

Latest Gear and New Accessories
Releases from Icom, Vine Antennas, SDRplay,
Klingenfuss, bhi, Paradan, Anysecu and more



RadioUser

November 2021 £4.99

www.radioenthusiast.co.uk

REVIEW

SEE THE LIGHT

Discover the best ultra-lightweight receiver for you in our £40 to £200 group test



Weather Ships

Developments in maritime safety and their impact



Lockdown Design

A reader's aerial solution in his home during Covid

AVIATION Runways, Lasers and Clouds

Changes in runway condition reporting, developments in laser communications and more



DIGITAL The Future of DAB Format Explored

The UK Digital Landscape; plus news from Digital Radio UK and the European Broadcasting Union



WARNERS
Display until 25th November 2021

Afghanistan Radio • BBC History • Indigenous Radio • E. Alexanderson • LOFAR • Magnetic Loops

PRICE PLEDGE – we aim to be competitive – seen it cheaper then let us know



AOR AR-5700D

Digital Communications Receiver

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

£4595



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



Icom IC-R8600

Professional Communications Receiver

- 10kHz-3.0GHz Super Wideband
- P25, NXDN™, dPMR™, D-STAR Mode
- Real-time Spectrum Scope with Waterfall
- Software Demodulation by FPGA Processing
- Large 4.3 inch TFT colour touch screen display

£2499.99

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

£44.95

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



Sirio SD-3000N Discone
High quality stainless steel,
chromed brass & anodised
aluminium construction
• 300 MHz-3GHz

£69.95



Scanmaster Desktop
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

Nevada EFW-1 End Fed Wire



High quality receive
antenna c/w mounting
hardware and 8 metres
of coax w/ PL259 plug

- Covers: 2-30MHz
- Kevlar Mil spec. wire
- Length: 20m

£69.95

AIRSPY



Airsipy HF+ Discovery

- Pre-selectors
- 9kHz - 13MHz
- 60MHz - 260MHz
- Use over internet
- 60 x 45 x 10 mm

£199.95



AIRSPY R2

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 pwr 4.15 dBi..... £39.95
CX455..... (455 - 470)MHz pwr 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

7 metre Mini Pole..... £59.95
10 metre Mini Pole..... £69.95
Mini Carrying Bag for Mini Poles..... £14.95
12 metre Heavy Duty..... £89.95
18 metre Standard..... £199.95
22 metre 'Long John' NEW..... £399.95
26 metre Standard..... £499.95

Aluminium Telescopic masts

10 metre Standard..... £299.95
10 metre Heavy Duty..... £325.00
12.5 metre Standard..... £329.95
14.5 metre Heavy Duty..... £425.00
15 metre standard (2m retracted)..... £399.95

SDRplay



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



RSP DUO Dual Tuner SDR

- Covers: 1 kHz - 2GHz
- Software upgradable

£239.95

NEVADA Power Supplies

Quality Power Supplies 2 YEAR WARRANTY!



PSW-30

Switch Mode

- 25-30A supply
- Low noise

2 YEAR WARRANTY

£79.95



PS-40M

Linear

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

£129.95

PS-08..... Linear 8A (max) 13.8V DC..... £34.95
PS-30M..... Linear 30A (max) 3-15V DC..... £99.95
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
PSW-04..... Switch mode 5A (max) 13.8V DC..... £24.95

ULTRA LOW LOSS COAX



Ecoflex 15 per metre..... £7.99 price per 102m drum..... £759

Ecoflex 15 plus 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 (Cablex) 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

JUST
ARRIVED!



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

£89.95



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



Tecsun PL-990x
Top Of the range Portable radio

- 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

£259.95

TECSUN®

World Radios

NEW



Tecsun H-501x
FLAGSHIP RADIO
with Bluetooth

- Covers: LW, MW, Shortwave, FM (64-108 MHz)
- All mode reception incl. SSB
- Local, medium, DX selector
- ATS: Auto search and storage
- SD slot with 16Gb card supplied
- 3150 memories in 25 pages.
- USB sound card function
- Two channel Stereo speakers
- Batteries:
Uses 2 x 18650 batteries, charging one as a spare, whilst running on the other



£329.95

AOR



AR-DV10
Digital Handheld
Scanning Receiver

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

£999.95

£939.95

ICOM



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

POWEREX



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
- Displays:
Capacity, Voltage, time & rate

£69.95

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



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



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 Digital Scanners



Whistler TRX-1E

£419.95



Whistler TRX-2E
Base version of TR-X1E

£479.95

Whistler TRX-1E and Whistler TRX-2E

- 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 WS1065
Advanced scanner using
cutting edge technology

- 25-1300MHz (with gaps)
- 1,800 memories

£299.95



Whistler WS1040
Analogue scanner covering
Trunked systems

- 25-1300MHz (with gaps)

£299.95

Serving our customers for 50 years



follow us on twitter: @NevadaRadio



follow us on facebook: www.facebook.com/nevadaradio

- Unit 1
- Fitzherbert Spur
- Farlington
- Portsmouth
- Hampshire
- PO6 1TT



Contents

Favourites

Reviews

Features

News

Profiles

RadioUser

ISSN 1748-8117

November 2021 Vol. 16 No 11

On sale: 28 October 2021

Next issue on sale: 25 November 2021

RadioUser

Warners Group Publications plc

The Maltings, West Street

Bourne, Lincs PE10 9PH

www.warnersgroup.co.uk

Tel: 01778 391000

Editor

Georg Wiessala

wiessala@hotmail.com

Designer

Mike Edwards

mike.edwards@warnersgroup.co.uk

Advertisement Manager

Kristina Green

kristina.green@warnersgroup.co.uk

Tel: 01778 392096

Production Manager

Nicola Glossop

nicola.glossop@warnersgroup.co.uk

Production Assistant

Charlotte Bamford

charlotte.bamford@warnersgroup.co.uk

Marketing Manager

Katherine Brown

katherine.brown@warnersgroup.co.uk

Marketing Executive

Luke Hider

luke.hider@warnersgroup.co.uk

Publisher

Rob McDonnell

robm@warnersgroup.co.uk

Technical Help

We regret that replies to technical queries cannot be given over the telephone. Any technical queries by e-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by RU, then please write to the Editorial Offices, we will do our best to help.

Book and back issue orders

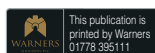
Send your completed form to:

RadioUser Subscriptions Dept

Warners Group Publications plc

The Maltings, West Street

Bourne, Lincs PE10 9PH



GIFT A SUBSCRIPTION



This Christmas give the perfect gift to anyone, anywhere in the world.

SEE PAGE SIX FOR DETAILS



Keep up to date on Facebook
www.facebook.com/radioenthusiasts



Follow us on Twitter
@REntusiasts



38 Subscriptions Page

A regular subscription to your best-loved radio magazine means that you have each issue delivered to your door or device and that you never miss any reviews, features or monthly columns.

7 News and Products

New bhi in-line module; AN-SOF 6.20 software; Lamco RST-SPKR-S; Icom 3D printing & IC-9700 interface; ML&S Paradan Antenna-Disconnect; SDRUno Scheduler; Anysecu WP-9900, and more. (see also pp. 23-24, 37, 47, 59)

13 Bookstore

The RadioUser bookstore extends to you the invitation to enlarge your shack library and to stock up on your essential listening guides, technical handbooks and radio history titles for the winter.

14 Book Review

David Harris reviews a remarkable new publication on the repressive structure, function and content of fascist radio broadcasting in Nazi Germany.

15 Book Review Extra

Robert Connolly and the editor take an in-depth look at Scott Caldwell's new eBook on the role of radio communications in a maritime context, including some of the key events and personalities.

16 Radio in Afghanistan

Martin Butera returns to outline the volatile story of radio in war-torn Afghanistan in the course of the last two decades, up to the re-emergence of the Taliban a few months ago.

20 International Radio and New Media

In a RU first, Chrissy Brand offers a broad radio profile of Sweden and shares her suggestions for the very best international radio programmes and podcasts worth listening to this month.

Cover Story

38 Ultra-Light Radios and DXing

Clint Gouveia is back to take a look at a group of small, but perfectly-formed, receivers, which offer plenty of opportunities for low-cost mobile DXing pleasure and radio adventure.

26 Aerials Now

Keith Rawlings reacts to some great reader feedback on innovative aerials, revisits the Wellgood loop and appraises an interesting online comparison test of magnetic loop aerials.

30 Airband News

With the 2021 Airshow Season all but complete, David Smith turns his attention to advanced aeronautical laser communications, runway condition data, and a profile of RAF Marham ATC.

34 Emerging Issues in Radio

Chrissy Brand embarks on a new two-part mini-series on the value of radio for indigenous communities worldwide, commencing her exploration in Australia, Canada and the USA.

43 European Private Short Wave Stations

Stig Hartvig Nielsen shares the latest instalment of this crucial Europe-wide listening resource.

44 Digital Radio

Kevin Ryan considers the future of DAB and Digital Radio in the UK, examines key news from the EBU and Digital Radio UK and asks what lies ahead for the development of in-car radio technology.



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

Welcome



44 TV & Radio, Past & Present

In addition to sharing vital DX-TV & FM News, Keith Hamer and Garry Smith draw to a close their assessment of 85 years of BBC Television, profiling the personalities behind the first transmissions.

51 Rallies and Events

With the end of the year fast approaching, we have updated our inventory of the remaining radio rallies, club gatherings, lectures and related events for now, and into 2022.

52 Ernst Alexanderson

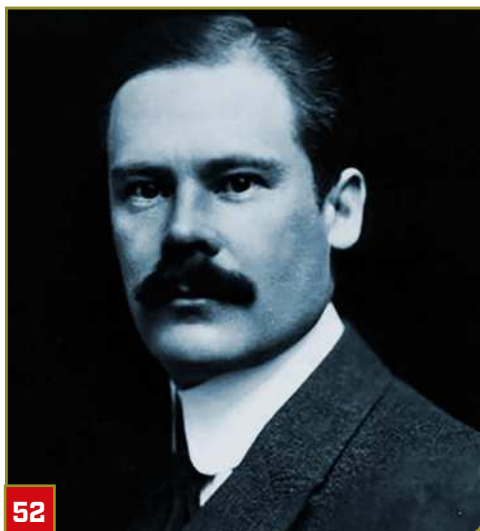
Scott Caldwell delineates the fascinating life and inventions of Ernst Alexanderson, the creator of the eponymous alternating transmitter, known by many today because of SAQ Grimeton in Sweden.

56 Signals from Space

Tim Kirby continues his investigation of introductory radio astronomy by taking an in-depth look at LOFAR, the Low-Frequency Array, a pan-European instrument of the very latest generation.

60 Maritime Matters

Robert Connolly discovers the intriguing history of international weather observation ships, has some noteworthy aerial news and remembers a recent incident near the Isle of Man.



Portable Radio Joy & Indigenous Waves

Georg Wiessala

wiessala@hotmail.com

Hello and welcome to the November issue of *RadioUser*. We have arrived at the penultimate issue for this year, and you will find that some of our contributors are beginning to offer a look back at some of the key developments, products and events of 2021.

In our features this month, we present a survey of the radio landscape in Afghanistan over more than two decades, in the context of an ever-changing, contemporary, political context. Martin Butera, who has joined our regular team of writers for 2022 is back to attempt this.

Right on time for the start of this winter's core Dxing Season, another long-standing *RadioUser* friend and contributor, Clint Gouveia, of *Oxford Short Wave Log* fame, has undertaken a group test of some reasonably-priced, portable, world band radios. If you are already thinking of gifts, start here. Chrissy Brand's full review of the exciting new Tecsun H-501x is waiting for you in the wings of the December issue, don't miss it.

Our *Bookstore, News and Products* and *Book Review* sections are slightly more expansive than usual this month – the idea was to give you the best possible idea of what's new in the run-up to Christmas.

It is always great to see *RadioUser* authors publish elsewhere; therefore, I might mention, for instance, Scott Caldwell's book *Radio – Wireless Voice of the Sea* to you; check out our review in this issue. David Smith's new *Air Traffic Control Handbook* too is about to come out as we are going to press.

In other features, we begin a new two-part series on the social and cultural roles of radio broadcasting



for indigenous communities, looking ahead to a related theme on radio and minority languages early in 2022.

Furthermore, we have initiated the first in a new, occasional, series on 'radio-portraits' of entire countries, beginning with Sweden.

Radio as a means to understand our environment and a historical marker is what could be said to unite the columns by Tim Kirby and Scott Caldwell this month. While the former explores the fascinating world of LOFAR radio astronomy, the latter profiles the scientist who gave his name to the machine at Grimeton, which VLF radio enthusiasts are always keen to monitor a few times per year.

Elsewhere in this issue, you can discover more on loop aerials, aeronautical laser communications, pan-European short wave radio and in-car digital radio technology.

We conclude our celebration of 85 years of BBC Television, with Keith Hamer and Garry Smith, and we take a look at the history and function of weather observation ships, with Robert Connolly.

Enjoy the magazine, stay safe, and please get in touch about what you would like us to cover here in the forthcoming year. You might even want to become one of our new writers in 2022 ...

Georg Wiessala

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

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

TREAT YOURSELF OR A LOVED ONE!

Give the perfect gift this Christmas,
with a subscription to RadioUser



Aerials Galore
New six-element beam aerial and much more

All New Handhelds
Icom IC-N94DE and the Anytone 80-D878UB 'Plus'

RadioUser
www.radioenthusiast.co.uk

July 2021 £4.99

EQUIPMENT **RADIOS FOR SEA RESCUE**

12 Issues • One-Time Credit Card Payment • No Commitment

To set up a gift subscription, visit bit.ly/raus-giftasub21
or call **01778 395161** and quote **RAUS/FESTIVE2021**

Prefer to gift digital?

You can also gift a digital subscription! Simply head to pktmags.com/ru-giftasub21 and check out as normal. Just be sure to check the 'give as gift' box, and follow the instructions.



What's New

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



New In-Line Module & Bypass Switch

The new **bhi In-Line Module** cleans up noisy signals and works with most radios and receivers. It comes with the latest bhi DSP noise cancelling technology, which brings improved audio quality to the listener when operating in noisy conditions across all radio bands. The audio is clearer and more intelligible as a result. The In-Line Module accepts speaker level audio and connects in between your radio and loudspeaker. The speaker audio is muted when headphones are connected, and when the unit is switched off the audio bypass feature routes the signal directly through to the loudspeaker.

The In-Line Module is powered from a suitable 10 to 16V DC power supply and has a three-position switch that turns the unit on and switches the noise cancellation on and off. The 'Status' LED illuminates red when power is applied and changes to green when the noise cancellation is active. The unit has an audio input overload LED, an audio output level adjust control and comes supplied with a 3.5mm mono plug lead, fused DC power lead, User manual and 4 rubber feet. The new bhi In-Line Module is available from bhi Ltd, or one of their authorised stockists. Price £159.95 including VAT. The key features of this new device are as follows:

- 8 noise cancelling levels, 8-40dB • Tone reduction up to 65dB
- Bespoke 5W audio amplifier • Audio-bypass feature
- Speaker output connection 3.5mm mono jack socket
- Headphone socket 3.5mm mono jack socket
- Audio input overload feature • DC power 10 to 16V DC (500mA)
- Compact unit, 135mm x 65mm x 46mm, weight 0.3Kg

The bhi Dual In-Line and Compact In-Line units don't have an internal audio bypass facility. If you switch the power off on your bhi unit, the audio will not pass directly through to your external speaker. The new **bhi Bypass Switch** enables this to happen by routing the audio from your radio directly through to your extension speaker without powering on your bhi unit. This can be particularly useful if you just want to listen to your radio without your bhi noise-cancelling unit switched on. A single push-button switch on the Bypass Switch provides this facility. Press the button in, and the audio routes through your bhi DSP noise cancelling unit (power on). The new Bypass Switch is available from bhi or one of their authorised stockists. Retail price £34.95 including VAT.

www.bhi-ltd.com

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



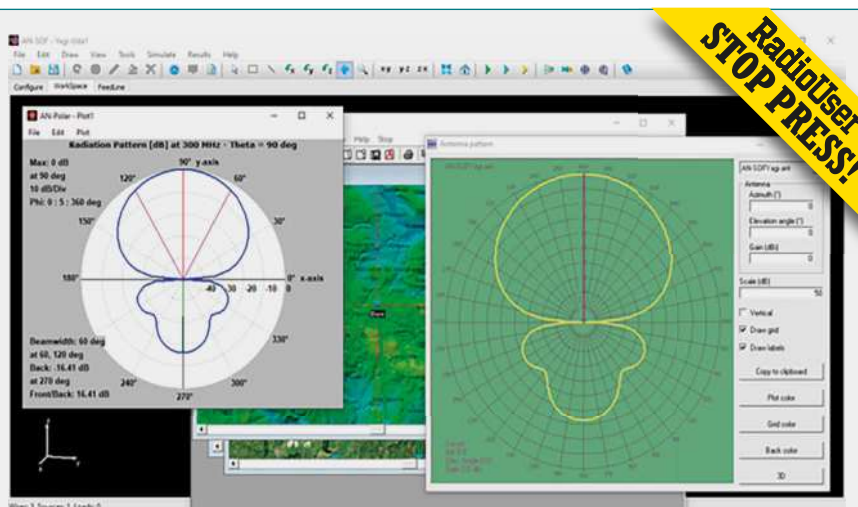
Klingenfuss Publications

With solar activity increasing strongly and providing much-improved HF propagation conditions, our friend Jörg Klingenfuss has been in touch again to let *RadioUser* readers know about his forthcoming products and frequency lists for 2022. *Klingenfuss Publications* are now working on the following products and updates:

- 2022 Shortwave Frequency Guide
- 2022 Super Frequency List on CD
- 2022 Frequency Database for the Perseus LF-HF SDR
- Supplement January 2022 to the 2021/2022 Guide to Utility Radio Stations

All to be published on 10 December 2021.

www.klingenfuss.org



AN-SOF 6.20: Export to Radio Mobile now possible

The developers of *AN-SOF* have contacted *RadioUser* to let us know about the new release of *AN-SOF 6.20* via Keith Rawlings, our *Aerials Now* columnist. The ability to export to *Radio Mobile* is a noteworthy development here. The following features have been added to the software package: Radiation patterns plotted in *AN-Polar* can now be exported as *.ant files.

The *.ant format can then be imported into the *Radio Mobile* propagation software. The format description can be found at the first URL, below. Versions 1 and 3 are implemented in *AN-SOF 6.20*. See how to export radiation patterns from *AN-SOF* to *Radio Mobile*, by looking at the second URL here:

<https://tinyurl.com/chvt95ka>

<https://tinyurl.com/abtcyacs>

For a 'one-slice' polar plot, an azimuth pattern

must be chosen (theta = const). For the two-slices polar plot, slice 1 must be azimuthal (theta = const) and slice 2 must be zenithal (phi = const). The Full 3D option must be selected via the *AN-SOF Configure* tab > *Far-Field* panel. Exportation of linear wires in DXF format has been added. DXF files can then be read by the *Autodesk* viewer at this URL:

<https://tinyurl.com/fuz7425f>

Among these improvements, the developers have also fixed some bugs reported by users. Users subscribed to an upgrade plan will receive the download link for *AN-SOF 6.20* in a separate email. The *AN-SOF* engineers want to thank all their software users for their generous feedback and support.

(Sources: *AN-SOF* | via Keith Rawlings)

keith.g4miu@gmail.com

<https://tinyurl.com/hawwnbfh>

LAMCO/Vine Antennas RST-SPKR-S Speaker

The LAMCO/Vine Antennas RST-SPKR-S Speaker features ABS enclosures and a sturdy metal grille. It is suitable for free-standing or wall-mounting via an adjustable fixing bracket. The trapezoidal design of the RST-SPKR-S allows for the enclosures to be mounted neatly into corners, making them ideal for most applications. The primary features of these new speakers are as follows:

- A 2-way speaker system with crossover network
- Alternative M6 threaded mounting points
- Dimensions: 150 x 195 x 150mm
- Frequency Response: 110Hz – 20kHz
- Impedance 100V: 500, 1k, 2k, 4kΩ

- Power Max: 70W; Power RMS: 35W
- Rotary selector switch for 100V line tapping's or 8Ω-operation
- SPL @ 1W/1m: 88dB
- Spring terminal connection
- Supplied singly
- Tappings: 20W, 10W, 5W, 2.5W + 8Ω
- Tweeter: 25mm (1") balanced dome
- Wall mounting bracket supplied
- Weight: 1.63kg
- Woofer: 100mmØ (4") reinforced paper cone.

sales@lamcommunications.net

<https://tinyurl.com/7ups6pfj>



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

New from Icom

Download IC-705 Exterior Case 3D Data and Create Your Own

Accessories: Icom is allowing the download of 3D data of the exterior case of the IC-705 HF/VHF/UHF Mobile Transceiver allowing customers to create their own related accessories. The 3D data that will be made available will be compatible with several pieces of free 3D-modelling software and 3D applications and will allow individual users to create their own IC-705 related items. All users of this data will be required to agree to a memorandum stating specific rules of use before download. The principle of any items created with the data is that they will be for individual use only and not for commercial purposes. This is the first time that Icom has done something like this and will be a test as to whether they will consider disclosing 3D data for other products in the future. To find out more, including FAQs and the *ICOM 3D Data License Agreement* visit the dedicated *IC-705 Exterior Case 3D Data Download Page*.

https://www.icomjapan.com/support/IC-705_STL

https://icomuk.co.uk/IC-705/Mobile_Amateur_Radio_Ham

Enhance Your D-STAR Experience With iOS/Android Apps: The RS-MS1i (for iOS™ devices)/ RS-MS1A (for Android™ devices) App allows your mobile device to wirelessly connect to a D-STAR transceiver and remotely set DR functions, link with a map app and send/receive messages in DV mode. In addition, pictures on an iOS/Android device can be transmitted in *DV Fast Data* mode or *DV* mode. Further details about these apps and compatibility with your radio can be found by visiting the RS-MS1i (for iOS™ devices) or RS-MS1A (for Android™ devices) product pages. Alternatively, you can download the RS-MS1 brochure here. To find out more about D-STAR digital amateur radio read our article, 'What is D-STAR?' For support, you can visit the *ICOM D-STAR Resources Page* (below):

<https://icomuk.co.uk/RS-MS1i-App-Software/4163/1155/14>

<https://icomuk.co.uk/D-STAR-Resources-Page/3997/1628>



Martin Lynch: Interface for the Icom IC-9700

ML&S are pleased to announce the new *PTRX-9700 Panadapter Interface* for the Icom IC-9700. Based on the same principle as their bestselling *PTRX-7300*, *Radio Analog* have now released their internally-fitted module, enabling users of Icom's V/U/SHF transceiver to feed an SDR like the *SDRplay RSP-1A* without any compromise to the transceiver's RF performance. Pre-delivery orders are now being taken at £279.95, and more information is available on the website.

(Source: Martin Lynch & Sons Ltd.).

www.HamRadio.co.uk/PTRX9700

www.MLandS.co.uk



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



Moonraker X1-HF Vertical 1-50MHz Receiving Antenna

Chris Taylor at Moonraker has been in touch to let us know that the firm has acquired new stocks of the excellent – and very popular – X1-HF Vertical 1-50MHz antenna. This is a discrete passive short wave receiving antenna supplied with 10 m of downlead terminated in SMA to connect to SDR (and other) receivers. This antenna has internal loaded wire traps to function as a great alternative to a long wire. Ideal for those who want to listen to short wave but have limited space - easy to assemble, easy to use. The key features and specifications are as follows:

- Type: Helical loaded HF vertical
- Frequency RX: 1-50MHz
- Length: 200cm
- Radials: Not required
- Mast: Up to 37mm (1.5")
- Connection: SO239
- Cable: Comes complete with 10m RG58 PL259 to SMA

[Look out for a brief review of this antenna in the December issue of *RadioUser* – Ed.]

<https://tinyurl.com/yf8rrc2u>



**New at Martin Lynch:
Paradan Antenna-Disconnect**

The *Antenna Disconnect* automatically disconnects the antenna from your radio and grounds it. It prevents static discharge, surges, and lightning-strike effects from damaging your radio and associated equipment. The *Antenna Disconnect Actuator* is installed at the output from your transceiver, power amplifier, or antenna tuner in line with the antenna's feed line. When the transceiver is turned OFF, the antenna's coax signal wire and shield are shorted together and grounded, and both the coax centre and coax shield are disconnected from the radio. When the transceiver is powered ON, the Actuator re-connects the antenna for normal operating. It is intended for HF operation, 160 through 6 meters, and can manage 1.5kW. A good earth ground connection is required for maximum surge protection. The *Antenna Disconnect* is ideal for remote station lightning and static protection. The *Antenna Disconnect Actuator* comes with SO-239

coaxial sockets. It is also available with 5-way binding posts for use with twin lead (ladder line) feed lines, such as 450Ω lines. The 12V power for the Actuator comes from the transceiver. For modern Yaesu transceivers, simply plug the control cable into the transceiver's auxiliary power RCA socket. For modern Icom transceivers, connect the control wire to the auxiliary socket's pigtails using the crimp barrels. Or connect the control cable to your power supply directly or through a power strip. Powerpoles are included. Simply turn on your radio or power supply to operate. If you wish to leave the power supply on, then a separate unit, the optional Radio ON Detector unit is used to sense if the radio is turned on. The *On-Detector* is placed in series with the radio's 12 V power wire [...]. Retail at £ 115. See more on the ML&S Ltd. Homepage: <https://tinyurl.com/428ysk3r>

Updated Edition of The Radio Caroline Bible

A new updated edition of Paul Rusling's *Radio Caroline Bible* is published on 1st November 2021, bringing the story right up to date. It now has a technical appendix describing the equipment of Caroline's ships and the land-based facilities, including their newly installed Harris transmitter! The story is packed with disasters, boardings, excitement and copious

amounts of 'skulduggery', covering events from Radio Caroline's four eras. Told by many of the key people who made Radio Caroline happen, this book gives a platform to the station managers, secretaries, and others who are usually in the shadows. Their unique aspects help put the flesh on the true story of what is the world's best-known radio ship. There is some

unique content, and many 'never-published-before' photos, among the 350 illustrations. It's chronologically correct, fully indexed and will surely become a real collector's item. The book's gorgeous full-colour cover shows the ship in all her magnificence with her huge tower clawing high into the sky [...].

<https://radiocarolinebible.com>

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

New from SDRplay: SDRuno V1.41: Full Scheduler Function

SDRuno V1.41 was fully released on 18th September. It includes the much-requested full scheduler facility, which allows you to set up numerous recording events for your RSP. As well as providing all the expected *calendar* options (time of day, date, start and stop times, repeating options and so on), you can also set the *profile* for each recording – this allows you to pre-set frequencies, bandwidths, demodulator options (AM/FM/USB/LSB), a choice of filters and antenna port selection. Additionally, you can choose the settings for connectivity to other third party software or the running of a specific plugin.

The following new functions have been added:

- Scheduler panel which replaces the old 'Recorder' panel (launch using the SCHEDULER button in the main panel).
- A new auto-layout to include the scheduler (for screen resolutions of 1920x1080 and above).
- Backup and Restore of the *ini*. file settings (access via the main panel OPT menu)
- A Screenshot button has been added to the SP1 title bar
- IQ wav files can now be used in plugins

The following pre-existing features have been changed:

- Auto layouts now take account of the taskbar location and size.
- Auto layouts have been improved to take account of higher resolutions.
- Saved workspace notification moved to the status bar.
- Memory Panel will now prompt to save any changes made when switching to another memory

The following issues have been fixed:

- Decimation and the LOLOCK state are now correctly saved and recalled within a profile.
- The main panel version tooltip now displays the correct information.
- Step size could be set incorrectly when using non-FM modes and pressing FM sub-mode buttons.
- Bugs associated with wav file playback
- When loading a profile, the last used memory bank field will update correctly
- Saving a profile will now update the displayed loaded profile field correctly

<https://youtu.be/fURaBmYcPbg>

<https://tinyurl.com/ufatvrbw>

<https://www.sdrplay.com/downloads>

Also available with SDRuno V1.41 is a new **ADSB plugin** that simplifies the way you can use an SDRplay RSP for decoding real-time transponder



signals from aircraft in your vicinity. You simply ensure you have a suitable antenna for 1.090 GHz and launch SDRuno and the new ADSB plugin. This new plugin works with freely available *Virtual Radar Server* software, which collects the data from the SDRuno plugin and produces a clickable map that shows all the aircraft found in real-time. Anyone who has an RSPduo (the dual tuner SDR) can simultaneously listen to the corresponding ATC voice channel to monitor the pilot interaction with air traffic control. Mike, KD2KOG from SDRplay has produced a video and a comprehensive app note covering this and the many ways this new plugin can be used to customise displays via its internal ADSB web server. The documentation can be found at the second URL here:

<https://youtu.be/CtcS90stHJI>

<https://tinyurl.com/nyakfexw>

Another great plugin improvement is the **squelch-activated record facility in the audio recorder plugin**. This allows recording only the active signals which break through the squelch threshold setting. There is another new video that demonstrates this:

<https://youtu.be/WB8GctTka0M>

Finally, please note that SDRplay has also updated the **SDRuno roadmap**. You'll see that we have changed the order in which the company is doing things to bring forward the release of V2.0. <https://www.sdrplay.com/sdruno-roadmap> (Sources: SDRplay | Jon Hudson | SWLing Post)



Anysecu WP-9900 Mini Mobile Radio at Moonraker

The Anysecu WP-9900 Mini Mobile Radio is a 25W 200-Channel, Dual-Band, Car Radio Transceiver, covering VHF from 136-174MHz and UHF from 400-480MHz. This radio is simple to fit as the main body has a small form factor, and all the controls are on the display microphone. First Delivery Early November. Moonraker Price - £99.95. The key specifications are being advertised as follows:

- Frequency Range 136-174MHz and 400-480MHz; Channel Capacity 200 channels
- Channel Spacing 25KHz, 20KHz, 12.5KHz; Channel Step 5KHz, 6.25KHz, 10KHz, 12.5KHz, 15KHz, 25KHz
- Working Voltage 13.8V DC $\pm$ 15%
- Squelch options CARRIER / CTCSS / DCS / 5-tone / 2-tone / DTMF
- Frequency Stability $\pm$ 2.5ppm; Operating Temperature -20°C $\sim$ +60°C
- Dimension(W*H*D) 98(W)*35(H)*118(D)mm; Weight 408g
- Sensitivity Wide Band Less than 0.25uV Narrow Band Less than 0.35uV
- Output Power 25W VHF and 20W UHF; Audio output 2W.

<https://moonrakeronline.com>

CITIES AND MEMORY: The *SWLing Post* reports this month that the excellent *Cities and Memory* sound project has partnered with the *Shortwave Radio Audio Archive* for an all-new take on the soundscape of cities, and you are invited to be part of it. The project *Shortwave Transmissions* is calling for sound artists and musicians to get involved by reimagining short wave radio recordings from across the world.

<https://tinyurl.com/srtwawzk>

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

Radio News

AA'S CHALLENGE: Classic FM presenter Alexander Armstrong has completed a remarkable 24 concerts in 24 hours to raise money for disadvantaged people across the UK. The classical singer, whose challenge started at midday on Thursday, 30th September, performed 24 concerts in and around London in front of thousands of people for *Global's Make Some Noise*, which supports small and local charities across the UK.

As the clock struck noon, Alexander began the marathon with the classical ensemble *VOCES8* in central London, before busking at Piccadilly Circus underground station.

He took to the water for a special concert on a River Thames boat and then headed across the city to give concerts at locations including St. Paul's Cathedral, The Queen's Chapel of the Savoy, Cadogan Hall and a construction site. Early on Friday morning, he treated airport workers to a moonlit performance of 'Fly Me To The Moon' on the tarmac of London Luton Airport. As the day dawned, he headed to Wembley Stadium, where, due to a torrential downpour, he gave a concert in the players' dressing room, rather than on the iconic turf. (SOURCES: Global | *ontheradio*)

<https://tinyurl.com/afhb6zht>

BBC RADIO 1XTRA TO LAUNCH WEEKLY UK CHART SHOW: BBC Radio 1Xtra is introducing a weekly *UK Afrobeats* chart show presented by Eddie Kadi. The hour-long show will air every Sunday from 1 pm starting 26th September 2021. It will be compiled by the *Official Charts Company*, based on sales and streams across the UK. Each week, Eddie will highlight the hottest music from the scene's emerging artists and global superstars, as well as championing the sounds, vibes and culture of Africa by celebrating and touching on the varied sounds and many different genres that come from the continent, from Amapiano to Afro-trap, plus more. Eddie Kadi said: "This is a significant moment for *Afrobeats* and the diverse sounds of Africa, as the UK is one of the main hubs of the music outside of the continent."

"To go on this journey with 1Xtra, a station that has been championing black music including *Afrobeats* for such a long time is also extra special. I look forward to showcasing the impact this great music is having on the UK scene and I'm even more excited for the artists who deserve to have their work displayed on the highest platforms."

(SOURCE: BBC Radio 1Xtra | *RadioToday* | Industry Press)

<https://tinyurl.com/5y3mhp9x>



BBC WORLD SERVICE PERFORMANCE

REVIEW 2016-2020: The *BBC World Service* has published its performance review covering the period of 2016 – 2020. During the period covered by this review, the total reach of *BBC World Service* has grown significantly, by 42 per cent, from 246 million people on average each week in March 2016 to 351 million people in March 2020. In addition to supporting audiences across the world with trusted journalism, *BBC World Service* brings benefits to the UK. Its international expertise enhances the BBC's UK news services by bringing unique insights to coverage on world events, helping UK audiences to understand what is going on in the world. UK audiences agree that the *World Service* helps to inform UK audiences about international events and the UK's place in the world better than any other brand.

(SOURCES: BBC Media Centre | Southgate ARC | *SWLing Post* Blog).

<https://tinyurl.com/2f5bjea3>

BBC AND GLOBAL SUPPORT STUDENT RADIO

AWARDS: The *Student Radio Awards* are to be supported by *BBC Sounds* and *Global* until 2023, thanks to a new deal just announced. Held annually at 'Indigo at the O2', the event celebrates the best and brightest talent emerging from universities across the UK. This year's event is set to be the first major in-person event hosted by the SRA since the same iteration of the event back in 2019. This year also celebrates 30 years of the SRA, as the organisation was founded in November 1991.

(SOURCE: SRA | BBC | *RadioToday*).

<https://tinyurl.com/yvcxksy5>

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

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

RADIO ENTHUSIAST BOOKSHOP

WORLD RADIO TV HANDBOOK 2022

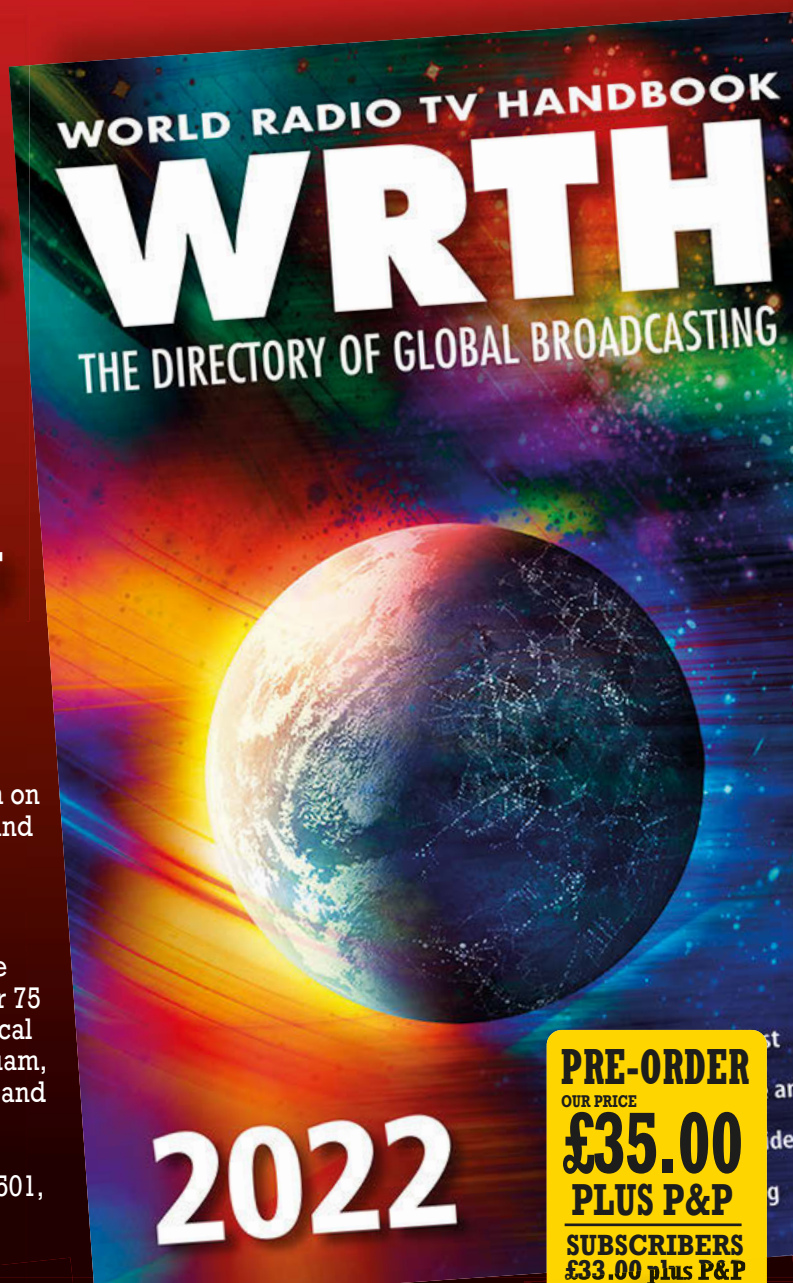
The Directory of Global Broadcasting

This is the 76th edition of World Radio TV Handbook and this great directory continues to offer the most comprehensive guide to broadcasting on the planet. With the help of international network of contributors, WRTH 2022 provides the most up-to-date information on mediumwave, shortwave and FM broadcasts and broadcasters available in any publication

WRTH 2022 will have:

Articles on topics of interest to professionals, listeners and dxers alike including ones on the Further Development of HF Transmitters, Over 75 Years With My Radio by Ullmar Qvick, Technical Monitoring at VOA, the history of KTWB on Guam, and Radio in Lesotho, as well as other articles and regular items.

Plus Reviews of the latest receivers and equipment, including Icom IC-705, Tecsun H-501, Tecsun PL-330, and ATS25 Si4732. Maps fully updated showing global SW transmitter sites



PRE-ORDER

OUR PRICE

£35.00

PLUS P&P

SUBSCRIBERS

£33.00 plus P&P

PRE-ORDER RadioUser 2021 Archive CD

All issues of Radio User published in 2021 available on a handy CD Rom.

£47.99 plus p&p

Subscriber price £23.99 plus p&p

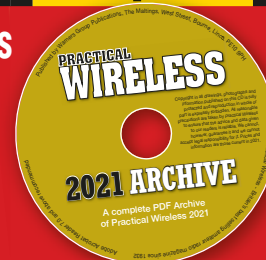


PRE-ORDER Practical Wireless 2021 Archive CD

All issues of Practical Wireless published in 2021 available on a handy CD Rom.

£47.99 plus p&p

Subscriber price £23.99 plus p&p



ORDERING IS EASY or call
at: www.radioenthusiast.co.uk/store/bookshop **01778 395161**

Browse our best sellers at: bit.ly/bestsellers21

Robert Connolly
gi7ivx@btinternet.com

Robert Connolly takes a look at our regular contributor Scott Caldwell's new e-book, which skilfully develops, contextualises and expands on, many of the themes Scott has touched on in *RadioUser* before.

This new 174-page title will be warmly welcomed by many *RadioUser* readers who may have followed my fellow contributor Scott Caldwell and his History of Radio column over the years.

Radio: Wireless Voice of the Seas contains revised, extended and updated versions of many unique articles Scott has published in these magazine pages over the years, to great acclaim.

The easily readable e-Book title charts the development of wireless over the years by looking at key people and detailing the use of radio in defining events in the medium's history.

The book begins with Samuel Finley Breese Morse (1791-1872), who developed the unified language of Morse code that is still used today in certain areas of radio communications and amongst hobbyists.

Scott then proceeds to look at the 'founding father' of radio: Reginald Fessenden (1866-1932) or 'Reg', as he was known to family and friends, who was a prolific inventor. His diverse creations ranged from micro-photography, sonar and turbo-electric drive for battleships, to wireless innovations.

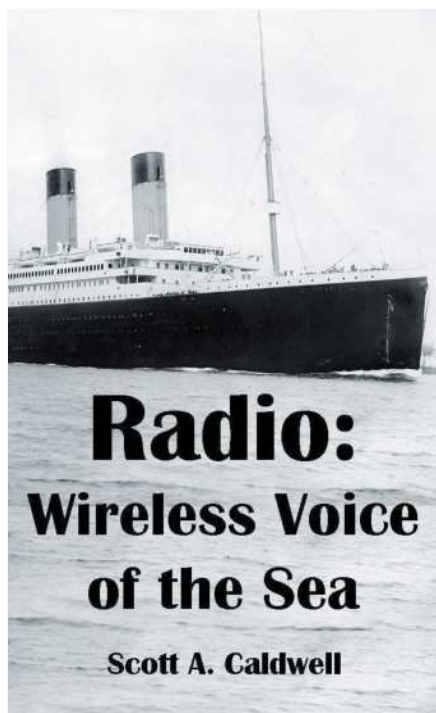
The author sensibly covers key events in this history, such as the *First International Conference of Wireless Telegraphy*, held in Berlin on 1st July 1908. Famously, the event failed to resolve the merging rivalry between the German *Telefunken* company and Guglielmo Marconi (1874-1937).

Sailing on, Scott also relates the story of Jack Binns. Binns was a typical Marconi operator; young, bright, disciplined, and well educated. On Saturday 23rd January 1909, the vessel *Republic* departed New York, bound for the Mediterranean, and carrying a total of 742 passengers in all three classes. At 05:30 hrs, she encountered fog and collided with the vessel *Florida*, resulting in significant damage to the Marconi room.

Binns was resting in the Marconi cabin when the collision occurred; with the power to the Marconi room cut off, Jack Binns had to wire up the emergency battery. This limited the range and performance of the set. *RMS Republic* sent one of the first-ever CQD distress messages.

Scott then delves into the 1910 story of

Morse Code Marvels, Cellar Murders and Maritime Disasters



Radio: Wireless Voice of the Seas
By Scott A Caldwell, July 2021
<https://tinyurl.com/3zjd278s>

Dr Crippen who had murdered his wife and was fleeing to America on the *Montrose* sailing to Canada. The ship's captain recognised the fugitive and, just before steaming beyond the range of his ship-board transmitter, he had telegraphist Lawrence Ernest Hughes send a wireless telegram to the British authorities: "Have strong suspicions that Crippen London cellar murderer and accomplice are among saloon passengers". Chief Inspector Walter Dew, who was in charge of the investigation, travelled across the Atlantic by a faster ship and was subsequently able to arrest Crippen as the *Montrose* entered the St Lawrence River.

In a further extended chapter, the author looks in some detail at the role of wireless in the *Titanic* disaster and the hunt for the German battleship *Bismarck* during WW2. Incidentally in the *Bismarck* chapter Scott re-



'Doctor' Hawley Harvey Crippen.

counts that it was spotted, and had its position reported, by the RAF vessel *Catalina* before its final encounter with the Royal Navy.

What is not so widely known – and not mentioned in Scott's book – was the fact that *Bismarck* was spotted by a US Navy pilot on the *Catalina* who was training RAF pilots to convert to this aircraft type.

As the US had not entered WW2 at that point it was not possible to credit the US serviceman, and it was only a few years ago that his role was finally acknowledged.

Other areas Scott covers in his wide-ranging book include *Artie Moore*, *Forgotten Radio Amateur*; *The Loss of RMS Lusitania*; *The Great Marconi Scandal*; *The Sinking of RMS Empress of Ireland*; *the role of Amateur Radio in World War 1*; *the Last Flight of Amelia Earhart*; *Alan Turing*; *Radio and Pearl Harbour*; *The Cuban Missile Crisis of October 1962*, and *the Loss of the USS Thresher*.

Unlike many other titles in this area, he also offers a useful six-page index at the end of the title. This is not only a book that would be of interest to readers who have an interest in maritime communications.

It will be enjoyed by anyone who is fascinated by personality-driven history, the evolution of wireless in global affairs and the history of crime and detection. [With additional writing by the editor – Ed.]

David Harris
mydogisfinn@gmail.com

David Harris reviews the latest offering amongst a growing number of new publications focusing on the role of radio, TV and the wider media and cultural landscape in Nazi Germany (1933-1945).

Radio Hitler is the story of the *Deutschlandsender* (the approximate German equivalent of the BBC) from the rise of Hitler to the end of the Second World War (1945). The book begins in 1933, with Hitler coming to power and recognising the importance of radio as a way of reaching out to the masses.

German radio in 1933 consisted of nine regional stations: Berlin, Leipzig, Breslau, Königsberg (now Kaliningrad), Hamburg, Cologne (Köln), Frankfurt, Stuttgart, and Munich (München). These names will be familiar to collectors of old radios as the names appear on the dials of many radios made in the 1930s. The Germans actively promoted radio ownership by producing the famous *Volksempfänger* ('The People's Radio'), a budget Bakelite radio that sold for 76 Marks (about two weeks' wages for a typical labourer).

[This radio was quickly dubbed 'Goebbels'schnautze' at the time – 'Goebbels's big snout' – Ed.]

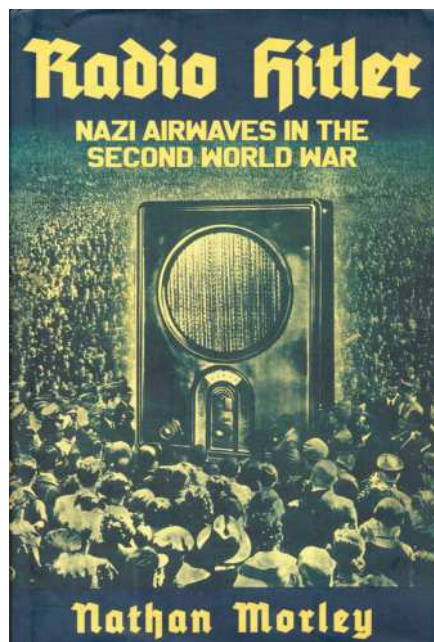
Radio ownership was low in Germany at the time, with 12 radios per 100 city dwellers and only 5 per 100 in rural areas, in 1937.

On coming to power Jewish and left-wing employees of *Deutschlandsender* were sacked, and broadcasting was soon centralised. The Nazis banned jazz from the airwaves along with broadcasts of any kind of Jewish content (see: *The Jazz War. Radio, Nazism, and the Struggle for the Airwaves in World War II* by Will Studdert, reviewed in *RadioUser*, July 2020: 12).

In 1933, Germany initiated short wave broadcasts in English, Spanish and German to North and South America. By 1943, this had increased to 31 languages (including Irish and Faroese) for a total of 228 hours a day. Some 107 MW and LW and 23 SW transmitters in Germany and occupied Europe were used to broadcast Nazi propaganda.

Radio Hitler also covers the history of television in Germany which was able to provide limited coverage of the 1936 Olympics which were held in Berlin. The Germans also established a German-language TV station in occupied Paris in 1942 broadcasting from the Eiffel Tower. This station was aimed at German soldiers in barracks and hospitals in the Paris area.

Führerradio and Fake News: German Radio under Hitler



Radio Hitler - Nazi Airwaves in the Second World War
by Nathan Morley
Amberley, 2021
Hbk. 287 pp. £20.
ISBN 9781398104464
www.amberley-books.com

The book follows the progress of the Second World War with the Nazis taking over radio stations in Poland, Austria and Czechoslovakia after invading these countries. During the war, Germans were prohibited from listening to foreign radio stations. The situation was very different in the UK, where some newspapers would encourage people to listen to the hateful ranting and raving of William Joyce.

The book offers extensive coverage of the broadcasts of the latter ('Lord Haw-Haw', 1906-1946). A British supporter of the Nazis, Joyce moved to Germany in 1939 and broadcast English-language Nazi propaganda to the UK until the end of the war.

The Germans were also able to recruit some British POWs to work with Joyce on

these broadcasts. Joyce was captured by British troops at the end of the war as he tried to flee Germany. He was hanged in 1946 having been convicted of treason.

In order to broadcast in English, French, Swedish and other European languages, some MW domestic frequencies were used in the evenings. This caused dissent in Germany as locals were unable to hear German stations. The book discusses the use of 'Black' propaganda stations. Those were used by the Nazis but masqueraded as stations that were based in France or the UK and purportedly represented the views of dissidents in those countries.

English-language stations included Christian Peace Station, New British Broadcasting Station (NBBS) and Radio Caledonia. The latter was announced as *The Voice of Scotland*.

The defeat of the Germans at Stalingrad marked the turning point of the Second World War, with Germany having to face this reversal of fortunes after the triumphs of the previous years. The UK started the black station *Deutscher Kurzwellensender Atlantik*, which broadcast to German troops and U-boat crews. Lord Haw Haw's broadcasts were moved to Luxemburg, due to the heavy Allied bombing of Berlin. However, after Luxemburg had been liberated, the transmitters were used by the allies who broadcast black station *Nachtsender 1212* to Germany. As the Allies moved into Germany in 1945 German stations gradually went off the air.

The author is a journalist who has written about the Second World War and also (self-) published a book about Radio Luxemburg. The book is well written and comprises many short chapters together with extensive notes, 16 pages of photos and a bibliography. The result is that this is a very readable book which makes one want to learn more about wartime broadcasting. Nathan Morley is to be congratulated for writing such a well-researched but highly accessible book.

[see also: Caldwell, S. (2020) 'Lord Haw-Haw and the Nazis', *Radio User*, June 2020: 56-60 – Ed].

Follow us on Facebook @radioenthusiasts and Twitter @REnthusiasts



Martín Butera
martin_butera@yahoo.com.ar

This article aims to throw some light on the changing process and the wider panorama of broadcasting and media in Afghanistan, during the last 20 years of military intervention by the USA and its allies in the region.

This is not a political essay, and some short introductory remarks may suffice, before looking at the radio landscape in the country.

Located at the crossroads of Central and South Asia, Afghanistan is a mountainous landlocked country of approximately 252,072 square miles.

At the time of writing this, in early September 2021, the Taliban has just regained control of Kabul and many provinces. Afghanistan has been called the *Graveyard of Empires* and has a troubled history of antagonistic tribalism, religious rifts and frequent, bloody, civil wars.

The Taliban originated in the early 1990s, after the withdrawal of Soviet forces from Afghanistan in 1989. You will remember that the Soviet Union had invaded in 1979 to prop up the communist government of the region.

In the context of the anti-Soviet struggle of the *Mujahideen* and Civil War, the

Broadcasting and the Media in Afghanistan

Martín Butera outlines the fast-changing media and radio landscapes in Afghanistan, from the time of the withdrawal of the Soviet forces in 1989 to the re-taking of Kabul by the Taliban in August 2021.

Taliban was born, with their promise to put Islamic values first, and fight against political corruption. In 1996, the Taliban declared an Islamic Emirate and imposed their strict interpretation of the *Qur'an*, harbouring Osama bin Laden, a Saudi-born ex-*Mujahideen* fighter who formed a terrorist group with global intentions: Al Qaeda.

Following the events of 11th September 2001 and the US invasion, the Taliban government was toppled, at a great cost in lives.

Hamid Karzai presided over a coalition government, between 2001 and 2014, first

under the *Bonn Agreement* and then as a consequence of the 2004 presidential elections, promoted by the US. He was succeeded by Ashraf Ghani Ahmadzai, an Afghan anthropologist, economist and professor. He announced his resignation and departure from the country after the fall of Kabul to the Taliban in August 2021.

US President Biden honoured the deal struck by ex-President Donald J. Trump with the Taliban and declared that US forces would leave Afghanistan in mid-2021.

His uncompromising withdrawal of US

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

troops and their allies was, at the time of publication, a fiercely debated issue in international relations.

Media Created in the Last 20 Years in Afghanistan

Following the fall of the Taliban government in Afghanistan in late 2001, the international aid community identified the need to create new media to help Afghans access information and rally their country to found a democracy.

Until then, the Afghan people only received news through the BBC's Pashto and Persian services, as well as the Voice of America and Radio Azadi, through short wave transmissions.

The main new funders for the creation of media were USAID (United States Agency for International Development and different NGOs interested in promoting media that could inform Afghans about the pace of reconstruction in their country and the new political process.

Most of the economic investments were concentrated in the creation of community radio stations (Fig. 4) with modulated frequency, then television and finally and to a lesser extent in the written press (newspapers and magazines).

Radio in Afghanistan

Radio in Afghanistan, of course, did not start 20 years ago. Radio has been the most popular means of communication in Afghanistan since the 1920s, mainly in the Dari (Persian) and Pashto languages.

The origins of broadcasting in Afghanistan date back to 1925 when a 200W Russian transmitter operating on AM 833kHz was installed in the Kabul Palace by King Amanullah Khan.

This transmitter was destroyed in 1929, in the uprising against the king. The transmitter was replaced in 1931 by the new King Mohammed Nadir Shah and was upgraded in 1940 when a new 20kW transmitter, operating at 600kHz, was installed in its place.

This is generally considered the official birth of Radio Kabul. The programs were broadcast in Pashto, Dari-Persian, Hindi, English, and French.

During the 50s, 60s and 70s, the Afghan broadcasting system experienced a period of relative peace. This led to the growth of internationally renowned Afghan artists such as Ustad Farida Mahwash, Ustad Mohammad, Hussain Sarahang, and Ustad Mohammad Hashem Cheshti.

These master musicians were not only successful in Afghanistan but also in India



and other countries.

After the Soviet Union installed its government in 1979, the station in Kabul was controlled by the Soviets.

During the civil war in the 1990s, the radio station was damaged several times during the fighting, changing hands as different factions gained control of Kabul.

In 1996, when the Taliban took control of Kabul for the first time, the name of the station was changed to *Shariat Ghagh*, which means *Voice of Sharia*

Radios from Heaven

A recent survey by the *Asia Foundation* indicated that radio was available in most Afghan homes. 88% per cent of the Afghan population mentioned that they have a working radio. A bicycle is the second most common property item (58%); very few households in Afghanistan have a landline.

Access to the Internet is limited and expensive, and this ends up acting as a brake on the use of social networks so that digital media do not have much audience or participation.

Therefore, Afghan community stations are of vital importance, especially in households in rural areas where the population only has radio receivers to meet their information needs.

During these 20 years, 'Radios from Heaven' literally rained down many times, almost always distributed by the United States and its allies, to help Afghans participate in the democratic process, by facilitating access to news and information. Thousands of hand-cranked and solar-powered radios were distributed and gifted to Afghans living in remote locations or lacking the means to ac-



cess news and information.

Remembering that many of the displaced persons camps and remote villages in Afghanistan had limited electricity, the US military and its allies needed to deliver this type of hand-cranked or solar-powered device.

Broadcast Content

In the beginning, these new radio stations broadcast Afghan music; their main objective was to inform the Afghan people that the United States Army and its allies had arrived to help with the development of the country.

In 2002, the new government reinstalled Radio Afghanistan (RA), repairing and using the same medium-wave transmitters that already existed in the country, spread over some five cities in Afghanistan, which had been damaged by the Taliban and previously by the Soviet invasion.

The RA signal reached the majority of Afghans; however, it did not provide a plurality of voices and different points of view, since, at the time, the information was still in the hands of the transitional government, which was strictly controlled by the state.

Community Radio in Afghanistan

In 2003, USAID, provided by the US Agency for International Development began funding massive media development projects through a group of foreign NGOs. This resulted in more than 170 community (FM) radio stations, located throughout the country, during the last 20 years.

Internews Network, an American NGO based in Northern California, designed (with input from USAID) a \$4 million project to build a network of 32 community radio stations throughout Afghanistan. The project also aimed to train local journalists. USAID has continued to fund the project. The EU (European Union) and DFID (UK Department for International Development) have supplemented USAID financial allocations with money for various training projects for Afghan journalists.

Salam Watandar is a national radio service that provides news, information and entertainment to a network of 53 community-operated radio stations. It was established in 2003 by *Internews*. With the support of USAID, its main objective is to create an independent and non-profit Afghan media production and distribution service.

36 stations were established between 2003 and 2011, a time when the media was initially mistrusted and the concept of community radio was foreign to Afghanistan.

The interesting thing is that some of these stations were managed and attended exclusively by women (except for security personnel). For example, Radio Rabia Balkhi in Mazar-e Sharif, Radio Zohra in Kunduz, and Radio Sahar in Herat.

Another group is the TKG (Kilid Group), a public media group funded by the US and the EU comprising 11 local radio stations, in different cities and provinces of the country, Kabul, Mazar, Kandahar, Jalalabad, Ghazni, Khost, Herat, Nimroz, Kunduz, and Baghlan. TKG also manages an association of 28 affiliated stations across the country.

Mode v. Reach

The main reason for the selection of FM transmitters was in the costs: FM transmitters are much cheaper than AM ones, both in the cost of the transmitter hardware and in its installation. Most of the investment in AM goes to the antenna, which represents a large area to raise the tower and bury the radials.

Moreover, electricity costs are always higher when employing amplitude modulation. In general, in many of the cities outside of Kabul and mostly in rural areas, electricity is a big problem, so the radios are powered



by generators with fuel. AM transmitters use much more fuel raising the overall operational costs.

Of course, these gains are lost in coverage. While FM far exceeds the AM in terms of audio quality, in terms of the range of the signal, it is the opposite, as we all know. This is due to the different forms that have waves when moving. In Afghanistan, 300W FM transmitters are used, with a signal coverage up to a distance of 50 km in flat areas and over shorter distances in mountainous areas.

Television and Written Press

Television began broadcasting officially in Afghanistan in August 1978, and it did so regularly until the mid-1990s. Between 1996 and 2001, the Taliban government banned television, although some stations in areas outside of the Taliban's control continued to broadcast.

With the arrival of the United States in 2001, television broadcasting throughout the country was resumed, beginning with the state channel Afghanistan National Television.

In the last 20 years, dozens of television channels have been created; among the most important are: Afghanistan National Television, Tolo TV, Lemar TV, Ariana TV, Shamshad TV, and 1 TV.

As reported by the Asia Pacific Broadcasting Union (ABU) in Afghanistan you can have access to more than 200 television channels, including repeaters and local and international channels, 96 in Kabul and 107 in

other provinces of the country.

Afghan television's largest audience is concentrated in urban areas, where electricity is more reliable and corresponds to a higher family income. The central region (Kabul) exhibits the highest number of television owners, with 53.3% of households having a single television, closely followed by the East and Southwest regions, according to data from the Malaysia-based ABU.

As far as can be ascertained, a written press has never grown too much in these last 20 years; the main reason is the high illiteracy rate; nearly 90% of women cannot read or write, while the figure for men is almost 60%. Added to this is the difficulty of distribution logistics in a country where the roads are not the best and suffer from a lot of insecurity.

Taliban Radio

During these 20 years, the Taliban managed to transmit their messages to the region as well, employing medium wave religious broadcasts. Outside Kabul and the main cities, transmitters were clandestine and mobile, often hidden in the mountains and using antiquated radio transmitters from the Soviet era.

These transmissions were reported throughout the last 20 years, becoming much more present in recent years mainly in the tribal areas along the border with Pakistan. These stations, commonly called *Mullah Radio*, incited hatred, intolerance and ethnic violence.

Later, in the brutal advance of the Taliban towards the capital of Afghanistan, the fight-



ers took over local radio stations, kicking out their staff and in many cases destroying the stations.

The Taliban may have operated mobile radio stations for the past 20 years, but they have not operated a station within a major city so far, since they ruled the country between 1996 and 2001. While they thus lacked experience so far, this may change from August 2021 onwards.

Economic Problems of Radio Stations in Afghanistan

As far as I know, no real independent and private Afghan media have been created in these last 20 years. The Afghan media is, therefore, 100% dependent on international donors. To top it all, coverage has frequently been reduced over the years with the loss of interest in the region by certain international NGOs.

Local Afghan companies never had the resources to finance real media.

Consequently, the community radio station network continues to rely heavily on international aid, often in the guise of paid, on-air, public service announcements.

The issue of sustainability is an immedi-

ate and ongoing concern for community radio stations. They must raise several hundred dollars a month to break even.

The Afghan Radio and Television stations generate no genuine income from private advertising, to cover their costs of maintenance, security guards, general production staff, and engineering.

In smaller towns, it was where the local radio stations had more difficulties generating publicity (advertisements, announcements) to cover the costs of the station (fuel for generators, salaries of the station personnel). What little publicity they used to get was in small-ads, for readings weddings and death announcements. At times, they also sold coupons local listeners could buy and sell for requesting songs or having poetry read. It is clear that, against this kind of backdrop, it is hard to maintain a radio station.

Conclusion

In recent years, significant progress has been made in the Afghan radio and media landscape. Examples of notable achievements include the training and education of producers, journalists, local reporters, studio operators, and technicians in general.

Further Reading

- *Afghan Media - Understanding the Audience* (Altai Consulting for Internews, Afghanistan 2015)
- *Afghanistan DX Guide*, compiled by Tony Rogers - last updated August 17, 2021 (BDXC)
- Ahmed Rashid *The Taliban. Islam, Oil and Fundamentalism in Central Asia*
- AMARC Asia Pacific Community Radio Related Directory, 2009
- Columbia School of Public and International Affairs (Resources)
<https://www.columbia.edu>
- Gall, C. (2014) *The Wrong Enemy. America in Afghanistan 2001-2014*
- *Local Radio in Afghanistan A Sustainability Assessment* (Altai Consulting for Internews 2017)
- *Potential for Community Radio in Afghanistan* (2002 Report) Bruce Girard, *Comunica*
www.comunica.org.

Many new radio stations in Afghanistan enabled the participation of more young people in debates on such topics as the role of women in Afghan society, the peace process, or the scope of democracy and civil rights. In addition to this, hundreds of productions like local musicals were broadcast on the air. There was even talk of art and culture in, something that 20 years ago was something unthinkable under the Taliban regime.

However, as we mentioned before, these radio stations could never be 100% independent, and this created a total dependence on NGOs and international aid.

To the economic problems must now – once again – be added the arrival of the Taliban.

This, to say the very least, ends up creating significant media uncertainty in Afghanistan.

And after the Taliban took control of the capital, Kabul, in mid-August 2021, at present, no one knows, or imagines, what the future will be of all the media created during the past 20 years in Afghanistan.

As for the people, we can see in the international news coverage, how tens of thousands of Afghans have fled their homes; many now fear the recent return to the oppressive regime of the Taliban.

N.B. This article was accompanied by many photographs of many current and past Afghan radio presenters, both male and female. It is a sad sign of the current crisis that I have had to decide to not reproduce them here; instead, the pictures shown here are of a more general nature, but still taken in the country, from 2004 onwards [Courtesy: Internews]– Ed.]

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

Chrissy Brand

chrissyLB@hotmail.co.uk

The western world's media is aglow with news of the first album and concerts by ABBA in forty years. Pop music fans around the world, young and old, excitedly await the November 5th release date. Europop radio stations everywhere will doubtless be broadcasting listening parties, discussions and singalongs throughout November (Fig. 2).

Back in the 1970s, Radio Sweden used to sometimes discuss what is, arguably, Sweden's greatest export, in their programmes. Who would have predicted this could happen all over again, decades later? Radio Sweden's English Service covered the story, with Chris Boswell reporting.

<https://tinyurl.com/a5ky9f6f>

Technologies have evolved at a rapid pace from those distant days when music was available only pressed on vinyl or audio cassette; albums and singles were promoted and heard only on an analogue radio.

ABBAAtars and Avatars

The 2022 ABBA concerts will take place at a specially-built arena in London and will star some clever, and flattering, digitisation of the four band members, now all in their seventies, recreated in their 1979 personas.

This is much more than a hologram performance, as good as they can be. For instance, footage of the successful Frank Sinatra hologram shows a few years back can be viewed online. In addition, Roy Orbison's son Alex toured with a Roy Orbison hologram concert in 2019 and, last year, there were talks about recreating Dean Martin and the rest of the Rat Pack for a Las Vegas residency.

The difference with ABBA, however, is that their concerts will comprise performances that were actually made by the band as *they are now*. These took place in a studio over five weeks. The ABBA magic part is that the technology will enable the band to appear as they looked in their prime.

Perhaps this is the closest technology will get to rebooting the ageing process.

For the generations of new fans that have been brought up on their music, this is an exciting innovation. For a world in depression with climate change and the pandemic, it brings a feel-good factor that will lift many spirits.

The London Evening Standard Tech and



ABBAAtars and More: Audio-Visual Sweden

Chrissy Brand takes a chance on a virtual and audio trip to Sweden and rounds up some radio news. She then offers her monthly listening recommendations for international radio, live, online and by podcast.

Science Daily Podcast (3rd September) explained how the "Swedish pop legends have announced a new album and a 'revolutionary' live concert experience. It will use digital technology similar to CGI in Hollywood to create 'ABBAAtars'."

The BBC were amongst media outlets that reported how, "The so-called 'ABBAAtars' were designed by Industrial Light and Magic - the visual effects company founded by Star Wars creator George Lucas. More than 850 people worked on recreating Abba in their

prime using motion capture technology to scan every mannerism and every motion of the musicians, who are now in their 70s, as they performed. Agnetha, Frida, Benny and Bjorn got on stage in front of 160 cameras and almost as many VFX geniuses, and they performed every song in this show, to perfection, over five weeks," explained producer Ludvig Andersson. "So when you see this show, it is not four people pretending to Abba, it is actually them."

<https://tinyurl.com/jxdxnjxb>

Fig. 1: Radio Nord is still rocking the airwaves after almost 60 years. Fig. 2: Radio stations will savour playing the first new ABBA music in forty years. Fig. 3: Jonna Jinton is a creative inspiration in the Swedish wilderness. Fig. 4: Pop Shop Radio: Top-40 sounds from Hope in Canada. Fig. 5: ePOP delegates in Marseille, Max, Gaël and Andrea (ePOP), Hermione (France Reunion), Marie-ève (ePOP), Apolline (France), Hadama (Mali), Adita (India), Ben Adama, and Abdoul Salam (both Burkina Faso).

I confess that even a cynical hack like me was reduced to tears when watching some of the new video footage and interviews as the news was announced in September. The *Today* programme on Australia's Nine Network, *CBS Mornings* in the USA and various BBC programmes, including BBC World Service's *Weekend*, were just a handful of the countless media outlets to feature the news.

The merging of technology such as this with popular culture is incredibly exciting. It will be fascinating to see how else it can be used over the coming months and years. On that note, the January 2022 *Emerging Issues in Radio* column will peer twenty years into the future to try and predict how radio and audio will be consumed.

Highlighting the speed of the tech world we inhabit, within a few hours of the new tracks being released, I was listening to a remix of *Don't Shut Me Down* (The Extended MHP edit), and very good it is too. MHP specialises in remixes of tracks, at their YouTube channel, *MHP Remixes & Edits 2*.

<https://tinyurl.com/MHPShutMe>

Garden of Sweden

Along with ABBA, Sweden is known by much of the world for IKEA. Therefore, one podcast names itself, tongue in cheek, as *The Flatpack History of Sweden*. This ambitious project traces the history of the country in chronological order, starting in the Palaeolithic and Mesolithic Ages. Currently, it has reached the year 1250 and the rise of Birger Jarl. I recommend this light-hearted yet informative voyage through time.

There are also occasional special episodes that leap out of the timeline into another era: Civilian dog tags and urban bomb shelters being two examples. Another, uploaded on September 5th, went back 35 years to the Chernobyl disaster. It recounted Sweden's role in how the world found out about the explosion at the nuclear reactor, with help from a power plant worker's shoes.

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

Radio Nord Revival transmitted a broadcast during the first weekend of September.



HARRY GROUT ON UNSPLASH



JONNA JINTON FACEBOOK

This year marks the 60th anniversary of this Swedish offshore commercial station. It originally operated from 8th March 1961 to 30th June 1962, broadcasting from a ship anchored in the Baltic Sea off Stockholm. The September 2021 broadcast came from Julita, by Hjälmaren Lake on short wave (6035, 6060 and 6130kHz), and on 91.9 MHz on FM in Stockholm.

If you look through the Radio Nord Revival blog, which was launched eleven years ago, you will find many fascinating stories and photos.

There was also an exhibition about Radio Nord at the Vaxholms Fästnings Museum; it ran until late summer (Fig. 1).

<https://radionordrevival.blogspot.com>
www.vaxholmsfastning.se

Follow us on Facebook @radioenthusiasts and Twitter @REnthusiasts

Date	Time (UTC)	Station	Programme	Podcast	URL/ Stream/ Frequency
Daily	1200 to 1700	Radio New Zealand	All Night Programme Interviews, features, music and drama	https://tinyurl.com/e4xbwb6	www.rnz.co.nz/audio/live/national
Daily	0800, 1200, 1800, 2130	Radio Soleil FM, Guinea	News bulletin, local music programmes	https://tinyurl.com/7fuf4wjr podcasts and station app	soleilfmguinee.net 93.5MHz locally
Weekdays	0200 to 0400	Cape Talk, Cape Town, South Africa	Early Breakfast with Africa Melane	https://tinyurl.com/22sdf5zu	www.capetalk.co.za and 567kHz
Tuesday	1800 to 2100	Scala Radio	Hannah Cox, Piano Playlist	https://tinyurl.com/hk6npy9u	DAB+, Sky Channel 0216, app, smart speaker
Wednesday	Uploaded in evening	The Brazilian Report	Explaining Brazil, weekly English podcast	https://brazilian.report/podcast	https://brazilian.report
First & third Friday	Uploaded 1300	Radio France International	Africa Calling	https://tinyurl.com/m58z92j2	www.rfi.fr/en
Saturday	1300 to 1500	NMFM	Hannah's Bookshelf	https://tinyurl.com/cwkbkz8n	106.6 MHz in Manchester https://northmanchester.fm
Saturday	1700 to 2000	Jazz FM	The Sarah Ward Collection	https://tinyurl.com/yf6t2m8t	DAB+, Sky Channel 0202, app, smart speaker, https://planetradio.co.uk/jazz-fm
Sunday	1800 to 1900	Absolute Country	Country Music Artist's Takeover	https://tinyurl.com/2br8rvff	DAB+, Sky Channel, app, smart speaker https://planetradio.co.uk/absolute-radio-country
Sunday	2000 to 2100	RTÉ Radio 1	The Rolling Wave, traditional Irish music with Aoife Nic Cormaic	https://tinyurl.com/4papz9bk	www.rte.ie and 252kHz

Table 1. Top Listening Recommendations for the Month Ahead: Times are given in UTC. Note that the clock changes occur on October 31st, and the UK goes from BST to UTC. UK stations listed may be on an hour later than stated below, from that date onwards.



Pop Shop Radio
Hope, British Columbia, Canada
EMAIL to: radiopopshop@gmail.com
WEBSITE: <http://www.popshopradio.ca>

The Sweden Sessions podcast from Visit Sweden only began in June but is full of a richness and vibrancy that make it a must-listen for me. Although targeted at travel professionals, I think it also works well for the general public.

It makes me want to revisit the country as soon as possible, "Sweden is a naturally progressive country full of stories. Funny stories; inspirational stories; stories about tradition, innovation – stories about adventure, food, nature, and sustainability. All wrapped up in to 100 million acres. The Sweden Sessions are designed to bring these stories to life for you our travel and tourism partners in bite-sized info blasts focusing on a region or city, a tradition or time of year or hot topics and themes such as Swedish food, design, nature and sustainable travel."

<https://tinyurl.com/k888kd43>

Startup Sweden is a project run by the Swedish Agency for Economic and Regional Growth (*Tillväxtverket*). It has an associated podcast survival guide, which, "accelerates promising tech start-ups, helping them on their journey to enter the global market." Themes covered in the podcast include how to communicate in times of crisis,



talent sourcing and women's participation in the workforce fundraising, being a venture capitalist, entrepreneurship and the "Joy effect". The latter refers to Joy Ajlouny, who is the founder of two start-ups and featured in the March 17th, 2021, podcast. It was the first in a miniseries that examined the MENA markets (the Middle East and North Africa). <https://tinyurl.com/SUSweden>
www.startupsweden.com

Moving on from the buzz of business, we turn to the peace of Nordic nature. Jonna Jinton is a Swedish vlogger, artist, musician and filmmaker, who I have been following on social media channels since last winter. Her lifestyle in the sometimes harsh, but always beautiful, northern Swedish forests

is documented in an extraordinarily stylish and creative manner (Fig. 3). With almost 3.8 million subscribers to her channel since it began a few years ago, she casts an impressive social media shadow that is as long as the Swedish nights are at this time of year. In Jonna's own words, "I share a mix of everything that I feel passionate about. From stories and glimpses of my everyday life to music, kulning (Nordic herding calls), painting, ice baths, nature and inspirational films and much more."

www.youtube.com/user/JonnaJinton
<https://jonnajintonsweden.com>

If my sudden sidestep into all things Swedish has inspired you, you may wish to learn a little of the language. I found one link to

a number of language resources available. It covers beginners' level through intermediate to expert. Start with *Simple Swedish*, progress to *Coffee Break Swedish*, and, one day, you may be ready to consume comedy with the *Alex and Sigges Podcast*.

<https://tinyurl.com/8kmjk4jb>
<https://tinyurl.com/nxk29w9k>

For me, the country overall is still best represented by Radio Sweden, which today broadcasts daily news online. A selection of archive programmes can also be found on the station website.

<https://sverigesradio.se/grupp/21203>

Radio Round-Up

My visit to Radio Caroline aboard the *Ross Revenge* (*RadioUser*, October 2021: 34-37) was followed by one from BBC One television programme, *The Antiques Road Trip*. The episode will be aired in February 2022 and will feature Dani Dyer (who appeared in *Love Island*) interviewing Radio Caroline manager Peter Moore. Antique expert Philip Serrell was on hand to spot anything of value.

Graham Smith reported hearing Czech station Radio Dechovka (it translates as 'Brass Band') on 792kHz from the Hradec Králové transmitter site (the 1233kHz transmitter closed in February). This is thanks to BBC Radio Foyle vacating the 792kHz frequency.

Graham also recalls Chiltern Radio and Radio France both being on 792kHz – once upon a time. An audio and video history of Chiltern Radio can be found on a 2021 legacy website. The station was part of the Chiltern Radio Network, which included Severn Sound, Galaxy (in Bristol) and Oasis. The red, white and blue station logos give a clear indication of its 1980s heyday.

www.chilternradio.com

Graham also heard Pop Shop Radio, in English on 6070kHz, one evening. Pop Shop Radio began in September 2020 and comes from the town of Hope in British Columbia, Canada (Fig. 4).

Each week, presenter Tony recreates the atmosphere of a Top 40 music programme from the 1960s to 1980s. An interesting twist is that it plays music from countries such as Singapore, Sweden, Japan and Germany, along with Canadian, USA and British pop.

On the August 4th programme, I heard a sublime reworking of Cockney Rebel's *Come up and See Me*, *Make Me Smile* performed to perfection by The Cadbury Sisters. This Bristol-based folk trio of Jessica, Lucy and Mary, are indeed related to William Cadbury, originator of the chocolate empire. Sweet!

Past Pop Shop Radio programmes (there are now over fifty in total) can be heard on the

website as well.

E-QSL cards are also available by emailing radiopopshop@gmail.com.

www.popshopradio.ca
www.popshopradio.ca/Past_Shows.html

Pop Shop Radio airs via WRMI and Channel 292 in Rohrbach, Germany. Check the latter's station website for details of the many stations and programmes that it relays on short wave. You can also click on links from the website that will take you to the Twente online receiver, which offers another way of listening.

The website is visually overpowering, with an awful lot of information and stations logos crammed in. However, we can appreciate this enthusiastic approach, for the fantastic audio service that is provided.

www.channel292.de
www.channel292.de/stations-contact-data

In Paris in September, there was a meeting of three great women of international radio. DXer (and former *RadioUser* contributor) Adita Prithika Subrahmanyam joined Radio France International's Susan Owensby and Anne-Marie Bissada on a rooftop garden in the heart of Paris.

You can join Susan Owensby every Saturday to see what she's cooking up in the *Sound Kitchen*.

www.rfi.fr/en/podcasts/sound-kitchen

Adita was in France as one of the Planète Radio ePOP laureates (Radio France International is one of the partner organisations). She took part in the International Union for the Conservation of Nature (IUCN) World Conservation Congress in Marseille (Fig. 5).

The ePOP initiative is an enterprise that sees, "Young people from the five continents produce video reports that relay the observations and questions of local populations, to report on the direct consequences of climate and global changes affecting their environments, or more simply their daily lives. In these short videos posted on *epop.network* and on Facebook and Instagram, people confide their feelings and question scientists and experts from around the world."

<https://epop.network>
www.rfiplaneteradio.org/en

Finally, I have included the podcast *Explaining Brazil* in my table of programme selections for the month ahead. This weekly round-up in English is under the auspices of *The Brazilian Report*. Written and recorded by serious journalists, it gives a good overview of current affairs in Brazil, covering topics from health inequalities to the antics of, and opposition to, current President Jair Bolsonaro.

Radio News



DRM SHORT WAVE FOR THE AMAZON REGION:

National Radio of the Amazon plans to use DRM short wave transmissions to serve indigenous populations in the northern Amazon region, according to the Digital Radio Mondiale (DRM) Consortium. The public broadcaster *Empresa Brasil de Comunicação (EBC)* ordered a 100 kW BT transmitter to broadcast in DRM at 11,780 kHz in the 25-meter band, a shortwave channel used by Rádio Nacional da Amazônia. The purchase, valued at about US\$ 650,000, was the result of an auction held a year ago for the purchase of equipment for EBC public radio broadcasts. This is believed to be the first domestic DRM installation on a locally produced transmitter in Latin America.

(SOURCE: *RADIO WORLD*)

<https://tinyurl.com/2jm8sety>

<https://radios.ebc.com.br/nacionalamazonia>

FCC ALLOWS FM ON CB IN THE US: 63 years after the introduction of Class-D 27MHz AM CB Radio, the FCC has agreed to permit FM to be used. The Federal Communications Commission stated that, "After considering this additional information, we conclude that allowing manufacturers to add FM as an optional modulation scheme will not substantially change the fundamental nature of the CB Radio Service and will improve the user experience, as described by Cobra and President. How people use the service will not materially change or be expanded. Further, Cobra states that AM is a well-established operating mode that is unlikely to disappear, even if we permit operations in FM mode. Continuing to mandate AM capability while permitting dual modulation will provide benefits to CB radio users who will have an additional modulation option while maintaining the basic character of the service. The addition of FM as a permitted mode will not result in additional interference because users who hear unintelligible audio on a particular channel can simply select another channel or switch modes [...]."

(*SW Ling Post* | FCC)

<https://tinyurl.com/4dyaan33>

<https://tinyurl.com/2k2spz46>



Radio News

BUZZER ACTIVE AGAIN: On 4625kHz USB, UVB-76 (MDZhB) - commonly known as *The Buzzer* - was heard again at 19:00 UTC 19th September 2021. This mysterious transmission now appears to have changed its sound to a multiple 'horn'. At approximately 20:28 UTC, there was a foreign language also. If you do not have a short wave radio, use the free University of Twente SDR. Check it out on dark evenings: (SOURCE: Bob Houlston G4PVB, RU Volunteer Correspondent)

<http://websdr.ewi.utwente.nl:8901>

COMMUNITY RADIO PRESENTERS TRAVEL TO THE ROSS REVENGE: Radio Caroline has invited presenters from an Essex community radio station to broadcast from its radio ship *Ross Revenge* in October. Volunteers from *Caroline Community Radio 94.7FM*, which serves the Maldon District, will be spending three days onboard the historic radio ship. "*Caroline Community Radio is an independent radio station which is supported by Radio Caroline with training and technical expertise*," said Radio Caroline station manager Peter Moore. "*As part of our support we will be handing the studios on *Ross Revenge* over to the community presenters for the weekend and they will be shown the ropes by Radio Caroline DJs staying with them on board.*"

There will be an opportunity for local people to visit the *Ross Revenge* during the broadcast on Saturday 9 and Sunday 10 October and be shown around by Radio Caroline DJs. The ship is moored on the River Blackwater, and trips will be running on both days from Bradwell Marina in Essex. Anyone interested in seeing this iconic piece of broadcasting history can book places by e-mailing this address:

(SOURCES: Radio Caroline | *Radio Today* | Chrissy Brand)

boattrips@radiocaroline.co.uk

www.carolinecommunityradio.co.uk

DIRECTORY OF SYNDICATED RADIO SHOWS:

A new directory of available syndicated radio programmes has been created. *Syndishows* aims to provide a convenient one-stop portal for stations looking for new programming to add to their schedule. Presenter and IT specialist Simon Harding, who has previously worked at radio stations across the Midlands, is the brains behind it. The idea for *Syndishows* came after launching his one-hour programme, *The Eurovision Show*, and finding the opportunities to promote it to stations that might like to take it very convoluted and time-consuming. His show is now heard on nearly 150 radio services across the UK and Europe, with a handful worldwide. Simon commented: "*I knew from my own experiences how difficult it is to get your show noticed by stations, so for me putting the*



directory together was a 'no-brainer'. It's taken lots of time and effort to grow the awareness of my own show through countless e-mails and social media posts, so I'm hoping that those offering regular daily, weekly or monthly radio shows, will find Syndishows easy to navigate and a valuable resource to get their creative content on more stations. It's already working too, with positive feedback from many creators!" Radio stations can search for specific types of content they need – from rock, dance, country and oldies shows through to regular daytime output from breakfast through to late nights. Each show listing contains a description, distribution methods and other useful information for programmers. There is a free trial for all show creators to see if the site is right for them, followed by the option to sign up for a small bi-annual or annual fee. It's free to use for radio stations searching for content. (SOURCE: *Syndishows*).

<https://tinyurl.com/vfp29dt6>
www.syndishows.com

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

Publications & Resources



AIRNAV RADARBOX INSIDER NEWSLETTER:
[Excellent product-, trade-/radio-show-news - Ed.]
<https://tinyurl.com/rsad5vk>

BRITISH DX CLUB (BDXC) COMMUNICATION:
[Visit to the Ross Revenge, '75 Years of BBC Radio3', 'UVB-76', and more! - Ed.]
<http://bdxc.org.uk/Communication.pdf>

CQ-DATV (OCTOBER 2021, ISSUE 100):
[The final issue? Surely Not! - Ed.]
<https://cq-datv.mobi/100.php>

SHORT WAVE RADIO ARCHIVE:
<https://shortwavearchive.com>

E-MEDIUM WAVE NEWS (VOL. 67; NO. 5; OCTOBER 2021):
[With an obituary for Clive Sinclair - Ed.]
<https://mwcircle.org>

INOVONICS, INC (INDUSTRY & EQUIPMENT):
<https://www.inovonicsbroadcast.com>

SWLING POST (DIGEST):
<https://swling.com/blog>

PATRICK LINDECKER F6CTE (MULTIPSK):
[Study of an active antenna for LW and MW - Ed.]
<https://tinyurl.com/bpjad7pd>
<https://tinyurl.com/zycnwn9>

KLINGENFUSS, J. (2021):
[Internet-Controlled Web-SDRs: a useful and up-to-date resource - Ed.]
<https://klingenfuss.org/websdr.pdf>

RADIOWORLD, 15TH SEPTEMBER 2021:
[Check out the articles on 'BEIT' and 'Drones and Radio' - Ed.]
<https://tinyurl.com/2utcxk8h>

RADIOWORLD E-BOOK:
What's Next for Virtualization? (October 2021):
[An informative article on radio - Ed.]
<https://tinyurl.com/34xf2jcy>

Follow us on Facebook @radioenthusiasts and Twitter @REnthusiasts

Keith Rawlings

Keith.g4miu@gmail.com

Readers may remember reader and *RadioUser* friend Lionel Clyne who contacted me a few months ago with a question about his MFJ pre-selector. At the time, he also explained to me his 'Heath-Robinson' style indoor aerial – a construction made from various pieces of wire, loops and brackets (Fig. 2).

Recently Lionel contacted me again, reporting on some improvements he has made to it.

He wrote, "I finished the basic construction of my 'Heath-Robinson' system some time ago, but I added the final visual refinements quite recently. The final result was a collection of three loops set at different angles, and two upright whips – four if one includes the supports for two of the 'loops', the third one being free-standing. One loop is a carboot-sale TV antenna and measures 18 cm in diameter. The second one is square, set at a 'diamond' angle and measuring 35 cm; the third one is a five-sided 'loop' measuring 70 cm.

"The final two loops mentioned are made from copper rods about 3 mm in diameter. The connectors to construct the loops and to keep them in place are wire springs (Rolson) available from the local store. I don't know many readers are aware of these cheap and useful bits of hardware, but they have solved a lot of wire-bending problems for me!

"It is difficult for me to give a detailed assessment of the 'HR' performance compared with my 20-metre random wire: however, a rough but meaningful guide would be that the HR equals the random wire until the latter is 'peaked' using my PR selector and balun. Once peaked, the random wire wins almost every time. I do hope that most of this makes sense!

"I am not yet satisfied with the HR performance, which in part might be attributable to my antenna switcher. As a result, I have ordered a new one. The one in use at the moment has lost any 'positivity' in the 'clicks' and I will let you know of any improvement. Concerning the springs, I found that 3 mm ones in the set are very useful in joining together 3 mm copper rods. The ones of slightly larger diameter work well for 5-6 mm steel rods. You might also find the O-rings useful as I have already mentioned [see URLs at the end of this section - Ed.].

"If you look at my setup, you will see two free-standing upright whips: I have mount-



Lockdown Designs & Loop Comparisons

Keith Rawlings reports on readers' aerial solutions, deals with a self-oscillating Wellgood loop and recommends an interesting video comparing several well-known magnetic loops.

ed these in a 'cheapskate' way, by using the 'feet' from an old armchair. These are suitably heavy, the right colour (black), appropriately shaped and pre-drilled ready for the antenna. Any 'wobble' can be eliminated by the use of O-rings."

Judging by the kind of stations Lionel is hearing, the performance of this design seems to be pretty good for an indoor aerial. Lionel makes the further point that, just because an aerial is not specifically designed for one frequency or range of fre-

See our great book and magazine offers at www.radioenthusiast.co.uk/store

Fig. 1: Lionel Clyne at his operating post.

Fig. 2: Lionel's outstanding home-brew aerial.

Fig. 3: A 9:1 balun at the top and 1:1 choke at the bottom. Fig. 4: A typical diagram of an inverted L end-fed with three counterpoise wires

Fig. 5: An MFJ 931 counterpoise tuner suitable for transmitting. Fig. 6: The rear of the MFJ 931.

Fig. 7: DCF-49, decoded with MultiPSK V.4.45.1.

quencies, it will not work on others!

Fig. 1 shows our friend Lionel operating his station. In Fig. 2, you can see Lionel's construction.

By the time this edition of *RadioUser* appears, Lionel will have turned 90. He will not only be celebrating his birthday but he will also be celebrating his wedding anniversary! I am sure that all readers will join me in not only wishing Lionel a happy birthday but also congratulations on his wedding anniversary.

[the editor happily joins in with the celebrations from his editorial shack/ lair – Ed.]

Spring set:

<https://tinyurl.com/2s84hhcv>

O-ring set:

<https://tinyurl.com/tzvu9f85>

The Wellgood Loop: A Reprise

Readers may also remember that I mentioned I had problems with my Wellgood loop going into self-oscillation when transmitting on 6m (50MHz). Well, on the 20th of July this year, we had a massive thunderstorm, which caused local flooding (including in my workshop) and plenty of disruption.

All of my aerials were disconnected from my equipment. However, I forgot to disconnect the DC supply running to my active aerials, including the Wellgood, so they were still 'running'.

After the storm had passed I connected everything back up, only to find that the Wellgood was self-oscillating again. No doubt, the high static charges were the cause.

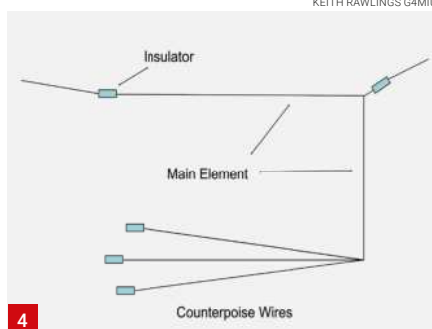
A Simple, Low-Visibility, HF Aerial

RadioUser reader Ken G8PWC contacted me to discuss making a simple and low-visibility aerial for the HF bands. He has just moved house and wants to make the most of his new rural – and low RF noise – location but keep his aerials discreet, for now.

He had a good idea of what he wanted. Therefore, considering the layout of his new property and the location of the shack, we decided that a simple end fed would



LIONEL



KEITH RAWLINGS G4MIU



KEN G8PWC



KEITH RAWLINGS G4MIU



KEITH RAWLINGS G4MIU

get him going and remain discreet.

Taking 66ft as a decent starting point, some suitable wire was obtained and strung up. This was fed into a 9:1 balun with a short run of RG58 which ran back to the operating position and Ken's IC7300.

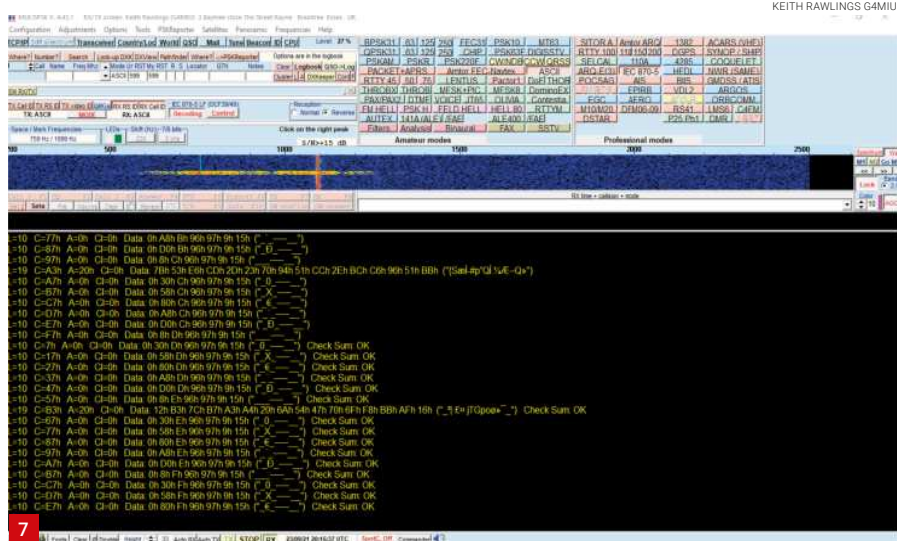
We discussed various earthing arrangements and found that to start with, a counterpoise would be suitable.

A counterpoise is a wire, or network of wires, used as a substitute for a real ground. Kept isolated from real ground, they are usually $\lambda/4$ long at the operating frequency and need to be cut and fitted for each band to be used. I suggested he stay away from a physical connection to ground to start with to avoid any issues with PME, and also to avoid earth losses in a less-than-perfect earthing arrangement.

Ken then e-mailed with the following: "Well, I have made some progress with my HF aerial, I have now also fitted a 1:1 choke on the bottom of the 9:1 Balun and, at the moment, got about 20' of counterpoise run out. When I use the feature on the 7300 to scan the SWR without the tuner switched on, I see a high SWR, but when I switch the tuner on, I find it will tune it to 1:1 on 40m

and above. I have only got the 7300 set to 25W, but it is looking promising. Now I know a counterpoise will work, I will install a longer one of about 66' and hide it a bit better. I have a lot of Yellow/Green earth cable of a very heavy-gauge, which I will use, since that will 'disappear' in the garden, I will start with the longest one and see how I go from there.

"In the picture (Fig. 3) you can see the 9:1 Balun connected directly to the top of the 1:1 common-mode choke, which I hope will keep RF from coming back down the feeder into the house. The blue wire on the left of the Balun is the antenna (66'), and the one on the right is the counterpoise. I may put



a terminal strip up and connect that to the Balun, and then I will be able to add extra counterpoises as I need them."

A counterpoise constitutes an RF ground, which is different to a DC ground.

A couple of points to note about a counterpoise is that they naturally work for both transmitting and receiving and can be run almost anywhere. For example, they can be connected to a radio chassis/ AMU ground connection and run around the shack under a carpet or, as in Ken's case, back outside and roughly under the path of the end fed.

Take note that, when transmitting, there will be RF voltages at the ends of the wires and, depending on the power being run, and these may be quite high. Also, a single counterpoise that is a $\lambda/4$ at the highest operating frequency can be tuned with a suitable matching unit – in much the same way as an end-fed or long wire – to make an artificial ground (Figs. 4-6).

In Other News ...

Patrick Lindecker F6CTE, who is the author of the excellent decoding software *MultiPSK*, has published an abridged English version of his paper *A Study of An Active Antenna for LW and MW*.

There are several 'data' transmissions in the long and medium wave bands (Table 1).

Using a suitable radio, *MultiPSK* is capable of decoding many of them.

Naturally, a decent aerial helps greatly with reception (and transmission) at these lower frequencies.

In sections 1 and 2, the paper gives a quick overview of what can be heard on these frequencies and also briefly describes some key propagation characteristics on LW.

Section 3 is about aerial selection and includes three main types: whip, air-loop and ferrite loop types.

Here, the advantages and disadvantages of each type are explained.

Meanwhile, Section 4 covers amplification and impedance matching, including a description of (and schematics for) an active ferrite aerial. Last but not least, Section 5 sums up the key findings of the paper.

This is an interesting and well-written document and can be found (in English and French) at these URLs:

<https://tinyurl.com/bpjad7pd>
<https://tinyurl.com/zycnwne9>

Magnetic Loop Aerials Compared

Editor Georg brought to my attention a couple of articles of interest on the new *SWLing Post* blog: First, the topic of *Wire Antennas v. Magnetic Loop Antennas* is covered here, in response to readers who have sent in questions, asking if they should go for a simple HF wire aerial or perhaps a magnetic loop.

In one of the articles, its author discusses the virtues of each type in an honest and informative way.

This is well worth reading if you are pondering what type of HF aerial may best suit your station.

<https://tinyurl.com/rd3ct298>

The second blog links to a 35-minute YouTube video introduced by Jon Hudson of SDRplay. In it, a number of active magnetic loops are compared, using a pair of SDRplay *RSPduo* SDRs.

<https://tinyurl.com/3jbkkp5t>

The video compares the performance of wideband active loop amplifier/aerials for LF/HF frequencies.

60 kHz: MSF, JJJ and WWVB time signals
 75 kHz: HBG time signal
 77.5 kHz: DCF77 time signal
 128.1, 134.6 and 138.0 kHz: IEC 870-5 (IEC 870-5 refers broadly to standards for remote data acquisition and control; there are quite a few 'standards' under this number. The three frequencies mentioned in the Multipsk list are transmissions using this protocol that can be decoded. Two transmitters are in Germany, and one is in Hungary and is used for signalling electrical switching / Tele-switching). A decode from DCF49 is shown in Fig. 7.
 147.3 kHz: DDH 47, RTTY 50 bauds (weather)
 162 kHz: France-Inter time signal
 198 kHz: BBC time signal
 191 and 285 kHz: NDB beacons
 283.5 and 325 kHz: DGPS stations
 490 and 518 kHz: NAVTEX.

Table 1: A selection of useful transmissions on long wave and medium wave.

Presented by Mike Harwood, the *Bonito Megaloop FX*, the *LZ1AQ amp*, the *Cross Country Wireless LAA++* and *Wellbrook ALA 1530N* are simultaneously compared side by side, on both broadcast and amateur radio signals. All four loops are positioned in such a way that they are close enough together for a fair evaluation, but they are also far enough apart from each other, for there to be little or no interaction between them.

In this video, the directional properties of each loop are not tested, and each loop aerial is kept orientated in the same plane. Each one is powered by its own Bias-T (DC power inserter).

All measurements were taken simultaneously during the daytime.

Two RSP Duo devices were used together, with both of them in dual-receive mode. This allowed a real-time comparison of the four loops, with each SDR running two of the loops. The results are displayed on the spectrum display. Signal levels and Signal to Noise Ratio (SNR) were evaluated for each model.

It was most interesting to see how the four various loops performed in this test.

Considering the price difference between the loops in question, the video makes for interesting viewing, and I recommend it to your attention.

<https://tinyurl.com/wtp3pajr>
<https://tinyurl.com/an988eke>
<https://tinyurl.com/5f6drawb>
 See you all next month!

Radio News

SAQ GRIMETON: On United Nations Day, Sunday, October 24th, 2021, the unique and historical Alexanderson alternator in Grimeton Sweden, with call sign SAQ, is scheduled to send out a message to the entire world on 17.2kHz CW. The station has been in touch to share the following information:

Program and Transmission Schedule:

15:30 CET (13:30 UTC): World Heritage Grimeton for visitors at the Visitor's Center
16:00 CET (14:00 UTC): Transmitter Hall visit for visitors.

Transmission & YouTube Live stream:

16:25 CET (14:25 UTC): Live stream begins.
16:30 CET (14:30 UTC): Startup and tuning of the Alexanderson Alternator SAQ.
17:00 CET (15:00 UTC): Transmission of a message from SAQ.

YouTube Live Stream:

17:20 (15:20 UTC): Live music concert from the transmitter hall. More details to follow on our website. This year's message has been composed by the Swedish human rights lawyer and sustainability expert Ms Parole Sharma.

Test Transmissions:

SAQ are planning to conduct test transmission on October 22nd, approximately between 13:00 CET (11:00 UTC) and 16:00 CET (14:00 UTC). SAQ will be on air for shorter periods during this interval when we will be conducting some tests and measurements. Your comments are welcome; please send them to:

info@alexander.n.se

Live Video from World Heritage Grimeton Radio Station:

Scheduled at 16:25 CET (14:25 UTC) on October 24th, 2021

QSL Reports to SAQ:

QSL reports to SAQ are most welcome and appreciated!
For guaranteed E-QSL from us, please report using our ONLINE FORM.

We cannot guarantee that reports by Email/mail/bureau will be confirmed.

The online form will be open from October 24th until November 14th.

Amateur Radio Station SK6SAQ:

The Amateur Radio Station with the call "SK6SAQ" will be QRV on the following frequencies; two stations will be on the air most of the time.

3.535kHz CW
7.035kHz CW
14.035kHz CW
3.755kHz SSB
7.140kHz SSB

QSL Reports:

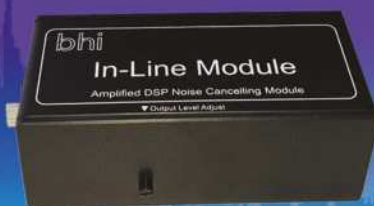
QSL-reports to SK6SAQ (NOT SAQ) are kindly received via: Email to info@alexander.n.se
SM Bureau Postal mail

Visitors are most welcome to World Heritage Grimeton Radio Station on UN-DAY 2021. Members of the Alexander association will have a 10% discount on entry, shop and activities. You can become a member of the Alexander Grimeton Friendship Association, supporting the preservation, documentation and bringing to life the unique Alexanderson alternator. As a member, you get a 10% discount on World Heritage Grimeton's entry, shop and activities, and free admission to Alexander's evening displays and the Alexanderson Day, upon presentation of your membership card. Four times per year, you will receive our online magazine *Alternatorn*, exclusively available only to our members. Alexander members also have free admission to the Radio Museum in Gothenburg.

www.grimeton.org

bhi Enjoy "noise free" audio with a... ...bhi DSP noise cancelling product!

New In-Line Module



- **New** amplified DSP noise canceling In-Line module
- 8 filter levels 8 to 40dB, tone reduction up to 65dB
- 5 W audio with latest bhi noise canceling
- Use with a passive mono extension speaker
- Audio bypass feature - 3.5mm mono input/output
- Headphone socket - DC power 10 to 16V DC
- Replacement for NEIM1031MKII & ANEM MKII

Dual In-Line

Fully featured dual channel amplified DSP noise cancelling module - Use in-line with a speaker, headphones or powered speakers
- Suitable for all radios - Mono or stereo inputs & outputs - Latest bhi DSP noise cancelling technology



bhi Ltd, 22 Woolven Close,
Burgess Hill RH15 9RR, UK
Tel: 01444 870333

NE10-2MK4



- 5W audio with latest bhi DSP noise cancelling
- Up to 65dB tone reduction
- Three position switch for off/audio bypass mode, power on and DSP filter on
- LEDs for Power on, filter on and audio overload
- Headphone socket

www.bhi-ltd.com

New DESKTOP MKII



- **New** improved DESKTOP MKII 10W DSP noise cancelling base station speaker
- Now with latest bhi DSP noise cancelling technology for even better receive audio
 - Easy to use rotary controls
 - 8 DSP filter levels 8 to 40dB
 - "Real time" audio adjustment
 - Suitable for all radios incl' SDR

Compact In-Line



- Easy to use controls
- Use with speakers or headphones
- Line and speaker level inputs
- Use mobile with AA batteries
- High-performance audio processing - Works on all radio bands - Enjoy clear receive audio!

E & O.E.



David Smith

dj.daviator@btinternet.com

Excursions' off the paved area remain one of ICAO's top aviation safety concerns. The most common landing excursion risk factor is ineffective braking action due to runway contamination, such as snow, ice, slush or water. This trend is also confirmed by the main aircraft manufacturers.

Shortfalls in the accuracy and timeliness of runway assessment and reporting methods by aerodromes have contributed to the problem, despite many decades of research effort to harmonise various friction measurement devices and their linkage to aircraft performance.

Whilst friction measurement equipment is useful for runway maintenance purposes, it is misleading to pilots due to the 'disconnect' between the friction measurement and actual aircraft performance. To help mitigate the risk of excursion, ICAO has developed a new harmonised methodology for assessing and reporting runway surface conditions.

The Global Reporting Format (GRF) harmonisation enables runway surface conditions to be reported in a standardised manner, such that flight crew can accurately determine aircraft take-off and landing performance. It also incorporates the potential to communicate actual runway surface conditions to the flight crew in real-time, and in terms that directly relate to aircraft performance data.

GRF and Snowtam

The GRF comprises an assessment by airport operations staff who assign a Runway Condition Code (RWYCC), ranging from '6' to '0'. This code is complemented by a description of the surface contaminant based on type, depth and % coverage for each third of the runway. The code is based on the effect of the runway conditions on aircraft braking.

The outcome of the assessment and associated RWYCC are forwarded to ATC for communication to pilots, either by speech or ATIS. The pilots will use the code to determine their aircraft's performance by correlating the code with performance data provided by their aircraft's manufacturer. This will help pilots to correctly carry out their landing and take-off performance calculations for wet or contaminated runways.

Briefly, the codes run from 6, a dry runway, to 0, wet ice, water on top of compacted snow or snow on top of the ice. The numbers in between indicate steadily deteriorating conditions with factors such as standing



Runway Conditions, Laser Terminals and Combat Clouds

With winter approaching, **David Smith** summarises a key change in runway condition reporting and describes ground-breaking developments in laser communications. He also profiles RAF Marham ATC.

water, dry snow or slush. The GRF also allows pilots to report their own observations of runway conditions, thereby confirming the RWYCC or providing an alert to any changing conditions.

The other key attributes to the GRF are its relative simplicity of use and the fact that it is globally applicable.

The word 'Snowtam' refers to an ingenious system of describing and tabulating runway conditions under snow, slush or ice and the degree to which they are cleared or about to be cleared. Braking action as determined above is also included. A series of letters and figures, each referring to a specific detail, can easily be decoded on receipt.

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

SNOCLO and Snow Plans

The word 'SNOCLO' used on R/T and in Snowtams means that the airfield is closed because of runway contamination. In the meantime, attempts will be made to clear the snow. Each airport has a Snow Plan detailing the priorities for snow clearance. Runways take first place, followed by taxiways and apron. In general, the objective is to clear the snow to a 'black top' surface. This can be achieved on most occasions by using snow sweepers, as long as clearing is commenced as soon as snow or slush begins to lie.

Aircraft operations may continue but may be delayed while the sweeper finishes a run. Back-up, if required, is provided by snow-ploughs and snow blowers. For best effect, sweepers work in echelon, sweeping one full length of the runway, working outwards from the centreline.

If conditions continue to deteriorate beyond those acceptable for aircraft operations, the runway will be closed to afford maximum priority to snow clearance. Salt-free chemicals are sprayed on runways and taxiways for anti-icing or de-icing, in response to Frost and/or Snow Warnings.

Aircraft Laser Communication Terminal

Airbus and the Netherlands Organisation for Applied Scientific Research (TNO) have launched a program to develop a laser communication terminal demonstrator for aircraft, known as *UltraAir*. The project is part of the European Space Agency's (ESA) *ScyLight* (Secure and Laser communication technology) program. It covers the design, construction and testing of the technology demonstrator.

Laser communication technologies are the next revolution in satellite communications (Satcom); said to bring higher transmission rates, data security and resilience to meet commercial needs in the next decade.

The *UltraAir* terminal will be capable of laser connections between an aircraft and a satellite in geostationary orbit 36,000km above the Earth, with technology including a highly stable and precise optical mechatronic system. The technology demonstrator will pave the way for a future *UltraAir* product with which data transmission rates could reach several gigabits-per-second while providing anti-jamming and a low probability of interception.

The Future of UltraAir

In this way, *UltraAir* will not only enable military aircraft and UAVs (Unmanned Aerial

RAF ATC Profiles 7: Marham

ICAO Code: EGYM IATA Code: KNF

Frequencies	(MHz)
Marham Approach/Radar	343.975 362.300* 127.250 278.350 378.700 124.150*
Marham Zone	357.000 133.750
Marham Director	232.150 356.150 123.300*
Marham Talkdown	259.600 278.175 118.325 257.800*
Swanwick Mil CAC	122.100*
Marham Tower	360.400 284.000
Marham Ground	
Marham Ops	
* NATO Common Frequency. Available on request only CAC Centralised Approach Control.	
ATIS	
Marham Information	245.675 126.500
Nav aids	ILS/DME CAT I
Runway 24	TACAN MAM 108.700
Hold	MAM TACAN
Runways	06 2783m x 45m 24 2783m x 45m 01 1864m x 45m 19 1864m x 45m

NOTES (A-Z)

Helicopter Operations

Landing area not specified.

Holding

All aircraft will be placed under a Traffic Service when entering the TACAN hold and will be warned of the close proximity of the radar overhead (blind spot).

Military Aerodrome Traffic Zone (MATZ)

A circle of 5nm in radius, up to 3,000ft above aerodrome level, with final approach-stub aligned on Runway 06/24.

Military Instrument Departures

MID 06, MID 24, MID 01 West, MID 01 North, MID 19.

Operational Hours

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

Sculthorpe Activity

All aircraft operating in the vicinity of Sculthorpe are to contact RAF Marham on VHF 124.150MHz (UHF 282.250MHz).

Use of Runways

The slow lane is the South side of Runway 06/24 and the West side of Runway 01/19.

Warnings

Instrument Approach Procedures for this aerodrome are established outside controlled airspace. Marham ATC will utilise FLARM-derived data to supplement traffic information call as required. (FLARM is a low-cost electronic device giving a proximity warning to similarly equipped aircraft). Visual Control Room Aldis lamps are not fit for use during daylight hours.

Vehicles) to connect within a 'combat-cloud' but also in the longer term allow air-line passengers to establish high-speed data connections thanks to the Airbus' *SpaceDataHighway* constellation. From their position in geostationary orbit, the *SpaceDataHighway* (EDRS) satellites relay data collected by observation satellites to Earth in near-real-time, a process that would normally take several hours.

After extensive laboratory tests, the *UltraAir* demonstrator will be integrated on an aircraft for flight testing by mid-2022. As

satellite services demand is growing, the traditional Satcom radio-frequency bands are experiencing bottlenecks. Laser links also have the benefit of avoiding interference and detection: In comparison to the already-crowded radio frequencies, laser communication is extremely difficult to intercept due to a much narrower beam.

Thus, laser terminals can be lighter, consume less power and offer even better security than traditional radio. This month's photograph shows the futuristic control tower at Farnborough, Hampshire.

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



MOONRAKER

ONE STOP HOBBY RADIO SHOP

Sales line 01908 281705  

E-mail sales@moonrakeronline.com   

www.moonrakeronline.com

Moonraker (UK) Ltd, Cranfield Road, Woburn Sands, Bucks MK17 8UR

WHISTLER

TRX-1E Digital Handheld Scanner

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

Buy the TRX-1E for just

£419.95



419 WATTS

WHISTLER

WS1065 Desktop Radio Scanner



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

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

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

KEY FEATURES

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

Buy the WS1065 for just

£299.95

299 WATTS

WHISTLER

WS1025 Desktop Radio Scanner



This 200-channel scanner can be categorized into 10 separate memory banks. Plus one-touch searches of marine, air and ham Frequency Range: 29-54 VHF Low Band. 87.3-107.9 FM Broadcast Band. 108-137 Civil Aircraft Band Includes 833 kHz steps. 137-144 VHF. 144-148 Amateur Band 2 Meters 148-174 VHF High Band

Buy the WS1025 for just

£89.95

89 WATTS

WHISTLER



TRX-2E Digital Desktop Scanner

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

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

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

Buy the TRX-2E for just

£479.95

479 WATTS

KEY SPECIFICATIONS

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

WHISTLER

WS1010 Handheld Scanner

This 200-channel scanner lets you listen to FM radio bands and can be categorized into 10 separate memory banks. Also, it offers the convenience of one-touch searches of marine, air and ham

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

Buy the WS1010 for just

£89.99



89 WATTS

WHISTLER

WS1040 Handheld Scanner

The WS1040 scans most common trunked radio system signalling formats, including Motorola, EDACS, LTR and P25 trunked radio networks. Talk group and individual call monitoring is supported.

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

Buy the WS1040 for just

£299.95



299 WATTS

WHISTLER

TRX-1 Leather case
Keep your treasured TRX-1 safe with this high quality leather case
£29.95

MRW-TRX3 Antenna Pack
Three compatible antennas in this great pack
£39.95

TRX SD cards
A genuine replacement for the Whistler TRX-1 SD card
£19.99



WHISTLER

UKAFG UK Airband Frequency Guide 2021

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

Buy this guide for just

£15.00



NEW IN!

15 WATTS

Join the best loyalty programme and start earning **WATTS** now!

All registered retail customers can now earn and redeem free product credits known as **WATTS**. It's simple the more you spend the more **WATTS** you receive. You will also receive bonus **WATTS** when you refer a 'New Customer', 'Write a Product Review', 'Share' a product' or 'Refer a Friend'

We have the best deals

We have your favourite brands, ready to ship!

Seen a better deal?

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

Check out our great Bundle Packs

Click the link on our website to see latest offers



MOONRAKER

BUNDLE PACKS SALE BRANDS USED AMATEUR ANTENNAS & ACCESSORIES AVIONICS

AIRSPY
Resurrecting The Radio Experience

HF Plus Discovery High Performance SDR Receiver



Building on the proven Airspy HF+ architecture, Airspy have designed the Most Refined HF/VHF SDR with world class performance in the smallest form factor.

The Airspy HF+ Discovery sets a new standard in terms of reception performance with extra pre-selectors for all the supported bands and a New DSP Core to optimize the gain distribution and the filtering parameters in real-time and dig deeper in the noise.

The signal path includes very high dynamic range data converters along with high performance passive mixers with an excellent Polyphase Harmonic Rejection structure. The included band-tracking pre-selectors eliminate unwanted interference and preserve the dynamic range of the receiver. With its world class strong signal handling capability and incredibly Low Noise, the HF+ Discovery is the ideal companion for All your High Performance Receive Scenarios.

Both the architecture and level of integration achieved in this design allow Airspy to bring top performance reception at a very affordable price.

KEY FEATURES

- HF coverage between 0.5 kHz - 31 MHz
- VHF coverage between 60 - 260 MHz
- 140.0 dBm (0.02 μ V / 50 ohms at 15MHz) MDS Typ. at 500Hz bandwidth in HF
- 141.5 dBm MDS Typ. at 500 Hz bandwidth in FM Broadcast Band (64 - 118 MHz)
- 141.0 dBm MDS Typ. at 500 Hz bandwidth in VHF Aviation Band (118 - 260 MHz) • +15 dBm IIP3 on HF at maximum gain
- +13 dBm IIP3 on VHF at maximum gain
- 110 dB blocking dynamic range (BDR) in HF
- 95 dB blocking dynamic range (BDR) in VHF
- 150+ dB combined selectivity (hardware + software)
- 120 dB Image Rejection (software)
- New High Performance Pre-selector for HF with 4 filter banks (corners at ~DC, 5, 10, 17 and 31 MHz)
- New High Performance Pre-selector for VHF
- New High Performance Pre-selector for the FM band

Buy the HF Plus Discovery for just

£199.95



AIRSPY
Resurrecting The Radio Experience

Mini High Performance SDR Receiver



AirsPY Mini builds on top of the successful Airspy R2 architecture to offer an affordable high performance alternative to RTL-SDR and other TV dongles for the VHF and UHF bands. The coverage can be extended to the HF bands via the Spyverter up-converter companion. This new addition to the Airspy family is 100% compatible with all the existing software including the de facto scanning standard SDR#, but also a number of popular software defined radio applications such as SDR-Radio, HDSDR, GQRX and GNU Radio.

- VHF/UHF/SHF Radio Monitoring • Real Time Spectrum Analyzer
- ADS-B, ATC receiver • Radio Astronomy • Satellite IF
- Telemetry Receiver • Wide Band Scanner Ham Radio, etc.

Buy the Mini for just

£119.95



AIRSPY
Resurrecting The Radio Experience

R2 High Performance SDR Receiver



AirsPY R2 sets a new level of performance in the reception of the VHF and UHF bands thanks to its low-IF architecture, high quality ADC and state of the art DSP.

The coverage can be extended to the HF bands via the Spyverter up-converter companion.

The Airspy R2, like its predecessor is 100% compatible with all the existing software including the de facto scanning standard SDR#, but also a number of popular software defined radio applications such as SDR-Radio, HDSDR, GQRX and GNU Radio.

TYPICAL APPLICATIONS

- VHF/UHF/SHF Radio Monitoring • Coherent Receiver Array
- Direction Finding • Passive Radar • ADS-B, ATC
- Radio Astronomy • Satellite IF • Telemetry Radio Receiver
- Wide Band Scanner • Education • Ham Radio, etc.

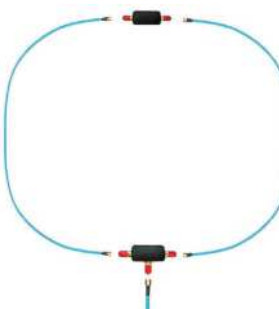
Buy the R2 for just

£199.95



AIRSPY
Resurrecting The Radio Experience

YouLoop Indoor HF Antenna



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

A New Magnetic Loop Concept

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

Architecture

The YouLoop is a generalization of the Möbius loop where a balanced electric shield is used as the centre of a multi-turn loop. The rest of the turns run inside the shield. This construction is electrically balanced for large wave wavelengths, i.e. when Lambda is very large compared to the size of the antenna.

Buy the YouLoop for just

£29.95



AIRSPY
Resurrecting The Radio Experience

SpyverterR2



Spyverter R2 builds on top of the successful Spyverter architecture and improves some of the key points of high performance HF reception. We designed the Spyverter R2 to extend the coverage of the Airspy receiver series to the HF down to virtually DC with world class dynamic range, frequency stability and sensitivity to rival with high end analog designs at a very affordable price. You have no excuse to use low performance receivers that require more filtering than your entire shack, killing the signals of interest along the way! The architecture is still based on our switched double balanced mixer that moves the entire HF spectrum to the VHF band between 120 MHz and 180 MHz. We replaced the LO generator with a programmable, low phase noise PLL with 0.5 PPM VCTCXO. The Voltage control of this VCTCXO allows fine calibration of the operating frequency at the factory.

The embedded microcontroller provides both the programming of the PLL (Si5351C) and the voltage control via its embedded DAC. Once the DAC is settled and the PLL is programmed, the microcontroller enters a deep sleep mode to eliminate any interference. We also added a 10MHz reference input clock for professional usages where phase coherency is required.

When used with an Airspy receiver, the Spyverter R2 can be powered from the integrated Bias-Tee, and only uses ~10mA of current (versus 47mA in the old design). This improves battery operation dramatically!

KEY FEATURES

- RF Input 1kHz to 60 MHz • Switched Double Balanced Mixer
- IF Frequency 120 MHz - Positive Image • 35 dBm IIP3
- Conversion loss: 5.2 dB typ.
- LO leakage: -42dBm typ. (12 dB lower than the original Spyverter)
- Phase noise at 10kHz separation

Buy the Spyverter R2 for just

£59.95



MOONRAKER

SkyScan Desktop VHF/UHF Indoor Scanner Antenna



This is the best all round wide-band desktop scanner antenna on the current market. Keeping within the famous discone design but smaller for internal use has proved wonders for indoor reception

- Discone style desktop receiving antenna • 25-2000MHz • 70cm
- Heavy duty 125mm magnetic plate for stationary use if required
- 4m RG58 mil spec coax

Buy the SkyScan Desktop for just

£49.95





Chrissy Brand
chrissyLB@hotmail.co.uk

A steady hand carefully tuned across the short wave bands to catch the latest international developments. She paused at around 9400kHz, recognising a familiar sound coming out of the ether; a melodic piece of music played on a flute and drum, before a voice announced, *"This is the Voice of the Cherokee, broadcasting to Europe in the 25, 31, 41 and 49 meter bands"*. Around 30 minutes – and a retune – later, she heard, *"Welcome to Radio Danuwar, on 12095kHz in Danuwar, Spanish and English."*

In a parallel universe, a counterfactual containing such announcements might well have been heard on short wave in the last century.

The Cherokee are probably one of the world's better known Indigenous populations; today, 141,000 inhabit parts of northeastern Oklahoma. The Cherokee Nation is the largest tribe in the USA, with more than 390,000 citizens worldwide. The Danuwar, meanwhile, are one of 59 Indigenous nationalities that are recognised by the government of Nepal.

Due to the legacy of empires, foreign invaders, oppression and silencing, communities such as these were often unable to express their voices locally – let alone on the international airwaves of the 20th Century.

Raising Diverse Voices

This short feature gives a brief overview of some of the Indigenous programmes that we can all listen to. I will largely con-

Radio and Indigenous Communities

In Part One of her new two-part mini-series, **Chrissy Brand** examines how some of the world's Indigenous communities use the power of radio. In this month's instalment, she focuses on the USA, Canada & Australia.

centrate on those offering (some) English language content (Table 1), which is, perhaps, another ironic twist in the, in my opinion, mostly negative, legacy of Colonialism.

When short wave was the 'internet of the day', from the 1930s to the 1980s, national governments and the powerful broadcasting organisations that had formed decreed they would speak for an entire nation. It came to pass, therefore, that it was The Voice of America (VOA) that became one of the world's leading broadcasters, there was no *Radio Hopi*, nor *Passamaquoddy Calling*, to speak for the country's original, longest established, populations.

At the *UNESCO World Radio Day* in 2012, James Anaya, UN Special Rapporteur on the Rights of Indigenous Peoples, emphasised that, *"Radio has been a fundamental means for Indigenous Peoples to maintain*

their languages and to exercise and defend their rights. As recognised by the UN Declaration on the Rights of Indigenous Peoples, Indigenous peoples have the right to establish their own media in their own languages and access to all other non-indigenous media without discrimination. States shall take effective measures to ensure that the media duly reflect indigenous cultural diversity. States, without prejudice to ensuring full freedom of expression, should encourage privately owned media to adequately reflect indigenous cultural diversity."

Today, thanks to campaigning by many Indigenous people and supportive organisations around the world, these diverse voices are, finally, being better heard, on radio waves across the planet. However, there are still too many people in the western world who are completely unaware of this.

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

Fig.1: *Raven Radio* in Alaska is a vital community voice. Fig. 2: Preserving Native American culture on KILI, *The Voice of the Lakota Nation*. Fig. 3: Broadcasts live from the radio deck at the *Angurugu Radio*. Fig. 4: A good range of music and entertainment is to be found on *Indigenous Peoples' Radio* in Canada. Fig. 5: The reputable team behind *Media Indigena* in Canada.

Native American Radio

A slightly more enlightened age evolved towards the end of the last century: US Native American rights were acknowledged and improved, although today's inequalities in health and wealth show that there is still a long way to go.

However, some communities can sustain and celebrate the languages and everyday cultural life, thanks in no small part to radio stations and podcasts.

In Sitka, Alaska, KCAW, also known as Raven Radio, is one good example (Fig. 1). Since 1982, it has broadcast community programmes, vital information about tsunami warnings and storm threats and phone-ins on all the local issues of the day. The station estimates it has a listenership locally of around 11,750. However, KCAW does relay other stations and programmes, including those of BBC World Service and *Democracy Now!*

KILI, the Voice of the Lakota Nation (Fig. 2), is owned and run by the Lakota community, with a mission to, "preserve Native American culture and instil pride in the peoples' unique heritage". It broadcasts from the Pine Ridge reservation in South Dakota to around 30,000 listeners. Programme content concentrates on culturally relevant music and news, health information and council meeting activity. In addition, the *Lakota Storytelling Hour* is broadcast in the Lakota language.

In September 2021, a new podcast, *Sovereign*, was launched by the Salt Institute for Documentary Studies. It tells the stories of four Native American tribes in Maine who are fighting to restore their rights and the state and local officials trying to stop them.

<https://sovereign.simplecast.com>

Another fascinating programme and podcast come in the shape of *Native America Calling*, *Your National Electronic Talking Circle*. Hosted by Tara Gatewood, it is on the *Native Voice One* network, which educates, advocates and celebrates Indigenous life and culture by providing radio programmes from a Native point of view. Recent programmes have covered the themes of reparations, sacred places, homelessness, environment, literature and the resilience of



native arts.

<https://nativeamericacalling.com>

Meanwhile, another good example is *Let's Talk Native* with John Kane, which performs the sole, but important, function of providing a forum for Native issues. John is a Mohawk man who has spent most of his adult life fighting for Native sovereignty and advancing the lives of Native people.

In one recent podcast I found engaging, Dr Stephanie Fryberg discussed her work on researching the psychological harm caused by native mascots and the impact they have. She has been able to, "document significant data that shows race-based mascots do in fact cause psychological harm and they are especially harmful to young children and teens."

www.letstalknative.com

I recently conversed with a Florida friend, and fellow writer, Ronald Kenyon, on the topic of Native American radio. I recalled chatting to some Navajo people many years ago and buying jewellery. They were as intrigued by my blonde curly hair as I was by their jet black straight hair!

Ronald wrote, "You are one of the few who I have known who have experienced the

Navajos. The Code Talkers deserve our admiration and respect. Today there are close to 200,000 native speakers of Diné, so it will survive, unlike some other Indigenous languages that are becoming extinct at a rapid pace. Cherokee, written and spoken is still alive, especially in Oklahoma, although there may be no more than a few thousand native speakers. They have a radio program called *Cherokee Voices* – *Cherokee Sounds*, aired on several stations."

<https://tinyurl.com/7wuhehc3>

Ronald continued, "Regarding radio listening during road trips, I remember once when I was traversing the gigantic Navajo Reservation, I heard a station broadcasting in Diné, the Navajo language. It's considered one of the most difficult languages to learn: there are no regular verb conjugations; every verb is irregular. The 29 Navajo code-talkers were famous during the Pacific Campaign in World War II. They not only spoke Diné, but they also invented a confidential lexicon of neologisms that they used. So, in the unlikely chance that the Japanese actually found somebody who understood Diné, that person still wouldn't have understood the conversation of the code-talkers!"

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

Australia First Nations

In Australia, First Nations Radio leads the way, based in Darwin in the Northern Territory. It provides a voice for Larrakia and all Aboriginal and Torres Strait Islander peoples. A station named Radio Larrakia is part of this network.

It was back in 1972 when the first Indigenous-produced radio broadcasts were aired. These were on 5UV Adelaide and 4KIG Mount Stewart, near Townsville. Today, there are over 130 television and community radio stations in the country.

In Groote Eylandt, Northern Territory, Angurugu Radio (Fig. 3) has a gathering on the last Friday of each month. Buskers, poets, musicians, singers and DJs are encouraged to turn up to the radio deck at the Angurugu Cultural Centre. The performances are broadcast and streamed live on Angurugu Radio. In 1972, the first Indigenous-produced radio broadcasts went to air at 5UV Adelaide and 4KIG Mount Stewart, near Townsville 50 years after the first radio broadcast in Australia. Along with its sister station, Radio Umbakumba, Angurugu Radio is part of the Groote Broadcasting organisation.

Canada Indigenous Radio

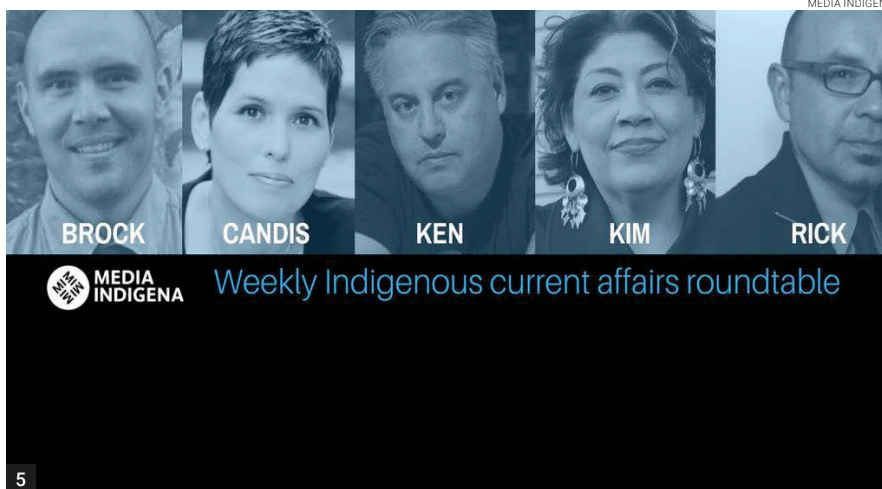
In 2018, Julia Szwarc, Department of Communication at the University of Ottawa, summed up the positive impact of Indigenous media, *"The Indigenous broadcasting sector is an integral part of Canada's diverse media landscape and provides a unique offering by broadcasting content that preserves Canada's Aboriginal languages, helps to retain cultural traditions, and offers opportunities for Indigenous youth across the country to participate in media production."*

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

National broadcaster CBC plays a part in Indigenous programming. William Firth hosts CBC North's weekday radio programme *Nantaii* (which translates as 'country road') to Gwich'in communities of the Western Arctic and Old Crow, Yukon. It broadcasts from Inuvik, entirely in the Gwich'in language. William's aim is not just to incorporate centuries-old words into everyday vocabulary, but to regenerate it for young people.

www.cbc.ca/news/indigenous

Canadian Indigenous Peoples' Radio can be heard in Canada and the USA on SiriusXM Channel 165, with a range of music and feature programmes (Fig. 4). As with much of the content aimed at Indigenous communities, such radio stations play an important



Station, Programme or Podcast Name	Website
KTNN, Voice of the Navajo Nation, New Mexico, Arizona and Utah, USA	www.ktnnonline.com
KSUT, Four Corners Public Radio & Tribal Radio, Colorado, New Mexico, USA	www.ksut.org
KCAW, Raven Radio, Sitka, Alaska, USA	www.kcaw.org
KILI, the Voice of the Lakota Nation, Porcupine Butte, South Dakota, USA	www.kiliradio.org
KOOP Radio, Austin, Texas, USA. Indigenous Hour with Ken Z	https://koop.org/programs/heartbeatz-indigenous-hour
BOIR, Bay of Islands Radio, Newfoundland, Canada. Mi'kmaq Matters	http://boir.ca/shows/mikmaq-matters
Nuxalk Radio, Bella Coola, Northern Turtle Island, Canada	http://nuxalkradio.com
First Nations Radio, Northern Territories, Australia	www.firstnationsradio.org
Radio Umbakumba and Angurugu Radio, Northern Territories, Australia	www.grootebroadcasting.com
2TLP The Listening Place, Ngarralinyi Radio, Taree, New South Wales, Australia	www.2tlp.com.au
2LND, Koori Radio, Sydney, New South Wales, Australia	https://kooriradio.com

Table 1: Selection of Indigenous Radio and Podcasts (with some English spoken).

role in educating (and entertaining) those beyond the target audiences, from the general public to campaigning organisations and government bodies.

Media Indigena is a weekly, current affairs programme about Indigenous issues and events in Canada and beyond (Fig. X). In recent months I have heard a wide range of topics debated, including law and order, leisure and recreation, hunting and harvesting rights, and medically assisted dying.

Media Indigena's programmes and website stories are presented and written by a team of academics, journalists and a playwright.

<https://mediaindigena.com>

Survival International

Survival International (SI) is a human rights group that originated over fifty years ago. It works to empower tribal peoples with control of their lives, lands and the freedom to determine their own futures.

There are over one hundred and fifty million people in more than sixty countries who live in tribal societies. According to SI, *"Their voices too often go unheard; their perspectives*

are routinely ignored. They are the best guardians of the natural world, but they experience appalling racism and genocidal violence. Their lands and resources are stolen for profit, and their ways of life are being deliberately and systematically destroyed."

By contrast, Survival's *Tribal Voice* is a (video-based) platform for tribal people to speak out:

<https://vimeo.com/user68964108>

The *Rough Drafts* podcasts of 24th May and 8th June 2021 interviewed Daniel Lavelle. He is the US Director for Survival International, working to empower people with, *"control of their lives and lands and the freedom to determine their own futures."* Amongst topics discussed were how Indigenous empowerment is a priority for global environmental solutions.

<https://tinyurl.com/DLavelle>

In *The Rewilding* Podcast of June 14th, 2021, Stephen Corry, a former director of Survival International, discussed the central myths of 'civilisation' and the prejudices that it generates to justify its destruction of tribal people.

<https://tinyurl.com/4wn42cdb>

Conclusion

In 2021, Indigenous community radio is a powerful tool in many more countries than I have had time to discuss on these pages. Countries, where such radio stations are growing or thriving, include Bolivia, Guatemala, India, Mexico, Namibia, Nepal and South Africa. The reference section below offers further, and wider, reading on the subject.

From the rainforest to the outback, over hundreds of years, the West has marginalised and oppressed Indigenous populations. Therefore, radio can help to stand with them in the fight to preserve their voices, cultures and unique ways of life.

I applaud the work done by all who are involved at Indigenous radio stations.

In Part Two of this short series, at a later stage, I will delve deeper into the provision and successes of Indigenous Radio in other countries, territories and regions of the world.

[N.B.: In keeping with the prevailing conventions in this field, I have left the term 'Indigenous' capitalised - Ed.].

References

- Canada's first all-Inuit Inuktitut TV: <https://tinyurl.com/2t7e6e57>
- Canadian Indigenous radio: <https://tinyurl.com/y3e33ud5>
- Cherokee Nation: <https://cherokee.org>
- Courtney Parker, Intercontinental Cry, July 28th, 2015: <https://tinyurl.com/vd4eubbj>
- Cultural Survival, May 3rd, 2018: <https://tinyurl.com/45t8rkb7>
- Development of Aboriginal Broadcasting in Canada: <https://tinyurl.com/2fstvdk5>
- First Nations Radio: <https://tinyurl.com/5bwawww3>
- Indigenous Radio Broadcasting in Canada: <https://tinyurl.com/ybad84x4>
- Mexico: <https://tinyurl.com/s5wcs475>
- National Māori Radio Network (e Whakaruruhau o Ngā Reo Irirangi Māori): <https://tinyurl.com/32chk3z3>
- Survival International: www.survivalinternational.org/tribalvoice
- The Importance of Indigenous Radio, by Olivia Marie Golosky (2017): <https://tinyurl.com/3wehr47z>
- Victor Chikaipa and A Gunde, *Journal of Radio and Audio Media*, 2020: <https://tinyurl.com/4a8hfdh8>.



Radio News

GLASGOW MULTIPLEX TRIAL CLOSING: The *Nation Broadcasting*-owned small-scale DAB multiplex trial in Glasgow will close on Friday, 8th October 2021, we have been reliably informed. This means a short break in service before the permanent licence commences. This is expected in the middle of 2022, also owned by *Nation Broadcasting*. For now, around 25 radio stations (according to the latest update at *Wohnort*) will cease to be available on DAB radio in the city from Friday 8th October 2021. *Nation Radio Scotland* has already made the move to the larger central Scotland multiplex. (SOURCE: *Community Radio Today* | *Nation Broadcasting* | *eRadio* | *Industry Press*) <https://tinyurl.com/vcu3wa39> <https://www.nationbroadcasting.com>

HEIL MICROPHONES: Here's an informative conversation with Bob Heil. Quote: "There are hundreds of microphones on the market - a wide selection. What does Bob Heil know about mics (and SWL headphones) that others have missed? Why do Heil mics sound great - on Ham Radio and in high-end studios? And what is Bob's secret piece of test equipment for mic development? Bob Heil joins Chris Tobin and Kirk Harnack on this episode of *TWiRT!*" (SOURCE: Bob Heil | via Bob Houlston G4PVB, RU Volunteer Correspondent) www.tinyurl.com/bobheilrics

HOSPITAL BROADCASTING ASSOCIATION:

The Hospital Broadcasting Association has appointed Amy Palmer as the organisation's new Executive Director. In her new role, Amy will have complete responsibility for leading and implementing all aspects of HBA's day-to-day and strategic operations, including the management of the organisation's volunteers. Amy has 10 years of experience as a charity professional working in a mix of healthcare and media charities. The HBA says Amy is enthusiastic about building networks and

partnerships to ensure back-office work is done with the minimum of fuss and volunteers can get on with doing the parts of the work they love. Over 160 hospital, health, and wellbeing broadcasting organisations across the country are supported by the HBA.

(SOURCE: HBA)

<https://tinyurl.com/4tusxu4j>
<https://www.hbaurk.com>

MERSEYSIDE COMMUNITY RADIO STATIONS IN STATION OF THE YEAR:

Merseyside community radio station KCC Live has been awarded station of the year at a local event. The service is based at Knowsley Community College and has been broadcasting to the students, run mostly by volunteers since 2003. The award was judged by people such as Ben O'Brien (Head of Comms Liverpool City Region Combined Authority) and Andrew Diggle (Head of Digital Content, Formula 1), but no shortlist was released by the organisers. Station Manager Dan Spelman said: "To have achieved this award shortly before our 18th birthday is massive, and we want to thank all volunteers, past and present, staff and management... And of course the listening public. Created by Sir George Sweeney, knighted for his work within education and then Principal of Knowsley Community College, and Hywel Evans, known for working with Rock FM, who after 17 years stepped down and on behalf of everyone past, present and future we would like to thank him without him we all wouldn't have this incredible platform he has helped changed so many people's lives in Knowsley. The station has gone through many incarnations, for me to get the call last year from now Station Director Miguel Doforo to become Station Manager after being a volunteer at the station for many years was an honour to continue the legacy this station has. We move this station forward into a new era with our shared vision on bringing more creative opportunities for young people in both Knowsley & the city region of Liverpool. We are excited to see where things can be taken." (SOURCE: *Radio Today*).

<https://tinyurl.com/3ktdm6rr>



Clint Gouveia

clintgouveia@scientificmagnetics.co.uk

Throughout 2019 and 2020 I was frequently asked to write about 'portable' DXing. This was partly in response to the feedback I received via my YouTube channel, the *Oxford Shortwave Log* <https://tinyurl.com/ydk52n55>

The short series I subsequently penned for *RadioUser* in 2020 (*RadioUser*, January 2020: 60-63; February 2020: 54-57; April 2020: 24-26) concerned some very interesting DX catches – all obtained on lightweight, cheap and portable equipment. I sought to demonstrate then that better DX results were, in fact, obtainable on cheaper radios out in the field than with expensive table-top receivers and sophisticated aerials, which often suffer from a ubiquitous blanket of QRM – or 'electro-smog'.

The Joy of Ultralight DX

Clint Gouveia MOOXF reviews an array of recent ultra-light receivers that you can take mobile, and which offer a diversity of practical features, at asking prices ranging from around £40 to £200.

I was, of course, very pleased to write that series of articles and to illustrate what equipment I used for a DXpedition on foot, in a car and on an international trip.

Here, I intend to partially reprise that article, but this time in a more general

sense, focussing on what I consider to be some of the best small portable receivers, across a reasonably wide price range and accessible to many (Fig. 1).

Thus, I hope to cater for all ultra-light DX operators with varied pocket depths!

See our great book and magazine offers at www.radioenthusiast.co.uk/store



Ultra-Light Radios: A Matter of Definition

For me, trying to settle on appropriate definitions for 'ultra-light radios' or 'ultralight DXing' takes me straight back to the time I spent in the jungle of Northern Brazil: What I took then was a simple portable with a few tens of metres of wire as an external aerial. The same will apply to this article. I did move on from 'ultralight' in the jungle, eventually using some active E-field antennas and then the excellent *Bonito MegaLoop FX*.

However, in this article, I wish to stick with a radio and wire antenna. Some DXers specify the dimensions of a portable radio *quite precisely*; to such a degree that, for example, the XHDATA D808 wouldn't be considered an 'ultralight' receiver because it is 'too big' – Really? I have to humbly disagree with this rationale.

For me, 'ultralight' means a radio that is designed to be portable, and whose size limit extends to the likes of, for example, the Tecsun PL-880 (see below).

The latter has been with me all over the world. It does not get any more portable than that. Anything bigger? Well, you'd be looking at something like the new Tecsun H-501 or the vintage but very special Sony ICF-2001D or ICF-SW77. None of these radios could be considered here, they are simply too large and heavy.

Which Radio?

So, what are the radios one might consider in this context? Well, take a

look at Table 1. It was no surprise that the Tecsun brand featured heavily. This manufacturer is probably the largest manufacturer of shortwave-enabled portable radios in the world right now.

The odd-one-out is, of course, the tiny Belka DX: Diminutive in size, but certainly not in performance.

I have included it here because – although very different to the other radios in this test – it does fit the 'ultralight' bill very well, even with a couple of shortcomings that I will explain shortly. It was interesting to note that the price delta across this selection of receivers is £150, yet all have 'ultra-light' potential.

There are other radios to consider, of course, but here we have a selection of what I consider to represent close to the best in performance, and performance as a function of price.

With a price range of only £40 to almost £200, this group of excellent receivers has something for every pocket.

Starting at the top, let us run through the primary features and benefits of each radio in turn and see whether or not there are any undesirable aspects to their usability or performance.

A Long-Time Flagship: The Tecsun PL-880

For a long time, this radio (Fig. 2) was the 'flagship' product for Tecsun, until the PL-990 was introduced and more latterly the Tecsun H-501x.

[The Tecsun H-501x model will be reviewed in next month's *RadioUser* – Ed.]



Fig. 1: The range of portables assessed in this group review.

Fig. 2: The Tecsun PL-880.

Fig. 3: Very popular: The XHDATA D-808.

Fig. 4: Almost the same size as the PL-380 (see below, Fig. 5), this is the Tecsun PL-330.

Fig. 5: The Tecsun PL-380.

Fig. 6: *RadioUser* author Martín Butera with the CCrane CC Skywave model from the USA.

Fig. 7: A compact high performer: Belka DX.

Fig. 8: The author's external aerial junction box.

In terms of sensitivity and selectivity, the PL-880 was right up there with the best. The materials used in its construction are high quality, as was the 'feel' of the controls, particularly the tuning, fine-tuning and volume knobs.

The audio quality was superb; this is the one radio on the list that many will enjoy listening to broadcast band programming on. I felt that everything about operating this radio was satisfying – down to the audio bandwidth filtering and tuning functions on SSB; in short, this was a joy to use.



Manufacturer	Model	Approximate price
Tecsun	PL-880	£190
Tecsun	PL-380	£40
Tecsun	PL-330	£60
XHDATA	D-808	£80
C. Crane	CC Skywave	£158
Alex Buevky	Belka-DX	£130

Table 1: Clint's Ultralight Receivers Parade.

Rating	S	I	N	P	O
5	Excellent	Nil	Nil	Nil	Excellent
4	Good	Slight	Slight	Slight	Good
3	Fair	Moderate	Moderate	Moderate	Fair
2	Poor	Severe	Severe	Severe	Poor
1	Barely audible	Extreme	Extreme	Extreme	Unusable

Table 2: The SINPO Code (Signal, Interference, Noise, Propagation, and Overall).

Station	Frequency/ kHz	Tecsun PL-880	XHDATA D-808	Tecsun PL-330	Tecsun PL-380	Belka DX
Rádio Clube do Pará, Brasil	4885	55545	55545	44544	44444	55545
CHU time signal, Ottawa Canada	3330	45545	44545	33543	32433	44444
Radio Mali, Bamako	5995	54555	54555	44444	44344	55455
Radio Voz Missionaria, Brazil	5939.41	45544	44544	24442	No copy	45554
Rádio Nacional da Amazônia, Brasil	11780	55545	55545	34444	34444	55555
Radio Tarma, Peru	4775.05	45545	35545	No copy	No copy	45544

Table 3: Some Test Results on Short Wave.

All-Round Talent: XHDATA D-808

This small receiver (Fig. 3) is cheaper and more compact than the PL-880. It is constructed with lower-quality materials and is, generally, less robust. Although smaller, however, it was more than equal to the Tecsun, in terms of both sensitivity and selectivity. This is probably the best radio on the market today if you are looking for performance as a function of price. In that respect, it is something else. Audio quality was (just about) acceptable.

However, SSB reception mode is included, which further assists the excellent selectivity of this little radio.

Design Inspiration: The Tecsun PL-330

Almost identical in size to the PL-380, this little radio (Fig. 4) measures ca. 3x5 inches; therefore, it is 'properly' compact, with the indented tuning and volume controls very reminiscent of Grundig radios of years gone by (for example, the *Satellit 500* and *700* models).

In my test, the sensitivity of this receiver was good; this DSP-technology equipped radio supported all RX modes, including sideband and AM-SYNC. The audio quality was pretty good for such a small form factor. In general, reception condition benefited from adjustable audio filter bandwidths from 0.5 to 4kHz. The information provided on the display will be most familiar to anyone who already owns a Tecsun.



Station	Frequency/ kHz	Tecsun PL-880	XHDATA D-808	Tecsun PL-330	Tecsun PL-380	*Belka DX
VOCM, St. John's	590	44434	34553	34453	24433	N/A
Newstalk Toronto 1010	1010	35444	34443	No copy	23342	N/A
Bloomberg Radio, New York	1130	44444	44544	24542	14551	N/A
WGIT, Puerto Rico	1660	24542	25442	No copy	No copy	34442

* Antenna: 10-metre wire clipped to the supplied (removable) telescopic

Table 4: Selected Test Results on Medium Wave.

Good Filtering: The Tecsun PL-380

This model (Fig. 5) appears to be very similar in performance to the PL-380 in terms of sensitivity. However, it is lacking a couple of features some might consider important; there is no external aerial socket – and no provision for the SSB reception mode.

The former issue was obvious, although as an ultralight DXer, clipping an external wire to the telescopic aerial is a decent fix, if not an ideal one. The latter omission might compromise the selectivity of this radio; but not completely because audio bandwidth filters for AM of 6, 4, 2 and 1 kHz are available to the user.

Popular Stateside: The C. Crane CC Skywave

I do not own this radio and have never used one, but it certainly deserves a mention. It benefits from very good sensitivity and selectivity but offers

slightly compromised audio (this can be resolved with headphones, of course). This radio is popular in the US; it comes with SSB receive and has a superb, well-lit, display. Fine-tuning is selectable across all bands, and there are 400 memories for storing stations. The battery life from the two AA cells is said to be excellent

(additional information by Martín Butera [Fig. 6], 30th June 2021)

A Serious Contender: The Belka DX

Although not much larger than a box of matches, this little box of tricks (Fig. 7; *RadioUser*, June 2021: 24-26) boasts levels of sensitivity and selectivity to trouble the most expensive of portable HF receivers. The front-end was very robust; I did not experience any overloading, intermodulation products, and so on.

The frequency coverage is limited to the HF broadcast band: 1.5 to 31MHz. Therefore, LW and MW enthusiasts are not

catered for, other than at 1.5MHz to the end of the X-Band.

Ergonomics let this radio down as you had to push through various menus to perform simple operations; but this receiver was worth including because it has to be the epitome of the 'ultralight' concept.

Probing the Portables

To me, a reasonable way to measure the relative performance of these potential ultralight DXing companions was to compare them in real-time, with the same signal, using the same type of aerial. I felt this should be undertaken out in the field (see images) to reduce QRM and following a method that allows for signal strength and clarity to be observed before changes in propagation take effect.

To that end, I took the radios out into a wood in West Oxfordshire, near my QTH on several occasions to collect signal reports. All the radios in this group test are fitted with an external aerial jack, other than the Tecsun PL-330. Using one of my original Sony external aerial junction boxes (Fig. 8) allowed me to connect a wire to a standard 3.5mm jack, I was thus able to quickly link a ten-metre wire to each radio and record the signal strength, modulation/audio of any target station(s).

If any readers have owned Sony radios from back in the day (for instance, the ICF-SW55, SW77, 2001D, or similar models), you will probably be familiar with this simple little device. It is also worth saying that, across this range of radio receivers, the audio quality differed significantly. This can affect impartiality when assessing the quality of the received signal.

I have therefore tried my best to ignore audio quality *per se* and focus on discernibility of the audio content. In order not to over-complicate the reporting of the results, I have used the SINPO code. For those of you who either aren't aware of this method of reporting radio signals or have forgotten some of the details, Table 2 explains the format.

Reception on Short Wave

I started on the short waves because, in theory, this band should present many opportunities to copy DX signals that are not exactly easy to copy, but *copyable* with most or all of these ultralight receivers.

The results are shown in Table 3, referencing the SINPO code summary given in Table 2 above.

Of the stations listed (Table 3), Rádio

Clube do Pará, Radio Mali and the CHU time signal are generally the easiest to copy. By that does not necessarily mean they were easy to copy during my test; the fact that all of these stations were *heard* was not a surprise. However, it was interesting to note how well they were *copied*.

The most difficult station to hear is Radio Tarma, and this was reflected in my results. Neither the PL-330 nor the PL-380 was able to deliver any discernible modulation/audio. Overall it became clear that the PL-880, D-808 and Belka DX performed best on short wave.

Medium Wave DX

Moving on to the medium wave band (Table 4), I was interested in finding out whether any of these small receivers would be capable of transatlantic DX, using just the internal ferrite antenna (except in the case of the Belka DX, which benefited from the 10m wire clipped to the supplied telescopic aerial).

Therefore, I purposely chose signals on the band which were usually the strongest to be copied.

Note that my reception logs (Table 3 and 4) constitute the result of more than one night of listening.

Once again, the PL-880 and D-808 performed the best. Most of the signals could not be copied by the Belka DX anyway, as band coverage only starts at 1,500kHz. Both the PL-330 and the PL-380 struggled somewhat.

Summary and Conclusions

Both on short wave and medium wave, the PL-880 and XHDATA D-808 proved the most sensitive. This was no surprise to me; I have used both radios extensively; in fact, both were my go-to radios for my travels, back in the day, before the pandemic.

Another winning performance was that of the Belka DX. Brilliant on short wave – and again, no surprise. The only downsides to this radio were the that it does not offer (most of) the medium wave band, and that the ergonomics are somewhat challenging – particularly in the dark in the middle of a wood!

As regards the PL-330 and PL-380 receivers, what can you say? They are similar in terms of both design and performance. In my test, the PL-330 outperformed the PL-380 on the short waves *but only just*.

On medium wave, the lack of SSB on the PL-380, in what is still a crowded band, ren-

dered the reception of some signals copied by the other receivers in this group test, impossible.

One should note though, at their respective price-points, you really cannot go wrong with either unless you are a hard-core MW DXer, in which case you should go with the 330. Selectivity on the PL-880, D-808 and Belka DX was excellent, with SSB and well-chosen audio bandwidth filters. But, of course, you are paying more for this higher level of performance.

Moving on to the C.Crane CC Skywave, here I have pleasure in referencing Martín Butera once again. His experience allowed him to conclude that it benefits from excellent sensitivity and selectivity.

The audio was good and the display excellent – as was the case with all of the radios in this group test.

I would only comment that, in terms of price as a function of performance, this radio appears to be rather expensive.

So, finally, which radio in my opinion was the overall winner? It cannot be the Belka DX because the ergonomics are not quite there, in my view. The selectivity of the PL-380 was slightly hampered by the lack of SSB, although this was compensated for, to a certain extent, by the various audio bandwidth filters.

The PL-330 represented excellent value, but its sensitivity was not as good as the more expensive sets.

The C. Crane CC Skywave, I feel, was not as fair a value for money as some of the other radios in this test, even though its manufacturing quality ranked significantly above average.

In my opinion, the D-808 was the opposite – brilliant value for money, but the audio was not the best.

Thus, overall my winner has to be the Tecsun PL-880: Brilliant sensitivity and selectivity, super audio and high quality; plus controls that are designed in a very ergonomic way – it was just a pleasure to use.

The only slight downside was its physical size – it is slightly larger than the D-808, which, in turn, is larger than either of the Tecsons or the Skywave. Does this really matter? I certainly do not believe so.

As I have said many times in the past, take a decent, moderately priced portable and a few metres of wire out into a quiet location and you will hear more DX than you would at home using thousands of pounds worth of equipment. The PL-880 fits the bill perfectly – which is why I will be carrying mine when I finally escape from my working-from-home routine!

Radio News



NEW CULTURE SECRETARY: The Department for Digital, Culture, Media and Sport has a new minister in charge, as Nadine Dorries MP replaces Oliver Dowden CBE MP in the cabinet reshuffle. The change, was announced this month, and it makes Nadine the 11th Culture Secretary in the last 11 years. Nadine, originally from Liverpool, has been MP for Mid Bedfordshire since 2005. Her upcoming tasks will be to appoint a new Chair for Ofcom and agree on the next *BBC Licence Fee Settlement*. Her public profile had no mention of any radio or television experience, but she did appear on the 'Reality-TV' programme *I'm a Celebrity...Get Me Out of Here!* without informing the Chief Whip in 2012. Oliver Dowden is now co-Chairman of the Conservative Party after being appointed Minister without Portfolio, Cabinet Office. (SOURCES: HMG | RadioToday) <https://tinyurl.com/5btv46s>

SODIUM-BASED BATTERY TECHNOLOGIES

Sodium based batteries have a high energy density, long cycle life and can operate in harsh environments, such as temperatures of -40°C to +60°C. For these reasons, they can be found in application in energy grid storage, such as storing energy from intermittent energy sources such as wind- and solar power.

Unlike other batteries, sodium-based ones consist of a solid or solid and molten electrolyte with liquid sodium acting as the negative electrode. These batteries are usually constructed in a cylindrical form, encased in a container that acts as the positive electrode.

The chemistry is quite simple with no side reactions and a 'roundtrip-efficiency' (charge/discharge) of up to 85%. (SOURCE: EUROBAT, via Bob Houston).

www.tinyurl.com/4vmb2yvd

Radio News



RADIODAYS EUROPE 2021: THE ROLE OF HUMOUR

The final day of sessions at *Radiodays Europe* in Lisbon included the topics of serious comedy, country music, morning shows and news. The location for *Radiodays Europe 2022* was also announced as Malmö in Sweden. Here are some of the highlights from sessions involving radio professionals from the UK [...]: BBC radio's Laura Grimshaw and Jon Holmes had some serious fun during their session at *Radiodays Europe*. Laura, who produces the *Podcast Radio Hour & other Fun Things* for BBC Radio 4 / 4 Extra was on stage with comedian and presenter Jon Holmes to talk about comedy on the radio. Ideas emerge from any moment, sometimes when you are sleeping, sometimes even in the shower – according to Jon, the work of a comedian never really stops he says. Laura agrees, the work never really ends. You have to work hard to be successful, even with raw talented people, you only go far if you put in the hours. Comedy is highly subjective and even if you work hard to make it in the business there will always be people who don't think you are funny and even people who don't like you – people take comedy as something global, but it can't be seen that way, rather in comedy clubs or in the radio, at the end of the day comedy is a personal matter. Being such a delicate and flexible reality, sometimes making it happen might get hard, and that's why keeping a good relationship with producers and managers seems to be a fundamental key to avoid difficulties. Can you use swear words on comedy radio? Swear words seem to be a constant debate, should you say them? Should you avoid them? Well, overall, it depends on the audience and the entertainment; but, just as Laura points out, swearing just needs to have context, it needs to be justified or at least to make a bit of sense. Radio also has the challenge that content needs to tread carefully – it cannot be too 'filthy' – although if it serves a purpose you can push it in a subversive direction [...].

(SOURCES: *Radiodays Europe* | Chrissy Brand)

<https://tinyurl.com/33zdxexj>

European Private Shortwave Stations

October 1st 2021

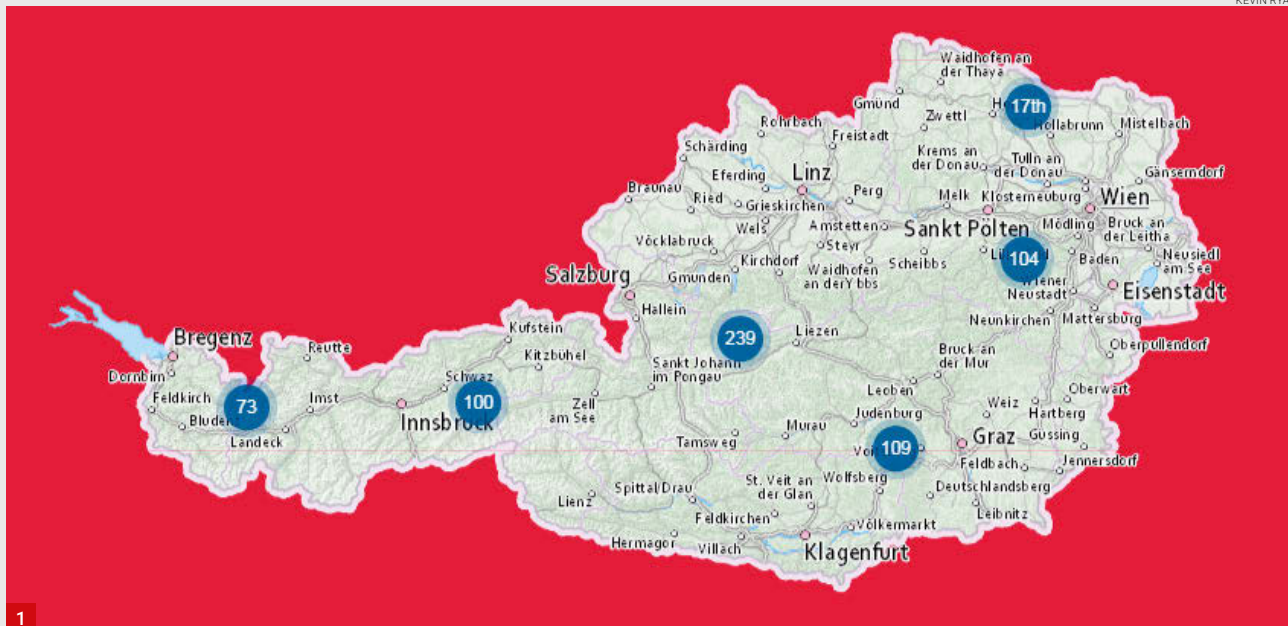
Only legal stations are included. Most stations use low power, but a few use several kW. Note that UTC is used here – not CET/CEST. D = Germany, DNK = Denmark, FIN = Finland, NL = Netherlands, NOR = Norway F.pl.: future plan, Int'l = International, Irr. = irregular, 24/7 = twenty-four hours a day, seven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

kHz	Country	Name	Transmitter site	Schedule (UTC)
3920	NL	Radio Piepender	Zwolle	Irr.
3955	D	Radio Channel 292	Rohrbach Waal	24/7
3975	D	Shortwave Gold	Winsen	Daily 1800-2200
3985	D	Shortwaveservice	Kall-Krekel	Daily 1400-2200
3995	D	HCJB	Weenermoor	24/7
5895	NOR	Radio Northern Star	Bergen	Daily 0329-2210
5920	D	HCJB	Weenermoor	Daily 0600-1600
5930	DNK	World Music Radio	Bramming	24/7
5955	NL	Sunlite	Overslag	F.pl. from November: Daily 0600-1800
5970	DNK	Radio208	Hvidovre	24/7
5980	DNK	Radio OZ-Viola	Hillerød	We 2100-2200, Sa-Su 1100-1300
5980	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month
5985	NL	Radio Delta International	Elburg	F.pl. from November
5990	NL	Studio Denakker	Klaziehaveen	F.pl.
6005	D	Shortwaveservice	Kall-Krekel	Daily 0800-1600
6005	NL	Radio Delta International	Elburg	Sa 2000-2100 & 2200-0100
6020	NL	Radio Delta International	Elburg	Su 0600-1800
6055	DNK	Radio OZ-Viola	Hillerød	Alternative to 5980
6070	D	Radio Channel 292	Rohrbach Waal	24/7
6085	D	Shortwaveservice	Kall-Krekel	Daily 0700-1700 (Radio MiAmigo Int'l)
6115	D	Radio SE-TA 2	Gera	Irr. (10-12 UTC)
6125	NL	Radio Europe	Alphen a/d Rijn	Irr. (14-23 UTC)
6140	NL	Radio Onda, Belgium	Borculo, NL	Daily 0600-1700
6150	D	Europa 24	Datteln	Daily 0800-1600
6160	D	Shortwave Gold	Winsen	Daily 18-22 + Sa 10-16 & Su 08-16
6170	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month
6185	NL	Radio Piepender	Zwolle	Irr.
7220	NL	Rockpower	Nijmegen	Irr. (alt.: 7215 kHz from November)
7365	D	HCJB	Weenermoor	0800-1300
9520	NL	Radio Onda, Belgium	Borculo, NL	F.pl. from October or November
9670	D	Radio Channel 292	Rohrbach Waal	24/7
11690	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month
11720	FIN	Scandinavian Weekend Radio	Virrat	1st Sa of the month
15790	DNK	World Music Radio	Randers	Sa-Su 0700-2000 + irr. at other times
25800	DNK	World Music Radio	Mårslet, Aarhus	24/7

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

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

KEVIN RYAN



Kevin Ryan

kevin@radio-digital.co.uk

Digital Radios, Smart and Hybrid

Kevin Ryan assesses the future of the DAB format beyond 2021, shares news from Digital Radio UK and the European Broadcasting Union, surveys the UK digital landscape and considers digital in-car technology.

Last month I looked at the possible future directions of DRM. In summary, this technology is slowly winning over new, and potentially large, markets while waiting for that elusive breakthrough on affordable receivers. It has been doing that for the last decade, and nothing seems set to change any time soon. A DRM-capable radio is an option for new cars in India, and it is estimated that the total fitted is now around three million. DAB is the main competitor to DRM in Africa and Asia, while HD Radio mainly stays within the confines of continental North America. There have been extended tests in many countries in Latin America, Southeast Asia and several in Europe, but it was never adopted as a standard. The most recent evaluation is in India, but I have not as yet read any feedback on the results. The EU *European Electronic Communication Code (ECCC) Directive* specifies that all new cars should be capable of receiving “digital broadcasting via terrestrial transmitters”. Both DAB and DRM are acceptable, and DRM is an approved digital standard in many EU countries. However, most countries choose to use only DAB+. This is a shame because any test of DRM+ seems doomed to go nowhere.

<https://tinyurl.com/2v8y9wd6>

DAB in 2021 and Beyond

The question for me is then, how well is DAB faring, and does the format’s actual progress match the widely published figures from *WorldDAB*?

Digital Audio Broadcasting (DAB or *Eureka 147*) has two big advantages; first, there are plenty of receivers available; and second, this is the adopted standard for digital radio in nearly all the countries in the European Union and probably North Africa as well.

Multiplexes in France

France launched two national multiplexes on the 12th of October. This is the first ‘spoke’ in their ‘nodes and arcs’ strategy that will expand coverage along a line from Paris via Lyon to Marseilles. The two networks are using some DAB channels

in a Multi-Frequency Network (MFN) rather than the usual Single Frequency Networks (SFN) favoured by many national broadcasters.

The capital, the Rhône cities, as well as the highways connecting them, and the towns crossed by this north-south-east axis, will have access to 25 DAB+ stations. The plan is to continue regional roll-outs, alongside the expansion of national services to achieve 40% coverage of the population by the end of 2022.

It has taken France a long time to move forward with DAB since a law was passed in 2007 to modernize the radio networks. DAB first launched, on a regional scale, in 2014, starting with the cities of Paris, Marseille and Nice. It took another four years to get the national stations on board to unblock the expansion of DAB.

COURTESY OF JOHN Q. A., THE MAP'S CREATOR.



Fig. 1: Austrian transmitters. The numbers in the circles indicate how many broadcast transmitters are in the area. Fig. 2: The EBU area has expanded well outside the accepted 'European' area.

Fig. 3: Four of the DAB+ stations listed in the *Get Digital Radio Postcode Checker*.

Fig. 4: The *HD Radio* website has information on Canada and Mexico, as well as the USA.

Cars in Germany

Germany had to relaunch its DAB+ rollout, and, the second time around, it has been a lot more successful. Recent figures show that there are nearly 22 million DAB+ radios in use (both car and domestic), which equates to 11 million households. The number of FM radios in use is declining, probably driven by new cars having to have a digital radio. Currently, 20% of German cars are said to have DAB+ radios.

The figures are interesting, but I take them with a pinch of salt. Car and portable radios come with both DAB+ and FM, so we don't know how quickly listeners are choosing DAB+ over FM.

However, FM is still the main distribution channel for radio programmes, by a large margin ahead of DAB+, which is in second place and ahead of the internet, cable and satellite. There are almost 122 million FM radios in Germany today, six times as many as there are with DAB+. However, this is around 20 million fewer than in 2015.

Germany along with other German-speaking countries provides their citizens with mountains of information, and there are very interesting reception predictors and transmitter lists to be found online (Fig. 1).

Germany:

<https://tinyurl.com/j64tkdts>

Austria:

<https://senderkataster.rtr.at>

Switzerland:

<https://tinyurl.com/73ajtfk>

DAB Not Needed Here

Around another dozen countries continue to trial a limited number of services and transmitters. Portugal, Hungary and Finland tested DAB and decided to switch off their networks for different reasons; Ireland followed suit this year mainly to save RTÉ, the national broadcaster, some money and also because listening figures showed that the public is happy with the widely available FM networks.

EBU Data

Against this background, *WorldDAB* paints a positive picture of the roll-out of DAB. The European Broadcasting Union (EBU) publishes its own data on broadcasting within its area (Fig. 2).

<https://www.ebu.ch/home>

Of all the countries in the EBU region, only four (UK, Norway, Denmark and Switzerland) are seen as 'digital leaders' with extensive network coverage and the ongoing launch of new services. Norway has switched over to DAB and closed down all national FM networks. Switzerland is expected to follow suit, probably at the end of 2024. Other FM stations in Norway are set to close next year but there is pressure to extend this deadline.

The digital 'followers' are Germany, Italy, Belgium, and the Netherlands – all are investing heavily in DAB+ and expanding networks and services. The third tier of countries recently launched services, but coverage and expansion plans are limited. The EBU places France, Poland and the Czech Republic in this category.

AN EBU Infographic

The 2020 document, entitled *Radio Stations Across the EBU Area*, is very interesting in terms of comparing analogue and digital broadcasters. I am not sure how the EBU defines a 'broadcast station', but I assume it

only counts stations *actually broadcasting* in a particular mode. Digital stations number 1,926; all of them are using DAB/DAB+, except four, which are in DRM. The four must be the BBC World Service, TDF in France, Radio Purga in Russia and Radio Romania International – all on short wave. Of the DAB stations, just 14% are still using the original DAB, our own BBC among them. By comparison, the EBU lists 11,419 analogue stations, of which 11,267 are on FM, 203 on MW, 12 on LW and 135 using short wave. Pretty soon, the only choice will be between FM and DAB+ and most digital receivers come with these two options anyway.

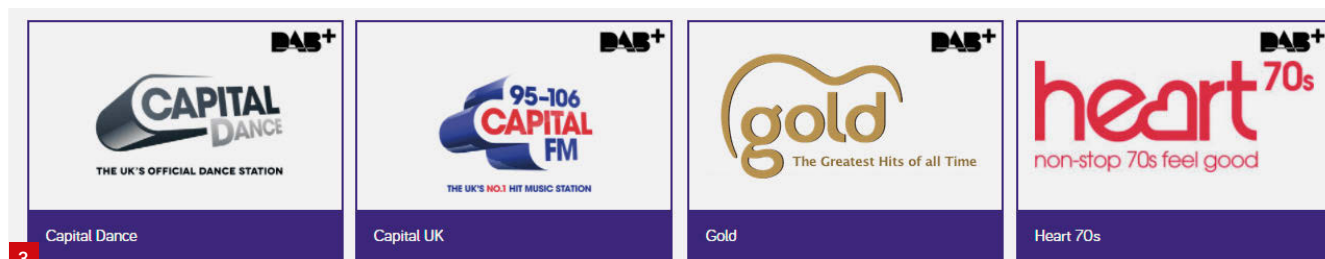
<https://tinyurl.com/353p5ekx>

The UK Situation

Just looking at the number of analogue over digital ones listed in the EBU graphic, you would probably conclude that most listeners are staying with analogue stations. As one of the frontrunners in the move to digital, the UK is different. The last RAJAR figures from Q1 2020 state that digital listening is now 60%, while analogue (AM/FM) is 40%. However, listening via DAB is around 40% and has declined from the previous year, while online and apps-based listening has increased over the same period. In a way, digital now has the advantage with the expansion of the small-scale DAB multiplexes and the real possibility that more spectrum in Band III will be made available. The analogue spectrum is limited, unless and until a major user like the BBC or Classic FM moves fully over to DAB. However, it seems much more likely that one of the quasi-national stations like Heart or Greatest Hits will make that decision.

DAB+ Stations

Of course, many DAB-only receivers in the UK need to be replaced or upgraded to



DAB+, otherwise many national broadcasters will remain on the DAB standard effectively 'hogging' more capacity than they really need. *Digital Radio UK* has launched a low-key campaign to show listeners what they are missing by not upgrading to DAB+. The DAB+ station checker for my address lists 25 stations with good reception and another six with fair reception (Fig. 3). Doing a reverse-lookup the checker included DAB+ stations from the D1, SDL and the London 2 multiplexes. You can try it for yourself on the internet.

<https://getdigitalradio.com>

DAB Receivers in the UK

Moreover, *Digital Radio UK* estimates that there are 25 million DAB domestic receivers, plus 15 million cars, which are fitted with DAB/DAB+ receivers. New cars must have a digital radio, but most will come with FM too. The market is currently finely balanced between analogue and digital, and it may stay that way for some time.

Buyer Beware

There are still a few DAB-only receivers on shelves in shops and sold online. I have found that it is very hard to know if they receive DAB+; reading a copy of the user manual online may help.

Why are Cars so Important?

The *WorldDAB* body is certainly preoccupied with enhancing the car dashboard and wants a system called *Hybrid Radio* to be specified for the new generation of 'connected' cars. The term 'connected' means having access to the internet.

After concluding that 5G did not pose much of a threat, *WorldDAB* is now determined that broadcast radio will be the primary audio source in any combination of terrestrial radio and the internet.

The belief is that homes that have adopted smart speaker technology will not go back to tuning in broadcast radio on a receiver and that there is time to stop the car market from going the same way. I was wondering why there is so much effort to put more information on the car dashboard. Are driv-

ers not supposed to be watching the road, instead of reading weather maps?

<https://www.worlddab.org>

Hybrid Radios

What is more, *WorldDAB* wants DAB broadcast radio stations to be the 'default' audio source and get additional data from the internet, which may be via 5G. The radio broadcast can be either analogue or digital. This extra data could be station logos, weather and traffic information, and, eventually, adverts. However, I can understand why there is a scramble to secure broadcast radio's place in the car before 'Big Tech' take over with their smart speaker technology and driverless electric cars.

Who Will Win?

DTS Autostage and *RadioDNS* are two of the more prominent groups in Hybrid Radio. Interestingly, the BBC selected the former to work with. As I understand it, *RadioDNS* is a publishing standard that requires broadcasters to give up some control over who can access their digital services. *DTS Autostage* likes to highlight this 'failing' in *RadioDNS* by saying it is a service provider that merely adds information to a radio broadcast such as artist and song information, station contact details and upcoming programmes.

<https://tinyurl.com/wru9ayjm>

<https://tinyurl.com/32jra4zy>

Smart Speakers Alternative

Portable radios for home use have a version of 'hybrid radios' usually known as a DAB/FM/Internet radio or even a Radio Internet Tuner (e.g. the *Majority Fitzwilliam* or *Roberts Stream 107* models). Invented by Frontier Silicon recently, this type of radio is called a *SmartRadio*. So far, I am only aware of two brands, *Pure Radios* and *LeMega Radios* who use this marketing name.

<https://tinyurl.com/w8y3emc5>

<http://www.lemegaaudio.com/>

<https://www.pure.com/en-GB/smartradio>

The big difference between in-car and home radios is that, even though *SmartRadios* also have broadcast radio and internet radio available, together with online

music providers like *Spotify*, the channels are completely separate from each other.

HD Radio

HD Radio is also involved in the car dashboard development groups but has other issues to deal with. AM stations, still very important in the Americas, are some way behind FM stations in implementing features of the HD Radio system, and, of course, HD Radio can be difficult on this band because of skywave interference. All-digital AM is seen as an important step in securing the future of the medium wave band, but it would need many more stations to adopt it, so that the wide digital sidebands stop pushing interference into adjacent channels. *Xperi*, the owner of the HD Radio technology, issued nearly 40 licences to use that mode but just four stations are on air. In the USA, the difference between the number of analogue and digital receivers is huge. I have seen estimates of between 600 million and one billion analogue receivers. I got mesmerized trying to find reliable figures for the split between analogue, HD Radio and satellite-based *Sirius*. My best guess is that half of the 250 million vehicles still use old fashioned AM/FM, while HD Radio has about 30% of the share, and *Sirius* around 20%. It is more interesting to see that, of the 15,000 plus commercial stations in the USA, only 2,500 use HD Radio, and the remainder seems reluctant to adopt the technology. Canada has around 25 stations using HD Radio, mainly on FM. There is a list of them on the HD Radio website and you can compare a sample broadcast on both analogue and HD Radio (Fig. 4).

<https://hdradio.com/canada>

Wise Words from Canada

The Canadian Association of Broadcasters (CAB) recently issued a report on the future of digital radio in that country. I feel their conclusions apply to many other countries too, despite the progress in implementing digital radio. The headline conclusion is that "the pathway to a fully digital future for radio is still unclear. Radio broadcasters will continue to deliver programs on multiple tech-



nology platforms and to multiple devices to meet audience preferences for listening at home, at work, portable (mobile) and in the car. "The CAB estimates that it will take at least another 10-15 years for new digital radio broadcasting technology to replace analogue FM and AM radio. The CAB echoes the distinct and separate challenges for AM radio stations noted in the USA: AM transmission can cover large geographic regions and often be the only radio service in parts of the country. AM radio stations dominate the news, talk and sports formats in major cities but suffer from increasingly poor reception quality caused by noise and interference. For reasons I do not fully understand, the CAB states that AM radio stations cannot achieve the same benefits as FM stations from HD Radio and Hybrid Radio.

<https://tinyurl.com/3m42cuc>

New B21 Schedule

The new short wave transmission schedule for the winter period will be published at about the same time as you get this issue of *RadioUser*. The tentative schedule issued in August by the ITU shows DRM transmissions just from Russia and China and the BBCWS. Russia's agency continues to register inactive *Voice of Russia* broadcasts and the active test transmissions from Radio Purga aimed at parts of the Arctic region. Radio Purga's frequencies from a 20kW transmitter are 6025, 11860 and 15325 kHz from 2000-1000 UTC. This is a difficult catch from remote SDRs in that area. The BBC's regular one hour to Europe on 3955 kHz (0600 UTC) and to Asia on 15620 kHz (0800 UTC) continue for another season. This tentative B21 schedule also lists China's domestic and international services to Australia and New Zealand. Apart from a move to a higher frequency for one of the transmissions from Qiqihar, transmissions are identical to B20.

<https://tinyurl.com/4c69xxsp>

Radio News



RADIO ACADEMY: NEW MENTORING PROGRAMME

The *Radio Academy* has opened applications for the first pan-industry mentoring scheme for people in the UK radio and audio sector.

RAMP – The Radio Academy Mentoring Programme – is supported by *Broadcast Bionics* and is designed for mid-career professionals who are ready to take a significant step in their careers.

Applications are welcome from people working in all disciplines including production, presentation, journalism, technology, craft, commercial and support roles, and RAMP is open to anyone with a minimum of five years of professional experience.

A total of 20 mentoring places will be available, and mentees will be carefully matched with an industry leader that suits their challenge, for six mentoring sessions taking place monthly from January next year. Successful applicants will also form a *2021 Cohort Network*, with peer-to-peer feedback, access to group seminars, and networking events designed to boost confidence, enhance skills, and provide ongoing support. Mentors already signed up to share their experience and knowledge include Scott Taunton (CEO of *Wireless*), Lorna Clarke (Controller *BBC Popular Music*), Mohit Bakaya (Controller, *BBC Radio 4*), Chris Skinner (Vice President, *Entertainment Podcasts UK, Somethin' Else*), and Rebecca Frank (Content Director, *KISS*), who said: "I've been lucky enough to have had mentors who have boosted my energy, helped me realise what I wanted and enabled me to go for it. Being a mentor is an incredibly rewarding, stimulating and humbling role to take on, for someone wanting to demystify things or to take their next step. Mentoring, quite frankly, makes the world go round, and I can't wait to connect with new people, and learn things myself along the way."

The RAMP will be facilitated by Hannah

Cornick, an executive coach, training designer and professional development consultant with over 30 years of experience in TV and radio [...].

(SOURCES: *eRadio* | *Broadcast Bionics* | *RadioToday*)

<https://www.radioacademy.org>

<https://tinyurl.com/28vj4au8>

MORE ON SWEARING ON THE RADIO: In September 2021, Ofcom published research on what listeners consider highly offensive language and what they would accept hearing on the radio.

The survey, which was conducted by Ipsos MORI, provides an update on previous research on this subject that was published in 2016. Listeners told Ofcom they are generally more relaxed about most swearing on TV and radio, particularly if it is accidental and an apology swiftly follows.

Audiences say they still want broadcasters to consider carefully when, and how, offensive language is used, so that children, in particular, are protected.

But many people recognise that, in the right context, it can play a key role in programmes – for example, to create a dramatic impact, bring humour, reflect real life, or even to inform and educate. Participants also told Ofcom, however, they felt increasingly worried about discriminatory language on TV and radio – particularly around race – and expect such language to be used only when it is highly contextualised.

Ofcom reminds stations it does not consider that the findings of the new research will fundamentally change Ofcom's approach to applying the offensive language rules.

"We are aware that our existing guidance on offensive language has remained largely unchanged since the *Broadcasting Code* was first introduced.

"We will therefore be using this opportunity to review our guidance in this area to make sure it more closely reflects the findings of our new research.

"Licensees should continue to use our existing guidance in this area ahead of any new guidance being published. In the interim, if any licensees have any queries arising from the research, they should contact the *Ofcom Standards Team*."

[@ofcom.org.uk](https://twitter.com/ofcom)

A list of words that are widely seen as more 'offensive' than others is online (cf. URLs). (SOURCE: Ipsos MORI | OFCOM | *RadioToday* | *eRadio with Broadcast Bionics*)

<https://tinyurl.com/bj33ywtm>

<https://tinyurl.com/vkpaerzh>

<https://www.ipsos.com/ipsos-mori/en-uk>

Keith Hamer

Keith405625.kh1@gmail.com

Garry Smith

Garry405625.gs@gmail.com

The BBC had to find an announcer for their Television Service in rather a hurry. As it turned out, he had been at Broadcasting House in London all the time.

Women listeners and future 'lookers-in' (the word 'viewer' had not yet been coined) were excited to hear that the great search for the 'Adonis of the Televisor' was over.

No less than 590 handsome young men had been tested by the Director of Television for this much sought-after post. None passed, especially those with red hair! In despair, Gerald Cock turned to look for his paragon inside Broadcasting House. And there he found him. Mr Leslie Mitchell was the lucky man (Fig. 1).

For some months he had held a 'temporary' job at the BBC in the Variety Department. Listeners knew his voice well. He had frequently acted as *compère* to variety and other light entertainment programmes and had also been the special announcer for broadcasts by non-BBC dance bands.

He was a tallish, slim young man, and had a pleasing voice. He apparently fulfilled all the necessary qualifications for television announcers. The BBC's official requirements were: *"The person must have a clear cheerful voice, average height, well proportioned, but not with prominent features, dark eyes, not red-headed (still a taboo colour!) a good memory, good education and stage experience."*

Leslie Mitchell owed his first engagement with the BBC to the public's protest against the indifferent announcing of dance bands when broadcasting away from Broadcasting House. As a result, a search was made for a special dance band announcer, and he fitted the bill. Mr Mitchell's television appointment was made by the BBC in complete secrecy, and even when the announcer's name was out of the bag on May 22nd, 1936, no-one would admit that the appointment was any more than a 'stop-gap'.

He went down in history as being the first man to announce a British television programme into the 'Televisor'. He took up his duties when Alexandra Palace opened for transmission and appeared opposite Elizabeth Cowell and Jasmine Bligh, two newly appointed *hostess-announcers* to the television staff (Fig. 2). Incidentally, these two ladies had to undergo one of the most uncomfortable experiences of their lives for the sake of television. Together with Leslie

Announcers and Transmissions

Keith Hamer and Garry Smith conclude their series on 85 years of BBC Television with a look at the first announcer and the first day of transmission. They also furnish the link to their regular online column, DX-TV & FM News.



Mitchell, they had been instructed to 'lend their faces' in August 1936 for several days to a party of make-up experts at Alexandra Palace. The experts worked on them to decide what combination of powder and paint was most suitable for television.

Every type of make-up was tried, washed off, and then tried again. The two different television systems which were to be in force called for two different types of make-up treatment.

On August 3rd, 1936, the BBC appointed Mary Allen to be make-up 'expert-in-chief' for television. She started her new job on August 10th. The BBC, having no precedent to go by, made its choice from those applicants who had the most experience of stage make-up. Mary Allen possessed 15 years' of experience in stage- and film work and costume design.

BBC Television Goes on The Air!

The programme schedule for the first official day of television on November 2nd, 1936, was extremely short. There was very little fuss about the new service in the *Radio Times* and the national press.

Table 1 reproduces the line-up for the world's first, regular, public, high-definition Television Service. These are the exact details as printed in the original cast and crew running order.

The programmes were seen and heard only by owners of suitable receiving sets living in Greater London. The broadcast began with speeches by representatives of the BBC, the Post Office, the Television Committee, and the transmitter manufacturers (Fig. 3).

The opening ceremony was performed twice and transmitted firstly by the Baird process and then by the Marconi-EMI system. The Baird process won precedence by the toss of a coin. Reception via the two systems was, apparently, clear and brilliant. Changes from long shots to close-ups by the Baird system involved a brief interval of a blank screen, but the use of two Marconi-EMI *Emitron* cameras enabled a perfect dissolve to be made from one scene to the other. Leslie Mitchell introduced to the public Mr R. C. Norman, chairman of the BBC, who said: *"At this moment, the British Television Service is undoubtedly ahead of the rest of the World. Long may that lead be held."* Then followed Major Tryon, Postmaster-General, whose speech inaugurated the service, and William Mitchell-Thomson (1st Baron Selsdon), chairman of the Television Advisory Committee, who gave owners of receiving sets an assurance that no change would be made in transmission for at least two years.

Speeches were also made by Mr Alfred Clark, a director of the Marconi-EMI Company, and Harry Greer, the chairman of the Baird Company. The current *Movietone* newsreel was then broadcast. A studio camera (Fig. 4) was then physically pushed towards Miss Adele Dixon, the musical comedy star, who performed a specially composed song called *Television* (Fig. 5). Comedians, *Buck and Bubbles*, played, sang, and danced.

There were no technical problems during the entire programme, which was transmitted from a studio draped with black velvet and brilliantly illuminated by arc lights. The faces

ALL PICTURES: THE KEITH HAMER+GARRY SMITH ARCHIVE COLLECTION



of the official speakers tended to appear too pale because they used no make-up. Apart from that, the image produced by a GEC Televisor was sharp and clear and in good black-and-white. Viewed from 8ft, the image was comfortably large, and the flicker was negligible. *Picture Page* was very successful. The first edition, introduced by Joan Miller and edited by Cecil Madden, featured ghost stories read by the author Algernon Blackwood in dramatic lighting.

Trouble Brewing Behind the Scenes

Although the official opening was a huge success, there were murmurings behind the scenes amongst the top hierarchy. The BBC was faced with finding money to build four or five regional television transmitters. Alexandra Palace only covered a fraction of the homes of the country. It was envisaged that millions of licence-holders were liable to protest to Parliament if their radio programmes were to come under an economic drive in order to pay for television. After all, television programmes were initially for only three hours a day. The public, who were to buy television sets, would not be content with such a short programme time for so large an outlay on receivers.

To start a full daily television service of programmes would have cost the BBC several millions of pounds a year. But the BBC simply did not even have enough money to pay for its sound broadcasting services. Television in 1936 was firmly in the luxury class. For some years to come, sets would

not be bought by the general public.

Faced with the biggest problem of its existence, the BBC were certain about one thing. There would have to be a separate licence issued for television, apart from the fee-to-receive sound broadcasting. Licence-holders were already beginning to complain that their 10-shilling fee should not go towards the television service which, for many years to come, would be far beyond the means of the great majority to enjoy.

It was proposed that a Parliamentary Committee should be set up to consider the licence problem, despite the recommendation of the Ullswater Committee that the 10s. radio licence should pay for both radio and television. It was later revealed that the BBC simply did not have enough money for television. The expenditure on programmes, artists, and the staff was enormous. Their television grant had already been virtually spent.

The Merits of Both Systems

Both technologies had advantages and disadvantages: The Baird system showed pictures of films with great clarity, but studio scenes couldn't be faded from one shot to another. There had to be a short pause between camera angles. The Marconi-EMI system showed outside shots through their remarkable invention called the *Emitron Camera*. By this method, it was possible to bring the camera right up to the artist and to fade scenes in and out in a similar way to a film. *British Movietone News* films were televised for the first time at *Radiolympia*



Fig. 1: Leslie Mitchell, the first television announcer in 1936. Fig. 2: Elizabeth Cowell (left) and Jasmine Bligh were appointed BBC 'hostess-announcers' in 1936. Fig. 3: The opening ceremony was performed twice; it was transmitted firstly by the Baird process, and then via the Marconi-EMI system. Fig. 4: A studio camera moves in close to the performer. Fig. 5: Miss Adele Dixon performed the specially composed opening song, *Television*.

(*RadioUser*, October 2021: 38-40) and the pictures were astonishingly clear.

Outside Broadcasts were being planned to include cricket matches.

However, it was thought that even with the aid of the *Emitron Camera*, this would be difficult for a long time to come. Cables would have to be laid between the site of the Outside Broadcast and the transmitting station at Alexandra Palace.

A Fascinating End to the Programmes

The BBC film, *Television Comes to London* still is a fascinating, and extremely detailed, documentary programme about all aspects of preparing for the station to open. Nowadays, it seems to us, that the BBC simply do not research and produce technical programmes of this calibre.

The film starts with construction work at Alexandra Palace and shows in detail the erection of the transmitting mast. Workers are seen swinging about on steel girders without any safety harnesses or hard hats. The scenes are enough to make any present-day



Health & Safety executives hide behind their settees and shut their eyes tight!

The accompanying music, with excerpts from *The New World Symphony* (Symphony No. 9 in E minor, op. 95) by Antonin Dvořák, makes the horrendous scenes even scarier.

Sadly, today, the studios and offices at Alexandra Palace have been left, largely, to go to rack and ruin. When we visited 'Ally Pally' in September 2009, with BBC reporter and cameraman, Simon Hare, to make a documentary about the history of television, it was somewhat depressing to see the once-famous studios in such a state of utter dereliction. It was also quite a shock to discover that the BBC had to actually pay for permission to film in, what were in 1936, their own studios.

Walking around the dilapidated studios in 2009 somehow seemed to conjure up spirits from the past and the authors found themselves humming Adele Dixon's opening song, *Television*.

Nowadays, the only external reminders that Alexandra Palace was once home to the World's first, regular, public, high-definition television service are parts of the transmitting mast and a ubiquitous standard-type blue plaque over the entrance.

The Television Service Closes Down

After less than three years following the official opening, the BBC Television Service was closed down for reasons of national defence with the declaration of War. On Friday, September 1st, 1939, viewers had settled down to watch a *Mickey Mouse* cartoon when

suddenly, screens went blank. Programmes had been unceremoniously switched off without any warning.

War was declared on September 3rd. It was thought that television signals from Alexandra Palace could assist the German *Luftwaffe* during impending bombing missions. All the technical expertise gained by operating the television service was redirected into the War effort and engineers switched to producing radar and tracking equipment.

Television transmissions resumed after the War on June 7th, 1946, from Alexandra Palace with the announcer, Jasmine Bligh, welcoming viewers back with the greeting, "*Hello. Do you remember me?*", which, of course, most people did. Programmes began where they left off in September 1939 - with the same *Mickey Mouse* cartoon.

The War years gave the BBC some respite from tackling the thorny issue of introducing a separate television licence. The BBC announced that from June 1st, 1946, the broadcast receiving licence would increase from 10 shillings (50p) to £1. A new combined radio and television licence would be introduced, costing £2.

The intractable difficulties surrounding the BBC television licence, currently costing £159 for colour, still rumble on in 2021!

DX-TV & FM News

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

www.radioenthusiast.co.uk

London Television Programme: Alexandra Palace

Vision: 6.67 Metres (45mc.)

Sound: 7.23 Metres (41.5mc.)

BY BAIRD SYSTEM

- 3.00 pm Opening of the B.B.C. Television Service by Major G. C. Tryon. Mr R. C. Norman and Lord Selsdon will also speak.
- 3.15 British Movietone News.
- 3.20 - 3.30 Variety, produced by D. Bower, with A. Dixon, Buck and Bubbles, the B.B.C. Television Orchestra, conductor: Hyam Greenbaum.

N.B.: One interesting note, which was not written down in the script, was the fact that, while the dignitaries were helping themselves to tea and light refreshments in the restaurant during the 30-minute interlude from 3.30 p.m., Hyam Greenbaum and the Television Orchestra soldiered on and continued playing until 4.00 pm, when it was time to repeat the entire Ceremony using the Marconi-EMI system. Also, we dare not give the official BBC description of the *Buck and Bubbles* act. Now we return you to the script...

BY MARCONI-E.M.I. SYSTEM

- 4.00 p.m. Opening of the B.B.C. Television Service.
- 4.15 British Movietone News.
- 4.20 - 4.30 Variety.

N.B.: A further programme was aired from 9.00 p.m. using the Baird system. These are the exact details as printed in the original cast and crew script.

BY BAIRD SYSTEM

- 9.00 p.m. Programme Summary.
- 9.05 Television Comes to London: A B.B.C. Film.
- 9.20 Picture Page, devised and edited by Cecil Madden.
- 9.50 - 10.00 British Movietone News.

Table 1: The First Day of BBC Television.

Stay Tuned!

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

Rallies & Events

Due to the Coronavirus situation, the Rallies calendar remains dynamic at the moment, and there will be more cancellations and postponements. All information published here reflects the situation up to and including 18th October 2021. Readers are advised to check carefully with the organisers of any rally or event, before setting out for a visit. The Radio Enthusiast website will have updates, please check here regularly: www.radioenthusiast.co.uk
To get your rally or event onto this list, please, e-mail full details as early as possible, to: wiessala@hotmail.com

17 October

HACK GREEN RADIO SURPLUS

HANGAR SALE: Hack Green Secret Nuclear Bunker, Nantwich, Cheshire CW5 8AL. Government Covid Regulations Permitting. Fully Covid-compliant. From 10 am to 3 pm. Any last-minute cancellation will appear on our Facebook Page

<https://tinyurl.com/2b7ayfbv>

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

<https://tinyurl.com/3xcrrj3m>

17 October

HORNSEA AMATEUR RADIO RALLY:

Driffeld Show Ground, Driffeld YO25 3AE. Open 10 am. Admission: £2 (under 14s free). There will be a raffle (BB | CR | CBS | FP)

Les 2E0LBJ Tel: 01377 252 393

lbjpinkney1@hotmail.com

7 November

HOLSWORTHY RADIO RALLY:

Holsworthy Leisure Centre, Well Park, Western Road, Holsworthy, Devon, EX22 6DH. Open 10 am. Traders. (BB | CR | D)

Howard MOMYB

m0omc@m0omc.co.uk

2 January

SPARKFORD WIRELESS GROUP RALLY:

Davis Hall, Howell Hill, West Camel, nr Yeovil BA22 7QX. Open 9.30 am to 1 pm, entry is £2. (FP | CR)

Enquiries: wjh069@gmail.com

BB Bring & Buy CBS Card Boot Sale

CR Catering / Refreshments TS Trade Stalls

D Disabled visitors T1 Talk-In (Channel)

RSGB (RSGB) Book Stall FP Free Parking

SIG Special-Interest Groups L Lectures



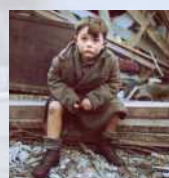
Commemorating the military and human aspects of this famous chapter of WWII



The Blitz in Colour

This 132-page special collectors' magazine – written by Andy Saunders, the former editor of Britain at War and also editor of The Battle of Britain in Colour – covers all the military and human aspects of the Blitz. It doesn't just look at London, it looks at all the UK cities attacked. It looks at the aircraft used, the losses and the heroic stories. It uses hundreds of original images which have been colourised to bring them to life.

Just **£9.99**



Available in all good newsagents. Order online at militaria.ma/blitz-order-here or call 01778 392489



Alexanderson the Great

Scott Caldwell

Scottandrew.caldwell@yahoo.co.uk

Many Historians now regard the Swedish-American electrical engineer Ernst Frederick Werner Alexanderson (1878-

1975, Fig. 2) as one of the most important radio pioneers of the 20th Century. Ernst Alexanderson was a multi-faceted talent who crossed over inventions from one mainstream use to another area. He was a classical problem solver, an extremely capable electrical engineer, a philosopher and a project manager.

He was a prolific inventor who held a total of 344 patented inventions to his name, from the variable-speed AC motor to devices that laid the foundations of many areas in modern telecommunications.

He has been called a clear-headed individual who was very determined to succeed in his career, and he took time to assess any employment opportunities before he committed to them.

Early Life and Education

Sweden was an emerging industrialised nation at the dawn of the 20th Century.

Scott Caldwell throws the spotlight on a pioneering electrical engineer whom we largely remember today because of a UNESCO World Heritage Site at Grimeton in Sweden and its occasional VLF transmissions.

The country possessed a vast supply of natural resources, such as iron ore deposits and hydroelectric power. Several multi-international companies of the calibre of LM Ericsson, ASEA, SKF, and Alfa Laval began to compete against rival European companies at this time.

However, the Swedish still lagged behind the British and German Empires, in terms of research and development in wireless communication.

The early driving force in this field was the Royal Swedish Navy, which instigated a series of contractual negotiations with both Marconi and *Telefunken*. The main supplier of wireless equipment was *Telefunken* after protracted negotiations with Marconi had broken down. The friendly relations Sweden enjoyed with the German Empire at the time may have also played a significant part in *Telefunken* being awarded the tender.

This situation would soon change thanks

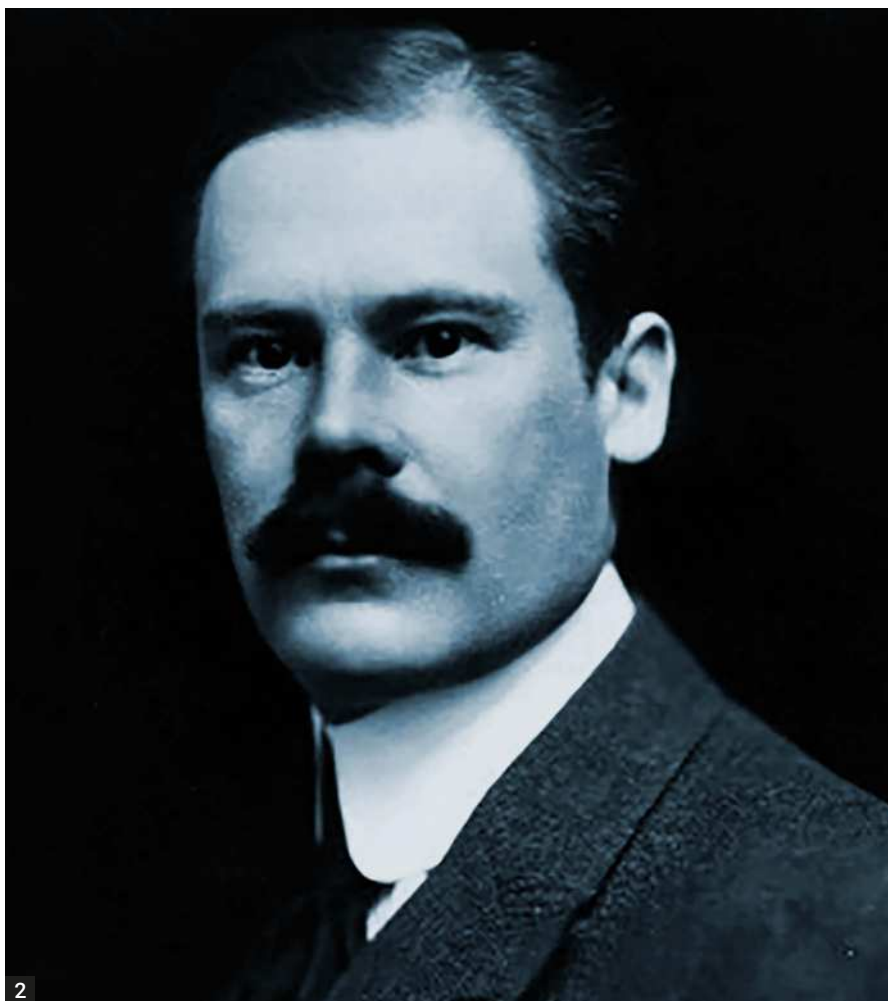
to a young pioneer by the name of Ernst Fredrik Werner Alexanderson, who turned out to be a very prolific inventor.

Alexanderson was born on January 25th, 1878, in Uppsala, Sweden. His father, Professor A.M. Alexanderson, was a lecturer at the University of Uppsala, who specialised in European languages. His mother was Amelie Charlotta Margareta von Heidenstam, a member of the Swedish nobility ('von').

Alexanderson began his academic career at Lund High School, and he learnt the fundamentals of English, German, French, and Latin. This exposed him to a wide range of scientific literature that captivated his mind. Whilst, studying in Berlin, he received tuition from Adolf Slaby (1849-1913) who is often described as the 'German Marconi'.

He also studied the fundamentals of electrical power with the renowned engineer Gisbert Kapp (1852-1922). Alexanderson's

See our great book and magazine offers at www.radioenthusiast.co.uk/store



life changed forever when he absorbed an English copy of *Alternating Current Phenomena* by Charles P. Steinmetz (1865- 1923; Fig. 3). Alexanderson's enthusiasm for Steinmetz's research was evident from his student notebook entries. Consequently, he decided that his future lay in the United States, where he heard that "things were done in a big way".

Alexanderson and the 'New World' of Radio

Alexanderson's first port of call in the United States was the company of Thomas Alva Edison (1847-1931) at Menlo Park. The young Alexanderson was quite forthright and single-minded in his views, and he concluded that the great days of unrestricted exploration had been replaced by an autocratic system. He subsequently withdrew his employment to work at the Edison Company.

He finally obtained employment as a draftsman for the *C and C Electrical Company* in New Jersey. However, he soon decided that this was a temporary

position while he sorted out his dream job and employment at either *Westinghouse* or *General Electric*. He was not a person who would let people take advantage of his good nature. The drafting job was ultimately boring, and it was viewed by Alexanderson as a stop-gap to maintain his lifestyle and offer some financial security in his new homeland.

After a few months of waiting, Alexanderson was finally offered employment at *General Electric*, where his career would prosper in the dawn of the era of commercialisation. A *General Electric* advertising campaign featuring Alexanderson proudly proclaimed, 'An invention every seven weeks!'.

Working with 'The First Voice of Radio'

In 1904, Alexanderson began working for a distinguished customer of General Electric, R.A. Fessenden (1866- 1932; Fig. 4) who was experimenting with voice transmissions over great distances. A 50kHz version of Alexanderson's



Fig. 1: The wireless station at Grimeton. Fig. 2: Ernst Alexanderson, a multi-faceted engineer Fig. 3: Charles P. Steinmetz. Fig. 4: Reginald Fessenden – The First Voice of Radio. Fig. 5: The SAQ message from Grimeton on 4th July 2021 ('Alexanderson Day') [Courtesy: Peter Newton].

alternator was initially installed in Reginald Fessenden's wireless station at Brant Rock, Massachusetts. By late 1906, its power output had been systematically increased to 500W at 75kHz.

This version enabled Fessenden to broadcast Christmas music to navy ships and East Coast stations as far as Arlington. Alexanderson was never satisfied with the alternator's performance, and he continued to refine its design. The US Government utilised the alternator in their wireless systems, and it broadcasted, from New Brunswick, President Woodrow Wilson's (1856-1924) ultimatum to Germany, informing listeners of the peace terms (Wilson's *Fourteen Points*) that would end the First World War (1914-1918).

While on route to the Peace Conference

in Versailles, President Wilson monopolised the New Brunswick station to maintain constant contact with his administration. A combination of desire, talent, and circumstance would enable Alexanderson to design alternators of 500,000W, which were cable of networking the globe.

General Electric even managed to sell several alternators to universities, which utilised them in research on high-frequency spectra. Alexanderson recognised the system dynamics of his alternator early in the research and development stages and stated that, *"The problem of radio engineering is to establish the relationship between kilowatts and words output"*.

Marconi even managed to secure a visit to the *General Electric* factory in 1915, and he keenly observed a series of tests conducted by Alexanderson and his research assistants. Marconi was subsequently impressed and entered into a contract with *General Electric* to supply alternators with a guaranteed 200kW output for international communications.

Alexanderson's alternator acted as a catalyst for the United States to emerge as a global power in wireless communications, keeping expatriate Swedes in touch with the New World.

Innovations and Awards

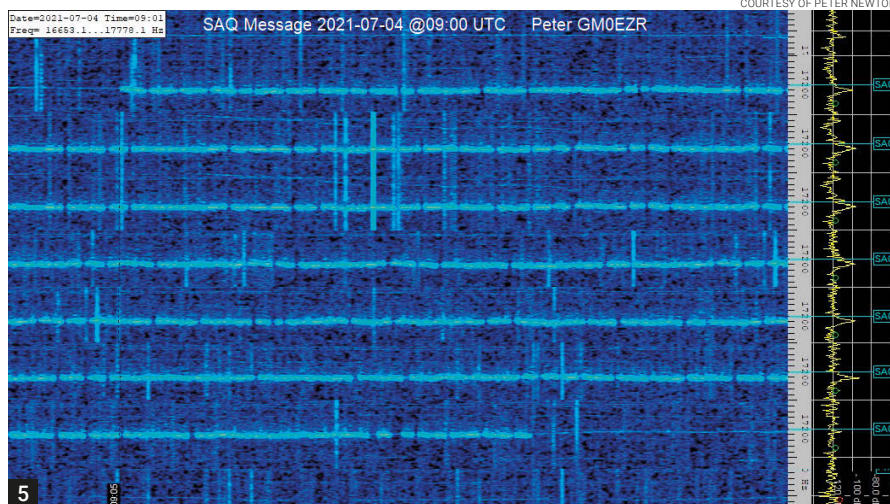
Alexanderson continued to improve the alternator; in addition to this, he made important research contributions in a diverse range of disciplines: radio antennas, electric railroads, ship propulsion, and electric motors.

The alternator was manufactured by *General Electric* and was marketed by the Radio Corporation of America (RCA) around the world. The global network consisted of 18 transmitters in the USA, Hawaii, Wales, Poland, England, and Sweden (Grimeton).

The two transmitters planned for Brazil were never installed.

In 1919, Alexanderson became the second recipient of the Institute of Radio Engineers (IRE) *Medal of Honour*. On June 5th, 1924, he transmitted the first facsimile (fax message) across the Atlantic Ocean, and in 1924, he was awarded a *Knighthood of the Polish Order of Polonia Restituta*.

Other outstanding achievements of this remarkable man included the first public demonstration of a television receiver on January 13th, 1928. His work was further recognised in 1928 when he received the *John Ericsson Medal* for outstanding contributions to the field of



COURTESY OF PETER NEWTON

radio engineering.

To this, he added (in 1938) a degree of Doctor of Philosophy (PhD) from the Royal University of Uppsala. Last but not least, in 1940, he was given the honour of being listed on a 'Wall of Fame' of foreign-born citizens who made a significant contribution to American democracy.

A Crowning Attainment

The crowning glory for him came in 1944 when he received the *Edison Medal* from the American Institute of Electrical Engineers (AIEE). The New York Times of December 19th, 1944, contained the following words:

"Engineer to get medal Dr Ernst F.W. Alexanderson is chosen for Edison award – The Edison Medal for 1944 has been awarded to Dr Ernst F.W. Alexanderson, consulting engineer of the General Electric Company, for outstanding inventions and developments in the radio, transportation, marine and power fields, the American Institute of Electrical Engineers announced yesterday."

"The medal will be presented to the Swedish-born scientist on Jan. 24 during the winter technical meeting of the institute here. The award for achievement in electrical science was established by associates and friends of the late Thomas A. Edison. The winner is chosen annually by a committee of 24 institute members."

From 1952 onwards, Alexanderson worked for the Radio Corporation of America (RCA) as a research consultant. His 321st patent was awarded in 1955, for a colour television receiver that he developed for RCA.

During his career, Alexanderson would average about seven successful patents per year.

The Radio Corporation of America (RCA)

A pivotal decision of the management of *General Electric*, with the full support of the US Navy, led to the establishment of a new American corporation, known universally as 'RCA'. This entailed a slight career change for Alexanderson who was appointed as Chief Engineer. He subsequently supervised the installation of the alternators.

The primary business objective of RCA was to install and operate radio alternator transmitting stations. In this context, in 1922, RCA embarked on an extensive marketing campaign. Alexanderson was at the forefront of this. RAC circulated a publication entitled 'Alexanderson the Great', which depicted him as being 'born with a textbook in his hand – and ever since he has been everlastingly night and day at textbook and mechanical invention' [sic].

In the end, Alexanderson managed to work in a dual capacity for *General Electric* and RCA. However, in 1926, he returned to *General Electric* in a full-time capacity as an inventor/engineer. He much preferred this dual role, as it facilitated a much greater degree of freedom to pursue his research passions.

Grimeton SAQ Radio Station and Alexanderson Day

On December 1st, 1924, the Grimeton radio station (Fig. 1) commenced broadcasting with the call sign 'SAQ' on 16.1 kHz (wavelength 18.6km [!]). The station was formally inaugurated by King Gustaf V (1858-1950) on July 2nd, 1925, in the presence of Alexanderson and other distinguished guests.

In 2004, the Grimeton station was added to the *UNESCO World Heritage* list with the following declaration:

"The Varberg Radio Station at Grimeton in southern Sweden (built-in 1922 – 1924) is an exceptionally well-preserved monument to early wireless trans-Atlantic communication. It consists of transmitter equipment, including the aerial system of six 127-metre-high steel towers. Though no longer in regular use, the equipment has been maintained in operating condition.

"The 109.09 ha site comprises of buildings housing the original Alexanderson transmitter, including the towers with their antennae [sic] and a residential area with staff housing.

"The architect Carl Åkerblad designed the main buildings in the neo-classical style and the structural engineer Henrik Kreüger (1882-1953) was responsible for the antenna towers, the tallest built structures in Sweden at that time. The site is an outstanding example of a major transmitting station based on pre-electronic technology".

Grimeton (Fig. 1) was a part of the RCA global wireless network that is referred to by historians as the 'Internet of the 1920s'.

<https://grimeton.org/?lang=en>

<https://whc.unesco.org/en/list/1134>

Remembering a Pioneer

Today, *Alexanderson Day* is held on either the last Sunday in June or the first Sunday in July – whichever date is closest to July 2nd. On this date, the only known operational Alexanderson alternator transmitter in the world is fired up to transmit short messages in Morse code on 17.2kHz (Fig. 5).

Many hobbyists try to receive these transmissions at Christmas each year and on other special days.

The geography of the Grimeton site is ideally suited to long-distance wireless transmissions, situated, as it is, in a very flat landscape. The Morse code keying speed was set at 50 words per minute (WPM), but the transmitter could in theory modulate up to 150 WPM.

This system was far superior to traditional telegraphy submarine

cables which had a standard capacity of 25 WPM. The remarkable transmitting capability of Grimeton is emphasised by a record output in 1936 that totalled 1.8 million words, which equates to approximately 10 megabytes.

However, the technology operated by Grimeton was considered already obsolete from the very moment of its construction. New vacuum tube electronics and short wave communications were capable of facilitating fixed long-term communications.

That notwithstanding, the operating system at Grimeton did offer greater reliability, due to its independence from ionospheric propagation conditions. But the laying of telephone submarine cables in the mid-1950s further reduced the need for trans-Atlantic telegram messages via traditional wireless transmitters.

In Conclusion

Alexanderson reached the mandatory retirement age of 70 in January 1948, although his standing at *General Electric* led to continued service in a consultancy capacity for several more years. His long-time friend and colleague Albert Hall composed a fitting poem in honour of Alexanderson's impending retirement:

"How can the pension board be thinking your labours should be through?

The place you leave would still be vacant – there are no more like you!

But I suspect that we shall see you continue 'til you drop.

Inventing still, you can't be idle – inventors never stop!"

The last line in Hall's poem proved correct; in 1951, Alexanderson embarked on a new journey of discovery, based on the utilisation of transistors to control electric motors. His last academic paper entitled *Control Application of the Transistor* was published in the proceedings of the Institute of Radio Engineering in November 1952.

He continued experimenting at home in his specially-converted laboratory and still retained his scientific awe of discovery.

Further Reading

- Aitken, H.G.J. (1985) *The Continuous Wave: Technology and American Radio 1900-1932*. Princeton University Press.
- Alexander [sic] Association (Sweden): <https://alexander.n.se/en/>
- Brittain, J.E. (1992) *Alexanderson: Pioneer in American Electrical Engineering*. John Hopkins University Press.
- Caldwell, S. (2020): 'Reginald Aubrey Fessenden: The First Voice of Radio'; *RadioUser May 2020: 50-53*.
- Early Radio History: <https://earlyradiohistory.us/1922RCA.htm>
- Edison Tech Centre: <https://edisontechcenter.org/alexanderson.html>
- Johansson, J. (2013) *The Early Days of Radio in Sweden [...] UNESCO Eu Cap: 3148 – 3152*.
- Newton, P. (2019) 'VLF Monitoring and SAQ Grimeton'; *RadioUser, December 2019: 32*
- Scanning Our Past Electrical Engineering Hall of Fame: <https://tinyurl.com/kbs8tz7y>
- Wiessala, G. 'A Rare Catch: Grimeton SAQ'; *RU June 2018: 33* | 'Alexanderson Day 2019: SAQ Grimeton'; *RU August 2019: 24*

Alexanderson died on May 14th, 1975, at the age of 97. Ernst Alexanderson was buried at the Vale Cemetery, New York.

He always stressed that it was important for engineers to use foresight in their experiments, not merely developing those inventions that appear to be able to generate immediate returns on investments.

He always instructed younger engineers to become wide-ranging in their interests and focus, since it was this method that would facilitate solutions to engineering problems, rather than over-specialisation, which could curtail the imagination.

In our time, the Swedish government is committed to preserving the wireless station at Grimeton for future generations to enjoy as a living monument of the inventions devised by the great F.W. Alexanderson.

Device	Patent Number	Issue Date	Assignee	Patent Description
High-frequency alternator	US 1,008,577	1911	General Electric Company New York City	Radio Frequency Generator: The Alexanderson mechanical alternator was a high-frequency generator (up to 100kHz) for LW transmissions.
Selective tuning system	US 1, 173, 079	1916	General Electric Company New York City	Tuning and frequency selection by a push-pull vacuum tube configuration (A Class A Amplifier).
Means for controlling alternating currents	US 1, 328, 797	1920	General Electric Company New York City	A magnetic amplifier was utilised as a voice modulator for a 2KW Alexanderson alternator.
Television receiver	US 1,889, 587	1932	General Electric Company New York City	Scanning disk and high-frequency neon lamps to improve television transmission

Table 1: Ernst Alexanderson: His key patents and inventions [https://juliantrubin.com/patents/inventors/ernst_alexanderson_patents.html].

Follow us on Facebook @radioenthusiasts and Twitter @REnthusiasts

Tim Kirby

tim@livingland.wales

Typically, when I think of radio astronomy, I imagine work being done in the Gigahertz (GHz) regions, using dishes such as Jodrell Bank in Cheshire and Dwingeloo in the Netherlands. In the UK, there is also a 25m dish at Chilbolton in Hampshire.

Chilbolton will come up again later in this article, as you will see.

However, there is a branch of radio astronomy looking at lower frequencies, between 10 and 240MHz which has received far less attention. I must admit I was intrigued at the prospect of HF based radio astronomy and the difficulties that might be presented by terrestrial signals arriving via the ionosphere.

What frequency allocations are made for radio astronomy, I wondered?

A quick Google search found a useful document from OFCOM on this very topic. If you have an interest in radio astronomy generally, you'll find the document fascinating.

<https://tinyurl.com/ytkhyre6>

The bands in question, concerning LOFAR between 10 and 240MHz and the usage detailed in the OFCOM document are shown in Table 1. 'CLFST' stands for the *Cambridge Low Frequency Synthesis Telescope*.

This consists of 60 tracking Yagi aerials on a 4.6km baseline. It sounds rather interesting and perhaps we will come back to this another time (Fig. 1).

A Distributed System

The exciting and interesting thing about LOFAR (Low Frequency Array) is that it is a distributed system rather than being a single site or observatory. It is a radio interferometer constructed in the north of the Netherlands and across Europe (Fig. 2).

The core site and heart of the system are located near the village of Exloo in the northeast of the Netherlands.

There are a number of other stations located in the Netherlands with other stations being located in Germany, France, Sweden, Poland, Ireland, Latvia, and the UK. A station in Italy, near Bologna, has been funded and will shortly be built.

We will come to how the individual stations work in a moment, but the interesting thing is that the array can be 'steered' electronically without any physical movement, it is all done by changing the configuration of the array electronically – computer-con-



Looking at LOFAR: A Low Frequency Radio Astronomy System

This month **Tim Kirby** explores the history and functions of the Low Frequency Array (LOFAR). This distributed instrument is developing into an indispensable tool for low-frequency radio astronomy

trolled, of course. The practical thing about that, apart from avoiding physical wear and tear, is that it can all be done very quickly, efficiently and precisely.

The data from each of the LOFAR 'outsta-

tions' is piped back to the central computing location for the project, which is located in Groningen in the Netherlands. Here, a *Blue-Gene/P* supercomputer processes the data, allowing radio images of the sky to

be produced. The supercomputer provides about 28 Teraflop/s of processing power (a teraflop is a unit of computing speed equal to one million million floating-point operations per second).

If you are wondering how that equates to a computer you might have at home, an article on *Hackaday* in 2012 suggested that around 700,000 Raspberry Pi computers harnessed together might achieve the same sort of computing power. However, please note that later Raspberry Pis are considerably more powerful nowadays, so that number will have dropped somewhat, but it will still be in the hundreds of thousands.

<https://tinyurl.com/3wjveh37>

After processing in the *Blue Gene/P*, the data is written into a storage cluster for additional post-processing. In the case of imaging, this might include flagging of the data, for the presence of radio frequency interference, as well as averaging, calibration, and the creation of the final images.

Very high network bandwidth is required to do this in all parts of the system. Each LOFAR station can generate in the region of seven Petabytes (one thousand million million bytes) of data each year which needs to be shifted, in real-time, to Groningen for analysis.

A Closer Look at a LOFAR station

What about the LOFAR stations themselves? They are classified as *Core* (Exloo), *Remote* (in the Netherlands) or *International*. Each of these types has a different antenna field configuration.

When the system was originally envisaged, it was intended that all stations would be identically configured but owing to a need to reduce costs this was subsequently changed. Each of the stations has a Low Band Array (LBA) which operates between 30 and 80 MHz and a High Band Array (HBA) which operates from 120 to 240MHz.

In the Netherlands, each station has 96 LBA aerials, 48 HBA aerials and 48 digital receiver units (RCUs). However, international LOFAR stations have 96 LBA aerials, 96 HBA aerials and 96 RCUs.

This means that all of the LBA or HBA aerials can be used in any particular observation. Neither type of station currently can use LBA and HBA arrays at the same time.

The LBA antennas are grouped into an *inner circle* and an *outer ring* (Fig. 3). Each antenna is a dipole, equipped with a ground plane. In the centre of each dipole, there is a moulded cap that contains a low noise amplifier. The antennas are configured to be most efficient around 58MHz. Lower in



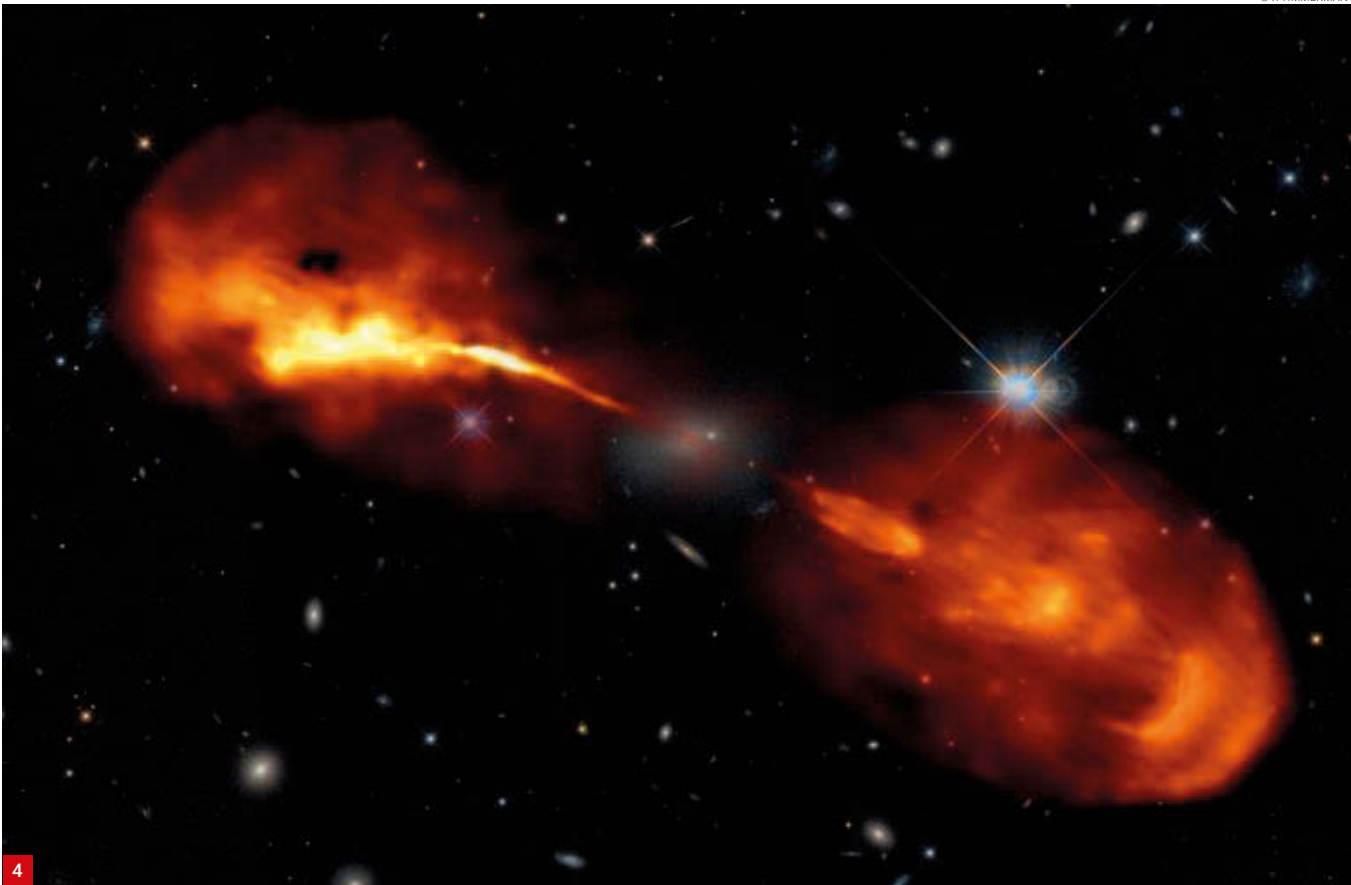
the spectrum below 30MHz, there is strong terrestrial interference and of course, above 80MHz owing to the FM broadcast band.

Because the dipoles are omnidirectional, each station can carry out simultaneous monitoring of the entire visible sky, which is sometimes used for studies or the large scale Galactic emissions from the Milky Way as well as 'all-sky' monitoring for radio transients (Fig. 4).

The High Band antennas are known as a 'tile'; each tile consists of a square, 4 x 4 element dual polarised phased array with built-in low noise amplifiers. There is also a 'beam former'. This allows electronic 'steering' of the array, controlled centrally. Each of the 16 element tiles measures 5 x 5 metres, and there is a spacing of 15cm between tiles. The tiles are made of an expanded polystyrene structure supporting

the aluminium antenna elements.

Coax cables connect each of the antennas to the RCUs and associated processing hardware. Within this hardware are some of the digital electronics which is used for 'beam-forming', in other words, steering the array in a particular direction. The 'steering' of the 'beam' is achieved by adding electronic 'delays' to some of the antennas making up the array.



The computer works out which of the antennas should have the delays added in order to ‘skew’ the array in a particular direction and then combines all the signals. Digital processing functionality also includes the control and management of the wide-area network to Groningen.

Data Processing and Evaluation

Central processing for LOFAR is located at the University of Groningen’s Centre for Information Technology (CIT). Unless a LOFAR station is operating in standalone mode, all data generated from all LOFAR stations are transmitted to CIT as a data stream. Once arrived, there is some initial processing which takes place in real-time before the data is written to disk.

Once written to disk, it is then available for less time-critical processing; this includes the analysis and processing of the raw data into products to be used by the astronomers and the public.

The data written to disk forms the LOFAR long-term archive. It is worth bearing in mind that data can be streaming in at over 80Gb every second. After analysis and managing, the volume of the data that needs to be kept for the long term can be reduced significantly. Even so, the archive can be

Frequency Band	Typical application
13360 – 13410 kHz	Radio astronomy (used at sunspot minimum)
25550 – 25670 kHz	Radio astronomy (used at sunspot minimum)
37.75 – 38.25 MHz	Radio astronomy – All-Sky Survey at CLFST
80.5 – 82.5 MHz	Radio astronomy – Scintillation studies and mapping radio sources
150.05 – 152 MHz	Radio astronomy – MERLIN mapping of radio sources and by CLFST for All-Sky Survey
232 – 236MHz	Radio astronomy – Pulsars at Jodrell Bank

Table 1: LOFAR between 10 and 240MHz.

growing at up to 5 Petabytes per year. The Long Term Archive involves data centres in both the Netherlands and Germany and provides data retrieval and data mining facilities for astronomers, as well as the ability to process information.

With a distributed system such as LOFAR, something that is critical is to ensure time synchronisation between all the separate sites. Initially, a system clock was provided to each site but it was quickly discovered that each of these site clocks drifted in a slightly different way to its neighbours, making time synchronisation problematic. However, using a GPS system and distributing the time data (made simpler by the very high-quality data network) has resulted in much better time synchronisation than the

previous system for the stations located in the Netherlands. Looking to the future it is hoped to distribute time data to the International stations in this same way.

Everyday operations are controlled by the Netherlands Institute of Radio Astronomy (ASTRON) from their headquarters in Dwingeloo. This includes scheduling and configuration as well as monitoring the system and ensuring that it is working as it should. Each International LOFAR station though retains overall responsibility for running their station, although advice and support are available from ASTRON if required.

LOFAR became operational in June 2010 and now, over 10 years later, scientists and astronomers are looking to the future and imagining what LOFAR 2.0 may provide.



© DR G B GRATTON/STFC

What Has LOFAR Ever Done For Us?

Looking back over 10 years of operation, ASTRON has made available a fascinating document which details some of the achievements from LOFAR including a study of 'Why lightning really DOES strike the same place twice!'

Moreover, there has been a study of the slowest-spinning pulsar so far detected. Of course, the ability to have a complete image of the (radio) visible sky every second allows us to study the important transients of the universe including the birth of black holes, cosmic rays and so on.

LOFAR is engaged in an all-sky survey at 150MHz and has been used to study the Earth's ionosphere – something very important to every radio enthusiast.

If you love this stuff as much as I do, have a look at this document – it is fascinating:

<https://tinyurl.com/azxf5sa3>

LOFAR 2.0 – planning ahead

Looking forward to LOFAR 2.0, it is hoped to continue the study of pulsars and, in particular, the extreme examples. The slowest pulsar yet discovered rotates every 23.5 seconds and the fastest 707 times a second. Another plan will allow both LBA and HBA antennas to be used at the same time (at present, it is one or the other). Operators hope that this will make the system over 100 times more sensitive than at present and offer the data captured at over 5 times the current resolution.

Of course, there will be improvements and upgrades to the processors at the heart of the system; as well as the predictable processing speed improvements, it is a stated aim of the project to make the system more energy efficient.

Intriguingly, one of the major interference sources to LOFAR is wind turbines. In the Netherlands, an agreement has been signed between the scientists and the turbine operators to allow the astronomers to be able to have the turbines switched off when the system needs to be at its most

Resources

- ASTRON:
<https://www.astron.nl/telescopes/lofar>
- Chilbolton Observatory:
<https://tinyurl.com/ufcas2ny>
- Heald, G.; McKean, J.; Pizzo, R. (Eds., 2018) *Low Frequency Radio Astronomy and the LOFAR Observatory* (Springer)
- I-LOFAR (Ireland):
<https://lofar.ie>
- International LOFAR Stations (I-LOFAR):
<https://lofar.ie/international-lofar-stations>
- Knowles, M. (2019) Jocelyn Bell Burnell (*RadioUser*, July 2019: 47-49)
- LOFAR-UK:
<https://tinyurl.com/32x5ubsm>
- Max Planck Institute:
<https://www.mpifr-bonn.mpg.de/en/lofar>
- Square Kilometre Array (SKAO):
<https://www.skatelescope.org>
- Verschuur, G. (2006) *The Invisible Universe* [...] (Springer) [highly recommended - Ed.].

sensitive. However, in return, the LOFAR system will be designed to be made more robust against interference and there are already plans using a system called 'spatial filtering', which allows unwanted signals to be subtracted from the 'whole'.

Furthermore, LOFARs use as a *solar telescope* is set to increase to monitor solar activity more closely and provide better data of 'space weather' events, which might affect GPS, satellite comms and power distribution networks.

The UK involvement - Chilbolton

Earlier on, I mentioned Chilbolton in the UK. The Rawlings Array at Chilbolton is the site for the UK's LOFAR site (Fig. 5). It was officially opened on 20th September 2010 by Dame Jocelyn Bell Burnell (Dame Burnell being the first person to discover radio pulsars as part of her postgraduate research; see reading box).

The station is known as *LOFAR-UK* and is the first radio telescope to be built in the UK for many years. LOFAR-UK is a consortium of astronomers representing 22 British Universities with over 70 leading UK astronomers directly involved in the project.

You might like to see a video giving a tour of the station at this URL:

<https://youtu.be/rTlDd13kyoA>

If you would like a much more in-depth and technically focussed view of the system, you can find it here:

<https://tinyurl.com/25vsr49b>

Radio News

SATELLITE LIGHT POLLUTION: A GLOWING PROBLEM:

Go outside and enjoy the night sky because it might be about to change. That's according to Dr Samantha Lawler with the Physics Department at the University of Regina (Saskatchewan, Canada). She explains that thousands of communications satellites are being launched over the next few years and one company alone, *Starlink*, is planning to launch 42,000 satellites in the next 20 years. *SpaceX's Starlink* is adding 60 new satellites every few weeks.

Dr Lawler explains that all of these satellites reflect the sun, which then muddies the view for astronomy research. Her prediction for the light pollution is that the worst of it will be at 50 degrees latitude North and South, which aligns with Regina, Calgary, Vancouver and Winnipeg, among others. Lawler says right now there are no rules about how bright a satellite can be or what orbits it can use.

She is urging for international regulations and for satellite companies to take it upon themselves to make their satellites less reflective. Lawler calculates that in the future, one in ten points in the sky will be a satellite, not a natural object, but she believes there is still time to fight this. She also wonders what kind of effect this light pollution could have on migrating animals, although she stresses she is not a biologist and does not know the answer to that.

(SOURCE: ICQ Amateur / Ham Radio Podcast)

<https://tinyurl.com/rtsx95zb>

<https://tinyurl.com/4bck58y6>

RADIO JOINT AUDIENCE RESEARCH: RAJAR

(the *Radio Joint Audience Research* body) will release its first listening figures for UK radio stations since Q1/2020 to member stations on Wednesday 27th October 2021. The figures will cover 28th June 2021 – 19th September 2021 (weeks 26-37), known as Q3/2021. The body has been privately working out how and when the figures could return since first announcing the data was being put on hold in July 2020.

Whilst no announcement has been made regarding the return of the service, the date for the release of the first figures in 18 months has recently appeared on its website. Q4/2021 data is also scheduled for release to stations on Wednesday 2nd February 2022. RAJAR told *RadioToday*, following a request for more information and a release date, that it is, "still currently evaluating various streams of data."

(SOURCES: RAJAR | *RadioToday*).

<https://tinyurl.com/4hr566d9>

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

Robert Connolly

gi7ivx@btinternet.com

This month I am continuing to look at the role of ships at sea providing weather information. Today we are used to seeing weather satellite images on our television screens. However, how was weather data, particularly weather data in the Atlantic and Pacific Oceans, obtained before 1 April 1960, the date when the first weather satellite was successfully launched?

The short answer was the deployment of weather observation ships.

In the 1860s, Britain began connecting coastal lightships with submarine telegraph cables so they could be used as weather stations. There were attempts to place weather ships using submarine cables far out into the Atlantic. The first of these was *The Old Corvette* in 1870, 50 miles off Land's End.

The impressive sum of £15,000 was spent on the project, but it ultimately failed. While there was a further proposal, in 1881, for a weather ship in the mid-Atlantic, it was not developed, and this had to wait until radiotelegraphy came about.

In early 1939, France established a merchant ship as the first stationary weather ship. It took surface observations and launched radiosondes to measure weather conditions aloft.

The Atlantic Weather Observation Service was authorized by President Franklin Delano Roosevelt in late January 1940. Germany began to use weather ships in the summer of 1940. Unfortunately, three of their four ships had been sunk by November 23, resulting in the use of fishing vessels for the German weather ship fleet.

Their weather ships were out to sea for three to five weeks at a time, and German weather observations were encrypted using *Enigma* machines. By February 1941, five 100-metre long United States Coast Guard cutters were used in weather patrols. They were usually deployed for three weeks at a time, then sent back to port for ten days. As World War II continued, the cutters were needed for the war effort, and, by August 1942, six cargo vessels had replaced them. The ships were fitted with two deck guns, anti-aircraft guns, and depth charges, but lacked SONAR (Asdic), Radar, and HF/DF.

A Wide Geographical Range

Ocean weather ships were primarily located in the North Atlantic and North

Weather Ships, Flying Boats, Enigma and Dial-a-Buoy

Robert Connolly sheds some much-needed light on the forgotten development of weather observation ships, reports on his aerals and a maritime incident near the Isle of Man and proffers some Christmas gift ideas.



Pacific oceans, reporting via radio. In addition, the ships aided in search-and-rescue operations, supported transatlantic flights, (in those early days of trans-Atlantic flights it was mainly flying boats that provided the service and flew at much lower levels than today's aircraft, making them more susceptible to weather conditions);

acted as research platforms for oceanographers, monitored marine pollution, and aided weather forecasting.

Table 1 details the station of each ocean weather ship and the country responsible for it. Incidentally while researching these stations I became aware that supplies were dropped to them from an aircraft.

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

Fig. 1: MV Polarfront, a Norwegian Meteorological Service Vessel. Fig. 2: The Foynes Transmitter. Fig. 3: Richard Phillips's Certificate from 1980. Fig. 4: My Watson W-8682-MKII outdoor wireless station (outdoor unit). Fig. 5: My Watson W-8682-MKII outdoor wireless station (indoor console). Fig. 6: The author's Non-Directional Beacons Of Europe (Arctic To North Africa), 2019/20 Edition.

The last ocean weather ship in service was the Norwegian vessel *MV Polarfront* (Weather Station *Mike*, Fig. 1). It was taken out of service on 1 January 2010. Since June 2017, the ship has been owned and operated by a French shipping company for expedition purposes in high latitudes.

Buoys and Flying Boats

Before fixed-wing aircraft began flying trans-Atlantic, flying boats crossing the Atlantic to Europe – normally only in the summer months due to weather conditions – would also have transmitted weather reports along with their position reports to Foynes, located in the Shannon estuary, where they would land on the water.

Foynes would also transmit local weather conditions to the aircraft.

Fig. 2 shows a transmitter in the Foynes Flying Boat Museum. During the Second World War (1939-1945), flying boats also transmitted the position of any German U-boats they spotted in the Atlantic.

These resources made a significant contribution to much better weather forecasting, not just for ships but also for those living ashore. The final days of ocean weather ships were changed due to the use of new weather satellites and automatic weather buoys being deployed in the oceans.

These provide information on atmospheric pressure, wind direction and speed, temperature, dew point, humidity, wave period, wave height, and sea temperature. Two types of buoys are used, fixed buoys that are anchored to the seabed and drifting buoys that are deployed in the ocean currents.

Raw data is processed and logged on board the buoy and then transmitted via radio, cellular phone, or satellite communications to meteorological centres for use in weather forecasting and climate study.

Buoy reports may be accessed via a country's weather authority, for example, the UK Met Office or *Met Éireann* in Ireland.

<https://www.metoffice.gov.uk>

<https://www.met.ie>

The US National Data Buoy Center carries



2

ROBERT CONNOLLY



3

RICHARD PHILLIPS



4

ROBERT CONNOLLY



5

ROBERT CONNOLLY

data for many fixed weather buoys (1319 deployed stations) around the world with around one thousand buoys having transmitted data in the last eight hours.

This data may be accessed by visiting their website:

www.ndbc.noaa.gov

The current data from some buoys is also accessible by telephone using the *Dial-A-Buoy* facility. This facility is used by many mariners for updated weather information in their area if at sea. Leisure craft owners may access buoy weather data for a sea area in order to consider setting sail in that area.

Fixed weather buoys have a secondary role in that they may also be used for navigation purposes.

The National Data Buoy Centre also carries weather reports from ships operating under the VOS scheme, which I mentioned in a recent column (*RadioUser*, September 2021: 48-52).

Further to this, reader Richard Phillips kindly advised me that, before GMDSS came along, and while radio officers were still employed onboard ships, most weather observation messages were actually passed by morse on either MF or HF, depending on where the ship was using the OBS prefix.

Richard went on to say "If you were diligent (or lucky) you'd get a gift from the Met Office thanking you. Ship's Master used to get a splendid drum barograph, whereas we poor radio officers used to get a dictionary"

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

Station	Position	Operating Country	Timeline
Able/Alfa	62 00N 33 00W	USA	1954 to 1974
Baker/Bravo	56 30N 51 00W	CANADA / USA	1928 to 1974
Charlie	52 48N 35 30W	USA	1910 to 1990
Dog/Delta	44 00N 41 00W	USA	1962 to 1984
Easy/Echo	35 00N 48 00W	USA	1910 to 1979
Fox/Foxtrot	35 00N 40 00W	USA	N/K
George/Golf	46 00N 29 00W	USA	N/K
Hotel	38 00N 71 00W	USA	1927 to 1982
India	59 00N 19 00W	UK	1955 to 1975
Juliett	52 30N 20 00W	UK	1950 to 1975
Kilo	45 00N 16 00W	Holland/Belgium	1949 to 1973
Lima	57 00N 20 00W	France	1975 to 1989
Mike	66 00N 02 00E	Norway/Sweden/UK	1948 to 1998

Table 1 details the station of each ocean weather ship

Richard kindly sent a picture of the *Cassell's Dictionary* he received, along with a certificate (Fig. 3) that he received from the Met Office back in 1980.

Mast & Aerial Survival and Weather Stations

Before I finish on the topic of weather, many of us hobbyists consider weather important, not just from the point of view of propagation but also regarding the survival of our aerals. My HF aerial is at the top of a 21-foot mast mounted on one of the heavy-gauge galvanised steel clothesline poles. As it is located in the middle of my garden, I took the precaution of adding stay lines to four secure fixings.

This minimises the movement of the mast during high winds.

My VHF/UHF antenna is around 18 feet above the ground-mounted on the house wall with two double offset brackets and a custom-made heavy-duty galvanised steel swan-neck mast bottom section.

Several years ago, I had an outdoor weather station until it suffered damage one night during a storm. Recently I replaced it with a Watson W-8682-MKII outdoor wireless station (Figs. 4 & 5).

The main features of this practical device include atomic locked date and time from the German DCF77 long wave atomic standard signal, easily received here in Northern Ireland. Data provided also include indoor/outdoor temperature, humidity, wind speed and direction.

It was extremely easy to set up as it came with everything needed, including a stub mast, batteries and mounting clamps.

Probably the most difficult thing during setting it up was ensuring that the outdoor unit was aligned to the North to ensure wind direction accuracy. This model does not display atmospheric pressure.

However, the receiver-unit from my old Maplin weather station is still working to display the values for indoor temperature, humidity and atmospheric pressure. In addition to this, I have my old ship-style brass barometer. I cross-check the pressure reading on it against the old Maplin electronic unit and adjust the calibration if required from time to time.

Maritime Christmas Gifts

With Christmas rapidly approaching an outdoor wireless weather station would make a useful stocking filler.

Another idea for a Christmas stocking filler is an interesting book written by my fellow *RadioUser* author, Scott Caldwell, entitled *Radio: Wireless Voice of the Sea*.

This is an interesting history of wireless development, with Scott using many infamous incidents and their timelines to demonstrate how wireless communications progressed.

It is available as an e-book on Amazon:

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

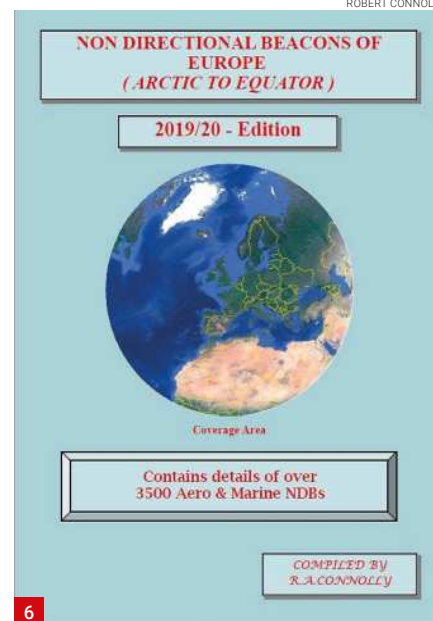
[See our review of Scott's book, elsewhere in this issue – Ed.]

Moreover, for those of you interested in DXing non-directional radio navigation beacons, you might wish to consider another potential gift. This is my own publication, *Non-Directional Beacons Of Europe (Arctic To North Africa)* (2019/20 ed.; Fig. 6).

The book contains details of frequencies, callsigns, locations and coordinates of over 3,500 aero and marine NDBs. You may find that this is an ideal quick reference source for decoding beacon callsigns quickly.

Coverage area is from Greenland and East Coast Canada to Arctic Russia, to 70 degrees East, to 10 degrees North in North Africa, including the Azores.

It contains a general information section, FAQ, Morse Code table, NDB operation and



NDB aerial examples. Aero NDBs in alphabetical order, Marine NDBs in alphabetical order, reverse frequency listings, country, and off-shore NDB listings, on 243 A4 pages.

www.kilkeel.org.uk/publicat.htm

Please note that have not produced an update to this edition, due to other commitments. However, anyone who orders this edition between 1 December 2021 and 31 January 2022 will automatically receive a 50% price reduction on the next edition when it becomes available by Easter 2022.

Isle of Man Incident

In late August, *Ceg Orbit*, a 64-metre cargo vessel, on passage between Liverpool and Belfast, ran aground on the northeast of the Isle of Man, near Cranstal, at high tide.

An attempt was made by a tug from Laxey Towing Company, but this failed to pull the vessel free; a second attempt was planned for the following tide with the assistance of a tug from Liverpool.

While the crew were in no imminent danger, the crew were advised by Manx authorities that they could not leave the ship, due to the Island's Coronavirus (COVID-19) entry restrictions in force at that time.

The Isle of Man has some strict constraints on entry to the Island, in order to reduce infection rates among its population.

Eventually, a second salvage attempt succeeded in freeing the ship, allowing it to move to Douglas Port to be inspected for possible damage before it resumed its passage to Belfast.

That is all for this month; until next time, take care and *Fair Winds*.

Scotland



A complete range of Multi purpose Masts

The best of Scottish engineering!

Tel: 01505 503824

www.tennamast.com
sales@tennamast.com

Somerset

LINDARS RADIOS

'A Modern Company With Old Fashioned Values'

USED AMATEUR
RADIO EQUIPMENT
PURCHASED AND SOLD
www.AmateurRadioSales.co.uk
01935 474265

South Yorkshire

LAM Communications Ltd.
5 Doncaster Road
Barnsley
South Yorkshire
S70 1TH
01226 361700
sales@hamradio-shop.co.uk
www.hamradio-shop.co.uk

/lamcomms

Suffolk

www.itender.co

Monthly communications tenders!

Ex Police Service

General comms company stock

Contact: 07788 498962

**WOULD YOU LIKE
TO ADVERTISE IN**

**RADIO
USER**

Then contact
Kristina Green on

**01778
392096**

or you can email her on
kristina.green@warnersgroup.co.uk

DealerGuide

For Sale

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

Wanted

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

TradingPost

FOR SALE

SK SALE. Yaesu FT-101ZD/III and FV101DM/VFO £200. Yaesu FRG7700 and FRT7700 tuner £150. Sommerkamp FT7B inc original PSU and auxiliary display £150. All power up, not fully tested. Offers? Collection Only.

Andy, M0GYK, 07479393212, m0gyk@protonmail.com **MILTON KEYNES**

Trading Post adverts cost £5 per advert (Subscribers free)

Adverts will also be published in Practical Wireless unless requested otherwise.

BY EMAIL Firstly email your advert's wording to kristina.green@warnersgroup.co.uk and then call **01778 392096** to make your payment. **BY POST** Your order form can be downloaded from bit.ly/tradingpostform
Send your advert to: **Trading Post, Radio User, Warners Group Publications plc, West Street, Bourne, Lincs. PE10 9PH** Please write your advert clearly in BLOCK CAPITALS up to a maximum of 30 words, plus 12 words for your contact details on the form provided and send it together with your payment of £5 (subscribers can place their advert free of charge as long as they provide their subs number or mailing label). Cheques should be made payable to **Warners Group Publications plc**, credit card payments also accepted.

Please help us to help you by preparing your advert carefully. Any advert which contains ?? marks indicates that the advertising dept. could not read/interpret the wording.

Advertisements from traders or for equipment that it is illegal to possess, use or which cannot be licensed in the UK, will not be accepted. No responsibility will be taken for errors and no correspondence will be entered into on any decision taken by the Editor on any of these conditions.

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

A profile of USAF aircraft operating in Europe from 1909 to the present



Aircraft of the USAF in Europe

This 132-page special collectors' magazine records and shows aircraft from the Great War, World War Two, the Cold War and more recent conflicts in the Gulf and Afghanistan as well as training aircraft, cargo flights and even the racing aircraft that competed for the interwar Pulitzer Trophy. It is intended to appeal to both enthusiasts and those with a passing interest in aeroplanes.

Just **£9.99**



Available to order from all good newsagents, order online at militaria.ma/aircraftofusaf or by calling 01778 392489

Copyright © Warners Group Publications plc. Copyright in all drawings, logos, photographs and articles published in RadioUser is fully protected and reproduction in whole or part is expressly forbidden. All reasonable precautions are taken by Radio User to ensure that the advice and data given to our readers are reliable. We cannot however guarantee it and we cannot accept legal responsibility for it. Prices are those current as we go to press. Published on the second Thursday of each month by Warners Group Publications plc. Printed in England by Warners Midlands plc. Tel: 01778 395100. Distributed by Warners Distribution, West Street, Bourne, Lincs, PE10 9PH. Tel: 01778 391000. Web: www.warnersgroup.co.uk. RadioUser is sold subject to the following conditions, namely that it shall not, without written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover, and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.



SDR RADIO

SDRPLAY RSPdx

New Mid-range SDRplay Radio.



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

**ML&S: £194.95
FREE SHIPPING!**

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.

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
FREE SHIPPING!**

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.

KerberosSDR

A Coherent RTL-SDR with 4x Channels.



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

ML&S: £249.95

SDRPLAY RSP1a

Brand new design.



The RSP1a is a major upgrade to the popular RSP1.

**ML&S: £99.95
FREE SHIPPING!**

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

FUNcube Dongle Pro+

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



ML&S: £149.95

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

ANTENNAS

AOR SA7000

Super wide band base aerial system.

The SA7000 is an ultra-wide range external receiving aerial with a useable frequency coverage of 30 kHz to 2 GHz - short wave / VHF / UHF. The aerial is designed for areas where space is a problem or when an "unobtrusive" installation is essential.

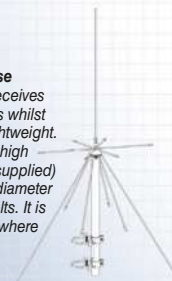


ML&S: £209.95

AOR DA1500

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

ML&S ONLY: £149.95



AOR LA400

10kHz-500MHz, Receive only Magnetic Loop

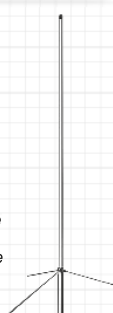
Since the invention of this revolutionary concept by KOLSTER in 1915, loop antennas, especially of the active type, have also been widely used by the military in the 70s, before becoming very popular among hobby listeners.



ML&S: £419.95

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: £66.95**

Diamond D-190

Super Discone Antenna covering 100 to 1500MHz for receiving and 144/430/904/1200MHz for transmitting. Rust-free stainless steel is employed in major component parts making the antenna rust resistant and durable with 10m cable included.



ML&S ONLY: £81.95

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

DIGITAL & ANALOGUE

UNIDEN UBC-355CLT



Quality base and mobile scanner in an elegant cabinet. Designed for home and mobile use, with a large speaker for excellent sound.

ML&S: £99.95

UNIDEN UBC-125CLT

Compact 500 channel handheld scanner.

Covers 25-88MHz, 108-174MHz, 225 - 512MHz and 806 - 960MHz.

ML&S: £139.95

UNIDEN UB3600XLT

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

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

ML&S: £479.95

SF Screen Protectors

For Yaesu, Kenwood and Icom. ONLY £7.95

UNIDEN UBC-370CLT

Base Scanner with watch, alarm clock & FM broadcast radio.

ML&S: £129.95



ICOM IC-R6E

The 100 Ch/Sec Wideband Signal "Search Machine"

100 channel per second scanning speed, 1,300 memory channels, 15 hours of continuous receive capability.



ML&S: £199.95

ICOM IC-R30 SCANNER

Supports all of the usual analogue modes (FM, AM, SSB, CW) as well as a few digital modes including NXDN, P25, DPMR and DSTAR. A worthy upgrade over the older IC-R20.

ML&S: £569.95



AR-DV10

The ULTIMATE all mode digital handheld scanning receiver.

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

ML&S: £969.95



WHISTLER TRX-2 DIGITAL DESKTOP MOBILE RADIO SCANNER

ML&S: £489.95



Multi-system adaptive digital trunking scanner capable of monitoring these unencrypted channels/systems:

Conventional DMR (Entered as a DMR trunked system, NXDN™, Hytera XPT, MotoTRBO™ Capacity Plus, MotoTRBO™ Connect Plus, and MotoTRBO™ Linked Cap Plus systems and NXDN.

- 500 Channels in 10 banks
- FM & broadcast (Store and search up to 30 Preset FM broadcast channels)
- CTCSS/DCS (Search and display any tone)
- Alarm Clock
- USB PC Programmable

RECEIVERS

AR-5700D RECEIVER

Advanced digital communications.



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

ML&S: £4595.95

ELAD FDM-DUOR

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



10kHz-54MHz Direct Conversion SDR Receiver. SDR receiver that offers the possibility to operate stand-alone like traditional radio or attached to a Personal Computer discovering the possibilities offered by the SDR technologies. After the great success of the FDM-DUO transceiver the manufacturer now offers the "R" as a receiver — as to be expected by Elad in a sleek Italian design and equipped with top-notch technology.

- Frequency range: RX 9kHz to 54MHz direct sampling receiver + VHF undersampling reception
- 10 selectable and customisable filter pre-selectors
- Internal switch box for use with an external transceiver
- Stand-alone Modes: CW CW+ CW- LSB USB AM
- ADC Linear LTC2165, 16bit clocked @122.88MHz
- DDC FPGA Spartan 6 XC6SLX25 + Serial Flash for stand-alone mode
- Stand-alone RX demodulator with STM32F4 ARM floating point uController
- LPC1114 Cortex M3 for LCD & Keyboard control
- Clocking source Si5338 driven by 10MHz TCXO or External reference input
- CAT USB interface with FTDI controller
- Fully managed by FDM-SW2 software included

ML&S: £759.95

Elad Companion Speaker SP1 for FDM-Duo. £134.95



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: £1249.95

ICOM IC-R8600

100kHz-3GHz Receiver with SDR Technology from IC-7300.



The IC-R8600 replaces the IC-R8500 wideband receiver and features technology incorporated into Icom's best selling IC-7300. The IC-R8600 receives a wide frequency range from 0.01-3000MHz frequency in analogue and various digital modes (D-STAR, P25, NXDN and dPMR). The IC-R8600 also features a larger 4.3 inch touch screen display which displays a fast moving spectrum scope and waterfall display.

ML&S: £2499.95

Includes an Icom AD-55 PSU worth £49.95!

More from us...

If you've enjoyed RadioUser here are six more magazines from us to try



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.

As for the outbreak of war in September 1939, there followed eight months of what became known as the 'Phoney War'. 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 the BEF, a large Air Component was supplemented by an Advanced Air Brigade. In total, there are forces amounted to six squadrons, six of which were Hawker Hurricane-equipped, and four of which were Spitfire-equipped. The remainder of the RAF force in France comprised largely light bombers and Army Co-operation squadrons. Eventually, however, the 'sitting' became the 'fighting'.

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 moved inexorably towards the English Channel and while the French and British tried desperately to stem the advance, the situation became ever more desperate.

Predicted Catastrophe
When the fighting had broken out in France, the BEF's Air Component was in almost certain trouble, and it was to continue to be so.

BACKGROUND TO BATTLE

Left: A Hurricane of 501 Squadron, sent to France for an operational sortie at Bethune, France, May 1940. An RAF Hurricane High Dive bomber, sent to France for an operational sortie, against further wave of the German High Dive bomber force by sending German fighters to France to build a battle of attrition.



THE RAF FIGHTER PILOT



Left: A Hurricane of 501 Squadron, sent to France for an operational sortie at Bethune, France, May 1940. An RAF Hurricane High Dive bomber, sent to France for an operational sortie, against further wave of the German High Dive bomber force by sending German fighters to France to build a battle of attrition.

Right: As the anticipated approach of German military might advanced across Europe, the steady stream of Hurricanes sent to France for an operational sortie, against further wave of the German High Dive bomber force by sending German fighters to France to build a battle of attrition.

Right: As the anticipated approach of German military might advanced across Europe, the steady stream of Hurricanes sent to France for an operational sortie, against further wave of the German High Dive bomber force by sending German fighters to France to build a battle of attrition.

THE RAF FIGHTER PILOT



Right: As the anticipated approach of German military might advanced across Europe, the steady stream of Hurricanes sent to France for an operational sortie, against further wave of the German High Dive bomber force by sending German fighters to France to build a battle of attrition.



DOWNLOAD NOW ORDER A PAPER COPY