to provide you with as much radio reading as possible for the Holidays.

And why not give yourself a radio present for Christmas? Why I have done this for years! It's an Anglo-German tradition.

To that hedonistic end, enjoy Chrissy Brand's review of the new Tecsun H-501x, as well as our news about the brand-new Sangean ATS-909X2 – which we are aiming to review next month.

Meanwhile, Kevin Ryan evaluates the nifty Telestar DIRA M 6i hybrid radio, which is virtually unknown here.

Moreover, I have had many items travelling through the editorial shack this month, so I am taking the liberty of introducing some of them here.

First off the mark, there is the new 5W amplified DSP Noise Cancelling In-Line Module from bhi, which I have looked at from the point of view of an HF broadcast listener and occasional utility signals chaser. Second, with the same kind of spectrum in mind, I have tried out a new version of the Moonraker X1-HF vertical outdoor aerial, because I wanted to acquire a solid, dependable, alternative to a loop. See how I got on in the pages that follow. And, last but by no means least, I have played with one of those ubiquitous SI4732 chip radio receivers, in this case, a branded ATS-20 model; I have used it on FM and HF for both broadcast and SSB signals. I think this may end up monitoring specific things, but above all, this is fun to play with.

In our primary features this month, there is a bit of a radio history theme. Tony Smith is mindful that 2022 is an important Anniversary Year for the BBC and he looks right back to 1925, when the BBC was, for a short while, the British Broadcasting *Company*. Meanwhile, Keith Rawlings reports on *HMS Collingwood Museum* and the German battleship *Admiral Graf Spee*.

In the first part of a two-part article, Scott Caldwell assesses what can be gleaned from analysing two-way comms and broadcast programmes during and after the events of 9th September 2001; and Keith Hamer and Garry Smith conclude the absorbing story of *Westward Television*, using their unique and wide-ranging archives.

In our regular columns this month, you can learn about a new book on coastal radio stations by a well-known *RadioUser* contributor, the greatest radio books ever, the best times and frequencies for international short wave- and online listening, RAF Shawbury, and the nostalgia of old radio adverts.

You might also enjoy Robert Connolly's survey of radio navigation and the wonderful *Smörgåsbord* of CB radio, PMR446 and other two-way communications items that Tim Kirby is serving up this month.

I hope you enjoy this issue.

Thank you very much for your support throughout 2021 – it is truly appreciated – and a Very Merry Christmas and a Happy New Year to you all. See you in 2022.

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**

New at ML&S: Sangean ATS 909X2

The ATS 909X2 is billed as the perfect world band radio to roam the globe with. Never forget your favourite radio stations because of the alpha-numeric memory system. The built-in 3-inch speaker lets you conveniently listen anywhere. You can also listen to the radio using the 3.5mm headphone jack with the included earbuds. Many features, generally found in much more expensive tabletop communication receivers have been included in this compact and stylish package. For the monitoring professional on the go, the ATS 909X2 is the ideal choice, featuring wide-band AM/FM coverage, from long and medium wave to short wave. DSP comes as standard and includes features that can significantly enhance reception through improved interference rejection. For portable operation, you can use four AA-type batteries (not included). For working from home, choose the supplied power adapter. Accessories include a vinyl case and a wind up wire antenna. The radio offers LSB & USB for the amateur bands, with auto-bandwidth and gain controls. At the time of writing, these are described as the key features of this new model *[to be reviewed in the January 2022 issue - **Ed.**]*:

• A total of 1674 station presets • Additional Airband (118-137MHz) • ATS (Automatic Tuning System) on LW/MW/SW/FM • Automatic Bandwidth Control system. • Automatically search for the strongest signal station within SW station pages • Built-in 42 world cities time + DST. device with 2 editable city names • Dual conversion device for MW / LW / SW / AIR • Fine-tuning control and Quick Shift Tuning • Five Tuning methods: Direct frequency tuning, auto scan, manual tuning, memory recall and rotary tuning • FM 'Softmute' feature and headphone amplifier • Information provided: RDS PS/PTY/RT, SNR, RSSI, Memory Bank • Large LCD screen with adjustable LED backlight • Signal- and battery strength indicator; smart battery charger; this can detect the state of each battery. • Squelch function: adjust the receiving threshold to eliminate weak transmissions • SSB (Single Side Band): USB / LSB; 10Hz step on fine-tuning setting • Three alarms by radio or HWS (Humane Wake System) buzzer; sleep timer • Three memory banks; 10 characters for the editing of the station name on the display • Tone control (*Music / Normal / News*).

https://tinyurl.com/295u7u2a

CountyComm GP7 SSB (Gen 4)

A first online review of the long-awaited US *CountyComm GP7/SSB (Gen 4)* small portable world band radio with SSB coverage has been posted by the *SWLing Post* blog. According to this source, this radio is the 4th generation of a series of radios adapted by the company from the Tecsun PL-36 series of receivers. Features:
• Direct Frequency Entry • Variable Tuning Rate - Steps • Built In removable rechargeable battery included • Now Features Rechargeable BL-5C Lithium with BMS • Custom Stainless Steel 27" Long Antenna • Band-with Filters (SSB 5kHz, 1.2kHz, 2.2kHz, 3.0kHz, and 4.0kHz) • AM / MW Filter Range (2.5kHz, 3.5kHz, and 9.0kHz)
• 16-Ohm High Fidelity Speaker
• Ultra Fast Autoscan Feature • ETM + Enhanced Tuning Modes - Create time specific memories for LW / MW / SSB • Adjustable maximum volume threshold • Synchronous Detection - Helps reduce fading on AM SW broadcast
Read more at the URLs below:
(SOURCES: Dan Robinson | SWLing Post) Tecsun | CountyComm | Spectrum Monitor).
https://tinyurl.com/bh63k56w
https://tinyurl.com/yhcmmx42

RadioUser STOP PRESS!

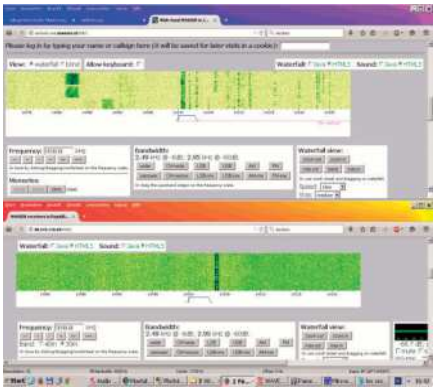
ML&S: AntennaJet AAS 300

Bonito's brand new active antenna signal splitter *AntennaJet AAS300* is distributing the signal from one antenna to 3 different receivers simultaneously. The AntennaJet has a wideband (>300MHz) and ultra-low noise amplifier and can share one antenna with up to 3 different receivers, which can be tuned to different frequencies, without switching the antenna cable or even pressing a button. Due to the extraordinary high decoupling of the outputs (70dB), interference between the connected receivers is avoided.
At the same time, the emission of interference to the antenna is effectively suppressed. Non-connected outputs can remain open and do not need to be terminated. With its ESD-protection circuit, the antenna input is protected against short or pulsed voltage surges or short circuits*. The key features are currently listed as follows and may be subject to change:
• Large dynamic range
• Wide Frequency range (VLF - VHF)
• High intermodulation suppression
• High isolation between outputs
• High reverse isolation
• Inputs ESD-protected
• USB-Power supply
• Made in Germany
* N.B.: 'ESD Protection' does not replace lightning protection!
https://tinyurl.com/uwh9te8
https://www.bonito.net/index_en.php

Chameleon Amplified Loop Aerial

SWLing Post contributor Mike recently shared a video from David Casler, featuring the CHA RXL Amplified Loop Aerial for 137kHz to 30MHz.
(Source: Lutz Electronics)
https://chameleonantenna.com
https://tinyurl.com/yxa7mzvb

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



'Kool' Running, with Klingenfuss and Kiwi-SDRs

RadioUser friend Jörg Klingenfuss writes that more than 600 Kiwi-SDRs worldwide, covering the complete 0-30MHz spectrum, have now been made accessible at the KiwiSDR website (URL 1, below). This is simply great for the reception of HF utility radio stations, and even NAVTEX on MF, from interesting locations all over the world. A new Klingenfuss article, with a plethora of new sample screenshots, is now available. It is entitled *Internet-controlled Software-Defined Radios (Web-SDR)*. It can be accessed at the second URL, below . Moreover, the 2021 KF catalogue, plus full A4 size sample pages of all printed new publications and other materials, can now be downloaded from the Klingenfuss website. One outstanding new product is a USB stick containing *21,000 Digital Data Decoder Screenshots*. Furthermore, the *Hot Frequencies* website is updated daily.
(Source: Jörg Klingenfuss)
http://www.kiwisdr.com
https://klingenfuss.org/websdr.pdf
https://www.klingenfuss.org/homepage.htm
info@klingenfuss.org

Albrecht AE 6290 CB Transceiver at Nevada

Nevada has announced a new CB radio from Albrecht with both Vox and CB repeater facilities. The AE 6290 is the first Albrecht CB radio with an integrated repeater/relay function. The unit transmits on one channel and receives on a second one.
The radio automatically switches back and forth between the two channels.
This allows communication with weaker, more distant, radio stations that are within the range of a relay. The key specifications are:

- Multi norm CB radio with all Continental European frequencies
- VOX hands-free function; CB radio relay/ repeater function, freely programmable
- S-/ Power-Meter and AM/FM switching
- TalkBack function to check own modulation
- SCAN functions for all channels
- Channel 9/19 emergency button (freely programmable)
- Automatic squelch ASQ and Noise Blanker against radio interference
- Up/Down keys on the radio and the microphone
- Display illumination in 8 colours.

https://www.nevadaradio.co.uk

GOLDEN GLOBE RACE: This event will return in 2022 but with some changes. Amateur radio will be banned, replaced with a 100% waterproof HF SSB radio and weather fax. In 2018, there was controversy when it was revealed some of the skippers didn't have Ham radio licences. This change has caused concerns, with some of the 2018 entrants highlighting difficulties in picking up Global Maritime Distress and Safety System frequencies in the Southern Ocean due to the shrinking of the broadcasting network, as more mariners rely on satellite communication. The route will also different, 'to make it less demanding on the boats,' according to McIntyre
https://tinyurl.com/yzwu5xea

RADIO FROM THE CENTRE OF THE GALAXY: International student Ziteng Wang detected unusual signals from deep in the heart of the Milky Way using CSIRO's ASKAP radio telescope. Now astronomers are on the search for more evidence of what type of object could be emitting them. *"The strangest property of this new signal is that it is has a very high polarisation. This means its light oscillates in only one direction, but that direction rotates with time,"* said Ziteng Wang, lead author of the new study and a PhD student in the School of Physics at the University of Sydney. *"The brightness of the object also varies dramatically, by a factor of 100, and the signal switches on and off apparently at random. We've never seen anything like it."*
Many types of stars emit variable light across the electromagnetic spectrum. With tremendous advances in radio astronomy, the study of variable or transient objects in radio waves is a huge field of study helping us to reveal the secrets of the Universe. Pulsars, supernovae, flaring stars and fast radio bursts are all types of astronomical objects whose brightness varies […]. The discovery of the object has been published in October in the *Astrophysical Journal*.
SOURCES: Astrophysics Journal | AAU | The SWLing Post Blog)
https://tinyurl.com/2jdvrbep

Radio News

AM RADIO STATIONS IN THE UK: AM, which stands for 'amplitude modulation', is the oldest form of radio broadcasting technology. Despite the growth of newer alternatives, it is still in use in the UK, though services are limited and are gradually reducing in number. AM radio in the UK uses the MW (medium wave) band of frequencies, which ranges from 526.5 to 1606.5kHz. A few stations broadcast on LW (long wave), which ranges from 153 to 279kHz. Most of the stations broadcasting on AM in the UK are talk, news and sports stations. This is because AM transmissions are more susceptible to interference than FM transmissions and tend to have lower fidelity, so they are less suitable for broadcasting music (Sourced from the link below, where you may click on (blue-text) 'Radio Info' to access a multitude of information on different radio contents).
(SOURCE: Bob Houlston G4PVB)
RU Volunteer Correspondent)
www.tinyurl.com/rnkzhv56

JAMES CRIDLAND - STREAMING NEWS TV CHANNELS FROM AROUND THE WORLD: Take your pick from a series of international live news broadcasters on the website of 'radio futurologist' James Cridland. There is much to discover here for news addicts:
https://livenow.news

ARRL VOLUNTEER MONITOR PROGRAM REPORT (USA): The *Volunteer Monitor (VM) Programme* of the *American Radio Relay League (ARRL)* is a joint initiative between the ARRL and the Federal Communications Commission (FCC) to enhance compliance with the *Amateur Radio Service*. This is the VM Program report for September 2021. Technician operators in Mansfield, Ohio; Avon Park, Florida, and Pulaski, Tennessee, received *Advisory Notices* after making numerous FT8 contacts on 20 meters. Technician licensees do not have operating privileges on 20 meters. A Volunteer Monitor in Mission Viejo, California, received a *Department of Homeland Security, United States Coast Guard Certificate of Appreciation* for his efforts in locating a defective transmitter on Marine Radio Channel 16 that was blocking emergency communications on that channel. A former licensee in Durham, North Carolina, received an *Advisory Notice* for operating under a call sign and license cancelled by the FCC. An operator in White Pine, Tennessee, received an *Advisory Notice* regarding the operation on 7.137MHz, a frequency not authorized under his General class licensee. Operators in Swannanoa, North Carolina, and New Albany, Indiana, received *Good Operator Notices* for exemplary operation during 2021 and for regularly assisting other operators with transmitter adjustments and amateur radio procedures. The VM Program made one recommendation to the FCC for case closure. VM Program statistics for August showed 2,008 hours on HF frequencies and 2,642 hours on VHF frequencies and above, for a total of 4,650 hours. (SOURCES: ARRL | FCC | ICQ Amateur / Ham Radio Podcast | RadioToday).
http://www.arrl.org
https://www.fcc.gov
https://tinyurl.com/upjh72rk

New at Moonraker: Senhaix 8800 and 8600

These new dual-band handhelds offer 2m,70cms TX/RX and wideband RX, including Air- and Marine bands. You can charge by USB, and the 8800 can be programmed via Bluetooth. The transceivers come with a battery, antenna, -charger, adaptor, belt clip, and hand-strap. At the time of writing, the key features of the 8800 model are as follows:

- Power Output 5W
- Dual Band - Dual Watch - Dual Standby
- LED Flashlight - SOS Warning
- DTMF Tone - ANI Code - PTT ID
- 1750Hz Tone - Customize Channel Names
- Bluetooth Programming
- IOS Appstore: App is 'SHX8800'.

https://tinyurl.com/4vj8ysz5

New at Nevada Radio: The Tecsun DAB-119X

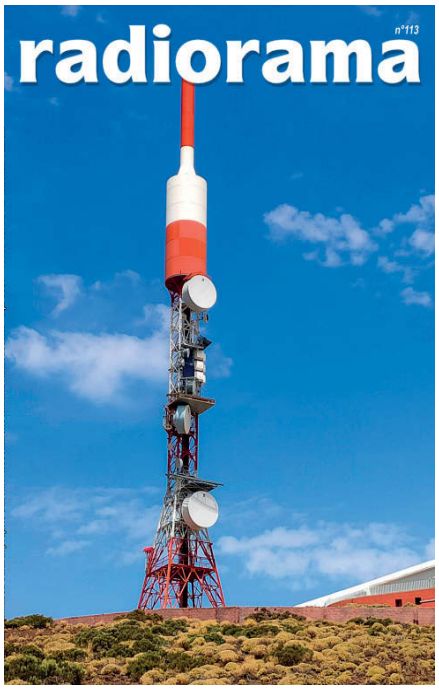
The newly expected Tecsun DAB-119X is a DAB+ radio with multi-band coverage and Bluetooth. Provisional Specifications are as follows:

- FM: 87.5-108MHz; MW (AM): 525-1629kHz; SW: 2300-26100kHz
- DAB+/FM Stereo/MW/SW/Bluetooth 4.0
- FM RDS Playback
- Tune and store stations automatically (ATS)
- Radio alarm clock function
- Extra-large LCD screen; 4 levels of LCD backlight
- Time and date display
- Built-in charging function
- FM & SW external antenna connection (3.5mm)
- Line In jack (3.5mm) to use as a speaker for external audio player Stereo headphone jack (3.5mm)
- USB (Type-A) DC output (5V) to charge external devices
- 4.0mm DC in jack (9V)
- Power source: DC adapter or Li-ion battery
- Dimensions: 192 x 64.2 x 102.5mm

(SOURCE: Nevada | David Harris | Tecsun)
https://www.nevadaradio.co.uk

Radio News

BRING-YOUR-GAELIC-TO-WORK-WEEK IN KIRKCALDY: The K107 FM radio station is supporting the *#Bringyourgaelictoworkweek* initiative to help raise the profile of the Gaelic language. A spokesperson at the station said: *"This is a serious project though and aims to make the language visible to people who do not necessarily encounter the Gaelic language and for some workplaces involves signage and use of phrases to promote the language. K107FM is conscious of the Gaelic-speaking population within Fife and has previously provided the Gaelic version of The Adventures of Captain Bobo to its Listen Again service, alongside the English speaking version on-air."* Now, the Kirkcaldy-based station is set to share a six-part conversation series with masters of their instruments, which celebrates the finest traditional music Scotland has to offer. Native Gaelic speaker Bekah MacLeod (Bekah NicLeòid) present the series. In each episode, Bekah chats in Gaelic to people from the world of Celtic and Gaelic music looking at their instrument of choice and the resulting relationship with the music they love to play. The programmes will be illustrated with examples of their music and tracks featuring musicians who influenced them. All 6 episodes are available at *k107.co.uk*. Each show will concentrate on a musician's musical journey, why they chose to make it with a certain instrument and the joy it brings to them. Bekah will expand the conversation to cover their whole career […].
(Source: RadioToday | K107 FM)
https://www.k107.co.uk/listen-again
https://tinyurl.com/229awaby



LISTENING CONTEST: The *Associazione Italiana Radioascolto (AIR) Contest 2022 Attilio Leoni*, will begin at 0000UTC on 2nd January 2022, and it will end at midnight UTC on 9th January 2022. Participation is open to all listeners, AIR members and non-members alike. The Contest is divided into three parts , organised according to languages and countries of origin of the broadcasts. The picture (above) shows the Italian Association's Newsletter, *radiorama*.
(SOURCE: AIR | via Chrissy Brand/ BDXC)
bpecolatto@libero.it
www.air-radio.it

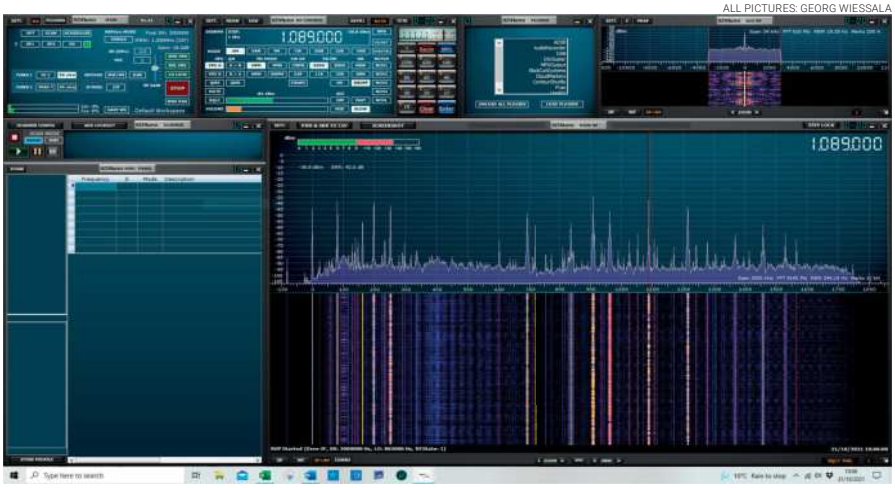
AUSTRIAN TELECOMS ACT PASSED: Austria's amateur radio society ÖVSV report on October 13, the Telecommunications Act 2021 was passed in the country's National Council. The ÖVSV organization was able to achieve important improvements for the amateur radio service in Austria. The amateur radio service also played a role and its importance was underlined in the speech by Eva-Maria Himmelbauer, Member of the National Council (with applause from the plenum). It tabled two amendments with improvements, which were adopted.
(Source: Colin Butler | ICQ Amateur / Ham Radio Podcast).

Georg Wiessala
wiessala@hotmail.com

Moonraker X1-HF Vertical Antenna

The editor takes a look at an outdoor HF vertical, which will please those who are broadcast DXers, monitor HF utility signals or are just after a viable professional alternative to the larger loop aerials for this band.

ALL PICTURES: GEORG WIESSALA



I have to make an admission: I have used the Moonraker X1-HF vertical 1-50MHz receiving antenna (pictured) for years already – well, a previous incarnation anyway. It has been on my roof in what is possibly the most reception-unfriendly part of the otherwise splendid Ribble Valley, and it has rendered me some good service.

However, I forgot it was there – as you do – and I had never reviewed it. Therefore, a new, improved, version of it and the appearance of several new stock items available at Moonraker recently, immediately aroused my attention. I have recently moved house to a much more rural open-hillside location, with nearly unobstructed views all-round the valley. Therefore, with no other HF aerial currently in permanent use here as yet, I was keen to see how this piece of kit would perform.

This is a receive antenna only, mind, and it would primarily be attractive to the HF broadcast listening and DXing fraternity, to chasers of utility signals and semi-professional monitors. The aerial arrived well-packaged and with all the mounting gear, tools and cables you will need, especially a 10 metre PL259-to-F-type BNC coaxial cable, with F-to-BNC adapter provided.

Assembly was easy and quick, and I rigged the unit up on a sturdy tripod (also from Moonraker) for temporary, outdoor use. The antenna's base element is sturdy and larger than you might expect. Being white, it may not always be as inconspicuous as you might wish for, but you could always spray-paint it in an 'operational camouflage colour' of your choice. Don't worry, Moonraker friends, I have not done that!

The vertical element fits firmly into its socket via two Allan key screws. None of the recent mini-tornadoes up here has so far affected the assembly, aerial and tripod can withstand considerable winds; they have to here.

So, no 'IKEA-rage' here; I was up and running in no time at all. I conducted the cable through the patio door with a strip of flat BNC 'through-the-window' flat cable. This is at best a temporary solution; since then, I have installed things properly, cable through the wall and all.

I linked everything up to my AOR AR7030 and tuned the bands, from long- to short wave. Given the usual diurnal variations, I was able to receive nearly everything my former Wellbrook ALA 1530 loop would have, and more than the Reuter RLA3 indoor magnetic crossed loop that I also use.

Very happy camper on that account.

Turning to utility signals, I often have the AOR running all day on one of the weather frequencies of the Hamburg Weather Service (*Deutscher Wetterdienst*, DWD), so I require a stable performer, aerial-wise.

And again, no sweat there, and both Radiotelex (RTTY) and Radiofacsimile dropped in with better-than-average quality.

Switching away from the 'vintage' gear to an *SDRplay RSPduo* Software-Defined receiver, the aerial brought in a good range of daytime stations at my new, more exposed position here; once again, the reception will vary depending on where you are and how you mount your aerial.

All in all, this is an excellent all-rounder of an aerial with above-average performance, which you should consider acquiring and experimenting with.

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EQ20B-DSP *QST Dec 2019* review *"easy-to-use device that improves the audio clarity of amateur signals"*

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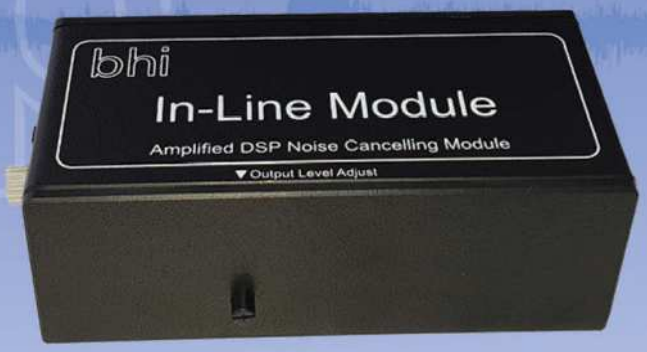

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The Tecsun H-501x Deluxe Shortwave Radio

Chrissy Brand puts the highly-anticipated Tecsun H-501x receiver through its paces during a trip to Portugal, appreciating both the technical performance and the unique design philosophy of this new radio.

Chrissy Brand
chrissyLB@hotmail.co.uk

My initial impression of the Tecsun H-501x was that it was a larger receiver than I had realised, and a slight panic set in as to how I might take it abroad with me. It is a large portable and I am used to packing small radios on my trips. However, that feeling very quickly subsided. This Tecsun is similar in size to many gadgets that people take on holidays. Larger than a tablet, for instance, but far smaller than a laptop.

The radio's exact dimensions are 277 x 164 x 44 mm. This makes the H-501x of a size that could be transported in a backpack easily enough. It is also a very good size for a radio that could sit in the shack, the office, sitting room or your kitchen.

Big is Beautiful

The quality of sound, the tone and the loudness all ensure that the radio can be placed in any room in the house and be heard clearly and pleasantly, without distortion.

It is a case of 'big is beautiful' – certainly in terms of its robustness, the generously sized display read-out, and because of the benefit of having space to accommodate two good speakers.

Maybe it is just me, but the tan-coloured, leatherette carry case is reminiscent of a men's grooming set or women's vanity case from yesteryear. It has a reassuring look of quality and a touch of luxury, especially when compared to the pouches that come with smaller, cheaper portable radios.

The receiver fitted very neatly into the small suitcase I took away with me, well-protected by rolled up clothes and a beach towel. The case itself would give protection enough on its own though.

I did rather want to carry the radio around in Manchester Airport with me, as I was feel-

ing rather proud of being its temporary owner. However, airport security is rarely much fun, and rather than have to put the Tecsun through the scanner along with my laptop and bag of liquids, I bade it *au revoir* at the check-in desk.

I had taken far larger radios away with me in the past. I remember my first foreign holiday being a family fortnight in Austria when I insisted my parents allow me to pack a 1970's *Fidelity Rad 27*. No one was going to stop me this time, either.

Appearance

Whilst very much being a state-of-the-art contemporary radio, the Tecsun H-501x does also have a reassuring 'retro' feel about it. I showed it to product designer Tim Sutton-Brand, who was impressed with the radio's functionality and design; he also commented that it had a boxy, classic-1980s design vibe, appearance-wise.

The two speakers, the layout of buttons and dials and the shape all reminded me a little of some of the 1990s *Grundig Satellit* receivers, and maybe even some of the first short wave receivers that I used, back in the 1980s. I must emphasise, however, that I consider this to be a positive thing.

The five control knobs consist of a trio of volume, bass and treble on the left front and side of the receiver. A fine-tuning dial and a larger regular tuning dial sit on the right-hand side. I always wonder if this standard design implementation ever causes problems for left-handed users?

The dials give the user an incredibly tactile experience and are made to a high standard. I simply wanted to turn them with my thumbs all the time – such is their ease of use, enticing you to explore just a little further, gliding along whichever band you happen to be on. This is surely a DXer's delight!

The rubberised surface on the side of the two tuning dials enable you to quickly spin along the bands, whilst the more robust, metal, ribbed dials, accessed from the front of the receiver, emphasise that you are in control and are driving this set. Of course, you can enter any frequency by using the keypad, too.

The LCD display is of a substantial size, large enough to see from a distance and, when close-up, does not require my middle-aged eyes to use reading glasses (which I have to resort to on many radios).

The Listening Experience

The long wave band is found more easily than on some radios, as it is clearly marked: Just press the medium wave/long wave button and there it is, you 'zap' between the two bands. It is also simple to scroll through each of the short wave bands by pressing the + or – keys. You can store station frequencies in the memory to your heart's content. There are 3150 presets you can use, and which are separated over 25 memory pages. This enables the storage of 100 FM stations, 100 on medium wave, 100 on long wave (not that there are more than 40 or so long wave stations), 250 on short wave, 100 on SSB, and 100 on synchronous detection.

The tone can be beautiful, although is slightly dependent on the station heard. This is where the two speakers, bass and treble controls are welcome and enhance the listening experience.

The speakers produce a very good timbre, and I found there to be no distortion, even when turned to full volume. I turned the volume up to the maximum while listening to Beatriz Rosario on the local FM station, Radio Portimão (106.5MHz). The singer, who takes the Portuguese musical genre of Fado to a new, alternative level, sounded as if she could have been on the apartment balcony with me. The rap music of Carlão, a middle-aged Angolan singer, had a fresh urgency with all the musicians involved on the track *Os Tais*, being heard in equally fine voice. As well as music, jingles, news and features all sounded crisp and clear on FM. I even enjoyed listening to advertisements, for once.

Short wave was, of course, dependent on propagation. Tuning to 13740kHz at 1845 UTC one evening, I enjoyed a Radio France International broadcast, in French. An all 5 SINPO helped the song *Tala n'dile*, by Ariel Sheney featuring DJ Arafat, sound great.

BBC World Service, from the Woofferton transmitter back in the UK, on 13660kHz at 1800 UTC sounded excellent, and just up the dial, American evangelism was coming in loud and clear from World Christian Broadcasting from the Madagascar transmitter, on 13670kHz. Meanwhile, the medium wave was dominated each night by many powerful Spanish stations.

As you would expect of any quality radio, there is a gentle fade away of the signal when you push the red on/off button. This bids a gentle *adieu* to the singers or presenters you have been engaged with and is always preferable to an abrupt cut-off.

Maybe it is me, but such cut-offs on radio jar, and somehow seem curt or rude to the people at the radio station who have been entertaining you!

To Buy or Not to Buy?

If the acquisition of a new radio is likely to be met by raised eyebrows in your household, then the Tecsun H-501x can put forward a compelling case to be accepted into the home. It is more than just another radio for the shack and makes a desirable addition to any room.

Sitting down to hear a BBC Radio 3 concert on this radio is a pleasurable experience, sound quality-wise. Likewise, an afternoon play on FM or a sports commentary on medium wave becomes an enhanced event. Whether it is Alison Mitchell or Karen Carney on BBC 5 live, the shouts of Lucy Ward and Courtney Sweetman-Kirk talkSPORT, or one of the enthusiastic football commentary teams on the many Spanish stations that can be heard across Europe.

The H-501x Bluetooth and MP3 features allow you to stream podcasts and playlists from your smartphone or music device. Or insert a microSD card with audio files. By using a USB data cable, you can also use the radio as a speaker for your laptop or PC.

Friends of mine who are not radio enthusiasts fail to understand why I still need a physical radio that covers all the FM and AM broadcast bands. They ask me why streaming music, playlists and podcasts through my phone, laptop or a smart speaker does not provide total audio fulfilment for me. They say, *"Why take a radio away with you, when you can use your phone, or a station-specific or generic app (such as* Radio Garden*) to access many radio stations?"*

My simplest answer is that radio can always provide the unexpected. The thrill remains, of scanning through the FM and medium wave bands in every new town I visit. This excitement level rises even more when I am outside the UK, increasing the likelihood of chance encounters with musicians that are new to me; and sometimes entirely different musical genres, such as Fado, when in Portugal.

Although most of these encounters take place across the local airwaves, they can also occur in the flesh, as it were. In the hill town of Monchique, I enjoyed watching a Fado musician busking amongst the cork trees. Fado translates as 'fate' and is a mournful, moving style of music with its origins in Portuguese working-class communities of the 19th Century.

At the *Radiodays Europe* conference in Lisbon (which I will report on in next month's *RadioUser*), I also met Dino d'Santiago and saw him perform; his brand of Fado connects with the soul of Cape Verdean music.

These experiences with musicians, in turn, regenerate the power of music radio and encourage me to continue a never-ending journey, tuning up and down the bands.

You never know what is just a little further along the band, be it breaking news, a wonderful piece of music, a station style that you've not previously heard.

Perhaps you are eavesdropping on a political power struggle via a clandestine station in Eritrea, a tropical band signal from Latin America, or transatlantic medium wave signals bringing Nova Scotia to West Yorkshire. In short, listening to short wave on a decent receiver can still unearth audio treasures: heritage classical music of India or a travel programme from Vietnam or Turkey.

The unpredictable nature of radio station content, as well as propagation and listening conditions, make for an often unexpected but always intoxicating, experience.

To summarise, the Tecsun H-501x delivers, in its quality of sound, manufacture and aesthetics. Being an attractive looking radio as well, equally at home on the bedside table or in the dining room, may strengthen the argument as to why your home needs one. The comprehensive band coverage and additional features such as a sensible strong metal stand that enables operation at a very user-friendly angle and the two internal speakers all help propel it to the top of my Christmas list.

Facts and Figures

The H-501x is equipped with several useful audio features, a Bluetooth function to play music from a smartphone, tablet or another Bluetooth device, an SD card slot, with a 16Gb card included, and a USB soundcard function so it can be used as a set of stereo computer speakers.

The large LCD display is very easy to read with extra-large digits for frequency readout and lots of information about the receiver operation, such as signal strength in dB and microvolts, battery status, receive mode, and much more.

A unique feature of the H-501x is the dual charging facility that uses two 18650 batteries, this allows you to use one battery whilst charging the spare. Included with the radio is a 16GB memory card, Stereo earphones, USB charger with cable and a leatherette carrying case.

The Tecsun H-501x sells for £329.95. Thanks to our friends at Nevada for lending *RadioUser* a receiver to review. Check the Nevada website for more details of the receiver and how to order one.

Other reviews of the Tecsun H-501x, from DXers around the world, can be found online.

https://tinyurl.com/dvjnm33h
https://tinyurl.com/4etj5ax8

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- Batteries not supplied!

£59.95

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Intelligent 4 way 9V charger – charges in just 2 hours.
With Car capable charging - DC converter supports 12 volt vehicle power

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- Supports 7.2, 8.4, and 9.6 Volt types
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Rapid charge 4 x AA batteries in under 100 minutes
Unique charging system and 4 independent slots allows the batteries to accept a more complete charge. Charge from home or in the car.

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- Supplied with 4 x 2700mah Powerex AA Ni-Mh rechargeable batteries
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- The Unique charging system developed by battery experts allows the battery to accept a more complete charge.
- Four independent charging circuits to ensure optimum charging for each battery.
- Ultra-low temperature charging with unique Flex Negative Pulse algorithm.
- Manually switch between 100 minute fast charge and 5 hour gentle charge.
- Can be powered by AC adaptor or cigarette-lighter car adaptor.

Supplied Complete with:

- 4 x 2700mah Powerex AA Ni-Mh rechargeable batteries
- Car adaptor kit
- Battery carrying case
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- 4 Modes of Operation: Charge, Break-In, Discharge, Refresh & Analyse
- Memory Settings: Remembers the last settings that were used
- Easy Setup: Set settings for 1 slot and apply same settings to all slots
- Large backlit LCD display with On/Off option
- Displays Capacity, Voltage, Time, and Rate

Operational Modes:

CHARGE MODE
Useful when battery needs to be recharged without determining the capacity of the battery. It should be used on batteries known to be in good condition and have been in continuous use

BREAK IN MODE
For batteries that cannot be rescued with Charge & Analyse mode

DISCHARGE MODE
Useful for analysing the amount of stored charge in the battery. Battery not recharged at end of cycle.

REFRESH & ANALYSE MODE
Charges, rest for 2 hours, discharge, rest, then recharge. Useful when battery capacity needs to be determined and for batteries with degraded performance.

Note: UK version supplied with compliant UK plug

£69.95

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USB Compact Travel Charger for AA /AAA NiMH Batteries. Charges up to 4 AA or AAA nickel-metal hydride (NiMH) rechargeable batteries.

CHARGE
Your batteries anywhere using a wall adapter, computer, solar panel, car charger or Power bank.

RECHARGE
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The charger is great for use in the home or office, as well as in the car. Charges 2 or 4 AA or AAA nickel-metal hydride or (NiMH) batteries

- AA size – requires 4hrs to charge, AAA's take 2 hrs (450mAh charge rate)
- Charge your batteries anywhere around the world via the included universal power adapter.
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MHRAA4Pro.. AA 2,700 mAh 1.2V (pack 4).....£15.95
MHR84V .....PP3 300mAh 8.4V.....£14.95

Pre-Charged
Store for extended period retains up to 85% charge

MHRAAP4..... AA 2,600 mAh 1.2V (4 Pack).....£16.95
MHRAAAP4.... AAA 1,000 mAh 1.2V (pack 4).....£15.95
MHR84VP.....PP3 300 mAh 8.4V.....£14.95
MHR9VP.....PP3 230 mAh 9.6V.....£14.95
MHRCP2.....C Cell 5,000 mAh (2 Pack).....£25.95
MHRDP2.....D Cell 10,000 mAh (2 pack).....£35.95

Imedion Batteries
Retains 85% charge for one year!

MHR84VI.....PP3 8.4V 250 mAh.....£9.95
MHR-C12.....C cell 5,000 mAh (pack of 2)..£25.95.. £14.95

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David Harris
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Marconi's Heritage: A History of Coastal Radio Stations

David Harris takes a look at a new book by Larry Bennett, which combines a comprehensive account of maritime communications development with a richly illustrated survey of former coastal radio stations.

Larry Bennett worked as a Radio Officer at Portishead long-range maritime radio station and in 2020 wrote, *Portishead Radio* (reviewed in *Radio User*, August 2020: 16). In my view then, that excellent book was the definitive history of long-range maritime communications in the UK.

Larry has now complemented this with another fine book which provides a comprehensive history of medium- and short-range maritime communication, together with detailed accounts of 32 coastal stations around the coast of the UK and Ireland.

In 2000, the ten remaining British Telecom (BT) coastal radio stations closed down; this brought to an end almost 100 years of coastal radio communications. Responsibility for monitoring distress frequencies was transferred to the Maritime and Coastguard Agency (MCA) who now operates just 11 Coast Guard stations around the UK.
https://tinyurl.com/wsk78ccr

The book is in two parts:

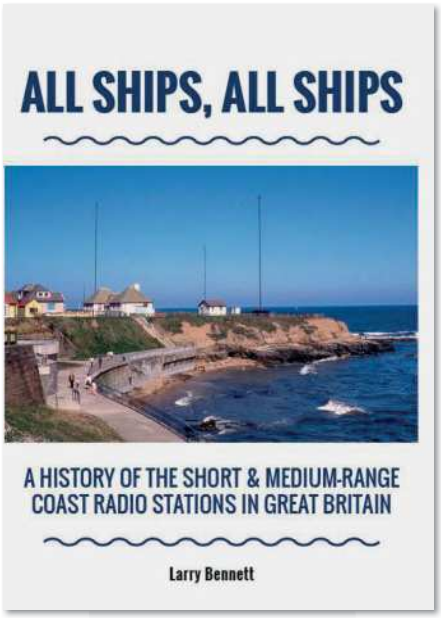
The first 153 pages offer an account of the history of UK marine communications from 1896 - 2000, followed by over 400 pages of detailed information about the history of the individual stations.

It was Marconi who pioneered marine communications in this country, with early experiments carried out in the Bristol Channel and the Isle of Wight. The first ship-to-shore service was established in 1898 when a radio link was set up between *East Goodwin Lightship* and *South Foreland Lighthouse*.

By 1901, Marconi had established eight coastal stations around the UK and Ireland. He also agreed to equip the existing Lloyd's signal stations with Marconi equipment. In 1908, the Post Office opened its first radio station at Bolt Head, near Salcombe, South Devon; and in 1909, the Post Office acquired the existing Marconi coastal stations.

The Post Office continued to be the public body responsible for marine communications until privatisation in 1981 put the stations under the ownership of BT.

By the end of the First World War (1918), over 3,400 British ships were equipped with Wireless Telegraphy. In 1930, Humber Radio was the firsts to offer radiotelephony services; and in 1937, Humber provided the first link-call service, which enabled ships to talk directly to UK telephone subscribers (for £0.35 for three minutes; about £25 in today's money).



All Ships, All Ships. A History of the Short & Medium-Range Coast Radio Stations in Great Britain
by Larry Bennett. New Generation Publishing. 2021. Pbk. 496 pp. £17.99.
ISBN 9781800311459
www.newgeneration-publishing.com

During the Second World War (1939-1945), all Post Office stations came under Admiralty control and UK ships were forbidden to transmit other than distress calls. During the conflict, coast stations handled over 5,000 distress calls from ships and aircraft that had been attacked by submarines, aircraft and enemy ships.

Then, in 1947, an international agreement adopted 500kHz (W/T) and 2182kHz (R/T) as radio distress frequencies, to be monitored by national maritime safety organisations. In the same year, the first VHF marine service started in the Thames area, initially using AM.

The post-war period also saw the sharing of some Maritime Mobile frequencies with those allocated to radio amateurs in the 160 metre (or 'top' band). By the year 1957, FM was adopted for marine VHF communications and by 1972 VHF coverage was available around the UK for up to 40 miles from the shore.

New stations were built to accommodate the demand for the service, although some were automated. Moreover, from the 1960s onwards, the boom in North Sea oil entailed a significant increase in the subsequent demand for communications between offshore rigs and oil company offices.

The shipping and offshore industries were booming, and evolving technology was making coastal stations slowly redundant. Satellite phones meant that ships could contact their owners and agents from anywhere in the world. Satellite navigation and AIS meant safer navigation and the mobile phone gave ships the ability to call landlines direct when in sight of land, thus making redundant the link-call service formerly provided by coastal stations.

If the book had finished on page 153 it would have been a perfectly acceptable contribution to radio history.

What makes it so important is the 400 pages of detailed and meticulously researched history of the 32 coastal stations that came under the Post Office. Some like Bolt Head (1908 -1914), Hunstanton (1905 -1918) and Skegness (1906 -1919) may be unknown to most people, whilst others – such as Cullercoats, Humber, Land's End, Niton and Wick – will be familiar to many *Radio User* readers who monitor NAVTEX or will have heard these stations on M/F and VHF up until their closure in 2000.

Every chapter of the book is illustrated with rare period photos of radio equipment, old station buildings and radio masts. The book concludes with 15 appendices listing such information as Coastal stations in 1908, 1922 1969 and 1991.

I commend this fine book to anyone who has served at sea, worked in marine communications or just has an interest in monitoring marine frequencies.

QUIRKS & QUARKS FACEBOOK

1

Mind-Blowing Programmes and TV on the Radio

This month, **Chrissy Brand** chooses some stand-out radio programmes, finds another inspiring use for short wave and observes some international television channels in English

Chrissy Brand
chrissyLB@hotmail.co.uk

Which radio programmes or podcasts do your non-radio friends talk about the most? Three programmes seem to have captured the hearts and minds of my friends. Perhaps unsurprisingly, they are all 'human-interest' programmes. The first one is *Outlook*, which has been a mainstay of the BBC World Service since July 1966. There are almost 1,400 episodes to hear on the BBC website, all of them comprising extraordinary first-person stories from around the world. However, although that is a sizeable archive to trawl through, it only contains programmes from June 2016 onwards.

www.bbc.co.uk/programmes/p002vsxt

A Trio of Longevity

Three recent episodes of *Outlook* I can recommend include *The Epic Road Trip that Taught me how to Live Again*, broadcast on 16th September 2021: *"Suleika Jaouad's newspaper columns about facing cancer in her twenties received a huge response, but she would end up needing her readers more than she ever could have imagined."*

A second noteworthy programme reports on the improbable rise of Europe's 'Tofu King'; vegetarian hippie Bernard Drosihn set up Germany's first tofu collective and was even imprisoned for it (August 11th).

And third, on 23 September 2021, former Radio Caroline DJ Nick Richards spoke to Harry Graham about his adventures on the *Mi Amigo*, rotting below the waterline in its final years. Check out these programmes here:

www.bbc.co.uk/programmes/w3ct1k3m

I searched for older editions, wondering if there was another *Outlook* archive out there, be it an official or unofficial one. I have yet to find anything substantial. However, the *Random Radio Jottings* YouTube channel has a nice, if short, compilation from 1999. The BBC itself celebrated the programme's 50th anniversary in 2016 and there is a short clip of one of the inspiring stories on the BBC News YouTube channel.

I did find some BBC web pages from 2007, which contained a few programme overviews of that era. Topics covered included the *Men's Shed Movement* in Australia and real-life superheroes. The audio was no longer available but there was a synopsis of each programme. In addition, there was also an album of photos taken behind the scenes at Bush House in the *Outlook* production offices.

Other programmes can be found online – often on the YouTube channels – of individuals who appeared or of some of the organisations relevant to the particular edition's subject matter.

https://tinyurl.com/8ervuhsx
https://tinyurl.com/vedk2p26

Another programme that I often overhear friends discussing, on walks or in cafés, is *Radiolab, Investigating a Strange World*, It clearly does have something unique and appealing. Produced in the USA by WNYC, it even has a weekly slot on BBC Four Extra. At the time of writing, *Radiolab* is heard on BBC Four Extra on

CITIES AND MEMORY

2

LORENZO SPOLETI ON *UNSPLASH*

3

Fig. 1: CBC has aired *Quirks & Quarks* for many decades; Bob McDonald is the host. Fig. 2: The *Cities and Memory* project adding short wave to its field recordings and musical output.
Fig. 3: Tropical visions and audio from the Seychelles Broadcasting Corporation.
Fig. 4: This autumn, Warda Imran and Madelaine Pitt explore hidden gems for Deutsche Welle.

Sundays at 1000 and 1800 UTC, as well as on the *BBC Sounds* app for 30 days after the broadcast. The BBC airs older episodes of the programmes, presumably as it has only bought rights to some of the series. Series 8 was being aired this autumn.

On September 20th, I heard a *Radiolab* episode from 2019. Entitled, *Asking For a Friend*, it answered questions of what the oldest word in the English language is, what would happen if the Earth was made entirely of blueberries, whether humans own their body parts, and what would it be like to chat with a Neanderthal woman or man in a bar.

Mind-blowing listening, as usual.

https://tinyurl.com/tx9yf6s6

"Created in 2002 by host Jad Abumrad, Radiolab *began as an exploration of science, philosophy, and ethics using innovative composition and sound design.* Radiolab *has expanded and evolved to become a platform for long-form journalism and storytelling. The show challenges its listeners' preconceived notions about how the world works.* Radiolab *provokes, it moves, it delights, and it asks its audience to see the world around them anew.* Radiolab *is co-hosted by Lulu Miller and Latif Nasser."*

The *Radiolab* website also carries transcripts of the programmes; plus there is a children's version of the programme that is worth checking out.

www.bbc.co.uk/sounds/play/m000ztsm
www.wnycstudios.org/podcasts/radiolab
https://tinyurl.com/3496rxut

In Canada, a long-running CBC programme still captures the imagination of over 800,000 listeners a week. *Quirks & Quarks* began in 1975 and takes on a variety of incredible subjects. Bob McDonald has been the host since 1992 (Fig. 1). Recent topics have included 200,000-year-old handprints found in Tibet, which may be the world's oldest art, and the discovery that some animals are shape-shifting in response to climate change. *Quirks & Quarks* can be heard live online, as a podcast or through the CBC website.

www.cbc.ca/radio/quirks

Cities and Memory

In September, *The SWLing Post* was pleased to note that the excellent *Cities and Memory* sound project partnered with the *Shortwave Radio Audio Archive* for an all-new take on the soundscape of cities. *Cities and Memory* is one of the world's leading podcasts for field recording and sound art (Fig. 3).

Its *Shortwave Transmissions Project* called for sound artists and musicians to get involved by reimagining short wave radio recordings from across the world. Compositions were to be aired in late November with an album release planned for the best ones. Currently, episodes of the podcast showcase short musical compositions and field recordings, which include extracts from cathedrals to train stations (Fig. 3).

https://tinyurl.com/srtwawzk
https://tinyurl.com/yznmtjma
https://citiesandmemory.com
https://citiesandmemory.com/podcast

It is good to see that this concept is not a dying art. Taking radio broadcast extracts and blending them into musical pieces has been ongoing in western popular music for many decades. I first became aware of it in 198,3 when Orchestral Manoeuvres in the Dark opened their album, *Dazzle Ships*, with an arrangement of the Radio Prague interval signal and sign on. Two years later, Tears For Fears inserted BBC Radio 4's shipping forecast into a piece of music, but perhaps it did not get the exposure that its brilliance warranted; *Pharaohs* was released as the B

Date	Time (UTC)	Station	Programme	Podcast	URL/ Stream/ Frequency
Daily	2300 to 0700	Harrogate Hospital Radio	Night Shift, upbeat tunes to keep you going through the night	Tune In, Radio Net, station app	https://tinyurl.com/rc9ed64j or 95.3MHz
Daily	24/7	Africa No. 1, Gabon	African music and French talk	https://mytuner-radio.com/radio/africa-no1-402707	www.africa1.com
Daily	24/7	La Melinkana FM, Melinka, Chile	Folk and other indigenous music	https://lamelinkanafm.cl	101.3 MHz locally https://tinyurl.com/36xdta9m
Weekdays	1500 to 1520	Bulgarian National Radio	Bulgaria Today	https://tinyurl.com/58vkwdct	https://bnr.bg/en
Wednesday	1100 to 1200	Radio New Zealand	Inside Out, jazz with Nick Tipping	www.rnz.co.nz/concert/programmes/inside-out	www.rnz.co.nz/listen/amfm and FM locally
Wednesday	1400 to 1500	Marlow FM	Internetted, tech show with Michael Bird and Rob Murgatroyd	www.marlowfm.co.uk/programmes/internetted	http://radioplayer.marlowfm.co.uk and 97.5 MHz locally
Wednesday	1900 to 2030	CHLY, Nanaimo, Canada	Nash Holos, Ukrainian music and culture with Pawlina Demchuk MacQuarrie and	www.nashholos.com	www.chly.ca and 101.7 MHz locally
Saturday	2200 to 0100	Hits Radio UK	Stephanie Hirst's Belters, dance-floor throwbacks from the 90s & 00s	https://planetradio.co.uk/hits-radio/shows/steph-hirst-belters	FM, DAB and https://planetradio.co.uk/hits-radio
Sunday	0200 to 0300	CHMB, Vancouver, Canada	Nash Holos, Ukrainian music and culture with Pawlina Demchuk MacQuarrie	www.nashholos.com	https://am1320.com and 1320kHz
Monthly	Unknown	Liverpool Community Radio	How Very Interesting, facts with Dave Cash	https://tinyurl.com/3dxtrwvw	106.7 MHz or https://l-c-r.co.uk

Table 1. Chrissy's Top Listening Recommendations for the Month Ahead - Enjoy!

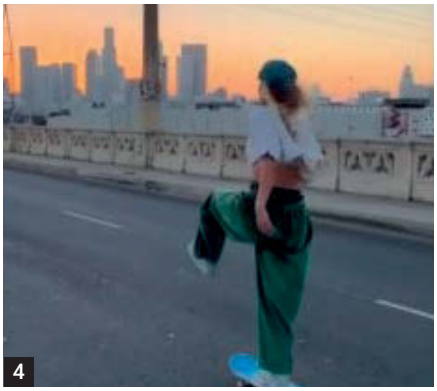
side of the single, *Everybody Wants to Rule the World*. In 2004, an album called *Music for DXing*, by Spunkle, merged short wave sounds with synthesizers and can still be heard at the Last FM link below. There were some absorbing abstract videos made to accompany the music.

https://tinyurl.com/c4vkxavyl
https://tinyurl.com/ysjmxpfz

There are many other exponents of this type of art and, clearly, a synergy exists between electronic music and the audio content of the short wave bands, be it in the form of otherworldly whistles, atmospheric noises or programme extracts. In fact, *Electronica* music appears to be the most infectious genre of all. In findings from a study released in September, it was discovered that popular music can be infectious; patterns of music downloads resemble epidemic curves. Dora Rosati was the lead author of the study conducted at McMaster University in Ontario, Canada. She stated, "*Popular songs are often said to be 'contagious,' 'infectious' or 'viral.' We find that download count time series for many popular songs resemble infectious disease epidemic curves. This paper suggests infectious disease transmission models could help clarify mechanisms that contribute to the 'spread' of song preferences and how these mechanisms underlie song popularity. We analysed data from MixRadio, comprising song downloads through Nokia cell phones in Great Britain from 2007 to 2014.*"

https://royalsocietypublishing.org/
doi/10.1098/rspa.2021.0457
https://tinyurl.com/yr8atncp

DW



4

TV on the Radio

Many international broadcasting organisations broadcast television programmes and channels in English, online and on satellite TV and cable channels. Most of these English services owe much to today's international audiences' attention through the broadcaster's short wave legacy.

Such programmes are useful sources for different angles of news and current affairs, often covering the kind of news not aired elsewhere. Along with its radio broadcasts, NHK World Japan operates a live television service in English, as well as in other languages, via the *NHK Newsline*.

One of the highlights for me is a Sunday programme called *The Professionals*: recent editions have looked at hospital workers, search and rescue dog trainers, vegetable growers, and futon makers. Also worth

watching is the Saturday programme (mornings and evenings) called *J-Flicks*, which discusses new Japanese film releases.

www3.nhk.or.jp/nhkworld/en/live
https://tinyurl.com/4k2frdry

Less well-known, perhaps, is the Seychelles Broadcasting Corporation. Its radio and television website includes news bulletins in French, giving a voice for a country that is not given much prominence on the global stage (Fig. 3). SBC runs two television channels, SBC1 and SBC2, and two radio services, Radyo Sesel and Paradise FM. The latter is worth listening to for some very interesting music with local ballads, folk and chanson, alongside the genres you hear often elsewhere online.

https://sbc.sc/paradisefm.html
https://sbc.sc
https://sbc.sc/programme-guides

Other, more familiar broadcasters that operate televisions services in English include a partner of Radio France International, France 24. Its international news seems to me to cover far wider issues than those you see on BBC or ITV, from the calls for President Bolsonaro's impeachment in Brazil to a mainland European take on Brexit.

www.france24.com/en

KBS World in South Korea air a range of high-quality feature and drama programmes. Sadly, it is not a case of streaming via the website but finding cable channels or local broadcasters that relay the programmes. *Worlds Within* was a critically-acclaimed drama series from way back in 2008. It was set behind the scenes of a television drama production company.

https://tinyurl.com/ptm7e34n
https://tinyurl.com/djwpnsyd

For more recent South Korean dramas, turn to Netflix to see the astonishing, and popular, *Squid Game,* which was released in the UK in September. Another series that deserves such popularity is this year's *Love (featuring Marriage and Divorce),* which is about three successful women who work on a radio show.

Whilst on international television drama and film, the Channel 4 *Walter Presents* world drama selection currently offers 83 series, from Scandi Noir to Brazil in 1970. Two that I am about to watch are Senegalese crime drama, *Sakho and Mangane*, and *Liberty*, which is set amidst a Danish ex-pat community in Tanzania.

https://tinyurl.com/2772ajn3

A problem with watching much of international television content is that for licensing reasons, much of it is unavailable outside of the country of broadcast. That also applies to some radio programmes, which, although understandable, still seems a shame, as SBS in Australia and CBC in Canada provide programmes that many of us would like to enjoy. However, there is always more than enough video and audio output available elsewhere to sate the demand of international viewers and listeners.

News from Germany

Deutsche Welle is amongst the most well-known radio and television broadcasters. Mostly absent from short wave for several years, the radio arm of the German state broadcaster returned in September with programmes targeted at Afghanistan. These are broadcast on 15230 and 15390kHz at 1400 UTC in Dari and 1430 UTC in Pashto. Deutsche Welle has dozens of quality radio programmes in English to hear, online. There is also a live stream of DW radio in English, French, Kiswahili, Hausa, Portuguese, and Amharic. I am always delighted to hear the old-school station interval signal at the audio live stream. It is a nice nod to the station's heritage. Programmes include *Science Unscripted*, *The 77 Percent* (this refers to the percentage of Africans younger than 35, shaping the continent's future). *World in Progress* explores the many facets of globalisation.

www.dw.com/en/radio/s-32771

Deutsche Welle TV is invaluable to me, especially the news bulletins, *Euromaxx* (Lifestyle in Europe) and *Focus on Europe* (Spotlight on People). The media giant also uses all its social media channels well. Many have followed *@dw_travel* on Instagram this autumn, where Warda Imran and Madelaine Pitt explored Germany, Switzerland, Liechtenstein and Austria, travelling only by electric vehicle, to uncover hidden gems. A mountain railway at Alpbachstad on the Pilatus Railway won the second vote. Moreover, the two intrepid DW correspondents climbed aboard the world's steepest cogwheel train (Fig. 4).

For another take on German life, try out Bear Radio, a Berlin-based podcasting network and production house. Podcasts of interest include *Berlin Bigwigs*, *September 26* (which was about the recent German elections) and *All Boats*. The latter highlighted an incredible range of city life: Girl Gang Berlin inspires a community of women; Susan Choi owns Mr Susan cocktail bar in Berlin; and a French ceramicist, Violaine Toth. The housing crisis and nightclub scene were also covered.

www.bearradio.org/all-boats

Radio News

BBC RADIO 1 LAUNCH *ANNIE NIGHTINGALE SCHOLARSHIP* FOR EMERGING DJs: BBC Radio 1 has launched the *Annie Nightingale Presents Scholarship*, a brand-new initiative designed to champion up-and-coming women and non-binary DJs in the Dance scene. The Scholarship aims to celebrate and elevate talented women and non-binary people in the electronic music scene by providing them with a national platform to highlight their taste and expertise. Each year Annie will highlight three DJs she feels are deserving of recognition for their work. Those selected will go on to appear in a special edition of *Annie Nightingale Presents* on Radio 1.
(SOURCe: RadioToday | Radio 1)

https://tinyurl.com/55chv3pj

YOTA MONTH: It is not too late to register your interest in December YOTA Month 2021. The RSGB has been granted the call sign GB21YOTA, for allocation to youngsters to operate throughout December. Slots are open for clubs and individuals but you must be a Full licence holder or have one willing to supervise the activity. To see operating slots still available, please visit the RSGB QRZ listing (URL below). Email *yota.month@rsgb.org.uk* to register your interest in hosting the call sign during December. Please include your name, call sign and, if possible, your RSGB membership or affiliation number. If you would like to request a specific time slot that is different to the spreadsheet on *QRZ.com*, just add this to your email.
(SOURCE: Heather Parsons, RSGB).

https://www.qrz.com/DB/GB21YOTA

Tony Smith G4FAI
g4fai@btinternet.com

ALL PICTURES: TONY SMITH G4FAI

1

Bottled Wireless, Radio-Film, & the Nightingale's Song

Tony Smith tunes in to the year 1925, looking at the transmissions of the British Broadcasting Company, the equipment used to receive them, and the experiments undertaken in that age of remarkable originality.

A regular broadcasting service, licensed by the Postmaster-General (PMG) to provide programmes of speech and music in the United Kingdom, was launched by the British Broadcasting *Company* (BBC) in November 1922. The company was a consortium of six manufacturers of wireless apparatus, namely Western Electric; Marconi; General Electric; British Thomson-Houston; Radio Communication Company; Metropolitan Vickers, and a number of smaller manufacturers.

From the beginning, the BBC sought to provide varied and new experiences for its listeners who, in 1923, heard the first outside broadcast, the first weather forecast, the first Greenwich time signal, the first Big Ben time signal and the first continental programme relayed by landline. The following year,1924, saw the first religious broadcast, the first broadcast to schools, the first broadcast by the King, a live running commentary from the Lord Mayor's Show in London, and a relay from America.

By 1925, the service was beginning to settle down and take shape with even more experimental and innovative presentations to entertain and intrigue the ever-growing numbers of wireless enthusiasts across the country. At the same time, technical improvements in transmission provided improved reception over all areas.

Homemade Receivers

Listeners mainly used homemade receivers, principally crystal sets (Fig. 1). Components for them were widely available (Fig. 2), and the simplest sets could be made by anyone, including school children. The broadcasts were on medium wave, and there was no sign yet of professional shortwave broadcasting. Nevertheless, broadcasts or other transmissions could be heard at times on medium wave from other countries, including Belgium, France, Germany and Holland.

To be able to listen, a Broadcasting licence was required, permitting the licensee to own and operate a receiver to receive 'music, speech, and news items,' transmitted by British broadcasting stations. This was available to anyone over 21 years (or to parents on behalf of minors), for ten shillings, but many listeners who thought the price was too high used their sets illegally, without a licence.

Representations were made to the Postmaster General (PMG) to allow weekly low-wage earners to pay for their licences by instalments. The PMG's reply was, in effect, that if everyone paid up he would consider reducing the price to five shillings! At this time, there were approximately 1,356,000 licences in force.

A report in *Wireless World* estimated that a further 1,250,000 listeners had not yet taken out a licence.

Popular Radios

For most, a crystal set was the only option, either bought commercially or home-constructed, and there were a large number of kits on the market, which were much cheaper than ready-built sets. The cheapest 'ready-made' set was sold pre-tuned to operate on a fixed wavelength, usually 1,600 metres, that of the BBC's Daventry transmitter, and for use with a 100 feet aerial. No tuning was required, the cat's whisker was simply manipulated across the surface of the crystal until the best result was found.

Coil tuner sets had a coil with sliding contacts for tuning, with a cat's whisker and a crystal requiring an adjustment in the usual way. Tuning with a variometer set was easier. The variometer control was simply turned until something was heard, then adjusted to the best position for the loudest signals received. When semi-permanent and automatic crystal detectors became

Fig. 1: A simple crystal set. Fig. 2: Crystals were readily available for home constructors. Fig. 3: Home-made regenerative three-valve radio with horn speaker. Fig. 4: Early valves did not have a long life. Fig. 5: An H.T. battery and L.T. accumulator used for the first valve sets. Fig. 6: A NNC 'Meat-safe' studio microphone. A *Marconi-Sykes Magnetophone* moving coil microphone was suspended in a rubber sling inside a Faraday Cage.

2


3

available, a set's tuning adjustment could be fixed for best results. All that was needed was to put the headphones on!

A crystal set gave satisfactory results, provided it was located within a reasonable range of a broadcasting station. Its sole disadvantage was that the signals were not very loud so most people, eventually thought about getting a valve set, which would work with a horn loudspeaker (Fig. 3) or provide much louder signals on headphones.

Valve Sets

The super-heterodyne had not proved as popular as anticipated, with a price beyond the means of most listeners. A small number had been built by enthusiasts, but the vast majority had constructed Reflex, Unidyne (HT-less), 'straight,' and other types of valve (Fig. 4) sets.

These early sets were mainly of the TRF (tuned radio frequency) type, often with reaction to control sensitivity. They required an H.T. (high tension, 90V) battery, together with an L.T. (low-tension, 2V) accumulator (Fig. 5). The latter needed charging regularly and topping up with distilled water. They were usually taken to a garage, a bicycle shop or an electrical shop. In some places, entrepreneurs provided a door-to-door replacement service, delivering a charged accumulator and taking away the old one for recharging.

A mains H.T. battery eliminator had been introduced by E.K. Cole Ltd a year previously, and the possibility of dispensing with an H.T. battery now existed, although many homes still did not have a mains electricity supply. The licence required all regenerative valve sets sold to be of an approved type, incapable of causing interference to nearby stations when operated by an unskilled person. Interference was usually caused by advancing the reaction control too far, causing the detector valve to oscillate. This functioned as a transmitter and interfered with the reception of other sets in the vicinity. Home-made sets were more likely to cause this problem than commercially made sets, and listeners were constantly reminded in the magazines of the day that this was both an illegal and anti-social activity.

Technical Improvements

The BBC's major event of the year, in 1925, was the opening of a new 25kW long wave station, 5XX, at Daventry, estimated to serve over 23 million listeners and providing a much better signal for many crystal set users. With a T-formation aerial, 500 feet high, it was hypothetically capable of providing a national broadcasting service to 94 per cent of the population of the UK.

The 2LO London transmitter (Table 1) was transferred from its site at Marconi House in the Strand to the top of Selfridges store in Oxford Street in April, with twice the power of the previous station. It provided satisfactory crystal set reception for listeners within a range of 25 miles, compared to 17 miles from the previous transmitter, and it increased the strength of signals in the London area for around 90 per cent of listeners.

A central receiving station was constructed at Keston in Kent with two fixed aerial masts 60 feet high,120 feet apart, and directional aerials to pick up foreign stations. As an experiment, the opening speech of the French Prime Minister at the *League of Nations Conference* in Geneva was relayed by landline from Geneva to Paris from where it was sent by wireless link to Keston.

Unfortunately, the changeover to wireless from such a long landline link resulted in clipping and distortion, and the initial broadcast was not a success. A speech by Mr Austen Chamberlain, Britain's Foreign Secretary, the next day was broadcast with greater success, despite some interference by Morse signals from two telegraph stations near the wavelength of the Eiffel Tower.

[see also Scott Caldwell's article on the Eiffel Tower in the June 2021 issue of RadioUser – Ed.].

BBC engineers were examining a new machine, an early form of electro-magnetic wire recorder, with a view to recording programmes for rebroadcasting. Nicknamed 'Bottled Wireless,' experiments had shown that, while speech recording was satisfactory, music did not record so well. Various difficulties had to be overcome, but the engineers believed it was only a question of time before the system was perfected.

National Coverage

Nine regional stations, each of about 1kW, broadcast from main cities throughout the UK, each producing programmes of local as well as general interest. Simultaneous broadcasting of particular programmes took place via Post Office landlines when they were considered of sufficient interest. Regular news bulletins were simultaneously broadcast through all stations from 2LO in London.

As some areas with large populations had difficulty in receiving satisfactory signals on crystal sets, 11 relay stations, each of about 200 Watts and linked by landline, received and rebroadcast programmes from their

main city stations. The regional stations were: 2LO London on 365m; 5IT Birmingham on 479m; 2ZY Manchester on 378m; 5NO Newcastle on 404m; 5WA Cardiff on 353m; 5SC Glasgow on 422m; 2BD Aberdeen on 495m; 6BM Bournemouth on 386m; and 2BE Belfast on 440m.

They were all linked by landline to the national station 5XX Daventry on 1600m long wave when simultaneous broadcasting was required.

Review of the Year

A review of the previous year in the *1926 Radio Year Book* commented on the extraordinary extent to which wireless had succeeded in capturing and holding the public interest in such a brief time. Wireless was steadily becoming as much of the daily life of the people as a newspaper. These were pioneering and exciting times for both the BBC and its listeners as new techniques and new types of programme were developed. During the year, 567,000 new broadcast receiving licences had been issued. It was estimated that 10 million people now listened to BBC programmes, and that, in two years, the number could reach 20 million.

The engineers were constantly seeking new broadcast experiences, which they referred to as 'stunts' to intrigue the listeners. In London, an experimental 'radio film' linked a short silent film sequence at a cinema in Shepherd's Bush with synchronised background music relayed to the cinema by the BBC from the Prince of Wales' theatre. The experimental synchronisation of film and music was considered successful, and further broadcasts were planned.

Outside Broadcasts

An outside broadcast from the London Zoo used a 'Wireless Pram,' fitted with a specially-designed transmitter. This was pushed round the zoo to broadcast the sounds of the parrot house, baboons, chimpanzees and other animals, followed by a talk on the peculiarities of animals and birds.

Another experimental transmission was made when 'characteristic noises' were transmitted from King's Cross station, followed by a discussion between a BBC announcer and an official of the railway on the footplate of the *Flying Scotsman*, as it steamed out of the station one evening.

For this broadcast, a battery-powered transmitter was installed in a brake van on the train. A three-wire aerial was mounted 18 inches above the roof of the van. An earth connection was made to the two bogies of the van and the tender and engine, and an improved carbon type microphone was suspended in the engine's cab by rubber bands to avoid vibration from the engine. The receiving aerial was a single wire, one of a group of line-side telegraph wires between Potters Bar and Hitchin. Cut at each end, it was tapped at Hatfield station and connected to a wireless receiver, the signals from which were transferred by Post Office landlines to the Savoy Hill studio and simultaneously broadcast from all BBC stations.

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High Flyers and Top Bidders

A flying lesson was broadcast directly from an aircraft in mid-air. Alan Cobham, a famous pioneer of long-distance aviation, instructed his pupil (Miss Heather Thatcher, a well-known actress and dancer) *"in every problem of aeroplane management."* His instructions were transmitted by wireless to a receiver on the ground from which they were relayed to 2LO by landline. To emphasise the reality of the broadcast, *"the noises associated with taking off and landing were included in the broadcast."*

Adding to the *"novel diversity of subjects available to the listeners"* was a broadcast from Christie's Auction Rooms in London when pictures belonging to the Countess of Carnarvon, including a famous Gainsborough, were auctioned. The microphone was placed on the auctioneer's rostrum and the progress of the bidding was relayed to 2LO. In a forerunner of today's natural history broadcasts, the song of the nightingale was broadcast live from its native habitat. BBC engineers went deep into Oxted Wood, letting out a quarter mile of cable, to achieve a three-minute broadcast of the birdsong accompanied by a well-known cellist, Miss Beatrice Harrison, playing her cello in the garden of her house near the wood. The first attempt was a failure, but all went well with a second attempt at a later date.

Studio Audiences

During the year, consideration was given to the concept of a 'public broadcasting studio,' visualised as *"the establishment of psychological contact not only between artist and audience but between listener and listener."* The idea was to *"arouse the listener at home to a consciousness of the response of an audience to a broadcast performance from a public hall."*

Recognising that performing alone in a studio *"militated against an artist's best performance,"* the public were admitted to a number of broadcasts from King George's Hall, London, as they had been previously to symphony concerts direct from Covent Garden, and Central Hall, Westminster.

A limited number of visitors were also allowed to occupy seats in the studio for programmes like *Radio Radiance Revue*, featuring songs, music and sketches by well-known West End artists; and other revues and musical extravaganza.

Some Disappointment

The RAF Display at Hendon was one of the disappointments of the year. A squadron of aircraft was to be flown through various manoeuvres under the control of an officer flying with the aircraft. His R/T commands

to each pilot and exchanges with the ground were to be broadcast to demonstrate the difficulties of intercommunication by voice with the noise of the engines dominating everything.

Rehearsals had proved satisfactory but, on the day, after the first command, which listeners heard perfectly, the broadcast was blotted out by a powerful heterodyne, believed to be deliberate. The RAF had previously announced the wavelength to be used and had, perhaps unwisely, issued an appeal to the public to refrain from interference on it. *An Hour in a King's Ship* was relayed to 2LO from HMS President, HQ of the London Division of the Royal Naval Volunteer Reserve. Part of the broadcast involved a 'man-overboard incident,' involving the use of three microphones and a hydrophone to pick up the sounds of a lifeboat being launched; the crew being alerted, and noises under the water. One of the microphones was damaged as the lifeboat was being lowered, but the engineer in charge was able to maintain transmission; the broadcast was completed successfully.

Underground Broadcasts

Constantly looking for new ways to educate or entertain the listeners, the BBC presented lessons in the *French Tango*. A dance teacher gave a talk on the dance and, in later broadcasts, he described the steps in detail, as he danced with, and instructed, a partner in the studio to the sound of appropriate music.

Following a successful broadcast from the Whitwood Collieries in Yorkshire the previous year, when the colliery band had performed a musical selection and a talk had been given from the pit bottom, 1,500 feet below ground, the Sheffield regional station undertook a similar broadcast in June.

On this occasion, the sounds of coal cutting, boring, explosion shot, fall of coal, filling of tubs, the noise of the train, and signals controlling the working of the cage, were heard directly from 750 feet below the surface.

York Minster and Canterbury Cathedral

Severe acoustical problems were overcome in broadcasts from York Minster and Canterbury Cathedral. An 11-second echo at York was a major concern but, thanks to the use of strategically-placed microphones and special correcting apparatus, there was no trace of the echo in the broadcasts. In the Minster itself, the congregation, seated more than 30 feet from the pulpit, could not hear the preacher clearly because of the noises of a large number of people present. At 200 miles away, listeners could hear every word distinctly. At Canterbury, owing to even more difficult acoustics, the echo had again to be overcome, while speech, received by a microphone placed more than seven feet from the choir, was unintelligible. Special arrangements were made again to ensure successful transmission.

Third Birthday

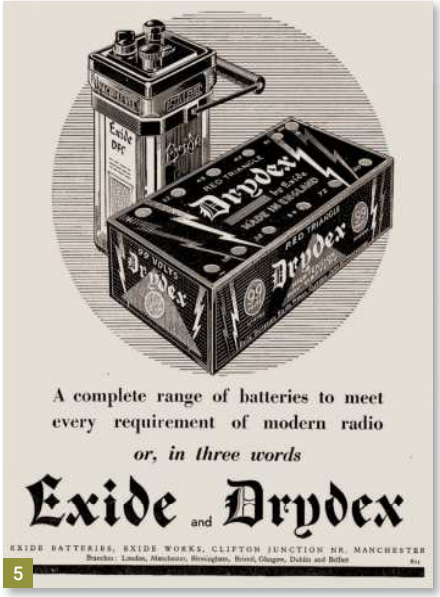
The BBC marked the completion of its third year of operation with special birthday broadcasts throughout the week of 8-14th November. The Prince of Wales broadcast a *Poppy Day* message in support of Earl Haigh's British Legion Fund; The Archbishop of Canterbury preached from Canterbury Cathedral on Armistice Day; the Prime Minister spoke from the banquet at Guildhall on Lord Mayor's Day; and several other famous people were heard during the week, including Sir Oliver Lodge and Sir Robert Baden-Powell, founder of the Boy Scout movement. It was a week of great choices for the listeners. Many famous orchestras, bands and performers were heard. There was also comedy, drama, a Radio Military Tattoo, and a concert broadcast direct from an aeroplane flying above Croydon Aerodrome.

Light Entertainment

The *Radio Radiances* dancers broadcast their first musical revue from 2LO. A report commented, *"The pit-pat of the dancing could plainly be heard by listeners-in."* Norah Blaney and Gwen Farrar, a famous musical comedy act of the time, gave a farewell performance to listeners across the UK prior to their departure for America. Max Darewski, musical prodigy, pianist and composer, also appeared, playing a number of his own compositions. Music lovers were thrilled when the famous Italian coloratura soprano, Madame Luisa Tetrazinni, broadcast from 2LO; and Sir Alexander MacKenzie, Director of the Royal Academy of Music, conducted a concert of his own works. A host of other well-known entertainers of the time were regularly heard in the BBC broadcasts, nationally, or in local programmes generated by the various regional stations.

Agreement with Theatres

There was concern in the entertainment industry that BBC broadcasts could adversely affect attendances at live performances. Accordingly, an agreement was entered into with the industry that the BBC could broadcast up to 26 excerpts from stage performances per annum, if possible at fortnightly intervals, but not more than once in any one week.



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Repertory grand opera and similar productions were not included in this agreement; if they were broadcast twice in any one week there should be no stage broadcast in that week. No first-night performances were to be broadcast, and the BBC was to arrange, as far as possible, that Fridays and Saturdays should be the only nights of the week when stage excerpts would be broadcast and should not normally exceed 30 minutes.

No cabaret performances were to be aired during theatre hours. The BBC was not to present plays touring the provinces during the first 12 months of a tour and was to endeavour to exclude broadcasting excerpts of plays actually being performed on stage from being relayed to towns where the plays were running.

In the search for originality, the BBC explored the possibility of introducing natural noises into a new type of radio play. Instead of leaving everything to the imagination of the listeners, it was intended to transport them in mind to the scene described by speech or song. Country plays would have a background of country noises; town plays of town noises, and plays relating to life in the armed services would have their natural settings. It was also hoped to produce several plays connected with open-air life, *"with the appropriate atmosphere."*

Broadcasting Talks

Throughout the year, many famous personalities responded to the challenge of the new medium and willingly took part in BBC broadcasts. The Prime Minister, Mr Stanley Baldwin, appealed for funds for a club for working girls; Mr Ramsay MacDonald, the country's first Labour Prime Minister, gave a talk on *"Open Diplomacy"*; the Earl of Meath, founder of *Empire Day*, made a speech on the day; a group of Tibetan priests who were with the Mount Everest Exhibition visited 2LO and broadcast several Tibetan chants and instrumental music; Mr A.E.R. Gilligan, Captain of the English Cricket Team broadcast an account of that year's cricket tour: French tennis star Suzanne Lenglen broadcast a tennis talk.

Twice-monthly talks by the Radio Society of Great Britain (RSGB) were also broadcast by 2LO, each lasting 15 minutes. Previously broadcast weekly, the time of each broadcast had been extended in the hope that this would *"considerably increase"* the interest of the listeners in this feature. The microphone 'interview' had proved so successful, on the few occasions when it had been attempted, that the Birmingham station 5IT intended to try a similar experiment, when Mrs E.W. Barnes, the wife of the Bishop of Birmingham was to be interviewed in front of the microphone (Fig. 6) by a Birmingham journalist.

Broadcasts for Children

Schools broadcasts had begun the previous year from 2LO and continued throughout 1925, relayed nationally through 5XX, with an increasing number of schools taking advantage of them. All the regional stations broadcast their versions of *Children's Hour*, each hosted and presented by 'Uncles or 'Aunties,' with the object of providing a balanced programme, avoiding any impression of 'education.' They included news bulletins; stories of all kinds; talks on music, books and travel; competitions and plays. From this early start, *BBC Children's Hour* broadcasts continued for many years until 1964.

Listener's Comments

The Company believed that there was public support for its intellectual ideals and standards. It declined to limit its programmes to ephemeral entertainment. It took the view that broadcasting should be the means not only of amusing but of instructing and guiding its listeners.

However, the listeners did not always agree. Following a broadcast of *The Tempest*, some commented on the difficulty of identifying the numerous characters in the play, expressing a preference for presentations, not exceeding 20 minutes, and with fewer characters. One simply wrote, *"I'm fed up with Shakespeare!"*

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Another wrote about *"unknown speakers talking on subjects of limited interest, at times when light music would be more acceptable."* Other comments included: *"Broadcasting, on the whole, is as dry as dust, with very little appealing to the average man or woman,"* and *"If the BBC had to arrange the programmes for any theatre, music hall or picture house they would empty it in a fortnight!"*

Others liked the presentations very much. One listener wrote, *"I and my family are completely satisfied with the BBC programmes."* Another wrote, after hearing a broadcast of *Westward Ho*, by Charles Kingsley, *"The background noises were most realistic. The sound of the seawater was wonderful. How do you do it?"* The BBC replied, *"that is a trade secret and may not be divulged!"*

Following a complaint received, the PMG reported that no evidence had been received regarding injuries to pigeons through collision with wireless aerials, but he had asked the National Homing Union to furnish information so that the matter could be given further consideration!

Tuesday, 19th May 1925:

13.00	Holborn Restaurant, London, Luncheon music.
15.15	Transmission to schools, Miss Ethel Home (*Characters of Tunes*).
16.00	Books to read, by Ann Spice. Organ and Orchestral Music relayed from Shepherd's Bush Pavilion. *What do we mean by Play?* by Muriel Wrinch.
18.00	Children's Corner (Pinkety and Old Mother Ribbony Rose), from The Enid Blyton *Book of Fairies*. Astronomy Talk by Captain Ainslie. Music by Auntie Sophie.
18.30	Children's Letters
18.40	Music.
19.00	Weather Forecast and First General News Bulletin [*S.B. to all stations]. James Agate (Dramatic Criticism) [*S.B. to all stations].
19.25	Music [*S.B. to all stations].
19.40	Elephant hunting in Burma. Travel Picture by Lieut.-Col. M. C. Nangle [*S.B.to other stations].
20.00	**Concert arranged by the **Fleetway House Press [*S.B. to all stations].
22.00	Weather Forecast and Second General News Bulletin [*S.B. to all stations]. Prof. J. Arthur Thomson: *The Underworld of Animals* [*S.B. from Aberdeen]. Local News. Contributors.
22.30	The *Savoy Orpheans* and *Savoy Havana Band* relayed from the Savoy Hotel, London [*S.B. to all stations].
23.30	Closedown

* S.B. = Simultaneous Broadcast

**The BBC's licence allowed it to carry sponsored programmes. Eight such programmes were aired in 1925 and were well received by the listeners, many of whom thought they were of a better standard than the regular BBC programmes. On Sundays, only serious programmes were broadcast, e.g., hymns, prayers, talks, organ recitals, classical music, news bulletins, and weather reports.

Table 1: A Day's broadcasting from 2LO, London.

One More Year to Run

Not everyone can be pleased at the same time; but considering the adventurous and pioneering state of the early technology and the difficulties that were overcome, the broadcast engineers, producers, and performers created an interesting mix of features, including the forerunners of many broadcast techniques and programmes taken for granted today. The British Broadcasting Company had one more year to run. It was dissolved at the end of 1926. Its assets and its ideals were transferred to the British Broadcasting Corporation on 1st January 1927. The rest is history.

Radio News

BROADCASTER OF THE YEAR: The BBC has won the *Broadcaster of the Year* accolade at the New York Festivals Radio Awards. Most of the Gold Awards went to the BBC or independent producers working on BBC programmes. Across its radio networks, the BBC collected 14 Gold, seven Silver and 10 Bronze Awards, with podcast series including *I'm Not A Monster, Where Is George Gibney* and *Fight Of The Century* all picking up several each […]. TBI Media UK earned the title of *Production Company of the Year* for the 7th year running. The London-based company also earned multiple Gold trophies for their work for high-profile clients, including the BBC.
(SOURCES: BBC | Radio Today)
https://tinyurl.com/md6nd4mx

GPS AND SPACE WEATHER: Researchers have developed a new mathematical model to more accurately capture how irregularities in Earth's atmosphere interrupt signals from Global Navigation Satellite Systems. Societies around the world now depend on satellite-based navigation systems, such as GPS, for a multitude of applications, including transportation, agriculture, military munitions, emergency services, and social networking, among others. However, natural hazards such as space weather can disrupt signals from these Global Navigation Satellite Systems (GNSS). To better understand such disruptions, Sun et al. have developed a mathematical model that accurately emulates interruptions of GNSS signals caused by one particular space weather phenomenon: irregular low-density patches in the charged ion plasma that makes up Earth's ionosphere. These low-density plasma patches usually form above Earth's equator around twilight and are known as equatorial plasma bubbles. When GNSS signals encounter them, the signals undergo a type of modification known as ionospheric scintillation, which can fade their intensity to the point that they are no longer detected by a receiver—the signal may be lost. Many GNSS satellites use signals at two different frequencies to counteract ionospheric scintillation-driven fading, with one frequency acting as a backup. However, a signal could still be lost if both frequencies are disrupted. To capture the effects of ionospheric scintillation and explore the benefit of dual-frequency GNSS signals, the researchers developed the new model using a mathematical approach known as a *Markov Chain*. They estimated parameters for the model from data on actual signal disruptions caused by ionospheric scintillation above Hong Kong on 2 March 2014 […].
(SOURCE: EoS Science News, November 2021).
https://tinyurl.com/4ebns66j

European Private Shortwave Stations

November 1st 2021

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

kHz	Country	Name	Transmitter site	Schedule (UTC)
3955	D	Radio Channel 292	Rohrbach Waal	Daily 0700-2000 & 2200-0600
3975	D	Shortwave Gold	Winsen	Daily 1700-2200
3985	D	Shortwaveservice	Kall-Krekel	Daily 1700-2100
3995	D	HCJB	Weenermoor	24/7
5895	NOR	The Sea / Radio Northern Star	Bergen	Daily 0428-2307
5920	D	HCJB	Weenermoor	Daily 0700-1800
5930	DNK	World Music Radio	Bramming	24/7
5955	NL	Sunlite	Overslag	F.pl. from December: Daily 0600-1800
5970	DNK	Radio208	Hvidovre	24/7
5980	DNK	Radio OZ-Viola	Hillerød	We 2200-2300, Sa-Su 1200-1400
5980	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month
5990	NL	Studio Denakker	Klazienaveen	F.pl.
6005	D	Shortwaveservice	Kall-Krekel	Daily 0900-1700
6005	NL	Radio Delta International	Elburg	Irr.
6020	NL	Radio Delta International	Elburg	Su 0700-1900
6055	DNK	Radio OZ-Viola	Hillerød	Alternative to 5980
6070	D	Radio Channel 292	Rohrbach Waal	24/7
6085	D	Shortwaveservice	Kall-Krekel	Daily 0800-1800 (Radio MiAmigo Int'l)
6115	D	Radio SE-TA 2	Gera	Irr. (10-12 UTC)
6125	NL	Radio Europe	Alphen a/d Rijm	Irr. (14-23 UTC)
6140	NL	Radio Onda, Belgium	Borculo, NL	
6150	D	Europa 24	Datteln	Daily 0800-1700
6160	D	Shortwave Gold	Winsen	Daily 0900-1700
6170	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month
6185	NL	Radio Piepzender	Zwolle	Irr.
7220	NL	Rockpower	Nijmegen	Technical problems. Back soon.
7365	D	HCJB	Weenermoor	0900-1400
7425	NL	Radio Piepzender	Zwolle	F.pl.
9520	NL	Radio Onda, Belgium	Borculo, NL	F.pl.
9670	D	Radio Channel 292	Rohrbach Waal	24/7
11690	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month
11720	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month
15785	D	FunkLust	Erlangen	DRM-modulation
15790	DNK	World Music Radio	Randers	Sa-Su 0700-2000 + irr. at other times
25800	DNK	World Music Radio	Mårslet, Aarhus	24/7

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

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Keith Rawlings G4MIU
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HMS Collingwood Museum Closes

Keith Rawlings deplores the closure of an important museum and relates the fascinating behind-the-scenes story of one particular object from the battleship Admiral Graf Spee.

In April this year, this important museum, which was set up in 1953, closed. Known more recently as the Collingwood Heritage Collection (CHC), it housed many fine exhibits from the Royal Navy's radio, radar and electronic past and, in addition to these, possessed an extensive document archive.

The collection was founded in Autumn 1953 by Instructor Lieutenant Commander Cyril Sinfield RN, after he saw equipment being scrapped and started a campaign to save items for posterity.

It will now be taken over and cared for by the National Museum of the Royal Navy.

CHC curator Clive Kidd has informed *RadioUser* that, "*The Heritage Collection items have left* HMS Collingwood *and are now cared for by the National Museum of the Royal Navy. Currently, all of the hardware is stored in the Cobham Building down at the Fleet Air Arm Museum Yeovilton. They have all been tagged and re-catalogued and some of them have been cleaned by a specialist company.*

"I believe that there is an intention to display some items on special occasions, for example, the 271 Radar as part of a Battle of the Atlantic Celebration *exhibition, currently being planned. The archived books and the photographs – something in the order of 10,000 separate items – have also been entered into the NMRN catalogue. The books and photos are being cared for in the NMRN library in the Historic Dockyard Portsmouth. They are currently in quarantine, to ensure no mould, silverfish, and so on, transfer to the other library items in the NMRN. The NMRN library catalogue – soon to be available online – will include the documents previously located in Collingwood. Access rights will be the same as for any other document in the NMRN library."*

One of the more unique exhibits of the CHC would probably normally go completely unnoticed, resembling as it did, an old electronics chassis that had been cleaned up after being pulled out of a bonfire (Fig. 3).

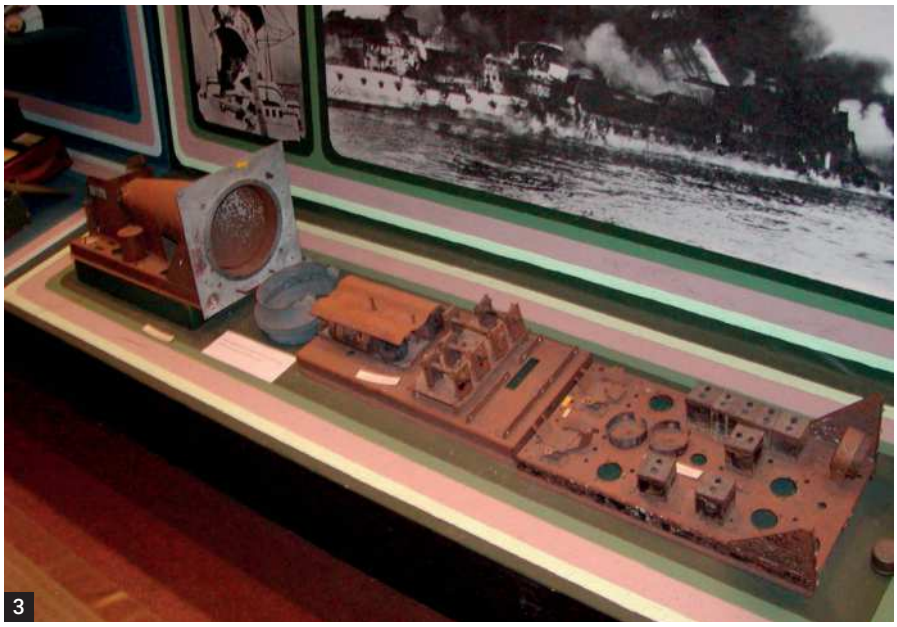
Well in truth, it was.

This priceless artefact is in fact the burnt remains of the *Seetakt* radar display of the German 'Pocket Battleship' *Admiral Graf Spee* (Figs. 1 to 3; *['Graf' denotes the aristocratic title of 'Count' in German – Ed.]*).

Armed with six 11-inch and eight 5.9-inch guns, she used this radar to good effect during the Battle of the River Plate (13 December 1939) to target the three British Cruisers *HMS Ajax, HMS Achilles* and *HMS Exeter*. It is believed that this was the first time that radar was used in a major naval action.

Indeed, early on in the battle, those on the British side remarked at how accurate the *Graf Spee's* gunfire was. *HMS Exeter*

Fig. 1: The *Graf Spee* burning.
Fig. 2: The *Graf Spee* in Montevideo.
Fig. 3: The museum's showcase with the burnt-out remains of *Graf Spee's Seetakt* radar display.



was put out of action after about half an hour (however, not before she had already scored critical hits on *Graf Spee* with her 8-inch shells).

Eventually, after both sides had received many hits and taken casualties, the action was broken off and the *Graf Spee*, damaged, headed for a neutral harbour in Montevideo, Uruguay.

To avoid being interned in Uruguay, and also to evade the flotilla of British warships – which the captain of the *Graf Spee*, Hans Langsdorff (1894-1939), had been successfully tricked into believing awaited his ship – with just a skeleton crew, she sailed from the port into the River Plate and was scuttled with explosives.

However, this was not before her *Seetakt* aerial had been photographed and sent to the Admiralty in London. Although the ship burnt for many days, her radar aerial was still visible.

The British were eventually able to get people on board and they salvaged the radar.

Clive explains further:

"The Graf Spee items were amongst the first things in the museum's inventory, and the Museum Log shows them coming from L.H. Bainbridge Bell. Bell was the man who went down to Montevideo and retrieved them from the scuttled ship. Whether they were in his possession, or whether he just knew where they were, is not clear. Sinfield was also instrumental in acquiring the 271 and 79 radars, as well as other non-radar artefacts."

Captain Langsdorff adhered to the Hague convention by safely removing the crews of merchant ships before they were sunk and – after the scuttling and his dead crew members' funerals – Langsdorff committed suicide.

Some five years later, in December 1944, his son Joachim Langsdorff, was also killed while piloting a *Biber ('Beaver')* midget submarine.

The *Seetakt* worked on a frequency of 375MHz (or Mc\s) with a corresponding wavelength of 80 cm (some sources quote a frequency of 386MHz) and ran a power of 7kW. It had a range of around 11 miles and was well in advance of anything the Royal Navy had planned at the time.

As well as an impressive collection of electronic equipment of varied types, including communications equipment, radar, and so on, the museum at one point had a very large collection of Thermionic Valves and also a very interesting collection of domestic radios.

Sadly, this fabulous and important collection of naval electronics has now gone from Collingwood.

All its supporters and volunteers who have worked so hard over the years must be bitterly disappointed.

It is also unfortunate, and indeed surprising, considering the past and present roles of *HMS Collingwood*, that space could not be found on this large shore base to house the CHC.

Hopefully, one day, someone will see fit to re-establish the collection as a whole; if not *HMS Collingwood* then what better place than the FAA museum at RNAS Yeovilton (HMS Heron).

Our sincere thanks go to Clive Kidd and Ken Sutton.

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WHISTLER

TRX-1E Digital Handheld Scanner

MOONRAKER IN STOCK

We have worked with Whistler to customise a UK band plan for the scanners! This ensures the radios cover UK bands in the correct steps and the correct mode. The TRX-1 will receive both amateur and commercial DMR transmissions as apart from the frequency they are fundamentally the same mode. The radio is supplied with software and users can select mode when writing memories or select auto and it will work out the mode itself!
This multi-system adaptive digital trunking scanner supports Motorola P25 Phase I, X2-TDMA, Phase II and DMR.

Buy the TRX-1E for just

£419.95

WHISTLER

WS1065 Desktop Radio Scanner

MOONRAKER IN STOCK

The Whistler WS1065 employs cutting edge technology to bring a high level of performance and innovative features. This model clearly raises the bar in the area of advanced trunking scanners. Frequency coverage is extensive including: 25-54, 108-17, 137-174, 216-512, 764-776, 795-805, 849-869, 896-960 and 1240-1300 MHz.
1800 memories are available and may be dynamically structured to bank sizes you prefer. Plus you can store 21 virtual scanners (so that is a total of 37,800 objects).
The large backlit LCD is four lines by 16 characters. The keys are also backlit. Supported trunking systems include Motorola Analog, EDACS, LTR and Digital APCO (9600 bps).

KEY FEATURES

- Alert LED • Audible Alarms • Automatic Adaptive Digital Tracking
- Backlit Liquid Crystal Display • Data Cloning • Digital AGC
- Flexible Antenna with BNC Connector • High Speed PC Interface
- Free-Form Memory Organization • LTR Home Repeater AutoMove
- Key Lock • Lock-out Function • Memory Backup
- Menu Driven Programming with Context Sensitive Help
- Multi-System Trunking • P25 NAC Functionality

Buy the WS1065 for just

£299.95

299 WATTS

WHISTLER

WS1025 Desktop Radio Scanner

MOONRAKER IN STOCK

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

Buy the WS1025 for just

£89.95

89 WATTS

WHISTLER

MOONRAKER IN STOCK

TRX-2E Digital Desktop Scanner

Buy the TRX-2E for just

£479.95

479 WATTS

The radios will receive both amateur and commercial DMR transmissions as apart from the frequency they are fundamentally the same mode. The radio is supplied with software and users can select mode when writing memories or select auto and it will work out the mode itself!

This multi-system adaptive digital trunking scanner supports Motorola P25 Phase I, X2-TDMA, Phase II and DMR making it capable of monitoring the following unencrypted channels/systems:

- Conventional DMR (Entered as a DMR trunked system)
- Hytera XPT
- MotoTRBO™ Capacity Plus
- MotoTRBO™ Connect Plus
- MotoTRBO™ Linked Cap Plus systems
- NXDN & DMR out of the box

KEY SPECIFICATIONS

- Frequency: 25-54MHz, 108-136.99MHz, 137-174MHz, 216-379.97MHz, 380-512MHz, 764-781MHz, 791-796MHz, 806-960MHz (excluding cellular), 1240-1300MHz
- Simple Zip Code programming
- Easy updating via Internet
- APCO P25 Digital Phase I & II
- Removable, remote magnetic head
- Scanning at up to 70 channels/second
- CTCSS and DCS subaudible decoder
- IF Discriminator Out • Store Favourites Scan List
- User upgradable CPU firmware
- Spectrum Sweeper • Clock / Calendar
- Tuning Steps: 2.5, 3.125, 5, 6.25, 7.5, 8.33, 10, 12.5 ad 25 kHz.

WHISTLER

WS1010 Handheld Scanner

MOONRAKER IN STOCK

This 400-channel scanner lets you listen to FM radio bands and can be categorized into 10 separate memory banks. Also, it offers the convenience of one-touch searches of marine, air and ham
Key Features/Specifcations:
200 Channel memory - plenty of memory to store all your favorite frequencies in 10 separate storage banks. Backlit Liquid Crystal Display - easy to read and program data even in low light situations.. Data Cloning - allows transfer of the programmed data to another WS1010 scanner.

Buy the WS1010 for just

£89.99

89 WATTS

WHISTLER

WS1040 Handheld Scanner

MOONRAKER IN STOCK

The WS1040 scans most common trunked radio system signalling formats, including Motorola, EDACS, LTR and P25 trunked radio networks. Talk group and individual call monitoring is supported.
When monitoring P25 digital systems, the exclusive Automatic Adaptive Digital Tracking instantly adapts the digital decoder to the digital modulation format of the transmitted signal, then analyses the signal over 50 times each second and adapts to any subtle changes caused by multipath or fading. No cumbersome manual adjustments are required.

Buy the WS1040 for just

£299.95

299 WATTS

WHISTLER

MOONRAKER IN STOCK

TRX-1 Leather case

Keep your traesued TRX-1 safe with this high quality leather case

£29.95

MRW-TRX3 Antenna Pack

Three compatible antennas in this great pack

£39.95

TRX SD cards

A genuine replacement for the Whistler TRX-1 SD card

£19.99

MOONRAKER IN STOCK

UKAFG UK Airband Frequency Guide 2021

Includes website access to frequency updates, civil and military call-signs, and maps. Features: VHF UHF • Civil and Military • Common Frequencies • Airports A to Z • UK ATC and high-level European • Frequency/Channel list • Squawk codes • 8.33khz conversion

Buy this guide for just

£15.00

15 WATTS

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We will match or beat any other UK in stock price!

SDRplay

MOONRAKER IN STOCK

SDRplay RSPduo Dual Tuner 14 - bit SDR

The SDRplay 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. Combined with the power of readily available SDR receiver software (including 'SDRuno' supplied by SDRplay) you can simultaneously monitor two completely separate 2MHz bands of spectrum anywhere between 1kHz and 2GHz. The RSPduo provides three software selectable antenna inputs, and clocking features ideally suited to industrial, scientific and educational applications. All it needs is a PC and an antenna to provide excellent communications receiver functionality. A documented API allows developers to create new demodulators or applications around the platform.

KEY BENEFITS

- Simultaneously receive on two totally independent 2MHz spectrum windows anywhere between 1kHz and 2GHz
- Simultaneous processing from 2 antennas enables direction-finding, diversity and noise reduction applications
- Ideal for cross band full-duplex reception, e.g. HF + VHF or VHF + UHF
- Simultaneous Dump1090 and VHF ATC reception
- Simultaneous monitoring and recording of 2 ISM bands
- Covers all frequencies from 1kHz through VLF, LF, MW, HF, VHF, UHF and L-band to 2GHz, with no gaps
- Receive, monitor and record up to 10MHz of spectrum at a time (single tuner mode)
- External clock input and output for synchronisation purposes, or connection to GPS reference clock

Buy the RSPduo for just

£239.95

239 WATTS

AIRSPY

MOONRAKER IN STOCK

HF Plus Discovery High Performance SDR Receive

Building on the proven Airspy HF+ architecture, Airspy have designed the Most Refined HF/VHF SDR with world class performance in the smallest form factor.
The Airspy HF+ Discovery sets a new standard in terms of reception performance with extra pre-selectors for all the supported bands and a New DSP Core to optimize the gain distribution and the filtering parameters in real-time and dig deeper in the noise.
The signal path includes very high dynamic range data converters along with high performance passive mixers with an excellent Polyphase Harmonic Rejection structure.

Buy the HF Plus Discovery for just

£199.95

199 WATTS

SDRplay

MOONRAKER IN STOCK

SDRplay RSP-1A SDR Receiver

The SDR-Play RSP1A is a major upgrade to the popular RSP-1, 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. Combined with the power of readily available SDR receiver software (including 'SDRuno' supplied by SDRplay) you can monitor up to 10MHz of spectrum at a time. Documented API allows developers to create new demodulators or applications around the platform

KEY FEATURES/SPECIFICATIONS:

- Covers all frequencies from 1kHz through LF, MW, HF, VHF, UHF and L-band to 2GHz, with no gaps
- Excellent dynamic range for challenging reception conditions
- Low levels of spurious responses
- Works with all the popular SDR software (including HDSDR, SDR Console, Cubic SDR and SDRuno)
- ExtIO based plugin available

Buy the RSP-1A for just

£99.95

99 WATTS

AIRSPY

MOONRAKER IN STOCK

R2 High Performance SDR Receiver

Airspy R2 sets a new level of performance in the reception of the VHF and UHF bands thanks to its low-IF architecture, high quality ADC and state of the art DSP. The coverage can be extended to the HF bands via the SpyVerter up-converter companion.

Buy the R2 SDR Receiver for just

£199.95

199 WATTS

AIRSPY

MOONRAKER IN STOCK

MINI High Performance SDR Receiver

An affordable high performance alternative to RTL-SDR and other TV dongles for the VHF and UHF bands.The coverage can be extended to the HF bands via the Spyverter up-converter companion.It is 100% compatible with all the existing software.

Buy the MINI SDR Receiver for just

£119.95

119 WATTS

SDRplay

MOONRAKER IN STOCK

SDRplay RSPdx 1kHz-2GHz HDR SDR Receiver

The SDRplay RSPdx is a complete redesign of the popular RSP2 and RSP2pro multi-antenna receiver. It's a wideband fullfeatured 14-bit SDR which covers the entire RF spectrum from 1kHz to 2GHz. Combined with the power of readily available SDR receiver software (including 'SDRuno' supplied by SDRplay) you can monitor up to 10MHz spectrum at a time. The RSPdx provides three software selectable antenna inputs, and an external clock input. All it needs is a computer and an antenna to provide excellent communications receiver functionality.

KEY SPECIFICATIONS

- Covers all frequencies from 1kHz through VLF, LF, MW, HF, VHF, UHF and L-band to 2GHz, with no gaps
- Receive, monitor and record up to 10MHz of spectrum at a time
- Performance below 2MHz substantially enhanced – improved dynamic range and selectivity

Buy the RSPdx for just

£194.95

194 WATTS

AIRSPY

MOONRAKER IN STOCK

YouLoop Indoor HF Antenna

This simple, lightweight travel loop is quick to deploy and the perfect companion for Airspy and similar SDR radios!

A New Magnetic Loop Concept

The success of our award winning Airspy HF+ series brought us a lot of feedback from hundreds of customers and enthusiasts. Most of the problems were related to ineffective RX antennas that were too sensitive to the surrounding noise, had excessive gain and lack the necessary linearity. So, we decided to bite the bullet and design a new Noise-Cancelling Passive Loop (NCPL) to fix the noise problem, leverage the low-noise performance of our SDR receivers while being perfectly suitable for portable operation.

Buy the YouLoop for just

£29.99

29 WATTS

Visit our website's product pages to see

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Check out our great Bundle Packs

Click the link on our website to see latest offers

MOONRAKER

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ALL PICTURES: KEITH RAWLINGS G4MIU

Keith Rawlings
Keith.g4miu@gmail.com


1

A Review of 2021 and a Look at my Aerials

Keith Rawlings condenses the key developments relating to his column in 2021 and allows us a glimpse of his transmission and reception shacks and the various aerials he is -or has been - using of late.

I can't believe that the year has gone past so quickly, what with continuing Covid-19, Afghanistan, issues with obtaining goods from the EU, the 'Gas Crisis', HGV driver shortages leading to some empty spaces on the shelves and panic buying of petrol; perhaps it is just as well that we are approaching a new year – surely, 2022 has to be better!

Looking back, the one thing I did see in 2021 was a steady flow of readers' correspondence, much of which I replied to directly. It is good to see readers are continuing to experiment with – and in some cases improvise – various aerial designs. Therefore, I thought I would take the opportunity to look back at some of the feedback topics covered this year.

End-Feds and Loops

The 'end-fed ' (or 'bit of wire') seems to be an ever-popular choice on HF. Reader Alan's simple end-fed in the October edition (*RadioUser*, October 2021: 60-62) generated interest and prompted Robert M0NVQ to send in details of his own derivative of this design, which I will cover in the next issue, all being well.

Coaxial-cable-fed dipoles and active aerials, mainly of the Mini Whip varieties, are also popular. Some readers have used Mini Whips located outside on a mast or pole, and a few took them indoors, recognising this is far from ideal. These aerials were hung up by a window or, as in the case of one reader, propped up on a bookcase, and put away when not in use.

Throughout 2021, there was also some considerable interest in loops. I tend not to hear much from readers with Wellbrook loops or anyone using an LZ1AQ design, but I have had correspondence regarding the Cross Country Wireless Loop Amplifiers with readers asking my opinion of different types of loop elements. There has been also some interest in the MLA30 loop. The latter seems to get varying opinions, whereas the CCW loop amps seem to be well-received (pun very much intended). I have never tried an MLA30 so can't comment. Perhaps sometime in the new year I will try and source one to see what they are like.

The beauty of these two loop concepts is that they are open to experimentation and also relatively cheap.

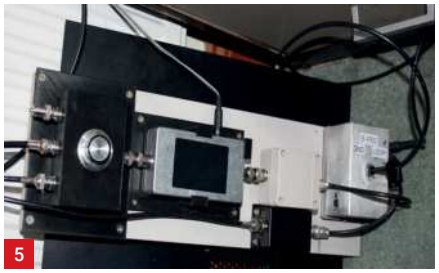
Once again, readers have used loops indoors as well as outdoors; in both these cases, mounting them is relatively simple: They can be located just a few feet above ground where they are quite accessible for modification. Since these HF loops are directional off of the ends, some readers have their loop mounted on a rotator; others turn them by hand, with some leaving them in a fixed position to counter locally generated noise.

Noise Issues and VHF/ UHF

Noise – usually locally generated – continues to be another bone of contention with many readers, and not just in the UK. Recently Emre HZ1ES from Saudi Arabia contacted me to say that he was suffering from QRM generated by LED spotlights and neon advertising signs coming from a flower shop near to him. He tried the LOG (Loop on Ground) that I described in the August /September editions of RU (*RadioUser*, August 2021: 54-56; September 2021: 60-62), and the great news was that this helped to reduce the QRM he was suffering on 40m by a considerable amount.

Readers from South America, North America and Europe have spoken of

Fig. 1: My former V2000 and Discone aerials.
Fig. 2: The combined VHF-UHF multi-coupler and protection unit during assembly.
Fig. 3: My combined multi-coupler – front panel.
Fig. 4: Inside view of the HF isolation transformer.
Fig. 5: My aerial switching and power units.
Fig. 6: An earlier, homemade, VHF/ UHF multi-coupler. Fig. 7: The base for my new mast, waiting to be fitted.



similar problems throughout 2021. Therefore, it is not just the UK that suffers, and this is a subject I want to continue to cover in 2022. On the VHF and UHF bands, our readers seem to own a mix of, mainly commercially-produced, aerials, with some performing better than others.

For general listening, a decent amateur-grade 'white stick' works as well as anything: I have a Diamond V2000 for 6 and 2 metres and 70 cm (Fig. 1). I find that reception on the VHF PMR bands, VHF air-band and UHF PMR is as good as anything I have tried. By the way, just because an aerial is not designed for a particular frequency or frequency band, do not let anyone tell you it won't work. Models like the V2000 will offer gain on their designated frequencies and this will also be apparent to a greater extent on frequencies outside of these ranges. Indeed, the 'polar diagram' (that is the radiation pattern) may alter with frequency, but typicality not by too much. The higher up the aerial is, the better; even more so on V/UHF, since the radio horizon will be increased. Bear in mind feeder losses, this is another topic I have had questions on.

Putting an aerial up from 20ft to 60ft will certainly increase coverage. However, if it is fed with something like an RG58-type cable, the losses in the cable may outweigh any advantage gained with increased height. For example, at 455MHz, 20ft of RG58, with a match at the feed point of 50Ω, will have a loss approaching 2dB. Increase this length to 60ft, and this rises to some 5.5 dB; and even when using something like RG213, the loss would be around 3dB, and this is one half. If you were to transmit 50W, you would see 25W at the aerial.

There are some superior quality feeders out there and my advice is to use the best feeder you can afford.

Discones and Coupled Resonators

Another useful aerial for the V/UHF bands is the classic discone (see above, Fig. 1; bottom-right).

This is a bit of a 'jack-of-all-trades' design but I find it a pretty 'honest' aerial, what you see is what you would expect from it: A flat response over a wide frequency range with unity gain. Some designs have additions that reportedly make them more efficient at selected frequencies.

Another kind of aerial system I use is a coupled resonator.

This is cut for two frequencies, one in the VHF air-band and one in the UHF air-band.

This aerial consists of a vertical dipole, with one element driven and fed with a coaxial cable in a conventional way. The second (higher-frequency) element is closely spaced (but not connected to) where it couples itself to the main element. I leave this connected on one of my older scanners where I often monitor the two channels set in the scanner's memory. The UHF channel it was designed to monitor has since changed frequency by some 15MHz but it still works more efficiently on this frequency than my discone.

One reader e-mailed to tell me he uses a Skyscan multiple-element mobile aerial in his attic, sitting on top of a biscuit tin. The coaxial cable is coming down through a hole in the plaster ceiling to his shack. This I understand works well and was improved when a sheet of steel was substituted for the tin.

My Aerial Array

I was frequently asked about my home aerial setup, which, at the moment, is not much! I have started to tidy the house up for a future move (to somewhere where there are no nearby houses, power lines, telephone lines or anything that can generate noise, which, my friends tell me, will have me ending up in a caravan in the middle of a field in the Orkneys) so I have taken most of my aerials down. My external V2000 and discone (Fig. 1) have been removed from the bracket on the side of my house, my V/UHF log-periodic beams are stored in the garage and my wire HF transmitting aerial – lately a doublet – has also been taken down, for now.

Furthermore, my 40ft pump-up mast has been removed from its ground mount by the garage. The latter, more recently, has only had a PA0RDT mini Whip left mounted on it, but has been used for a variety of aerial types and even as a base for my Diamond CP6. The mast will soon be replaced with a lower-profile aluminium scaffold pole, which will be 20ft + rotator and stub mast; the new base is now ready, and I am awaiting a couple of new wall brackets to get going on it.

This leaves me with the Wellgood loop, my 66ft inverted-L end-fed outdoors, a discone and the coupled resonator mounted in the attic. I also have a half-wave vertical for ADS-B reception.

Shack Diversity

I have a 'transmitting shack' and a 'receiving shack'. The HF transmitter, used with the doublet and HF receivers in this room, were protected by a Racal MA1970 multi-coupler and receiver protection unit (Figs. 2 & 3) fed by an M0AYT Loop. In my receiving shack (which is, in fact, the study) I have all my scanners and some HF receivers. The HF receivers are presently linked to the end-fed and the Wellgood loop.

On the 'active' path (Wellgood, PA0RDT and a spare) there is a three-way aerial selector switch.

This feeds into a bias-T and then leads

through an isolation transformer (Fig. 4).

From there, it goes to a reversing selector switch.

The 'passive' end-fed path routes to another isolation transformer, which also runs directly to the selector switch (Fig. 5). On this switch, *Position 1* grounds the inputs. *Positions 2 and 3* switch the two inputs and reverse them to the outputs. This enables me to swap either aerial to a receiver path or a noise-cancelling unit path.

The isolation transformers have DC blocking and back-to-back silicon diodes to clamp voltage levels to around 0.6V. The VHF/ UHF side of things is now only fed by the attic discone; this used to go through a homemade multi-coupler (Fig. 6).

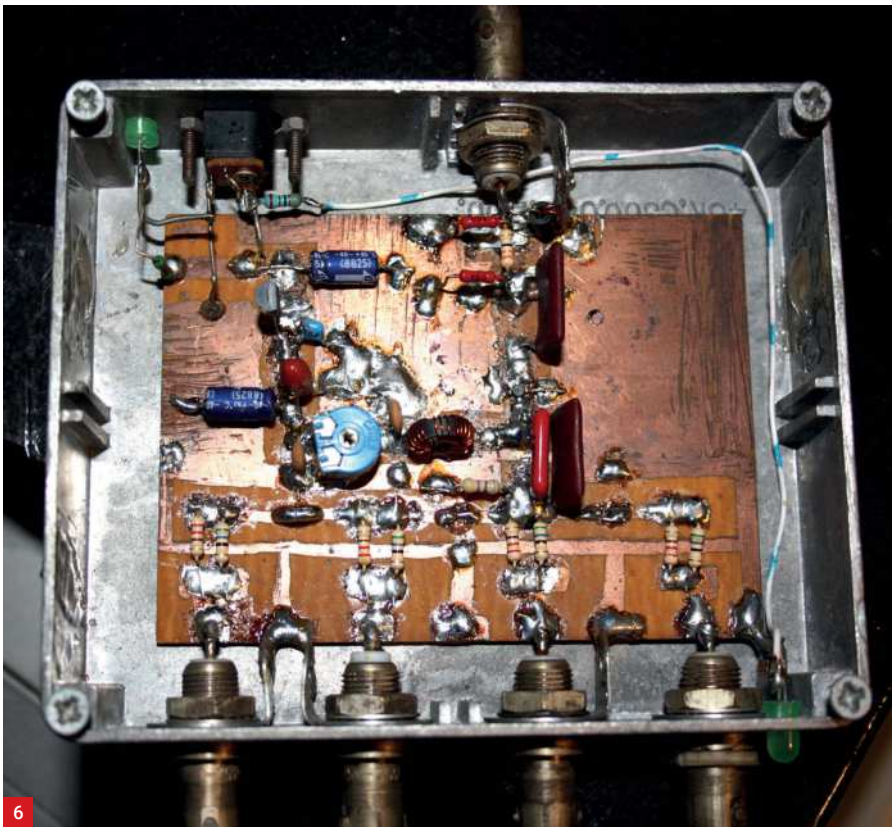
All inputs – from LF to UHF – now route through a 'receiver protection and multi-coupler unit' before they connect to a radio. This ensures that inadvertently transmitting while sensitive receivers are connected to an aerial will not cause any damage to the front ends.

The protection unit consists of two sections: One (the VHF/ UHF path goes via a 16 port output *Raven Research* multi-coupler with input protection. The second path is for HF and consists of two main units. One is the receiver protection unit that I described some years back. This unit DC decouples and limits the level of RF input; it also physically grounds, through coaxial relays for additional protection, should the input remain high. It also grounds the V/UHF input.

This then feeds a Racal MA1950 10 port multi-coupler which feeds the HF receivers.

Moreover, there is a switched direct input/ output port with no protection. One of the V/UHF outputs and one of the HF outputs are fed to a Diplexer to give a single (VLF to 1GHz) output. I also have a line to drive external switches/relays if needed. All inputs are automatically disconnected and grounded when power is switched off.

Where possible, I have added back-to-back diodes across the inputs of most of my most vulnerable receivers. The diodes are old devices with CV numbers and, on a test, are very similar to 4148s. Any risk of intermodulation distortion (IMD) problems due to the diodes is to be accepted.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More on AN-SOF Antenna Simulation Software

It seems that most months I can report another significant upgrade to this software. The latest update is most interesting, as patterns plotted in AN-Polar can now be exported as *.ant files. These files can be imported into the *Radio Mobile* software, which simulates RF paths and uses aerial patterns to calculate RF communication paths as set up by the user. This means that users of AN-SOF and *Radio Mobile* are now able to design any type of aerial and then analyse its performance over a given path in *Radio Mobile*.

AN-SOF is paid-for software and comes with full support.

https://groups.google.com/g/ansof

That's it for this month, I will leave you with a photograph of my new mast base (see above), waiting to be fitted (Fig. 7).

Season's Greetings and I will see you all in 2022!

Radio News

RSGB CONVENTION PRESENTATIONS ON YOUTUBE: The RSGB online Convention's keynote presentation is now available separately on the Society's YouTube channel. This inspiring talk by Professor Cathryn Mitchell, M0IBG explores the connections between radio and space and also looks at the many ways in which everyone can get involved. The seven presentations from the 'Introduction to' stream will also be published individually this afternoon so that it will be even easier to find the presentation you'd like to watch. That full day's stream has received over 5,000 views already with some great reviews. We'll be releasing the *Learn more About* stream presentations next week. Go to the *RSGB YouTube Channel* and choose the *RSGB Convention 2021 Playlist:*
(SOURCES: RSGB)
https://tinyurl.com/5df99wz9
http://www.youtube.com/theRSGB

MARITIME RADIO PARTNERS WITH MORRISONS FOR CHRISTMAS GIVEAWAY: Maritime Radio has launched its *Christmas Day Give-Away* as part of its plans for this year's festive activity. The community radio station has joined forces with Morrisons in Sidcup to give a deserving member of the community a Christmas treat. Morrisons Community Champions Jennifer and Jane (pictured) joined Duncan in the studio on Monday 1st November to launch the Christmas Day Give-Away which will see a lucky family or individual receive everything they need for a perfect Christmas Day. A station spokesperson said: *"We will also be helping raise funds for the Greenwich and Bexley Community Hospice this December and will be having our Trolley Dash around Morrisons in Sidcup on 10th December, with the entire contents of the trolley being donated to the hospice. And, as if that wasn't enough, we will have our Christmas Appeal auction, with a chance to bid on some fantastic items from driving lessons to gym membership, with all funds raised going to the hospice."*
(SOURCE: Maritime Radio | Morrisons)
https://tinyurl.com/udd78s5b

NEW CHIEF EXECUTIVE: The Digital Regulation Cooperation Forum (DRCF) has announced the appointment of Gill Whitehead (pictured) as its Chief Executive. The DRCF was formed in July 2020 to harness the collective expertise of its members – the Competition and Markets Authority (CMA), Financial Conduct Authority (FCA), Information Commissioner's Office (ICO) and Ofcom – and ensure strong regulation of online services. Gill was most recently a member of Google's UK Management Group, leading specialist teams in data science, analytics, measurement and UX, and

she previously led Google's consumer and market insights function across Europe, the Middle East and Africa. She will bring insight from a career that has spanned the broadcast and digital media sector, having previously worked for Google, Channel 4 and the BBC. As Chief Executive of the DRCF, Gill will lead the collective expertise of its members to ensure the digital landscape is regulated effectively, efficiently and coherently, and will oversee the delivery of the forum's established action plan. She will be in charge of the Secretariat formed by each of the regulators and work closely with their CEOs to develop joined-up approaches and to ensure that regulatory policy is developed responsively and holistically.
(Sources: DRCF | RadioToday)
Industry Press)
https://tinyurl.com/nfxy3dsp

NORTH POLE LINK: *Devaweb* is once again connecting radio stations with the North Pole each morning in December with a daily update from Santa Claus. *Santa's Christmas Updates* has Santa filling your listeners in on his plans during the lead-up to the big day. Heard on stations around the world, the daily audio is 60 seconds long and can run on weekdays or weekends, or both. *Devaweb's* commercial manager Zoë Vernon said: *"This is the 13th time we've connected Santa with radio listeners worldwide, and every year it seems to pick up more momentum! I think it feels that bit more special, having picked up silver at The British Podcast Awards this year too!" Santa's Updates* include a production kit of beds, intros and promo shells. They can run in any show, as a standalone promo feature, or even multiple times per day.
(SOURCES: zoe@devaweb.co.uk | RadioToday)
https://tinyurl.com/pw9e3r2w

A RARE FIND: At the outbreak of WWII in 1939, Nazi Germany's Enigma encryption machine stood as the state-of-the-art method for sending and receiving secret messages. It wasn't until 1940 that English mathematician Alan Turing, and the team at Bletchley Park, cracked the daily changes Berlin made to its cypher system and helped the Allied powers win the war.
While the Enigma stands out as the most famous of encryption machines, Italy, set out to develop a high-end machine to rival its war partner, Germany. In 1939 Italy's government secretly tasked a little-known photogrammetric equipment company, Ortica Meccanica Italiana (OMI), to build a device capable of rivalling its more famous cousin. Founded in 1926, OMI's tools were used to create precision topographical maps and surveys using stereoscopic aerial photography. The technical expertise made OMI a natural fit for the job. The end result was OMI's first cypher machine known as the Cryptograph Alpha. OMI built cypher devices throughout WWII, and into the 1960s, including the *OMI Cryptograph, the OMI Cryptograph-CR* and the *OMI Cryptograph-CR MkII*. While many of these devices managed to survive passing through the hands of various collectors and museums, examples of the second iteration, the OMI Cryptograph machines, were widely believed to have been destroyed long ago.
Until now. Digging through its vast collection of warehoused artefacts, the National Cryptologic Museum (NCM), curators found an OMI Cryptograph machine in its collection. NCM Collections Manager Spencer Allenbaugh recently discovered the *OMI Cryptograph* in a dusty crate and immediately knew he had found a treasure […]. Originally introduced around 1954, the OMI Cryptograph operated similarly to the German *Enigma*, with five moving cypher wheels to encipher/decipher messages, but, unlike the military *Enigmas*, it also had a built-in printer that produced its output directly onto a paper strip. This model was operational until the late 1950s when the OMI Cryptograph-CR succeeded it. Visitors to the NCM can look forward to viewing this treasure when renovations are completed and the museum reopens in 2022.
(SOURCES: NSA | SWLing Post | via Andrea Borgnino)
https://tinyurl.com/sv8zmdhy
https://tinyurl.com/9u7vutj4 (NSA)

HEART: Global has switched on Heart Xmas on Global Player and several DAB multiplexes across the UK. The festival station has gone live over two months ahead of the big day because Global was seeing an increase in the number of listeners to its Christmas playlist on Global Player. Andy Everett, Managing Editor of Heart, said: "We're thrilled to be bringing back the much-loved festive sister-station Heart Xmas even earlier than ever before. Listening to the Heart Xmas playlist on Global Player has boomed since the August Bank Holiday, so we're launching the station more than two months before the big day, bringing our listeners the best non-stop festive tunes 24/7!" There was no news from Bauer as yet, regarding its usual Christmas offering from Magic.
(SOURCES: Heart | RadioToday).
https://tinyurl.com/57xs5ze
https://tinyurl.com/fvctn387

Georg Wiessala
wiessala@hotmail.com

GEORG WIESSALA

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The New bhi In-Line Module

The editor takes a look at the new 5W amplified DSP (Digital Signal Processing) Noise Cancelling In-Line Module from British noise suppression experts bhi.

Over the years, I have run a succession of noise-cancelling products from British firm bhi landing in my shack; most of them we have reviewed in these pages.

This new bhi In-Line Module with a 5W audio amplifier (Fig. 1) is no exception. The engineers at bhi have developed this new Amplified DSP Noise Cancelling Module (135 x 65 x 46 mm), together with a Dual-In-Line unit, as a replacement for the earlier bhi NEIM (Noise-Eliminating In-Line Module) 1031 and ANEM (Amplified [DSP] Noise Elimination [In-Line] Module) MKII models.

The information available on the bhi website, as well as the relevant manual (*In-Line Module Issue A 08/21*) holds the full technical description of the unit.

In its promotions, the manufacturers accentuate the 5W audio amplifier, the input-overload LED and the (factory-preset) audio output level adjust control as noteworthy features.

Upon unboxing, I noticed that, with this unit, the design and form-factor of past incarnations of noise suppression units have been 'flipped,' so that the main controls are now on the *sides* of the sturdy rectangular plastic box that holds the circuitry, not on top. This is much more practical if, like me, you slot your unit in with many other competing devices in your already over-stacked shack.

On the left-hand side of the unit, users will find the 'On-Off-DSP' multi-switch, status and 'overload' LEDs and the DSP filter level control (light grey knob; Fig. 2). At the opposite end, you'll find the sockets for 'Audio-Input', 'Speaker', 'Headphones' and 10-16V DC In (Fig. 3).

The grey DSP-level adjustment knob now appears slightly recessed into the inside of the box; this makes it more difficult to damage it. No rocket science here, and the unit was up and running in seconds.

Many radio amateurs will find this latest version invaluable when it comes to removing background noise, hiss and static from transmissions received. It is very useful to do this, especially if you struggle to make out a strand of speech from a background soundscape.

My principal use for this bhi noise-cancelling unit – as indeed for earlier models – was to clear up the audio on *broadcast* radio stations from long- to short wave.

It is very useful to be able to do this in eight finely graded steps. In this way, broadcasts – both daytime and after dark – from such stations as RTÉ or Radio Luxembourg become so much more enjoyable, especially when, in the case of the latter, you are listening to a foreign language station broadcasting. Here, the unit can make the crucial difference between understanding and unreadability.

For many, the unit will come into its own when in the monitoring of HF *utility speech signals*, such as the RAF VOLMET weather transmissions on (for example on 5,450 and 11,253kHz) or aeronautical and maritime HF speech signals in the relevant frequency bands. In this case scenario, the In-Line module cleans up speech clarity and resolvability very considerably, lifting it from the hiss, crackle and pop of a bad day to full resolution, in no time at all.

Although not especially suitable for music, those who enjoy tunes on these bands may also have a more stress-free listening experience, *with a low filter setting*. High-level filter settings tend to affect the quality of the music.

The other way in which I am utilising this unit, and its predecessors, is for the audio-monitoring of signals in the Extremely Low Frequency (ELF) and Very Low Frequency (VLF) bands: Dawn chorus, whistlers, tweeks, and a host of other sounds, which result from the impact of the solar wind on the Earth's ionosphere and atmosphere. With a bit of a practised ear and the right (electro-smog-free) setup, you can use

Fig. 1: The In-Line Module out of the box.
Fig. 2: Frontal view of the module.
Fig. 3: Sockets and connections.

this little box to filter out the unwanted atmospheric hiss from the 'nature-radio' phenomena you are after. The eight DSP settings are certainly enough to make an audible difference. But this is, perhaps, a nîche interest, albeit possibly one worth noting for our growing band of VLF hunters.

Altogether, this is a welcome further constructive development of a very popular product that will find many new users amongst radio amateurs, DXers, programme listeners, and radio enthusiasts.

Moreover, if you do experience any age-related hearing loss or similar issues, you will notice the difference, both in an amateur radio context or for your general radio listening enjoyment.

The unit retails at £ 159.95 and is available from bhi Ltd. or any of their authorised dealers.

I used the In-Line module with the bhi cabinet-style 8Ω passive extension speaker (EXTSPK25). More information can be found at the website, below.

My warm thanks go to **Graham Somerville at bhi Ltd.** for the additional information provided and for the kind loan/donation of the review unit (see right).

www.bhi-ltd.com

WORTH £159

Win an amazing bhi In-Line Module

Thanks to the generosity of our friends at bhi, we have one of these great units to give away.

The new bhi DSP noise cancelling In-Line Module cleans up noisy radio signals and will work on most radios and receivers. It has the latest bhi DSP noise cancelling technology inside, which brings improved audio quality to the listener when operating in noisy conditions across all radio bands.

To be in with a chance of winning this fabulous prize worth £159, all you need to do is visit our website at **bit.ly/ru-dec21-comp** and answer the following multiple-choice question...

How many noise suppression levels does the new bhi In-Line Module offer?

a. 5 b. 6 b. 8 c. 9

Entry is only via our website. Entries close at midnight on 31st December 2021. To enter you must answer the question correctly and answers received after the end date will not be accepted. The winner will be notified by email by 28th January 2022. Warners Group Publications Plc standard competition terms apply, to view visit warners.gr/compterms. For information on how your personal data is processed, secured and your rights, our Privacy Policy can be viewed here – warners.gr/privacy or available in hard copy upon request. The winner will also be announced in the March 2022 issue of RadioUser.

ALL PICTURES: GEORG WIESSALA

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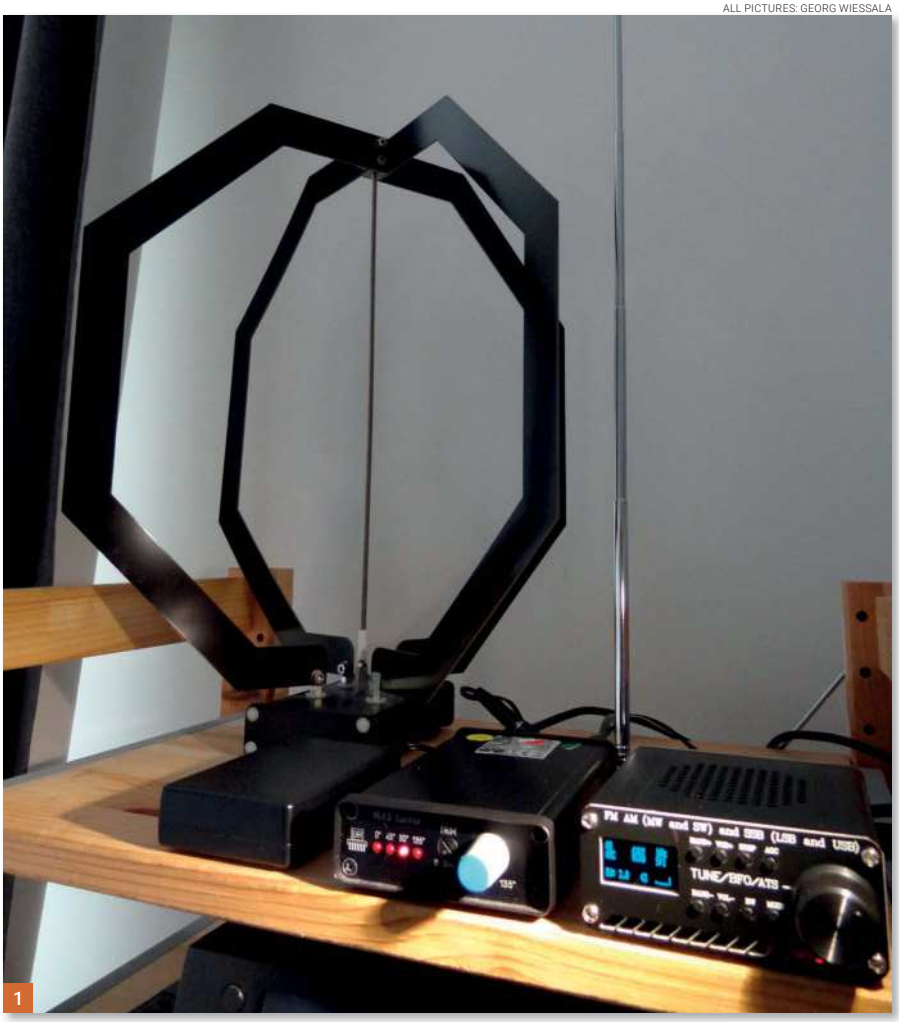

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Small is Beautiful: ATS-20 SI4732 Radio Receiver

The latest incarnation of the diminutive ATS-20 SI4732 Radio Receiver turns out to be a very nifty multi-band radio for travel or your shack. It looks cool, and its performance is respectable.

Like, perhaps, quite a few of you, I had seen this little radio – and I mean *little* – appearing on radio blogs and websites for a while now. Initial reviews were not great, so I put off buying for a while. As so often in these cases, there was also the issue of cheap fakes of this product knocking around, which was a bit of a concern.

Half a year later, I tried again; after some online research, I found one at a reasonable price-point, around £45-50 and took the plunge. I bought it from a seller called *AllAboutFun*, and, unlike many other of these radios, this one was branded as 'ATS-20' (Figs. 2 and 3). Quite a lot of these have been sold in Germany, my radio friends there are telling me, so the name was quasi-familiar.

The unit arrived fast, and out-of-the-box, you get the radio a USB charging cable and a simple telescopic aerial. Up and running in no time, first on FM, where the audio quality from the topside speaker surprised me, as did the inclusion of RDS and the metal case. The aerial that comes with it, by the way, is principally for FM.

The table in Fig. 4 shows the key data for the ATS-20, note the 64-84MHz provision and the stepped HF frequency bands. I ran the radio from a power bank, or you could charge it from a USB charger – the input voltage is 5V with a current of 1A.

Upon switch-on, the initial screen shows the software and developer information: '*SI473X; Arduino Library; All-in-One Radio; V3.0.7b-ByPU2CLR*'. The screen is small – about the size of a postage stamp – but the display is crisp, with information about mode and frequency, step size and bandwidth, volume gain control, and a rudimentary S-meter visible (with my glasses on, mind).

The (small) buttons with a '+' after them, combined with the plastic tuning knob enable you to change parameters. Just follow the instructions in the two-page leaflet; it's not in *Chinglish,* and this is, on the whole, an intuitive device. I found that, using just the telescopic aerial, you can achieve acceptable LW and MW reception during the daytime, depending on your location. Hitch it up so a half-decent aerial, and reception improves. I did the overkill-thing and connected the ATS-20 to my Reuter RLA3 (Figs. 1 and 5 for size comparison). RTTY and Fax reception were (just) possible then, on a good day and with the RLA3 or my Wellbrook hooked up.

You might use this as a *rudimentary*, compact, FM/AM listening post with Lithium-Ion battery for on the road (Fig. 1); or as a 'monitor' for just one, or a few, utility data/ voice stations, such as HF VOLMET.

However, in general, I just left the telescopic on and enjoyed medium wave sports coverage on the go. At night, I could receive all my favourite larger short wave stations, for instance, China Radio International, Radio Romania International, and the Voice of Greece, plus a few smaller ones. I was also able to listen in to radio amateurs on SSB, to HF VOLMET, CW, and

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Modulation mode and frequency table

Modulation			Frequency Band		Band
FM			64 ~ 84MHz		VHF/USW
			84~108MHz		
AM Mode					
AM	LSB	USB		30,000KHz	HF/SW
				28,400KHz	
				27,500KHz	
				24,940KHz	
				21,200KHz	
				18,100KHz	
				17,600KHz	
				15,300KHz	
			1.8~30MHz	14,270KHz	
				13,600KHz	
				11,940KHz	
				10,100KHz	
				9,600KHz	
				7,050KHz	
				6,000KHz	
				4,850KHz	
				3,700KHz	
				1,900KHz	
			520~1720KHz		MF/MW
			150~510KHz		LF/LW

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Fig. 1: The telescopic is enough, given what this is, but another aerial can improve things, of course. Fig. 2: Frontal view of the ATS-20 SI4732 Radio Receiver. Fig. 3: The rear of the branded version. Fig. 4: The radio's key technical specifications, as per its product leaflet. Fig. 5: That's about the size of it.

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to RTTY. Sensitivity was good, for what it is, but, of course, this is not a DX machine. However, I had a lot of fun using this small device. There has been some criticism of the bandwidths provided (1.0, 1.8, 2.0, 2.5, 3.0, 4.0, and 6.0kHz), but I did not find this an issue – maybe this is related to an earlier model of this radio.

As I am writing this, another (ATS-25) model is also out there, offering touch-screen functionality and wideband reception. Go on, treat yourself to one now, tinker a bit and beat any emerging Christmas boredom. But have your glasses ready …

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The Perfect Flight, Holographic Radar and Wind Turbine Reflections

David Smith describes further efforts to demonstrate a 'perfect flight' and highlights the advantages of 3D radar. He also presents a profile of RAF Shawbury ATC.

A cross-industry collaboration of aviation partners recently demonstrated how they are working towards the 'Perfect Flight', with a flight between Heathrow and Glasgow on 14 September, showing the efforts being made to reduce aviation's carbon footprint. Led by British Airways, and involving Heathrow and Glasgow airports, Airbus and BP, it was up to NATS to ensure that air traffic controllers optimised the flight profile and provided the most direct routing.

The flight proved to be a great success, reducing CO^2 emissions by 62%, compared to the original Perfect Flight, more than a decade ago. Operations teams across the NATS control centres at Swanwick and Prestwick, as well as those at the control towers at Heathrow and Glasgow airports, had been planning for months to ensure an uninterrupted journey and achieve minimal delay and emissions.

Starting at Heathrow, controllers approved the pushback of the aircraft without delay and provided the shortest possible taxi route to the nearest appropriate runway holding point. Information on the anticipated timing of the take-off was given to the crew so that the engines were not started up too early. A runway intersection clearance was given, so the pilot did not need to use the full length of the runway for take-off, again increasing efficiency.

Controllers then assured a continuous climb, with no levelling off, once the aircraft had followed the Noise Preferential Route to 4,000ft, before passing the pilot onto NATS colleagues based at Swanwick. They are responsible for all flights in the London Terminal Manoeuvring Area (TMA) and en-route airspace over England and Wales up to the Scottish border.

The most direct routing with a continuous climb to cruising altitude was given by Swanwick controllers, as well as the most

optimal flight level. Due to the meticulous pre-planning, there were minimal tactical interventions by the controllers along the way, so the pilot navigated to the agreed waypoint before arriving at the chosen point of descent. After speaking with Prestwick Control Centre, the aircraft was able to follow a continuous descent approach into Glasgow Airport, where controllers in the tower there guided it into landing without airborne holding and with the most efficient taxi-in.

The *Airbus A320neo* used for this year's demonstration was able to fly without day-to-day, necessary, constraints imposed on air traffic because this was a special project. Current efforts to modernise airspace will make flying more efficient, providing even greater CO^2 reductions. While the *Perfect Flight* might not be a reality today, the industry has made great progress over the last decade, and with further collaboration and Government support, the industry can move closer still to the Perfect Flight in the future.

The data from the British Airways BA1476 flight will now be analysed, to fully understand the benefits and how the techniques and procedures used can be implemented now and into the future.

This was British Airways' first ever passenger flight to be powered directly by sustainable aviation fuel, and the remaining emissions were offset. The journey emulated the first *Perfect Flight* that operated to Edinburgh in 2010. At the time, neither offsetting nor sustainable aviation fuel was available.

3D Radar

UK company, Aveillant, provides advanced Holographic Radar (3D) systems for the detection of small drones, reducing the effects of wind farms on air traffic control. This advanced kind of radar differs from traditional mechanically and electronically scanned systems, as it locates targets in three dimensions.

To do this, it uses a very wide angle transmitted pulse, forming multiple simultaneous receive beams. It monitors all targets within the field of view continuously, which provides increased sensitivity and the ability to track even small targets at long ranges.

The special array antenna can split the complete surveyed volume into three spatial dimensions of range, azimuth and elevation, in addition to target velocity. Despite delivering several benefits compared to traditional radar systems, Holographic Radar uses simple radio frequency and digital design to realise the concept cost-effectively. There are no moving parts, meaning any maintenance and lifetime costs are minimised.

The *Aveillant Gamekeeper 16U* is designed to detect, track and classify all types of drones, including micro-systems, such as the *DJI Phantom*. The system provides 3D target tracks and target classification to discriminate drones from birds. The *Aveillant Theia 16A Holographic Radar* provides air traffic controllers with clear aircraft tracks close to, and directly above, wind turbines.

The latter can affect the image on a traditional ATC radar: Rotating wind turbine blades can cause clutter and false tracks as the blade tips produce large radar reflections with 'Doppler-shifts', similar to those from aircraft. Holographic Radar can recognise and remove the reflections from wind turbines meaning the ATC display will only show the genuine aircraft tracks.

This month's photograph shows a *Bell Griffin* of the *Defence Helicopter Flying School*.

https://tinyurl.com/8yptkyc8

RAF ATC Profiles 8: Shawbury

ICAO Code: EGOS IATA Code: None allocated

Frequencies	**(MHz)**
Shawbury Approach/Radar	269.425; 133.150; 362.300*
Shawbury Director	373.225 123·300*
Shawbury Talkdown	377.775; 360.450; 123·300*
Shawbury Low Level	369.175
Shawbury Tower	362.000; 122·100*
Shawbury Information	121.575*
* NATO Common	
ATIS	
Shawbury ATIS	341.65
Navaids	ILS/DME CAT I Runway 18 DVOR/DME SWB 116.800 Hold On SWB *[DVOR = Doppler VHF Omni Range DME = Distance Measuring Equipment SWB = Super Wide Band Ed.].*
Runways	18 (1831m x 45m) 36 (1831m x 45m) 05 (1375m x 45m) 23 (1375m x 45m).

NOTES (A-Z)

Helicopter Operations
RAF Shawbury parents the Defence Helicopter Flying School, a tri-Service helicopter training establishment. Intensive instrument flying and general handling training by large numbers of helicopters, up to FL70, within Shawbury Area of Intense Aerial Activity. RAF Shawbury- based aircraft have priority; visiting aircraft may be refused Instrument Flight Rules (IFR) approaches during periods of intense flying. Visiting rotary-wing inbound to land may be given the clearance 'land threshold only'. This clearance limits the aircraft to the first 1,000ft of the runway with vehicles/helicopters crossing/occupying the runway 1,500ft upwind of the threshold.

Local Traffic Regulations
All visiting aircraft must arrive before 1600 UTC.
All civilian traffic call Zone on 133·150; all military fixed-wing traffic call Radar on 282·000. Inbound aircraft will receive radar-assisted recovery to the airfield.

Military Aerodrome Traffic Zone (MATZ)
A circle 5nm radius up to 3,000ft above aerodrome level with final approach stubs aligned on Runway 18/36.

Operational Hours
0800-2359 Mon, Tue, Wed, Thu. 0800-1800 Fri.
24hrs notice required for armed diversion requests.

Use of Runways
Visual circuit exceptionally 1,500ft QFE flown to the East or South-east of the Runway in use; circuit direction notified on contact. Helicopters fly various circuits up to 1000ft QFE. Runways have non-standard white hollow markings (QFE = Atmospheric Pressure [Q] at Field Elevation).

Warnings
Helicopter traffic may dictate an instrument recovery regardless of flight conditions. Caution: helicopters operate within 50m of both sides of the runway; circuit activity will not be included in the final clearance; all overshoots are to be made down the full length of the Runway. There is no deadside. On Saturdays, Sundays and Public Holidays, helicopters and light fixed-wing aircraft may operate. No approach facility; transit aircraft to contact 120.775MHz. Local Instrument Approach Procedures are established outside controlled airspace.

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The TELESTAR DIRA M 6i

Kevin Ryan takes an in-depth look at a new hybrid digital radio from Germany, which is small and portable and features a range of interesting recording options and networking functionalities.

I recently spotted a most interesting radio on Amazon, from *Telestar DIGITAL GmbH* in Germany. *['GmbH' denotes a limited company – Ed.].* The company makes several digital radios, but I settled on the DIRA M 6i. This model is a hybrid radio able to access both broadcast and internet stations.

The DIRA M 5i is the same radio but without FM or DAB+. There is no indication where the radios are manufactured, and the brochure showed some interesting functions such as recording audio, making timed recordings and having an F-type socket for the antenna.

The radio measures 9.4 cm by 15.5 cm, making it a bit smaller than a paperback book.

https://tinyurl.com/fz75xxfe
https://tinyurl.com/ehvas6c7

Buying Abroad

I hesitated at first to order this because of the warnings from Amazon about possible additional VAT and customs charges and that warranties would not apply. I placed the order via Amazon's UK store that would oversee customer service and returns.

The product came from an *Amazon Global Store* in Germany and the order price showed me the complete amount that I would pay for an order for international products, including import duties, taxes, and fees.

Amazon will also manage customs clearance on your behalf. Perhaps being a *Prime* member helped defray some of these costs. My advice is to click on all the 'Learn More' links on the order page and read the information before proceeding with a purchase, although I am confident that Amazon would flag up all the possible costs in advance at the checkout.

In the Box

In addition to the radio, there is a (German-language) manual, USB cable plus a euro type AC adapter, a rigid antenna with F-type plug, a 1.6m long flexible (cable) antenna terminated in an F-type plug and a tool to tighten the antennas to the radio (Fig. 1).

Getting Started

The first hurdle was the manual because the radio came with the German-language version and, unfortunately, I learned French and school and technical college. The front page has a QR code to access the manual in English and other languages; sadly, I got a 404-error (page not available) from the *Telestar* website.

I couldn't find an English language version of the manual anywhere on the internet. I partially solved the problem by finding a manual for other *Telestar* radios with a similar layout of keys and functions. The *Telestar* DIRA M 14i hybrid desktop radio turned out to be a close fit.

However, I really needed both manuals side-by-side to explore all the features of the M 6i.

Choice of Antenna

First of all, I attached the rigid DAB/FM antenna to the radio using the supplied tool to tighten it to the F-type socket (Fig. 2) I tried the cable antenna later, but it didn't seem as good as the rigid one. Later I attached one of my loft antennas so that I could pick up one of the London multiplexes.

Power Applied

The PSU is a 5V USB type adapter with a 5mm plug on the end. The mains adapter is for the European market. Therefore, I replaced the plug 'bit' with a UK AC adapter. I switched on and, after a short wait, the *Telestar* logo appeared. The setup is straightforward, but do not forget to select 'English' as the on-screen language. I set the time/date update to 'auto.' The default setting gets this information from the internet, plus GMT time zone and daylight saving adjustment for BST.

There are two options when the radio is put into standby mode: *Eco Standby*, *Standby Mode with Clock* where there is a warning that more power is consumed in this mode. The *Auto-Standby* option sets a time, ranging from one to three hours before the radio goes into standby. There is also a Sleep Timer with 10-minute

ALL PICTURES: KEVIN RYAN

Fig. 1: The radio ships with two antennas, an antenna tightening tool, a PSU with cable, and a (German-language) manual.
Fig. 2: Sideview of the radio showing the USB slot and the fixed DAB+/FM Antenna.
Fig. 3: The opening menu for the Internet Radio mode captured from the *Soundmate* app.
Fig. 4: The *Radio* option expanded; each entry shows either a list of stations or opens another menu (captured from the *Soundmate* app in *Internet Radio* mode).
Fig. 5: Unfortunately, the misplaced DAB+ logo spoils the (otherwise nicely-designed) *Soundmate* app screen.
Fig. 6: A well-designed keypad, let down by some random actions the keys produce. Hopefully, there is an update pending.

increments from zero to 120 minutes. The clock is a numerical digital one with a small weather icon showing temperature and a forecast symbol. Next, I set the location to *Europe* and the *UK*.

This, of course, determines the list of local radio stations available.

Wi-Fi Network

The radio uses the older 2.4GHz Wi-Fi band and it takes a while to list all the available networks. The password has to be entered manually using a linear soft keyboard where you scroll along the list for each letter and then right at the end for OK.

Ten Options

Now the available audio sources and other options appeared on the screen: *DAB Radio, FM Radio, UPnP* (*Universal Plug and Play, i.e.* audio from another device on the network) *Multimedia* (via USB), *Equaliser, System, Weather, Bluetooth, Internet Radio,* and *Local Radio*.

DAB Stations

The radio is quite light because there are no batteries inside to give it stability. I extended the rigid DAB antenna (it is 72 cm long with eight segments) to its full length, and it would be easy for it to topple over.

Nevertheless, the *auto-scan* picked up 71 stations putting the radio just above average sensitivity.

The *manual scan* to add stations on a single multiplex is confusing because it never tells you if it found any stations. Eventually, using a loft antenna, I increased the number of stations to 100, proving that it works 'behind the scenes', so to speak.

The on-screen information is sparse. The tuned multiplex is shown when you select a new station, and the DLS (Dynamic Label Segment, i.e. the scrolling text, as sent by the station) is displayed alongside a static logo. I could not find a way to scroll through the range of information usually available from a DAB+ station and there is no signal strength indicator on the screen (Note: in the FM mode a signal strength graph is displayed next to the FM logo).

Thinking about it, this is primarily an internet radio with DAB+ added in.

The radio has 100 presets for DAB stations, many more than I would ever need.

Internet Radio

I was very keen to investigate this side of the radio for several reasons. The opening menu (Fig. 3) offers five choices to access the *Favourites List*, *Radio*, for a complete listing of radio stations, and *Podcasts* for a similar list; the *History* entry contains the ten radio stations last selected and *Search* is for looking for a specific station. The next level down from *Radio* (Fig. 4) is Recommendations, *Popular Stations, Trending, High Quality, New Stations* and *Filter by Location, Language or Genre*.

I finally selected *RTL- Die Besten Hits Aller Zeiten* – one of my favourite DRM stations from Luxembourg.

[The 'Best Hits of all Time' – Ed.].

The on-screen display alternates between the station logo and description and a picture of the sleeve associated with the song being played. Other rotating information covers the codec, station

language and location, Luxembourg City in this case.

The Soundmate App

This app is available for both Android and Apple devices. I used the QR code in the German-language manual to find it quickly. On opening it, the app immediately found the radio across the Wi-Fi network. The remote controller app has four quick keys at the bottom of the screen (Fig. 5) one of which displays the full keypad.

I spent some time checking each key (Fig. 6) to see how the radio responds. Some functions do not appear to do anything such as the "Sleep' and 'Record' keys; others do not do what you might

expect in a particular mode, such as "Info' in the *Internet Radio* mode – which is taking you back to the opening menu.

Therefore, the app is of limited use mainly because the handheld screen does not reflect what is on the radio screen. I did (somehow) open the *iRadio* menu, but it seems random, and I could not find a definite series of key presses to get to the menu again.

Which Radio Portal

I am always curious about which radio portal is behind the scenes. The internet menu on the DIRA M 6i did not match any of the ones I am familiar with. The *Pure SmartRadio* version subdivides into the *UK, Search, Location, Popular* and *Discover*, while the (more typical) list on internet radios contains *My Favourites, Local UK, Stations, BBC, Podcasts, My Added Stations* and *Help*. Picking two of the listed countries (Liechtenstein and Jersey) the stations available matched those listed on the John Lewis *Octave*. For me, this settled that the *Telestar* is connecting to the *Silicon Frontier* portal, not the *MediaU* one found on Bush and Majority radios. A small curiosity is that the *Frontier Silicon UNDOK* app did not find the *Telestar* on the network – or it did and discounted it as not one of its listed manufacturers.

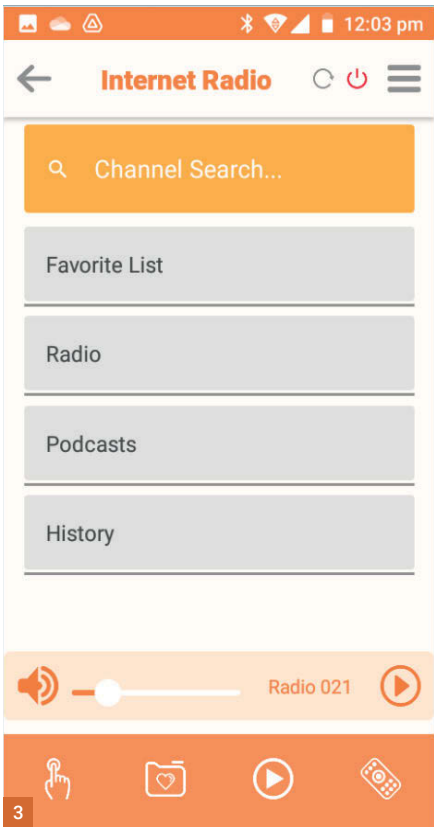
Weather

On investigation, the default location is set to Frankfurt. You can use *Set Location* in *Weather* mode to (by long-pressing Menu per the on-screen instruction) add another location but not to delete one. The weather database is extensive, and you might find your exact location. The manual warns that the weather outside your window might not match that displayed on the radio.

Universal Plug-and-Play (UPnP)

This option finds any available audio source on connected network devices, such as a PC or mobile telephone. In this way, the radio becomes your media player. You might need to know a bit about your PC's folder structure because the radio starts at the user level and then works down through the associated directory.

For example, when I started *UPnP*, there were two entries of *Local Shared (DMP)* that I took to be my PC and *From Cellphone (DMR)*. My Android mobile phone caused an error message – because 'DNLA' was not set up. 'DNLA' stands for *Digital Living Network Alliance*. This is the name for a



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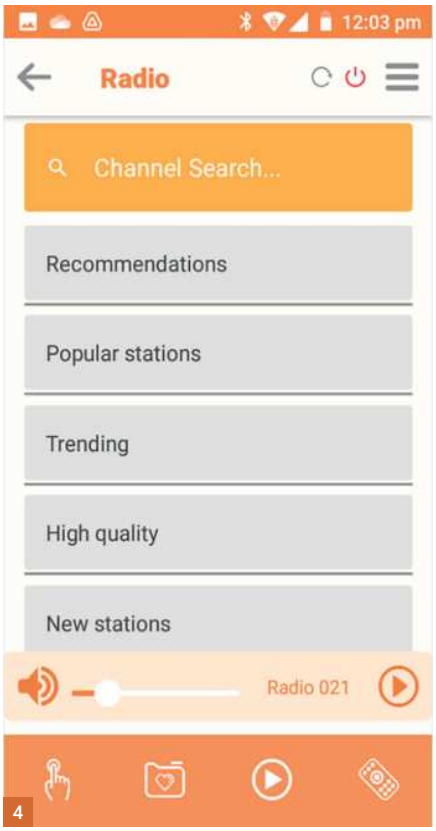

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set of standards to allow devices to share digital information. The *Shared Local* option connected to my PC and listed the four user accounts on it.

My advice is to stick with *Music*, then *Folders* and ignore other options like pictures and video because they do not work.

Recording

This is a very useful feature: The radio records to a USB memory stick from DAB, FM and Internet radio. The files get stored in a directory named 'PVR,' using different formats: usually *.mp3* for Internet, *.wav* for FM, *.mp2* for DAB, and *.aac* for DAB+. The System menu has a *Record Timer* with five slots, but I found it impossible to get it to work by entering the required information.

Purely by chance, I pressed the 'Rec' button for a bit longer than two seconds – and up came the record timer screen. It works by selecting (press the control knob) *Status* and changing it to *On*, by rotating the control knob and then pressing it to *Select*. There are two screens of options, including *Source, Start Time* and *Duration*; the default is two hours.

If anything is wrong, the radio displays an 'invalid entry' error message. This usually happens because the *Status* is still set to *Off*.

Recording Tips

I conducted a few tests to see how recording worked. If you hesitate in setting up an entry, the radio flips you back to the normal screen. Annoying, but I got there by being clear about what I wanted to do in advance.

Select the *mode* to be recorded *first* because this will be the only option available in the setup.

You cannot set another timed recording when the radio is actively recording.

Set up recordings *in the correct time order*.

The radio displays the red record circle in the top status bar when the radio is recording.

The radio *mutes* in record mode and will switch modes to make a recording.

You can review the timed recordings' settings in *System -> Record Timer* but cannot edit them.

To edit a future recording press and hold the 'Rec' key and then change any settings.

Recordings can be set to happen *once* or on a *daily* basis.

Playback and a Factory Reset

My initial test just using the REC button worked, and I played back the audio from the file. After I had used the *Record Timer*, however, nothing played back. Checking

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on a PC, I could not playback the FM or DAB recordings using the *Windows Media Player* or *Audacity* but *iRadio* recordings in the *.mp3* format worked. A different player might work too.

The only option left was a factory reset, which wiped all user applied settings. Luckily, the files stored on the USB drive are not touched. The reset fixed the problem, and I could playback all the file types created using the record timer. I repeated my test recording from DAB, FM and the Internet one after the other. This time all the recordings played back on the radio.

Local Radio

This option should be for the UK. It splits down into the four constituent countries. Unfortunately, the *Favourites List* is the global one and you cannot create a list of your local stations. You can change this in the *System -> Location Settings -> Country (Set Local Radio)*.

Equaliser

The equalizer is a menu item, and it has just five options for *Bass, Jazz, Rock, Classical,* and *Pop*. Unfortunately, there is no 'custom' equalizer setting.

Other Features

Like on many radios, there are controls to dim the display between two different brightness levels. In the *System*, choose the *Backlight* option; you can scroll in 20 steps between 'off' and 'full brightness' for both working mode and standby mode. There are five alarms for single, daily, weekday or weekend use. The alarm has three beeper options, or you can choose one of the three radio sources (FM, DAB Internet).

Was it Worth It?

In the end, I was reasonably pleased with this radio, especially when I cracked how to make timed recordings. DAB is functional but I would still have liked (possibly via the 'Info' button on the *Remote Controller* app) to scroll through the usual technical details such as bit rate, signal strength, and so on.

The corruption of the software that prevented playback of the timed recordings was a concern. The radio is very portable but is more like a desktop needing mains power and an external antenna to get the best out of it.

The *Soundmate* app needs some work so that it more closely mirrors what is happening on the radio, and a help file would be really useful.

The *Telestar* costs about £56 when purchased on Amazon. Other retailers stock it, and the list price in the *Telestar* catalogue is €80.

Radio News

DAB SALES WORLDWIDE: Global DAB receiver sales have broken through the key 100 million milestone this year – reaching a cumulative figure of 110 million units, including both consumer and automotive receivers. The latest information released by industry body WorldDAB shows that despite the impact of the pandemic, sales continue to rise. In the last 12 months, automotive DAB receivers exceeded 10 million units for the first time, and consumer receiver sales registered over five million units. The automotive DAB+ market has been transformed over the last two years – with DAB+ now a standard feature in over 89% of new cars in all key European markets.
This growth reflects the impact of the European Electronic Communications Code (EECC) introduced in December 2020, requiring all new car radios in the EU to be capable of receiving digital terrestrial radio. In the consumer receiver market, the proportion of devices featuring DAB / DAB+ has also seen a sharp increase – from 28% two years ago to 42% in the second quarter of 2021. DAB sales are benefiting from strong marketing in Germany and the Netherlands, receiver regulation in Germany, France and Italy – and the emergence of new DAB markets.
(SOURCE: WorldDAB | Radio Today)
https://tinyurl.com/233e44my
https://tinyurl.com/6nsnvt66

IRISH RADIO SPECTRUM 2022-2024: The Irish Radio Transmitters Society report that ComReg, the Commission for Communication Regulation, has published a document, *ComReg 21/90*, seeking consultations on a wide range of licensing issues, mainly in the commercial field. There are, however, several significant issues for the amateur community that need careful consideration and measured responses. .
(SOURCE: ICQ Amateur)
https://tinyurl.com/3a54a76u
https://tinyurl.com/r2ayrvvu

DX-PHILATELY: The 6th edition of one of the most complete listings of radio and DX related stamps is now available; it is used by stamp collectors worldwide. It is a Word file, the size of the file is about 1.1 MB, and it lists more than 400 radio stamps from 121 radio countries. The stamps are listed by continents and countries with the date, Michel No. and motive. You can also mark which stamp you have in your collection, unused or used and it is easy to modify with new editions.
(Source: SWLing Post | Lennart Weirell).
https://tinyurl.com/ju5bfhk6

"Cultured Refinement, Unequalled Delicacy, Accuracy & Fidelity"

Keith Hamer and **Garry Smith** unearth another vintage promotion for wireless apparatus, conclude their Westward Television story and reminisce about BBC Christmas graphics.

Keith Hamer
Keith405625.kh1@gmail.com
Garry Smith
Garry405625.gs@gmail.com

The question of transmitter power supplies was of great concern to the BBC in the 1920s. Apart from the normal wages bill, the greatest item in maintenance cost was power. Anything that could be done to reduce the amount of power required resulted in a great financial gain. The efficiency of a rectifier system was 60 per cent, whilst that of a motor generator was 80 per cent. This made designers and engineers eager to use direct current. Many technical difficulties arose in making this cost-cutting exercise a success. In the first place, 10,000-volt DC machines were not standardised products in the UK and the risk of breakdown was of real concern.

At the BBC's 5GB transmitter at Daventry, a high-tension generator had been used with remarkable success for eight months without exhibiting any signs of breakdown. Daventry 5GB was brought into service on an experimental basis on August 21st, 1927, to provide alternative programmes to listeners in the Midlands.

Perhaps the most serious disadvantage that had to be faced when using DC was the 'Rocky Point' effect. The use of rectified alternating current automatically limited the power which could be passed. The DC generator had better regulation and was more liable but imposing just that extra strain could destroy a faulty triode.

With AC, a defect with one triode passed practically unnoticed. In general, it was thought that it was better to use DC and employ some sort of electrical device to protect faulty valves. Not surprisingly, engineers in the 1920s were hoping for the day when triodes would be designed which did not exhibit the 'Rocky Point' effect.

The interesting problems associated with this phenomenon were discussed in further detail in our September 2021 column (*RadioUser*, September 2021: 37-39).

More on Vintage Wireless Equipment

This month's rummage through vintage copies of long-forgotten newspapers and magazines has discovered an advertisement for the *GECoPHONE New Cone Loud Speakers* (Fig. 1). The text has been left in its original format to reflect the spelling, grammar, and punctuation of the time.

This is the full description of the equipment manufactured by *The General Electric Company, Limited*, in London. This original advertisement was published in 1927:

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"Cultured refinement, unequalled delicacy, accuracy and fidelity of reproduction are idealised in the new GECoPHONE Cone Loud Speakers. There are four beautiful and distinctive models to suit individual requirements. Above is depicted the Standard Cone Loud Speaker, a handsome model with self-coloured and beautifully grained cone and fine coin bronze finished metalwork. Ask your dealer to demonstrate the Standard, Screen, Plaque, and Cabinet Models with GECoPHONE Radio Receivers and Gramophone, Reproducers. RADIO RECEIVERS AND GRAMOPHONE REPRODUCERS AND CONE LOUD SPEAKERS. The G.E.C. – Your Guarantee. Advt. of The General Electric Co., Ltd., Magnet House, Kingsway, London, W.C. 2."

It makes one wonder where things went wrong with loudspeaker technology. A loudspeaker with *"cultured refinement, unequalled delicacy, accuracy and fidelity"* was available to the mass market in 1927.

Nowadays, most radios and televisions are fitted with shoddy, tinny-sounding excuses for speakers!

Westward Television (Part III)

Westward began broadcasting on April 29th, 1961. We conclude our short series marking their 60th anniversary by looking at the station's programme output, the studios, and some of their technological achievements. The previous two instalments were featured previously, in the July and August columns (*RadioUser*, July 2021, pp. 41-43; August 2021, pp. 39-41). *Westward Diary* was the nightly news magazine programme which became part of West Country life and reflected the activities of the region. In a 1969 *Sunday Times* article, the newspaper reported the following: *"Westward TV regards this Monday to Friday, 6.00 pm programme as the backbone of its service to the South-West. More than 100 correspondents from Bath to Weymouth and as far west as the Scillies contribute to its comprehensive news coverage. Eight cameramen scour the region for news film and items of general interest. The success of this team operation is proved by the high ratings the programme consistently attracts and the frequency with which it appears in the regional top ten list of programmes. Each Monday and Friday, the Diary is followed by the Sports Desk, which aims to keep viewers abreast of every type of sporting event in the region. During the football season, the Westward TV outside broadcast unit also covers local matches for transmission in place of the networked matches."*

The programme was divided into two segments, separated by a commercial break. The

ALL PICTURES: THE KEITH HAMER+GARRY SMITH ARCHIVE COLLECTION.

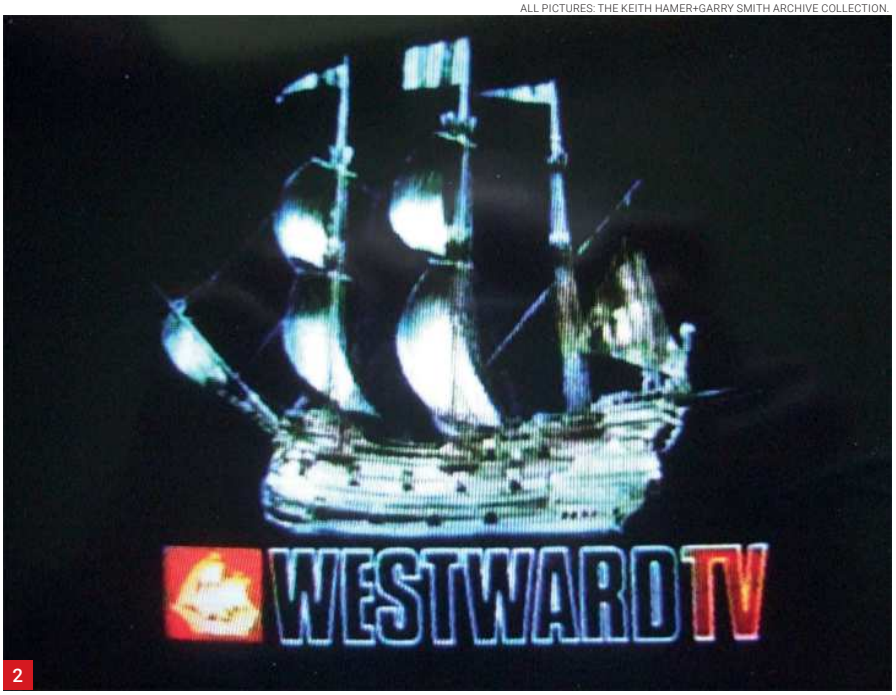

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Fig. 1: The original 1927 advertisement for the 'GECoPHONE New Cone Loud Speakers'. Fig. 2: Westward TV began broadcasting in colour in 1971, initially from the Redruth transmitter. The 'Golden Hind' logo was re-photographed in glorious colour. Fig. 3: The 1989 BBC-1 Christmas on-screen Ident Symbol.

first half concentrated on the regional news, whereas the second part included other items of interest to local viewers. A number of experts would visit to present regular features. For example, Ted Tuckerman would present a fishing spot called *Tight Lines*, and Jon Miller (a zoologist who also presented Southern Television's *How!*) would present a feature about nature. Architect, David Young, would examine the local architecture of interest, and Topline Broadhurst would present regular gardening spots. There was a regular item called *Help!* for charity and voluntary groups, and a slot called *Pick of the Post,* in which viewers' letters would be read. There was also the popular *Picture Puzzle* in which viewers had to try and guess the location shown in a photograph taken somewhere in the South-West.

Another favourite programme was *Treasure Hunt*, a game show presented by Kenneth Horne and Keith Fordyce, among others. It ran for 14 years, and at one stage featured a pirate co-host called *Jethro*.

Early Studios

Studio 1 had an area of 2,500 sq. ft. (230 m^2) and was equipped with three Image *Orthicon* cameras. Studio 2 covered 400 sq. ft. (37 m^2) and had two cameras and the associated facilities for news, sport and interview programmes. There was also an announcer's studio beside the Master Control area.

The Outside Broadcast Unit was located in a van equipped with a *Plumbicon* camera and sound facilities for recorded news and programme inserts.

The station was based at purpose-built studios at Derry's Cross in Plymouth, with London offices (sited at various locations including New Bond Street, Marble Arch and Sloane Square) and a sales office in Bristol. The studios were designed by the architects who had previously designed the TWW premises at Pontcanna in Cardiff.

The studios were originally installed by *Marconi Limited*, using top-of-the-range studio equipment. From the outset, Westward purchased the best equipment whenever they could afford it. By the time Westward began broadcasting, Derry's Cross had cost Westward over £500,000, with the company committed to spending another £20,000 on the studios by April 1962.

Technical Developments

Westward TV began broadcasting in colour in 1971, initially from the Redruth transmitter. A few months later, colour was extended to the Stockland Hill and Caradon Hill transmitters. To mark the occasion, the Westward TV 'Golden Hind' logo was re-photographed in glorious colour (Fig. 2).

In 1980, Westward Television made major advances to their technical facilities which gave West Country viewers a much-improved service. Regional news output was doubled, with longer and more varied local programmes after national news bulletins. The top-rated nightly news magazine 'Westward Diary' was supplemented by 'live' Saturday sport, news and a results service. The company took delivery of the country's first fully operational mobile recording unit, which made possible big advances in coverage for the far corners of the region. The £300,000 unit, mounted on a special chassis, carried lightweight cameras, and sophisticated camera-to-unit micro-wave and radio-control systems. The unit incorporated highly advanced miniaturized electronic cameras; it could do almost everything a much bulkier studio camera could achieve, and it could operate in low-light conditions too.

Inside the specially-equipped vehicle, a half-size vision mixer coped with all the usual special effects, like picture wipes, fades and cuts. The sound mixer could control the output from up to ten diverse sources. The unit also carried a compact videotape recorder which recorded pictures and sound on tape just 1-inch wide - half the size of the older studio VTR machines.

All this took place in one of Westward's busiest years which saw major light entertainment, local and network religious events, documentaries, news and current affairs, plus a unique peak-time exercise in community television. However, just when Westward Television was making great progress with programme content and technical facilities, the IBA pulled the plug on the station, announcing that their broadcasting licence would not be renewed.

Westward's Franchise Revoked

On December 28th, 1980, while the ITV network was showing *Drake's Venture*, starring John Thaw, (Westward Television's two-hour filmed drama to celebrate the 400th anniversary of Sir Francis Drake's circumnavigation of the globe), ITN interrupted the programme, at a suitable commercial break, to announce that ATV was to undergo major changes and Southern and Westward had not had their licences renewed by the IBA. The southwest franchise was awarded to TSW (Television South-West).

Following the loss of its franchise, Westward's management decided to sell up quickly, and the company (including its staff, premises and programme library) was purchased in early 1981 by TSW for £2.38-million. TSW continued using the Westward name and on-screen logo until December 31st, 1981. The station was then re-branded on-screen as TSW. A special programme, *20 Years of Westward*, was broadcast on December 21st,

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1981, to reminisce on the company's achievements. It was presented by Roger Shaw and recorded in front of a studio audience. Hastings Mann's *Westward Ho!* was used as the theme music. Studio guests included Angela Rippon, Kenneth MacLeod and Sheila Kennedy. There were filmed contributions from Alan Freeman, Jan Leeming and David Vine and many clips of Westward programmes were shown. The special programme ended with a message from Peter Cadbury, in which he wished TSW well.

The Final Closure

Unlike the other ITV stations that lost their franchises in this round, Westward (having been run by successor TSW since August 11th, 1981) opted to hand-over at midnight on December 31st, 1981. On that evening, they broadcast the first 25 minutes of Scottish Television's Hogmanay show 'live', and then cut away just before midnight when Roger Shaw appeared on-camera in a traditional dinner jacket seated at an antique wooden desk, surrounded by staff wearing formal suits and holding film reels and 2-inch videotapes.

He closed Westward Television with this announcement: "*Many thanks to our friends at Scottish Television, north of the border. Well, it's very nearly the end of 1981 and, for Westward Television, it's the end of its franchise to provide an independent television service for the south-west. So as we wish you a happy New Year from Westward, it's also goodbye and thank you for all your support and kindness over the past 20 years. But a New Year's Eve is also a time for looking ahead and as Dr Samuel Johnson said, 'New things are made familiar and familiar things made new'. So now in 1981, we say 'goodbye' from Westward Television.*"

Launch Of TSW

TSW began with a video clip of a champagne bottle being opened accompanied by the short audio version of the station's theme tune, *That's Soul, Write*. Roger Shaw then reappeared wearing a modern suit, (no longer in a dinner jacket) sitting in a contemporary chair, surrounded by staff wearing TSW T-shirts and holding 2-inch videotapes. This was clearly to remind viewers of a new modern era as well as a fresh look.

Roger Shaw made the first announcement on TSW:

"Let's say welcome to 1982 from your new television station, Television South-West, with the promise of a full-bodied blend of the new and the familiar. And from all of us here on duty in these first few seconds of 1982, a happy New Year from TSW. And to get the new year off to a good-humoured start, we have a brand-new comedy with Peter Cook and Mimi Kennedy in 'The Two Of Us'."

This was followed by the full version of TSW's logo. The comedy programme was followed by further continuity, the epilogue, weather and shipping forecast, then close down - all with TSW branding. However, when the screen finally faded to black at approximately 12.40 am on January 1st, 1982, Roger Shaw made a final out-of-vision courtesy announcement and managed to mention the now-defunct Westward one last time, saying, *"From all the staff here at Westward - good night"*.

It was thought that all recordings of the end of Westward Television had been wiped. Then, in 2012 (the 30th anniversary of the end of Westward), a full video recording of the evening was discovered, including the Hogmanay segment which STV had wiped.

TSW was one of the last ITV companies to start broadcasting 24 hours a day, which it did on September 2nd, 1988. This coincided with 24-hour programming by Border Television, Grampian Television, and Tyne Tees Television. TSW was also one of the first ITV companies to broadcast in NICAM digital stereo, which they began in the summer of 1990. On October 16th, 1991, due to changes in the way that ITV contracts were awarded, (using a 'blind auction' rather than a bid on 'merit and potential'), it was announced that TSW had lost their franchise because of an alleged 'unrealistic business plan' related to its bid which was viewed by the Independent Television Commission as being "far too high". The station had put in a bid of £16.12 million.

TSW held the 10-year franchise until 11.59 pm on December 31st, 1992, broadcasting from studios at Derry's Cross in Plymouth. The franchise was then taken over by Westcountry Television. In 1993, the Derry's Cross premises were sold to a firm of solicitors and converted into offices. In 2010, the buildings were demolished to make way for new retail development.

BBC Christmas Idents

Putting on our fortune-telling hats (earrings optional), now that the printed version of *RadioUser* has just become available, we can predict that the forthcoming special on-screen BBC-1 and BBC-2 Christmas Ident Symbols will be unveiled in just a few days' time. Special festive graphics have always been used by the BBC since the late Sixties. The colourful BBC-1 creation used in 1989 is shown in Fig. 3.

DX-TV & FM News

The latest DX news, plus details of changes to broadcast television and radio services, is available online via the *Radio Enthusiast* website:

www.radioenthusiast.co.uk

Stay Tuned!

Please send archive photographs, information, news or suggestions for future topics via the E-mail addresses shown at the top of this column. Please be advised that we cannot undertake to answer e-mails relating to technical issues or give advice on suitable equipment.

Rallies & Events

All information published here reflects the situation up to and including 9th November 2021. Readers are advised to check carefully with the organisers of any rally or event, before setting out for a visit. The Radio Enthusiast website will have updates, please check here regularly. To get your event onto this list, please, e-mail full details as early as possible: wiessala@hotmail.com

2 January
SPARKFORD WIRELESS GROUP RALLY: Davis Hall, Howell Hill, West Camel, nr. Yeovil BA22 7QX. Open 9.30 am to 1 pm, entry is £2. (FP | CR)
wjh069@gmail.com

30 January
LINCOLN SHORTWAVE CLUB WINTER RADIO RALLY: Wragby Town Hall, Louth Road, Wragby, Market Rasen, Lincolnshire LN8 5PH; Doors open at 10 am, with disabled visitors gaining access at 9.30 am. Indoor event; CR; entry £2.
contact@m1dhv.co.uk
m5zzz@outlook.com

6 February
RED ROSE RALLY: St Joseph's Hall, Mather Lane, Leigh WN7 2PR; (D | FP | CR | RSGB | TS). Individual stands, LAMCO dealership stand, low-cost Bring and Buy.
rally@wmrc.co.uk
http://wmrc.co.uk/rally.htm

22 February
RADIOACTIVE FAIR: Mid Cheshire ARS; Nantwich Civic Hall, Cheshire CW5 5DG (BB | CR | D | FP | RF | RSGB | TS)
https://midcars.org
http://www.radioactivefair.co.uk

6 March
EXETER RADIO & ELECTRONICS RALLY: America Hall, De La Rue Way, Pinhoe, Exeter, EX4 8PW.
g3zvi@yahoo.co.uk

1 May
NORTHERN AMATEUR RADIO SOCIETIES ASSOCIATION EXHIBITION: Blackpool Rally, Norbreck Castle Exhibition Centre, Blackpool FY2 9AA
dwilson@btinternet.com
www.narsa.org.uk

20-22 May
DAYTON HAMVENTION
https://hamvention.org

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

24-26 JUNE
HAM RADIO FRIEDRICHSHAFEN
www.hamradio-friedrichshafen.de

26 JUNE
NEWBURY RADIO RALLY: Newbury And District Amateur Radio Society (NADARS)
http://www.nadars.org.uk

17 July
McMICHAEL RALLY
https://mcmichaelrally.org.uk
rally@radarc.org
traders@radarc.org

24 July
FINNINGLEY ARS RALLY : Car-boot style rally. Food bar. Near J2 M180, Doncaster.
www.g0ghk.com

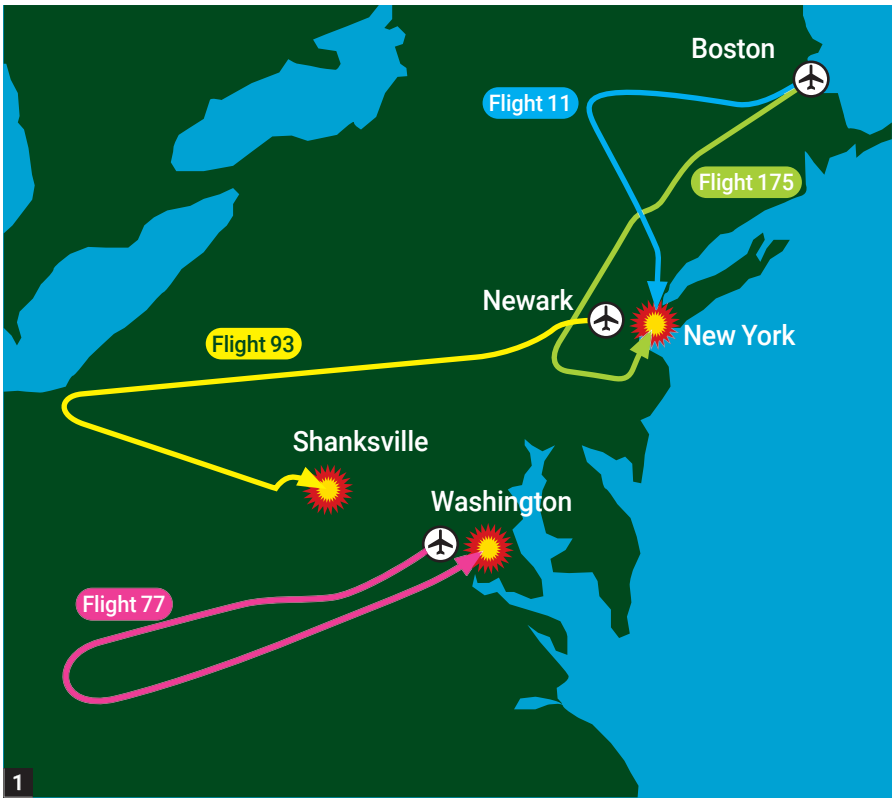
12-14 August
19TH INTERNATIONAL EME CONFERENCE, PRAGUE: Registrations open from 1 January 2022
http://www.eme2020.cz

21 August
RUGBY AMATEUR TRANSMITTING SOCIETY RADIO RALLY: Princethorpe College, Princethorpe, Rugby CV23 9PY. Open 10:00. Car boot sale.
Tel: 07956 855816
rally@rugbyats.co.uk
www.rugbyats.co.uk

4 September
TELFORD HAMFEST
http://www.telfordhamfest.org.uk

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

Scott Caldwell
Scottandrew.caldwell@yahoo.co.uk



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Radio Comms and the 9/11 Terror Attacks

In Part One of a two-part article, **Scott Caldwell** revisits the tragic events of 11th September 2001 and reappraises the role that radio communications played in the disaster.

Tuesday, September 11th, 2001, dawned as a beautiful late summer morning in New York. The people of New York readied themselves for another working day in the financial capital of world commerce. President George W. Bush went for an early morning run before he was due to attend a school in Florida to participate in a reading demonstration.

However, the normality of the day was broken when the WCBS AM traffic reporting helicopter broke the news at 08:48 hrs of an incident at the World Trade Centre. The following transcript involves WCBS anchor Pat Carroll and traffic reporter Tom Kaminski and reveals how the tragic events transpired as the United States was attacked by radical terrorists, without any prior warning.

Pat Carroll: *WBCS news time, its traffic and weather together sponsored by Henry Miller's Theatre. Tom Kaminski Chopper 880.*

Tom Kaminski: *All right uh, Pat, we are just currently getting a look at the World Trade Centre. We have something that has happened here at the World Trade Centre. We noticed flame and an awful lot of smoke from one of the towers of the World Trade Centre. We are just coming up on this scene, this is easily three-quarters of the way up, we are. Whatever has occurred has just occurred, uh, within minutes and, uh, we are trying to determine exactly what that is. But currently, we have a lot of smoke at the top of the towers of the World Trade Centre. We will keep you posted....*

Air Traffic Control Communications: Flight 11

IN the United States, the Federal Aviation Administration (FAA) is mandated by federal law to regulate the safety and security of civil aviation traffic.

https://www.faa.gov

The air traffic controller at Boston soon realised that something was seriously wrong with *American Airlines Flight 11* (Table 1, Fig. 1). This was at 08:14 am, when the aircraft had failed to acknowledge instructions to climb to 35,000 feet. The controller repeatedly tried to contact the aircraft on the standard emergency radio frequency. Then, at 08:21 hrs, the aircraft's transponder was suddenly deactivated. This immediately shut down the data stream from the aircraft.

American Airlines Flight 11 (Fig. 1) provided a non-stop shuttle service from Boston to Los Angeles. On September 11th, 2001, Captain John Ogonowski and First Officer Thomas McGuiness piloted the aircraft. The aircraft was at full capacity. This included nine flight attendants and 81 passengers (including the five terrorists).

At 08:25 am, Boston Air Traffic Control knew they had a serious problem with *Flight 11*. The hijackers had attempted to communicate with the terrified passengers. The microphone was keyed and immediately one of the hijackers shouted: *"Nobody move! Everything will be okay. If you try to make any moves you'll endanger yourself and the aeroplane. Just stay quiet"*.

The hijackers were unfamiliar with the cockpit radio communications systems and inadvertently broadcasted their warning over the air traffic control channel instead of the cabin public-address channel.

At this stage, unfortunately, the management of the FAA and the airline companies failed to issue a general alert to all aircraft in US airspace – even after the intercepted message by Boston ATC, which included the phrase, *"We have some planes"*.

In fairness to the FAA personnel, nobody had ever dealt with multiple hijackings. Finally, at approximately 09:10 am, the FAA decided to act and requested via Herndon

Fig.1: A Map showing the routes of: A. American Airlines Flight 11: Boston to Los Angeles; B. United Airlines Flight 175, Boston to Los Angeles, hijacked to New York; C. American Airlines Flight 77, Washington to Los Angeles, hijacked to the Pentagon; D. United Airlines Flight 93, Newark to San Francisco, hijacked and crashed in Shanksville. Fig. 2: A Moment Frozen in Time. Fig. 3: Air Force 1. Fig. 4: The White House.

(National Command Centre) that messages should be transmitted to all airborne aircraft to increase cockpit security. FAA Control Centres received information independently and formulated their strategic decisions accordingly.

On September 11th, Boston, New York, Cleveland, and Indianapolis monitored the four hijacked aeroplanes, Therefore, what Boston knew was not necessarily known by the air traffic control centres in New York, Cleveland, or Indianapolis, or for that matter at Herndon, and ultimately at FAA headquarters in Washington.

Remarkably, there is no documented evidence to suggest that Herndon issued such direct action.

United Airlines Flight 175

United Airlines Flight 175 (Table 2; Fig. 2) was scheduled to depart Boston for Los Angeles at 08:00 am. Captain Victor Saraccini and First Officer Michael Horrocks piloted the Boeing 767. They were assisted by seven flight attendants who were engaged in looking after the welfare of 56 passengers. At 08:42 am, Flight 175 had just entered New York air space and broke in with the following transmission:

"UAL 175: New York 175 heavy.
FAA: UAL 175 go [a]head.
UAL 175: Yeah. We figured we'd wait to go to your centre. Ah, we heard a suspicious transmission on our departure out of Boston ah, with someone, ah, it sounded like someone keyed the mikes and said everyone stay in your seats…"

This was the last radio message from Flight 175 (Table 2; Fig. 2). The first operational indication of a problem onboard Flight 175 came at 08:47 am when the aircraft suddenly changed beacon codes twice. This significant change was not noticed for several minutes, as New York, Air Traffic Control was undertaking an intensive search for the missing Flight 11.

Then, at approximately 08:55 am, air traffic controllers believed that Flight 175 had also been hijacked. Finally, they observed the aircraft in a rapid descent; the radar data stream terminated over Lower Manhattan.

ALL PICTURES: WIKIPEDIA

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Flight 77

American Airlines 77 (Table 3; Fig. 3) was a Boeing 757, piloted by Captain Charles F. Burlingame and First Officer David Charlebois. The crew also consisted of four flight attendants who were assigned to look after the 58 passengers. Flight 77 began flying erratically and deviated from its dedicated flight plan at 08:54 am, reflected by a sudden turn to the south.

Almost simultaneously, air traffic controllers saw the aircraft data disappear from their screens.
They followed routine procedures by checking for a primary radar return. A search of the aircraft's projected flight path and the airspace to the southwest had no positive results.

The last resort was to use the emergency radio frequencies. It was initially believed by air traffic controllers at Indianapolis that Flight 77 had experienced a serious electrical malfunction or mechanical failure.

They simply did not know about the tragic events unfolding in New York.

Flight 93

At 08:42 am, United Airlines Flight 93 (Table 4; Fig. 4) took off from Newark's *Liberty International Airport*, bound for San Francisco. The Boeing 757 was piloted by Captain Jason Dahl and First Officer Leroy Homer. They were assisted by five flight attendants. A total of 37 passengers (included the hijackers) boarded the aircraft. At 09:27, after 45 minutes of flight time, Flight 93 acknowledged a routine transmission from Cleveland Air Traffic Control.

This was the last normal contact the FAA had with Flight 93. A revolt by the brave passengers of Flight 93 would prevent the hijackers from crashing into the White House, resulting in the aircraft crashing into a field in Shanksville PA.

Problematic Communications Issues

Subsequent investigations in the management of the emergency services response to the 9/11 terror attacks revealed limited coordination and communications.

07:59	Take-off.
08:14	Last routine radio communications with American Airlines Flight 11.
08:19	Flight attendant notifies American Airlines of hijacking.
08:21	Transponder is turned off.
08:23	American Airlines attempt to contact the cockpit.
08:25	Boston Air Route Traffic Control made aware of hijacking.
08:46	North-East Air Defence Sector (NEADS) scrambles Otis fighter jets in search of American Airlines Flight 11.
08:46:40	American Airlines Flight 11 crashes into World Trade Centre 1 (North).

Table 1: American Airlines Flight 11, Boston to LA.

08:14	Take-off.
08:42	Last radio communication with United Airlines Flight 175.
08:42 – 08:46	Likely time of the hijacking.
08:47	Transponder code changes.
08:52	Flight attendant notifies United Airlines of hijacking.
08:54	United Airlines attempts to contact the cockpit.
08:55	New York Route Traffic Control suspects hijacking.
09:03	Flight 175 crashes into the World Trade Centre 2 (South Tower).
09:15	New York Air Traffic Centre advises NEADS that UA Flight 175 was the second aircraft that crashed
09:20	United Airlines headquarters were aware that Flight 175 had crashed into the World Trade Centre.

Table 2: United Airlines Flight 175, Boston to LA.

However, the heroic actions of the emergency services to assist people in dire need is beyond reproach.

It has been claimed that a long-standing rivalry between the New York Police Department (NYPD) and the Fire Department New York (FDNY) contributed to the overall view that the two departments proceeded to operate more or less autonomously throughout that tragic day.

The radio communication networks between the services were not compatible, and this issue was raised by the *9/11 Commission*. The Commission also reported that rescuers were forced to make rapid-fire, life-or-death decisions, based on poor communications, and this was a contributing factor to the high death toll.

This issue was still a cause for concern, and it was still evident, during the aftermath of Hurricanes *Katrina* and *Rita*. Many emergency services personnel learnt of the terror attacks from commercial radio and television stations. Communication breakdowns also delayed evacuation announcements to personnel still in the World Trade Centre. One survivor vividly recalled calling the Emergency Services from the 44th floor of the South Tower, only to be placed on hold twice. In fairness, the 911 operators were simply overwhelmed by the sheer volume of calls, and they also had a lack of awareness regarding what was happening at the Twin Towers. The 9/11 Commission Staff Director Phillip Zelikow remarked that, *'on the morning of September 11th the last best hope of the people in the World Trade Centre lay not with national policy, but with the firefighters and police officers who responded to the disaster'.*

The previous terror attack of 1993, also at the World Trade Centre, resulted in some improvements in communications for emergency services. For example, radio repeaters had been installed throughout the Twin Towers. Another lesson from the 1993 bombings related to the protocol to stay where they were and await further instructions from the emergency services.

This order had a tragic parallel to the stay-put-order that was issued to the residents of the Grenfell Tower during the devastating fire of June 2017.

Miscommunications relating to warnings over the structural integrity of the towers were also documented by the 9/11 Commission.

Communications Infrastructure

The primitive FDNY handheld 'handy talkies' did not work well when operated more than several floors from each other. They required a repeater system to amplify and rebroadcast the signals. However, the repeater system was rendered inoperable in the chaos that engulfed the towers that tragic day.

Consequently, some fire-fighters failed to receive urgent messages to evacuate from the towers. Assistant Chief Joseph Callan recalled that, "*We had very little control or contact, communication-wise, with the units that were on the upper floors and that to me was a very large problem'.* A similar view was

08:20	Take-off.
08:51	Last routine radio communications with American Airlines Flight 77.
08:51 – 08:54	Likely takeover of aircraft.
08:54	Flight 77 makes an unauthorised turn to the south.
08:56	Transponder is deactivated.
09:05	American Airlines head office aware that Flight 77 is hijacked.
09:25	Herndon Command Centre nationwide ground stop.
09:32	Dulles tower records a radar display of a fast-moving aircraft (subsequently identified as AA Flight 77).
09:34	FAA advises NEADS that American Airlines Flight 77 is missing.
09:37:46	American Airlines Flight 77 crashes into the Pentagon.
10:30	American Airlines head office confirms that Flight 77 has crashed into the Pentagon.

Table 3: Communications profile of American Airlines Flight 77, Washington DC to LA.

08:42	Take-off.
09:24	Flight 93 receives a warning from United Airlines about possible cockpit intrusion.
09:27	Last routine radio communications.
09:28	Likely takeover of aircraft.
09:34	Herndon Command Centre advises FAA headquarters that United Airlines 93 is hijacked.
09:36	Flight attendant notifies United Airlines of hijacking; United Airlines attempts to contact the cockpit.
09:41	Transponder is turned off.
09:57	Passenger revolt against hijackers commences.
10:03:11	Flight 93 crashes into a field in Shanksville, PA.
10:07	Cleveland Command Centre advises NEADS that United Airlines Flight 93 has been hijacked.

Table 4: United Airlines Flight 93, Newark to San Francisco.

put forward by Chief Joseph Pfeifer *'we had to rely just on handie-talkie communications, which is at best hit or miss in any high-rise. The phone lines were out, and nobody was picking up or the lines were busy to the dispatcher. We weren't getting good reports from the police at all'.*

In 2001, the NYPD utilised Ultra High Frequency (UHF) radios and the city was divided into 35 radio zones, potentially making their radio network less interoperable with other emergency services.

In the aftermath of the tragedy, radio communications from a multi-jurisdictional fire department training exercise were also analysed, revealing several opportunities for non-technical improvement in the command-and-control operation. Another 11.9% of the radio messages went unacknowledged by their intended recipients (39 out of the 51 unacknowledged messages were for the attention of the incident commander).

In addition to this, 2.6% of the total airtime was judged to be unnecessary, redundant, or of questionable value to the emergency response. This suggested that face-to-face conversations, if practicable, may have been more appropriate. A reduction of radio traffic would have facilitated a clearer and more coordinated response to an emotionally challenging situation.

Human and Psychological Factors

A closer examination of all the psychological and human factors may provide further explanation as to why the radio communication system failed. Any first responder may be emotionally compromised when they arrive at the scene. This was, after all, a crime scene that was unprecedented, and unexpected, despite all the experience, training, and length of service of the FDNY.

The impact of the second aircraft smashing into the South Tower (World Trade Centre 2) is still surreal, set against the clear blue sky (Fig. 5). This mixture of conflicting thoughts and feelings may have impaired responders' abilities to issue critical decisions and articulate commands to their personnel.

In situations like this one, it has been found that decision-makers are highly susceptible to cognitive biases when operating in stressful conditions (high workloads, time pressures, and information ambiguity.

This phenomenon may, in turn, adversely affect any lines of communication, facilitating the transmission of incomplete and/ or inaccurate strategic information. In a state of cognitive bias, a first responder may disregard information that contradicts their correct or incorrect preconceptions.

A Nation in Chaos

The White House also suffered a serious breakdown in communications. A message from Russian President Vladimir Putin inquiring why the US military was escalating their forces to DEFCON-3 could not be answered by President George W. Bush, as the White House did not have the technological capability to transfer his call to *Air Force One* (Fig. 6).

For approximately 30 frustrating minutes, the White House (Fig.) tried in vain to establish a secure mode of communications between *Air Force One* and the Kremlin. They finally admitted defeat and requested assistance from the Russian-speaking National Security Advisor Condolezza Rice, who contacted President Putin and negotiated a co-operative stand-down.

According to declassified testimony, it has been revealed that the decision to escalate the US military to DEFCON-3 was hotly debated. As DEFCON-3 was never intended to underpin a military response to terror attacks, it had its origins in the Cold War and the possibility of a nuclear conflict.

In response to this communications breakdown, a secure network has been installed by the US military in Wyoming. It has the technological capability to keep leading political figures connected 24/7, should a national emergency arise.

As a precaution, Vice President Dick Cheney was evacuated to a Cold War-era bunker, where he subsequently became isolated and was forced to watch news reports as the tragic events unfolded.

One of the day's most controversial moments occurred when Vice-President Cheney authorised fighter jets to intercept the hijacked airliners and shoot them down if they failed to respond to radio communications.

Many political commentators have questioned if the Vice-President had the authority to issue such an order.

They have also asked whether the then President Bush was aware of this order, given that the government communications network had collapsed under the fragmentation of the key decision-makers.

Navy Commander Anthony Barnes was acting as Deputy Director of Presidential Contingency Programme, and he recalled, *"the first hour was mass confusion because there was so much erroneous information. It was hard to tell what was fact and what was not. We could not confirm much […]."*

Conclusion

The emergency services were heroic in their response to a truly horrific and unprecedented situation. The communication system was found wanting in terms of 'interoperability' between the police and fire department, as investigated by the 9/11 Commission.

The same problem was embedded in the regionalised air traffic centres who access to limited amounts of information, failing to comprehend the full implications of the terror attack, until it was simply too late.

In Part Two of this article, I will be looking at the role of communications on board *Air Force One* and investigate the response of commercialised radio stations to the terrorist attacks.

MERVYN TERRY

1

Ancient Modulation? Make More Contacts on AM!

Tim Kirby
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This month **Tim Kirby** enjoys using AM on the air, looks at a CB-inspired Network Radio application and wonders whether PMR446 is now becoming 'UHF-CB'?

My intention when writing this column is to cover two-way radio in a fairly simple form, in other words, to talk about things that you can try yourself, without the need for too much complexity.

Thinking about what I might cover this month, I realised that I have often talked about specific bands of operation, be it CB, PMR446, Amateur Radio, even Network 'Radio'. What I haven't talked about so much is some of the different *modes* that you can use. This was brought to mind by some enjoyable contacts made recently on the 80m amateur band using the AM (Amplitude Modulation) mode.

In the same way that some people enjoy low power (QRP) or Morse code because of the simplicity, AM has a similar appeal (Fig. 1). Sometimes described, light-heartedly, as 'Ancient Modulation', it was the original voice mode on amateur radio, as well as CB radio. Many of us have fond memories of listening to stations using AM on the medium wave radio, with the stations fading up and down in signal strength, and several stations being audible on the same frequency over a few minutes. Back in the peak of the last solar cycle, I enjoyed receiving the AM CB stations from North America in the same way.

Listening to the stations fade up and down from different areas was fascinating. Inspired by this at the time, I decided to try out AM on the 10m amateur band, usually from the car, using a 10/11m multimode radio and a CB whip. It worked surprisingly well, even with around 20-25W output. I was interested in the range of gear in use, from old 1940-1950s (and earlier) equipment to modern SDR transceivers, and everything in between.

Contacts and Gear

Although solar conditions are not at peak level yet, they are steadily improving, and it may be worth looking for AM contacts on 10/11m. On CB, there is a fair amount of AM activity from Europe on the CEPT band.

ALBRECHT

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On the 10m amateur band, activity is less certain, but it may be worth looking around 29.000MHz for AM transmissions. Also look around 21.400-21.420MHz, in the 15m amateur band for AM activity.

If you are a radio amateur and enjoy AM activity, the best place to look is 3615kHz on the 80m band. Here, there is a considerable amount of activity, especially during the afternoons.

The pleasant thing about 80m during the daytime is that it will support some nice contacts even with quite low power. I was recently testing a rig with about 8W output and got a good report on AM even with a low aerial. Full licencees can also find some AM operation on the 60m (5MHz band) on 5317kHz.

What about equipment? There are plenty of possibilities. For the 10/11m operator, a multimode rig will include AM. Rigs such as the Anytone AT-500M are a good possibility too, covering both AM and FM over 25 – 30MHz. This includes all the CB allocations, as well as the 24 and 28MHz amateur bands. Perhaps it might be fun to try an AM activity night with a group of friends.

If you are on CB, pick a channel on the European Conference of Postal and Telecommunications Administrations (CEPT) allocation; if you have an amateur licence, select a frequency around 29MHz and see who joins in. Using simple equipment means, of course, that more people can take part. The only thing to be aware of is that not all of the CB-type rigs sound great on AM. A nicely modulated AM signal can sound really good, especially through a decent extension speaker, but quality does vary from rig to rig.

On the LF frequencies I mentioned previously, 3615 and 5317kHz, you will need an HF rig covering AM.

There are some bargains to be had, from time to time, particularly in terms of old valve equipment. This will produce AM on HF, although you may struggle to find such equipment covering the 60m band.

This is a much more recent allocation. If you listen on 3615kHz, for example, you will hear a wide variety of equipment in use, some old, some very old and some much newer. When you listen to many operators using older equipment, you will soon realise that they often have exceptional stories to tell.

Working AM

AM operation is relatively unusual these days on the amateur bands. However, up to the 1960s and 1970s, it was the predominant mode for voice operation. When SSB superseded AM, there was a lot of resistance to the change; this seems almost impossible to us now. It is amusing for those of us with long memories to see some of the same arguments being deployed, once again, against digital mode operation. The only constant, of course, is change!

If you enjoy using AM whether you are on CB or the amateur bands, drop me a line, perhaps with a photo of the equipment you use. It would be great to feature it in the column.

Albrecht AE-6290: CB with a Repeater

There is some very interesting news from Nevada Radio in Portsmouth of a new Albrecht CB radio, the AE-6290 (Fig. 2). This transmitter is a multi-norm CB with all the usual frequencies programmed into it. What is unusual is that it has a built-in repeater/relay function, which allows the user to receive on one channel and re-transmit it on another. It will be interesting to see how this performs in practice.

I am guessing there would be a benefit in making the separation between the RX and TX channels as wide as possible (e.g. RX channel 01/TX channel 40) to try and avoid the transmitter de-sensing the receiver. The AE-6290 should be available from the end of October and will cost £99.95

North American signals on FM CB

It was good to read reports of North American stations being worked on FM CB in the 27/81 allocation. In early October, there were descriptions of US stations calling into the Channel 35 'London Town' net and making some contacts. All being well, there will be more of this to come over the winter season. As reported previously in *Push to Talk*, there is most likely going to be increasing FM activity from the USA, owing to the FCC now permitting FM activity in the US CB band.

Fig. 1: Equipment for use on AM varies in size, as demonstrated by Mervyn GW8TBG's shack. Mervyn can often be heard on 80m AM. Fig. 2: The new Albrecht 6290 multi norm CB set, with built-in repeater functionality. Fig. 3: A screenshot from the Midland *CB Talk* smartphone application. Fig. 4: Another Midland *CB Talk* screengrab.

PMR 446

PMR446 too seems to have become very popular. Several dealers report a lot of interest in equipment being used on PMR446. Some of the radios are not legal to be used with PMR446, such as amplifiers and base aerials, but there is nevertheless a lot of interest in using the band. One dealer told me that PMR 446 has essentially become UHF CB and is becoming useless for handheld type contacts. That must vary from area to area. Where we are in rural West Wales, the band is much quieter, with some more typical use by families or outdoor enthusiasts.

The Floureon PMR446 handhelds, which I covered here previously, created quite a bit of interest but it seems that they are now pretty rare. Ed Spicer kindly e-mailed me when he spotted a pair available on eBay and I was able to add them to my collection. They work very nicely on FM. Barbara B said that there had been a lot of discussion of PMR446 on

the Network Radio channel she uses. She wondered how much of the operation was digitally encrypted. Certainly, it is clear that some of the operations are digital, but enthusiasts wanting to make longer-distance contacts, using standard (or otherwise) equipment will typically do that on FM without any encryption or CTCSS so that it can be heard as widely as possible.

CB Talk on Network Radio

A 'network radio' type application ('app'), which seems to have become very popular, is *CB Talk* (Figs. 3 and 4).

Marketed by the well-known manufacturer, Midland, the application runs on both Android and iOS type smartphones, as well as Network Radio devices. It provides both 'group' type channels and 40 channels available for one-to-one conversations with users who are within 30km of you. On the 'radar', you can see any users who are within a specified radius of your location, and therefore available for one to one chat. Or, if you are using one of the group channels, you can display a map of all the users on the channel and the person that is 'transmitting' comes up in red.

Installing the application on my phone allowed me to see that it seemed to work well, with the majority of the operation on the trucker groups, several of which had over 40 users logged in.

As well as running the application on your phone, you can use it with a variety of Midland Bluetooth-enabled microphones. I understand that this expands the use of the *CB Talk* application to provide a greater number of channels, as well as allowing wider use of the 'Radar' feature.

If you plan to use the application when driving, as the majority of users seem to be, you will, of course, need to use a Bluetooth microphone to comply with the law.

The application can only be used by users who are over the age of 18 and it is fair to say that there was some 'fully-expressed' language on some of the channels I listened to! The *CB Talk* application is free to install on your smartphone device.

Midland have built their own 'Network Radio' type application successfully and have packaged it in a way that the user interface looks like some of their CB radio equipment. Marketing the app into the CB market has clearly been successful and attracted a respectable number of users.

The majority of users seem to be from the trucking community, although I was interested to see that a group had been set up for farmers. The latter use CB radios quite

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widely; it would be interesting to see if the CB Talk/Network Radio approach gains any traction. It might depend on how good the mobile signal is where they are farming.

The benefit of the network radio approach means that you can use the system wherever you have a mobile phone signal. The audio quality heard on all the transmissions that I listened to was very good indeed – much better than you would expect over a standard two-way radio. I also liked the way GPS had been incorporated into the application so that you could see where other users are located (you can limit the application's access to GPS if you prefer not to disclose your location).

News from Sussex

Thanks to Ed Spicer for sending some information about some of the local amateur radio repeaters in the Sussex area. Ed writes, *"I've just had a chat with the repeater keeper Roy G4WTV on GB3CQ (29.620MHz) and I have found out the following. GB3CQ has a time-out of three minutes. Stations accessing GB3CQ via ground wave really need to use a vertical antenna. Polarisation doesn't matter quite so much with signals coming in via Sporadic E which can 'twist' their polarity, but some very local stations are noisy into the repeater simply because they are using horizontal dipoles.*

"GB3RW (Worthing) on the 2-meter band is now linked to GB3EB (near Eastbourne) via an Allstar network link. On the 70cms side, GB3LR (Newhaven) and GB7ZE (Hastings) are connected as well. This gives reasonable coverage along the Sussex coast and the audio quality is extremely good. GB3RW is now connected to Echolink*, so it is possible to come in to GB3RW via Echolink and go out through the other three repeaters as well.*

"GB3CC near Chichester is due back on the air shortly, subject to OFCOM granting approval for a site change. Once it is up and running, the plan is to connect this to the Sussex Allstar group too. This will provide coverage towards the west of the county and should cover Chichester, Bognor Regis and beyond.

"All of the above repeaters are FM only, apart from GB7ZE which does DMR as well. Repeaters further to the north in Sussex may end up being connected to Allstar in future, subject to successful negotiations with the repeaters' keepers."

If you would like to highlight the repeaters in your area in this column, just drop me a note with some details and I will be very pleased to include them here.

Seasonsal Greetings and see you in two months for another *Push To Talk* column.

Inspiring Radio Reading

David Harris
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David Harris looks back over the list of more than 100 radio-related books he has reviewed for RadioUser since 2015, and he recommends his personal favourites of all time.

One of the really enjoyable things about any hobby or sport is not just the taking part but the reading up about it in books and magazines. *Radio User* readers get their monthly fix and if they are radio amateurs may well also subscribe to our sister magazine *Practical Wireless* or *Radcom* (the RSGB members' magazine).

https://tinyurl.com/dk7tp4f5

If your interests are SW/MW/FM DXing, then you will probably be a member of the British DX Club (BDXC) and read their excellent monthly magazine, *Communication*.

www.bdxc.org.uk

I have been reviewing radio books for *RadioUser* since 2015. It is a great privilege to be able to obtain virtually any new radio book and write about it. I spend a lot of time on Amazon browsing for new titles and chasing up publishers to obtain review copies. I am also grateful to our editor Georg for his many helpful suggestions.

If you are looking for a new radio title then try the *RadioUser* bookstore first.

https://tinyurl.com/ye3v9nsk

Otherwise, you can try to order any new book from your local book shop. Independent bookshops, in particular, are a valuable community asset and many are struggling to survive.

Many people will go to online booksellers such as Amazon, eBay and Abe books (second-hand books)

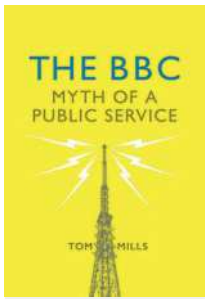
www.abebooks.co.uk

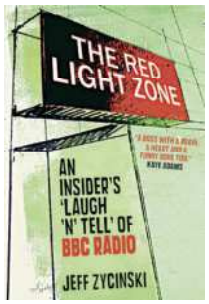
If pirate radio is your interest, *Offshore Echoes* offers a plethora of titles about offshore stations.

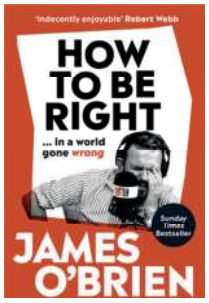
www.offshoreechos.com/Books.htm

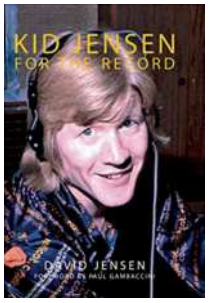
In general, online prices vary enormously, with some sellers asking astronomical prices for the most ordinary of books. However, you can occasionally find a real bargain with the book virtually being given away for just the price of the postage. Don't forget to browse in second-hand bookshops.

Even charity shops may sometimes yield an unexpected treasure.









I have reviewed around 100 titles for *Radio User* and I thought it might be time to take stock. Therefore, here is my personal selection of the most interesting radio books of recent years. The dates of my *RadioUser* reviews are in brackets. I have updated the bibliographic information as some of these books are now available in cheaper paperback editions.

***Shortwave Receivers Past & Present: Communications Receivers 1942 -2013*. Fred Osterman. Universal Radio Research, USA. $39.95 (+ *postage from the USA to Europe is $50)* www.rcvrpp.com/index.html.**
This is a magnificent book, which every serious short wave listener will want to own. It has over 800 pages listing 1,700 different radios from 360 manufacturers. The book is well illustrated and gives detailed descriptions, specifications and prices for virtually every SW radio made anywhere in the world since World War II *(July 2016)*.

***Marconi: The Man Who Networked the World* by Marc Raboy. Oxford University Press. £16.99 (pbk).** This is the definitive biography of Marconi. Raboy's thesis is that Marconi was not just an inventor but the first person to have a global vision for communications. *(Dec 2016)*

***The BBC: The Myth of Public Service*. Tom Mills. Verso. £9.99 (pbk).**
This is a left-leaning account of the BBC which challenges the idea of the independence of the BBC. Mills writes about political appointees, war reporting, business news and other examples which show that the BBC is a tool of the establishment *(April 2017)*.

Shadows of the State by Lewis Bush. Brave Books, Berlin (out of print).
A beautifully produced book about numbers stations, which features photos of the sites of stations plus explanatory text and a barcode which when activated will play an extract from the numbers broadcast. A highly unusual and collectable book *(May 2018)*.

***The Radio Caroline Bible* by Paul Rusling. World of Radio. £33.95 (hbk).**
This is the definitive book about Caroline. It is a very readable and well-researched book, which aims to shatter some of the myths around Radio Caroline *(Dec 2019)*.

***Red Light Zone* by Jeff Zycinski. Lunicorn. £8.99 (pbk).**
A fascinating account of Jeff's career at BBC Radio Scotland where he rose to become Head of Radio. A really good insight into what it is like to work in BBC regional radio *(June 2019)*.

***How to be Right* by James O'Brien. WH Allen. £9.99 (pbk).**
The LBC talk show presenter's book was the only 'bestseller' that I have reviewed. It is a powerful book that confronts the bigotry and racism that he deals with each day on his phone-in radio programme *(April 2019)*.

***Kid Jensen. For the Record* by David Jensen. Little Wing (Mango) 2020. 239 pp. £15 (pbk).**
A very readable account of the life of this popular presenter who began his career in Canada and worked for Radio Luxemburg, Radio 1, Capital, and many other stations *(April 2021)*.

ROBERT CONNOLLY

1

GPS Pitfalls, Alpha Navigation and Beacon Matters

Robert Connolly discusses the loss of traditional navigational skills in our GPS age, the effects of weather on GPS and the traditional Alpha Navigation System, before outlining some changes to his NDB column.

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Satellite navigation has been with us for quite a few years now, and more and more things are becoming almost totally reliant on it, from the Satnav in your car to navigation systems of ships and aircraft.

However, GPS navigation is fallible; many things, both natural and man-made, can affect its performance, accuracy and even availability. As an example, the reception results of GPS for navigation can be affected by solar flares, and, to a degree, wider weather phenomena – more on this later.

However, when we look at man-made disturbances, these can include a hostile person or state jamming the GPS signal or causing it to produce massive position errors.

In the maritime world, I have read many reports and studies where a simple, low-powered and low-cost, GPS jammer placed on board a vessel can throw its actual position out by many miles. I have also seen reports of foreign military interfering with the GPS signals resulting in ships showing their position many miles away, even well inland. Many of these accounts stemmed from the Black Sea region with the Russian military believed to have been responsible.

The majority of commercial vessels these days rely on GPS navigation, not only for their position but also employing a link to their autopilot systems, which enables the vessel to follow a pre-planned route. Given the fact that, in the middle of an ocean, landmarks to confirm your position are as scarce as the proverbial hens' teeth, it could be quite a while before an error in the navigational course could be detected.

Radio Navigation: Past, Present and Future

When GPS satellite navigation was first introduced to shipping, it was recommended that ships should also carry another radio navigation system, for example, Loran, as a backup to satellite navigation. Now, with integrated bridge systems, GPS is the main form of navigation. Some vessels are no longer carrying paper charts to revert to if there is a problem.

As the years progress, I believe this problem will increase; future generations of ships' officers may not even be trained to use paper charts and 'old-school' navigation. But currently, many ships' captains still firmly believe in the 'belt-and-braces' approach, manually cross-

checking their position shown by GPS to a position manually plotted on a paper chart.

Weather and GPS

Coming back to weather affecting GPS reception, I recently read a report in the maritime press of a tug on a passage from the UK to Africa. Some 3,000 miles from Dakar, the tug's mast was struck by lightning that took out not only the vessel's GPS navigation system, including its autopilot but also its radio communications, including Automatic Identification System (AIS) signals.

This resulted in the ship having to use not only paper charts but also plot positions using the old-fashioned method. In addition, they were unable to receive maritime safety information, including weather forecasts as the only working communications they had available was a portable satellite phone. Fortunately, the vessel made it to a port for repairs to the damaged navigation and communications equipment.

To me, this reinforced my opinion that not only should 'old-fashioned' manual and paper backup navigation equipment always be carried, but the crew should also be fully trained to use such a system effectively. It is a bit like Morse code or sextants – many of us know about them, but how many could use it effectively when all other available radio communications systems fail?

Loss of Skills

In the same vein, some years ago, I was invited to a special anniversary of a school I attended. I came across a teacher with a slide rule in his hand trying to figure out not just how it worked but what it was. For those of you of a younger vintage, a slide rule was an early non-electronic version of a calculator that we required when doing O-Level (GCSE) chemistry, physics and certain elements of maths to work out complex calculations. Despite not having used slide-rule for over 50 years within ten minutes I had taught the teacher how to do simple arithmetic using it. I fear that, in years to come, it will be deemed unnecessary for old navigation and plotting skills to be taught to a new generation of ship's officers and that system will become like the teacher I met with the slide rule (Fig 1).

Unfortunately, when something happens – perhaps a lightning strike, rendering the ship's navigation and communication system inoperable – a crew of the future might well be left scratching their head wondering what to do and how to proceed without electronic aids.

Overreliance on Technology

It seems to me that many of us may tend to put too much reliance on today's technology, especially satellite navigation. Just think how often you come across media reports of an HGV getting stuck under a low bridge or on a road that is too narrow. This is because many tend to follow the Satnav directions without question. On a recent holiday, my car's Satnav system would not play ball trying to take me on a route that I did not wish to go. Normally I would carry a road atlas and notepad in the car as a backup that I could use for route planning.

Unfortunately on this trip I did not have one with me and had to use road direction signs when my Satnav system decided it wanted me to take a scenic 30-mile-plus journey instead of the direct route of under 10 miles. I am sure many of you have experienced something similar.

However, it is one thing getting 'lost' on dry land; but eventually, you will come across a signpost, town or village where you can establish your position and re-route from there. However, it is different when you are on the open sea with just water for miles around you, hence, the importance of a backup be it manual charts or another form of radio navigation.

The Alpha Long Range Navigation System

Regular readers will be aware that in the past I have, from time to time, looked at some former long-range radio navigation systems used by ships and aircraft, in particular *Consol* and *Decca*. This month, I am taking a brief look at another long-range radio navigation system that you may have encountered the radio signals from if you have listened to the Very Low Frequency (VLF) band.

The system I am referring to is the Russian *Alpha* navigation system also known as *RSDN-20*. In Russian RSDN stands for Радиотехническая Система Дальней Навигации (***R**adioteknicheskaya **S**ystema **D**alyoloiy **N**avigatsii*, or: Radio-Technical Long Distance Navigation System).

Alpha / RSDN-20 is a hyperbolic navaid, developed by Russia and is their equivalent to the (now closed) western *OMEGA* VLF navaid system. Even though *Alpha* has been in operation for at least 30 years not a great deal is known about it.

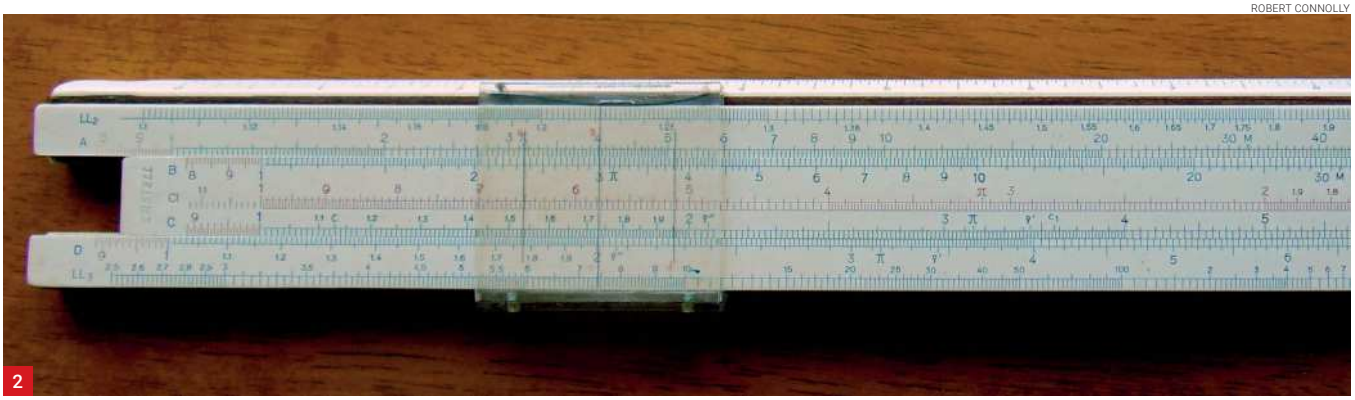
Operation and Transmitters

Currently, the system is believed to be only partially operating however this is not uncommon as there have been very long maintenance periods in the past. *Alpha* was used to determine the positions of aircraft, ships, and submarines (in underwater positions). The Alpha system coverage is believed to be up to 10,000 km from the master station, with a position error of two to four nautical miles.

The system consists of three transmitters, Novosibirsk, Krasnodar and Khabarovsk. Two other transmitters at Revda and Seyda are not currently believed to be operational.

Fig. 1: The bulk carrier *MV Anastasia S*.
Fig. 2: A sliding scale of skills. Fig. 3: Hyperbolic navigation and much more. This is a good primer on the history of this subject [Ed.].

ROBERT CONNOLLY



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These transmitters radiate signals of 0.4-second duration, in a 3.6-second cycle, on the frequencies F1: 11.904761kHz, F2: 12.648809kHz and F3: 14.880952kHz. A radio fix is taken by measuring the phase difference of the received signals. Other alternative frequencies are F3p: 14.881091kHz, F4: 12.090773kHz, F5: 12.044270kHz, F6: 12.500000kHz, F7: 13.281250kHz, F8: 15.625000kHz, and Fx: 12.700000 kHz.

The masts of Alpha must be very tall, for technical reasons. Unfortunately, no data are available for their height. The *Omega* navigation system used masts that were between 415 and 430 metres in height, and one would expect the masts for the *Alpha* system to be of similar height. The transmitter power is believed to be in the region of 500kW. At the moment, signals from this system may be heard in Europe once again, following a period of silence, but there is limited information available on its use. It is not known if the system is being operated operationally or for testing purposes.

More information on *Alpha / RSDA-20* is available in the resources-box, at the end of this month's column.

NDB Matters and Plans

Regular readers will know that I normally produce my routine Non-Directional Beacon (NDB) surveys approximately around April, August and December. For various personal reasons I have decided that, in 2022, I will provide a summer and winter NDB update, in order to reflect reception more accurately during the main winter DX season.

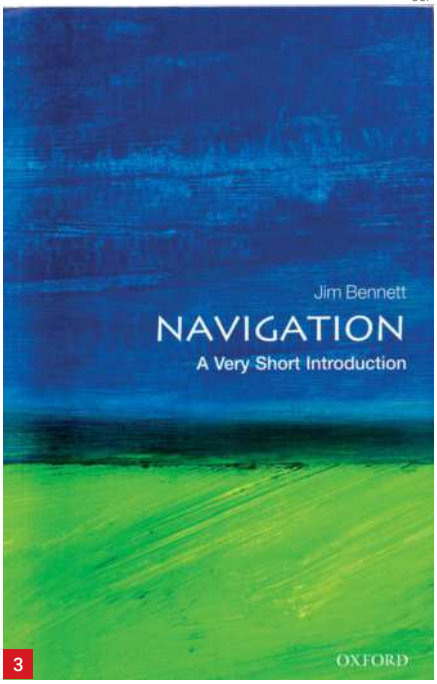
I must stress that this is my decision as part of my overall workload – at 'three score years and ten', I now need to pull the proverbial reins in a little. My plan for the next *NDB Monitoring Survey* will appear in the April 2022 issue (covering the winter period) and October (covering the summer period).

As always, I still welcome your logs for inclusion, no matter how large or small and they should be with me by the end of February for the winter round-up and the end of July for the summer report.

There are still many NDBs available out there to be received, despite closures continuing. Nevertheless, currently, the offshore platforms at Kinsale, off Cork, Ireland are being decommissioned; therefore *Kinsale A* and *Kinsale B*, both on 375kHz, are no longer operational.

While European waters are seeing the decommissioning of various oil-related platforms with the closure of their NDBs there is an increase in the number of maritime mobile NDBs in waters around Europe as the number of wind farms being constructed increases. Many of the construction vessels used for wind farms have helidecks fitted with NDBs for helicopters to locate the vessel when required.

OUP



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The NDB is frequently tested, along with the vessel's other radio communications equipment. For these, it is a case of regular monitoring and patience.

My 2019 NDB publication contains details of maritime mobile NDB stations and is still available. For more information and how to order your copy please visit my website: **www.kilkeel.org.uk.**

My thanks to Andy Thomsett who kindly sent me his recent logs along with a link to a Nav Canada document detailing their planned closure of navaids until 2024. As Andy correctly states, catch them while you can! The document is available at this URL: **https://tinyurl.com/cn55feub**

As you will see, the period for each phase will be based on an *Aeronautical Information Regulation and Control (AIRAC)* cycle, with submission and review every five months.

Seasonal Maritime Incidents

For those of us who live within the VHF radio range of the coast, winter is normally a much quieter time for incidents, although they still happen. During winter storms, vessels may occasionally get into difficulties. Radio equipment plays a vital role in their safety with weather and maritime safety information available by MF, HF and VHF, along with satellite reception.

You might remember that, in August 2021, a Norwegian ferry suffered an engine failure and issued a distress call. Four helicopters and several fishing boats and lifeboats rushed to the ship to assist in the possible evacuation of the 306 persons on board. The incident occurred in the same area as the *Viking Sky* cruise ship was in danger of running aground after an engine failure in 2019 prompting a major rescue operation. The information available following the investigation into the *Viking Sky* incident found that engine oil levels were too low, with the result that – when hit by a large wave – the vessel keeled over to one side. This led to the oil not being pumped into the engine, which, in turn, caused it to shut down. It was found that the oil levels were within the tolerances of the company's operating procedures, but still below the engine manufacturer's recommendations. This meant they were insufficient to keep the flow of oil being pumped from the sumps when the vessel was hit by the wave; as a result, the engines immediately shut down.

Finally, for this month, my photograph (Fig. 1) shows the bulk carrier *MV Anastasia S.* The title in Fig. 3 provides a lively introduction to the development of navigational techniques throughout history. Until next time, Season's Greetings and *Fair Winds*.

Resources on the Alpha/ Omega Hyperbolic Navigation Systems

- Alpha Hyperbolic Navigational System **https://www.qsl.net/g4cnn/vlf/alpha.htm**
- Bennett, J. (2017) *Navigation: A Very Short Introduction* (OUP)
- Bentley, S. (2017): **https://tinyurl.com/v94kpd66**
- Jacobsen, T. (1999): **www.vlf.it/alphatrond/alpha.htm**
- Jacobsen, T: ZEVS, The Russian 82Hz ELF Transmitter: **www.vlf.it/zevs/zevs.htm**
- Omega: End of an Epoch: **www.auroralchorus.com/omega.htm**
- Russian Radio DX: **https://tinyurl.com/9km4aeme**
- Van Horn, L. (2021) '*The World of Strange Military Signals*', The Spectrum Monitor, January 2021: 33-37 (37).

Scotland

Somerset

South Yorkshire

Suffolk

DealerGuide

For Sale

CHECK OUT OUR WEBSITE! Windows 10 ready CAT and programming cables, latest version RTL-SDR USB sticks and other genuine RTL-SDR.com products, replacement microphones, cables and PTTs for studio microphones, linear switching cables and much more. **technofix.uk** or **www.technofix.co.uk**

Wanted

VINTAGE FIREWORK COLLECTOR Do not light the blue touch paper and burn British heritage. Private collector will pay cash and collect from anywhere. Licensed explosive storage. **Call Tony on 07956 506300**

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TENNAMAST 30ft wall mounted mast with a Cushcraft MA5B Antenna Beam Antenna with a emotator rotator. £650 the lot ono. currently erected. **Tel: 01269 870076**

GRAMPION 600A PA AMPLIFIER. Unused for many years hence restoration project. **£100 Tel: 01977 614277**

MFJ-914 AUTO TUNER EXTENDER 8 Position switch which includes OFF/Dummy Load and By-Pass (through). SO239 sockets for Antenna, Transmitter, Dummy Load, ground stub Cost £100 Selling for £45 including delivery **Trevor (M3TVN) Tel: 01642 452189**

NISSEI RX-103 SWR/WATT CROSS NEEDLE METER AVG and PEP covers 1.6 to 60 MHz SO239 sockets and dc 13.8 for background light. Ranges X1-X10 and X100 Cost £100 Selling for £45 including delivery Both these items are in pristine condition. Reason for sale is I have bought an Automatic Tuner Unit which has these facilities built in. **Trevor (M3TVN) Tel: 01642 452189**

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AMATEUR GIVING UP after 65 years. Over 200 items: Test equipment, components, plugs etc. Sale as one lot, buyer collects. Email for lists and photos. **kelwood@talktalk.net TRURO**

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WANTED

OLD HALF INCH FERRITE RODS. Must be half inch 12.7mm in diameter and be six inches long or more will pay good money for the old rods. **Contact Peter Tankard on 0114 2316321 or Email: peter.tankard@gmail.com SHEFFIELD**

FRG100 RECEIVER/ FRG100 Keypad/ Polstar R30A **Tel: 01724 763404**

WELLBROOK Universal Magnetic Balun UMB 130. **Rob MW0CVT Tel: 07974 717152**

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You should state clearly in your advert whether equipment is professionally built, home-brewed or modified. The Publishers of Radio User also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

A Perfect Christmas Gift From ML&S?

SANGEAN MMR-88-DAB-PLUS
(Survivor DAB) Camouflage £129.95
(Survivor DAB) £119.95

The Survivor DAB, is a rechargeable emergency radio: when the power is out, you can receive important information via DAB+ or FM radio. You can use the hand crank, Micro USB or the solar panel to recharge this radio! Or go on an adventure with the Survivor DAB. it is convenient to have music via speaker or earphone, charging your phone, and having a flashlight nearby in every environment. You can even turn the flashlight into SOS: with Morse Code it will let others know that you are in need. The Survivor DAB has 20 station presets (10 DAB+, 10 FM), an stereo Earphone Jack and a built-in clock and speaker. You can see if the device is charging with the LED indicator.

ML&S Now UK Distributor for SANGEAN

In 1980 Sangean entered the short wave radio business with the SG-786. This model had a great reception and was easy to use. Sangean Radios are produced from A to Z, or in other words; from Research and Development to After Sales. In this way, they can ensure quality reception and sensitivity in places where their competitors could not reach.

ATS-909X2 £214.95
The Ultimate SSB / FM / SW / MW/ LW/ Air / Multi-Band Receiver in White or Graphite

The Discover 909X is the perfect world band radio to roam the globe with. The world is brought together via radio so enjoy it with the Discover 909X. Never forget your favourite radio stations because of the alpha-numeric memory system. The built-in 3" speaker provides good loud audio & has a 3.5mm headphone jack with included earbuds. It provides performance and features generally found in the more expensive table top communication receivers into a very compact and stylish package. For the monitoring professional who's on the go, the Discover 909X is the ideal choice! Featuring wide[1]band AM/FM coverage from long wave, medium wave, short wave. The DSP comes as standard (Digital Signal Processing) with the unit and includes a number of features which can significantly enhance reception through improved interference rejection. For everyday portable operation, use four "AA" batteries (not included). For operation from your home, choose the supplied AC-AC power adapter. Includes Vinyl case and wind up wire antenna. LSB & USB for the Amateur bands with Auto Bandwidth control and RF Gain control

FUSION 600 £269.95

The Fusion 600 is a multi-purpose network streamer. The tuner makes it possible to play music files via wired or wireless network. Besides this, the Fusion 600 receives radio via FM, DAB+ and Internet. Internet allows the radio to communicate with other devices on your network, such as a local computer or other UPnP / -DLNA[1] enabled devices. This makes sure you can access and play back your personal music collection, through your home network. In addition, the device is compatible with Spotify Connect. Next to the network features, you can plug and play with an USB stick! Use the UNDOK app to manage the radio with your smartphone. It's so good even the Guv'nor uses one!

U5-DBT £149.95
DAB+ / FM-RDS / Bluetooth / Aux-in Ultra Rugged Digital Tuning Receiver

The Utility 50 has the option to use wireless audio streaming via built-in Bluetooth with indicator. The Utility 50 is an FM/DAB+ radio designed to withstand all job site conditions with IP65 water and dust resistance. Built with a protective roll cage, this radio is shock resistant and ready for any job site. The Utility 50 has the latest Bluetooth technology allowing you to stream your favorite music or programs. Other great features are: auto scan stations, equipped with an easy to read LCD display with backlight, a rain/dust/ shock resistant radio with sleep timer and 2 alarms and snooze function.

GOTUNE 200 £119.95

The GoTune 200 is the easiest way to renew your vehicles' existing audio system: Receive clear DAB+ signals with your FM car radio using the GoTune 200. DAB+ Service... at your service! More and more tabletop radios are equipped with DAB+, but it is not so easy to upgrade your car radio. Forget the hassle of pulling your car apart and then putting it back together again. The GoTune 200 is easy to connect to your existing system; with a few steps you will be on the digital road! Connect the GoTune 200 DAB+ receiver via the cigarettes plug or a USB port. Make sure it is secure attached to your window with the supplied suction cup, and lastly add the antenna to your car and you will be ready to go tune! Listen to your favourite radio stations with interference free quality.

U4-DBT-PLUS £199.95
Black / FM-RDS / Bluetooth / Aux-in / USB Playback Ultra Rugged Digital Tuning Receiver

The Utility 40 is an DAB+/FM radio designed to withstand all job site conditions with IP64 water and dust resistance. Built with a protective roll cage, this radio is shock resistant and ready for any job site. The Utility 40 has the latest Bluetooth technology allowing you to stream your favorite music or programs. Simply touch to pair your device with NFC technology. The Utility 40 features a Smart battery charger that ensures optimal charging of each individual battery! The Utility 40 has the option to use wireless audio streaming via built-in Bluetooth with indicator. Furthermore, it supports aptX® decoding for high fidelity music and low latency. Other great features are: auto scan stations, equipped with an easy to read LCD display with backlight, a rain/dust/shock resistant radio with sleep timer and 2 alarms and snooze function.

see www.HamRadio.co.uk/Sangean

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The Battle of Britain
IN COLOUR

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THE BATTLE OF BRITAIN IN COLOUR

The Battle Looms

The Battle of Britain was one of the most iconic battles of the Second World War, embedding itself indelibly into the nation's consciousness. Earlier, the Battle of France could easily have spelled defeat before the air battles got underway in July 1940.

After the outbreak of war in September 1939, there followed eight months of what became known as the 'Phoney War'. However, it was clear that large-scale fighting would ultimately follow, and a British Expeditionary Force was sent to France before the end of that year. As part of that BEF, a large Air Component was supplemented by an Advanced Air Striking Force. In total, these air forces amounted to 25 squadrons, six of which were Hawker Hurricane-equipped fighter squadrons. The remainder of the RAF force in France comprised largely light bombers and Army Co-Operation squadrons. Eventually, however, the 'Stukoj' became the 'Blitzkrieg'.

On 10 May 1940, German forces launched their all-out assault on France and the Low Countries and what followed in Belgium, the Netherlands etc. was the complete collapse of those countries under the overwhelming might of German military power. Across France, German forces rolled inexorably onwards towards the English Channel and while the French and British tried desperately to stem the advance, so the situation became ever more hopeless.

Predicted Catastrophe

When the fighting had broken out in earnest on 10 May 1940, aircraft of the Air Component were in almost constant combat, and losses had to continually be made good from squadrons based in Britain. The Commander-in-Chief of RAF Fighter Command, Air Chief Marshal Hugh Dowding, had already stated as early as September 1939, that if he was expected to defend Britain's skies, then he would need 52 fighter squadrons. At that time, he had only 32 under his command and was told it would be impossible to produce the number he required. However, efforts would be made to provide him with a further eight.

During the fighting in France, increasing numbers of fighter squadrons were sent across the Channel, urged on by desperate appeals from the French Prime Minister, Paul Reynaud. Dowding saw his resources 'slipping away like

BACKGROUND TO BATTLE

THE RAF FIGHTER PILOT

THE RAF FIGHTER PILOT