RADIO & TV AT WORLD'S FAIRS

RadioUser

May 2021 £4.99 www.radioenthusiast.co.uk

NEW GEAR | **Check out the latest product releases**

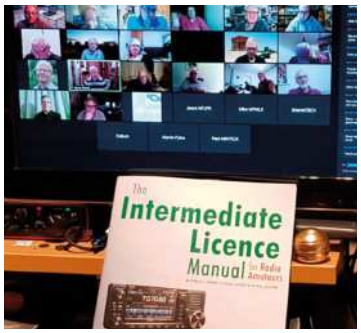
REVIEW

TECSUN PL-330

An ideal compact travel companion for MW, SW, LW and FM listening

Hearing in space

Apollo 11's eavesdropping project re-examined



Distance learning

A modern approach to radio amateur licencing

MARITIME **The rise of 'Drones' on the oceans**

Radio's role in the emergence and running of crewless vessels

REVIEW **So, how does your aerial measure up?**

The Moonraker Mini 1300 Antenna Analyser is put through its paces

DRM in the French Navy | Global Radio News | Outdoors Programmes
Radio and Education in Brazil | RAF Brize Norton | Wartime Radios

9 771748 811135 05

WE ARE OPEN FOR INTERNET AND TELEPHONE ORDERS!

NEW

Icom IC-R8600
Wideband Communications Receiver

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

GENEROUS PART EXCHANGE AVAILABLE

£2499.99

Tecsun S-2000
LW/MW/FM-Stereo/SW (with SSB) and Airband

- 1000 station memories
- Signal Attenuator
- Dual timer alarm
- Wide/narrow filters
- 1000 station memories
- Dual alarm clock function
- MP3: Aux input
- Rotary Antenna: MW/LW

£299.95

Tecsun S8800 GM
SSB Shortwave Radio

- FM, SW, MW, LW • SSB with LSB/USB
- 650 station memories
- Deluxe Gun Metal Tuning knob
- Remote control, Alarm & sleep/timer
- DX/Local antenna gain control
- Built-in battery charging feature
- Supplied with batteries & remote control

£279.95

BEARCAT

UBC-125XLT
500 Channel AM/FM scanner

Easy to use scanner - our most popular for Civil/Military Airband

- 25-960MHz (w/gaps)
- Includes civil/Military Airbands
- Close call RF capture
- Alpha tagging
- CTCSS & DCS squelch modes

£129.95

UBC-75XLT
Popular 'Airshow' scanner

- 25-512MHz (with gaps)
- Modes: AM/FM
- 300 channels
- Close Call

£99.95

EZI-33XLT
Compact handheld - easy to use!

- Covers: 78 MHz-512MHz (w/gaps)
- PMR, Marine, Aircraft, FM, etc.

£64.95

UBC-370CLT
500 channel AM/FM scanner

- Includes VHF FM broadcast radio
- Covers: 25 - 960MHz (w/gaps)
- Listen to PMR, Marine, Air, CB, Amateur

£119.95

HEADPHONES

Yaesu STA77
Lightweight Stereo headphones - as used by our boss!

£79.95

JIM M75

Wide Band pre-amp
Low noise pre-amp with 3 band pass filters

- 24-2150MHz
- Variable gain
- 12V DC or PP3 battery (not supplied)

£89.95

ANTENNAS

Create Log Periodic Antennas - Japan
as used by the 'Professionals'

CLP-5130-1N
21 Element LPA

- 50-1300MHz
- Gain: 10-12dBi

£379.95

CLP-5130-2N
17 Element LPA

- 105-1300MHz
- Gain: 11dBi

£299.95

DIAMOND D-777 Airband Antenna

Fibreglass 1.7m long, this antenna gives High Gain coverage of VHF/UHF Airband

£69.95

Scanmaster HFA
Active Receive Antenna
Covers: 1.8-30MHz

8" long c/w all leads - just needs 12V DC!

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Sirio SD-3000N Discone
High quality stainless steel, chromed brass & anodised aluminium construction

- 300 MHz-3GHz

£69.95

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Indoor Discone antenna
25-1300MHz complete with cable and BNC plug

£49.95

Tecsun Receive Loops
AN200
MW passive loop..... **£39.95**

AN48X NEW!
Covers: SW, MW, LW
Active wire loop..... **£39.95**

AOR LA-400
Low Noise - hear weak signals in the LW, MW and SW Bands

- Receives 10kHz-500MHz
- 30.5cm diameter Loop
- 20dB built-in Pre-amp

£399.95

End Fed Wire Receive Antenna

High quality complete kit includes mounting hardware & coax cable

- Covers: 2-30MHz
- Kevlar Mil spec. wire
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£69.95

AIRSPY

NEW

Airspy HF+ Discovery

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- 60MHz - 260MHz
- Use over internet
- 60 x 45 x 10 mm

£199.95

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VHF/UHF/SHF Receiver

- 24MHz-1,800MHz
- 10MHz panoramic spectrum
- 3.5 dB NF (42-1002)MHz
- Tracking RF filters

£209.95

AIRSPY Mini

- SDR Dongle
- 24 – 1,800MHz

£119.95

SIRIO Antennas

Quality Antennas from Italy!

WY108-3N
Airband
3 element Beam

- Freq: 108-137MHz
- Gain: 7 dBi
- Boom: 1.4m

£89.95

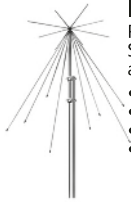
VHF/UHF Verticals

CX4-68	(68 – 73)MHz 4m 4.15 dBi	**£69.95**
CX440	(440 – 455)MHz pmr 4.15 dBi	**£39.95**
CX455	(455 – 470)MHz pmr 4.15 dBi	**£39.95**
TORNADO 50-60	(50 – 60)MHz 6m 3.5dBi	**£59.95**

HF/VHF/UHF Beams

SY3	3 el (26-28)MHz 10.65 dBi	**£99.95**
SY4	3 el (26-28)MHz 13.15 dBi	**£119.95**
SY50-3	3 el 50MHz 8.5 dBi	**£99.95**
SY50-5	5 el 50MHz 10.5dBi	**£129.95**
SY68-3	3 el 70MHz 7.0 dBi	**£79.95**
WY108-3n	3 el 108-137MHz 3 el. Air Band	**£89.95**
WY140-6n	6 el 144MHz (wide band) 10.5 dBi	**£99.95**
WY400-6n	6 el 432MHz (wide band) 11.0dBi	**£79.95**
WY400-10n	10 el 432MHz (wide band) 14.0dBi	**£119.00**

ICOM



Icom AH-8000
Professional Discone Antenna Suitable for both Transmit and Receive

- Rx: 100-3,300MHz
- Tx: 144, 430, 1200, 2400MHz
- Height: 936mm
- Supplied c/w 15m cable + N connector & Mounting hardware

£240

SPIDERBEAM MASTS

Fibreglass Telescopic Poles

12 metre Heavy Duty	£89.95
18 metre Standard	£199.95
22 metre 'Long John' NEW	£399.95
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10 metre Standard	£299.95
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12.5 metre Standard	£329.95
14.5 metre Heavy Duty	£425.00
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SDRplay

NEW

RSPdx
SDR in metal case
Covers: 1kHz-2GHz

Now with Improved:

- Performance below 2MHz
- Plus more!

£194.95

RSP 1A
Wideband Budget SDR

- Covers: 1 kHz - 2GHz
- Software upgradable
- Good dynamic range

£99.95

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- Covers: 1 kHz - 2GHz
- Software upgradable

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NEVADA Power Supplies

Quality Power Supplies 2 YEAR WARRANTY!

PSW-30
Switch Mode

- 25-30A supply
- Low noise

2 YEAR WARRANTY

£79.95

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Linear

- 40A (max) with meter
- 1.5-15V DC
- Cigar adaptor output

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PS-08	Linear 8A (max) 13.8V DC	**£34.95**
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PSW-50	Switch mode 50A (max) 9-15V DC	**£129.95**
PSW-30	Switch mode 30A (max) 9-15V DC	**£79.95**
PSW-30H	Switch mode 30A (max) 9-15V DC	**£69.95**
PS23-SW1	Switch mode 23A (max) 13.8V DC	**£59.95**
PSW-07	Switch mode 7A (max) 13.8V DC	**£29.95**
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Ecoflex 15		
per metre	£7.99	price per 102m drum **£759**
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per metre	£7.99	price per 102m drum **£759**
PL259 connector (Part: 7350)		**£8.95**
N type connector (Part: 7395)		**£9.95**
Ecoflex 10		
per metre	£3.79	price per 102m drum **£359**
Ecoflex 10 Plus		
per metre	£3.79	price per 102m drum **£359**
PL259 connector (part: 7378)		**£5.95**
N type connector (part: 7367)		**£6.50**
Aircell 7		
per metre	£2.99	price per 102m drum **£269**
PL259 connector (part: 7390)		**£2.65**
N type connector (part: 7392)		**£5.25**
Aircell 5		
per metre	£2.75	price per 102m drum **£259**
Other 100M Coax Drums		
Westflex 103.. Semi Air-spaced low loss		**£179.95**
RG-213 (Cabnex).....Low loss good quality		**£99.95**
RG-Mini 8.....Super XX		**£69.95**
RG58/CU.....Mil spec		**£39.95**
Twin Feeders		
450 Ohm.....Twin feeder		**£89.00**
300 Ohm.....Twin feeder		**£76.50**
Nevada Antenna Wire		
Coated flex weave Antenna wire		**£59.95**

New TECSUN Radios

JUST ARRIVED!

Tecsun PL-990x
High Performance SSB Shortwave Radio

£259.95

Considered to be the Tecsun design team's masterpiece! Uses modern DSP technology to improve performance

- Covers: LW, MW, FM, SW (1.711-29.999) MHz
- MP3 player via SD port
- Memories: 3150
- Synchronous detector
- Local, Medium, DX input selector
- Powered by 18650 Lithium battery
- Bluetooth connectivity
- Optional USB mains supply.....£9.95

£89.95

Tecsun PL-330
SSB Shortwave Radio

- FM stereo, LW/MW/FM/SW
- 650 memories
- DSP technology
- Multi-function display
- Lots more info on our web site
- USB - Rechargeable battery

AOR AR-5700D
Digital Communications Receiver

- 10 digital modes - TETRA, P25(Phase 1), DMR, Mototrbo, dPMR, NXDN, D-CR, D-STAR, Alinco, Yaesu.
- Covers 9kHz - 3,700MHz
- 900kHz wide IQ output

£4595

Now with TETRA!

AOR AR-DV1
100kHz-1300MHz Wide band reception

New Firmware - gives TETRA decoding and more! Decodes virtually ALL popular digital modes: DMR, D-STAR, Yaesu Fusion and lots more!

Supplied with: 4GB SD Card

£1299.95

AOR AR-8600 MkII
Communications Receiver

- Frequency: 530kHz-3000MHz no gaps
- Modes: WFM, NFM, SFM, WAM, AM, NAM, USB, LSB, CW
- Memories: 1000 (20 banks)

£649.95

Optional Mains Power supply..... £25.95

AOR

LATEST FIRMWARE

AR-DV10
Digital Handheld Scanning Receiver

- 100kHz-1300MHz analogue and digital modes
- TETRA, P25 (Phase 1+2), DMR, Mototrbo, dPMR

~~£999.95~~
£939.95

ICOM

NEW

R-30
Digital & Analogue Multi Mode Scanner

- With dual watch and dual band recording
- Listen to two signals (analogue + analogue or analogue + digital)
- Decode D-STAR, P25, NXDN and dPMR digital (conventional) modes

£569.95

ICOM

IC-R6E
Pocket sized Wideband Scanner

- Freq: 100kHz-1309.995MHz
- Modes: AM, FM, WFM
- 1300 memories
- High Speed Scan 100 channels/second
- 15 hours receive capability

Optional BC-194
Drop-in charger stand
.....£22.95

£199.95

ALINCO

SAVE £50!

DJ-X11E
All Mode 1200 Channel

- Frequency: 0.1-1300MHz
- AM/FM/WFM/ SSB/CW
- 1200 memories
- Twin VFO feature
- IQ output for SDR use
- 1800mAh Li-ion inc

SPECIAL PRICE ~~£349.95~~ £299.95

BEARCAT

BCT-15X
Latest Base Mobile Scanner with 'Close Call'

- 25-1300MHz (with gaps)
- 9000 memories
- AM/FM/WFM
- Band scope
- CTCSS/DCS decoding
- Alpha-numeric tagging feature
- GPS enabled

Supplied with:
- Mains adaptor
- DC Car Power Plug
- Telescopic Antenna
- Mounting Bracket and Hardware

£249.95

BEARCAT

NEW

SDS-100E
Advanced Digital & Analogue Scanner

- Frequency: 25-1300MHz (w/gaps)
- Weather Resistant IPX4

Standard Version (licence required to activate DMR, NXDN) £599.95
Activated Version (DMR, NXDN already activated) £649.95

BEARCAT

NEW

Bearcat SDS-200E
Digital Scanning Receiver

- With DMR, NXDN, and ProVoice monitoring modes
- Covers: 25 - 512MHz, 806 - 960MHz, 1240 - 1300MHz
- Too many features to list here - visit our web site for more details!

£779.99

BEARCAT

UBCD-3600XLT
Digital Scanner with 'Close Call' and Analogue AM/FM

- Receives: 25-1300MHz
- SD card slot

£425

UBCD-3600XLT - NXDN
Same specs as above but with NXDN activated NXDN digital protocol is used by Kenwood & Icom

£479.95

ALBRECHT

Albrecht AE255M
Wideband Base Scanner

- Covers 25-960MHz (w/gaps)
- Step sizes: 5/6.25/8.33/10/12.5/20kHz
- Turbo search (180 steps/sec)
- 300 memories, Clock Display, Skip feature, c/w Mains adaptor, Car adaptor, Antenna, Mounting bracket

£99.95

ALBRECHT

Albrecht AE125H
500 Channel AM/FM Scanner

- 5-960MHz (w/gaps)
- Civil/Military Air bands
- Close Call feature
- Hyper search -300/sec
- CTCSS & DCS
- Supplied c/w: Mini USB lead, 2 x AA 2,300 mAh NiMH Batteries

£129.95

WHISTLER

Whistler Digital Scanners

Whistler TRX-1
£419.95

- Receives 25-1300MHz (with gaps)
- Covers DMR, MotoTRBO - and more!
- Upgradable CPU, DSP, and library
- Store Scan lists
- EZ Scan PC software
- IF/discriminator output
- Record & save to Windows
- Clock & Calendar function
- Spectrum Sweeper

Whistler TRX-2
£479.95

POWEREX

NEW

Powerex C-9000-Pro
Battery Charger Analyser

Advanced unit suitable for all your batteries

- Charge from: 1 to 4 AA or AAA niMH/NicD
- 4 modes: Charge, Discharge, Refresh, Analyse
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- Fitzherbert Spur
- Farlington
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50 YEARS nevada

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RadioUser

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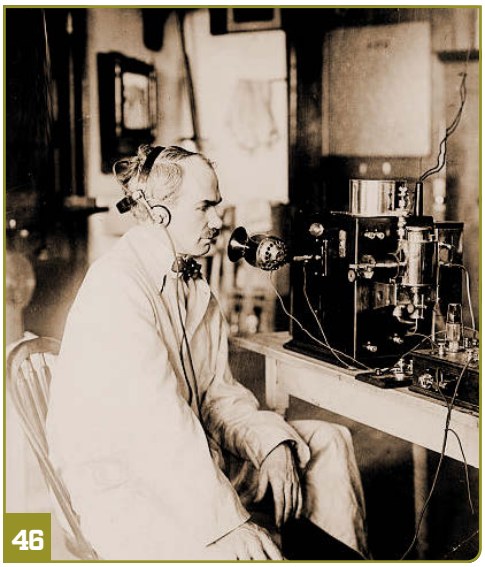
Welcome



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Education by Radio & for Radio

Georg Wiessala
wiessala@hotmail.com

Hello and welcome to the May 2021 issue of *RadioUser*. As we tentatively come out of the latest lockdown and Spring has sprung, the radio hobby, for many more of us, is stronger and more diverse than ever.

I hope that you will think that our latest issue reflects this.

There is certainly no shortage of new radios and accessories, as our *News* pages in various parts of this issue attest. Against this backdrop, Chrissy Brand has had the opportunity to test out the brand-new Tecsun PL-330 portable radio with SSB & DSP technology. Kevin Ryan takes a short look at a new DRM radio from India. Last but certainly not least, Keith Rawlings brings us a review of the new Moonraker Mini1300 antenna analyser.

In our principal features this time around, we showcase the current trend towards distance-learning and 'learning-by-radio' initiatives. For the UK, Steve Hartley profiles the *Bath Amateur Radio Course*, and, from the other side of the globe, Martín Butera shoes how very vital radio schooling is in parts of contemporary Brazil.

Elsewhere, there is a maritime flavour: Robert Connolly investigates autonomous shipping and associated communications; and, together with Scott Caldwell, he reviews a fascinating new title on the history of that pivotal figure, the Radio Officer. Elsewhere, we evaluate summer reading on John Logie Baird, a presenter autobiography, and the role of radio in post-colonial times.

Also in this issue, Tony Smith has written an informative feature on special wartime radios, and Scott Caldwell continues to offer us historical insight into the roles radio (and television) played at those international showcases of national pride and technology dubbed the *World's Fairs*. Keith Hamer and Garry Smith, in a similar vein, go on investigating some memorable early wireless equipment.

In our regular columns this month, you can learn more about callsign prefixes and RAF Brize Norton, DRM in the French Navy, radio during the *Apollo* Missions, and programme tips for the outdoor life.

Finally, a request for help from reader **Simon Bagg**, who is experiencing some trouble with his trusted AOR AR7030. Following a recent filter calibration through the *Configuration* menu, the sequence failed to complete, and instead, the LCD readout just stated *'CPU???'*.

I have checked this on my own AR7030 and could not find a solution. Suggestions to the editor at the above e-mail, please, I will pass them on to Simon.

Please remember to stay in touch, stay safe and enjoy your radio.

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**

AH-705 HF/50MHz Automatic Antenna Tuner

Icom UK is pleased to inform readers that the Icom AH-705 automatic antenna tuner for the IC-705 is now available from Icom UK dealers. The AH-705 is a small, portable, antenna tuner that has been designed to work between the 1.8-50MHz bands. It can be powered either by alkaline batteries or a DC 13.8V supply. The key features of the AH-705 HF/50 MHz Automatic Antenna Tuner include coverage of the 1.8 MHz to 50 MHz bands, using a long-wire element; two-way power sources using alkaline batteries or 13.8 V DC; latching relays used for saving power consumption; IP54 dust-protection; water-resistant construction for outdoor use, and a compact design that neatly fits in the optional LC-192 multi-function backpack. The suggested retail price is £309.60, including VAT.

https://www.icomuk.co.uk
https://tinyurl.com/ys5zv9nk

COMMUNITY RADIO SURVEY: The DCMS (Department for Digital, Culture Media and Sport) is conducting a survey of who listens to community radio. It is well worth participating in this.

(SOURCE: Community Media Association

https://project.tolunastart.com/s/a5ERo3b

RadioUser STOP PRESS!

Icom IC-M94DE Marine VHF Transceiver

Icom brings all the features of your fixed VHF to a hand portable with the introduction of the all-new IC-M94DE. This radio is the world's first marine VHF hand portable radio with an integrated AIS receiver as well as DSC and GPS. The IC-M94DE is the first handheld marine radio that offers users receive information broadcast by other AIS-equipped vessels.

The IC-M94DE provides vessel traffic information shown on the radios large clear display. With its elegant design and abundance of simple to use features, this is a game-changing device for anyone who ventures out to sea for recreation or work.

The IC-M94DE doesn't just come with added AIS. Other features include 6W of RF power, class-leading 1500 mW of audio output with improved acoustic sound clarity, ensuring clear communications no matter the environment.

This hand portable has more battery power (approx. 10 hours) for extended operations. You can also assign up to 50 favourite destinations, fishing spots etc. as waypoints with the enhanced Navigation feature. The radio features Icom's own Float'n Flash and AquaQuake, keeping your radio operational if it becomes submerged.

The Man Overboard function is included for operator protection. Pressing the distress button while Float'n Flash is activated will transmit the MOB distress signal, allowing the operator to be more quickly and easily located. The IC-M94DE will be available from Icom Marine Dealers from mid-April with a suggested retail price of £349.95, including VAT. For further information about this new model, visit the IC-M94DE VHF Marine Transceiver with AIS Receiver product page:

https://www.icomuk.co.uk

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

GQ Electronics Multi-Function Meter EMF 390

With the requirement for radio amateurs to measure the EMF of their station, **Moonraker** now offers the GQ Electronics multi-function EMF Meter. Use this high-sensitivity meter for checking EMF/RF radiation easily. Examples: amateur radio, wireless computer mouse, car remote key, cell phone, cell tower, cordless phone, static electricity, electric field, Wi-Fi, computer laptop, microwave, electric heater, hairdryer, vehicle engine, light,or outdoor power lines. With the RF spectrum power analyser, you can monitor the Wi-Fi signal power, smart meter signal power, spy wireless video camera signal, and even track a radio/ TV signal in the air.

https://www.moonraker.eu

SF-401 Plus Frequency Counter

ML&S: The MyDEL Surecom SF-401 Plus reads your RF transmitted frequency from 100 to 3,000MHz (27 to 100MHz coverage with reduced specs). Additionally, it can read and display your CTCSS tone and DCS code on the backlit colour LCD screen. The display may be set to read 0.000 or 0.0000 MHz. With TCXO and charging LED. Auto-power-off may be set for 1 to 9 minutes. Built-in 3.7 Volt Li-ion battery. This item comes with a BNC antenna, USB charging cable and UK 3 pin USB power supply. More information / spec sheet below.

https://www.hamradio.co.uk
https://tinyurl.com/n6s9u6hj

Mini Spiderpole Telescopic Antenna Poles

Nevada is pleased to announce *Spiderbeam* have introduced two new Mini Spiderpole telescopic Antenna poles. These smaller sizes (10 metres and 7 metres) plus an optional carrying case, make them ideal for outdoor or portable operations. Although they are light and small enough to fit in any suitcase, they are developed to be rugged and durable. The Mini poles use a fixed screw bottom cap which is flat and padded inside. This gives the pole a stable stand and prevents the mast from unwanted extraction while hiking. Spiderbeam fibreglass poles are extremely strong, with a much greater wall thickness than the usual 'fishing-rod types. A special reinforcing winding technique - several layers of fibreglass are wound in alternating direction providing greatly increased lateral and linear strength. Stronger joints are achieved by a much larger overlap between the individual tube segments than usual. Prices start at £59.95, with the (optional) carrying case priced at £14.95. The new Spider poles are available from UK Distributor Nevada Radio.

www.nevadaradio.co.uk

Leg Pegs

Martin Lynch & Sons have recently introduced another accessory for the Yaesu FT-817/FT-818ND portable QRP transceivers. The MyDEL-brand Leg-Pegs is a neat retractable pair of folding feet that allow the transceivers to be tilted up when placed on a flat surface. Unlike wire bale-type versions seen before, this design allows the user to fold away the stand when not in use. Better still, they are so beautifully made that it looks like Yaesu put them there in the first place and you can still use the Yaesu CSC-83 carry case without removing them. In stock at £19.95 plus P&P. More information is here:

www.HamRadio.co.uk/LegPeg

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

RADIO ENTHUSIAST BOOKSHOP

Behind the Enigma:

The Authorised History of GCHQ, Britain's Secret Cyber-Intelligence Agency

You know about MI6. Now uncover the mystery behind Britain's most secretive intelligence agency, in the first ever authorised history of GCHQ. For a hundred years, GCHQ - Government Communications Headquarters - has been at the forefront of innovation in national security and British secret statecraft.

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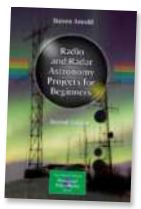

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Chrissy Brand
chrissyLB@hotmail.co.uk

Tecsun PL-330 Review and Online Meetings

Chrissy Brand examines the new Tecsun PL-330 portable receiver, reports on DX meetings that took place in February 2021 and pays a virtual visit to the Africa Podcast Festival.

The Tecsun PL-330 receiver became available in the UK earlier this year. It is a welcome addition to my array of portable radios. I have long been impressed with the Chinese-manufactured brand, having used a PL-310 ET and a PL-360 for several years. The PL-330 may now well be the first radio I slip into in my bag and backpack as I – hopefully – embark upon my travels this spring and summer. It sits in the same range as its fellow Tecsun models and my two other current portables, an XH DATA D-808 and the Eton / Grundig Executive Satellit (Fig. 1).

First Reactions

My immediate reaction was how wonderfully light in weight and small in dimension the PL-330 is, weighing 210g (without the lithium battery) and measuring 139 x 85 x 26mm. This makes it ideal for travel of any kind, from a day walking in the hills or along the coast, or a longer excursion, further afield.

It also has the essentials that I always ensure before purchasing a radio, a short wave/FM external antenna jack plus a Lithium battery power supply. A USB power supply or charging can also be used.

The Tecsun PL-330 covers MW, LW, SW and FM. The frequency range for long wave is 153 to 513kHz (9kHz step, fine-tune step 1kHz); medium wave is 520 to 1710kHz (10kHz step, 1kHz fine-tuning step for America) and 522- to 1620kHz (9kHz step, 1kHz fine-tuning step for Asia, Africa, Europe and Oceania).

Short wave ranges from 1711 to 29999kHz (5kHz step, 1kHz fine-tuning step). When the short wave band is received in SSB mode, the step 1kHz, and the fine-tune step is 10Hz.

The FM band runs from 64 to 108MHz, which, therefore, includes the OIRT band. This starts at 64.0MHz and is in use in Russia, the Caucasus and part of the Caspian Sea and Black Sea regions. The Japanese FM band starts at 76.0MHz. This is, of course, useful to have should you be travelling in those countries. It also allows you to try for FM DX signals from eastern Europe during the summer when Sporadic E and tropospheric conditions make such aural delights a possibility.

Second to its functionality, a radio's design is a fundamental decision-maker in how long I use a product for. Another plus of the PL-330 is its rotary volume control. This is situated on the right side of the receiver, just beneath an identical tuning control. This intuitive way of adjusting sound is something I much prefer on a radio to the 'up' or 'down' volume control buttons that are used on most others of this class.

In an ideal world, I suppose there would be versions available with these controls on the left side, for left-handed people. But a modification like that is a rarity, even in mass-produced consumer items that are found in every home, and I appreciate it is not a realistic option for a more niche-product like a world band radio.

Tecsun PL-330 Performance

Performance-wise, I was impressed. The sound is good and belies a radio of such a dinky size. The PL-330's volume is powerful and strong enough to hear with comfort across a large room, without distorting. This is a feature that many smaller radios can fall short on.

When I tuned across the FM band, I caught all the big BBC and local commercial signals, of course. Besides, I was pleased to hear community radio station Seahaven FM, on its relatively new Eastbourne relay frequency of 95.6MHz, from about 20 miles away.

I was impressed with the signal from Radio France Musique on 89.4MHz. The station is hardly 'DX', being just across the English Channel (*La Manche*) from my location and one of my regular stations of choice. However, listening to classical music on any radio, especially a small one, is a good test, and this was a perfectly pleasant experience.

CHRISSY BRAND

Fig. 1: Tecsun PL-330 (top left) with stablemates PL-310 ET and PL-360, plus a Grundig Executive Satellit and an XHDATA D-808.
Fig. 2: The UNESCO *World Radio Day* event celebrated 10 years in 2021.
Fig. 3: This year, the *Africa Podcast Day* centred on one message: *"We're proud to be here!"*

The often eclectic music choice of Delta FM on 100.7MHz makes that station another French favourite for me. A good signal is dependent on conditions. However, for the week that I was putting the Tecsun through its paces, I was able to listen to Delta with perfectly acceptable signal strength.

On short-, medium- and long wave, I heard all of the stations that are regulars for me. For instance, Voice of Vietnam, Voice of America and Radio Havana Cuba on short wave; while, on medium wave, MR1 Kossuth Radio in Hungary, plus the usual Spanish and Czech stations.

When you power down the receiver, there is a nice fade away of the volume, which is preferable to the sudden cut-off that many receivers have. My only slight gripe would be that there is no stand at the back. This makes it more difficult to use the radio at an angle, something I prefer to do when operating a portable.

Design-wise, the appearance of the Tecsun PL-330 is the same as pretty much every other portable radio of its class, in dark grey. Silver, grey or black-coloured receivers are the norm, which is a wasted opportunity, in my mind. When a product is competing in a crowded marketplace with radios that are similar in price and looks, surely it would be a smart move to aim to stand from above the rest.

When I look at my portables, it is hard to tell them apart at a glance, it must be said.

A blue or red coating on a receiver would be a quick win to enable this. Although I am unaware of any manufacturers doing this, perhaps it is too expensive or impractical. However, it works on other products, where sleeves and cases for tablets and smartphones allow the user to individualise their equipment.

This deepens the emotional connection with the product.

The Tecsun PL-330 retails at around £89.95 (including VAT). Tecsun is clearly keeping up their good reputation. A fellow 'radio head', David Morris, gave a favourable review of the Tecsun PL-990 in February's issue of BDXC *Communication*. The PL-660 retails for around £260.00 and this high-performance short wave radio may be Tecsun's last high-end portable. It is considered by many to be the Tecsun design team's masterpiece.

Full specifications are available online at many websites, including that of Nevada Radio. With kind thanks to **Mike Devereux** at **Nevada Radio** for the loan of a Tecsun PL-330.
https://tinyurl.com/57ehv5n9
https://tinyurl.com/yfbftvw3

World Radio Day

There were numerous online events and radio programmes to celebrate the 10th *UNESCO World Radio Day*, on February 13th (Fig. 2). I joined other DXers for an online gathering that was facilitated by the Indian DX Club International. At the webinar, Dr S Sanatani argued that radio needs to adapt to new technologies, to remain accessible to everyone, no matter where they are. Pradip Chandra Kundu has collected more QSL cards than anyone else in India, and he pointed out how radio remains the fundamental means of communication in times of natural disasters, epidemics and socio-economic crises. He emphasised the need for leaders to attract the younger generation to the hobby of radio listening.

Mr Sunil Bhat, Deputy Director-General of All India Radio (Prasar Bharati) congratulated the IDXCI and applauded the club for bringing together radio enthusiasts around the country and abroad in celebrating World Radio Day. Among other speakers, Jim Salmon of Radio Emma Toc in the UK, DXer Alokesh Dasgupta from Delhi and Professor Dr Jaishakti Thangavel from Chennai focused on different aspects of radio emphasising the importance of radio in our lives. I was honoured to represent the European DX Council at the meeting and repeated my mantra of the power of radio and its unique ability to reach wide audiences, especially in the vast swathes of the planet where there is no electricity, let alone the internet.

The webinar was also covered in *North East Colours*, a daily English language newspaper in northeast India, as well as in the Indian DX Club International's bulletin for March. The Indian DX Club International is a vibrant and active DX association, which I wholeheartedly recommend. Its monthly bulletin, *Asian DX Review*, is free of charge and can be found, along with other useful radio resources and information, at the club's website:
https://idxci.in

UNESCO Director-General, Audrey Azoulay, in her message to mark World Radio Day, stated, *"More than ever, we need this universal humanist medium, a vector of freedom. Without radio, the right to information and freedom of expression and, with them fundamental freedoms would be weakened, as would cultural diversity, since community radio stations are the voices of the voiceless."*
https://tinyurl.com/esw9u82r

Amongst the countless radio stations that took part in the global events that day, perhaps one of the stand-out programmes lasted 53-minutes and was aired by the BBC World Service: *The Documentary, World Wide Waves: The Sounds of Community Radio.*

Produced by David Goren and presented by Maria Margaronis, the programme examined some inspirational radio stations. Tamil Nadu's Kadal Osai (The Sound of the Ocean) broadcasts to local fishermen about the weather and climate change. Radio Civic Sfantu Gheorghe in the Danube Delta

preserves the history of the community, while Radio Tasboom in a Cameroonian rainforest operates on solar power.

Two of the stations mentioned were ones I have previously written about in these pages: Radio Pio Doce is one of the Bolivian tin miners' stations that started in the 1940s (*Sounds Like Autumn*, *RadioUser*, December 2019: 44-47). Much further north in the Americas, KTNN, the Voice of the Najavo Nation, celebrates and supports the local indigenous population (*American Road Trip Radio*, *RadioUser*, July 2019: 50-53).

www.bbc.co.uk/programmes/w3ct20d6

Other parts of UNESCO also supported *World Radio Day*. The UNESCO Intergovernmental Oceanic Commission took the opportunity to promote the *UN Decade for Ocean Science (2021 to 2030)* in its work. This includes Trinidad and Tobago radio broadcasts called *Beyond the Blue*.

https://tinyurl.com/27u84fjc

Africa and America

The *2021 African Podcast Day (Africa Podfest)* was forced to take place online rather than in person. This occurred on February 12th and was a resounding success (Fig. 3).

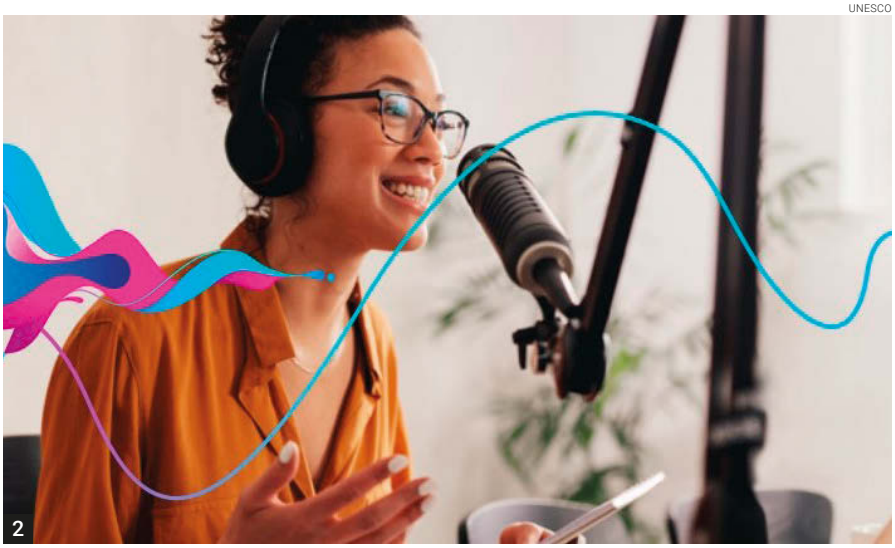
Co-Director of *Africa Podfest*, Melissa Mbugua stated how, *"the future can only be determined by what we do to build this industry as individuals and a community. We get to create space to let our dreams for African podcasting fly. I am reflecting on insights from the festival and challenging myself to imagine pathways to a future where podcasting in Africa is economically, socially and culturally thriving, for Africans by Africans."*

Over 270 people from across the planet took part in the festival, while the hashtag #AfricaPodcastDay reached over 1.1 million people on social media. A gamut of topics was touched upon, from comedy to health, plus technical aspects of podcasting and how to build audiences.

There are several videos to be viewed at the *Africa Podfest YouTube* channel.

Moreover, there is a database of African podcast on the festival website. Have a play with it and be guided to gems such as *Sincerely Accra*, a Ghanaian, fast-paced, music and vox- pop-driven show. *The Sandton Times* podcast, meanwhile, offers views and news from an affluent area of Johannesburg. *The Cosmic Savannah* integrates technology and world-class astronomy under African skies. From Uganda, *Station Kampala* sees Classic and Will talk about life, *"from our perspective as intelligent young men. Knock yourself out."*

UNESCO



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AFRICA PODFEST

3

In the February 21st episode of *The Podcast Sessions*, the festival's co-directors, Josephine Karianjahi and Melissa Mbugu spoke to Rutendo Nyamuda about launching Africa's first global podcast festival.The increase in the podcast industry in Africa is heartening to observe, and the bonus for us is that many of the programmes are in English. As we know, through decades of listening to international radio, programmes are an ideal way to be immersed in another culture.

https://tinyurl.com/AfricaPodfest
www.africapodcastfestival.com
https://tinyurl.com/ec53497w
www.thepodsessions.com

In the USA, the *35th Annual SWL Winterfest* went online this year. I attended a few of the sessions and it was a convivial atmosphere, with chat, expertise and plenty of giveaways, including radios and magazine subscriptions.

Amongst the highlights were WBCQ airing the session given by Larry Will, about pirate radio, on 6160kHz, and Thomas Witherspoon (The SWLing Post) giving a presentation about his collection of current day radios, many of them portables which he takes on field trips. These included the Tecsun PL-330, which takes us neatly back to the beginning of this month's *Emerging Issues in Radio* column!

https://swling.com/blog/tag/pl-330

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Specifications

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- 1900 station memories
- Multi-tuning methods
- Built-in Ni-MH battery charge function
- Power sources:
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  230V Mains adaptor (included)

Accessories supplied include:

- Stereo earphones
- External antenna
- Mains adaptor
- Carrying case

Tecsun S-8800 (GM)

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- Built-in battery charging feature
- Supplied with batteries and remote control

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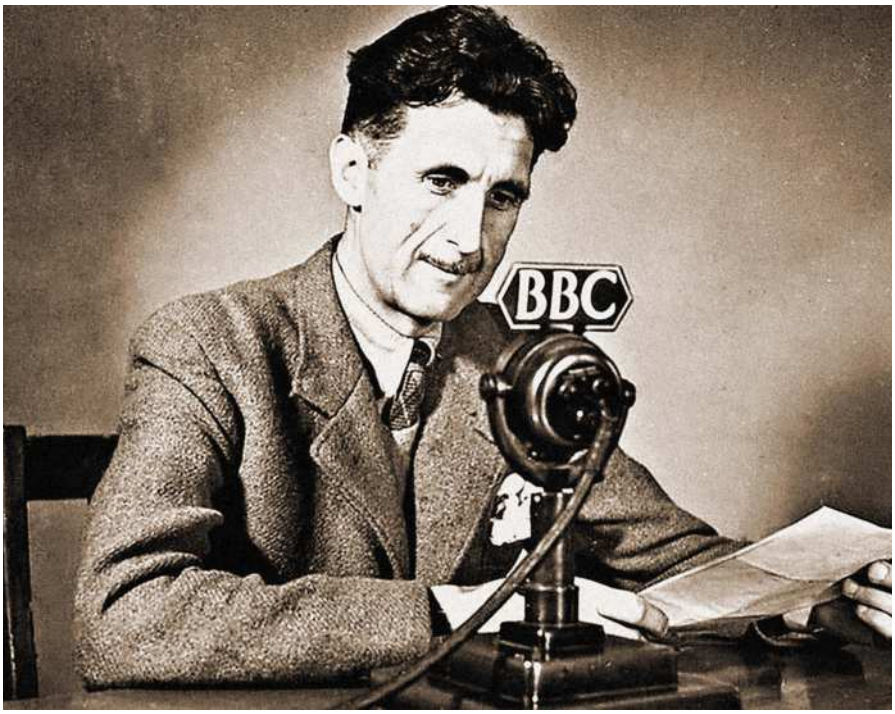


Postcolonial Literature and Johnny Sellotape

David Harris reviews a title that embeds external BBC post-war broadcasting in the wider context of literature and radio history, and he recommends a new autobiographical publication on class, upbringing and radio.

Postcolonialism and Home Radio

This is a radio book with a cultural twist: *Radio Empire* is about the influence that the BBC's 'Eastern Service' broadcasts to India had on the development of the Indian novel. The author makes the case that these wartime broadcasts acted as 'pilots' for the 'Third Programme' (now BBC Radio 3) which was launched in 1946 as a cultural radio station.

When BBC radio was launched in 1923 the audience was very small, well-educated and affluent. Many of the early programmes consisted of classical music recitals and 'worthy talks'.

The URL below allows you to read copies of the *Radio Times* listing magazine from 1923 onwards.

https://genome.ch.bbc.co.uk

During the 1930s, radios became much cheaper and easier to use. Consequently, audiences grew, and programmes became more popular. During the Second World War (1939-1945) BBC radio had to entertain troops and factory workers alike, who wanted light entertainment, rather than intellectual talks. After the Second World War, the BBC reorganised its domestic radio network into the *Home Service* (now Radio 4), the *Light Programme* (now Radio 2) and the *Third Programme* (now Radio 3). Following a reorganisation in 1967, Radio 3 became more of a classical music station and talks were moved to Radio 4.

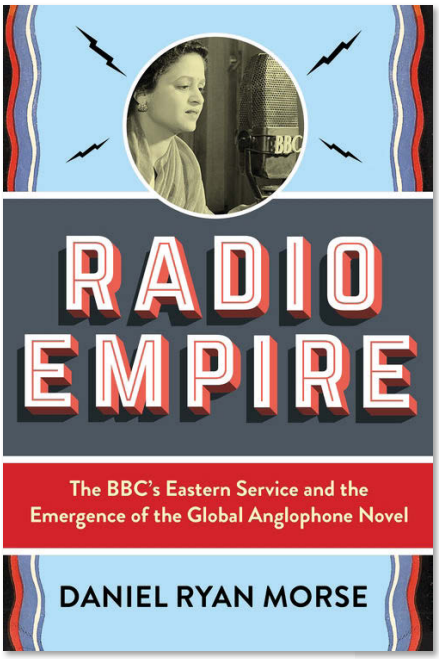
The *BBC Empire Service* was launched in 1932, originally as an English-language short wave service to English-speaking countries around the world. The *Eastern Service* began in 1940 with programmes in Hindi and English. Other Indian languages such as Gujarati, Burmese, Sinhala and Tamil were added later in the War. The BBC was aware that the target audience in India was very small and consisted mainly of university students, professionals and intellectuals. Very few other Indians had access to a short wave radio. The idea of the broadcasts was to shape opinion and promote Western values amongst the Indian intelligentsia.

The *Empire Service* also countered the propaganda broadcasts to India that were transmitted by the pro-Nazi station, *Azad Hind*. This station began in Germany and then moved to Singapore and finally Rangoon (modern-day Yangon) before the Axis forces were defeated. George Orwell (above) (1903-1950), author of *Animal Farm, 1984* and many other fine books worked for the BBC's *Eastern Service* from 1941-1943. In 1985, the scripts of his programmes, *George Orwell – the War Broadcasts*, were published.

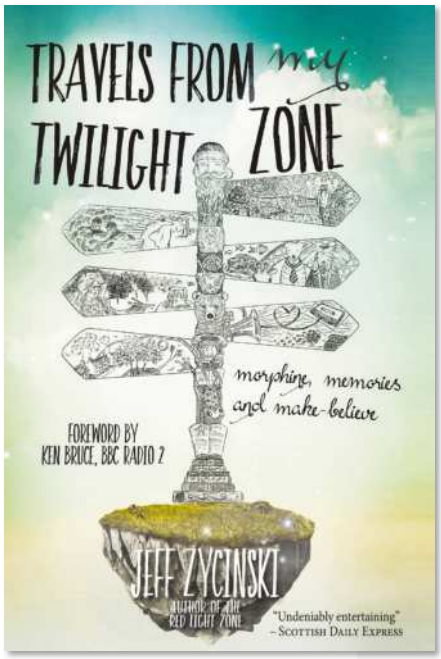
This was closely followed by *George Orwell: The War Commentaries*, which comprised the scripts he wrote, and which were translated and broadcast by Indian-languages speaking presenters at the BBC. Many of those presenters such as Mulk Raj Anand (1905-2004), Venu Chitale and Attia Hosain (1913-1998) went on to become major names in Indian literature. Quite a lot of the book is taken up with detailed studies of these authors' writing and how it was influenced by radio.

The challenges of broadcasting and its immediacy helped shaped some post-war Indian writing. What is noticeable about many *Eastern Service* broadcasts, is how 'radical' and 'highbrow' they were, compared to what was being broadcast in England. In addition to Orwell, E M Forster (1879-1970) author of such classics as *A Passage to India* and *Howards End* presented a monthly programme of book reviews. Forster recommended books by DH Lawrence, whose novel *Lady Chatterley's Lover* was banned in the UK until 1960.

One very controversial literary figure featured in the broadcasts was James Joyce (1882-1941). Recordings of him reading *Finnegan's Wake* were broadcast to India but the book was considered too radical to talk about on British domestic radio. Although the central theme of *Radio Empire* is how the broadcasts shaped the Anglophone India-Novel, the secondary idea of how the service shaped the *Third Programme* is very important. One can get a feel of these wartime broadcasts by reading Orwell's *War Broadcasts*, in which he talks about subjects as diverse as rationing, Jonathan Swift, George Bernard Shaw, poetry, and Macbeth. The *War Commentaries* provide detailed coverage of the war in Europe and the Far East from December 1941 to March 1943. These writings have also been repackaged in various compilations of Orwell's writing and his *Collected Works*. Professor Morse concludes his book by noting that, by the 1950s, there was a shift in BBC External broadcasts away



Radio Empire. The BBC's Eastern Service and the Emergence of the Global Anglophone Novel,
by Daniel Ryan Morse. Columbia University Press. 2020. Pbk. 272 pp. £26.74.
ISBN 9780232298370
www.cup.columbia.edu



Travels from my Twilight Zone. Morphine, Memories and Make-Believe,
by Jeff Zycinski. Lunicorn Press. 2020. Hbk. 264 pp. £12.99.
ISBN 9780992962489
www.lunicorn.com

from India to Africa. After the Second World War, All India Radio (AIR) took up some of the cultural programming, which had been previously supplied by the BBC.

Many of the *Eastern Service* presenters now went on to work for *The Third Programme*. In this title, the author traces the link between radio and Indian novelists to Salman Rushdie's novel, *Midnight's Children* which also contains references to the subject of radio.

This is an important book for students of Indian Anglophone literature but is also a useful contribution to the history of BBC Radio 3 and the role of the BBC's external broadcasts.

Radio, Travels, and Class-Consciousness

In *Radio User*, June 2019: 49, I reviewed *Red Light Zone* by Jeff Zycinski. The book was a memoir of his career in broadcasting, in the course of which he rose to be Head of BBC Radio Scotland. I described it as, *"a very well written book which gives an excellent insight into the life of a BBC producer"*. In this book, Jeff hinted that he may write another volume. Therefore, I was very pleased when *Lunicorn Press* sent me his latest book, which is both a prequel and a sequel to *Red Light Zone*. The new title starts with quotes praising *Red Light Zone*, collated mainly from Scottish publications. I was delighted to note that my quote (above) was included too. I always send publishers copies of reviews that I have had published but very few even acknowledge them. This is the first time that one of my quotes has appeared in a book.

*[congratulations to David; may this not be the last time either – **Ed**.]*

Red Light Zone concluded with Jeff having retired from the BBC. Unfortunately, shortly afterwards, he contracted cancer of the tongue and found himself in hospital. He had many vivid dreams about his childhood when in hospital – hence the subtitle of this book. The bulk of the book is taken up with recollections of his early life growing up on the tough *Easterhouse Estate* in Glasgow. He was one of eight children whose father came to Scotland from Poland during the Second World War and settled in the country where he became a welder. Jeff's background is in marked contrast to that of many senior executives at the BBC who came from the same public school/Oxbridge background as so many of our elite. Jeff is a very accomplished writer who draws upon his memory of childhood to bring alive special moments from the past. I think that anyone who grew up in the UK in an ordinary family background will be able to relate to his stories of childhood. He recalls tales of playing in the austere environment of a housing scheme with few amenities for children but making their own fun.

Moreover, Jeff writes quite a bit about his Polish background. His father was born in Germany but grew up in Poland. He was captured by Russian troops in the early days of the Second World War and sent to Siberia. Released in 1941, he joined the Polish Navy, where he was based on a warship that spent some time in Clydebank, Scotland. This is where his father met his mother; after the war, they married, and he stayed on in Scotland. When Jeff was older, they went on holidays to Germany, where his father surprised him by speaking in fluent German and making friends with many men of his age who had served in the German Army. There are also chapters about Polish relatives turning up in Glasgow and being accommodated by his family.

Jeff recounts his sister's love for Neil Reid, a young singer who had appeared on the TV talent show, *Opportunity Knocks*. Neil came from nearby Hamilton and achieved 'one-hit-wonder status in 1972. Jeff accompanied his sister to his concerts, and she names her rabbit after the boy singer. Jeff first realised that he came from the 'wrong side of the tracks', when, on a school trip, he and his classmates were turned away from a National Trust stately home because they were from Easterhouse. Jeff manages to sneak in anyway and look around the house by following children from a 'posh' school. School holidays were always endless periods with nothing to do but Jeff and his family decamped each year to a hut near the coast of Fife on the east coast of Scotland. He has a good eye for detail and fills the book with anecdotes drawn from deep in his memory of childhood. Jeff was a bright boy who loved going to the library and being able to borrow books. He even confesses to a period in his childhood where he truants regularly and sees little point in school.

However, he returns to school and eventually goes to university and then on to a career in radio. The second part of the book is taken up with nine original short stories, some of which were written when he was much younger. The stories are well written, and I liked the fake obituary of Johnny Sellotape, a comedian who is Jeff's *alter ego*. The book concludes with a glossary of the Scottish places which are mentioned in the book. I feel that these and other places could be the basis of a new book for Jeff, something like a 'Bill-Bryson-style' odyssey around Scotland. Overall, this was a most entertaining read, and I certainly think we will hear more from Jeff in the future.

Radio Officers: A Window in Time

Scott Caldwell
Scottandrew.caldwell@yahoo.co.uk
Robert Connolly
gi7ivx@btinternet.com

Scott Caldwell and Robert Connolly have both enjoyed reading a new book on the history of radio officers, which opens windows into a fascinating past and reveals a history that lives on through writers such as this one.

Comments by Robert Connolly

From the early 1900s, ships had carried specialist radio officers until the requirement for the position came to an end on 31 December 1999. The author of this 235-page book, John Brew, was a ship's radio officer employed by Marconi in the 1970s. His book recounts his life at sea in that role, along with information on the ships he served on, their captains and crews, and the ports visited.

For those interested in maritime radio, this book provides valuable insight into, and understanding of, the role and requirements of a ship's radio officer. This includes watchkeeping and many aspects of life on board a commercial ship, including the relationship between captain and senior crew member.

The book also provides an insight into the radio officer's 'downtime' while in ports and contains interesting photographs including the radio room of the ship *Howard W Bell*.

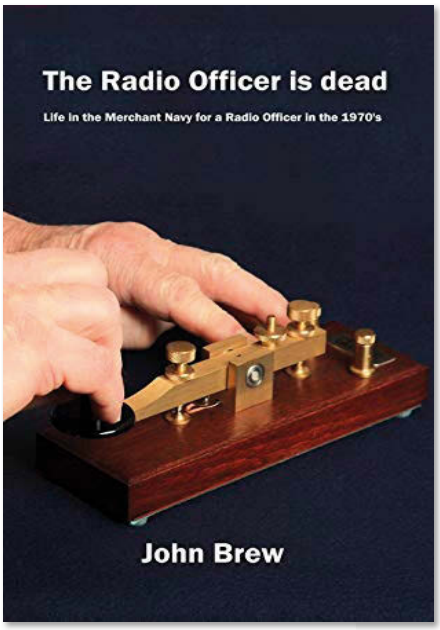
The book will bring back memories for readers who were themselves ship radio officers and former radio officers working at coast stations – at the other end of the proverbial line.

The author explains that three main aspects defined his job: First, maintaining the safety of life at sea, requiring the radio officer to maintain a listening watch on the distress frequencies for as long as possible.

Second, managing communications, with incoming and outgoing radio telegrams and radiotelephone calls. The third facet was to carry out maintenance of all the electronic equipment on board the vessel.

John explains about radio telegrams – and the cheaper option that crew members could use by sending a ship's letter-telegram; this was posted to the recipient by the coast station that received it.

He also muses about the use of Morse code, including its use by some mobile telephone manufacturers for start-up and SMS messages, along with being incorporated into the theme tunes of some television programmes and other music.



The Radio Officer is Dead – Life at Sea for a Marine Radio Officer in the 1970s
Brew, John (2021) Castlequarter (5 Feb. 2021)
ISBN10: 1527274632 ISBN13: 978-1527274631
Hbk: £ 21.94 Kindle: £4,00
https://tinyurl.com/cvunu8s

The author also mentions that learning Morse code is like riding a bike, something that you never forget.

This is something I was aware of, as my father was a Royal Navy wireless telegraphist before and during WW2. Although my father became a teacher after his Navy days, he remained proficient in receiving Morse until he died, even though he did not become a radio amateur.

John Brew also provides an interesting section on maritime expressions, along with the international Morse code and a list of merchant navy officers, in the hierarchical form to help the casual reader.

The *Radio Officer is Dead* is available from Amazon in either paperback or Kindle version.

Comments by Scott Caldwell

Reading this book was a very enjoyable experience. It has several interesting parables that relate to my research interests. The section that deals with John Brew's first ship; his jovial reception from the carpenter reminded me of a recent article from the personal diary of Alec Bagot, who was the second wireless operator of the *RMS Olympic* during her role in the sinking of her sister ship, *Titanic*.

The close working dynamics of the role is very apparent in this book and is also reflected by many relevant primary historical sources. I have provided a section that provides an interesting parallel on the working relationship between the senior and junior wireless operators.

It is an extract from the *Diary of Alec Bagot*, the Junior Wireless Operator on the *RMS Olympic*:

"I have but to close my eyes to feel again Ernie Moore, shaking my shoulder, saying, 'Get up quickly, the Titanic's sinking.'

'What's the time?'

'Eleven forty. I can't wait. Get up.'

I turned back, disgruntled. It was a mean thing to wake you twenty minutes before you need go on watch. Five was enough. Nor was there anything funny in the greeting, although usually, it was the 'Maurie' or the 'Lucy' – our Cunard rivals, 'Mauretania' and 'Lusitania' who were supposed to be in distress. That, or 'The old man wants you on the 'Bridge', too corny to carry weight with any seasoned 'Sparks'. So when the first Wireless Officer of RMS 'Olympic', E. J. Moore awakened me with such lack of originality, I wasn't impressed and said so as boldly as any junior may to his senior. But Ernie was serious. It's true, I'm telling you. It's true. Don't fool around. Get up".

The diary is now housed in the State Library of Australia (D Piece (Archival) D 7428 L). **https://www.slsa.sa.gov.au/home**

In many respects, this book is like a window through time to a bygone era when radio officers were an essential part of a ship's company and a legal requirement under SOLAS legislation. From the very first page, this book had me hooked.

The commercial aspect of marine radio is another interesting parallel that remained with the Marconi Company, in terms of charging for the sending of personal messages. The *Vernon Pools Syndicate* is another reminder of a past era, long before the dawn of the Internet, and it provided much-needed entertainment for the ship's crew.

I particularly found it amusing that the Marconi Company were very reluctant to reimburse their employee's travel expenses related to airfares.

Overall, this is a fascinating and easy-to-absorb title that should be in the shack libraries of all those with an interest in maritime history, the history of technology, and maritime radio. **https://tinyurl.com/4c45ej32**

Rallies and Events

Plan your visits with our list of forthcoming events. Warners (*RadioUser & Practical Wireless*) will be attending events marked with an asterisk (*). Club secretaries/ event organisers: Please send full and accurate details of your events, affiliations and clubs as early as possible, if you would like to be mentioned here: **wiessala@hotmail.com**

11th and 25th May 2021

SOUTH ESSEX AMATEUR RADIO SOCIETY: We meet at 17 pm on the second Tuesday at *The White* House, Kiln Road, Benfleet SS7 1BU (Region 12). May 11th: Club meeting on the air at 8 pm on 145.325MHz FM. May 25th: SEARS Net at 8 pm on GB3DA. Daily net hosted by our president Brian Bellamy, G7IIO, at 3.30 pm Monday to Friday on 145.325MHz FM.

Terry Howchen, G1FBW: Tel: 07986 070 040
thowchen@hotmail.com
http://www.southessex-ars.co.uk

4th July 2021

DARTMOOR RADIO RALLY: The Rally this year will be held at a new venue - The Yelverton War Memorial Hall, Meavy Lane, Yelverton. Devon, PL20 6AL on Sunday 4th July 2021. Free Parking. There will be the usual Bring and Buy, Trader Stands and Refreshments available. Doors open at 10 am. Admission is £2.50.

Roger, Tel: 07854 088 882
2e0rph@gmail.com

11th July 2021 (New Date)

EAST SUFFOLK WIRELESS RALLY ESWR 2021: Opens at 9.30 am; Kirton Recreation Ground, Back Road, Kirton, Ipswich IP10 0PW. A14 Junction 59.

Kevin Ayriss, G8MXV
Tel: 07710 046 846

29th August 2021

TORBAY ANNUAL COMMUNICATIONS FAIR: Newton Abbot Racecourse Devon TQ12 3AF. Doors open at 10 am with disabled visitors gaining access at 9.30 am. Indoor event with plenty of free parking on site. There will be a Bring & Buy, as well as an RSGB Book Stall. Catering will be available on-site entry £2. Please follow prevailing Covid rules.

Pete, G4VTO: 01803 864 528
Mike, G1TUU: 01803 557 941.
rally@tars.org.ukG1TUU

2nd September 2021

WESTON -SUPER- MARE RADIO SOCIETY 6TH RADIO & ELECTRONICS RALLY: The Campus Community Centre, Worle, Weston-super-Mare BS24 7DX; 9.30/10 am - 3 pm (Traders 7.30 am).

Dave, G4CXQ: 07871 034 206
g4cxq@btinternet.com

European Private Shortwave Stations

Stand: April 1st 2021

Only legal stations are included. Most stations use 100 to 3,000W of power.
D = Germany, DNK = Denmark, FIN = Finland, NL = Netherlands, NOR = Norway, Irr. = irregular, F.pl.: future plan, min. = minutes, Mo = Monday, Tu = Tuesday, We = Wednesday, Th = Thursday, Fr = Friday, Sa = Saturday, Su = Sunday.

kHz	Country	Name	Transmittersite	Schedule(UTC)
3920	NL	Radio Piepzender	Zwolle	Weekends (1600-2400)
3940	NL	Mike Radio	Heerde	? (1600-2300)
3955	D	Radio Channel 292	RohrbachWaal	24/7
3975	D	Shortwave Radio	Winsen	Daily 1500-2300
3985	D	Shortwaveservice	Kall-Krekel	Daily 1400-2200
3995	D	HCJB	Weenermoor	24/7
4895	NL	Mike Radio	Heerde	? (1600-2300)
5895	NOR	Radio Northern Star	Bergen	Daily 0329-2210
5920	D	HCJB	Weenermoor	Daily 0600-1600
5930	DNK	World Music Radio	Bramming	24/7
5940	NL	Radio Piepzender	Zwolle	Testing
5970	DNK	Radio 208	Hvidovre	24/7
5980	DNK	Radio OZ-Viola	Hillerød	We 2100-2200, Sa-Su 1100-1300
5980	FIN	Scandinavien Weekend Radio	Virrat	1st Sa of the month (not in May)
6005	D	Shortwaveservice	Kall-Krekel	Daily 0800-1600
6005	NL	Radio DeltaInternational	Elburg	Testing
6020	NL	Radio DeltaInternational	Elburg	Sa 0900-1300 & Su 0600-1700
6070	D	Radio Channel 292	RohrbachWaal	24/7
6085	D	Shortwaveservice	Kall-Krekel	Daily 0700-1700 (Radio Mi AmigoInt.)
6115	D	Radio SE-TA2	Hartenstein	?
6140	NL	Radio Onda, Belgium	Borculo, NL	Weekends only. F.pl.: Daily 0630-1900
6150	D	Europa 24	Datteln	Daily 0700-1700
6160	D	Shortwave Radio	Winsen	Daily 0800-1600
6170	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month (not in May)
6195	NL	Mike Radio	Heerde	?(Su 0600-1300)
7365	D	HCJB	Weenermoor	?(0800-1300)
7440	NL	Radio Piepzender	Zwolle	Alternative to 5940kHz
9670	D	Radio Channel 292	RohrbachWaal	F.pl.: 24/7 from April
11690	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of th emonth (not in May)
11720	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of th emonth (not in May)
15505	NL	Radio Piepzender	Zwolle	Weekends
15790	DNK	World Music Radio	Randers	Sa-Su 0700-2000 +irr. at other times
25770	DNK	World Music Radio	Maarslet	F.pl. from April or May–24/7

This list is compiled by Stig Hartvig Nielsen (**shn@wmr.dk**) each first day of the month – and is based on details supplied by the various radio stations, the stations websites and HFCC registrations. The list is not copyrighted and may be published everywhere. Next list will be published on May 1st 2021.

Robert Connolly
gi7ivx@btinternet.com

COURTESY OF ROLLS ROYCE

1

Autonomous Vessels and Crewless Cruises

Robert Connolly charts the possible future of independent shipping and the radio communications required, recommends frequencies for seasonal maritime listening and has news from the Irish Coast Guard.

Video Killed the Radio Star is the title of a song written in 1978 by Trevor Horn, Geoff Downes and Bruce Woolley that I used to enjoy listening to. It may have been written before some of you were even the proverbial 'twinkle in your parents' eyes', but those five title words always said to me that – given advancing progress in technology – something well established, becomes effectively redundant.

For example, in the maritime world, sailing ships were replaced with steam vessels, the compass and sextant were replaced with satellite navigation, developments in marine radio communications resulted in the loss of the traditional ship's radio officer, and so the list goes on.

In our own time, commercial shipping is under pressure to 'clean up its act', in just the same way as aircraft and road vehicles are moving to greener energy sources. Many existing ships have been fitted with exhaust scrubbers to reduce their environmental impact. Furthermore, several innovative technologies are currently being experimented with to reduce ship emissions further. Some ships are being fitted with experimental sails, (either a rotor- or traditional type of sail) which may be used to reduce fuel consumption. A Scandinavian passenger ferry, for instance, is currently operating with a rotor sail fitted for this purpose.

There are ongoing developments and experiments to power ships by battery, particularly smaller cargo coasters. The aim of the International Maritime Organisation (IMO) is to 'de-carbonise' shipping by 2050.
https://www.imo.org

Autonomous Shipping

Running in tandem with these developments are moves to make battery-powered cargo ships either remote-controlled or fully autonomous. The difference between 'remote control' and 'fully autonomous' is basically as follows: the latter vessel carries no crew at all and will be able to 'make decisions' and 'take actions' by itself.

Subsea Remotely Operating Vessels (ROV) are already distantly controlled from their mother ship, usually linked via an umbilical cable for control and video feedback from the ROV. In my February 2019 column (*RadioUser*, February 2019: 23-25) I reported on a small, unmanned surface craft that was being used for mapping the seabed with sophisticated sonar. The device was being remotely controlled from the company's office in Co. Louth, Ireland. There are currently several larger vessels undergoing trials in various European countries, in terms of their ability to be remotely operated. As a safety precaution, they do carry a crew on board.

They can step in, should something go wrong. Currently, these are tugs but trials with larger cargo coasters, between 75 to 80 metres in length, are soon to begin in Norwegian waters.

AIS Control

For fully autonomous ships, technicians will command and control all onboard equipment including winches, cranes etc., from a shore-based control centre. Technology using Broadband cellular network and satellite connections will send the data collected from the vessel to the shore station. I have previously

COURTESY OF ROLLS ROYCE

Fig. 1: A shore-based remote/autonomous ship control centre. Fig. 2: The progress of an autonomous ship. Fig. 3: The submarine *USS Seawolf SSN21* arriving in Gibraltar.

reported that the US Navy is to experiment with technology that would not only allow autonomous ship operation but also the vessel's ability to transmit live VHF radio communications with other vessels.

The Automatic Identification System (AIS) transmissions of remotely operated or autonomous ships will show these vessels as 'unmanned', thus allowing other vessels in the area to ensure necessary safety precautions. Under normal circumstances, shore control station operators would steer the autonomous ship to ensure that all the normal rules and vessel separation regulations are adhered to.

Covid-19 Impact

In some ways, the current Covid-19 (Coronavirus) pandemic has fuelled the race to develop and establish this type of new technology. One massive problem the pandemic caused in the maritime world was that of crew replacement. Ship crews are contracted for a specific time on the vessel; normally, when that period is up, the crew members return home on leave for a period after being replaced by a new crew.

However, due to borders being closed and flights stopped because of Covid-19, it has not been possible for many ships to carry out these crew changes. At one point, some 400,000 crew members were stuck on vessels, owing to the unavailability of crew changes.

This was a particularly serious problem for crews on cruise ships when they were forced to lay up. After passengers had been repatriated, some cruise ships rendezvoused at sea to transfer crew members to other ships that then sailed to different parts of the world to take crew members as close to their home country as possible.

There were still many crew members stuck on both cargo and passenger ships – well beyond their contracted employment time.

With autonomous ships, you have no crew on board. Therefore, in the event of another pandemic in the future, this problem would be reduced. There could still be problems rotating staff at the shore-based control centres, should another worldwide pandemic occur. Nevertheless, should an autonomous ship sink for some reason, no lives would be lost.

Secure Communications

The video and audio feedback data from the autonomous vessel to the shore-based control centre could shed some light on the cause of a ship loss. However, given the rapid increase in cyber-attacks in the commercial world in recent years, the transfer of data between ships and shore control stations would have to be very secure to prevent the crewless vessel from being hijacked for its cargo or from being used as a potential weapon by a rogue state or terrorist organisation.

While having crewless cargo vessels is feasible and will probably develop to include larger ocean-going ships in the coming years, I wonder how an autonomous ship could be repaired at sea, should it suffer a mechanical breakdown off-shore that is not software related. Certainly, with a coastal vessel, it could be accessed by engineers using another vessel, but this would not be a particularly fast method of getting a repair team on board.

Another option could be using a helicopter. Then, what about some years down the line when an ocean-going autonomous ship has a mechanical breakdown in the middle of an ocean? The use of a helicopter would not be possible due to range issues. Therefore, a surface craft would have to be used, potentially taking several days to reach the crippled vessel.

In the meantime, the ship in question could present a navigation hazard to other shipping.

One hopes that those designing autonomous ships have something in the back of their mind to handle a situation such as this.

Crewless Cruises?

I believe that it will be many years down the line - if ever - before passenger ships become 'crewless'. Where passengers vessels are concerned, crew members not only carry out their routine duties, be they restaurant, bar or housekeeping staff; they also are trained to assist passengers in the evacuation of the ship, should the worst happen, and the vessel became in danger of sinking. Rest assured that if you are going on a passenger ship in the next 10-30 years' time, or more, there will still be crew onboard to look after your needs.

Finally, on this topic, currently, every ship requires a crew to operate, maintain watches, and so on.

Autonomous ships, by their very design, would not have a crew on board, as full control would be carried out from a shore-based centre. This could mean that one shore-based operating team could control several ships at once. Would this lead to the maritime equivalent of "*Video Killed the Radio Star*"?

Could ships' crews be consigned to the history books, like the ships' radio officer, in the coming years? Only time will tell!

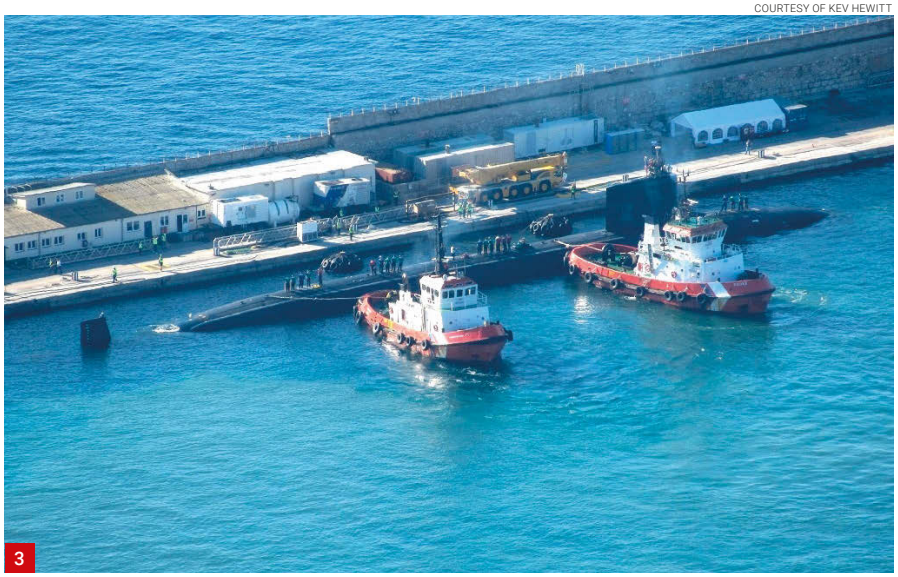
More information may be found at the following websites:

https://tinyurl.com/2c3vc7jm
https://tinyurl.com/xu5b9akx

Cruise News

While on the subject of ships, at the time of writing most cruise ships have not re-commenced operations and a quick virtual

COURTESY OF KEV HEWITT



3

tour of the south coast of England using the *MarineTraffic* or *VesselFinder* websites still show these at anchor. It could be the early summer before things change, although they do make occasional port visits to re-supply, bunker and change crews.

For a year, these ships, whose passengers have visited tourist attractions have become tourist attractions in themselves. Since the pandemic began, two cruise companies have permanently ceased trading and around 15 cruise ships, mostly older ones in the various fleets, have been sent for breaking.

By contrast, there are also several new vessels due to enter service during 2021.

Summer Scanning

Summer is just around the corner, hopefully. Due to the ongoing pandemic, it looks as if many more people will be holidaying at home this year so our seaside resorts might be very busy. As a result, this is likely to make our coastguard and lifeboat volunteers even busier than during a normal summer.

Some coastal visitors may be less aware of the hazards caused by tides, cliff walking or the use of inflatable toys. For some of you, it may well be the first time staying at a seaside resort within the British Isles.

If you are bringing your scanner, Table 1 lists some of the main marine VHF frequencies to listen out on.

The actual channels for coastguard maritime safety information (MSI) broadcasts vary from area to area. However, an announcement is always made on Ch 16 (156.800MHz) detailing the channels used for the different coastal areas. The excellent *Coastal Radio* website provides detailed information on UK coastguard MSI broadcasts, including the times and channels used for various areas.

www.coastalradio.org.uk

If you are going to the seaside, please ensure that you adhere to the current Covid Government advice - to not only help you to stay safe, but also to protect local residents. Keep a sharp lookout for local lifeboat and coastguard volunteer team members who are trying to get to their station for a callout. Seconds lost can cost lives lost, so please allow them through the usual congested summer coastal town traffic as quickly as possible.

As their private vehicles used to get to the station for callouts do not have sirens and/or blue flashing lights they will often drive with their headlights and hazard warning lights switched on.

No Cliff Rescues

As I was preparing this column, I came across a report on the RTÉ news website (RTÉ is the Irish national radio and television broadcaster) that the Irish Coast Guard has stopped carrying out cliff rescues until further notice due to Covid-19 precautions.

https://www.rte.ie/news
https://tinyurl.com/v47zkyzv

Such rescues are normally carried out by volunteer teams, in conjunction with one of four coastguard rescue helicopters, and there is an average of one such tasking per month. The Irish Coast Guard states that their helicopter cliff rescue will continue as normal until their land-based rescue teams can resume operations.

In a similar vein, while RNLI lifeboats continued with rescue operations during the pandemic, their crews were not permitted to undertake training exercises until recently.

"If you are going to the seaside, please ensure that you adhere to the current Covid Government advice - to not only help you to stay safe, but also to protect local residents"

In a previous column (*RadioUser*, April 2021: 34-36) I promised you some information on European marine MF/HF coast stations. You can now find this in Table 2. Some of these stations only broadcast in their local language, while others will transmit in both English and their local language(s). In general, the best time to receive the majority of these stations is during darkness, although some may also be received during daylight hours via groundwave propagation. Over the last 12 months, I have received the majority of these stations in Areas 1 and 2, along with most Italian stations, French and Spanish stations in Area 3. I have used either my SDRplay RSP1A (or, more recently, the RSPdx model) with my PA0RDT mini-whip antenna.

I have omitted a few stations located in Africa and stations in the Black Sea. If you require information for other areas a full detailed list is available on this very useful website:

www.dxinfo.com

N.B.: Table 1 *(General Maritime VHF Frequencies)* and **Table 2** *(European Marine MF/HF Coast Stations)* can now be found on the *Radio Enthusiast* website:

www.radioenthusiast.co.uk

Finally for this month, my thanks go to Kev Hewitt for kindly providing the image for Fig. 3. This shows the submarine *USS Seawolf SSN21* arriving in Gibraltar.

ime, *Fair Winds*.

Further Reading

- European Commission: **https://tinyurl.com/98set3nn**
- Felski, A. and Zwolak, K. (2020) '*The Ocean-Going Autonomous Ship [...]*; JMSE 8: 41
- IEEE Spectrum: **https://tinyurl.com/3ud6hne2.**
- 'The Robot Ships are Coming': **https://tinyurl.com/ucarraxa**.

Chrissy Brand
chrissyLB@hotmail.co.uk

RADIO ROMÂNI ONLINE

Targeting Audiences & The Great Outdoors

Chrissy Brand looks at how radio broadcasters cater to different audiences. She also rounds up some international station news and explores programmes that celebrate the outdoors and the wilderness.

Every radio station in the world has its target audience. No single station can provide enough breadth of programme content to satisfy a wide demographic. However, the intended listenership is based on different factors. A certain musical genre, such as jazz or classical music, can find fans amongst all age ranges; 'Golden oldies' stations will frequently appeal to middle-aged and older audiences who want to be reminded of their youth. Perhaps that desire for nostalgia is why there are so many stations in the oldies format, not just in the UK, but globally.

Decades ago, I recall reading audience research reports stating how international stations on short wave were aimed at policymakers and high-ranking professionals. Another premise was a belief in short wave listeners being of above-average intelligence. It is unwise to generalise, but people tuned to short wave and global broadcasters in the past, and probably today, for four main reasons: A desire for information (sometimes live-saving); an interest in international affairs and international culture; and for DXing.

Back in the year 2000, former BBC Head of Audience Research Graham Mytton gave a presentation at the annual meeting of the *US National Association of Shortwave Broadcasters*. It is a fascinating snapshot of international broadcasting interactions with audiences at the turn of the century, and worth reading even today. One point noted, and which has not changed, is that, *"Short wave broadcasters are niche-broadcasters. Often they are not aiming to reach mass audiences, but people with specific needs, interests and tastes."*
https://tinyurl.com/r926c4pk

Boomers and Millennials

Boom Radio took to the airwaves in February. It is on DAB in many cities, online, on smart speakers and has a dedicated app. The hosts read like a roll call of 1970s' radio. The station has a trio of former Capital Radio DJs and presenters from that era: Nicky Horne, agony aunt Anna Raeburn and Graham Dene, who has a breakfast time slot. Other big radio names from the past have been recruited and make for a strong station brand.

The backers of Boom Radio feel there is enough potential advertising revenue for the station to prosper. It is aimed at the middle of the road segment of the over 60 years old demographic (the 'Baby-Boomer Generation').

It is competing in the marketplace with the mainstream rock, pop, soul, disco and funk that is the staple of BBC Radio 2 and the commercial golden hits stations. Alex Clark presents *Front Row* on BBC Radio 4 and is a host on the *Vintage Podcast*, a programme about books. I agreed with her review of Boom Radio's opening week, in *Hello, boomers' radio. How did you end up in the culture wars?* in *The Observer,* February 21st, 2021. It also neatly captured a question I have often pondered. Music addict Alex commented, "*If you love music, you don't stop listening to it; you don't freeze it in time and, as much as you cherish the songs of your youth, you make room for the new.*"
https://tinyurl.com/4t8dvupr
https://tinyurl.com/6u43swz7

The youth market is probably the most important segment of the industry. A good representative of this is Trickstar Radio. Established in 2013, Trickstar Radio represents youth music culture, playing underground Hip Hop, electronic and dance music. It has expanded from its Brighton DAB coverage of 400,000 people. A new licence enabled the station to extend its reach to listeners in Bournemouth, the Isle of Wight, Portsmouth and Southampton. It is innovative and fresh, with residency shows and syndication of, "*some of the biggest most reputable radio shows on the planet.*" The station also has a presence at music festivals and international music conferences.
www.trickstarradio.com

Community Spirit

Another method to attract an audience is by broadcasting for an entire town. This is how community radio became popular; by producing content that could unite youngsters and community elders alike. There may be different music tastes but a town's shops, eateries, leisure facilities, public services and events all affect the whole town in similar ways. One UK station that encapsulates this community spirit is Radio Alty. Based in the market town of Altrincham, it is an online station that trades on its Mancunian roots with the straplines, "*From Blue Mondays to Happy Mondays*" and "*From Goose Green to Green Onions.*" The programmes are presented by enthusiastic volunteers. Examples to whet your appetite include *Pastries in the Morning*, where Pete and Tom Scotson lend a blend of chat, music and personality. Local bakery and restaurant, Blanchflower,

Fig. 1: Radio ROMÂNi Online, entertaining and informing the UK's Romanian diaspora since 2007. Fig. 2: Hungary's government closed independent station, Klubrádió, on-air since 2000. It remains online. Fig. 3: Monthly music from Ireland to Scandinavia on Radio Northern Europe.

KLUBRÁDIÓ

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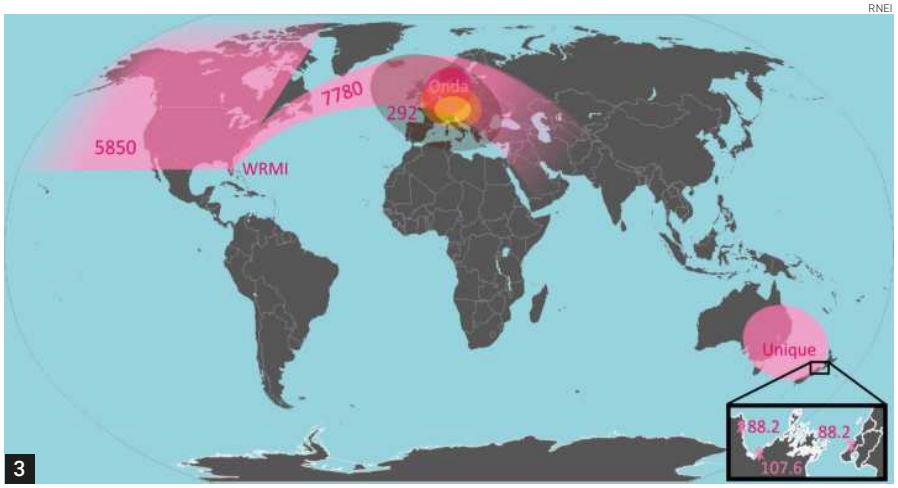
RNEI



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delivers an eclectic mix of chilled tunes, while on Thursdays at 1800 UTC, *Hot Buttered Soul* is where Annie presents two hours of Soul, Motown and Northern Soul Club Classics.

www.radioalty.co.uk

Radio stations that cater to minority groups can find both a national and a local audience. For example, Gorgeous FM in Wolverhampton (DAB and online) puts the LGBT+ communities at its heart. As well as news and specialist programmes, *The Pride Show* with Stu Payne aims to keep listeners up to date on the latest LGBT+ events, along with guests from across Birmingham, The Black County and Shropshire. It is broadcast on Sundays from 1600 to 1900 UTC.

www.gorgeousfm.com/radio

Some of the many other minority groups in the UK also have special programmes and podcasts, if not stations, to tune to. It is, of course, hard to meet the needs of an entire ethnic minority on one audio platform. *Noor Talks* is a podcast aimed at the Afghan community, with, *"discussions on what British Afghans go through in their daily lives. It covers not only the struggles but the successes of how far we have come. We will be discovering* [guests'] *experiences, careers, challenges, aspirations and focus more on their successes."*

http://noortalks.co.uk

Part of the Romanian population in the UK has been served by Radio ROMÂNi Online (Fig. 1). This volunteer-led station started fourteen years ago and, *"offers Romanians in the UK, as well as those in the diaspora, an online alternative to radios in their home country or those in their adopted country. Impartial news and carefully selected music, especially promoting quality Romanian music and Romanian values."*

https://radioro.uk

Overseas Radio

We are familiar with the two Korean state broadcasters on shortwave (KBS World and Voice of Korea), but there is also a good resource for listeners interested in the South Korean capital's radio scene. The *Seoul AM Radio Listening Guide* is a three-hour documentary, narrated by Chris Kadlec. It concentrates on the AM band as heard in Seoul, Korea after dark, with video, audio and detailed documents, including a 115-page guide. As well as the South Korean capital, it covers other areas of broadcasts in both North and South Korea, including jammers and number stations.

www.chriskadlec.com/radio/seoul

The Hungarian government's crackdown on radio stations and other media continued, when the country's last independent radio station, Klubrádió (Fig. 2), was taken off the air in February. Thankfully, this commercial news and talk station retains an online presence. Its history of positivity and resistance is related on Wikipedia, although I am unsure why it uses a Zebra for its logo.

www.klubradio.hu

Radio Northern Europe International started in February last year and its thirty-minute, monthly programme attracts listeners all over the world. Presenter Roseanna plays pop and dance music from Northern Europe on short wave. It is reassuring that the station has made it through the first year and established a loyal following (Fig. 3). It appears that DXers, QSL hunters and dance music aficionados all tune in, or listen online.

https://rnei.org

Graham Smith noted that Radio Dechovka, the Czech station that plays brass band music, left 1233kHz on February 28th. However, the station remains on 792kHz, with 1260kHz to be added. I have also heard Radio Dechovka play a musical a genre that I can only describe as a cross between schlager and Czech country and western, on Thursdays around at 1000 UTC. The station can also now be heard on Czech television (Fig. 4).

www.radiodechovka.cz

Urban and Rural Exploring

This time, I have chosen a selection of my favourite radio programmes and podcasts that celebrate being outside (Fig. 5). High Street Tales is a project funded by Historic England. This has resulted in engaging, modern tales scattered with characters, memories, and personal histories. North Shields, Weston-Super-Mare, Leicester and Woolwich were the first four towns to be explored.

https://tinyurl.com/2zc6xrrj

Stories from around the coasts of the UK and Ireland are presented by Charlie Connelly, author of *Attention All Shipping: A Journey Round The Shipping Forecast*.

Date	Time (UTC)	Station	Programme	Podcast	URL/ Stream/ Frequency
Daily	1200 to 1300	Radio Poland	Culture, history, Letter From Poland	https://podcasty.polskieradio.pl/	www.polskieradio.pl/395 and 1386kHz
Weekdays	0900 to 1000	CBC	Ideas, Radio for the Mind, with Nahlah Ayed	https://tinyurl.com/f2mu3pbe	www.cbc.ca plus FM locally and Sirius XM nationally
Tuesday to Saturday	0100 to 0130	RAE Argentina to the World	News, culture, arts travel.	https://tinyurl.com/4kd6a9f8	https://tinyurl.com/4kd6a9f8 and 9395kHz to North America
Thursday	1030	Scala Radio	Book Club with Mark Forrest or Simon Mayo	https://tinyurl.com/4h2adahw	https://planetradio.co.uk/scala-radio and DAB
Saturday	1200 to 1400	Siren Radio, Lincoln	Steam Punk Weekend with Hal Crompton	www.sirenonline.co.uk	www.sirenonline.co.uk and 107.3 MHz
Saturday	1500 to 1600	BBC Radio 3	Sound of Gaming, with Louise Blain	BBC Sounds App	https://tinyurl.com/dnp96jah DAB and FM

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

RADIO DECHOVKA

4

CHRISTOPHER CZERMAK ON *UNSPLASH*

5

Fig. 4: Czech station Radio Dechovka is now on TV, as well as on medium wave. Fig. 5: Many podcasts offer a new view of the great outdoors.

"*Take fifteen minutes out of your day for a true maritime tale of the heroic, disastrous, startling, hilarious, mysterious, tragic or just plain WTF*".

https://tinyurl.com/298rw2bt

Meanwhile, *Field Recordings* is a programme with a difference, in that there is minimal human sound. It is a podcast where *"audio-makers stand silently in fields (or things that could be broadly interpreted as fields)"*. A night barge on the Rhine, a fireplace on the west coast of the Republic of Ireland, the dawn chorus at Mallacoota in Australia and a recording for the 25 April Bridge in Lisbon give you an idea of what to expect. The *Field Recordings* programme is a novel way to escape incessant human chit-chat, for a while.

https://fieldrecordings.xyz

The Gravel Ride looks at aspects of cycling. Earlier this year there was a fascinating two-part programme which told tales of Namibia's *Desert Dash* and South Africa's *The Munga*, described as 'The Toughest Race on Earth'. A story that, "*should inspire anyone looking for a gravel adventure*".

http://thegravelride.libsyn.com/website

The *Geographical Podcast* is a new audio offshoot from *Geographical*, a UK magazine published since the 1930s. Each episode includes a feature-length story from the print magazine. The first two podcasts looked at ylang-ylang essential oil in the Comoros Islands and restoring the Scottish Highlands ecosystem.

http://geographical.co.uk/podcasts

Desert Oracle Radio is broadcast on Friday nights at 2200 local time on KCDZ 107.7 in the Mojave high desert. Ken Layne has a great voice for radio and his observations and anecdotes of strange happenings in and around Joshua Tree National Park in California make for an enthralling listen.

www.desertoracle.com/radio
https://tinyurl.com/du4nd9hk

Cole Moreton (BBC Radio 4) and Emily Jeffery present the Edge of England podcast, from the south coast. It delves, *"deep into the deep South, where we're closer to France than we are to Westminster but if you go too far you fall off."*

The ever-changing landscape of the eroding chalk cliffs and stories about the people who live and work there.

https://edgeofengland.com

The Announcers

A departure from podcasts but I must mention a TV series that I am sure readers will enjoy. *The Announcer* is a French series, made in 2018 and set in 1962, during the aftermath of the French conflicts in Algerian. It is a six-part drama that takes place at a real-life French broadcaster, RTF (Radiodiffusion-Télévision Française).

Plenty is going on: Political intrigue and sex scandals, the De Gaulle government interfering with the station's news agenda, police corruption and a Franco-USA initiative to launch a joint satellite TV venture, Mondovision.

The main character, **Christine Beauval** (played by Marie Gillain) is the TV announcer, breaking the glass ceiling but juggling a complicated family and personal life, plus sexism in the workplace.

Add to this a selection of stylish French furnishing and radios plus Parisian chic, flair, fashion and some strong characters (heroes and villains) and it makes a perfect mix. *The Announcer* has been available since last November on Channel 4's 4OD platform, as part of the wonderful *Walter Presents* international series.

Radiodiffusion-Télévision Française was the French public service broadcaster, founded in 1949. It was later replaced by Office de Radiodiffusion-Télévision Française, which ran from 1964 to 1974. All programming was strictly controlled by the government.

https://tinyurl.com/zx693jh3
https://tinyurl.com/rmvasfz6

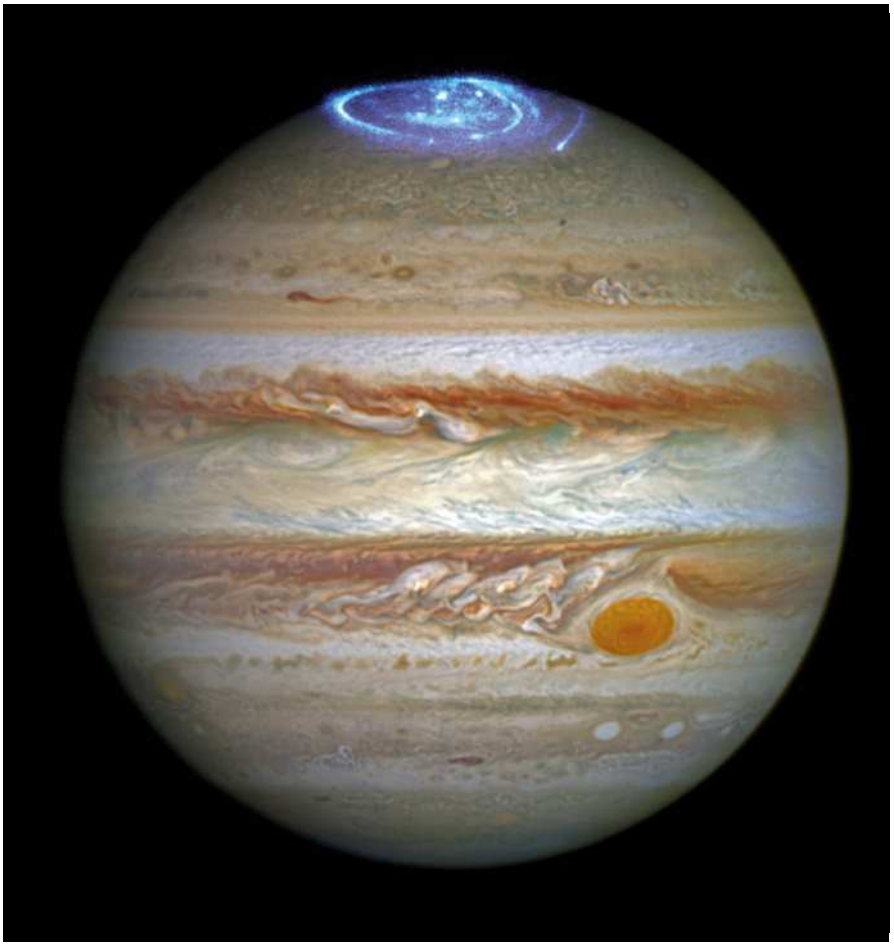
An announcer also stars in a podcast episode of WNYC Studios and Snap Judgement's *Spooked*. A spine-chilling 33 minutes await you a haunted Mexican station Radio Centro. Season Five, Episode 13 back in October of last year.

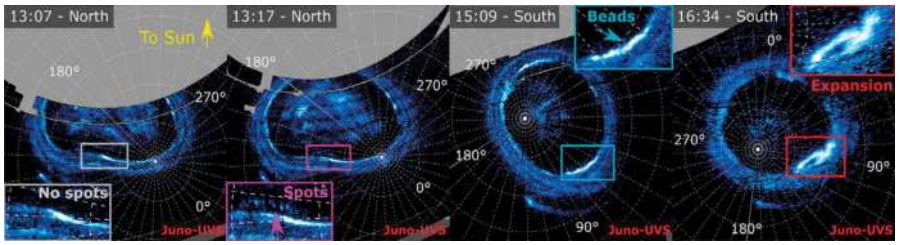
www.wnycstudios.org/podcasts/spooked
https://tinyurl.com/3kren3h9

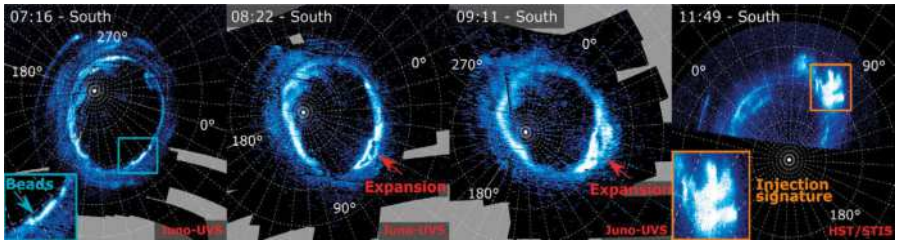
Radio News

AMSAT JOURNAL: A bi-monthly digital magazine for amateur radio in space enthusiasts, published by the Radio Amateur Satellite Corporation (AMSAT). A source for hardware and software projects, technical tips, STEM initiatives, operational activities, and news from around the world. Join AMSAT today to get immediate access to the latest issue and archived issues of The *AMSAT Journal*. Inside the Current Issue (January/February 2021), you will find articles on the following subjects: Apogee View – Robert Bankston, KE4AL | For Beginners – Amateur Radio Satellite Primer IX – Keith Baker, KB1SF/VA3KSF | The Yolinda Lindenblad: A Wideband Omnidirectional Circularly-polarized Antenna – Lapo Pieri, IK5NAX | Martha Saragovitz Retires – Keith Baker, KB1SF/VA3KSF & Joe Kornowski, KB6IGK.
(SOURCE: AMSAT)
https://www.amsat.org

BDXC COMMUNICATION:
(Issue 557 | April 2021 | ISSN 0958-2142)
www.bdxc.org.uk
CQ-DATV:
(Issue 94 | April 2021)
https://cq-datv.mobi/94.php
CRYSTALS GO TO WAR: A great story (in pictures) about the preparation and manufacture of quartz crystals for radio communication. Produced by André de LaVarre.
https://tinyurl.com/w2nnkuza
DOMESTIC BROADCASTING SURVEY: DBS 23 (Anker Petersen, DSWCI) The next edition of the Domestic Broadcasting Survey
http://www.dswci.org
EOS SCIENCE NEWS (AMERICAN GEOPHYSICAL UNION, AGU):
Recent articles on Radio:
https://eos.org/?s=Radio
E-MWN (MEDIUM WAVE NEWS):
(Volume 67, No. 1, April 2021)
'USING CARRIER SLEUTH': Medium Wave News 66/10: 65-73 (Medium Wave Circle)
http://www.mwcircle.org







DAWN STORMS AT JUPITER: Bonfond et al. [2021] are the first to provide a global description of dawn storms in Jupiter's aurorae, from their initiation to their end. Their work utilizes comparative planetology, where the authors have compared their observations at Jupiter to observations at Earth. They show that Jupiter's corotation-dominated magnetosphere has auroral features which combine effects of co-rotation and (solar-wind-driven) 'tail-substorm-depolarization', mapping to ionospheric features visible both by *JUNO* spacecraft imaging and by the *Hubble Space Telescope*. This type of study helps us probe and better understand physical processes that affect Earth directly.
(SOURCE: Bonfond, B., Yao, Z., Gladstone, R. et al. [2021]. 'Are Dawn Storms Jupiter's Auroral Substorms?' *AGU Advances*, 1, e2020AV000275; M. Hudson, Editor, *AGU Advances*.
https://doi.org/10.1029/2020AV000275

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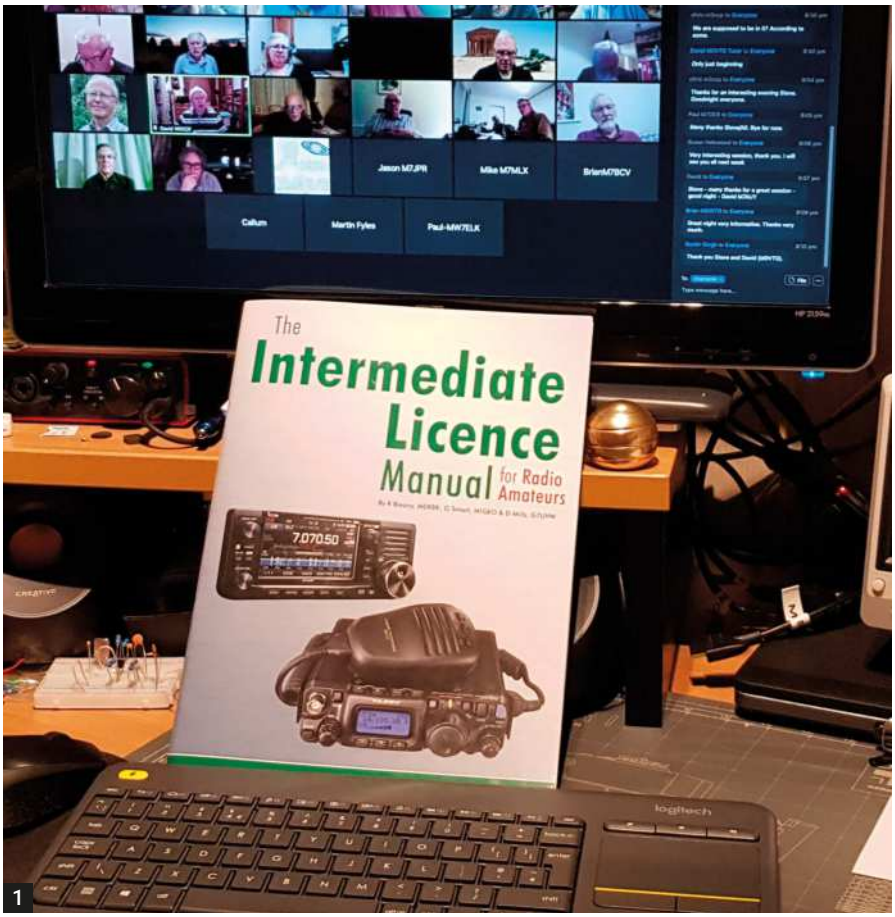
BBDL



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Amateur Radio Distance Learning in the UK

Steve Hartley, GOFUW shares his experiences with running the Bath Distance-Learning Course for Radio Amateurs, looking at the unique approach to, and structure of, this course and at success rates.

It was only when I was sitting down to pen this that it struck me that I have been doing radio for just over 40 years, initially on CB and then on the amateur bands. Back in the 1980s, it was quite an undertaking to do the *City & Guilds Radio Amateurs Exam*. Now, with the three-step system, it is much more accessible.

However, the Covid-19 pandemic put paid to any classroom training for the UK amateur radio exams. Therefore, many have turned to distance learning to fill the void, especially when they found themselves with time on their hands, during various periods of lockdown.

Several radio clubs and individuals started to offer online support, and the numbers taking the *Foundation Licence* exam broke all records. This was helped by the Radio Society of Great Britain (RSGB) making the exams available online, from the comfort of your own home, and waving the requirement for the *Foundation* and *Intermediate* practical assessments.

But distance learning for the amateur radio exams did not start with Covid-19; some teams have been offering such training for years now. I am proud to lead the Bath Based Distance Learning team, who have been running courses for the top-level exam since 2011. It was not, perhaps, that well known – because we did not publicise it – that the Bath team also offered *Intermediate* Distance Learning courses (Fig. 1).

We did not advertise those courses because we were only able to cope with small numbers and we feared being overloaded if word got out! At the *Foundation* level, the Essex Ham training (Fig. 2) is very well respected, popular and successful.

Launched in 2015 they have had over 5,000 students enrolled for training – more than 3,000 since the first lockdown.

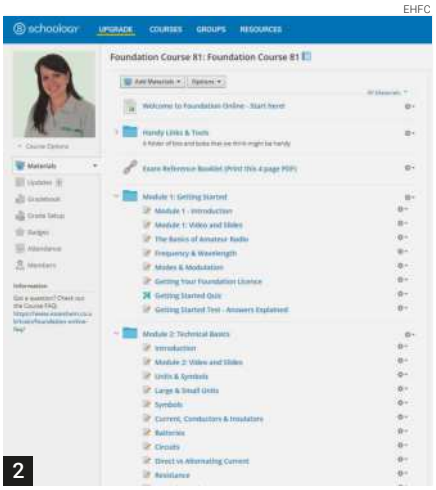
Distance Learning Approaches

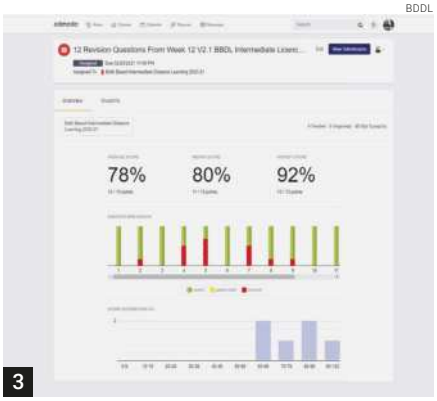
Like many things, there is no single approach to distance learning; different providers do things in different ways. My own approach has its roots in the Open University (OU), where I studied and gained my first degree, and in the work that I currently do with Portsmouth University's *Learning at Work* department.

In both cases, the students rarely meet their tutors, and all learning is done away from a traditional classroom. With the wonders of the internet, we now have online classrooms, or Virtual Learning Environments, electronic document transfer, virtual meetings, and a raft of other facilities available.

At the core of all of our training are the RSGB's textbooks, which are intended to provide the learning material required by the relevant exam syllabus. By and large, they do that, but we find many people need some help to work through the books, especially at the top level and at the intermediate stage.

For those coming to the hobby with zero background, even the *Foundation* can be a bit daunting, so having some distance learning support is very reassuring. Of course, some smart folk can simply read the textbooks and pass the exams; I have arranged exams for a few people who have done that and completed all three exams in a single sitting, but I find that these are few.





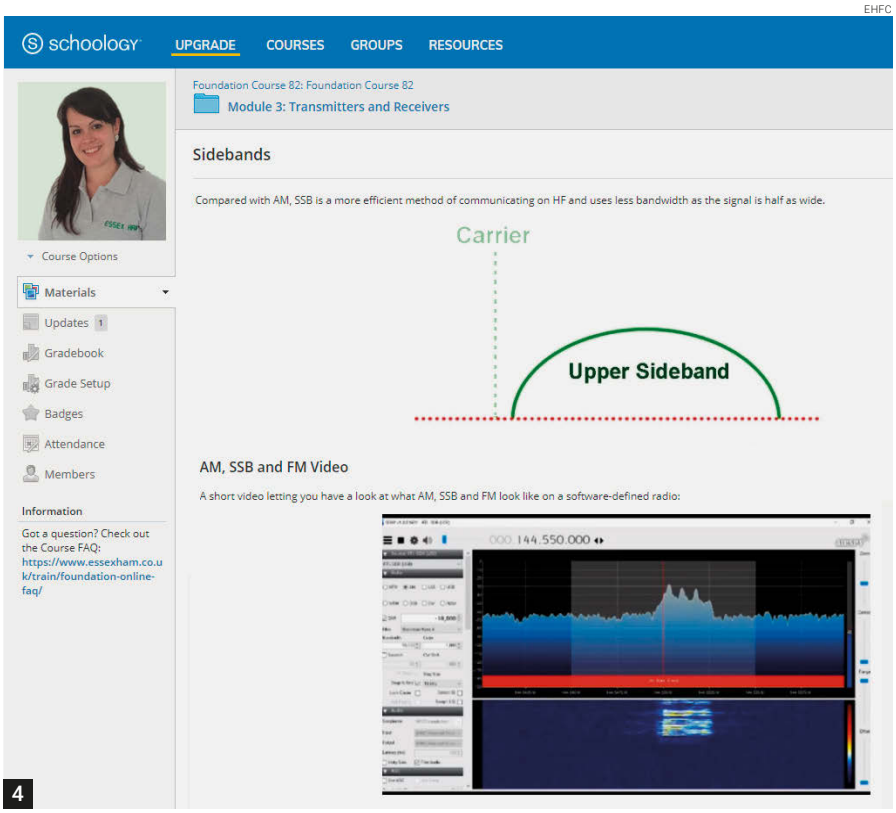


Fig. 1: BBDL Intermediate *Zoom* Tutorial. Fig. 2: The *Essex Ham Foundation Course* on Schoology. Fig. 3: *Edmodo* Intermediate Quiz Results. Fig. 4: *Essex Ham Foundation Course*: Example of Learning Materials.

The online classrooms are essentially websites that guide you through sections of the books with additional material like videos, quizzes (Fig. 3) or exercises to help bring the texts to life. They also provide a closed community for learners to seek advice from their peers, as you would in a traditional classroom, or at least at break times or after school'. This peer group support can be a very valuable part of distance learning for some; knowing you are not alone is sometimes all you need to keep the motivation alive.

The Bath Team approach is based on learning a bit, checking recollection and/or understanding and then moving on, with occasional pauses to look back again at what has been covered to date. This approach is very successful as it flags up weak spots and allows learners to revisit topics and build strength. We also provide a number of mock exams at the end of the course to help prepare for the real thing and make it less unfamiliar for those who have either never sat exams or have not sat them for a long time.

Our original distance learning offering was effectively an online version of our classroom training that had been running successfully for a decade. Therefore, it was just a case of finding a way to get it to people remotely. Initially, we used an e-mail group, which was OK but had some limitations.

Then we were pointed towards the *Edmodo* system (Fig. 3). This is free and works well (most of the time). Others use *Google Classroom, Microsoft Teams* or *Schoology*, to name just a few.

Pete Sipple, M0PSX, who runs the *Essex Ham Foundation* courses (Fig. 4) uses a very similar approach, albeit using a different Virtual Learning Environment (VLE). He told me they have nine modules with a quiz at the end of each module. In addition to this, there are three mock tests at key milestones. Online lessons are posted every two to three days, with narrated videos and slides. The courses are free of any charge and are supported via an optional Facebook group and recently-introduced optional live webinars.

The *Online Amateur Radio Community* are another group that follow a similar blend of on-line meetings and textbook study. Their courses are said to be more suited to those who are comfortable with modern communication methods, from *Google Classroom and Zoom* through to *Discord*. This provider runs *Intermediate* and *Full* level courses for just £5 to cover admin costs.

Course Length

Again this is not fixed. How much you put into each week determines how many weeks it will take. Some distance learning providers work at a quick pace, and their courses are suited to those who are used to studying and/or with a radio/electronics background.

One example of this approach is the *On-Line Radio Community*. They favour a fast-track approach with the *Intermediate* course being completed in 7 weeks and the *Full* level in 9 weeks. Their website notes that it is an intense pace and requires significant self-study, although off-line support is available from community members. Pete's *Essex Ham Foundation* course runs for three weeks and works well for those coming into the hobby.

The Bath team take a slightly slower pace. Our *Intermediate* and *Full* courses now run for 16 weeks each. This includes a couple of revision weeks and a week designated as 'Exam Week'. Each week covers about five or six pages of the textbook with practical exercises when relevant, videos, and one or two quizzes.

This all takes time; therefore, we advise learners not to underestimate the commitment required for study.

Many of our students are busy people

and taking on a course of study adds to an already busy life. We do see some folk dropping out, especially when life throws a banana skin in their way; promotion, redundancy, bereavement, divorce, serious ill-health, and death have all featured at times.

We set out with weekly work packages; some simply provide the whole course material and leave the learner to work at their own pace during the week. However, we have been told by students that having a regular structured course helps to keep them on track.

Some say we go too fast; some say it is too slow, most seem to think it is just about right.

Are All Students, Engineers and Academics?

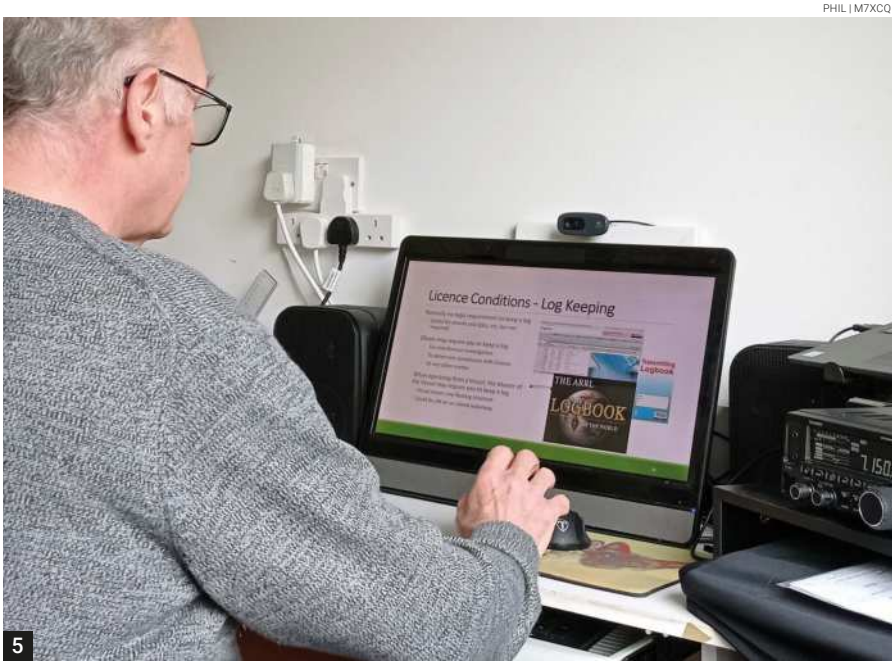
Far from it! I often joke that we have seen the butcher, the baker and the candlestick maker on our courses. The last one may be a fib, but we have seen rock stars, TV presenters, accountants, lawyers, painters, welders, homemakers, a cat breeder, farmers, and so on.

The age range has been from teenagers to those in their 80s and we have had people from just about every part of the UK, plus some overseas students. The only common features were an interest in amateur radio, a desire to learn, and the ability to put in the time.

What Do the Results Look Like?

One of the downsides of distance learning is that you do not always hear from students after the exam. I generally chase down those who complete our courses, but it is amazing how many just disappear. I had assumed that no news was bad news in those circumstances, but I have subsequently found out that some passed and assumed we, as tutors, were told.

PHIL | M7XCQ



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Therefore, data is less than 100% reliable; if anything, it understates the success, due to the nil reports being counted as fails.

The *Bath Based Advanced Distance* Learning courses ran from 2011 to 2019. In that period we had 1711 registrations. Some were repeats due to dropouts, or exam failures, so we cannot say how many individuals that is, but it's a lot. Of those registrations, 935 (55%) completed the courses.

That appeared quite low, and we tried various ways of 'incentivising' people to stick with it. However, the drop-out rate remained about the same throughout. The Open University publish their completion rates and it was surprising to see that our rates are very good, by comparison; it seems that distance learning generally has a low completion rate.

On a different note, of those who completed our courses and sat the exam, 85% passed. That compares with a national pass rate over the same period of 65%. As our name spread, more and more students came our way, and in 2017 we trained 44% of all those who passed the UK Advanced exam. One of our students suggested we look at the national pass rate without our passes and that showed the national pass rate for those studying elsewhere was 59%, compared with our 85%.

So, you can maybe see why I have some pride to be leading the BBDL team!

I do not have data on our old *Intermediate* courses as they were tagged onto our classroom courses, but I can only recall a handful of failures at that level.

We do not yet know if the work we did to re-align our material to the 'new' 2019 syllabus has worked, as none of our new

Some Bath Distance Learning Course Testimonials

The attraction of the Bath intermediate course for me has been (a) the wealth of teaching material - Live Zoom session, video recordings of the sessions, presenter slides, weekly instructions, practical exercises, weekly quizzes and worked answers for the quizzes (b) the organisation of this material. Not easy to achieve but I know exactly where to find everything (c) the personalised responses from the personal tutors to quiz questions I got wrong. Not only does the Bath team know their stuff from years of experience but they know how to communicate it. The course is not easy but rewarding. The pre-course classroom work was key in ensuring I knew what I was getting into. I cannot believe I do not have to pay for this!
Gurbir Singh | M7DSN

I began my Ham radio journey by joining my local club and signing up on the Foundation Course, I had also participated in the Essex Ham online course which together with the mock exam test helped me enormously - and was devastated when lockdown occurred, and my exam was cancelled but delighted when I was able to take it online. So when I learnt that the Bath Team were offering an online course for the Intermediate Licence, I jumped at the chance to take part. The tutorials together with the slides, weekly instructions, videos and of course tests are giving me an excellent grounding and did not hesitate to book my Intermediate Exam. Without these online facilities, I would be stuck at the Foundation level.
Graham Postlethwaite | M7POS

Fig. 5: Phil | M7XCQ, learning online.
Fig. 6: The BBDL Team Leader on Screen.

BBDL | STEVE HARTLEY

students sat any exams. The progress thus far on our *Intermediate* course suggests that we are on the right track. With our first new Full Licence course about to start, it will not be too long before we have data to compare the old and the new. Watch this space.

Course Fees

Our courses, and many other Distance Learning courses, are free; they are run by amateurs who do it for the love of the hobby and the reward of seeing newcomers learn and grow their knowledge, understanding and experience of amateur radio. Some distance learning providers charge a small fee to cover their costs, and there are some commercial operations that, not surprisingly, charge commercial rates.

The only costs that are inescapable are the *Foundation, Intermediate* and *Full Licence* textbooks, which are very reasonably priced at £6, £9 and £14, and the associated exam fees, which are £27.50, £32.50 and £37.50. For the *Intermediate* and *Full Licence* training, we also advise buying a Casio scientific calculator for about £12, not because we own shares in Casio, but because the tutors all know how to drive them, and it makes writing training material so much easier if everyone is using the same gear!

For our *Intermediate* course, we also supplied a small kit of parts to allow students to carry out practical exercises in measuring resistance, voltage, and current and building an oscillator. We used solderless breadboards and the total cost was just £6. Students had to provide their own multi-meter, which is a useful thing to have in a radio shack in any case.

By the way, it may be a coincidence, but those who did the practical work appeared to score better marks in our progress tests.

How do I find out more?

With more and more on-line resources becoming available, there has never been a better time to get an amateur licence. The best starting point if you are looking for distance learning for amateur radio is the RSGB web page :

https://tinyurl.com/4hm763k3

This contains a list of providers for each of the three levels. In our case, we advertise our courses via the *Radio Enthusiast* website, the RSGB GB2RS News, Southgate News, ICQ Podcast and the Bath & District ARC training web page

www.radioenthusiast.co.uk
https://badarc.webs.com/bath-training

If you have any general questions about distance learning, I am happy to answer them. Please e-mail me via the e-mail address shown at the head of this article.

Table 1 contains some representative examples of feedback from students on the course.

I have done quite a bit of training over the years, more recently this involves watching pre-recorded online web-based courses with little or no direct contact with tutors or other students. Sometimes this is fine, but I don't think it's as effective as putting your knowledge into practice. For me, all this pales into insignificance because the beauty of the BBDL approach is a truly blended model. We not only have the live sessions, which are recorded and can be re-watched, paused, and rewound - we can ask questions and interact with other students via the Edmodo pages. It doesn't stop there though - having the luxury of a dedicated tutor who can respond quickly to any questions or problems is the icing on the cake. Nothing is off-limits, and the material covers exactly what we need to know - addressing one of the main problems with the books in sticking to the syllabus. The textbooks assume more than they should and veer off tangent into topics that aren't needed at the expense of topics that are barely touched-upon and feel like they are in the wrong order too. Too much info perhaps, but I have heard the term blended-learning a lot and this is the first time I have experienced it in this 360-degree style - you have so many ways of engaging with the subject that everyone should benefit.
Paul Wood | M7NKY

Notes about the author: Steve Hartley, G0FUW (Fig. 6) has held a radio amateur licence since 1984. He has been involved in training newcomers for many years. He was involved in developing the 3-tier exam system and has written textbooks on the subject. He has held several posts with the Radio Society of Great Britain, including Company Secretary, Director and Chairman. He is now a trustee of the Radio Communications Foundation charity and Chairman of the G-QRP Club. He is semi-retired and lives in Bath with his wife Jane and their three cats.

Callsign Prefixes, Renaming North Sea Helicopter Tracks, and Brize Norton

David Smith
dj.daviator@btinternet.com

David Smith explains radio callsign prefixes, reports on changes in North Sea helicopter route denominations, has a short news item about remote towers in the UK and includes a profile of ATC at RAF Brize Norton.

The official list of callsign names and codes is published periodically by ICAO as *Doc 8585, Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services*. The latest edition, the 195th, was published in January 2021 at the eye-watering price of US$289! However, it is possible to find previous editions online in full, albeit a few years out-of-date.

For more current information, you can enter the three-letter code or spoken designator in either of the two websites below:

http://www.avcodes.co.uk
http://www.airlinecodes.co.uk/home.asp

In this way, the identity of the operator will usually be revealed.

The radiotelephony callsigns range from the very obvious such as Air Canada, American and United, to some very obscure ones. For example, Jet2 use *Channex*, a portmanteau-term stemming from the company's original name of Channel Express. South African Airways has always used *Springbok*, in homage to the animal painted on their aircraft as far back as the 1930s, even though this emblem has long been superseded. Cedar Jet identifies Middle East Airlines, this tree being symbolic of Lebanon. Moreover, Aer Lingus's *Shamrock* is immediately recognisable.

An example of a smaller commercial company is the German Hahn Air, which uses the callsign *Rooster*. Not so mysterious when you discover that its base at the town of Hahn is also the German word for rooster!

Quick Air Jet Charter, also in Germany use *Dagobert*, the name of several kings of an area that covered much of what became Germany centuries later. American cargo operator Kalitta Air uses *Connie*. It might sound odd at first, but not when you know that Kalitta's callsign comes from its founder Connie Kalitta.

The *Avcodes* website (above) has a historical section listing many (now defunct) companies. Notable among them are Pan-American, which used *Clipper*. Air 2000 was *Jetset*, Canadian Pacific was *Empress*, FlyBe was *Jersey* (from its origin in Jersey Airlines); the UK airline Novair was *Starjet*, and – perhaps this is - self-explanatory – Monarch used *Britannia*.

Requests for the registration of, or change in, a designator will only be recognised by ICAO when received from the state having jurisdiction over the aircraft operating agency. Conversely, when a designator is no longer required, ICAO should be informed immediately but undertake not to reassign it until a period of at least 60 days has elapsed.

https://www.icao.int/Pages/default.aspx

Some years ago, ICAO issued a safety bulletin highlighting the fact that the word 'Air' was used either as prefix or suffix in more than one in five radiotelephony designators in use worldwide. Furthermore, one of its derived translations, 'Aero' in the Spanish language, represented 270 cases worldwide. 'Avia' used by many Russian operators occurred 174 times, 'Jet' 155, 'Trans' 134, 'Express' and 'Cargo' 83 times each. Less numerous examples included 'Flight', 'Star', 'Service', 'Charter', and 'Wings'.

The situation is little changed today, and the potential for callsign confusion leading to dangerous situations is obvious.

Reordering the North Sea Helicopter Track Structure

A track structure exists for use by helicopters operating in support of the North Sea Oil and Gas industry. Historically, each track has been named a Helicopter Main Route (HMR). In order to differentiate these tracks from designated Air Traffic Services Routes, the title has been changed to *Helicopter Main Routing Indicators (HMRIs)*. The track structure is established across the northern North Sea, west of Shetland (Atlantic Rim) and in the *Anglia Radar Area of Responsibility* in the southern North Sea. The naming/numbering of individual tracks is unchanged, for instance, 'HMR053' will be renamed 'HMRI053', and 'HMR X-Ray' will be re-named 'HMRI X-Ray'.

Remote Control Tower Developments

The MoD has issued a tender for providing remote control tower services for Royal Naval Air Station Predannack in Cornwall. The requirement is for services to be performed from RNAS Culdrose.

The tender includes options for similar operations at other unspecified locations.

My aircraft photos this month show a Bristol Britannia at RAF Cosford and a Convair 440 Metropolitan in the Finnish Aviation Museum, near Helsinki Vantaa Airport.

https://ilmailumuseo.fi/en/info

RAF ATC Profiles 2: Brize Norton

ICAO Code: EGVN IATA Code: BZZ

Frequencies	(MHz)
Brize Approach/Radar	231.950
	127.250
	278.350
Brize Zone	119.000
Brize Director	399.025
	133.750
Brize Talkdown	362.225
	123.550
Brize Tower	120.675
	123.725
Brize Ground	341.200
	121.725
Brize Ops	369.900
	373.100
	130.075
ATIS	
Brize Information	284.975
	126.500
Navaids	ILS CAT I Runways 07 and 25
	TACAN BZN 111.900
	NDB BZ 386kHz
Runways	07 (3050x 45m)
	25 (1683 x 45m)

NOTES (A-Z)

Helicopter Operations
Helicopters operate south of Taxiway G normally not above 800ft QNH. Helicopters should normally approach and depart from the main runway and hover taxi to dispersal as required.

Military Emergency Diversion Aerodrome
Brize Norton is designated as such.

Preferred Runway
Runway 25 is the preferred runway unless either the tailwind exceeds 5kts or the pilot requests otherwise. Light aircraft and rotary traffic arriving/departing Brize under Visual Flight Rules (VFR) will be required to enter or leave the Brize Control Zone via the Burford or Faringdon Visual Reference Points.

Training
Limited training available because of noise abatement procedures. Restrictions on visual circuits apply. Practice diversions 0800-2200 Mon - Fri only, except holidays. Only one straight in approach and touch and go permitted.

Visual Reporting Points
Bampton; Burford; Charlbury; Faringdon; Farmoor Reservoir; Lechlade; Northleach Roundabout.

Warnings
The aerodrome lies within the Oxford AIAA. Oxford ATZ overlays the north-eastern corner of the Brize Norton CTA. Light aircraft flying club operates seven days a week, visual circuit height 1300ft QNH.

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ICOM

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

Handheld

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

Base

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

Accessories

BC-194 drop in charger for IC-R6 ..... **£21.95**
CP-18E cigar lighter cable **£24.95**
CS-R6 cloning software for IC-R6 ..... **£34.99**
SP-27 clear acoustic earpiece **£24.95**
BC-223 rapid charger for IC-R30 ..... **£59.95**
BP-287 hi capacity 3280 mAh replacement battery for IC-R30 ..... **£74.95**
BP-293 dry cell case (3x AA) for IC-R30 ..... **£34.99**
CS-R30 programming software for IC-R30 ..... **£59.95**
LC-189 soft case for IC-R30 ..... **£24.95**
CS-R8600 software for IC-R8600 ..... **£69.95**
RS-R8600 remote control software for IC-R8600 ..... **£99.95**
RC-28 remote control system for IC-R8600 ..... **£279.95**
SP-38 desk top speaker for IC-R8600 ..... **£149.95**
SP-39AD external speaker with DC power supply for IC-R8600 ..... **£199.99**
AH-8000 100-3300 MHz professional discone receiving antenna **£209.95**

bhi Noise Cancellation Products

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

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

Uniden

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

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

Handheld

EZI-33XLT 78-174/406-512 MHz 180 channel analogue scanner **£64.99**
EZI-33XLT PLUS as above but includes rechargeable NiMH batteries and USB charging cable **£74.95**
UBC-75XLT 25-512 MHz 300 channel analogue scanner **£99.95**
UBC-125XLT (best seller) 25-960 MHz 500 channel analogue scanner **£139.95**
UBCD-3600XLT (NXDN Version) 25-1300 MHz Digital & Analogue scanner **£479.99**
SDS-100E Advanced 25-1300 MHz Digital & Analogue scanner **£589.95**
SDS-100EDN as above but preloaded with DMR & NXDN **£649.99**

Mobile/Base

UCB-355CLT 25-960 MHz 300 channel analogue scanner **£89.99**
UBC-370CLT 25-960 MHz 500 channel analogue scanner **£119.95**
BCT-15X GPS enabled 25-1300 MHz 9000 channel analogue scanner **£249.95**
SDS-200E Activated DMR+NXDN+ProVoice 25-1300 MHz Digital & Analogue **£749.99**

Accessories

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

DIAMOND ANTENNA

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

Scanner Antennas

D777 is a VHF/UHF civilian and Military air band receiving antenna. It has a gain of 3.4dB on VHF (120MHz) and 5.5 dB UHF (300MHz) with a length of 1.7m and SO239 socket for easy connection **£64.99**
D-190 is a high performance wideband discone antenna covering 100-1500 MHz including 10m RG58 terminated in PL259 ..... **£99.95**
D-130M is a Discone antenna with wide frequency coverage on receive 25 to 1300MHz and covers 6m (20W) and 2m (200W) when used with a transmitter. This model is supplied with 15m RG58A/U and 2 x PL259 plugs **£129.95**

WHISTLER

BACK IN STOCK

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

Handheld

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

Mobile/Base

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

Accessories

TRX-1 leather case **£29.99**
MRW-TRX3 Triple hand held replacement antenna pack to increase performance **£39.95**
TRX-1 or TRX-2 SD Card – preprogramed with Airband, Marine, 446, FM/DMR/NXDN/25 Repeaters + FM/DMR simplex **£19.99**

LEATHER CASE for TRX-1 £29.95

FlightAware

Live Flight Tracking

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

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

AIRSPY

Redefining The Radio Experience.

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

HF+ Discovery 0.5kHz – 31MHz VHF 60-260MHz SDR receiver **£199.95**
R2 VHF/UHF 24-1800MHz SDR receiver **£209.95**
MINI VHF/UHF 24-1700MHz SDR dongle..... **£119.95**
Spyverter R2 extend your AIRSPY coverage **£59.99**
NEW YouLOOP indoor HF Antenna 0.5-52MHz **£29.99**

TECSUN

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

Portable

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

Electronics Multi-function EMF Meter

Just what you need to make your EMF measurements

This multi-function digital EMF meter is designed to be a portable device. It can be used as industrial, commercial maintenance, research, evaluation, simulation and other analytical or scientific applications in areas such as industrial plants, public utilities, universities, laboratories, and electronic repair shops. The device integrated testing features include three axis Electromagnetic Fields, Electric Field, Radio Frequency and Radio Spectrum Power Analyzer..... **£115**

MOONRAKER

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WS200 V2 Professional Solar Weather Station

This Moonraker Weather station utilises a solar panel for the outside unit which sends the collected data to the indoor display unit wirelessly. The indoor unit displays Indoor and outdoor humidity, Indoor and outdoor temperature, Wind speed, Wind direction, Rainfall, Time, Date and available memory..... **Only £64.99**

Scanner Antennas & Accessories

To get the best out of your scanner or receiver look at getting a better antenna or an amplifier – we have what you need and in stock ready for same day despatch

Beam Antenna

MLP-32 100-1300MHz Log Periodic Antenna Length: 142cm Connection: N-Type .
£199.99
This month only just
£99.95!

The log periodic antenna is a particularly useful design when modest levels of gain are required, combined with wideband operation. A typical example of this type of RF antenna design will provide between 4 and 6 dB gain over a bandwidth of 2:1 while retaining an SWR level of better than 1.3:1. With this level of performance it is ideal for many applications, although a log periodic antenna will be much larger than a Yagi that will produce equivalent gain. However the Yagi is unable to operate over such a wide bandwidth

Discone Antennas

DISCONE 25-13000MHz Discone antenna Length: 100cm Connection: SO239 ..... **£39.95**
ROYAL DISCONE 2000 25-2000MHz Stainless Steel Discone Length: 155cm Connection: N-Type..... **£59.95**
HF DISCONE 0.05-2000MHz Length: 185cm Connection: SO239 ..... **£69.95**

Base Antennas

GPA-RX Wideband HF/VHF vertical antenna Freq: 2-90MHz Length: 600cm Connection: SO239 ..... **£99.95**
X1-HF Wideband HF/VHF vertical antenna Freq: 1-50MHz Length: 200cm Connection: SO239 ..... **£69.95**
D777 Civil & Military GRP receiving antenna Freq: 120/300MHz Gain: 3.4/5.5dBi Length: 1.7m Connection: SO239 ..... **£54.95**
SSSMKII The original white stick scanner antenna Freq: 25-2000MHz Gain VHF 4.5dBd+ UHF 7.2dBd+ Length: 150cm Connection: SO239. ..... **£49.95**
SSSMKI as above but compact version Freq: 25-2000MHz Gain VHF 2.5dBd+ UHF 3.2dBd+ Length: 75cm Connection: SO239 ..... **£39.95**

Desktop

SKYSCAN DESKTOP this is the best all round wideband 25-2000MHz desktop scanner antenna on the current market – comes complete with 4m RG58 terminated in BNC **£49.95**

Amplifiers

MRP-2000 MKII 25-2000MHz 6-20dB gain complete with BNC patch lead **£39.95**
M-100 Professional 24-2300MHz -10-2300MHz variable gain complete with BNC patch lead **£69.95**

MINI-1300 0.1-1300MHz Handheld Antenna Analyser

Instantly check and tune any antenna from 0.1-1300MHz with this rugged easy-to-use complete antenna test unit No more lugging bulky, expensive test equipment to remote antenna sites and hard-to-get-places **£199.95**

Internal SDR Antenna Kit

This is a great complete starting kit for listening to SDR receivers. The loop covers all HF and the desktop discone covers 25MHz and up. All cables included..... **£79.95**

SDRplay

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

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

AOR

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

Handheld

AR-DV10 100 kHz-1300 MHz Digital scanner with TETRA DMR. NXDN. dPMR. APCO25. D-STAR **£939.95**

Mobile/Base

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

Accessories

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

MOONRAKER

MICRO CB

This is a fantastic beginners radio, compact and with only the basic functions needed for simple two way communication..... ~~£49.95~~ **£39.95**

MINOR II PLUS CB

A high quality CB rig covering all standard CB frequencies. The Minor II Plus 80 Channel (works on both 12v and 24v) whilst traditional in appearance, has a wealth of modern features typically only found in more expensive rigs. Included with the radio is DC lead with fitted cigarette plug, perfect for connecting straight to the car or van, as well as a command microphone featuring Auto Squelch on/off and Up/Down channel selection buttons. The radio features RF gain and squelch controls, as well as a quick access channel 9/19 knob. Also supplied with the kit is a mounting bracket, with thumb screws, as well as a microphone hanging bracket. **£59.99**

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Kevin Ryan
kevin@radio-digital.co.uk

DRM for the French Navy and some UK DAB News

Kevin Ryan compiles the very latest DAB News from across the UK, participates in a Hybrid Radio event, reports on new digital radios from India and explains the use of the DRM format for the French Navy.

As we gradually exit the lockdown there are plenty of DAB multiplexes that should be advancing their plans to launch services during the second half of the year. The pandemic delayed the launch of three local multiplex licence awards for the Channel Islands, North/West Cumbria and Morecambe Bay. The revised launch deadline for these three multiplexes is still October 2021, and I can see Ofcom extending the deadline by another three months because of all the uncertainty.

Small-Scale DAB

Alongside the local multiplexes, the first licence awards for round one of the small-scale DAB expansion slowly appeared from Ofcom in early March 2021. By mid-March, just five of the 25 multiplex operators were known (Table 1). Looking through the details, I am surprised at how large some of the areas are.

Northern Ireland

The Derry/Londonderry area also covers Strabane to the south of the city. Foyle DAB Limited is a new operator and proposes using two transmitters to cover the area. It hopes to attract at least six services to launch by the end of the year.

Scotland

Nation Digital Investments Ltd., one of the original trial DAB multiplexes, will continue to provide services in the Glasgow area. It will use two transmitters located in the north and south of the city. The SSDAB licence will operate on a different frequency (10B -> 8B) to the existing trial, which will require some modification to the Dundasvale Court transmitter. Nation is moving its second transmitter to the Arqiva transmission site at Cathcart in the city centre. The launch window is within six to 12 months of the licence award by Ofcom, which makes an end-of-year date likely. The company wants to preserve as much of the footprint as possible from the Glasgow small-scale DAB trial multiplex while making coverage more robust overall. There is some coverage overspill to the North and Northwest of the city. The multiplex operator is a wholly-owned subsidiary of Nation Broadcasting Ltd. Nation is the UK's third-largest operator of local commercial radio licences and has interests in some local DAB multiplexes across the UK.

1

England

Ofcom awarded the Salisbury licence to Muxcast One Limited. The operator is majority-owned by Nation Broadcasting Ltd. and includes BFBS, both as a minority shareholder and a radio service. The plan is for three transmitters in Salisbury to cover the city. The *Bulford Camp* transmitter site will provide coverage in the North, and the *Sandy Balls* location will cover the southern region. Coverage has been planned to provide radio reception as good as listeners would expect to get from national DAB services in the Salisbury area.

Tynemouth & South Shields covers a large area from Wallsend and East Gateshead in the West to Whitburn

"There are plenty of DAB multiplexes that should be advancing their plans to launch services during the second half of the year"

Fig.1: *MUX ONE* is a new multiplex operator with an impressive web site. Fig. 2: *Communicorp UK* runs a franchise of 'Global' stations here. Fig. 3: The *RadioLine* vision for this technology is based on the concept of broadcast radio, combined with IP data. Fig. 4: A new hand-held DRM prototype from *Gospell Radio* aims at listeners in India. Fig. 5: The target areas (red boundary) for DRM transmissions to the French Navy and the service from China Radio International (green) to Australasia.

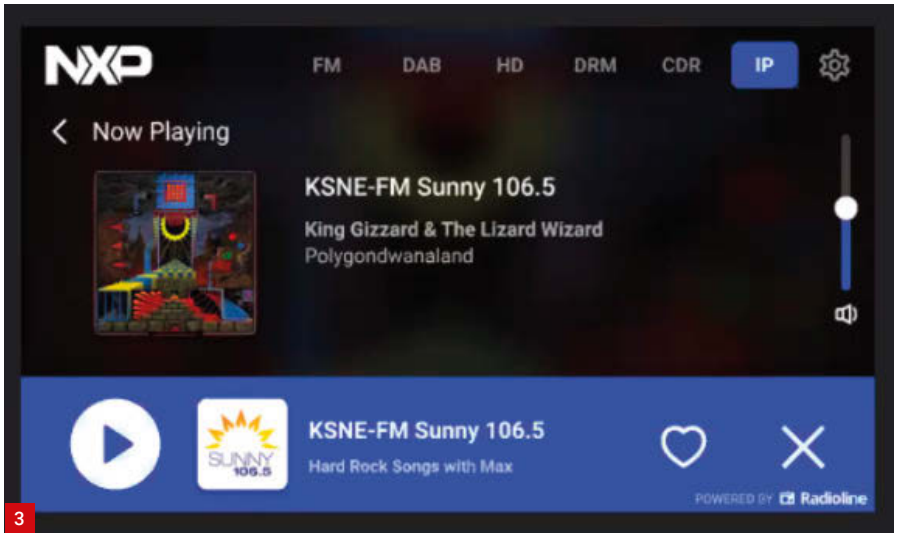
in the East. Mux One Limited (Fig. 1), a new multiplex operator, has quite a list of potential clients from Tyneside communities, including LGBT, BAME, mental health, elderly, hospital, sport and education groups.
https://www.muxone.uk

Wales

The size of the Welsh Valleys licence area surprised me. GTFM (South Wales) Limited lists eight transmitter sites to provide a service to the western part (about a third) of the advertised area, targeting the county of Merthyr Tydfil and the Rhondda Cynon Taf County Borough. Ofcom calculations indicate that this would result in just over 37% of the adult population in the advertised licence area being able to receive the service. Ofcom accepted GTFM's reasoning that the mountainous nature of the terrain in the Welsh Valleys makes it an exceptionally difficult area to serve without a very large number of transmitters, which would add considerably to the overall costs of establishing the multiplex, and probably make it unviable. Six of these will be located in or very near main towns in the area, namely Merthyr Tydfil, Pontypridd, Aberdare, Mountain Ash, Treorchy and Tonyrefail, with a further one serving the Rhondda Fach valley and one in Hirwaun (north of Aberdare and near the main A465 east-west "Heads of the Valleys" trunk route) extending coverage to an area not currently reached on FM by any of our participating community stations but still within the northwestern boundary of Welsh Valleys SSD licence area. GTFM says that the Western Valleys multiplex (I wonder if Ofcom will split the area into East and West at some point) will considerably broaden local listener choice and operate in DAB+ mode to maximise the capacity of the multiplex.

The plan is to carry all the community stations in its catchment area from the outset to a larger area than they reach individually on FM. In addition to this, there will be up to 15 commercial services, many of which will probably not otherwise be audible to listeners in the South Wales Valleys.

2



3

Round Two Ofcom Awards

Ofcom announced that, given the ongoing impact of Covid-19 restrictions, it now expects to advertise the second round of small-scale multiplex licences in the North West of England and North East Wales on Tuesday 1 June. The original plan was to advertise each round at six-month intervals, and this puts that schedule three months behind.

Bauer Media Ireland

Bauer Media is buying the *Communicorp* radio stations in the Republic of Ireland. The deal, if approved by the regulators, is for the group's Irish stations but excluding *Communicorp UK*, which operates the rival *Global Radio* brand (Fig. 2).
https://tinyurl.com/abyuphsa
https://communicorpuk.com/radio

In addition to the two national stations, Today FM and Newstalk, *Communicorp* also owns local stations Spin 1038 and 98FM in Dublin, and Spin Southwest in Limerick, as well as many digital-only radio services like the sports station *Off the Ball*, the digital audio exchange *audio I*, and the listening platform *GoLoud*.

RTÉ DAB

Raidió Teilifís Éireann (RTÉ) is to cease transmission of its radio services on the Digital Audio Broadcast (DAB) network on

31 March 2021 – nearly two years after announcing its intention to do so to save money. However, its digital radio services, RTÉ Gold, RTÉ 2XM, RTÉ Radio 1 Extra, RTÉ Pulse, and RTÉjr Radio, will remain available on Saorview (the equivalent of Freeview), Saorsat (like Freesat) and online. In a statement, the broadcaster said the move to cease DAB transmission was driven by three main factors: first, DAB is the least-utilised platform in Ireland; second, RTÉ is the only Irish broadcaster on the DAB system; and third, the issue of cost reduction. The Irish radio regulators allowed several DAB trials in the past decade but clamped down hard on unlicensed operators (FreeDAB being the prime example). The regulator never produced a solid plan for DAB in Ireland.
https://www.rte.ie

Hybrid Radio

I took part in a webinar on *DAB+ at the Heart of Hybrid*, organized jointly by the European Broadcasting Union (EBU) and WorldDAB.
https://www.ebu.ch/home
https://www.worlddab.org

'Hybrid Radio' is the name given to a technology that combines broadcast (digital radio or FM) and the internet (usually called IP) in the 'connected car' (Fig. 3). It aims to ensure that the tuned audio is not interrupted by a weak radio signal and the radio connects to an internet stream instead. This is not like hybrid radios in the home, where broadcast and IP are separate audio sources that are switched manually.

The event saw presentations from the various groups working to create standards and find solutions for the large car conglomerates. As far as I could tell, the BMW, Volkswagen and Daimler groups are planning to incorporate the technology into car models next year.

I sensed some urgency on the part of the presenters with several mentions of the threat from 'big tech', such as Google's *Android Automotive* operating system and Apple's *Carplay*.

DAB+ is not the only digital radio format being evaluated in this project; HD Radio dominates in the USA; however, there was no mention of DRM. In the roundtable discussion on the innovations DAB+ should be thinking about, one member hoped that DAB+ would use lower compression (i.e. higher bit rates) to be more compatible with other IP providers delivering CD-quality audio. Another panel member said that there was no capacity in the UK to provide data services (images, weather info, and so on) because of the demand for audio. Therefore, data services would have to be transmitted over the internet.
https://en-gb.radioline.co
https://dts.com/autostage
https://radioplayer.org

ALL PICTURES: KEVIN RYAN

AD-820P Pocket DRM/AM/FM Radio
DRM/AM/FM Radio

4

SmartRadio

Frontier Smart Tech invented the concept of the SmartRadio, but I found a recent White Paper by them a bit confusing. The blueprint echoed the view that the future of radio listening is likely to be a combination of DAB+ broadcast and IP services, with broadcast the primary source on a radio. Quoting directly from the White Paper the company state that, *"in an area of poor reception – particularly in an automotive setting – SmartRadio can switch from broadcast mode to IP and stream from the Internet, ensuring constant connectivity"*. This made me wonder whether or not radios in cars would behave differently to those at home, or it is just Frontier Silicon trying to establish its 'SmartRadio' name?

India DRM Tests on VHF

DRM has been tested by many nations on VHF, including in the UK (in Edinburgh). The test was requested by the Telecom Regulatory Authority of India (TRAI) and the Ministry of Information & Broadcasting as part of deliberations, which will lead to the recommendation of the most suitable radio standard to digitise the FM band in India.
https://www.trai.gov.in

The only other possible digital option would be HD Radio, but I am unaware of any tests of that system. The test was officially launched on February 24th and 25th at the Headquarters of All India Radio (AIR) in New Delhi. The transmitter is on 100.7MHz – alongside an analogue transmission on 100.5MHz.

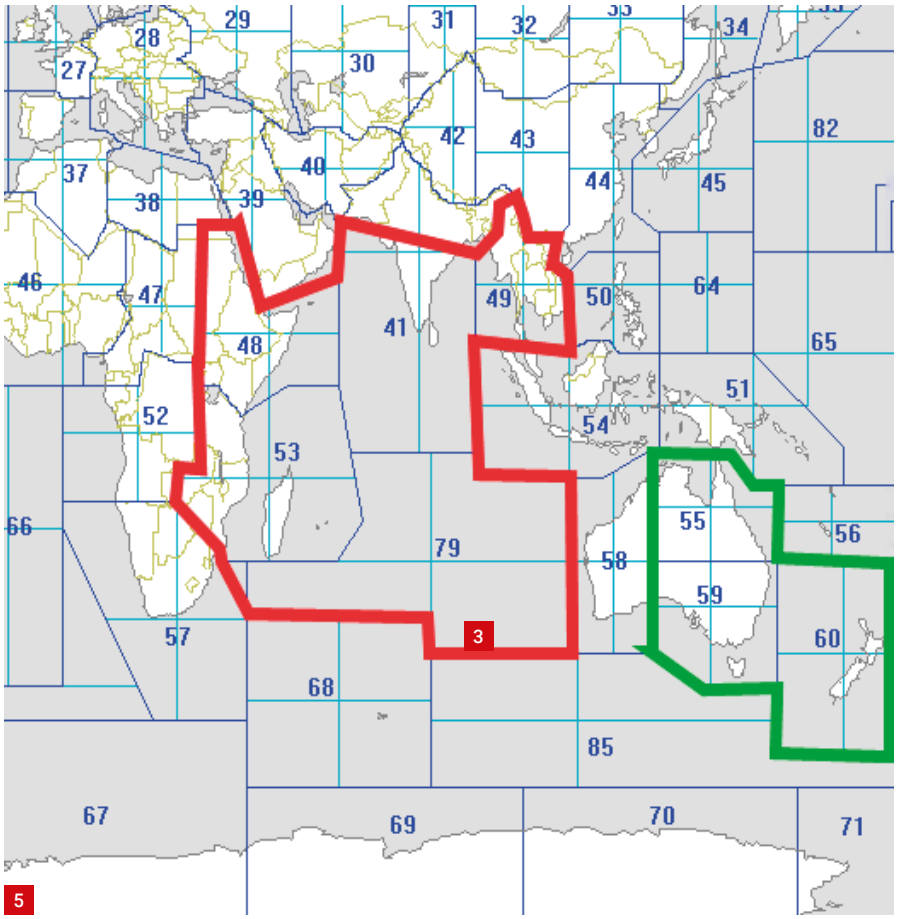
A DRM multiplex carries 3 audio services and one data service.

A test of the multi-DRM transmission of up to 6 DRM signals – providing up to 24 DRM services (18 audio programmes, plus six stand-alone *Journaline* services) from a single FM-band transmitter – was captured by Alokesh Gupta VU3BSE and shared on his Twitter feed. A DRM multiplex is spaced every 100kHz, starting at 100.4MHz.

The second phase will be taking place in Jaipur (I think there is an existing FM transmitter on 100.3MHz) and is designed to prove the compatibility with the FM band channelisation in India, where DRM fills the gaps between existing analogue FM services that are not otherwise usable.

Automotive Tests

There are over 2.5 million cars in India fitted with DRM receivers. The DRM Consortium points out that the India trial has been an opportunity to demonstrate how the existing DRM transmissions in the former AM bands can be upgraded to support DRM in both AM and FM bands



by a simple receiver firmware update (no change in hardware needed). I've watched many *YouTube* clips of listeners receiving the DRM FM-band services in New Delhi, both during the presentation on 24th and 25th February 2021 and during the measurement trips.

www.drm.org

New DRM Receivers

The trial also became another opportunity for the various developers to promote their prototype DRM Receiver models. There are desktop and portable radio sets, software upgrades to existing car radios to extend DRM support to the FM band, and upgrade kits to enable DRM reception on virtually any Android-based mobile phone available to Indian consumers today. Gospell Digital Technology Co., Ltd. announced the availability of three new DRM receivers. These include a new pocket DRM receiver (AD-820P, Fig. 4) for the Indian market. There are two other new tabletop receivers (AD-828P and AD-828PM). These are essentially the same, except that the AD-828PM has 512MB storage for music playback.

http://en.gospell.com

DRM for the French Navy

Télédiffusion de France (TDF) has developed a DRM-based system (*DRMCast*) usually transmitted as a mix of RFI in French and data files sent as multimedia. I successfully received and decoded the sea area weather data broadcast to the boats in the *MiniTransat* race (*RadioUser*, December 2019: 50-53).

https://www.tdf.fr

https://minitransat.fr/en

The target of the latest long-term test has been a mystery, but it appears that it is directed at the French Navy (*DRMC @ ST Project*) and is to test a means of civilian broadcasting complementary to the existing military means. The idea is to free up *Syracuse* satellite communication capacity while using a discrete installation (a small radio receiver with a whip antenna) rather than a visible satellite antenna.

The DRM broadcasts can also be directed at regions not readily covered by military satellites and also cover small ships. In March 2021, for instance, TDF directed the broadcasts to the Indian Ocean (Fig. 5).

https://tinyurl.com/3ctvzfjc

Area	DAB
Alnwick & Morpeth	8B
Basingstoke	7D
Bradford	9A
Cambridge	8B
Cardiff	10D
Clevedon, Avonmouth & Filton	12D
Derry/Londonderry Foyle DAB Ltd	11C
Dudley & Stourbridge	9C
East Bristol & Keynsham	7D
Edinburgh	9B
Exeter	7D
Glasgow Nation Digital	8B
Inverclyde	9B
Isles of Scilly	8A
Kings Lynn	9C
Leeds	8B
Newcastle & Gateshead	8A
North Birmingham	8A
Norwich	12A
Salisbury Muxcast One Ltd.	9A
Sheffield & Rotherham	7D
South Birmingham	7D
Tynemouth & S. Shields Mux One Ltd.	9B
Welsh Valleys GTFM (South Wales Ltd.)	9C
Winchester	9C

Table 1: Ofcom Licence Awards (March 2021).

This solution could make it possible to transmit digital files (for example, image, text, weather files) on the short wave bands, at a higher speed than can be achieved with the Ministry of the Armed Forces existing system.

https://tinyurl.com/3w268cnz

https://tinyurl.com/53xwf62e

This time the data files are in an unknown format and type, probably still associated with maritime weather data. For now, I can only collect them and hope that someone else might find a way to decode them.

CRI on DRM

China Radio International (CRI) registered several DRM transmissions for the A21 season directed towards Australia (Fig. 5).

http://chinaplus.cri.cn/gettheapp

You can keep track of them and all the other DRM transmissions on my website.

https://tinyurl.com/34vhtd8u

Raiders, Jed Sets, Gibson Girls, and Biscuit Tins

Tony Smith returns to RadioUser to unveil some of the stories behind the best-known – and some lesser-known – special-purpose communications receivers in the UK and USA during World War II.

Tony Smith G4FAI
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Some radios used in World War II were very large and heavy. The Wireless Set No.19, with all accessories, for example, weighed just over 86lbs (approx. 39kg) and had to be mounted in a tank or other vehicle, or transported by two men using a specially made stretcher/handcart. At the other extreme, there were some very small transmitter/receivers and receivers, mostly designed for 'special' purposes. Some of these are described here, together with the stories behind them.

The US Raider's Hidden Aerials

The tiny U.S. Navy Model 'RBZ' or *Raider* receiver (Table 1) utilised its operators' steel helmets as an aerial and was intended for use by U.S. Marine Raiders to receive beach landing instructions during amphibious operations. In June 1944, *QST* reported: *"Marine Corps raiders and paratroopers now receive their orders over 'Raider' receivers …. The 'Raider' is a compact kit containing a receiver and battery and is carried on the marine's chest… Unlike most radio equipment in use by the armed forces, the 'Raider' is practically invisible, thus safeguarding its operator in that it does not distinguish him from his companions."*

It not known if the RBZ was ever used on active service. However, a special version, with a modified frequency range, was supplied by the American OSS (Office of Strategic Services) to partisan groups in Occupied Europe. Its small size made it particularly suitable for clandestine reception of BBC news broadcasts and coded messages relating to aircraft supply drops of arms and equipment and, eventually, the invasion of Europe.

In this application, a wire aerial was used instead of the original helmet aerial. Listening to such broadcasts was banned by the occupying power and could incur the death penalty, so great care had to be taken by listeners to avoid detection.

Typical, strange-sounding messages received included *"Yvette likes big carrots"*, *"Paul has some good tobacco"*, *"I want to be a godfather"*, all of which were meant to confuse the enemy who was monitoring the broadcasts, but to have a very definite meaning for the intended recipients.

Wired Wireless: The British Set No. 38

In 1944, the British Army carried out experiments with the low-power Wireless Set No. 38 (Table 2), using a steel helmet as a transmitting aerial for use by troops when in close contact with the enemy. The experiments were abandoned but, more successfully, the set could be used on the battlefield as a 'wired wireless'. When introduced in 1942, it was classified as 'top-secret' and used in Operation '*Chariot*', a combined-forces raid on St. Nazaire. In *The Greatest Raid of All*, author C. E. Lucas Phillips refers to its secret status: *" […] communications will be very important but limited […]; we have been issued with some new and extremely 'hush-hush' portable radio sets with a microphone operating on the larynx. They must on no account fall into enemy hands."*

The Gibson Girl

The famous 'Gibson Girl' aircrew emergency transmitter (officially the 'BC-778'; Table 3), was intended for use after an aircraft ditched in the sea. Using this set, survivors in a rubber dinghy could call for help on the W/T distress frequency of 500kc/s, using an aerial suspended by kite or balloon. The balloon was inflated by a hydrogen generator.

Circuit: 5-valve superhet. AM only. IF 455kc/s.
Frequency range: Original model: 2-5.8Mc/s, covering the tactical frequency range. Special model: 5-13Mc/s, covering BBC short-wave broadcast frequencies.
Tuning: Permeability, with clutch on tuning.
Aerial: 27-inch (686mm) lead-in wire connecting the receiver to a steel helmet acting as an antenna.
Audio output: Headphones (600Ω), fitted in a skull cap worn inside the helmet.
Power supply: Dry batteries: 1 x 67.5 Volts, 2 x 1.5 V (D-cells). Also, for the special model - RBZ Power Pack, Model 2 (110 or 220 volts, AC or DC), housed in the same type of case as the receiver and battery.
Version differences: The original and special versions were identical except that the special set had an internally adjusted frequency range and a new paper scale pasted on the dial indicator.
Dimensions: The receiver and battery pack each measured 8-inches high, 2-7/8 inches wide and 1-7/8 inches deep (203x73x47.6 mm). Weight of combined units, 3lbs 11oz (1.67 kg)
Maker/Date: Emerson Radio & Phonograph Corporation, USA, 1944.

Table 1: The U.S. Navy Model RBZ ('Raider').

Fig. 1: Airborne lifeboat designed by Uffa Fox.

Designed for one-way operation only, the set was powered by a hand-turned generator. When activated, it automatically transmitted the international distress signal (SOS). If required, hand-operated Morse signals could also be transmitted. A hand-powered signal lamp could be used to attract the attention of aircraft flying overhead at night. The lamp could be manually keyed or could project a constant signal light.

The transmitter had an hourglass shape which enabled an operator to hold it stationary between his legs while he turned the generator handle. Its shape led to its nickname, derived from illustrations by Charles Dana Gibson of narrow-waisted American girls (the 'Gibson Girls') in the late 19th and early 20th Centuries. Apart from use with dinghies, the 'Gibson Girl' was also installed in a 22ft-long powered airborne lifeboat designed by Uffa Fox in 1943 (Fig. 1) to be dropped by parachute in air-sea rescue operations.

In 1944, a battery-operated 3-valve regenerative receiver, type R.1545, with a frequency range of 470-530kc/s, with CW, MCW and R/T modes, was also installed in the lifeboat.

Operating in conjunction with the Gibson Girl, this combination provided two-way W/T communication on 500kc/s to facilitate and improve rescue operations. In addition to the Gibson Girl's 300ft wire aerial suspended by kite or balloon, a whip aerial was fixed to the top of the lifeboat's mast.

The Wireless Set No.17

The two-valve WS No.17 (Table 4) was designed by Stan Lewer, G6LJ, for communication between searchlight section HQ's, searchlight and other anti-aircraft units. The initial testing was carried out in the summer of 1939 when a super-regenerative receiver was set up on the roof of the Territorial Army HQ in Edgware, London, to receive test transmissions from radio amateurs in the 56MHz band.

A full-scale demonstration followed. At the outbreak of war, an initial order for 24 sets was placed with GEC (General Electric Co. Ltd.) to provide communication between individual barrage balloon units. Shortly after, two further orders were placed, each for 5,000 sets.

As all detachment sets were on 'receive' during the hours of darkness, long battery life was required, and the WS No.17 unit met this requirement. Although they were intended to facilitate communication between searchlight and anti-aircraft installations, some WS No.17's were also issued to the secret Auxiliary Units (AU's) of the Home Guard.

The Role of Home Guard Secret Auxiliary Units (AUs)

The AUs were set up in 1940 to operate behind enemy lines in anticipation of a threatened invasion. An Operational Branch had a network of hidden underground bases around the country. Their brief was to 'harry and embarrass the enemy by all means in their power from the first day he lands.'

A parallel Special-Duties branch was set up to gain information about the enemy through a network of intelligence gathering, and to transmit this information to the Army. Some 500 sets are believed to have been issued to the AUs, of which about half were of the WS No.17 type.

Most of the other sets provided were TRD, VHF 48-65 MHz, R/T transmitter/receivers, with 1.5W output, made by the Royal Signals Special Communications Unit workshops at Whaddon Hall, Buckinghamshire.

There are no surviving examples of the

Purpose: Light-weight infantry pack, for short-range communication.
Frequency range: 7.3 – 8.9Mc/s.
Mode: AM, R/T.
Transmitter output: 200mW.
Range: ¾-mile (1.2km) with a 4ft (1.2m) rod aerial. Two miles (3.2km) with a 12ft (3.6m) rod.
Alternative aerials: When in close contact with the enemy, a rod aerial was too conspicuous, and a 45ft (13.7m) insulated wire ground aerial was used instead. Experiments carried out in 1944 using a steel helmet as an aerial were abandoned.
Microphone: A throat microphone allowed the operator to use both hands, especially during front-line action. The set could also be used when the operator was wearing a gas mask.
Receiver: Four-valve superhet. IF 285kc/s.
Audio output: DLR No.2 low resistance (27Ω) headphones.
Power supply: Dry battery pack providing 150/3v.
Weight: Complete set, including battery, 22lb (approx.10kg).
Versions: W.S. No.38 Mk. I, W.S. No.38 Mk. II, W.S. No.38 Mk. II*, W.S. No.38 Mk.III, W.S. No.38 AFV (operated in tanks in conjunction with the No.19 set.)
Wired Wireless: A special adaptor plug connected the set to the end of a field telephone cable. Two sets connected in this way could communicate over an extended range without interference.
Designers/Makers: Developed in 1941 by SEE (Signals Experimental Establishment) and Murphy Radio Ltd. By 1945, 187,00 sets had been made by Murphy Radio, Mitcham Works Ltd, and Radio Gramophone Development Co. Ltd (RGD).

Table 2: Description of W.S. No. 38

Model / Maker: Made in six versions, BC-778-A/F, differing only in details of electrical or mechanical design.
Circuit: Two-valve transmitter. Valves: 12SC7 audio oscillator and amplifier, 12A6 RF oscillator. Output power: 5 watts.
Modulation: Grid modulated by 1000 c/s tone.
Operating frequency: 500kc/s (International distress frequency).
Power supply: Hand-turned generator, providing 24v LT & 330v HT
Hand-turning speed approximately 80 revolutions per minute.
Approximate range at sea: 250-500 miles (402-804km).
Weight: 34 lb. (15.4kg).
Colour: Orange.
Accessories: Collapsible box kite,17 x 17 x 36 inches (432 x 432 x 914mm) when assembled; spare aerial wire; two balloons with hydrogen generators; two inflating tubes; signal lamp; parachute. The transmitter and accessories were packed in a waterproof yellow canvas bag which could be thrown from a ditched aircraft into the sea together with a dinghy. It could also be dropped by parachute from a rescue aircraft. The complete package was designated SCR-578-B.
Height of aerial: 300 ft, supported by kite or hydrogen balloon. The kite could fly in wind velocities of 7 to 40 m.p.h. (11.3 - 64.4 km per hour).
Maker/Date: The Gibson Girl was a copy of a captured German NSG2 transmitter, redesigned by Bendix in the USA in 1942 to provide a joint Allied dinghy set, and was made by several US manufacturers.
After WW2, it was used by the air force, navy, and civilian aircraft until the early 1970s, when it was replaced by a new version, the AN/CRT3.

Table 3: Description of the 'Gibson Girl' BC-778.

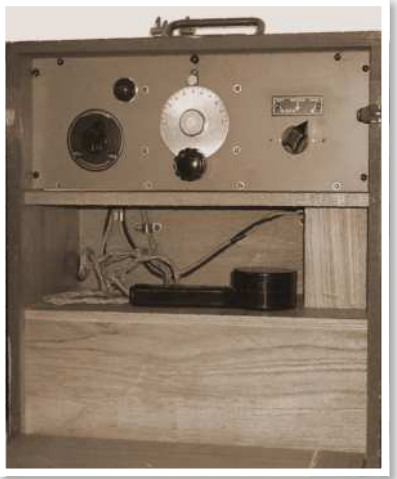
TRD. It is believed that, when the AUs were finally stood down in December 1944, all the radio sets were returned to Whaddon and destroyed.

The Biscuit-Tin Radio

The MCR1 special-purpose miniature communications receiver (Table 5) - complete with accessories - was packed in a 2-lb (907g) Huntley & Palmer biscuit tin, leading to its nickname, the "biscuit tin radio". Of this model, 10,000 were made, of which approximately 5,000 were distributed to clandestine networks in Europe by the SOE (Special Operations Executive). This enabled them to listen to BBC news broadcasts and other transmissions, including CW, from London. Their miniature size enabled them to be easily hidden, to evade discovery by enemy search parties.

Jed-Sets

The MCR1 was also used by three-man Jedburgh teams in *Operation Jedburgh*. This was mounted jointly by the SOE, OSS, and intelligence services of France, Holland and Belgium, to train and arm resistance groups to harass the enemy as the Allied invasion forces advanced across the occupied countries. The standard transmitter/receiver used by the Jedburgh teams was the *Nicholls Set*, comprising a transmitter from the B2 suitcase radio, an MCR1 receiver, and a hand-cranked generator. Another combination, known as the *Jed-Set*, was used by SAS groups in Europe with a modified transmitter from the WS No.18 and the MCR1 receiver.



Battery-operated 2-valve transmitter/receiver.
Transmitter: Output 0.3w, R/T only.
Frequency coverage: 44.0 to 61Mc/s.
Aerial: half-wave dipole with optional reflector.
Range: 3-8 miles (4.8 – 12.9 km), depending on the aerial in use.
Receiver: Super-regenerative.
Power supply: 2v, 75Ah, accumulator (150 hours working life before re-charging), and two 60v dry HT batteries (providing 300 hours on receiving before replacement).

Table 4: Description of the WS No. 17 Mk II.

Circuit: Sensitive superhet, with five miniature valves.
Frequency range: 150kc/s to15Mc/s (including long and medium waves).
Modes: AM R/T (speech) and CW (Morse).
Controls: Four knobs controlling aerial adjustment, sensitivity, regeneration for CW reception, and frequency selection.
Audio Output: Headphones, 120Ω.
Power supply: Battery, or a separate power supply pack suitable for AC/DC 97-250V. Battery life approximately 30 hours.
Weight: Approximately 2 lbs (900gm).
Size: Approximately 8.8 x 3.3 x 2.1 inches (224x85x54mm).
Designer: John I. Brown, G3EUR.
Accessories: Four plug-in coils, 150kc/s-1.6Mc/s (long and medium wave), 2.5-4.5Mc/s, 4-8Mc/s and 8-15Mc/s. Three batteries, or two batteries and a power supply pack, 30ft (9.1m) of aerial wire, and 10ft (3m) of earth wire.

Table 5: The MCR1 'Biscuit-Tin' Receiver.

Post-war Availability

All the sets described were a tribute to their designers, makers and users, and they all fulfilled their respective purposes when needed. Examples can still be obtained in the collector's market, but sadly some, like the TRD, can no longer be found to commemorate their wartime heritage.

After 1945, many of them were made available to radio amateur and other hobbyists at very low prices through government surplus releases. The weighty WS No.19, for instance, could be had for £17. The WS No. 38 for £2/5/0d (£2.25), with rod aerials 7/6d (37.5p) extra, and throat mike 3/6d (17.5p); while the MCR1 was

available for £8/5/0d (£8.50) complete with all accessories.

Although they were apparently not advertised in Britain, the Gibson Girl transmitter alone was available in the USA for $11 and the full pack, SCR-578, with all accessories, for $20. At the same time, both versions of the RBZ receiver were advertised for $15.

Some Discontent

Despite this bonanza of amazingly low prices, there was some discontent from within the radio hobby community at the time. A correspondent in *Practical Wireless* of April 1947 commented on some articles that had previously appeared in American magazines, reporting that the American Government had already released most of their surplus. However, in Britain it appeared that much of what could be made available was used to fill disused pit shafts instead of being sold to the public.

A statement by the Ministry of Supply (in the same *Practical Wireless* issue) attempted to clarify the situation. Although £500,000 worth of equipment had been sold already, it was the government's policy not to release the whole of the surplus stocks if this was against the national interest. There was concern that the effect of selling it at such low prices would cause serious harm to the industry concerned and lead to unemployment.

As it was not practicable to hold surplus stocks for any long period, because of a shortage of accommodation, the Ministry said, it was sometimes necessary to scrap goods in serviceable condition. This didn't go down well with radio enthusiasts, but eventually, more stocks did come on the market.

As a result, the surplus-shops in Lisle Street, London – and those of well-known dealers in other towns across the country – were awash with incredibly low-priced surplus equipment; from transmitter/receivers to valves, components, aerials, headphones, Morse keys, and much more. Happy days indeed!

Resources

- British Resistance Archive: **https://www.staybehinds.com**
- Cryptomuseum: **https://www.cryptomuseum.com**
- Military Wireless Museum (Kidderminster): **https://www.qsl.net/g4bxd**
- Royal Signals Museum: **https://www.royalsignalsmuseum.co.uk.**

Radio News

NEW SDRPLAY WEBSITE: SDRplay Marketing Director Jon Hudson reports that UK-based SDR receiver manufacturer, SDRplay has completely revamped its website. Because its new SDR receiver products are all about the software, owners of its RSP SDR receiver hardware need ready access to the latest features. With that in mind, and based on customer feedback, SDRplay has redesigned its homepage to make it easier, for newcomers and experts alike, to navigate their way to the latest software and support needed. Using the principle that 'less is more', there are now just 5 top-level menu categories; the attached picture indicates how everything is now grouped under products, purchase, software downloads, help, and 'miscellaneous', for everything else. So far, SDRplay reports a positive reaction since launching the website in late March 2021, and the number of support requests has dropped noticeably. New software products – which arrived in March and April 2021 via the new website – include several new community plugins, including Jan van Katwijk's *Weather Fax* plugin for *SDRuno* which is proving very popular.
www.sdrplay.com

BBC RE-ORGANISATION AND REGIONALISATION: The BBC has announced a major reorganisation plan to move radio services including 'rooting' BBC Radio 3, 6 Music and the Asian Network out of London. Three more local radio stations will also appear, in addition to the current services in Bradford, Sunderland and Wolverhampton. Key daytime strands on each of Radio 1, 1Xtra and Radio 2 will be moved from London and made across the UK, but Breakfast shows stay in London. BBC Radio 3 will be rooted in the North of England – including its leadership in Salford, and the majority of 6 Music will be broadcast from Media City UK. The BBC says it will consolidate the Asian Network into one base in Birmingham, and each network radio controller will have at least one commissioner based in one of our hubs around the UK by 2027. In News, The Today programme will be co-presented from outside London for at least 100 episodes a year, Radio 4's PM will be presented regularly from different locations around the UK including BBC local radio stations. And Newsbeat on Radio 1 and the Asian Network news teams will move permanently to be presented from Birmingham. Radio Business and long-form audio (producing radio current affairs and podcasts) will move to Salford, alongside the other BBC business teams. For BBC Local Radio, there will be more local bulletins for more than 50 areas across the UK on *BBC Sounds*.
(SOURCES BBC | *The Guardian*)
https://tinyurl.com/3kv52ash
https://tinyurl.com/x6f9e2bj


NASA
1

The Lunar Eavesdropping Project

Tim Kirby
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This month Tim Kirby relives growing up as part of the 'Apollo-Generation' and relates a fascinating story of a man who received signals direct from the Apollo 11 astronauts on the surface of the Moon.

I grew up as part of the '*Apollo*-Generation' who watched the *Apollo* missions (Fig. 1) as a child. One of the things that fascinated me was how *Mission Control* communicated with the *Command* and *Lunar* modules en-route to, or in orbit around, the Moon.

One Christmas, a very welcome present was *The Observers Book of Manned Spaceflight*, and there was an interesting diagram of the various communications links between the ground and the spacecraft.

I was surprised to find that much of the traffic from Earth to Space was in what was referred to as the 'S-band' around 2.0 to 2.3GHz – little chance, the young me realised, of building a crystal set to receive that!

More recently, doing a little reading around on the Internet I found some interesting articles on the systems that were used. A really good article is at this URL: https://tinyurl.com/xtbmd6k5

Apollo and Radio Communications

The write-up summarises the basics of the system as follows: "*The* Apollo *Unified S-Band System used the 2025-2110MHz band for uplinks (Earth-to-space transmissions) and the 2200-2290MHz band for downlinks (Space-to-Earth). The Saturn IV-B (S-IVB) upper stage had its own transponder so it could be tracked independently after separation from the Command Service Module until the stage passed or struck the Moon.*

"This tracking data greatly aided the analysis of impact shocks as recorded by seismometers installed in the surface by Apollo *crews. The S-IVB shared its S-band frequency pair with the Lunar Module. This created no problem in a normal mission as the Lunar Module remained dormant until lunar orbit, by which time the S-IVB had already struck or passed the Moon.*

"However, it caused some interference during the Apollo *13 mission, when the Lunar Module had to be used as a lifeboat,*

Fig. 1: The first Saturn V mission, Apollo 4, launched from Pad A, Launch Complex 39, Kennedy Space Center, Florida on Nov. 9, 1967. Fig. 2: Apollo S-band Frequencies. Fig. 3: Larry Baysinger and the antenna used to listen to the *Apollo 11* signals from the Moon. Fig. 4: Newspaper cutting from the *Louisville Courier-Journal*. Fig. 5: The 'Moon-Walk' Frequencies. Fig. 6: The worldwide network used for monitoring communications from the Apollo missions.

AB9IL.NET

Apollo S-band Frequency Assignments:

Spacecraft	Uplink (MHz)	Downlink (MHz)
Command Module PM	2106.40625	2287.5
Command Module FM		2272.5
Lunar Module (FM or PM)	2101.802083	2282.5
S-IVB PM	2101.802083	2282.5
S-IVB FM		2277.5
Lunar Rover	2101.802083	2265.5
Apollo 11 Early ALSEP	2119	2276.5
Apollo 12 ALSEP	2119	2278.5
Apollo 14 ALSEP	2119	2279.5
Apollo 15 ALSEP	2119	2278.0
Apollo 15 subsatellite	2101.802083	2282.5
Apollo 16 ALSEP	2119	2276.0
Apollo 17 ALSEP	2119	2275.5

2

well before Aquarius and the S-IVB reached the Moon. The Lunar Module frequency pair was also used by the sub-satellites left in lunar orbit by the later J-missions. They were deployed by the Command Service Module shortly before leaving lunar orbit returning to Earth, and the Lunar Module was no longer in use."

The same article lists the frequencies in Fig. 2 as being the ones in use at the time. A particularly exciting paragraph reads as follows:

"The Apollo *Unified S-Band System downlink also provided an "emergency key" capability consisting of a manually keyed continuous wave (CW) subcarrier at 512kHz. The crew could then tap out their messages in Morse code if the downlink were too severely degraded to support, even the backup voice mode. Although this mode had been tested (on* Apollo *7) and most of the astronauts were trained in its use, this mode was never actually needed during any* Apollo *mission.*

"There was no need for an uplink emergency key, due to the ground stations' excess power available. A typical Apollo *S-band spacecraft exciter produced 300mW, the downlink power amplifier 20W, while a typical uplink transmitter produced 10,000W – a power ratio of 26.9 dB. All of this doesn't count antenna gain. Rarely was the link budget capacity fully used during the* Apollo *program."*

Receiving the Astronauts

The article includes details on how amateur radio operators in the USA were able to receive signals from *Apollo* spacecraft. On the morning of August 1st, 1971, Paul Wilson W4HHK and Richard T Knadle Jr K2RIW received voice transmissions from the Command Module of *Apollo 15* in lunar orbit. An article in the American Radio Relay League (ARRL) magazine, QST provided more detail on how this was done. The same two amateurs also received signals from the next flight, *Apollo 16*.

However, the most interesting story, as far as I am concerned concerns Larry Baysinger W4EJA of Louisville, Kentucky (Fig. 3). Larry was a ham radio operator and amateur-radio astronomer. Baysinger detected radio transmissions from the surface of the Moon. These came from the backpack transmitters carried by *Apollo 11* astronauts Neil Armstrong and Buzz Aldrin. The activity was documented by a local newspaper, The *Louisville Courier-Journal* (Fig. 4) in an article written by a reporter named Glenn Rutherford who, at the time, was 23.

What is great about this article is that Glenn Rutherford did not just write about the experiment – he witnessed it, he was there, listening to the signals and helping to point the antenna at the Moon.

You can read much more about this here in an engrossing article written by Professor Chris Graney, a professor of Physics and Astronomy at the *Jefferson Community and Technical College* in Louisville:
https://tinyurl.com/ebprkper

The *Courier* story opens with this paragraph: *"Thanks to some homemade electronic equipment, including a rebuilt 20-year-old radio receiver from an Army tank and an antenna made of spare pieces of aluminum, nylon cord and chicken wire, a small band of Louisvillians were able to 'eavesdrop' Sunday (July 20) night on the American astronauts' conversation directly from the Moon'.*

The piece goes on to discuss how Larry Baysinger recorded 35 minutes' worth of conversation from the VHF signals transmitted between Neil Armstrong, Buzz Aldrin and Michael Collins. This period included the time in which President Nixon sent a message of congratulations to the astronauts. Larry Baysinger and Glenn Rutherford were so excited about what they were receiving, they didn't notice that the reel-to-reel tape recorder that they were using to record the transmissions had run out of tape!

Fortunately, they did notice after a little while – enabling more of the event to be captured for posterity. As far as I can see the 'Moon-walk' frequencies monitored would have been the following (Fig. 5).
https://tinyurl.com/xtbmd6k5

LOUISVILLE COURIER-JOURNAL

Staff Photo by Jay Thomas

LARRY BAYSINGER looks over the antenna he designed to receive voice communications from the Apollo astronauts during their walk on the lunar surface of the moon Sunday night.

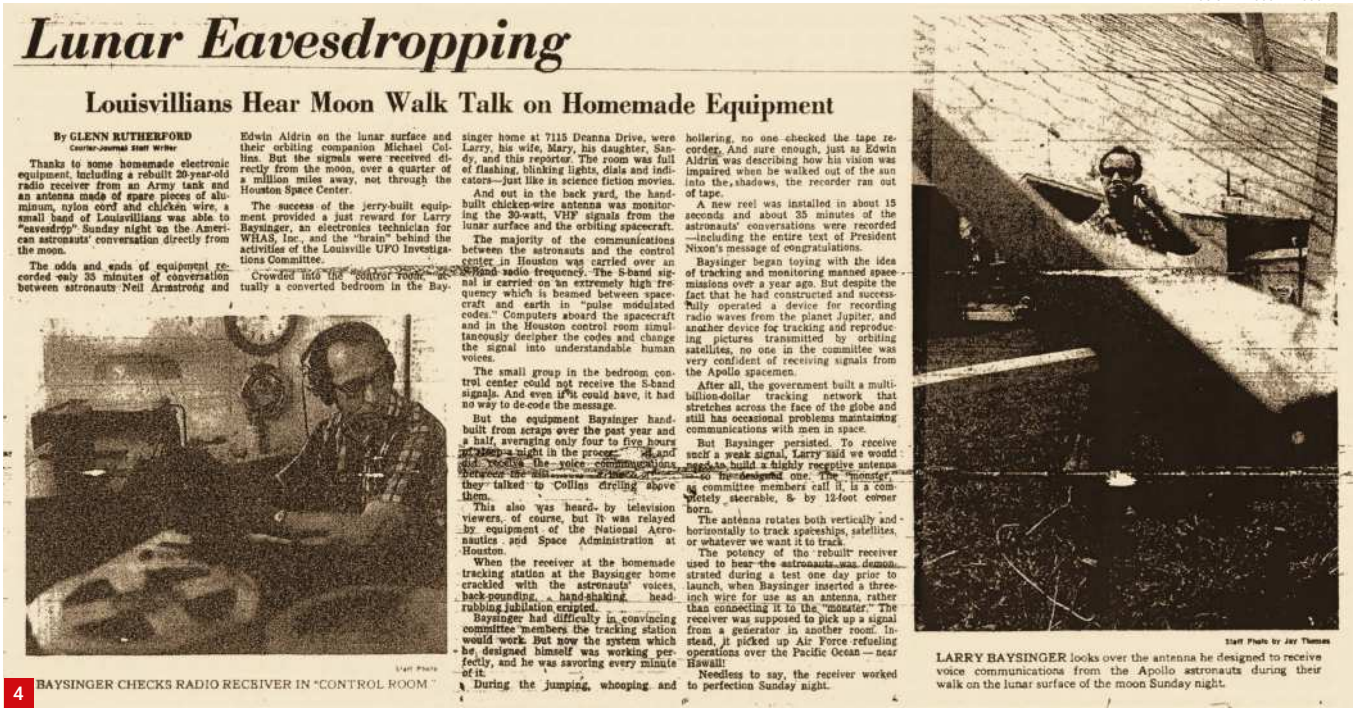
3

The Equipment Used

The aerial that Larry Baysinger used was a fully-steerable 8 x 12-foot 'corner horn' – we'd probably now call it a 'corner reflector'. Corner horn or reflector aerials are more typically used at microwave frequencies where they are smaller and a bit more manageable. Having such a large antenna must have taken a bit of handling; presumably, the winds were light in Louisville the night of the Moon Landing!

Baysinger had modified the receiver's sensitivity to improve it for the *Lunar Eavesdropping* project. In the newspaper article, it is reported that, as a test of the receiver, Baysinger replaced the 'monster-antenna' with a few inches of wire and received signals from a US aircraft refuelling. The article reports that the

LOUISVILLE COURIER-JOURNAL



Lunar Eavesdropping

Louisvillians Hear Moon Walk Talk on Homemade Equipment

By GLENN RUTHERFORD
Courier-Journal Staff Writer

Thanks to some homemade electronic equipment, including a rebuilt 20-year-old radio receiver from an Army tank and an antenna made of spare pieces of aluminum, nylon cord and chicken wire, a small band of Louisvillians was able to "eavesdrop" Sunday night on the American astronauts' conversation directly from the moon.

The odds and ends of equipment recorded only 35 minutes of conversation between astronauts Neil Armstrong and Edwin Aldrin on the lunar surface and their orbiting companion Michael Collins. But the signals were received directly from the moon, over a quarter of a million miles away, not through the Houston Space Center.

The success of the jerry-built equipment provided a just reward for Larry Baysinger, an electronics technician for WHAS, Inc., and the "brain" behind the activities of the Louisville UFO Investigations Committee.

Crowded into the "control room" at the singer home at 7115 Deanna Drive, were Larry, his wife, Mary, his daughter, Sandy, and this reporter. The room was full of flashing, blinking lights, dials and indicators—just like in science fiction movies.

And out in the back yard, the hand-built chicken-wire antenna was monitoring the 30-watt, VHF signals from the lunar surface and the orbiting spacecraft.

The majority of the communications between the astronauts and the control center in Houston was carried over an S-band radio frequency. The S-band signal is carried on an extremely high frequency which is beamed between spacecraft and earth in "pulse modulated codes." Computers aboard the spacecraft and in the Houston control room simultaneously decipher the codes and change the signal into understandable human voices.

The small group in the bedroom control center could not receive the S-band signals. And even if it could have, it had no way to de-code the message.

But the equipment Baysinger hand-built from scraps over the past year and a half, averaging only four to five hours of sleep a night in the process, did receive the voice communications between the astronauts and Houston as they talked to Collins circling above them.

This also was heard by television viewers, of course, but it was relayed by equipment of the National Aeronautics and Space Administration at Houston.

When the receiver at the homemade tracking station at the Baysinger home crackled with the astronauts' voices, back-pounding, hand-shaking, head-rubbing jubilation erupted.

Baysinger had difficulty in convincing committee members the tracking station would work. But now the system which he designed himself was working perfectly, and he was savoring every minute of it.

During the jumping, whooping and hollering, no one checked the tape recorder. And sure enough, just as Edwin Aldrin was describing how his vision was impaired when he walked out of the sun into the shadows, the recorder ran out of tape.

A new reel was installed in about 15 seconds and about 35 minutes of the astronauts' conversations were recorded —including the entire text of President Nixon's message of congratulations.

Baysinger began toying with the idea of tracking and monitoring manned space missions over a year ago. But despite the fact that he had constructed and successfully operated a device for recording radio waves from the planet Jupiter, and another device for tracking and reproducing pictures transmitted by orbiting satellites, no one in the committee was very confident of receiving signals from the Apollo spacemen.

After all, the government built a multi-billion-dollar tracking network that stretches across the face of the globe and still has occasional problems maintaining communications with men in space.

But Baysinger persisted. To receive such a weak signal, Larry said we would need to build a highly receptive antenna —so he designed one. The "monster" as committee members call it, is a completely steerable, 8- by 12-foot corner born.

The antenna rotates both vertically and horizontally to track spaceships, satellites, or whatever we want it to track.

The potency of the rebuilt receiver used to hear the astronauts was demonstrated during a test one day prior to launch, when Baysinger inserted a three-inch wire for use as an antenna, rather than connecting it to the "monster." The receiver was supposed to pick up a signal from a generator in another room. Instead, it picked up Air Force refueling operations over the Pacific Ocean — near Hawaii!

Needless to say, the receiver worked to perfection Sunday night.

Staff Photo by Jay Thomas

LARRY BAYSINGER looks over the antenna he designed to receive voice communications from the Apollo astronauts during their walk on the lunar surface of the moon Sunday night.

4 BAYSINGER CHECKS RADIO RECEIVER IN "CONTROL ROOM"

AB9IL.NET

Apollo 11 VHF Moon Walk Frequencies		
Frequency	**Mode**	**Link Description**
296.8 MHz (channel A)	AM	Lunar Module to both Commander (Armstrong) and Lunar Module Pilot (Aldrin) relaying Capcom.
259.7 MHz (channel B)	AM	Commander (Armstrong) to Lunar Module carrying both Commander (Armstrong) and Lunar Module Pilot (Aldrin)
.0 MHz (channel C)	AM	Lunar Module Pilot (Aldrin) to Commander (Armstrong)

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aircraft was over Hawaii, which I would be somewhat surprised about, but this is indeed a remarkable story.

In an article I found on the ARRL website, and also written by Chris Graney, about the project there are some further, fascinating, insights. Chris Graney had got to speak to Larry Baysinger first-hand about the project. I was interested to read of Baysinger's motivation to carry out the project: "*The* Lunar Eavesdropping *project arose because he had an interest in independently verifying the information that NASA had been providing about the* Apollo *program. Could he get unedited, unfiltered information about the* Apollo 11 *landing by eavesdropping on the radio signals transmitted from the lunar surface? Maybe he could find out things that NASA did not want the public to know about. In addition, successfully detecting a transmission from the lunar surface would be a great technical accomplishment. Various 'experts' had told him that it could not be done.*

https://tinyurl.com/556xt59t

Chris Graney's article goes on to say, "*Baysinger says that on the night of the* Apollo 11 *landing, he and Rutherford had to essentially aim the antenna at the Moon by getting behind it and sighting it like a gun. This was difficult since the weather was cloudy and the Moon not easily visible. The antenna, which was originally built for Baysinger's radio astronomy work, had a motorized steering mechanism but it had to be manually guided.*

"Its 'beam' or 'field of view' was such that, once pointed at the Moon, it could be let go for a little while, but pretty soon it would have to be re-aimed because the motions of the Earth and Moon caused the Moon to drift out of the antenna's field and the signal to be lost. In fact, this was one piece of evidence that the Apollo 11 *signals the receiver picked up were indeed from the Moon — if the antenna was not kept aimed at the Moon, the signal disappeared."*

"Baysinger's wife and daughter watched the Apollo 11 *landing on TV while Baysinger and Rutherford listened via Baysinger's equipment. The signal on the home-built equipment came through approximately 5-10 seconds earlier than the signal on TV. It was noisy, but you could hear what was going on.*

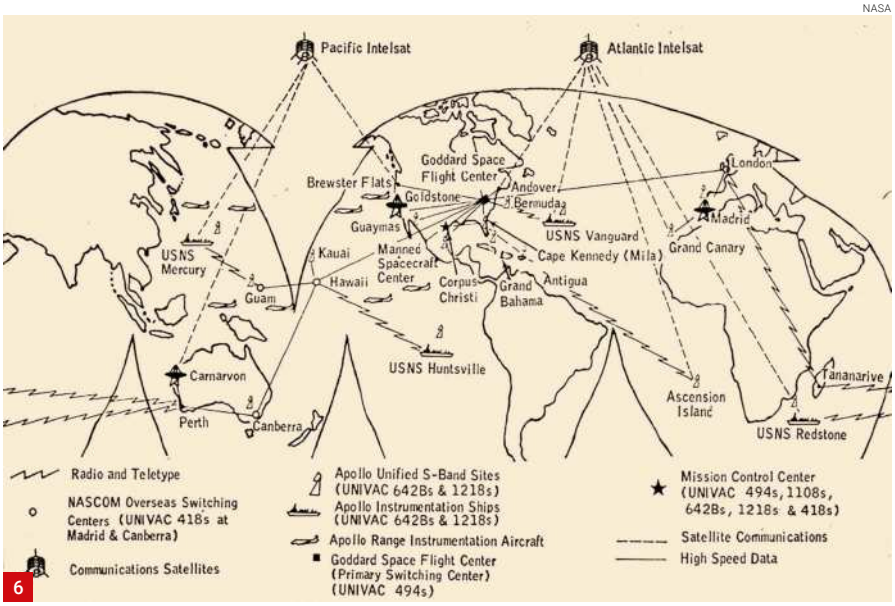
"I asked Baysinger whether he found anything that NASA edited out — comments about things going wrong, the astronauts being loose with their language or exclamations about meeting space aliens. He said no — absolutely everything was transmitted to the public on TV. In fact, he said, 'that was kind of disappointing'. Part of the idea of the project was to hear the unedited 'real' story – and it turned out there was nothing edited. Indeed, Rutherford's story makes no mention of hearing anything unusual."

Unedited Evidence

On the webpage (above) there are also audio links to the signals that Larry Baysinger had received. I do not know why, but I found it curiously moving to listen to these, very 'unofficial' recordings of Neil Armstrong and Buzz Aldrin talking away on the surface of the Moon. Although the signals are a little noisy, it's quite clear what is going on.

Chris Graney goes on to conclude what I was also thinking about as I read the story, although he puts it so much better than I would have done: "*Baysinger's lunar eavesdropping is an independent verification that men were on the Moon, by a local person who is not part of the scientific establishment. Had there been more Larry Baysingers eavesdropping on* Apollo *or had there been more Glenn Rutherfords to record the work of the Baysingers who did eavesdrop, there would be no "Apollo-deniers"*".

NASA



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This is an illustration of the importance of 'reproducibility' in science. Both Larry Baysinger and Chris Graney also thought about the question 'did Baysinger *really* pick up signals from the Moon?'. Could he have just picked up a spurious signal from a local radio or TV station that was relaying the Moon Landing?

We can fairly safely assume that the signals were from the Moon because the antenna needed to be aimed at the Moon to receive the signals, and the signal was lost once the Moon had set. Also, the audio could be heard through Baysinger's receiver a second or two *before* it was heard on the TV. This would have been the case because of the latency introduced at the broadcaster, as well as in NASA's S-Band receive system and link to the broadcasters. Perhaps most conclusively, the audio that Larry Baysinger recorded is different from the NASA audio, because only Neil Armstrong and Buzz Aldrin can be heard, whereas Michael Collins and CAPCOM cannot.

On the broadcast, all those individuals can be heard, because the broadcast feed was taken from the NASA downlink of the S-band receive, as opposed to the 'local Moon-based' feed received by Larry Baysinger.

Larry Baysinger did not attempt to receive any other of the *Apollo* missions. Chris Graney suggests that this is because Baysinger did not turn up anything that could not be received by the official channels. Larry Baysinger's work received some brief recognition at the time, notably a meeting with the *Collins Radio Company* who had built the communications systems for the *Apollo* missions.

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Finally, Fig. 6 illustrates the worldwide network used for monitoring communications from the *Apollo* missions.

What an amazing story! As I delved into this story, it truly fascinated me.

I hope it will interest you, too.

Radio News

THE 'UN-SMARTPHONE': US start-up firm *Sky's Edge Open Source Technology* is taking pre-orders for kits of its 'un smartphone'. So, why a rotary cell phone? *"Because in a finicky touchscreen world of hyperconnected devices we have no real control over, there should be an alternative. This isn't merely an anachronistic curiosity. It's an everyday-usable phone that embraces the lost art of the tactile interface and glove-slaps the "every-piece-of-technology-should-be-a-featureless slab" design philosophy. As a telephone, in many ways it is more functional than a smartphone".*
(SOURCE: *Radio Kurier 4/2021: 7*: *Sky's Edge*)
http://skysedge.us
https://tinyurl.com/2e3tas59

CRICKET COVERAGE: The BBC has signed a four-year contract with the England and Wales Cricket Board to cover over 400 games per year on the radio. Ball-by-ball commentary will be provided on every men's First Class and List A cricket match played in England and Wales covering the LV= Insurance County Championship, the Royal London Cup and the Vitality Blast. The deal will see some 3,100 days of cricket broadcast on the BBC's network of local radio stations, the BBC Sport website and BBC Radio Wales (in the case of Glamorgan games). Some will also be aired on BBC Radio 5 Live Sports Extra. The agreement means the BBC will provide coverage of all red and white ball competitions for the following four domestic cricket seasons through to the end of 2024.
(SOURCES: BBC | RadioToday | Sports Press)
https://tinyurl.com/ntjfyuww

HAM RADIO FRIEDRICHSHAFEN: Due to current developments regarding the spread of COVID-19, *Messe Friedrichshafen* has been forced to make a very difficult decision. The *Ham Radio International* amateur radio exhibition will not take place in the planned time frame of 25-27 June 2021 but instead will be held from 24-26 June 2022.
(SOURCE: Colin Butler; DARC)
https://tinyurl.com/2ynmyfwe

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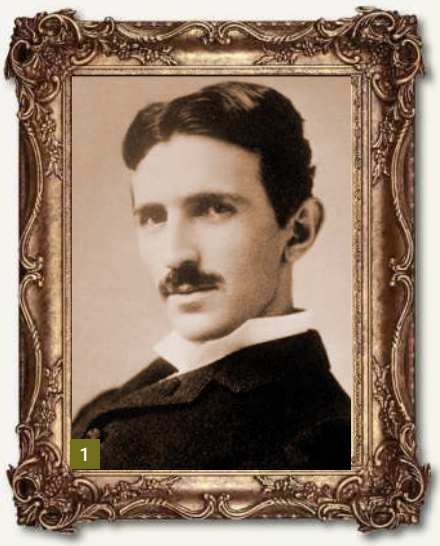
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Tomorrow's Worlds: Radio and TV at the World's Fairs

The lights are on, and **Scott Caldwell** takes us on a fascinating tour of the spectacles that were the World's Fairs, looking at those showcases of the latest developments in radio and TV technology.

A *World's Fair* is a large international exhibition showcasing a wide variety of industrial, scientific, and cultural items. International showcase-events such as these have, for example, championed electricity (Chicago, 1893), enabled the Eiffel Tower (Paris, 1889), promoted wireless communication (St Louis, 1893), and inaugurated television broadcasts (New York, 1939).

The World's Fairs are governed and regulated by the *Bureau International des Expositions (BIE)* – a Paris-based organisation established in 1928. These large shows are perceived by many historians as the timekeepers of technological innovation. However, beyond that, the purpose of holding a World's Fair extended to many other areas, such as politics, education, entertainment, and cultural, scientific, technological, and economic growth.

https://www.bie-paris.org/site/en

Nikola Tesla and the Chicago World's Fair (1893)

The Chicago World's Fair was also called the '*Columbian Exposition*', celebrating the 400th anniversary of Christopher Columbus (1451-1506) voyage to the Americas. Inventors were subsequently asked to submit bids to 'illuminate' the fair, utilising the power of electricity.

Thomas Edison (1847-1931) submitted a bid that totalled US$554,000. This was to utilise his DC power supply. However, George Westinghouse (1846-1914), making use of Nikola Tesla's (1856-1943, Fig. 1) patent, submitted a lower bid of $339,000 and he was duly awarded the contract.

The War of the Currents, involving Westinghouse, Edison and Tesla, and many other early inventors, was one of the most fascinating in the history of electricity and has been vividly dramatized in the novel *The Last Days of Night*, by Graham Moore.

DeForest and Marconi at the St. Louis World's Fair

The 'Louisiana Purchase Exposition St. Louis' was a vast complex that consisted of approximately 1,272 acres and 1,500 buildings. This large scale delayed its scheduled opening by a year, with increasing costs that had to be recuperated. Local, state and federal funding totalling $15 million was utilised to finance the event. Fortunately, the Fair was a great success, with over 20 million visitors paying an admission fee, between its opening date of 30th April until 1st December 1904.

Guglielmo Marconi (1874-1937) was invited to attend the 1904 St. Louis World's Fair by the Governor of Missouri. Initially, he was willing to accept and keen to promote his wireless telegraphy apparatus. However, it soon transpired that his arch-rival Lee De Forest (1873-1961; Fig. 2) and other market competitors would also be in attendance. Therefore, Marconi decided that he should not be lending legitimacy to his competitors, particularly at what he perceived as a short-term event. He promptly declined the invitation and concentrated on 'real' scientific research and development, focused on perfecting his technology over long distances.

Meanwhile, DeForest continued with his involvement and spent $10,000 on relocating a sightseeing tower from Niagara Falls

to St. Louis. This 300-foot tower provided an excellent opportunity to maximise his company's exposure, with his name emblazoned in light across its top. Visitors to the tower were amazed when operators sent wireless messages to Chicago, at a distance of approximately 300 miles.

On *Electricity Day*, De Forest gratefully received the *Grand Prize Medal* for 'general excellence in wireless technology. Overall, the World's Fair at St. Louis was well received and regarded as a great success. The advertising stated that the technology on show was, *"making life better – that was how the inventors and innovations introduced at the Fair were viewed. Visitors were excited as they communicated by wireless telegraphy, saw devices cooking chicken in only 14 minutes, and walked around huge power generators. No longer science fiction these discoveries seemed to offer the promise of a better life at home and at work"*.

The Radio World's Fair in New York (1924)

The *Radio World's Fair* began its annual run in 1924 in the prosperous city of New York. These shows are now regarded by historians as very significant; they were not just a trade show to introduce the latest receivers. The New Radio Fair was an extremely complex undertaking, akin, perhaps, to today's annual Consumer Electronics Show. Many unusual innovations were showcased during the fair.

Perhaps most memorable amongst them was the image of a wearable cage antenna that was intended for outside broadcasting.

The immediate years following the horrors of the First World War (1914-1918), witnessed an industrial and economic boom. Increasing the demand for commercial products as households looked to enjoy their surplus income. Besides, the number of commercial radio stations was rapidly increasing to meet the sustained demand for radio receivers (Tables 1 &2).

The 'Century-of-Progress' Chicago World's Fair (1933)

One of the primary purposes of the amateur radio exhibition at the Chicago World's Fair of 1933 (Fig. 3; Table 3), was to acquaint the general public with amateur radio operation.

In the event, the special callsign W9USA was made available, and the amateur

Fig. 1: Nikola Tesla – the Serbian-American radio pioneer. Fig. 2: Lee De Forest, the American 'Father of Radio Communications'. Fig. 3: The *Century of Progress* World's Fair in Chicago in 1933. Fig. 4: A special *New York World's Fair* receiver for the 1939 event.

radio exhibition was located on the second floor of the *Travel and Transport Building*, towards the south end of the grounds.

The event was remarkably popular, and approximately 4,000 amateurs signed the registration book – nearly 10% of all licenced operators in the US. The registration book also records visits from amateurs from a variety of nations; Barbados, Canada, Cuba, Mexico, Argentina, Alaska, Porto – Rico, Panama, Newfoundland, Hawaii, Guam, New Zealand, Australia, England, France, Austria, Japan, and China.

The general public also expressed considerable interest in the amateur radio exhibition. During, the first two and a half weeks of the World's Fair, it was estimated that 2% of the total attendance per day had visited the exhibition. This suggests that 360,000 people had seen the exhibition by October 1933. The purpose of the exhibition was to educate people and provide them with a good understanding of what the amateur radio hobby entailed, in addition to an overview of the function performed by the various pieces of apparatus.

A volunteer at the exhibition remarked that, '*It has given our visitors the knowledge that radio does not start at 0 and ends at 100, and that the short waves are much more interesting than the broadcast band. It also has created a large number of will-be hams"*.

Furthermore, the event's exhibit manager extended the narrative by remarking that, *"Without exception, this personal contact was greatly appreciated by the visitors; they were attentive and always interested. Sometimes a group would spend several hours in the exhibit and absorb every bit of knowledge we could give them. Old, young, and middle-aged; as soon as they saw what a fascinating hobby ham radio could be, fell like the proverbial ton of bricks. Many an elderly couple, living alone and wanting a hobby of interest to both have walked out with copies of 'How to Become an Amateur', the QST. And, in at least one instance, they returned a few weeks later with questions concerning the refusal of the detector of their first short wave receiver to oscillate"*.

The 'World of Tomorrow': New York World's Fair (1939)

The New York World's Fair of 1939 (Fig. 4) offered the Radio Corporation of America (RCA) an invaluable marketing opportunity – to announce the long-awaited arrival of television broadcasting.

The overall objective of the show was modernist: to promote the technological and cultural ideas of a 'New Age' New devices would readily be available in the not-so-distant future. RCA displayed its TRK-12 television set, installed in 'The Living Room of the Future'. However, its 'experimental' nature and its retail price of $600, made it a very exclusive product. The market segmentation was geographically limited to the New York and Los Angeles areas, with RCA selling just 7,000 television sets over a two-year period. Broadcasts were crude and audience figures were disappointing. Current affairs programmes featured hard-to-discern commentators who utilised pointers over impossible-to-decipher wall maps.

However, the broadcasting of a college baseball game between Princeton and Columbia offered some much-needed entertainment, viewed through a single camera lens.

The impact of the 'Great Depression' of the 1930s and the growing political tension in Europe and the Far-East had

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Further Reading

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dampened society's view of a future order where consumerism and democracy triumphed over extremism. Research suggests that television failed to make an as big impression as RCA hoped it would. The General Motors *Futurama* was the most attended and highly rated exhibit. However, some historians acknowledge that the birth of television did indeed coincide with the New York World's Fair, when on 30th April 1939 President Franklin D. Roosevelt (1882-1945) opened the opening address live on the NBC network.

The Italian Pavilion was based on the splendour of the ancient Roman Empire and was dominated by a 200-foot (61 metres) waterfall dedicated to the memory of Marconi. The pavilion was a three-tier structure that required 100,000 square-feet of space and it presented a significant financial investment, reported to have been in the region of US$3 million.

W6XBE at the Golden Gate World's Fair (1939-1940)

The Golden Gate Exposition was another World's Fair that was organised to commemorate the completion of San Francisco's two main bridges: the Bay Bridges and the Golden Gate Bridge. It was held on Treasure Island, located in the middle of the Bay Bridge's span across the San Francisco Bay.

One of the main attractions at this fair was General Electric's short wave broadcasting station W6XBE (universally known as General Electric's '*Showcase Station')*, operating from the Electricity & Communications Building. The station was licensed to broadcast with an output power of 20kW on 9530 and 15330kHz. Its target audience was in Europe and South America. The first broadcasts were scheduled for February 1939. In June 1941, after the successful completion of the Golden Gate World's Fair, General Electric relocated its transmitter to the salt flats of Redwood City, California. Encouraged by its popular appeal, the station's output was increased to 50kW, and the call sign was changed to KGEI.

Conclusion: Still Going On

Given the global impact of the Covid-19 pandemic, the Bureau International des Expositions has approved plans to re-schedule the *2020 Dubai World's Fair*, from 1st October 2021 to 31st March 2022. In many respects, the World's Fair has evolved to reflect the views of modern society.

The main focus is now directed on promoting urban sustainable development underpinned by intergovernmental treaties such as the *Shanghai Declaration*. This suggests that the World's Fair still has a place in society when we can all live our life's without governmental controls and restrictions (post-Covid-19). Promoting a better future for our children, in terms of environmental protection and technological innovation.

Year	Number of Stations	Year	Number of Stations
1921	5	1931	612
1922	30	1932	604
1923	556	1933	599
1924	530	1934	583
1925	571	1935	585
1926	528	1936	616
1927	681	1937	646
1928	677	1938	689

Table 1: The number of radio stations in the USA, 1921-1939.

Year	Sales (in Millions of US Dollars)
1922	60
1923	136
1924	358
1925	430
1926	506
1927	426
1928	651
1929	843

Table 2: Sales of radio equipment in Millions of Dollars.

Dates Open	Duration (Days)	Attendance
1933 Season		
27th May – 12th November	170	27,703,132
1934 Season		
26th May – 31st October	159	21,066,095

Table 3: Opening dates and attendance figures for the *Chicago World's Fair* in 1933.

Early Radio & TV: Sparks & Coherers

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Garry Smith
Garry405625.gs@gmail.com

Keith Hamer and Garry Smith continue exploring the early days of radio, review a book about John Logie Baird, revisit TV graphic design, and provide the link to their latest on-line column, DX-TV & FM News.

All early experiments with radio broadcasts were carried out using 'spark' transmission. In this system, which, in modified forms, was still used in the 1920s, especially aboard ships, a condenser was charged to a high voltage, and allowed to discharge through a spark-gap in series with an inductance, thus producing a train of waves for each spark.

The frequency of the waves depended on the value of the condenser and inductance, while the number of wave trains per second equalled the number of sparks per second. Each separate wave train died away before the next one was produced, and so spark transmitters were said to produce 'damped' waves, as opposed to 'undamped', or 'continuous' waves. The latter type of wave was basic to all means of communication in the 1920s.

The earliest types of receivers all used a 'coherer', or 'detector', for the reception (*RadioUser*, April 2021: 28-30).

However, from 1900 onwards, other devices were invented, each adding to its general efficiency. Several detectors were in use by 1928: First, the 'magnetic detector', on which many experimenters worked, was patented in a commercial form by Marconi in 1902 and used by Marconi's *Wireless Telegraph Company* in some of their ship installations right up to World War One (1939-1945; Fig. 1).

Second, many forms of 'crystal detectors' were patented. The types which came into most general use were the 'Galena', invented by Karl Ferdinand Braun in Germany (Fig. 2), the 'Carborundum' by Henry Harrison Chase Dunwoody (Fig. 3), and the 'Perikon', devised by Greenleaf Whittier Pickard, both the latter in the USA.

Third, in 1904, Professor John Ambrose Fleming patented the first 'thermionic valve'. This was a two-electrode valve or diode, and although as a detector it was not very sensitive, and therefore not a great advance on some of the crystal detectors, yet it was one of the most important advances made in the science of wireless telegraphy. It paved the way to the invention, in 1907, by Dr Lee de Forest in America, of the three-electrode thermionic valve (or 'triode'), which began to be used in the majority of transmitting and receiving sets for telegraphy and telephony.

The invention of the triode revolutionised the practice of wireless, for it provided a device capable of producing a continuous oscillation of any desired frequency, and of magnifying such oscillations to any required degree. It was, therefore, applicable to both transmitting and receiving circuits. The many ingenious uses to which it was put were the subject of investigation and research by many scientists, notably Lee de Forest, Benjamin Franklin, Alexander Meissner, Edwin Howard Armstrong, Captain Henry Joseph Round, and Edward Victor Appleton.


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Vintage Wireless Equipment

This month's delve through vintage copies of well-worn newspapers and magazines has unearthed the *Dunham Two-Valve Loud-Speaker Set* (Fig. 4). Table 1 shows the description of the equipment featured in a Dunham advertisement, dated 1927.

The advertisement proudly boasted that the Dunham loudspeaker set came complete with two *Cossor* 'dull-emitter valves'. This particular type of valve used a thoriated tungsten filament which operated at between 1,700° and 1,900° Kelvin. These gradually replaced bright emitters in domestic receivers between 1922 and 1925. The thoriated tungsten filament was much more efficient, consuming less than 1W. This reduced battery drain to one Amp, or even just a few hundred milliamps, and extended the accumulator life between charges by a factor of 5 to 10. A filament current drain above 1A was a real problem in the early 1920s and the search was on to achieve good electron emission from a reduced filament current.

Early efforts were based on the use of alkaline earth metalled filaments where tungsten was combined with thorite, barium or strontium oxides before being drawn into filament wire. Development progressed until a final composition of tungsten wire, coated with a thorium oxide layer, was agreed upon. Thorite is a rare mineral, thorium silicate (chemical symbol, ThSi04), occurring in the form of yellow or black crystals. The chief property of thoriated tungsten, when used as an electron source in valves of high-power, is its good emission efficiency in terms of milliamps per Watt when compared to pure tungsten. It can also withstand high anode voltages when compared to the alkaline earth oxide cathode used in smaller valves.

Book Review: *Television and Me*

Television And Me - The Memoirs Of John Logie Baird is a fascinating insight into the life and career of the Helensburgh-born genius who invented television back in the 1920s. We have written a lot about John Logie Baird, and there is more to come as we celebrate the forthcoming 85th anniversary of the world's first television service which officially began on November 2nd, 1936.

Fig. 1: The 'Magnetic Detector' was patented in a commercial form by Marconi in 1902.
Fig. 2: The 'Galena Detector', invented in Germany by Karl Ferdinand Braun. Fig. 3: The 'Carborundum Detector', devised by Henry Harrison Chase Dunwoody in the USA. Fig. 4: The Dunham Two-Valve Loud-Speaker Set, advertised in 1927 (Table 1). Fig. 5: The latest edition of '*Television and Me*', edited by Malcolm Baird. Fig. 6: Abram Games produced some of the most memorable war-time posters to promote the Auxiliary Territorial Service (ATS). Fig. 7: In 2014, the Royal Mail issued a special *Abram Games* postage stamp to celebrate the designer's 100th birthday.

Despite our best endeavours to present accurate information, there is certainly no better resource than this amazing book. This in-depth 210-page comprehensive publication is edited by none other than the inventor's son, Malcolm Baird. However, there appears to be one serious omission. Trawling through all the pages, several times over, the book fails to mention that in 1928, John Logie Baird transmitted the world's first 'live' television signal from an aeroplane. We will rectify this omission in a later column when his in-flight station identification, and details of the aircraft, will be featured. The honour of such an airborne achievement normally goes to the BBC when they transmitted their first 'live' air-to-ground television broadcast on September 30th, 1950.

This comprehensive book is divided into 10 chapters, each one graphically detailing the inventor's highs and lows, successes and disasters. It is richly illustrated with photographs from the family album, including hitherto unpublished pictures showing him as a baby in 1890, at the controls of his Humber Olympic tri-car in 1908 (looking for all the world like one of the opening sequences to the 1970's comedy series, *George & Mildred*), his advertising technique to promote the *Baird Undersock*, and the jam factory in Trinidad which he called *Bourg Mulatrice*, located in the Santa Cruz Valley.

Of particular interest to TV historians are the photographs showing some of his revolutionary inventions such as the *Phonovision* image-recording apparatus, the *Noctovision* system (first demonstration in Leeds in 1927), colour television in 1928, large-screen television (the summer of 1930), the mirror-drum television equipment used to televise *The Derby* in 1932, the *Baird Televisor* - the world's first mass-produced television set, and high-definition colour television demonstrated in December

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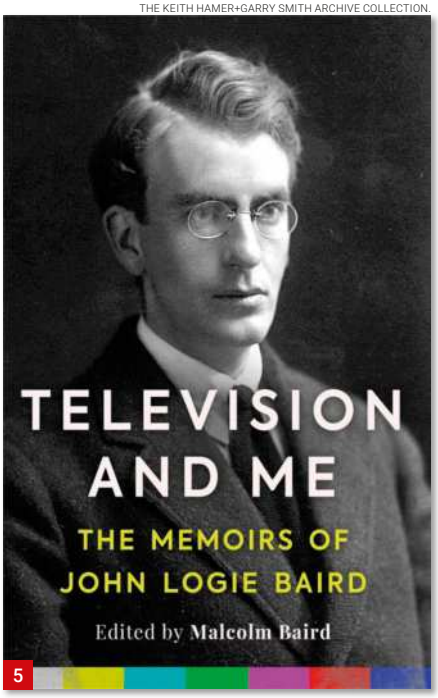
THE KEITH HAMER+GARRY SMITH ARCHIVE COLLECTION.



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1940. The list of his inventions seems almost endless. In later life, he met many important and influential people including the writer H.G. Wells, John Reith (the BBC's first Director-General) and Professor Oliver Lodge, the inventor of the first radio coherer, or tuner, in 1889 (*RadioUser*, March 2021: 30-31 and April 2021: 28-30; forthcoming: June).

This highly-recommended title is available from various on-line suppliers, in both electronic and printed formats. For example, it is currently available in electronic format from *Birlinn* publishers, priced at £6.99. It pays to shop around because some bookshops charge around £12 for the book, plus an additional fee of about £11 if delivered from the USA. Some well-known UK on-line companies are selling the book for £5, or less, but these tend to be second-hand earlier editions and in an unspecified condition. Earlier versions of the book have a completely different cover design. The cover shown in Fig. 5 depicts the latest edition.

Television and Me was originally published in 1988 by the Royal Television Society under the title *Sermons, Soap and Television* with subsequent reprints in 1990 and 2004. The current version was published in 2020 by *Birlinn Limited* in Edinburgh (ISBN 9781788854467). John Logie Baird's son, Malcolm, and grandson, Iain, operate and update the following website which features historical research and recent news, plus book and film reviews:

www.birlinn.co.uk
www.bairdtelevision.com

Graphic Design Pioneers

Our series on four of the most influential graphic designers in radio, TV and beyond continues with Abram Games.

Born on July 29th, 1914, Abram Games lived in Whitechapel, London. He later began working in his father's photographic studio. One of the tools which defined his early work was his skilled use of a small airbrush manufactured by *Aerograph*. Nowadays, Abram Games' graphic design work is a fascinating record of social history. For over 60 years, he produced some of the UK's most memorable images including the '*Blonde Bombshell*' poster of 1941 which was used to promote the Auxiliary Territorial Service (Fig. 6).

The United Nations, London Transport, British Airways, Shell, the Financial Times, and Guinness were just some of his well-known clients. He also designed postage stamps (which he referred to as "miniature posters") for the UK, Jersey, and Israel. In 2014, the Royal Mail issued a special *Abram Games* postage stamp to commemorate his 100th birthday (Fig. 7).

In addition to all his other work, he designed book jackets and magazine covers. In 1956, he became Consultant Art Director of Penguin Books. He was instrumental in the experimental introduction of colour covers for the first time in Penguin's history. Thirty-six covers were produced by his graphic design team. Unfortunately, as soon as Penguin's founder, Allen Lane, clapped eyes on them, the project was summarily stopped

because he thought that the covers were too crude. We won't divulge what he dubbed them…

In 1940, Abram Games joined the Infantry as a Private. One year later, he was posted to the War Office in Whitehall, London. He produced maps for the Army Bureau of Current Affairs, book covers, insignias and 100 posters for the army. His designs were so successful that he was given *carte blanche* to produce any posters which he thought necessary for army use. However, some were deemed to be too powerful and controversial, so they were banned and eventually shredded. Despite this setback, he was promoted to Captain in 1942 and appointed *Official War Poster Artist*, becoming the only person in army history to be given the title.

DX-TV & FM News

For details of DX reception covering January and February, plus the latest news about changes to television and radio services, please check out 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. Unfortunately, we cannot undertake to answer E-mails relating to technical issues or give advice on suitable equipment.

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7

Recommendation A Radio Engineer

"The Dunham two-valve loud-speaker set is a handsome oak cabinet model. In performance, equal to maybe three-valve sets (at half the price and half the maintenance cost) the design of this receiver represents a combination of simplicity with efficiency that has met with universal approval. Valves fitted internally on anti-microphonic holders, and there is a compartment in case for a high-tension battery. Tuning is by single dial with a small knob to vary reception power to individual requirements. Coils are entirely dispensed with. Range on loud-speaker 25-30 miles on ordinary station, 100-120 miles from Daventry. Phone range includes reception from many other stations at excellent strength. The operation of the set is an achievement in simplicity, just plug in and out to start set working. This action automatically lights up valves and puts all switches on. Complete with two Cossor dull-emitter valves, Exide accumulator, extra-large H.T. battery (100 volts), loud-speaker, in fact an installation complete. Marconi royalty paid, for £7/19/6, or 12/6 deposit secures and 12/6 monthly.

For Home Constructors: Envelope containing all details, drilling panel jig, wiring diagram, panel layout, complete list of components with full particulars, 7d. post free. The Dunham two-valve loudspeaker set was realised by Mr. C. S. Dunham (who until some time ago was Radio Engineer to Marconi Scientific Inst. Co. and had been a member of the B.B.C. since its conception) that radio appliances should not be machine-made articles designed on conventional lines. So he applied his knowledge and experience to the production of a range of radio sets and components that would be entirely different in their design and performance. These, by skilful methods of production, are sold at prices which represent wonderful value.

Truth In Advertising

We are prepared to prove the claims we make for our instruments. Sworn testimony supporting these claims together with a beautifully Illustrated booklet showing the full range of Dunham models will be sent per return on receipt of 2d. for part postage.

The Dunham Everlasting guarantee is your assurance of lasting and complete satisfaction.
Your own set taken in part exchange.

Beware Of Easy Terms

Buyers of various commodities have found to their cost that so-called easy terms are at times far from being what the name implies.

There is a way of purchasing out of income - easy terms that are easy AND FAIR. You keep what you have paid for. This is the Dunham way. Before you buy ANYTHING out of income write for our free treatise that tells you clearly what to avoid and how to keep on the SAFE side of the deferred payment system.

The latest Dunham Triumph:
a set that needs neither aerial nor earth.

C. S. Dunham, Elm Works, Elm Park, Brixton Hill, LONDON, S.W. 2. Write now for full particulars."

*[N.B.: the text has been left to reflect the spelling and punctuation conventions of the time – **Ed.**].*

Table 1: The Dunham Advertisement of 1927.

Radio News

NATIONAL HAMFEST 2021: The organisers of the UK's National Hamfest planned to take place at the Newark and Nottinghamshire Showground on 24-25 September 2021, will make a final decision in June. In a recent statement, they said: *"We are closely monitoring the ever-changing health landscape, government guidance and roadmap steps coming out of lockdown, and are optimistic that we can decide for this year's event in June. Preparations are continuing behind the scenes as usual to bring you the premier radio rally in the UK calendar. Our primary responsibility is to the health and welfare of our volunteers, traders and visitors. We thank you for your continued support and patience whilst we prepare."* Concerning other radio shows, swap-meets and similar events, you can keep in touch with the very latest developments and planning through our monthly *News and Products* section. (SOURCE: The Directors of National Hamfest . **https://www.nationalhamfest.org.uk**

Radio News

RADIO ACADEMY WOMEN IN RADIO & AUDIO AWARD: The Radio Academy will be celebrating Women In Radio & Audio this spring with a series of lunchtime webinars highlighting inspiring leadership and creative achievement. The programme of six talks will launch on Wednesday 24th February with a leadership panel hosted by Head of BBC Radio 2, and Chair of The Radio Academy, Helen Thomas. She will be hearing the stories of women in the business, including KISS Network Content Director Rebecca Frank, BBC Controller of Popular Music Lorna Clarke, CEO of *Radiocentre* Siobhan Kenny, and Chief Executive of Ofcom Dame Melanie Dawes. The launch event will be followed by five in-conversation talks, each taking place on a Wednesday lunchtime during March – International Women's Month. The talks will explore a broad range of areas of radio and audio, and confirmed guests include BBC Radio 2's Sara Cox and her producer Louise Molony, and podcaster Helen Zaltzman. More names will be announced in the coming weeks. In addition to the live events, March will see the return of the Radio Academy's Inspirations audio series, releasing daily clips of women in radio and audio talking about their heroes and inspirations in the business. Announcing the project, Chair of The Radio Academy Helen Thomas, said: "I'm so pleased that my first role as Chair of The Radio Academy is to host this fantastic event. I can't wait to hear about the journeys of some of the women I most admire, and who have motivated me in my radio career. The Women In Radio & Audio project throughout March is designed to inspire and encourage members, with brilliant stories and extraordinary achievements." All six events will be available free to Radio Academy Members through a live stream on The Radio Academy website and made available on-demand. Radio Academy Membership is free for many people in radio, and costs just £36 a year otherwise. Members can register their interest now, at the URL below:
(SOURCE: *Radio Academy, RadioToday*)
www.radioacademy.org/women

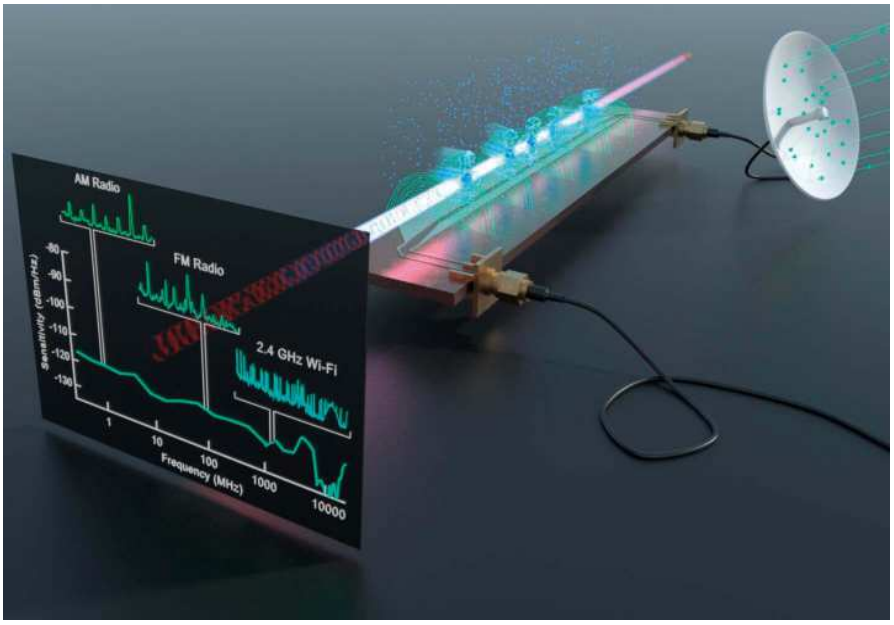
NEW 'R RADIO' ONLINE RADIO STATION FOR NORTHERN IRELAND : R radio has been created by former *Downtown* (see above) and *Q Radio* presenter Robert Skates, who was recently working as a broadcast journalist and news presenter at BBC Radio Ulster. Robert has over 25 years of experience in local radio in Northern Ireland and is known for his Sunday morning faith-based shows and launching the Friday night Downtown Country show some years ago. He is joined in this new venture by other experienced radio presenters from Northern Ireland. Robert said, *"We're working on the final stages of the project including our mobile phone app and online webpage – I can't wait to make that connection with the Northern Ireland audience again."* The station will play a mix of music from the 60s to the 90s and will feature country, lifestyle and a comedy show. Robert will launch the faith-based show called TODAY on Easter Sunday 8-10 am with a full station launch due later in the summer.
(SOURCE: *RadioToday*)
https://tinyurl.com/56muenkp

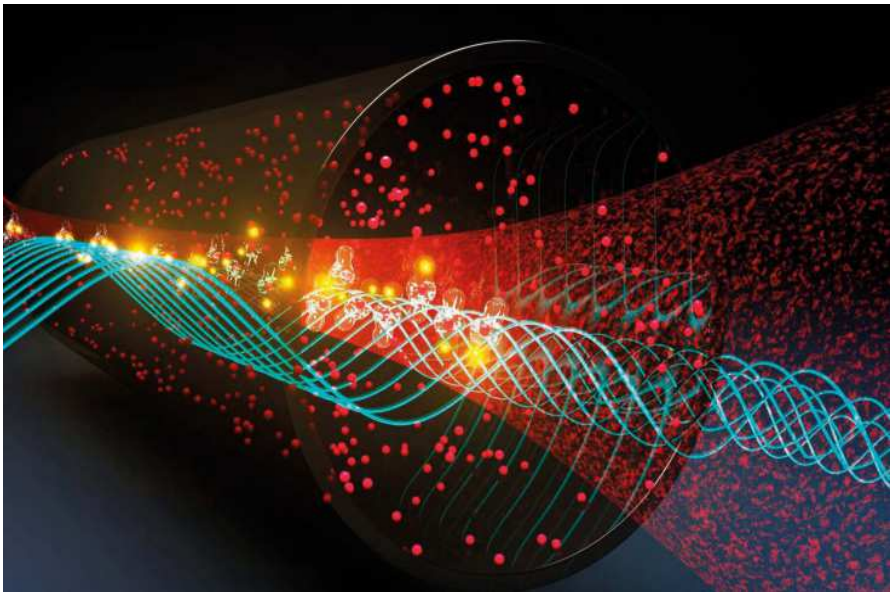
45 YEARS OF BROADCASTING: *Downtown Radio*, the first all-local Northern Ireland station marks its 45th anniversary this week. One of the earliest voices on Downtown Radio in 1976 is still hosting his very own show with listeners tuning in each week from across the country to hear Trevor Campbell. Big T was one of the original line-up of presenters which included Candy Divine, John Paul Ballintine and Michael 'Hendi' Henderson. Trevor said, *"The build-up to the launch of Downtown Radio was very exciting but for me, there was also the fear of not getting on it. There was no way of measuring how popular it would be until it launched in March 1976, and it just went crazy. Its popularity was phenomenal."* Looking back on Downtown's achievement, Bauer NI's Managing Director David Tighe added: *"Downtown Radio has been at the forefront of Northern Ireland radio for 45 years today. As Northern Ireland's first commercial radio station it will always have a special place in the media landscape here. Today Downtown Radio is as relevant and important to the community as it ever was, and it will continue to serve the population of Northern Ireland as proudly as it did on day one. I would also like to make a special mention to the legendary Downtown presenter Trevor Campbell, he was part of the launch team 45 years ago and remains on the air with us on Downtown Country, a huge achievement! Happy 45th anniversary on the air with us Trevor!"* To take a trip down Memory Lane, head to the *Downtown Radio* website where you can find photographs spanning 45 years.
(SOURCES: *Downtown Radio, Emma Dickson, RadioToday*)
https://tinyurl.com/f6huknty
https://tinyurl.com/44sv2rzy

RADIOWORLD SPRING PRODUCT REVIEW: *Radio World's* new e-Book for March 2021 is a look at brand-new or recently introduced products for the radio broadcast or audio industry professional. From products for the virtualized air chain to new microphones, on-air lights and codecs, there are approximately 50 products to learn about. Fascinating stuff.
(SOURCE: *Radioworld*)
https://tinyurl.com/2nwzsybm

NEW LICENCE CONDITION: The document ***Ofcom's New EMF Licence Condition – What You Need To Know As An Amateur Radio User*** (*Draft Version*) can be accessed at the URL below. All radio equipment produces EMF, and there are internationally recognised limits for public exposure are set out in guidelines published by the International Commission for Non-Ionising Radiation Protection (ICNIRP). In this document, we refer to these limits as the EMF limits. Ofcom is now proposing to add a new EMF condition to spectrum licences that allow transmitting powers above 10W EIRP (which is equivalent to 6.1W ERP). This means licensees will need to comply with the EMF limits and keep records demonstrating how they comply. The new EMF condition would be included in all amateur licences, including foundation licences. The guide provides an overview of the key points relating to the new EMF condition, with specific attention to the sorts of issues users of amateur radio are likely to encounter.

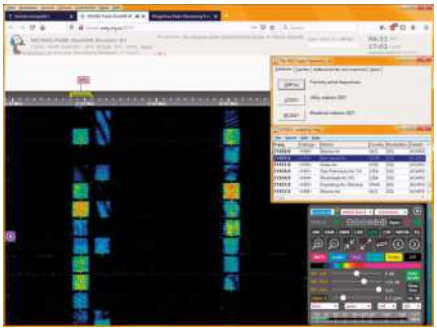
https://www.icnirp.org
https://tinyurl.com/2jmy86y3





ELECTRONIC WARFARE AND QUANTUM RECEIVERS: A new quantum sensor can analyse the full spectrum of radio frequency and real-world signals, unleashing new potentials for soldier communications, spectrum awareness and electronic warfare. Army researchers built the quantum sensor, which can sample the radiofrequency spectrum—from zero frequency up to 20 GHz—and detect AM and FM radio, Bluetooth, Wi-Fi and other communication signals. A Rydberg receiver and spectrum analyser detects a wide range of real-world radio frequency signals above a microwave circuit including AM radio, FM radio, Wi-Fi and Bluetooth. The Rydberg sensor uses laser beams to create highly-excited Rydberg atoms directly above a microwave circuit, to boost and home in on the portion of the spectrum being measured. The Rydberg atoms are sensitive to the circuit's voltage, enabling the device to be used as a sensitive probe for the wide range of signals in the RF spectrum. *"All previous demonstrations of Rydberg atomic sensors have only been able to sense small and specific regions of the RF spectrum, but our sensor now operates continuously over a wide frequency range for the first time,"* said Kevin Cox, a researcher at the U.S. Army Combat Capabilities Development Command, now known as DEVCOM, Army Research Laboratory. *"This is a really important step toward proving that quantum sensors can provide a new, and dominant, set of capabilities for our Soldiers, who are operating in an increasingly complex electromagnetic battlespace."* The Rydberg spectrum analyser has the potential to surpass fundamental limitations of traditional electronics in sensitivity, bandwidth and frequency range. Because of this, the lab's Rydberg spectrum analyser and other quantum sensors have the potential to unlock a new frontier of Army sensors for spectrum awareness, electronic warfare, sensing and communications—part of the Army's modernization strategy. *"Devices that are based on quantum constituents are one of the Army's top priorities to enable technical surprise in the competitive future battlespace,"* said Army researcher David Meyer. *"Quantum sensors in general, including the one demonstrated here, offer unparalleled sensitivity and accuracy to detect a wide range of mission-critical signals."* The peer-reviewed journal *Physical Review Applied* published the researchers' findings, Waveguide coupled Rydberg spectrum analyser from 0 to 20 Gigahertz, co-authored by Army researchers David Meyer, Paul Kunz, and Kevin Cox The researchers plan additional development to improve the signal sensitivity of the Rydberg spectrum analyser, aiming to outperform existing state-of-the-art technology. *"Significant physics and engineering effort is still necessary before the Rydberg analyser can integrate into a field testable device,"* Cox said. *"One of the first steps will be understanding how to retain and improve the device's performance as the sensor size is decreased. The Army has emerged as a leading developer of Rydberg sensors, and we expect more cutting-edge research to result as this futuristic technology concept quickly becomes a reality"* […]
(SOURCE: U.S. Army | CQ-DATV 94)
https://www.cq-datv.mobi/94.php

Radio News



KLINGENFUSS RADIO MONITORING UPDATE: Jörg Klingenfuss has an update on utility data reception. He says, "updated radiofax schedules of Athens Funabashi Guangzhou Hamburg Kagoshima Misaki and others can now be found on our website. What's more, since the publication (in December 2020) of the new 2021 editions of our books, CDs and databases, hundreds of new digital data decoder screenshots have been uploaded to our *hotfrequencies* webpage. We have monitored and decoded thousands of fascinating HFDL messages for decades, and from locations all over the world. While state-of-the-art CPDLC messages are widely used elsewhere, good old Europe is still considerably behind. The new station Muan, in particular, continues to be extremely busy.
(SOURCE: Klingenfuss Publications)

PODCAST RADIO'S LATEST EXPANSION: *Podcast Radio*, the UK all-podcast, 24/7 radio station on the DAB platform, has informed us that Birmingham has been added to the station reach. It is Britain's second-largest city. The expansion builds on the station's existing footprint covering London, Surrey, Manchester, and Glasgow. The expansion opportunity came when the multiplex space became available. Podcast Radio CEO Gerry Edwards said: *"We've wanted to expand to Birmingham for some time now. We've been waiting for space on the digital transmitter multiplex there and as soon as the opportunity arose for further expansion, we grabbed it."* *Podcast Radio* launched just over a year ago and is an independent platform for discovering and promoting podcasts through digital broadcasting and an online radio-like experience. It features sample episodes of podcasts from all over the world introduced by 'pod-jocks' who also interview content creators. The company has also started producing its own shows.
(SOURCES: Radio and Internet [RAIN] News)
https://tinyurl.com/39c34de7

SONGS TO LIVE BY – PODCAST: A new podcast celebrating Black voices and experience through the songs that shaped is heading to *BBC Sounds*. In each episode of *Songs To Live By*, BBC Radio 1's Vick Hope chats with two guests of different generations, about the music that has defined them – personally, politically, musically. This is the first podcast in a new co-production collaboration between the BBC and Warner Music Group. Working together, the BBC and WMG will create several new podcasts with different formats that have great storytelling and music at their centre. The genesis of this first podcast was wanting to do more to celebrate Black voices as well as open up more conversations about people's experiences with music as a cue for talking about their lives. Extracts from the songs will be played throughout the episodes as guests swap stories about their formative years […]. The first episode of *Songs To Live By* is available on *BBC Sounds* now, with new episodes available weekly.
(SOURCES: BBC | RadioToday)
https://tinyurl.com/vkbp4c3t

A STALWART OF THE SHORT WAVES: One of the, arguably, strangest and – many would say – most troubling presences on short wave radio is no more. 'Brother Stair', who founded the *Overcomer Ministry* has died. Ralph G. Stair, whose unique voice could be heard on the short waves for many years, has died of heart failure at his home over the weekend, according to US Colleton County Coroner Richard Harvey. Harvey said Stair had been under hospice care. His age was not immediately clear. The coroner's office listed Stair as 84, but Stair's Overcomer Ministry, which announced his passing on its website, listed his age as 87 and his time of death as 11:17 pm Saturday. At the time of his death, Stair was awaiting trial after being accused of sexually assaulting several women and children at the ministry. Stair was arrested on 18th December 2017, by Colleton County deputies and agents from the South Carolina Law Enforcement Division, the FBI and the Department of Homeland Security, the Colleton County Sheriff's Office said. Brother Stair was arrested on eight warrants and agents also executed a search warrant at *Overcomer Ministry*. The charges from that arrest included three counts of first-degree criminal sexual conduct, one count of assault with the intent to commit criminal sexual conduct first degree, one count of kidnapping, one count of first-degree burglary, one count of second-degree assault and one count of third-degree criminal sexual conduct with a minor.
(SOURCES: *SWLING.com*; US Press)
https://tinyurl.com/s3ky27ut
https://overcomerministry.org

RADIO CAN HELP BRANDS REACH THOSE WORKING FROM HOME: Working from home has plenty of perks, but there's no doubt you miss out on the office atmosphere and the company of colleagues. Radio cannot replace that, but it does add voices to your home office, and it will probably keep you more entertained than Derek from finance. New research from *Radiocentre*, *New Ways of Working, New Ways of Connecting*, has shown that the working-from-home (WFH) audience are doing exactly that. Of this large audience, 56% are commercial radio listeners and 90% of WFH listeners play radio in the background whilst working. This is great news for advertisers, and here's why. The new research shows that this audience is receptive to advertising, with over half of WFH listeners saying they search for a brand online after hearing it on the radio. Additionally, this WFH audience is made up of young to middle-aged professionals with an average household income that is 45% greater than the national average. Due to their lack of commute and a reduction in other costs, two thirds (63%) of people working from home have saved money since the pandemic began. The study also reveals that once lockdown lets up, the WFH audience has an increased motivation to spend money on travel (both domestic and international) and activities in the entertainment and leisure sector, such as going to restaurants and bars […].

LEVERAGING THE 5G NETWORK TO WIRELESSLY POWER IOT DEVICES: Researchers at the Georgia Institute of Technology have uncovered an innovative way to tap into the over-capacity of 5G networks, turning them into "a wireless power grid" for powering IoT devices that today need batteries to operate. The Georgia Tech inventors have developed a flexible Rotman lens-based rectifying antenna (rectenna) system capable, for the first time, of mmWave harvesting in the 28 GHz band. (The Rotman lens is key for beamforming networks and is frequently used in radar surveillance systems to see targets in multiple directions without physically moving the antenna system.
(SOURCE: Microwave journal, 26th March 2021)
https://tinyurl.com/5s5y547p

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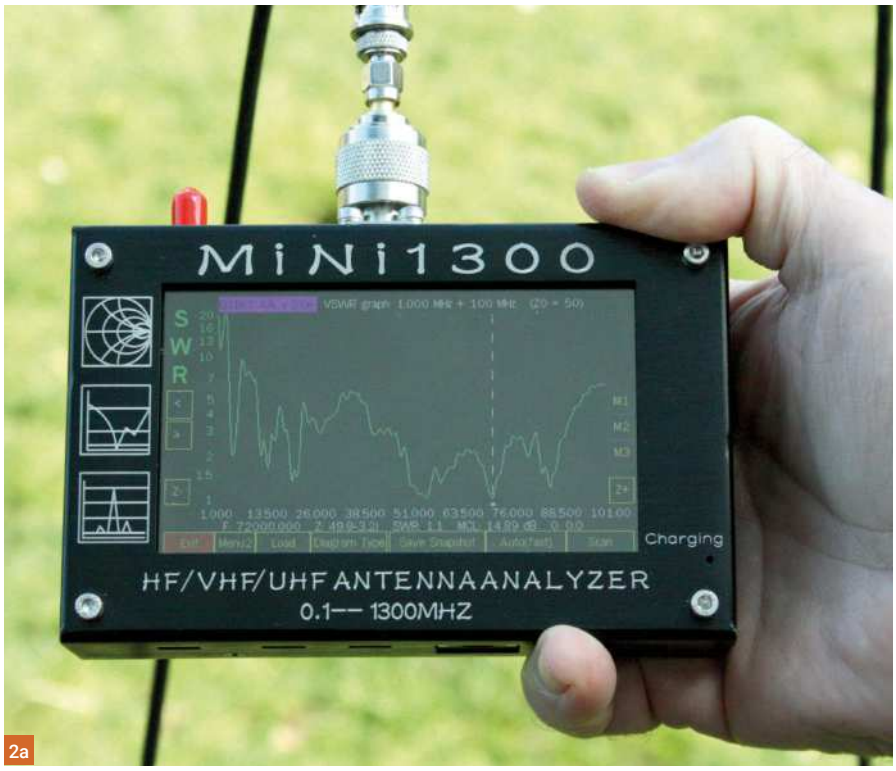
Keith Rawlings
Keith.g4miu@gmail.com

Keith Rawlings reviews the Moonraker Mini1300 antenna analyser unit.



2a

The Moonraker Mini1300 Antenna Analyser

We seem to be spoilt for choice these days when it comes to 'Antenna' Analysers. The Mini1300 is a development of the popular open-source design by EU1KY, which was built around the *STM32F7 Discovery* board. It has several interesting features.

To begin with, the many measurement parameters include: SWR, R, +Jx, -Jx, IZI, and Return Loss. The device displays these measurements graphically on the screen as a Smith-Chart, a Spectrum-Sweep or as numerical data.

The Mini1300 has a useful frequency range of 0.1 to 1300MHz, and there are a number of pre-set menu items covering, for example:

- Single Frequency Measurement
- Frequency Sweep / Multi-SWR
- Tune SWR / S21 Gain
- Find Frequency / Quartz Data
- TDR Mode / LC meter / DSP

Other options include *Configuration*, and *Screen-shot management/USB Card Reader*. The device also offers an RF Generator. If that was not enough, for the licensed user, the analyser incorporates a WSPR/FT8/JT65 transmitter.

It would be as well to point out that, despite the term 'antenna analyser', the Mini1300 is, in fact, another form of two-port Vector Network Analyser. Therefore, much of what I have recently covered on the NanoVNA will also apply to the Mini1300, although the latter approaches things rather differently.

As well as performing all of the functions of a conventional single-port analyser (VSWR, for example), it can also do two-port through-measurements for use with filters, amplifiers, attenuators, and so on.

Unboxing and Appearance

The review unit arrived, housed in a cardboard box, along with a USB power/charging lead, an SMA Calibration kit consisting of a Short-Open-Load (SOL), a Type-N to SMA female adaptor, a Type-N SMA male adaptor, and a three-part load kit. The latter includes three female SMC PCB sockets and three 5.1Ω, three 300Ω and three 49.9Ω SMD resistors.

These are for constructing low-impedance, high-impedance and 50Ω loads. To do this, you will need a suitable soldering iron, tweezers, and good eyesight.

A nice touch is that protective plastic caps are provided for the connectors. The analyser comes with an instruction leaflet which I can only describe as, well, 'unique'. It is written in three languages, all at the same time, apparently randomly and combined in a garbled form of 'Ching-Germ-lish'.

I do not think I have ever seen anything quite like it! Consequently, it is of little use.

The internet, by contrast, will be your main go-to tool for user information. However, be aware that there seem to be many variants of the EU1KY-design. The Mini1300 is just one of them, and the mechanical layout and firmware versions may well vary in different designs. The review model had firmware Version 1.04 loaded.

The analyser itself is built into an attractive metal case, finished in black. On the top of the case, there is an SMA socket with the lettering 'VNA'. Next to this, a socket for the TF/micro-SD card (which is included) and an N-type socket marked *Test Port*. You will also see the USB charge/power socket and the red power/on/off button. The unit has its own built-in Li-ion battery and charging circuit.

Underneath, there are various sockets and holes, which are not (yet) all in use. However, of those that are, one is for programming/updating the processor and one is for connecting to a PC to read stored files, such as images and Touchstone files from the micro-SD card. All configuration files are stored on this card, including calibration data, so it needs to be treated with care.

I did not try it, but I assume the *config* files could be copied to a PC and kept for backup.

The Mini1300 unit has a nice bright 4.3" TFT touch-screen display. The dimensions of the unit are 135Wx85Hx30D, excluding protrusions, and it weighs 550g. Overall, the Mini-1300 feels well built.

Getting Started and Calibration

On switching on, the user is presented with a menu screen with 15 options, to choose from set in three rows of five. On the top row, are

ALL PICTURES: KEITH RAWLINGS

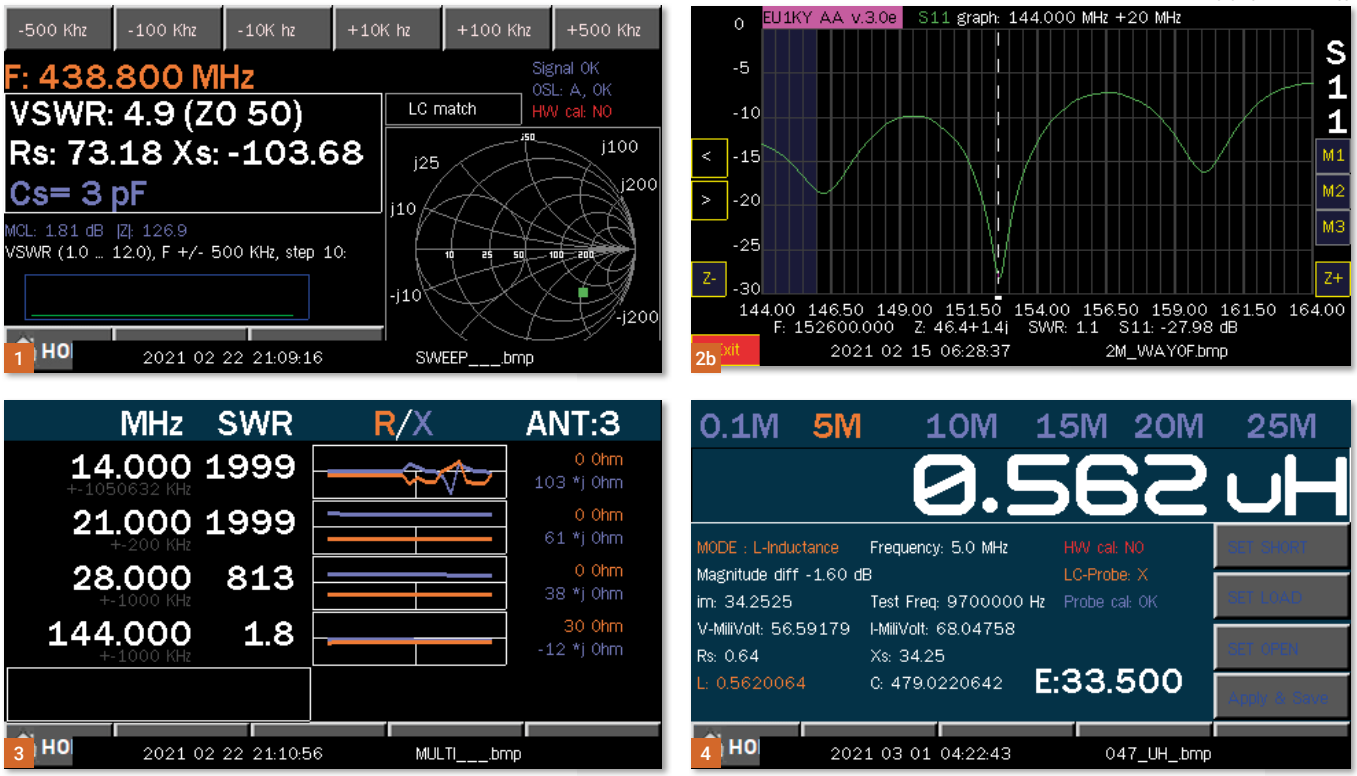


Fig. 1: A single-frequency sweep.
Fig. 2a: Panoramic sweep of the Vine 404 aerial.
Fig. 2b: Panoramic sweep of a 2m vertical whip.
Fig. 3: A multi SWR measurement.
Fig. 4: L-Measurement of a .47uh inductor.
Fig. 5: TDR Measurement of 5m length of RG58 coaxial cable.

measurement functions; the middle row contains 'tools' and the bottom row 'settings and 'signal generator'.

Unlike the NanoVNA, where the user has to select the measurement type and assign it to the appropriate port, the Mini1300 has pre-set measurement functions. These are selected by a touch on the appropriate screen icon. The features provided are various, but the top row consists of *Single Frequency Mode, Frequency Sweep, Multi-SWR, Tune SWR,* and *S21-Gain* modes.

Like every VNA, the first thing to do is to get the unit calibrated. To do this, the user needs to navigate to the configuration menu bottom left of the screen. The first item to select is the *OSL calibration* menu. Here, the user has to connect the supplied S-O-L to the N-connector but in the order of Short-Load-Open.

However, before doing so, users should first check to see if the unit is asking for 0Ω *Short-50 Ohm Load-Infinite Open* in the calibration menu, as the Mini1300 can be calibrated for systems other than 50Ω (75Ω is an example). It seems that calibration sweeps the whole range of the device so this can take some time. The calibration will have to be performed at the point of measurement for the best results.

As far as I can tell,16 different calibration files may be stored. For various tests I calibrated OSL A for 50Ω, measured at the end of the N/SMA adaptor fitted directly to the instrument itself, and OSL B at the end of a 10ft length or RG58 cable with BNC plugs fitted each end.

For through-measurements (S21) the user must select *[S21] Gain Calibration for VNA* and connect to both the SMA and N-type connectors, to perform a through-calibration sweep.

Also on the *Calibration* menu is *HW (Hardware) Calibration at first run.* Looking online, I found that this requires jumpers to be set internally. Seeing no means by which to do this, I emailed Chris Taylor for information and was told that it was understood that this has already been done and is only required when the system is built from a kit. The only calibration required is the OSL.

Therefore, the Mini1300 comes with an HW calibration already done.

My initial measurements confirmed that the unit was reading correctly.

The Mini1300 in Use

All user interactions are using the touchscreen display. The keypad-screen is typically used for frequency entry, which I found well laid out and intuitive. Many of the features may be run as a single scan or in continuous mode. Source impedance can be changed in the *Configuration Editor* (for example, to 75Ω, see under 'Calibration', above.

In what follows, I shall outline the main functions of this unit.

Single Frequency Measurement

In single frequency mode, the analyser continually sweeps a narrow bandwidth and returns figures for *SWR, Impedance* and *Reactance*. It also displays results on a Smith Chart. The frequency for the measurement can be set from the keypad menu screen in the usual way. It can be incremented/decremented 'on the fly', by +/- 10, 100 and 500kHz steps, while probing to find the required measurement point (Fig. 1).

Frequency Sweep

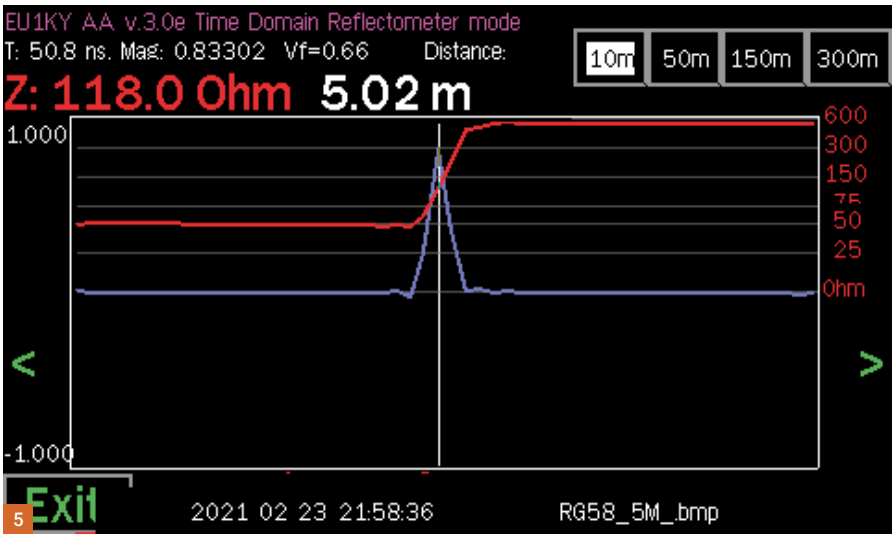
In this mode, the analyser sweeps a frequency range entered by the user (this can be to the full extent of the unit's frequency coverage). Frequency values are set as the minimum frequency + the required sweep. There are several options, available from the menu bar at bottom of the screen. The results are displayed panoramically as *VSWR, Real Impedance, Reactance, S11* or *Smith Chart*. A moveable cursor may be placed at any point on the screen to read off details (Figs. 2a and 2b).

The Multi SWR Function

Five user-defined bands can be swept simultaneously, with the unit displaying SWR, Impedance and Reactance. This is great for users with multiband aerials, such as the recently-reviewed Vine 404 OCFD, because it can be seen whether or not adjustments on one band are affecting other bands (Fig. 3).

The Tune SWR Function

This feature uses a horizontal bar graph and audible tone (which can be turned off) that changes in the note as the SWR alters. The lower the SWR, the lower the tone and bar graph level will be. This will be found of much use when performing adjustments to aerials where the analyser is located away from the adjustment point.



Measuring S21-Gain

This is used for through-measurement. It performs a panoramic scan of the user-selected frequency range. This function may be used for reading loss or gain of amplifiers and attenuators, and for measuring the parameters of filters, and so on.

The L/C Meter

With capacitance selected, the Mini1300 measures down to around 3pf and up to about 15nf, although a 15nf capacitor measuring correctly on my Peak Atlas LCR meter and VNWA read 18nf on the Mini1300. Switching to reading inductance a 0.470uh inductor read 0.560uh and a 4.7uh read 5.1uh. It appears that components can be measured at frequencies of 100kHz, and 5, 10, 15, 20, and 25MHz (Fig. 4). There is a provision to perform an SOL calibration, which I assumed needed to be carried out and saved before any measurements were taken.

Time Domain Reflectometry Mode

One of the inbuilt measurement features located on the second row is the *Time Domain Reflectometry (TDR)* mode. This is useful for determining the length of a cable, and, in particular, a coaxial cable. With this mode selected, the cable is connected to the test-port, preferably fitted with a suitable connector. A value of either 10, 50, 150 or 300metres is then selected, based on an estimate of the cable length. This selection is not critical; once a run is made, the length of the cable and cable impedance is displayed, no matter what range the analyser is on. However, the graphical representation on the screen of the cut-off point may be out of range.

The sweep runs automatically if the cable length is changed, or the *Scan* icon pressed.

For this to work correctly, the Velocity Factor (Vf) of the cable must be known and entered into the unit. The unit is pre-set with a value of 0.66 (such as for RG58). This may be altered and stored, either temporarily or permanently. I found this feature accurate although; with some cables, the analyser presented some odd impedance values directly at the cut-off point (Fig. 5).

The Vf of an unknown cable can be found by measuring a known length of the cable and altering the Vf on the analyser until it reads the correct cable length.

With amateurs now having to conform to RF exposure limits by set Ofcom, the Mini1300 is an ideal tool to accurately measure feeder length (especially in existing installations) and this data can then be entered into the RSGB/OFCOM EMF calculator.

An RF Generator

The analyser incorporates a basic signal generator, capable of outputting a fixed-level signal on any frequency within its range. There is also a basic facility for either FM or AM modulating of the signal. The modulating frequency is 500Hz. On the review model, I did notice a frequency error that increased as the generator was tuned higher in frequency. At 10MHz, I measured it at a negligible 0.6kHz high, by 144MHz it was 8kHz high, and by 1 GHz it was 52kHz high. I found that this error also applied to SWR measurements.

It may be that this can be trimmed out in the *Configuration Menu* but as this was a review model I did not attempt this. However, it does mean there may well be a frequency error of a few kHz with measurements made at the higher frequencies. Not having the correct USB lead I was unable to test the USB/Reader PC connection. My screenshots were taken directly off of the MicroSD card.

Overall Conclusions

In this brief look, I found that the Mini1300 provided a complete 'all-in-one-box-take-anywhere' tool for the testing and adjustment of aerials. It performs all of the usual S11 SWR, Impedance, TDR, Return Loss functions that most traditional analysers do. Also, it can perform S21 through-tests.

The unit also benefits from a signal generator that can typically be used for relative field strength measurements on a receiver connected to the aerial under test. With WSPR/FT8/FT4/JT65 capability, you can even use it to try your aerials out on-air and see how they perform.

The metal case is sturdy and well finished. The touchscreen is easy to manipulate clear, bright and colourful; it provides plenty of information. It is easy to recall images to view on the device or upload to a PC.

When images are saved, Touchstone files are generated at the same time, and these can be uploaded into other applications for analysis.

All in all, the Mini1300 is a very handy device. It is versatile and easy to use, and I thoroughly enjoyed using it. My sincere thanks to **Chris Taylor of Moonraker** for the loan of the review model.

The current price of the unit is £199.99.
https://tinyurl.com/44cnj44n
https://tinyurl.com/8dypn6m2
('testing the calibration kit')
https://tinyurl.com/2snn3hn9
('calibrating the Mini1300').

*[(1) our warm thanks go to **Chris Taylor at Moonraker**, for the loan of the review unit (2) a **Glossary** containing many of the specialist acronyms and terms used in this article has been placed online -- **Ed**.].*
www.radioenthusiast.co.uk

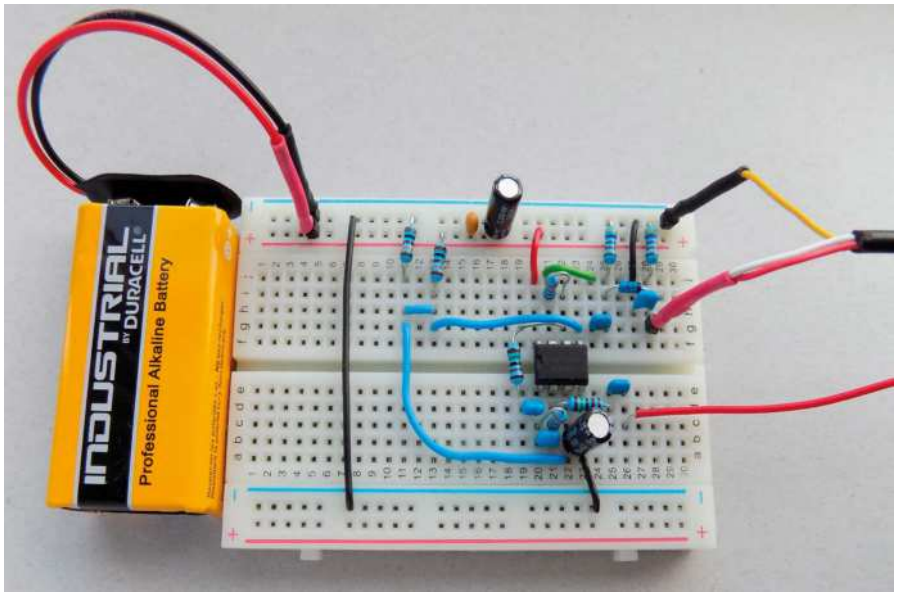
Feedback

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

Our reader **Andy** wrote to **Chrissy Brand**, regarding her article about Refugee Radio (*RadioUser*, April 2021: 53). Andy said, *"Hi Chrissy, I have just finished reading your article in this month's RU on Refugee Radio. Finally a UK journalist brave enough to speak common sense in these dark days of Populist hate. This is what Radio does best: it brings people together and undermines the propaganda machine (sadly much of UK media is in full propaganda mode). I hope you do not get too much abuse for your wise words. Reading your article I think there is room for a* Free Radio Britain *service delivering the real stories behind the populist claims. Maybe the EU would fund such a project, I'm sure they are as fed up as are the rest of us with what's going on these days. Once again, thank you for your excellent and inspiring article."*

[Many thanks for your letter Andy, it is good to see some of the impact of Chrissy's writing in troubled and uncertain times. I am looking forward to a future Free Radio Britain *-**Ed**.]*

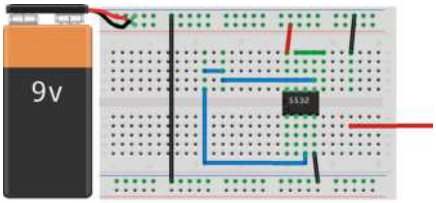
Mark Allen, of *PanAm Radio*, wrote in to **David Smith**, our *Airband News* columnist. Mark said, *"Hi David, just a short note to say thanks for including PanAm Radio in your recent column. A really nice surprise and thanks for the kind words. As you know, we are on HF every day, and I wanted you to know we are seeing a definite improvement in HF conditions as [Solar] Cycle 25 kicks into gear it is now making a difference. My opinion, after 50 years in this business is that your readers should be enjoying airband monitoring on HF in another six to nine months as propagation continues to improve. David, once again, thanks for the mention. If I can be of any support to you or your readers, please don't hesitate to reach out."*

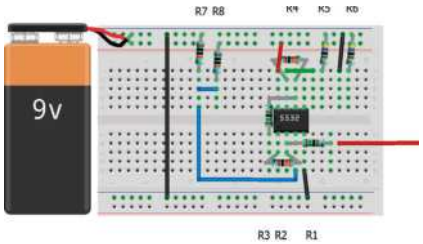


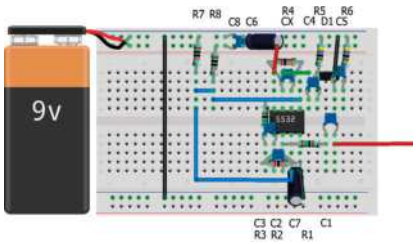
[Many thanks, Mark. I have reached out; consequently, we will be featuring a longer piece about PanAm Radio *in one of the forthcoming issues of RadioUser – **Ed**.].*

Corrections

RadioUser, April 2021: page 45, Figs. 9 and 10: apologies to Roger, Ian and readers for the duplicate picture; the complete set of illustrations is shown on this page.







RADIO EXECUTIVES PUBLISH LEADERSHIP BOOK: The former Chief Executive and Content Directors of UKRD, William Rogers and Dave Coull, and ex-GWR senior manager, Jonathan Bradley, have come together to publish a book. Between them, they have gathered their business experience to write a new book on leadership, *The No Normal Leader*. The book takes a swipe at the concept of the 'new normal' and sets out a leadership philosophy based on maximum readiness and cultural engagement. Dave Coull, who worked with William Rogers as Content Director at UKRD before it was acquired by Bauer, said that he had found the whole process of working collaboratively on a book hugely beneficial and that the result was, *"something which sets out a clear path for any leader who wants to ensure that the business they lead is as ready as it can be through cultural and people empowerment. The thread running through the book is, fundamentally, all about the people and the difference that any business can make to its future readiness if the right policies are in place to maximise the impact people can make."*
(SOURCES: Amazon | RadioToday | media.info)
https://tinyurl.com/w79s65nf
https://tinyurl.com/chaumzrx

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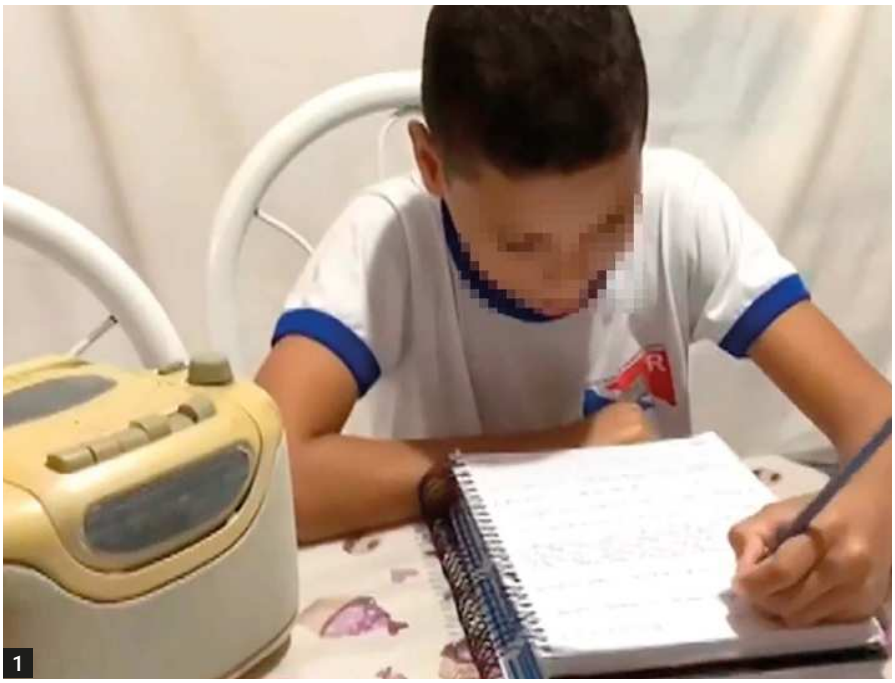

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Education and Radio in Brazil

Our South American correspondent **Martín Butera** returns to report from Brazil. He examines how radio plays a crucial role in reaching youngsters and students in the poorer regions of this vast country.

The last year 2020 will, in all likelihood – go down in international history as the 'Year of the Pandemic'. Coronavirus has confined most of the planet in a number of ways and has forced many of us to seek other ways to communicate with the outside world. It is probably true to say that Covid-19 took us entirely by surprise and showed us that we were not prepared for such a global crisis.

However, radio has proved to be one of the best tools to face this challenging time.

As a means of mass communication, it has helped people to know how to prevent and face this disease.

*[see also: RadioUser, March 2021: 44-48; April 2021: 56-59 – **Ed**.].*

There can be little doubt that the medium has constituted a welcome source of information and company for many, in these times of confinement. Consequently, radio is more current than ever.

I began in the hobby of radio listening, at the beginning of the 1990s, and I can say that from the first day I started, and I am aware that the 'death of radio' has been announced many times. Of course, I never let myself be carried away by these comments, and here I continue with more than 30 years of activity in the hobby. Radio, for me, is still alive as the first day and I think it is because it is the simplest means of communication par excellence.

Training Challenges

From where I stand, inevitably, radio continues to be the most important source of information. This applies, in particular, to the poorest regions of Brazil. Here – after more than 120 years of existence – radio is still on the air. In terms of education, and throughout South America, radio plays a vital part, not just as a vehicle of trust and comfort to older people.

For those unable to attend physical classes, due to the virus, listening on-air has become more significant than ever (Fig. 1). Without access to the Internet, some school officials found radio the best way to reach students. In an unequal country, 40% of the population does not have access to the internet, according to a survey by the Brazilian Institute of Geography and Statistics (IBGE).

Digital Divides

One in four people in Brazil does not have this luxury; in total, this represents some 46 million individuals without access to the network. The percentage of Brazilians with internet access in urban areas is very high at 92%, but in rural areas, the rate of people without access reaches 53.5%. Regarding a home connection, the Internet is present in 71 per cent of Brazilian homes. However, more than 20 million households do not have an Internet connection, a reality that particularly affects the Northeast region (35%) and families with incomes of up to the minimum wage (45%).

Almost half of those without Internet access say the reason is poor and expensive internet service in hard-to-reach areas. For this reason, words like 'YouTube', 'Facebook', 'Instagram', 'WhatsApp' and even 'Tik-Tok' are not used daily by a large part of Brazilian children and young people.

https://tinyurl.com/3dsznbck l

Radio-Learning

For many youngsters here, the reality often looks rather like in Fig. 2.

Therefore, many school administrators found the best way to reach students is by radio. More generally, Brazil is a great country, but it also faces enormous economic and development difficulties.

Where there is the internet, the signal is usually sufficient only to send messages via WhatsApp, at specific points in the house.

Therefore, many young learners without access have a battery-operated radio inside the house. This is very common in the poorest households in Brazil. Many of these students are from very remote regions, such as the Amazon River, and cannot afford a cell phone or a computer.

However, when they come into contact with the radio, school educational content reaches everyone equally (Fig. 3).

Fig.1: A Brazilian youngster, attentively listening to his classes on the radio.
Fig. 2: Many children without an Internet connection rely on school education via radio.
Fig. 3: Following basic classes is possible with a simple radio. Fig. 4: Pupils learn with their own radios in the North of the country. Fig. 5: A radio-teaching session being prepared in the studio.


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A Vital Resource

For these reasons, radio was the principal means by which the Brazilian Department of Education endeavoured to reach students without internet access during any quarantine periods (Fig. 4).

In mid-March 2020, all over Brazil, the suspension of classes in public and private was ordered. The duration of this 'break' in the school year is still uncertain, depending on the evolution of Covid-19.

With approximately 90 per cent of all students unable to attend school in person due to Coronavirus, many countries worldwide are now using distance learning methodologies and virtual platforms.

However, standardisation is elusive; in Brazil, most state education departments do not have an established online platform or methodology to offer remote classes over the internet.

Technology issues in the Brazilian context are frequently exacerbated by unequal access to digital learning tools by students since some of them do not have the necessary equipment for broadband connection at home. To overcome this problem, an alternative that some states have adopted is to use the radio to transmit a host of educational activities, since these devices have greater penetration in homes than broadband Internet. Radio was, therefore, the preferred means of the Brazilian Department of Education, for reaching students without internet access during the quarantine.

Educação em Quarentena

Consequently, a chain of radios throughout Brazil now broadcasts the one-hour programmes called *Educa Quarentena*. This broadcast goes back to an initiative of the *Brazilian Center for Comprehensive Education,* which monitors municipal and state education networks during the Coronavirus pandemic.

The initiative is divided into areas of knowledge, which include Mathematics, Natural Sciences, Humanities, Languages, and Arts. Next to content delivery, these radio-lessons also help to strengthen the bond between schools and families during the pandemic, the radio classes have a strong following, mainly in the interior of the country. The lack of internet and computers in the homes of many of the students in Brazil made radio a practical solution in the transmission of school content and the practice of educational activities.

Lessons On-the-Air

At the other end of the country, in Rio Grande do Sul, the city of Candelária asked its two commercial radio stations, *Rádio Sorriso FM Região dos Vales 104.3* and *Radio Princesa 103.4 FM*, to each set aside just 10 minutes for a programme called *Momento Educação*.

https://tinyurl.com/476jzrjr
https://www.princesacandelaria.com.br
https://tinyurl.com/vfa2z88w

This initiative is aimed at teachers in the local schools. It offers a short class-template on the topics that the children will have to work on, in addition to indicating the lessons, previously distributed to the families.

Classes take place at 7:30 am, and each day it is a different school that addresses its students. The idea of the local council is to reach 2,100 primary school students.

Although these classes are short, the programme allows pupils and parents to stay in contact with the school environment.

Transmitting Sound Worlds

These are some ways to avoid the difficult task of educating in these turbulent times. Brazil – this large and unequal country – has found that radio is also the most democratic way of disseminating education.

Therefore, radio in Brazil is the way to reach as many people as possible.

Another example is found in the city of Joinville, in the state of Santa Catalina, also in southern Brazil. Here, the Cultural FM radio, which is owned by the city government, has been broadcasting classes since April 2020, for students from kindergarten age up to EJA (an education qualification for young people and adults). The content is

MARTÍN BUTERA

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prepared by local teachers, who present the programs together with the station's journalists. For its part, the program, for those enrolled in nursery schools, is also aimed at parents, so that they can develop activities with their children. *"You can get your hands dirty. No problem"* was one of the instructions in an art education class.

Brazil knows that the advantage of radio is that it is free and local. Using a conventional receiver or even a smartphone without a data plan (the handset serves as an 'antenna' for the digital FM signal), the listener can access the content. Several state education departments in the north-central part of the country, such as Goiás and Maranhão, are using their public radio and television stations to broadcast the classes.

When talking about education, some believe that it is enough for a teacher to speak. This can be very tiring and boring. Radio, by contrast, has more than this; it offers sound-worlds, which include text, speech, music, noise, and sound effects. Therefore, radio is creating learning spaces by transmitting a wide range of sensations connected with learning (Fig. 5).

Having said this, this role of radio production could be tapped into to a much higher degree here, and the future will show how this aspect of disseminating learning will develop.

Radio Stations and Internet Challenges

More generally, many radio stations in Brazil had to adapt, to keep more isolated communities informed about Covid-19. Adhering to the slogan "*Stay at Home*" in the South American continent, as well as in many other parts of the world, has been particularly difficult for the poorest.

Most people in the South American region are seen to be located in the sector of the 'informal economy', i.e. living cheek-by-jowl, and day-by-day. With Covid-19, any kind of 'lockdown-protocol' has little chance of success among many poor South Americas, who argue that "*if the Coronavirus doesn't kill us, hunger will.*"

That is why Brazil did not implement any confinement rules more strongly. The merits or biases of this decision will be subject to further discussion. In Brazil, as elsewhere, the lockdown has caused many people to lose their income, something that is especially noticeable in less developed countries. The economic crisis in Brazil, caused by the virus will have serious consequences, perhaps worse than the virus itself.

Radio-based education and assistance in the pandemic continue to hold their own and expand, against the background of considerable technological challenges in Brazil, for instance, the persistent lack of computers and low internet connection speeds.

Resources

https://tinyurl.com/c9pfcdfk
https://tinyurl.com/5x8k5rjk
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https://tinyurl.com/4twf9swf
https://tinyurl.com/3ffynw46
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- CAT USB interface with FTDI controller
- Fully managed by FDM-SW2 software included

ML&S: £759.95

AR-5700D RECEIVER

Advanced digital communications.

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

ML&S: £4595.95

AOR AR-DV1

Communications Receiver

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

ML&S: £1199.95

SDR RADIO

SDRPLAY RSPdx

New Mid-range SDRplay Radio.

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

ML&S: £194.95

Multiple antenna selection, Improved pre-selection filters, Even more software, Selectable attenuation steps, Special HDR (High Dynamic Range) mode for reception at frequencies below 2MHz.
Designed and made in Britain.

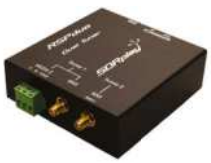
SDRPLAY RSP1a

Brand new design, the RSP1a is a major upgrade to the popular RSP1

ML&S: £94.95

Offering a powerful wideband full featured SDR covering 1kHz to 2GHz & up to 10MHz visible bandwidth. Better still, it's "Built & Designed in Britain"!!

RSPduo DUAL TUNER 14-BIT SDR



Dual-Tuner wideband full feature 14-bit SDR, 1kHz to 2GHz, 10MHz of spectrum visibility.

ML&S: £239.95

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

FUNcube Dongle Pro+

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

ML&S: £149.95

KerberosSDR

A Coherent RTL-SDR with 4x Channels.

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

ML&S: £179.95

HackRF One

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

ML&S: £219.95

DIGITAL & ANALOGUE

UNIDEN UBCD3600XLT

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

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

ML&S: £449.95

ICOM IC-R6E

The 100 Ch/Sec Wideband Signal "Search Machine"

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

ML&S: £199.95

WHISTLER TRX-1 DIGITAL SCANNER

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

ML&S: £419.95

AR-DV10

The ULTIMATE all mode digital handheld scanning receiver.

Latest firmware! 100kHz-1300MHz Analogue & Digital Modes.

ML&S: £969.95

ICOM IC-R30 SCANNER

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

ML&S: £569.95

SF Screen Protectors

For Yaesu, Kenwood and Icom. *Maintain the value of your radios with professional screen protectors. No more scratched displays, the screen protectors last for years and protect reliably even at daily use.* ***ONLY £7.95***

ANTENNAS

BONITO RANGE AT ML&S

ANTENNA JET AAS300

ML&S ONLY: £234.95

A USB powered antenna splitter designed to work between 9kHz and 300MHz. Now you can use your one antenna with up to 3 receivers simultaneously. Finally, you can listen to marine band traffic, The Archers on Radio 4 and the air band at the same time (provided your antenna will cover it all!)

ANTENNA JET ASM300

ML&S ONLY: £189.95

A USB controlled antenna switch and mixer. It can be used as a simple switch, or can be used to switch in more than one antenna, to aid receiving to an optimum performance.

BONI-WHIP (PSU needed)

The active antenna that is raved about. Covering 20kHz to 300MHz and ideal for times when you can't erect a wire antenna. For home, for travelling and for DX camps. And despite the whip being only 4 inches long, it actually works!

ML&S ONLY: £109.95

GigActiv GA3005

ML&S ONLY: £386.95

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

Diamond D-777

VHF/UHF air band receiving antenna, *not for transmitting. 3.4dB on VHF (120MHz) and 5.5dB UHF (300MHz) with an approximate length of 1.7 metres. The antenna is constructed from fibre glass materials and it is pre-tuned and fully weatherproofed. Mounting components are included. It's fitted with an SO239 connector, so can be connected to a PL-259 without the need of an adaptor. Tuned to receive 108-137.975MHz civilian air band, 225-400MHz military air band.*

RRP: £83.94 ML&S ONLY: £62.95

Diamond D-130M

Super Discone 25-1.3GHz
The D-130M Super Discone Antenna is an ultra-wideband antenna covering amateur radio, commercial 2-way, cellular, air traffic control and various utility frequency bands. Rust-free stainless steel is employed in major component parts making the antenna rust resistant and durable with 15m cable included with PL-259s.

ML&S ONLY: £124.95

MyDEL Smart Wire Kit

The MyDEL Smart Wire Kit antenna pack includes; 132ft of high quality flex-weave wire, 2x 3 metres of nylon guy rope and 2x heavy duty dog bone insulators.

ML&S ONLY: £44.95

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For new and experienced caravanners with top holiday ideas in the UK & overseas.

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Your Dog
The perfect go-to guide for all loving dog owners filled with advice & expert tips.

Your Cat
The must-have magazine for all cat lovers & cat owners alike.

Leave us a review

If you have enjoyed this magazine then do the next thing to shouting it from the rooftops and leave us a review instead! We all like to know when something is good and if something has been rated highly by others. Leave us a review to let others know what you think of Radio User.

The Battle of Britain
IN COLOUR

"Praise where due. This is the best magazine available which I have read - I am very impressed. I thoroughly enjoyed reading each chapter and it was written in such an easy style. It covered every aspect and I was saddened when I reached the end."

This 164-page special collector's edition commemorates the 80th Anniversary of the momentous Battle of Britain, making it the perfect gift for any aviation or Battle of Britain enthusiast.


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