

WIRELESS

JULY 2026

THE UK'S NUMBER ONE AMATEUR RADIO MAGAZINE



PORTABLE EQUIPMENT

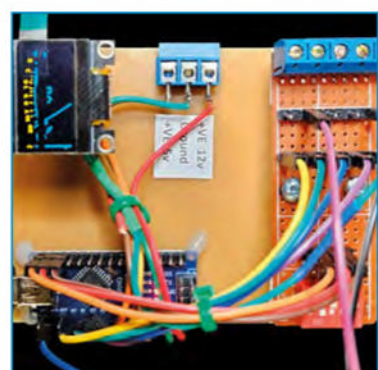
The verdict on QRP Labs' latest QMX+ transceiver



PRACTICAL WIRELESS
REVIEW

ONE TO CONSIDER

We investigate this little-known D9000 from Zastone, and whether it has the ability to punch above its weight



Analogue meets digital

How to use Arduino Nano to build a range of OLED meters



Vintage TV and radio

John Logie Baird, a Marconi transmitter and much more



REVIEW Is this cheap radio too good to be true?

A look at whether bargain radios really are all they crack up to be

FUTURE Using AI on amateur radio projects

A radio enthusiast's guide to using AI assistants such as Chat GPT



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TETRA P25 D-CR DMR
 NXDN dPMR D-STAR YAESU
 ALINCO GSSI* COSPAS-SARSAT* *Optional



NEW

DIGITAL VOICE RECEIVER AR-DV3

AR-DV3
INFO



MAIN FEATURES:

- 100 kHz - 3 GHz
- Analog + digital modes (TETRA, DMR, NXDN, D-STAR, DPMR, APCO 25, YAESU, ALINCO, D-CR) with automatic detection
- Cyber Search - up to 600 steps/sec
- 1 ppm frequency stability
- Solid RF stage
- Dedicated audio DAC and high quality Visaton speaker
- Plug-and-play USB audio class 1 support
- 12 kHz-offset analog IF via USB audio
- On screen audio equalizer
- USB PD (15V, min. 30W) power supply compatible

OPTIONS:

- ATM024T-W120V AC power supply 100-240V, 12V DC output
- RA8600 Telescopic rod antenna
- IFDV3 10.7 MHz IF output module (BW +/-2MHz)
- IQDV3 Digital I/Q output module (BW 300kHz), SDR# compatible
- AKTT-0003 TETRA GSSI user group filtering activation key
- AKCS-0003 COSPAS-SARSAT beacon decoder activation key
- MMDV3 Mobile mounting bracket
- GT-1MK2 Galvanic Isolation Transformer

AR5700D

DIGITAL COMMUNICATIONS RECEIVER



**TETRA DMR NXDN D-STAR DPMR
 APCO 25 YAESU ALINCO D-CR**

MAIN FEATURES:

- 9kHz - 3.7GHz
- Analog + digital modes (TETRA, DMR, NXDN, D-STAR, DPMR, APCO 25, YAESU, ALINCO, D-CR) with automatic detection
- Digital I/Q output (compatible with SDR#)
- 15MHz wide IF output for external IF recorders, signal and spectrum analyzers
- 10MHz reference input
- 0.1ppm frequency stability
- Full control command set for system integrators

OPTIONS:

- GP5001 GPS unit for 0.01ppm frequency stability
- ARL2300 Ethernet controller for remote access
- AS5700 Antenna switch to add inputs 3 and 4
- HRE5001 19inch rack

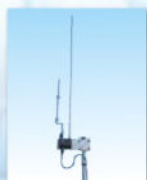
AR5700D
INFO



DA3200
25MHz-3GHz



DA6000
700MHz-6GHz



SA7000
30KHz-2GHz



MA500
25MHz-2GHz



DA1500
70MHz-1.5GHz



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Keylines



Above: Don operating recently as VE7/G3XTT.

Greetings to all of you. These deadlines seem to come around all too quickly! So much so that in the past month I have managed no operating from home, although I am hoping to put that right over the summer. But my daughter and I spent a very pleasant ten days in Vancouver and on Vancouver Island and during that time we stayed with **David VA7DXX (G3OUF)** and his wife **Rosemary (VE7/GONDB)** and I took the opportunity to operate from Canada for the first time. It's always interesting to experience propagation from a new part of the world and VE7 is particularly interesting as it's a long way from the major centres of amateur radio activity. My first session was late evening VE7 time (remember – 8 hours behind BST). At first there was little to work but as the sun started to rise over Eastern Europe I managed (this on 20m CW) to work several Russian, Ukrainian and similar stations. Over the next hour or so the propagation started to favour western Europe although only one G station made it into my log. By then it was late in Western Canada and I decided to head for bed, despite a number of stations still calling me – sorry folks! On the Saturday morning (mid-afternoon in Europe) I tried again but only worked one G station (by prior arrangement, and he had a big antenna and, even so, was only just workable). The rest of my contacts were with the USA. Propagation was definitely well down on my previous operating session!

Anyway, all good fun and it brings to 58 the number of DXCC entities I have operated from (with much of Europe still to go!).

Rallies and Conventions

In this issue **Georg Wiessala** reflects on the current state of Rallies and Conventions in the hobby.

Many previously popular rallies have died a death over the years – not least Woburn and Longleat who many will remember, but smaller ones too. A pity really, as they were a great opportunity to meet fellow enthusiasts. Some that survive are still thriving and it might be useful to consider why, because others are a shadow of their former selves with, as Georg describes, lots of junk and non-radio tat for sale and little to attract the serious punter, particularly if it requires travelling a significant distance.

As for Conventions, they have reduced in number too. We used to have the big RSGB event every year (Alexandra Palace, the National Exhibition Centre (Birmingham) and so on. And the VHF, HF and other specialist events survived for many years in their own right. Nowadays we have the National Hamfest (a rally plus limited Convention?) and the RSGB Convention at Milton Keynes, which now incorporates HF, VHF and Microwaves.

It may be that there were simply too many events in the past, and our monthly Rallies listing suggests that there are still quite a few local rallies, presumably catering to folk who live nearby. And maybe the traders simply can't justify attendance at as many events as they used to which, in turn, reduces their attractiveness. But rallies and Conventions do, in my view, still have a significant role to play in the hobby and I do hope you support at least any that take place in your area.

Don Field G3XTT

Editor, *Practical Wireless Magazine*

Contents



12

6 News

PW's monthly roundup of news from the UK and internationally, including new products, club news and recent events.

12 Zastone D9000 Review

Richard Constantine G3UGF takes a look at a radio you probably aren't familiar with, the Zastone D9000.

15 Observations about propagation in 50MHz(6m)

Andrei Buta YO6XK offers an interesting perspective on 50MHz propagation.

18 HF Highlights

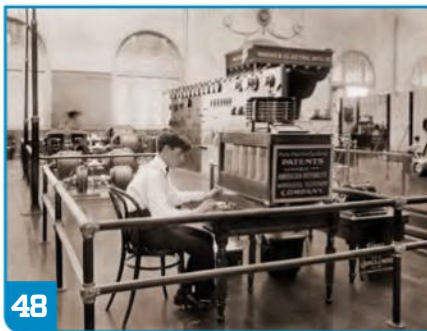
Steve G4JVG has another busy column despite moving into the summer season, where HF propagation can be disappointing.

22 The QRP Labs QMX: The Little Radio That Could (And Does!)

By a roaming SOTA activator, Ben Lloyd GW4BML, who values lightweight gear almost as much as a good cup of summit coffee.

24 The XH D-219

Tony Jones G7ETW reviews a very cheap radio from Amazon. Is it too good for the price to be true?



48

26 QMX+ QRP Transceiver - First Thoughts

Roger Laphorn G3XBM plays with the QMX+ from QRP Labs.

27 WRTC 2026

Don G3XTT looks forward to this year's WRTC, to be hosted in the UK for the first time.

28 Data Modes

Mike G4WNC starts by describing the Ultimate3S Multi-mode QRSS Beacon kit and how to build it before updates on RTL-SDR Blog V4 and VarAC.

34 Take 20

Steve Macdonald G4AQB uses an Arduino Nano to recreate the functions of analogue meters.

37 DXing from an 'impossible' QTH

Steve Telenius-Lowe G4JVG gives some hints as to how to get on the air as a flat dweller.

40 Antennas

Keith G4MIU describes his trials and tribulations during the recent construction of a dual-band Moxon 'Yagi' antenna.

43 The World of VHF

Tim GW4VXE starts with a report of a great achievement on the QO-100 satellite.

46 Vintage Television & Radio

Keith Hamer and Garry Smith continue their in-depth feature detailing the early days of BBC Broadcasting House in London, focusing on equipment used for experimental ultra-shortwave transmissions. An advertisement from the archives features 'Ormond Loudspeakers' from 1932. The series highlighting broadcasting events from exactly 100 years ago looks at July, 1926. The 'In Focus' series continues to look at the history of the BBC Crystal Palace transmitter.

There's more feedback from a PW reader who has written with first-hand experience of working at BBC LF transmitters. Coverage detailing the early years of BBC-2 describes the disastrous opening night. The series featuring the development of Icelandic radio and television looks at the start of RÚV in 1930.

48 Using AI assistants such as ChatGPT for Amateur Radio projects - Pt I

Dr Jonathan Hare G1EXG has the first part of a two-part article looking at using AI to help with radio-related projects.

52 Radio Shows, Rallies and Hamfests: Past, Present and Future

Georg Wiessala casts a critical eye over the past, present and future of radio shows, looking at what purpose they can serve in the modern world of amateur radio and how they might fare in the future.

56 The G6PH Collection

News of a historic collection of radio-related QSLs, letters and more, looking for a new home.

58 Readers' Letters

This month's Letters cover VNA trials, LoRa tracker, 145 Alive and more.

61 Rallies

Locate a rally or event near you; we have our usual comprehensive list.

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Newsdesk

Have you got something to tell our readers about? If so, then email practicalwireless@warnersgroup.co.uk

QUESTION BANK FOR FULL LEVEL

EXAMINATIONS: At its 2024 meeting, the RSGB Examination Standards Committee agreed, with Ofcom approval, to publish the Full level examination question bank after a thorough vetting of the questions by the Examinations and Syllabus Review Group had taken place. ESC Chair **Tony Kent G8PBH** is pleased to announce that the question bank is now available via:

rsgb.org/exam-questions

It will also be accessible via links on the RSGB web pages for exam candidates and trainers. Please note that the copyright to the question bank is held by the RSGB. Developed by **Aubrey M8AUB**, the user interface works on PCs and mobile devices with a web browser. It allows users to access questions in different ways, for example by syllabus section, and even to create and take their own mock examinations. The Society believes this initiative will make a significant contribution to training and should become a valuable resource for both candidates and trainers.

After it has had time to assess its impact at Full level, the ESC will consider rolling it out to the other examination levels of Foundation, Intermediate and Direct to Full. As candidates and trainers will now be able to use the interface to generate their own mock examinations from the question bank, the RSGB has removed all the Full level mock papers currently on its website. If you encounter any issues with the questions or question bank interface web page, please report them via the online examination informal query form.

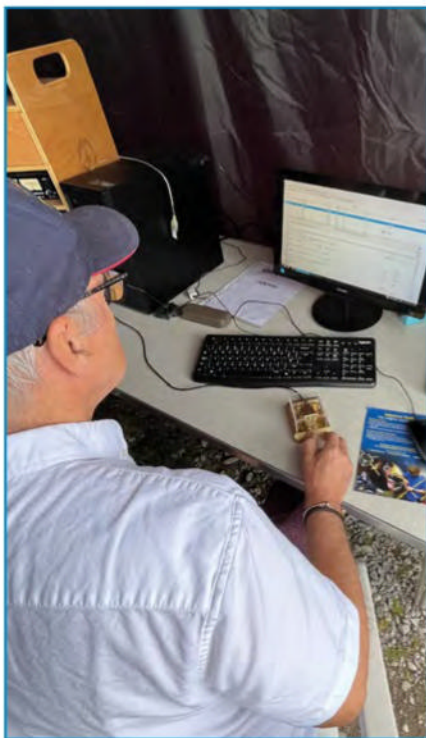
You can find the form at the bottom of the exam forms web page at:

rsgb.org/exam-forms

INTERNATIONAL MEN'S MENTAL HEALTH

MONTH: The Humber Fortress DX Amateur Radio Club is once again proud to support this event. As part of this initiative, we will be helping to raise awareness of men's mental health across the international amateur radio community. We will be operating from our club headquarters at Patrington Haven, East Yorkshire, during the weekend of 26/27 June. We will be using the special callsign GB0MMH across all HF bands. For further information, please visit:

www.qrz.com/db/GB0MMH
www.hfdxarc.com



FCC AUTHORISES COMMERCIAL SATELLITE CONSTELLATION USE IN 70CM BAND:

In the USA the FCC has authorised AST-SpaceMobile to launch its full constellation of 248 large satellites that includes 430-440MHz for emergency telemetry and control when not over the United States. This is despite there being no such frequency allocation. However, the FCC permitted the use of the frequencies using Article 4.4 of the ITU Radio Regulations. This follows an initial filing and review last year, and extensive amateur concerns, that resulted in over 2,500 comments being submitted. The IARU has released a statement on the matter which you can read on the IARU website. The RSGB has more background and earlier responses on its Spectrum Forum web page.

STEAM ON THE LEVELS: Over the weekend of 16/17 May, Taunton & District Amateur Radio Club (G5JJ) put on an exhibition station at the annual event; the third time they have done so. This event, which commemorates the use of steam power on the Somerset Levels, draws visitors keen to see the stationary steam engines, traction engines, miniature steam trains and classic vehicles. Operating using the special event callsign, GB5SOL, the Club made

contacts on 40m, 20m, 2m, 10GHz and on QO-100, using a variety of modes, including CW, SSB, FM, SSTV and Hellschreiber. This generated much interest from visitors and Club members were on hand to explain proceedings, handing out promotional material to those wanting further information on amateur radio. Details on the Club can be found at:

<https://tauntonradio.club>

DISTANCE LEARNING FOR THE FULL

LICENCE EXAM: The Bath Based Distance Learning team (BBDL) have been running courses since 2011. In that time they have helped nearly 1200 students to obtain their Full Licences. Student feedback is always very positive and the pass rate continues to be well over 80%, compared with a national average of around 65%.

After being awarded the Kenwood Trophy for our training efforts for the second time at the RSGB AGM in April, the BBDL team are now planning another Full Licence level course. The course will run from late August to December, aiming for exams in January. This course is intended for those that have passed the Intermediate exam so does not cover all of the material required for the Direct to Full exam.

Students receive weekly work packages via an online classroom and have access to weekly online tutorials. Each student is allocated to one of the remote tutors who provide feedback and additional guidance as and when required. There are weekly quizzes to check on progress and at the end of the course there are a number of mock exams. There are also crossword puzzles and practical exercises to help with learning.

There is no charge for the training but applicants must work through some pre-course material and complete a quiz to be eligible for a place. This focuses on the 'new' Intermediate topics that have been introduced to the exam since September 2019. The pre-course classroom aims to make sure applicants can use the BBDL systems, and to ensure that they are ready for the current Full training syllabus.

Each student will need to provide their own RSGB Full Licence textbook and arrange their own exam at the end of the course. Advice will be provided as part of the course.

The deadline for course applications is Friday 25 July. To request full details and an application form, please email BBDL Team Leader, **Steve G0FUW**, via g0fuw@bdbl.org.uk

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ID-5200: A New Generation Mobile Performance

Launched twelve years after the release of the popular ID-5100, the ID-5200 is its definitive successor in our mobile line-up. The new model has a large 4.3in colour touchscreen and is the first Icom mobile transceiver to feature a waterfall display providing an immediate view of signal activity and band conditions. The ID-5200 has been built with the operator in mind, offering easy control through its combination of a large touchscreen and independent dials for each band. Dedicated buttons for key functions mean you can navigate the radio's features without digging through complex menus. Beyond the hardware the radio offers enhanced D-STAR functionality including Terminal and Access Point modes via built-in Wi-Fi and supports true simultaneous dual-band reception (FM/FM, FM/DV, and DV/DV). Support for APRS (Automatic Packet Reporting System) is also planned through a future firmware update.

AH-6: Lightweight, Compact Antenna Tuner

Also showcased at Dayton is the AH-6 Automatic Antenna Tuner. This HF/50MHz tuner is notably lightweight and compact making it a versatile solution for various operating environments. The AH-6 is compatible with both long-wire and 50 Ω antennas, ensuring reliable matching across the HF and 6-metre bands. Icom UK will share final product features, cost and UK availability for the ID-5200 and AH-6 as soon as they are available.

Icom X-026 Concept Project

World Premiere at Dayton Hamvention 2026

Following the buzz generated by a teaser video published last month, visitors to Dayton had the exclusive opportunity to see the physical model on display for the very first time. The X-026 represents a significant step in Amateur radio design, continuing Icom's long-standing tradition of showcasing innovative engineering concepts to the global community. While Dayton Hamvention provides the first physical look at the concept project, the full official reveal is scheduled for the Tokyo Ham Fair later this year. Please remember that the product being shown is only a concept version. Icom UK will share final product features, cost and UK availability as soon as they are released.

Icom UK and Icom America Partner to Sponsor WRTC 2026

We are pleased to announce that Icom will be a major sponsor of the World Radiosport Team Championship (WRTC) 2026, taking place this July right here in the United Kingdom. Often described as the 'Olympic Games' of Amateur

News from Icom



Radio this prestigious event is being held on British soil for the first time in its history. This year's event, headquartered at the Wyboston Lakes Resort near Bedford, promises to be the most technologically advanced yet featuring live scoring, analytics and e-sports-style commentary for a global audience. Icom is proud to support this celebration of skill and international goodwill:

- **A Global Family Effort:** Icom has been a primary sponsor of the WRTC series for decades. While Icom America has been a dedicated Gold Sponsor since 2023, Icom UK is delighted to join the effort for this historic home-soil event, bringing our global expertise to this local stage.
- **Empowering the Next Generation:** We are excited to provide three of our brand new IC-7300MK2 transceivers as prizes. Two of these will be awarded to the Top Youth Team, ensuring the world's best young contesters have the industry-leading technology they need to continue their journey. A third will be awarded to the winner of the grand WRTC 2026 raffle held during the event.
- **On the Ground:** Representatives from both Icom UK and Icom America will be present at the event HQ throughout the week to meet the community and showcase our latest technology.

Bob Stockley, Managing Director, Icom UK Ltd said, "We are incredibly proud to support WRTC 2026 as it comes to the UK for the first time. While this event showcases the world's elite, Icom is particularly committed to what comes next. By placing the IC-7300MK2 into the hands of the Top Youth Team, we are providing these



competitors with the best possible start as they carry the torch for the future of the hobby."

"We want the UK event to be the best it can be to demonstrate our passion and set the foundations for a strong future for the hobby," said **Mark Haynes MODXR**, Chairman of the WRTC 2026 Organising Committee.

With over 500 visitors expected at the HQ and thousands more following online, WRTC 2026 is set to be the event of a lifetime for UK hams. We look forward to seeing many of you there at the Icom stand!

For more information on the event and to follow the live scoring this July, visit:

www.wrtc2026.org

For the latest updates straight from us, visit the Icom UK website, follow our social media channels or sign up for our Newsletter.

icomuk.co.uk

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New from ML&S

1. The HyEndFed 49:1 End-Fed half-wave antenna unit offers a robust and flexible foundation for those looking to deploy a high-performance, high-power, end-fed antenna system across multiple HF bands. Designed for the serious operator, this transformer enables efficient matching of a half-wave wire antenna, providing access to up to eight bands with a single, simple wire installation.

HyEndFed has established a strong reputation within the amateur community for producing well-engineered, high-quality antenna solutions, and this transformer continues that tradition.

A key strength of this unit is its impressive power handling capability. Rated for up to 2kW on SSB voice, it is designed to cope comfortably with high power stations, making it suitable for both home station and contest environments.

In addition, the transformer is built to handle the higher duty cycles associated with modern digital modes. With excellent performance on FT8 and similar modes, it provides reassurance for operators running sustained transmissions where thermal stability and efficiency are essential.

The appeal of an end-fed system lies in its simplicity. With a single support point and minimal infrastructure required, it is an attractive option for portable, temporary, or space-constrained installations. This transformer forms the heart of that system, enabling operators to confidently deploy a resonant wire across multiple bands. Priced at £254.99.

2. The TYTTH-8600 is a no-nonsense dual-band mobile transceiver covering VHF and UHF, aimed at operators who want solid performance without unnecessary complexity. With a strong emphasis on power and clarity, it delivers dependable operation for both everyday use and more demanding mobile setups.

Offering up to 50W on VHF and 25W on UHF, the TH-8600 provides ample output for mobile and base station use alike. Audio is clear and direct, and the controls are refreshingly simple, making it easy to get on the air without navigating complex menus.

The dual display and dual watch capability allow monitoring of two frequencies simultaneously, a useful feature for keeping track of repeaters, calling channels, or club nets. A standout feature of the TH-8600 is its IP67-rated waterproof construction, giving it a level of durability not often seen in radios of this class. Whether installed in a vehicle such as a motorbike, used in harsher outdoor environments, or simply operating in less-than-ideal conditions, it offers added confidence and resilience.

Priced at £99.95.

3. The Elecrow ThinkNode M6 Outdoor Solar Node is a compact, all-in-one solution for extending Meshtastic networks into the real world. Combining LoRa, Bluetooth and GPS with a built-in solar power system, it is designed for long-term, maintenance-

New from ML&S



1



2

free deployment. Operating on 868MHz, the unit provides reliable long range, low power communication, making it ideal for rural coverage, events, or emergency use where conventional infrastructure is limited. With an integrated solar panel, internal battery support and an IP65-rated enclosure, the ThinkNode M6 is built for permanent outdoor installation. Once deployed, it quietly becomes part of the network, extending coverage without the need for constant attention.

This is very much a fit and forget device. Install it, connect it to your network, and let it do the work. For those experimenting with mesh systems or building wider coverage, it offers a simple and effective way to expand capability.

Priced at £89.95.

hamradio.co.uk



3

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“FOOTBALL/FUTBOL ON THE AIR” SPECIAL

EVENT: Amateur radio will be carrying the ball this year for soccer – known in the rest of the world as football or futbol – to coincide with the FIFA World Cup 2026™. The tournament and unaffiliated ham radio event will run to 19 July. As players from around the world compete in the stadiums, amateur radio operators will be looking for contacts during this “Football/Futbol on the Air” special event. Teams of hams will be on the air calling CQ from some 16 World Cup host cities where the matches will be played throughout North America, starting with the first match in Mexico City on 11 June, and ending with the final match in New York/New Jersey on 19 July.

The host cities, like the teams, are truly international: three are in Mexico, two are in Canada, and the remaining eleven are in the United States. With a roster of 48 football teams, this is the largest international tournament to date.

Many of the amateur stations will be using 1x1 callsigns such as W5C, operating CW, SSB, and the digital modes on HF and VHF as band conditions allow.

Others will have longer special-event callsigns that can be found on the website, along with a full-colour display of the various QSL cards that are available. Each of these QSL cards is collectible and available upon request after a successful contact. There will also be a wildcard ‘bonus’ station using the callsign WC5WC.

A downloadable multi-city certificate will be available with endorsements at various levels. Host city stations are planning to be on the air on the day of their cities’ matches, but many will also operate at different times during the tournament.

www.wc2026ses.org

NEW MATHEMATICS COURSE LAUNCHES ON THE HADARS LEARNING ACADEMY

WEBSITE: Halifax & District ARS (HADARS) are proud to announce the release of a brand new course designed to help both Intermediate and Full licence students tackle the more complex areas of amateur radio mathematics.

The course covers a range of calculations and concepts relevant to amateur radio making learning easier and more accessible. Each module includes video explanations and a short test at the end. One of the key benefits of the academy system is that learners can revisit any topic at any time, making it ideal both for first time study and for revision ahead of examinations.

This latest addition to our learning hub has been designed by HADARS resident expert, **Mr Max Townend G4SDX**, and complements our Foundation course, which has enjoyed a



fantastic first year with over 600 enrolments and continues to grow in popularity. Special thanks go to **James Cathey-Currie G5JCC** for his expert assistance in developing and maintaining the website, and to **Matt Hardy M8KHC** for editing the video content.

The course is now available through the ‘HADARS Academy’ and is free to all. Visit:

www.hadars.org.uk

Click ‘Academy’ (Top right) and then ‘Enrol Now’.

13 COLONIES SPECIAL EVENT 2026: G4EUZ

Durham and District Amateur Radio Society (DADARS) is privileged to be participating again as one of the bonus stations in the hugely popular 13 Colonies Special Event. The NoV special callsign GB13COL has been issued for this event and will run from the club station 1 July 1300UTC to 8 July 0400UTC. The primary focus of the event will be the HF bands, including VHF, UHF & Satellite for QSOs using SSB, CW, FM, and various Digital Modes.

The 13 Colonies event began in 2009 as a way of celebrating American Independence with the original 13 colony States circa 1776.

Since the UK was a major historical player in the Revolutionary War, GB13COL from England

will present an added positive flair, historical significance and a challenge for radio amateurs to contact. This event has rapidly become the premier Amateur Radio on-air activity in North America and beyond.

This year is the 250th anniversary of American Independence, and will no doubt be an extremely popular event as a result of this.

2026 QSL cards have been kindly sponsored by Canny Components. A warm thank you to **Amanda & Davey** for this.

Every year there is a different certificate theme for amateurs who make contact with either one or all participating stations, including the bonus stations. Ideally, amateurs taking part aim to get a ‘clean sweep’ of all 13 stations: K2A (NY), K2B (VA), K2C (RI), K2D (CT), K2E (DE), K2F (MD), K2G (GA), K2H (MA), K2I (NJ), K2J (NC), K2K (NH), K2L (SC), K2M (PA), plus WM3PEN, GB13COL & TM13COL operating as bonus stations. Contacts made will be endorsed on to the certificate along with your own personal callsign. For further information regarding the 13 Colonies Special Event, please visit the website at:

www.13colonies.us

For UK QSL requests, please supply a Stamp Addressed Envelope to QTHR GB13COL.

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CAISTER MARCONI STATION CONTACTS NEARLY 180 RADIO AMATEURS IN 32 COUNTRIES:

Norfolk radio hams at Caister Lifeboat managed to contact 179 radio amateurs in 32 countries on Saturday 25 April when they took part in the International Marconi Day (IMD) event to mark the inventor's birthday. Using the call GBOCMS and a mixture of Morse code, telephony and digital, contacts were made with other radio amateurs across the world. Notable contacts were made with Marconi stations GB4IMD in Cornwall and GB0MBS in Dorset, plus other IMD stations in Pisa, Italy, the Netherlands, Austria and Sardinia. Other contacts included a station in Massachusetts, USA, and another in Victoria, Australia.

The Norfolk Amateur Radio Club (NARC) ran the all-day special event station at Caister Lifeboat to commemorate the village's original Marconi Wireless Station, which was established at Caister in 1900. The station was in a house in the High Street known as Pretoria Villa and its original purpose was to communicate with ships in the North Sea and the Cross Sands lightship. On Saturday, the closest to Guglielmo Marconi's birthday, stations around the world are set up at sites with historical links to the inventor's work. These include Poldhu in England; Cape Cod Massachusetts; Glace Bay, Nova Scotia and many others.

ECHOES FROM THE ROCK: 80 YEARS OF HAM RADIO & 50 YEARS OF GARS: On 27 May GARS hosted a public exhibition celebrating an important double milestone for Gibraltar's communications heritage: 80 years of Amateur Radio on the Rock and the 50th Anniversary of the Gibraltar Amateur Radio Society (GARS). Amateur radio in Gibraltar officially flickered to life in the shadow of the Second World War. As wartime radio restrictions were lifted in the late 1940s, local and military enthusiasts who had developed a passion for electronics and wireless technology during the war began assembling their own stations. It was 80 years ago in 1946 that the first licence with the ZB2 prefix, ZB2A was issued to the RAF Amateur Radio Club. Perhaps the most profound and emotionally charged chapter in Gibraltar's amateur radio history unfolded when the land frontier with Spain was strictly closed by the Spanish Franco government. Overnight, families were torn apart. Relatives in Gibraltar and the Spanish mainland could see each other across the physical barrier, but standard telephone lines and postal links were severed, and direct communication was virtually impossible. During this painful period, Gibraltar's ham radio operators stepped up as a vital, unofficial lifeline. Stepping far beyond the bounds of a technical hobby, local operators used their shortwave



radios to bridge the forced separation. All normal communications links Spain were cut, local Amateurs would use their stations on behalf of families relaying messages in order to keep the links over the airwaves. Operators passed crucial family news - births, marriages, illnesses, and simple reassurances of safety - from one side of the border to the other. For families starved of contact with their loved ones, the radio shack was a humanitarian lifeline.

It was precisely during this period of isolation that the need for a unified local body became most apparent. 50 years ago in 1976, right in the middle of the border closure period, the Gibraltar Amateur Radio Society (GARS) was formally established with the merger of the RAF Amateur Radio Club and the Gibraltar Amateur Radio Club. Later this year (dates yet to be advised) a commemorative 50p coin and a set of stamps are to be issued, to mark the 50th anniversary of the GARS and the 80th anniversary of the first ZB2 amateur radio transmission.

MOONRAKER LUNA VHF/UHF TRANSCEIVER:

The Luna is a powerful and reliable VHF/UHF radio designed for demanding communication environments. Operating across 144-146/430-440MHz, it delivers up to 70W of RF output, ensuring strong signal performance and extended range. Built for real-world use, the Luna features an IP54 rating, offering protection against dust and water splashes. Its high-contrast display provides excellent visibility in both bright and low-light conditions, while the remote head unit allows for flexible and convenient installation. Advanced communication features such as VOX hands-free operation and CTCSS/DCS tone

support help reduce interference and improve channel clarity, making this radio suitable for advanced hobby use.

As an added bonus, the Moonraker Luna comes fully ready to use out the box, with popular UK Wide repeaters programmed in ready to go. £199.95 from Moonraker online.

moonrakeronline.com

NEW REGULATIONS FOR NORWEGIAN HAMS:

NKOM – the Norwegian equivalent of PTS – has now published its update of the regulations for amateur radio in Norway. As previously announced, the most important change is the introduction of a new entry-level certificate, or as it is called in the legal text, 'limited license'. It will have simpler examination requirements than the 'full license' (HAREC) but a number of limitations. Holders of a 'limited license' are limited to a maximum of 10W transmitter power. The frequency bands are all from 3.5MHz – 432MHz (but not the WARC bands 10MHz and 24MHz). Compared to the previous revision version from November, some changes have been made. In addition to changing the name from 'beginner license' to 'limited license', the most important things are:

The ban on remote control has been lifted for both 'restricted licenses' as well as for stations in Norwegian 'overseas' territories.

The CE marking requirement is also removed for the 'limited license' (which can be considered logical since Norway is not part of the EU). However, this means that entry-level amateurs in Norway are allowed to build their own equipment (which must, however, be guaranteed to meet Norwegian requirements for out-of-band interference).

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GB2DWM FOR NATIONAL MILLS ON THE AIR

EVENT: Over the weekend of 9/10 May radio amateurs from the Huntingdonshire Amateur Radio Society (HARS) set up and activated a Special Event Radio Station for Duloe Tower Mill in Eaton Socon, Cambridgeshire using the callsign GB2DWM. The station was put on for the annual National Mills on the Air event which is set up by the S.P.A.B. Mills section (Society for the Protection of Ancient Buildings) with Nunsfield House Amateur Radio Group collating all the information for the Mills that were taking part, with this year well over 100 Mills being registered. This event is seen as a time to promote amateur radio while helping to preserve some of our local heritage, many types of Mills take part in the event albeit steam, saw, water, horse, tidal or wind. The National Mills event is the annual festival of our milling heritage and provides you with a fantastic opportunity to visit Mills which we have many locally across the UK and the world.

Collectively we managed to log 17 Mills plus we had one other SES Callsigns GB0SLB (Scottish Lifeboats).

After making sure we had cleared the site of items we spoke to the Mill Owners thanking them for their support during the event. As it was **Sandra's** (Owners) birthday on the Sunday, we presented her with a lovely cake and a bottle of 'pop' to celebrate it, she said *"I am surprised that we had remembered that it was her birthday and was very pleased with the presentation and kind of us"*. During the conversations with the owners they have invited HARS back again with no arm twisting implied we have agreed to attend again next year as they do enjoy having us on site for the weekend, so listen out for us during the weekend of 8/9 May 2027.

JARL 100TH ANNIVERSARY: On 12 June 2026, the Japan Amateur Radio League (JARL) will mark the 100th anniversary of its founding. Then, in September 2027, amateur radio itself in Japan will celebrate its own centennial milestone. To honour this historic moment and to open the door to the next 100 years, the JARL has designated the period from 1 June 2026 through 30 September 2027 as its Centennial Celebration Period, during which a wide range of commemorative activities will be carried out: <https://100th.jarl.org>

CLOSURE OF THE DROITWICH TRANSMITTER ON 198KHZ:

The BBC has announced that the Droitwich Transmitter on 198kHz will be permanently closed down during 2026. The Scottish Long Wave transmitters at Burghead and Westerglen will also be turned off. The Droitwich transmitter was commissioned during September 1934. These transmissions have always been part of our lives as radio enthusiasts. A date has not yet been formally

given, but the BBC is committing to providing two months' notice to listeners. The RSGB and the BBC Amateur Radio Group are planning to mark this occasion on the air. More details of how this will be achieved will be available soon. Please email ContestClub@rsgbcc.org if you would like to register your interest.

LIVINGSTON & DISTRICT ARS OPEN DAY: On Saturday 25 July, Livingston & District ARS will be holding an Open Day. We shall be demonstrating various aspects of Amateur Radio and inviting members of the public to participate. We have invited representatives of local Service organisations to demonstrate their own use of the Radio Spectrum. We shall be using the club callsign MS0LIV. Food and refreshments will be available. Our landlords, 6th West Lothian Scouts will also be holding activities on site and inside their Hall. Scout Hall & 57 Station Road, Broxburn, EH52 5QU.

DAYTON (XENIA) NEWS AND AWARDS

General Chairman **Brian Markland** announced following this year's event that the curtain has come down on another extraordinary Hamvention®, and the numbers tell a story of remarkable enthusiasm: 37,924 attendees gathered at the Greene County Fairgrounds & Expo Center, reaffirming Hamvention's standing as the world's largest and most celebrated amateur radio gathering.

Contest Hall Of Fame

The Contest Hall of Fame was established by *CQ Magazine* in September 1986 to recognize those amateurs who have made major contributions to the art of radio competition. Today, the Contest Hall of Fame is managed by the World Wide Radio Operators Foundation. This year's inductees, announced on 16 May during the annual Contest Dinner held in conjunction with the Dayton Hamvention, are **Mark Pride K1RX**, **Paul Young K1XM**, **Tom Lee K8AZ** and **Doug Zweibel KR2Q**. Their complete profiles can be found on:

<https://contesthof.com>

CQ DX Hall Of Fame

Established in 1967, and now under the stewardship of the International DX Association (<https://indexa.org>), this prestigious award honours those amateurs who have made exemplary contributions to DXing and DXpeditioning, including both on-air and off-air activities and accomplishments. This year's inductees, announced on 15 May during the annual SWODXA DX Dinner, are:

* **Charles Wilmott M0OXO** - Charles has taken the QSL management process to a new level. He handles logs with more than 9 million QSO's in them. He has become one of the first QSL Managers contacted to handle many of the

larger DXpeditions that come along. But not only does he handle the 'big ones', he also handles numerous smaller stations around the world. He has converted his garage into a small office, and he can be found out there from early morning through late evening in all weathers.

* **Elvira Simoncini IV3FSG** - Elvira (most recently 3X3A) has been an avid DXpeditioner who has operated from 34 different DXCC Entities since 1990, often including a strong humanitarian effort as well, which included an association with 'Informatici Senza Frontiere'. In a world constantly facing new digital challenges, this association seeks to bridge the digital divide through the intelligent supportive and sustainable use of technology by implementing nonprofit projects in marginalized and emergency situations worldwide. It also promotes innovative IT initiatives for people with disabilities. After a professional life entirely dedicated to teaching, this voluntary work led to extensive travel opportunities for activating amateur radio along the way, almost all carried out independently while continuing to optimize the portable setups used. This volunteer work often included introducing young students to amateur radio through dedicated courses and demonstrations.

DXpedition Of The Year

Presented annually at the DX Dinner by the Southwest Ohio DX Association, the DXpedition of the Year Award recognizes excellence in DXpedition planning and execution from Most Wanted entities. This year, the award was presented to the Russian DXpedition Team for their 9U1RU expedition to Burundi, which logged 179,831 QSOs and moved the entity from #60 to #106 in ranking.

DXpeditioner Of The Year Award

The Southwest Ohio DX Association's DXpeditioner of the Year award honours those operators who made an exceptional contribution to the DX community. This year, the award was presented to **Yuris Petersons YL2GM** for his solo ZS8W operation from Marion Island. His expedition logged 31,672 QSOs and helped activate an entity that moved from #11 to #25 in ranking.

The Heritage CQ Amateur Radio Hall Of Fame

Established in 2001, and now under the stewardship of Hamgallery, it recognizes those individuals who significantly affected the course of amateur radio; and radio amateurs who, in the course of their professional lives, had a significant impact on their professions or on world affairs. The 2026 inductees are **Prof. David B. Leeson, PhD W6NL (ex-W6QHS)**; **Richard Dean Straw N6BV (SK)**; **Dr. Jose 'Otis' Vicens NP4G**. Their profiles can be found on:

<https://hamgallery.com/HOF/AmateurRadio>

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1

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It may not be the first name or even on your shopping list when looking for a dual-band FM mobile radio but Zastone Technology Ltd, of Shenzhen, has been around since 2004, and appears to have a workforce of up to 50 people. It has three assembly lines presumably putting together parts from sub-contactors.

From what I read the company has extensive R&D and also produces branded products, including handportables, commercial rack mount repeaters some CB's and a compact, SDR 100-watt HF SDR transceiver with a waterfall colour display.

Not promoted by the major UK dealers it's yet another item in the secondary market available online emanating from the growing Chinese market.

It's a radio that appears to have been designed for global sales in a number of areas. It covers not only our Amateur bands (2m and 70cm) but has potential for what the Americans call Family Band, similar to our 446MHz but on different frequencies, and also business band. Early versions have the US 220MHz band also. I understand that this may have been removed in the most recent models. So effectively, 136-174 MHz (VHF) and 400-480 MHz or 400-520 MHz (UHF) plus Airband Rx and FM broadcast RX.

The Zastone D9000 an interesting choice?

Richard Constantine G3UGF takes a look at a radio you probably aren't familiar with.

Although it appears to have something of a cult following online in the UK with an entry price of circa £200-£240 and up to £280.00 for later models that include extras (will explain later), it is certainly not entry level in terms of what it offers.

Courtesy of friends, I recently had the opportunity to investigate an early version for myself and was surprised by what I learned.

First impressions are that it bears a striking and inescapable resemblance to the now discontinued ICOM IC-2820, including its detachable head, secured to the main body by magnets, an ICOM trademark.

One small point on which I can't make my mind up is that the RJ45 short cable between the pack set and the display panel, loops out to one side of the radio where it connects. I guess it saves money in production and doesn't affect performance. That said, the cable would be visible in remote head form anyway, just like some other radios.

It sports a side-by-side dual-band display

and row of dual push buttons below the screen. A design typical of the era when launched in 2019. Something it shares with the likes of Yaesu's FT-7900/8900 and a number of other Chinese made radios.

The package

It weighs in at around 1.6kg, and comes complete with the usual accessories. The unit I tested included something that most higher cost radios now charge extra for, a remote cable and bracket to permit dashboard or deck mounting of the control head.

NB: Current sellers may not include this to keep the price down so it would be wise to check when considering a purchase.

There's a programming lead for updating the radio and also for memory channel use. I did note a downloadable YouTube video on programming but didn't investigate for time reasons. I do understand that the programming software is bespoke, free and not currently compatible with the generic stuff like CHIRP.

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There's a chunky, keyboard electret hand microphone, that glows a nice amber in the dark. Most useful as the keypad gives direct frequency entry, band control plus up-down buttons on the top edge. Also, some of the front panel choices on the number buttons. Thankfully there is a keyboard lock as it's all too easy to press a button in the wrong hands, like mine. Two clearly visible LED's, Red for TX and Green tell you which band is active, left or right without looking at the radio – a nice addition.

The transceiver pack is a solid alloy fin type casting with a rear-mounted fan that runs on TX, not too noticeable in a quiet room, probably not at all in a vehicle. It runs for around two minutes on receive after a transmission but can be switched off if, say, running low power at a home station. There's a top-mounted substantial 600mm diameter internal speaker, with an extension speaker socket to the rear.

There's also a conventional looking round CAT style data socket marked PACKET on the front face of the transceiver body. It's covered when the radio head unit is in local mode and there's no information in the handbook I have. It's something of a mystery.

Power output is switchable in three levels, 5W/25W/50W on VHF and 40W max on UHF. A note in the handbook made me smile giving pause for thought. The max output in Taiwan of this made-in-China radio is limited to 25 watts... no comment.

Spurious emissions are below at least 60dB, more than can be said for some other imports.

There's a full range of adjustable channel steps from 2.5-100kHz, programmable repeater frequency splits and at full power the transceiver draws around 10A at 13.8V DC.

As expected, signalling includes tone burst, CTCSS, DCS and DTMF.

While it might look very similar to its ICOM counterpart it doesn't include D-STAR and has only 215 programmable memory slots – who needs more?

This radio has something I have only ever encountered in my professional life and that is a diversity reception, receive only antenna port BNC socket at the rear. Typically, its use is for a second location antenna mounted on a vehicle. This comes into its own in heavily built-up city areas surrounded by buildings where reflections, electrical noise and signal blocking hampers the main antenna.

Zastone have engineered the D9000 to provide cross band and even in-band repeat operation.

The handbook is a little brief on what's needed for in-band repeat other than the settings. Much more straightforward than some radios I know. I wouldn't want to do it without additional equipment, including a duplexer and significant antenna filtering.



However, cross band is much easier and activated from a single button on the panel. Once engaged, other functions on the radio are temporarily disabled.

Handbook

The A5 booklet has 62 pages employing a combination of step-by-step annotated instructions together with pictorial representations of the associated menu page. It's better than most with headings on many pages. However, I did find myself leaping

Photo 1: Front panel Menu display.

Photo 2: Handbook and Mic.

Photo 3: Remote display and connections.

around across the book to find the relevant information as the contents pages didn't tell me everything. I was initially confused by the difference between using the radio as a stand-alone repeater or conventional access to a remote repeater.

What also takes some adjustment is remembering that the front panel button

Photo 4: Later model with Bluetooth and Mic.

legends are used more than once for different functions according to the menu settings at the time. For example: The centre button marked 'Function' reveals a second row of on-screen options above. The far-right button clearly marked 'VFO/SCAN' now acts as the entry MENU button.

In menu a drop-down list appears similar to many Yaesu radios. This option list leads to a second menu selection. Scrolling down with what was the lower right MHz control gets you to where you want to be. Then it's a matter of pushing the same rotary control to see a selection choice. Once found, by scrolling again you push the control again (sometimes unclear in the instructions). Your choice becomes active and you can either go back or clear down.

It's helpful that the handbook graphically illustrates the relevant menu page as you go. Sounds a bit pedantic but once you get the mindset of the designer it gets easier and quicker with use.

AIP

Among the many choices and worthy of explanation is optional use 'AIP'...so what is it? The handbook only says it, "*helps to reduce audio distortion caused by intermodulation.*" For information...Auto Intensity Protection is intended to cope with strong close by signals in urban areas. It's dynamic RF signal handling that acts like an automatic attenuator.

D9000 has the usual batch of other facilities you would expect to find such as beep tones, speaker selection, time out timer, tone burst, mic lock, scanning, scan skip, squelch tail, busy channel locks out, priority channel, display colour choice (Blue or Amber) LCD contrast and, of course, not forgetting the comprehensive memory locations.

These days we tend to think of selective calling as the province of digitally enabled radios such as C4FM and similar. Before digital, DTMF type tone signalling was often used for selective calling. This radio has DTMF automatic tone transmit and receive, being capable of storing up to 16 unique calls in memory. This means that you can select to call a friend directly one-to-one or to a group, using FM.

In use

Once you get your head around the manual and the way it works, it can be set up to personal preference. As always, I would suggest taking time on the bench to do that in small doses. When set it's reasonably straightforward in everyday operation and it receive sensitivity at 0.2µV for 12dB SINAD is more than adequate



on both active Amateur bands.

Display and monitor both bands simultaneously or just your favourite band in larger print form and away you go.

Something that really confused me during set up was that the version I tested only displayed the presence of CTCSS tone in transmit, not receive.

Transmitted audio is perfectly acceptable and I received no real-world disparaging comments.

Upgrades

Naturally and over time the D9000 has been upgraded to keep pace with developments elsewhere and some later models are reputed to have options such as Barometer, Altimeter, Thermometer, 27MHz, AM SW and LW reception. However, I'm not seeing those features listed by sellers and can't guarantee they are present. Online packages are likely to vary dependent on how long the agents have been holding their stocks. Ask questions and let the price be your guide before spending.

There is definitely a Bluetooth microphone option if it floats your boat, as it does mine. You can retrofit it to older models but it costs around £90.00. A module clicks onto the front face of the transceiver pack. It comes with a remote microphone that can also be plugged in to charge it or use it direct. Look online for the quick installation video.

I would love to find out if the Bluetooth works with other generic in-the ear type headsets. It's pretty clear that the newer models are at the higher cost end that I mentioned earlier but cheaper overall than a retrofit.

The model I tested contained none of the above but did include FM broadcast receive (64-108MHz) and FM re-transmit on flea power to your car radio, presumably to use its audio system – I didn't go there and wonder what Ofcom makes of that?

Finally

The D9000 definitely has a following. There's a Facebook group plus a few helpful online videos, presumably posted by owners and not the main stream 'like-collectors'.

For a first radio or indeed a second /standby it offers quite a lot for the basic price tag and I would be happy to have one in my collection. However, you have to remember and unless I'm wrong, it remains an internet only purchase in the UK.

In common with many others in this price range it has no C4FM, D-STAR or DMR digital. Accepting these limitations, it's worthy of consideration. It's well built and the test model is evidence to its reliability... The choice is yours to make.

My thanks to **Raymond G1MSD** and **Leo M7LFL** for the opportunity to experience this radio. **PW**



1
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Many times in studying a phenomenon we start from an observation through which we find out why something does not work, maybe then we will prove why it works and how it works.

During the beginning of the pandemic, benefiting from more time at the station, I was able to correlate some observations regarding lightning and propagation in the 6m band. I was lucky for a year when the wind didn't blow and I could keep the antenna on the house (in Sibiu-Romania, the wind blows from the West for six months and from the South for the other six months...).

In two words, I would summarize that: IN THIS BAND (6m) when lightning storms occur in the area where the storm occurs, a barrier is formed and the radio wave does not pass any further...this applies both to transmission and reception.

To prove this, I followed the propagation in this band for several years, I used:
www.dxmaps.com/spots/mapg.php?Lan=
www.blitzortung.org/en/live_lightning_maps.php
www.lightningmaps.org
www.heywhatsthat.com

As equipment I use an FT-100 station that outputs about 80-85W in 6m, a Yagi of my own construction and design with 7 elements, gain about 9dBD, **Fig. 1**, and a bazooka type radiator.

Observations on Propagation in 50MHz (6m)

Andrei Buta YO6XK offers an interesting perspective on 50MHz propagation.

My biggest problem is that I live in Sibiu, Romania, in a pit, practically surrounded by mountains that reach 2000-2500m, **Fig. 2**. The area that stops the signal is marked with grey and the coloured part of the picture is the area of direct visibility.

I 'became aware' of the first observations at the beginning of June 2020 when, despite the fact that those in Western Europe were working Americans, **Fig. 3**, I couldn't hear anything.

Since I walk quite a lot in the mountains and was preparing for a trip I noticed the correlation of the storm front crossing Europe, **Fig. 4**, and blocking the propagation to America of the stations in eastern Europe was obvious. So I tuned in and for a few years I saved screens and tried to stay at the station when I could. Not even two days later, again propagation towards America and I again could not hear/see anything.

By the way, I'm not really a fan of digital communications, but in 6m no one appears in SSB except for some contests. I had the surprise of working Nepal in 6m with +16dB but there was no one in the voice mode.

To avoid unnecessary discussions, the only mode I accept in my mind is WSJT-JT65, for EME work where you really have to know what you're doing, and powers over 1-2kW for telegraphy (not to mention SSB) don't really have anybody!

So on Saturday, 13 June 2020, because the 'little one' was in session for the university and I had to sit well, not mountain trips because I'm setting a bad example, no bath, no kayak, I executed the wife's order: STAY well at the station ... whether you want it or not, execute the command!

Around 7 o'clock an opening to Asia starts and I have copy two Japanese stations, **Fig. 5**. On the map, **Fig. 6**, marked with yellow dots you can see only a few lightning bolts.

At 9 o'clock I briefly see a VK station, **Fig. 7**, I call it but it doesn't hear me. At 85W, I think if he had heard me, I would have screamed around the house like a madman. Notice that a storm front is beginning to form in the area between the Black Sea and the Caspian Sea, **Fig. 8**, which ends communications to Japan. At 1pm the situation is clear, a storm zone has

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Fig. 1: The author's 6m Yagi. **Fig. 2:** Surrounding terrain, showing direct visibility. **Fig. 3:** Western Europe working the USA. **Fig. 4:** Storm front occurring at the same time as Fig. 3.

formed that passes through Turkey, Romania, Poland.

In the image, **Fig. 9**, you can clearly see the blocking area of communications and the formation of some tunnels through which the signal somehow passes.

After 18:00 some opening towards America begins and the width of the storm front expands to hundreds of km and those from Eastern Europe who were lucky pinched a few more stations from America.

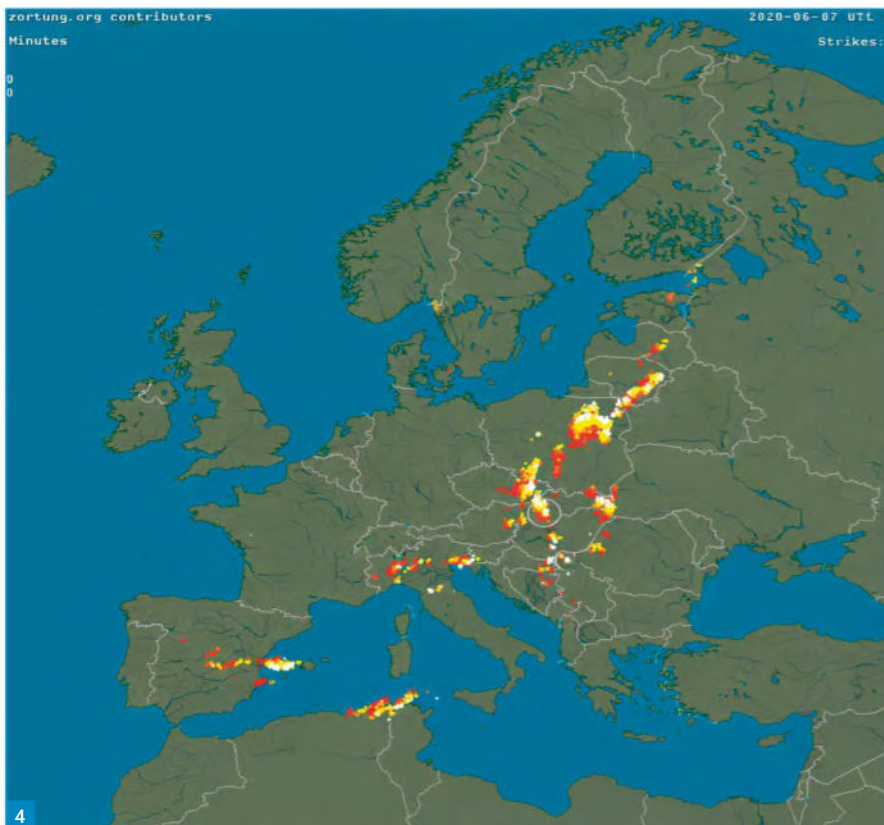
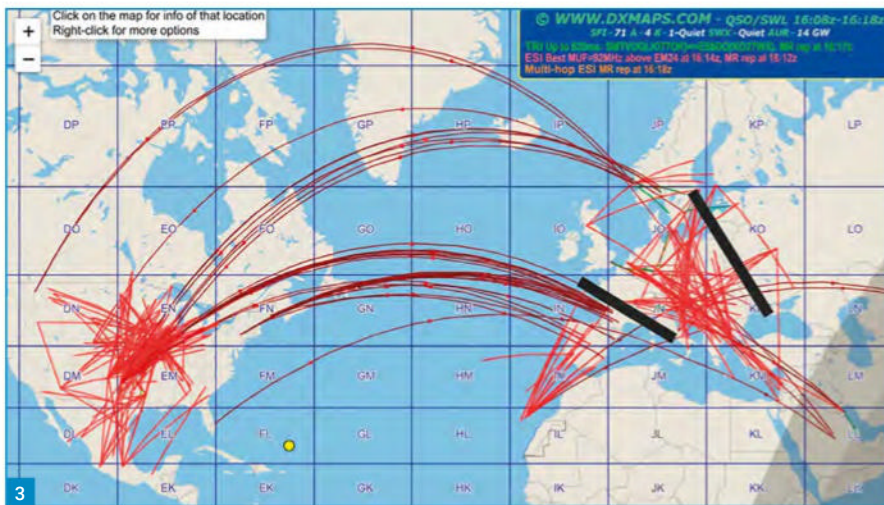
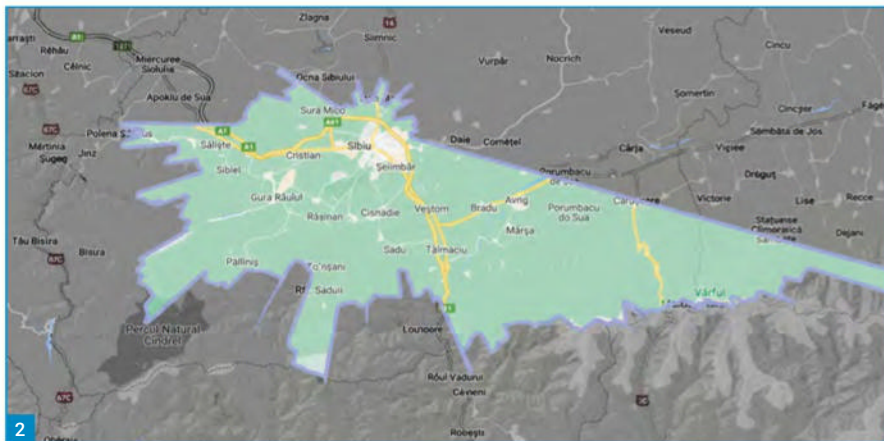
For us, in order to work stations in America, we would have to get rid of the storm fronts in the area of Germany, and somehow with luck if the storms in the Western Mountains if those don't have too much vertical development.

Now knowing all these things I tried to point the antenna in various directions and my expectations were not disappointed. For example, a connection to a station in V51.

It is a well-known fact that lightning has two propagation components, one from the cloud down to the ground and one from the cloud up to the ionosphere. The so-called 'blue jets' rise towards the ionosphere...red spirits are formed above them and to make the picture complete above them are the elves.....

All these reach altitudes of a maximum of 300km. So, if we calculate a lightning height of up to 300km, the result is a zone of silence of a maximum of 4000km, but usually it is about 2000-1000km from my observations.

1. Depending on the height at which the lightning reaches, the 'silence-blocking' zone can reach up to 4000km, but usually it is somewhere around 1000km.
 2. The optimal period for this type of propagation for DX is sometime from MARCH to mid-MAY when lightning activity is lower.
 3. The appearance of E layers 'sporadically' does not necessarily help (but sometimes it may be the luck that we lack) long-distance propagation in 50MHz.
 4. Even if the MUF does not reach 70MHz, you can try to work, but it is best for the MUF to be above 90MHz, about halfway through the distance we want to make the connection
- www.dxmaps.com/spots/mapg.php?Lan=E&
5. A 'small electromagnetic storm' can also help...usually 'about' on the second or third day (from the moment it hits the earth), the magnetic field lines that are from NORTH to SOUTH somehow bend or 'interrupts' them and the signal will pass more easily over the electromagnetic equator.
 6. It seems that some horizontal blocking



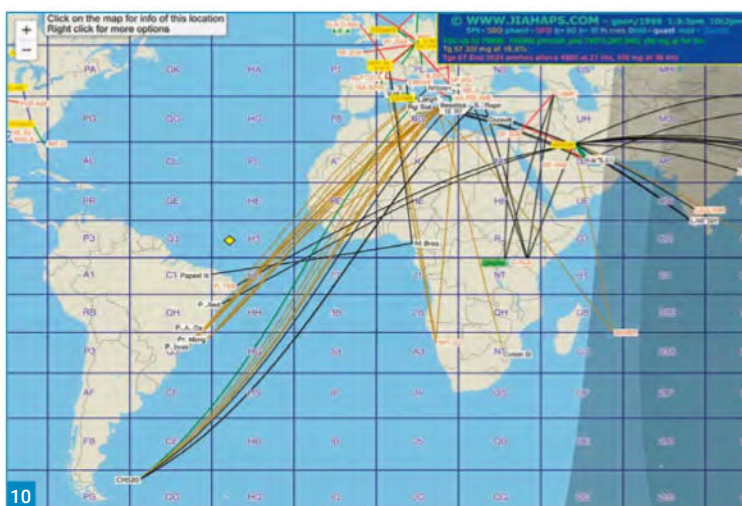
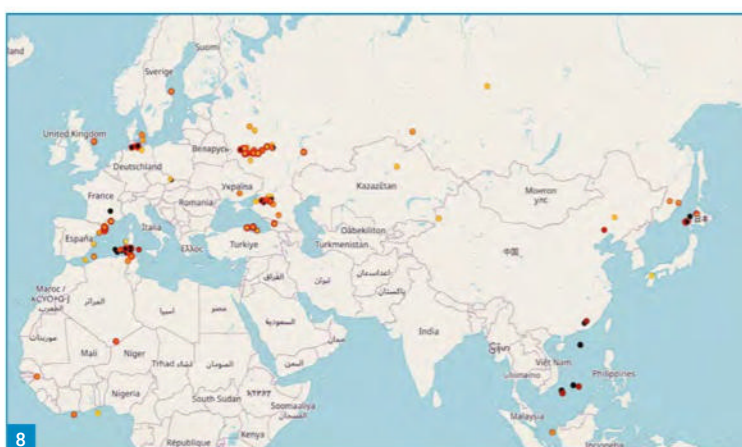
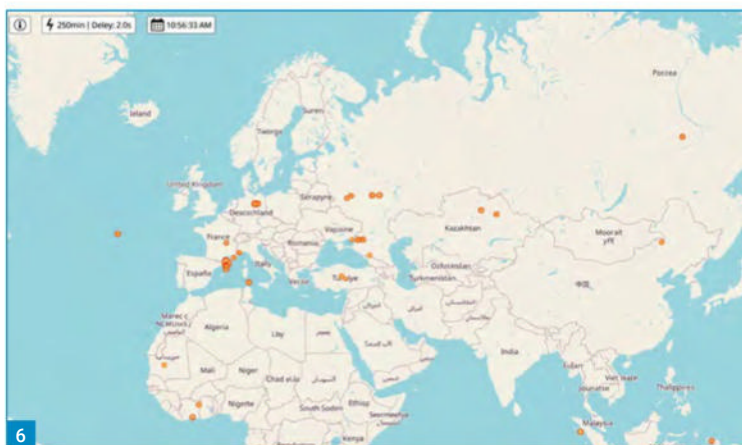


Fig. 5: An opening to Japan. Fig. 6: Lightning map at the same time. Fig. 7: A brief opening to VK. Fig. 8: A storm front blocking communications to Japan. Fig. 9: Signals blocked other than some 'tunnels'. Fig. 10: Band opening on 1 April 2023. Fig. 11: Some of the author's QSL cards for 50MHz.

passages are formed due to lightning storms which in time (months) go up or down in latitude depending on the season and the maximum seems to be towards the beginning-mid of June (Image, Fig. 10, from 1 April 2023). Since I am a follower of PAPER-QSL I present some QSLs received, Fig. 11, even though now it is fashionable to use eQSL but I can't show the eQSL to the wife who left me at the station even though from the ones on paper she said something I can't write. **PW**

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For the first time, WRTC – the World Radiosport Team Championship – takes place in the UK this summer. These ‘Olympic Games of amateur radio’ take place every four years: teams of two contesters compete on what is as close as possible to a level playing field, using the same output power and identical antennas (Fig. 1). Fifty teams are expected to compete in WRTC 2026 (Fig. 2) with all the stations in the same part of East Anglia.

The teams’ callsigns, operating sites and their referees are decided by lot before the competition, which runs concurrently with the annual IARU HF World Championship contest. Activity is on both CW and SSB and the contest takes place for 24 hours from 1200UTC on 11 July. All HF operators around the world who take part in the IARU contest can provide points for the WRTC teams. Live scoreboards will be available online to add to the excitement of this competition.

The official WRTC 2026 website says “WRTC is a means to demonstrate international goodwill and friendship in the true ham spirit. It also allows youth operators to demonstrate their skills within this highly competitive event. WRTC UK 2026 will focus not only on providing a fair and enjoyable event for those who qualify either as a competitor or referee, but will also provide engagement to spectators all over the world.”

www.wrtc2026.org

Solar activity

After weeks of low solar activity, on 23 April there were several M-class solar flares followed the next day by two X-class flares that led to HF blackouts on the sunlit side of Earth. The first of these, an X2.4, was around 0100UTC and the second, an X2.5 flare, was about seven hours later.

Then, on 10 May an M5.7 flare, followed by a coronal mass ejection, erupted from sunspot group AR4436, leading to the possibility of a minor geomagnetic storm and visual auroras, at least in northern parts of the UK, around 13 May (after this column was sent to the Editor).

www.spaceweather.com

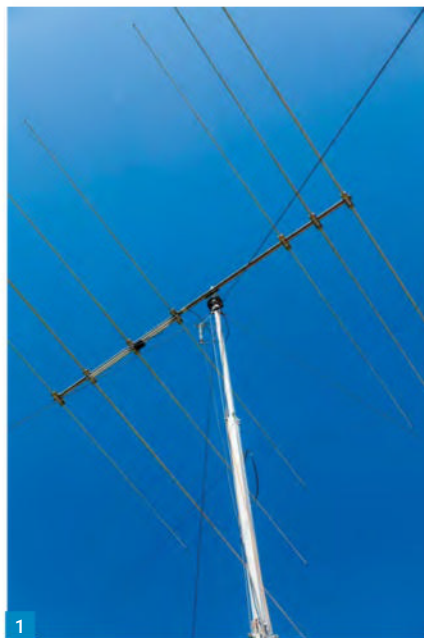
www.space.com

W2PH Radio

I know that many PW readers are also broadcast listeners (indeed, that’s how my interest in radio started, more than half a century ago) so, while not exactly HF, I thought readers might be interested to hear about W2PH Radio, Fig. 3. It is an internet radio station with a ‘classic rock’ and oldies format but which also features programmes about

WRTC and more

Steve G4JVG has another busy column despite moving into the summer season, where HF propagation can be disappointing.



amateur radio such as *This Week in Amateur Radio* and the ARRL audio news. It broadcasts 24 hours a day and all the ‘live’ DJs are also radio amateurs.

www.w2phradio.com

QSL from yesteryear

At the end of April, the DX-World website carried an article, ‘A step closer to activating KH3...?’, which carried a link to an official US government document dating from March 2025 (which no-one seemed to notice at the time). The US document stated that there were plans for an “Environmental Assessment (EA) to evaluate the impacts of construction and operation of two landing pads at Johnston Atoll for up to 10 [space rocket] reentry vehicle landings per year...”

Why is this of any interest to HF amateur radio operators? The answer is that Johnston Atoll, Fig. 4 – located in the north Pacific some 1400km south-west of Hawaii – is currently the second rarest DXCC entity in the world (only North Korea is more ‘wanted’). For more than 20 years no public access to Johnston has been permitted and so it has crept up the Most Wanted lists but, it is surmised, if rocket landing pads and other infrastructure are to be built there, access to the island might become easier.

The last major operation from Johnston was the AH3D DXpedition in January – February

2003, but my ‘QSL from yesteryear’ is from the previous decade. In 1990 I worked Pete Grillo AH3C on Johnston Island a few times. The QSL card, Fig. 5, confirms QSOs made on 4 September 1990 at 0811UTC on 21MHz SSB and on 6 October 1990 at 0743UTC on 14MHz SSB.

In those days Johnston was not really considered to be amongst the rarest of entities: John Bartlett KH3AE was also very active from Johnston between 1990 and 1993 and, as P29DX, I made a number of contacts with John while I was living in Papua New Guinea for three years.

Johnston is not exactly a tropical paradise: it was used as a nuclear test site which led to plutonium contamination; in the 1960s biological warfare tests took place there; in the ‘70s it was used to store thousands of barrels of Agent Orange, which leaked into the ground, and in the 1990s Johnston was used to incinerate and thus dispose of stocks of chemical weapons. A major clean-up programme followed and, in 2003, the island was effectively closed to the public. It is now controlled by the United States Air Force and US Fish and Wildlife Service. Incidentally, the unusual shape of the island as seen in Fig. 4 is due to it being expanded by dredging and infilling: it has grown from just 46 acres in 1942 to 596 acres today. There is much more about Johnston on Wikipedia, see:

en.wikipedia.org/wiki/Johnston_Atoll

Pete Grillo’s AH3C callsign was also used for an eight-man DXpedition to Jarvis Island in 1990: AH3C/KH5J was active for 10 days in April of that year with Martti OH2BH among the operators. Pete also held no fewer than seven other US callsigns as well as DL5HI, PJ2RTT and T32BS.

Thanks to DX-World for drawing our attention to this story:

dx-world.net/a-step-closer-to-activating-kh3

Antennas return to amateur market

In the July 2024 *HF Highlights*, I reported that Martin Jue K5FLU, the founder of well-known amateur radio manufacturer MFJ, had announced that he would be retiring and therefore MFJ, along with its sister companies including Hy-gain, Cushcraft and Ameritron, would be closing down. In April this year came news that the Hy-gain and Cushcraft parts of the business had been acquired by the Indiana-



based ITU Corporation. Popular antennas such as the Cushcraft A3S and Hy-gain TH3 beams, and the Cushcraft R7 and R8 verticals, among other items, should soon be being manufactured again.

Around the same time came news that SteppIR antennas (Fig. 6) would also be returning to the amateur market. SteppIR had ceased producing amateur antennas in June 2025 in order to concentrate on the commercial side of their business. An announcement on SteppIR's website stated that several beams and verticals would soon be available once again and that "we believe we will be able to introduce some exciting new products... in the not-too-distant future".

<https://consumer.steppir.com>

The month on the air

Well-known Italian DXpeditioner **Elvira IV3FSG** was active as 3X3A from Roume Island (IOTA AF-051) in Guinea between 10 and 25 April. She used SSB, CW, FT8 and FT4 to make over 40,000 contacts in all.

Paul M0ZBH has been volunteering at Murang'a school in Kenya and is active as 5Z4/M0ZBH from mid-April until mid-June. He uses 100W to wire dipoles and is active in his spare time.

Z66SP was a Polish operation on SSB, CW and FT8 from Kosovo for six days from 23 April.

Three Italian operators were active as 7P8WR from Lesotho from 24 April to 1 May. Almost all activity was on FT8.

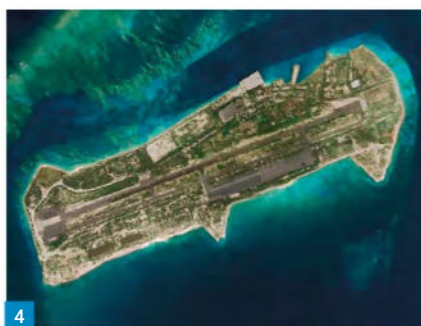
F4AGG and F5RAV were active as C5C and C5D on SSB, CW and datamodes, from Gambia between 25 April and 8 May.

What to look for in June-July

The FIFA World Cup takes place in the USA, Canada and Mexico in June-July and 16 special event stations (11 in USA, three in Mexico and two in Canada) will be active from the cities hosting the matches. Activity starts on 11 June and continues until the World Cup final on 19 July. The official website gives details of each of the stations and of a certificate available for those contacting the special event stations.

wc2026ses.org

A reminder to check the IARU HF



Championship contest on 11 and 12 July and hand out some points to those taking part in WRTC. Activity is on the six contest bands from 1.8 to 28MHz, though the WRTC stations won't be using 160m. Send an RS(T) report and your ITU Zone: the UK is in Zone 27. The rules are on the ARRL website at:

arrl.org/iaru-hf-world-championship

Readers' news

First up this month is **Carl Gorse M8HPI**, who reckons that married life is treating him well (see last month's HF Highlights), having enjoyed trips to the Isle of Wight and Blackpool. "We also visited East Yorkshire for a few days and activated multiple Parks On The Air locations, however, conditions didn't go as planned. I also did an activation at Grune Point in Cumbria on a overnight camp [Fig. 7], my first of many this year now the weather is getting warmer.... The Grune Point trip was excellent with around 300 logged, but all UK and Europe, sadly no DX despite getting up early. But I couldn't ask for a better sunset and sunrise! Let's hope next month brings more trips away and some DX contacts."

Martin Burch VK4CG near Brisbane in Queensland reports that he was "given a TYT 2m mobile radio by someone who was trying



Fig. 1: All the WRTC stations use these antennas. Fig. 2: WRTC 2026 logo. Fig. 3: Online station W2PH Radio features programmes about amateur radio. Fig. 4: Johnston Atoll is about 1400km south-west of Hawaii (photo from Google Earth). Fig. 5: My QSL from AH3C on Johnston. Fig. 6: The large SteppIR beam being put up at the station of Bert PJ4KY.

to get me to convert to the 'dark side'!... I sold a load of gear at the Redcliffe ARC hamfest the other month which had been accumulating for 10 years, including a Yaesu FT-1900 mobile which was mint condition sitting in its carton – and now I've got another 2m set... There is a sudden rush of MK1 Icom 7300 models appearing for sale due to hams upgrading to the MK2 version. A few gems coming up on VKHAM included a TenTec Orion2 with accessories for AUD \$3250." Martin said he would be tempted by these but work and other matters get in the way.

From Bedford, **Owen Williams G0PHY** wrote that "After the excitement of previous months April was a bit flat with most contacts made with European stations during World Amateur Radio Day and International Marconi Day. Marconi spent part of his childhood in Bedford from approx 1876 to 1880, with blue plaques on the houses he lived in. I did, however, work a couple of stations during the Florida QSO party. Yesterday morning FO/F6BCW was very strong on 14MHz from the Tuamotu Archipelago and today [11 May] HK4/PY8WW on IOTA SA-093 was strong also on 14MHz. That elusive 400th IOTA may yet get into the logbook."

Tim Kirby GW4VXE / GW4MM wrote that, since last month, "I seem to have worked four new DXCC entities, which isn't bad, considering the bands don't seem to have been that good. I was pleased to work **Elvira 3X3A** [in Guinea] on 15, 17 and 20m FT8 for a new country and

Fig. 7: Sunrise at M8HPI/P in Cumbria.

Fig. 8: A recent Parks On The Air activation by OS8D/P.

on 16 April I worked V85NPV for a new country on 17m CW. That was nice as I'd heard him around but not managed a QSO. Then on 1 May there was a CW contact on 15m that gave me a great deal of pleasure: D60DX. I'd not worked the Comoros from GW but of course it is a place dear to my heart, having been, like you, one of the operators at D68C [in 2001 – Ed]! ET3AA [Ethiopia] has been active over the last few days and my contact on 17m CW was an ATNO and I was pleased to catch the station again next day on 15m CW for a new band country. Conditions seem to be rapidly transitioning to the summer doldrums. Even worse, the overhead power lines have been very noisy here for the last three weeks or so. I imagine this is as a result of vegetation and the overhead power lines coming into contact with each other. Whatever it is, it's been significantly harder to listen to weak CW signals than usual."

Our man in Brussels, **Etienne Vrebos OS8D**, thought that conditions were not that good this month but at least he has now received his motorcycle portable rig, a Yaesu FT-891, back from the dealer after it had developed a fault (see last month's *HF Highlights*). **Fig. 8** shows OS8D/P back on the air again with his FT-891. The dealer said the transceiver had either suffered from a lightning strike or was zapped by a nearby transmitter, causing it to become totally 'deaf'. Etienne said "I got my 891 back within five days with an invoice of 42€... I think a good service is worth that money." Etienne also had some issues with his home station rig, an Icom IC-7610, and was advised to carry out a firmware update, something which he had "never been very eager to do". However, it was a complete success and it also added a new feature: Digital Pre-Distortion (DPD) on SSB, which corrects non-linearities in the final amplifier stage and results in an even cleaner transmission, with reduced distortion and 'splatter'.

28MHz beacons

The 28MHz beacon report for the period 1 to 30 April was compiled by **Neil Clarke G0CAS**. First this month a summary of Sporadic E within Europe. Openings took place on nine days, but unfortunately all openings were brief and very localised. They took place on the 2nd, 4th, 5th, 10th and from the 19th to 23rd. All openings were to Italy or Spain except on the 4th, when OE3XAC 28188, DL0IGI 28205, DK0TEN 28257 and DB0MFI 28285 were logged. Only SK7GH 28298 and ED1YCA 28226 were heard at the same time on the 5th. Hopefully, next month's report will cover some



7

major openings, fingers crossed.

Other than those in South Africa and South America, the DX beacons were very sparse. ZS6DN 28200 and ZS1TEN 28222 were heard on 22 and 18 days respectively, while PY2BBM 28198 and PY4MAB were heard on 27 and 23 days respectively. VK6RBP was logged on only three days, the 9th, 26th and 29th.

From Russia, RR9O 28200 was heard on the 5th and 8th. Even 4X6TU 28200 was only heard on 13 days. Openings to North America were very poor, with 4U1UN 28200 heard on only five days. W call area 4 was also heard on five days but areas 1 to 4 were logged even less than that. VE3TEN 28175 was the only Canadian beacon heard, on the 1st, 7th and 8th. Considering we are still in the sunspot maximum phase this was very poor.

Band highlights

Key: Q = <20W, M = 20 – 100W, H = >100W, S = Single-element antenna, B = Beam (see January *HF Highlights* for a more detailed explanation).

Carl M8HPI (MS) 14MHz SSB: 4X1DX, NC4XL. **21MHz SSB:** KY0R, N5WGA, PU2YES, PY5XT, W4TTO. **18MHz SSB:** K9ICP, KM7CSS, VE3KHR.

Martin VK4CG (MS): 7MHz SSB: K6ODI, N7RY, WU6T. **14MHz SSB:** AE2B, F5LIT, FK4UJ, ON5WO. **21MHz SSB:** JR1AYW. **28MHz SSB:** 4E9VVN, B4CRA.

Owen G0PHY (MS): 14MHz SSB: N4T, W4T.

Tim GW4VXE / GW4MM (MS): 14MHz FT8: 3X3A. **18MHz CW:** ET3AA, V85NPV. **18MHz FT8:** 3X3A. **21MHz CW:** D60DX, ET3AA. **21MHz FT8:** 3X3A.

Etienne OS8D (HB) 14MHz SSB: 4L1BB, CE1KR, EP5MM, FO/F6BCW, VK7ACE/P,



8

VP9NR, YN9H. **18MHz SSB:** ZF200. **21MHz SSB:** BH7FFR, YB8AO. **24MHz SSB:** C5D.

And finally, a few band highlights of my own: **Steve G4JVG (MS): 14MHz FT8:** 3X3A, HS0ZOY, VK7AC, VP2MAA. **14MHz FT4:** BI4KYT, VP8LP. **18MHz FT8:** 9V1YC, BU2FW, KL5EX, VP8NO, XU7O, Z81D. **21MHz FT8:** 7Q9JM, C5D, EP5TJS, EX8BT, J79WTA, T31TTT, TN8GD, V26K, XU7O. **24MHz FT8:** TT1GD.

Signing off

Thanks to all contributors. Please send all input for this column to teleniuslowe@gmail.com by the 11th of each month. Photographs of your station or antennas are particularly welcome. For the September issue the deadline is 11 July. 73, Steve G4JVG. **PW**

Tactical Mini

£48.50



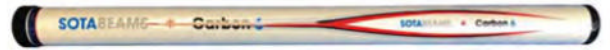
Fibreglass telescopic pole

Extended length 6 metres
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Weight approx 750g

Strong and compact
Supplied with camo bag
Built-in base shock absorber

Carbon-6 Ultra-light Mast

£48.50



Carbon-fibre telescopic pole, ideal for lightweight end-fed wire antennas.

Extended length 6 metres
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Weight just 315g

Small enough to fit in a rucksack, tall enough to support your antenna.

A highly portable light-duty mast.

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Noise Problems Solved

DSP NOISE CANCELLING PRODUCTS



ParaPro EQ20-DSP

- Advanced parametric equalisation system
- Improved audio for those with hearing loss
- Dual-channel DSP noise cancelling (9 to 40dB)
- Easily fits between your radio and extension speaker or headphones

In-Line Module

- 5W amplified DSP noise-cancelling module
- Works well across all radio bands
- Connects easily between radio and loudspeaker
- 8 adjustable filter levels (8–40 dB)
- Advanced DSP separates speech from noise

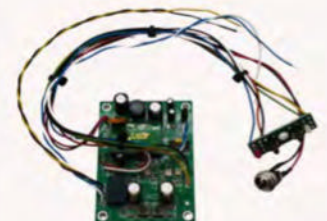


Dual In-Line

- Dual channel DSP noise cancelling in-line module
- 8 filter levels, 8 to 40dB
- 7W mono speaker output
- Separate 3.5mm speaker level input & line level input & output
- Separate headphone output

NEDSP1962-KBD

- Amplified DSP noise cancelling PCB module
- Provides up to 40 dB of noise reduction and 65 dB of tone reduction
- Easy to install pre-wired retrofit module
- Suitable for most extension speakers
- 8 filter levels & simple controls
- Includes full fitting kit & install instructions



Ben Lloyd GW4BML

practicalwireless@warnersgroup.co.uk

In a world where portable HF radios often feel like bricks disguised as 'lightweight equipment', the **QRP Labs QMX** arrives like a breath of fresh mountain air. Designed by the everbrilliant **Hans Summers G0UPL**, the QMX is a fiveband CW/SSB/digital transceiver that punches far above its weight - literally and figuratively.

For travelling operators, SOTA enthusiasts, and anyone who believes a radio should fit in a satchel without causing spinal damage, the QMX is a revelation.

Barcelona beginnings: CW only and loving it

My first real outing with the QMX took place on the sundrenched summit of **Castell de Montjuïc (EA3/BC086)** overlooking Barcelona. At the time, the QMX was CW and Digital only, the SSB firmware was still a twinkle in Hans' engineering eye.

But even in its early form, the QMX impressed. My very first contact? **WOCCA**, across the Atlantic. From a hill in Barcelona. On 5 watts. Not bad for a radio that weighs less than a packet of biscuits.

I quickly qualified the summit, working friends back home in GW with ease. The CW filtering was tight, the audio clean, and the ergonomics surprisingly intuitive for such a compact unit.

And the weight, or lack of it, was almost unsettling. I genuinely thought I'd forgotten half my kit.

Built for travellers, trailgoers, and minimalists

Because I travel frequently for work, I'm always hunting for a radio that can slip into a suitcase without raising eyebrows at airport security. The QMX fits that role perfectly. It's compact, rugged, and so light that you'll check your bag twice to make sure it's actually in there. And because the battery is separate, you can pack the radio itself in your hold luggage without any issues, which makes airport travel even easier.

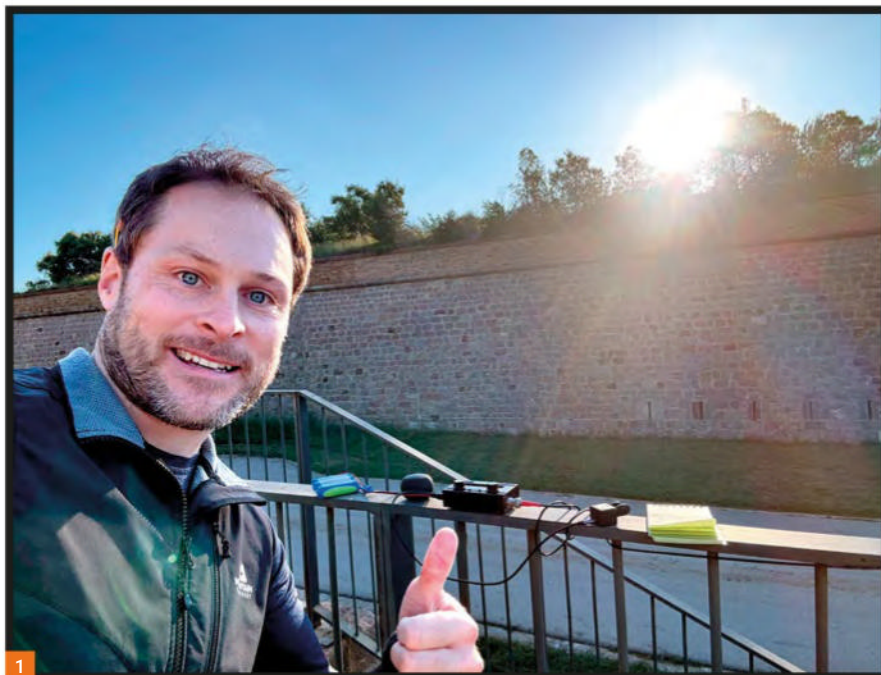
Even before SSB arrived, the QMX became my goto travel radio. CW only wasn't a limitation, it was an excuse to enjoy the purity of QRP Morse in beautiful places.

The firmware drop heard around the QRP world

Months later, rumours began circulating online, SOTA Reflector threads, email groups, and the usual digital watering holes, that Hans was working on an SSB firmware update.

Then it happened: The first BETA SSB firmware was released.

I waited a couple of months for the early bugs



A New Contender in the UltraPortable Arena

By a roaming SOTA activator who values lightweight gear almost as much as a good cup of summit coffee.

to be ironed out (being in electronics myself, I know bugs are as inevitable as rain in Wales). Once firmware **version 3** landed and reports were glowing, I updated my QMX and headed for the hills.

Rhialgwm (GW/NW046): the SSB trial by fire

With the new firmware installed, I took the QMX up **Rhialgwm** for its first SSB outing. Again, the rucksack felt suspiciously empty, this radio really does make you feel like you're cheating the laws of physics.

I fired up on 7 MHz SSB, called CQ, and within seconds a tidy little pileup formed. 16 stations later, all giving excellent reports and complimenting the audio, I was grinning like a kid with a new toy.

The receive audio was crisp, the transmit audio surprisingly full, and the QMX handled everything with the calm confidence of a radio ten times its price.

Technical impressions

Once I started exploring the menus in more depth, I realised just how astonishingly configurable the QMX really is. Hans himself describes some of the settings as

'embarrassingly configurable', and honestly, he's not wrong, but in the best possible way. This is a radio that lets you tailor almost every aspect of its behaviour, yet still remains friendly enough for operators who simply want to get on the air and sound good.

AGC & receive behaviour

The default AGC parameters are intentionally gentle, conservative, even. They work well in most environments, but when operating somewhere quiet like a SOTA summit, lowering the AGC threshold gives a noticeably more responsive and lively receive. It's one of those areas where a little experimentation pays off.

New firmware features

The latest software update also addresses the previous restrictions on battery supply voltage by allowing full control of the maximum PA voltage. This prevents transmission above a user-defined battery voltage, effectively removing the earlier tight 12V limitation, a very welcome improvement for portable operators using a variety of battery packs.

Another excellent addition is the new SWR protection feature. When my SWR was too high, the radio displayed an 'S' on the screen and

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automatically disabled the CW sidetone. You can choose how the SWR protection resets; I've set mine to reset with a press of any button, which works beautifully in the field.

In the Hardware Tests menu, the new 'Tune SWR' option provides real-time SWR reporting at reduced output power. This is absolutely brilliant when using a manual tuner, making it far easier to dial in a perfect match without stressing the PA.

Microphone & SSB configuration

The latest firmware reorganises the SSB menus into clear **Microphone** and **USB** submenus, making navigation far more intuitive.

- A few standout settings from my own testing:
- **Controlled Envelope SSB (CESSB):** Leave it ON. It gives around a 4dB boost in average power and keeps the audio clean and punchy.
- **Drive Level:** Although the radio allows values up to 999, I've settled on **950**, which leaves a little headroom and ensures nothing is being overdriven.
- **Mic Gain:** I have mine set at 55, but best adjusted using the builtin mic test tool - a brilliant touch.
- **Compression:** Even at 10dB it still sounds natural, but a modest setting gives the best balance, I have mine set to 14dB.
- **Noise Cancel:** Leave it on. It quietly removes ADC noise without affecting your voice.
- **Noise Gate:** Handy for stopping lowlevel background noise when you're not speaking.

Predistortion & signal purity

The QMX includes phase predistortion, which becomes active after running the SSB calibration routine. Once calibrated, it gives a small but worthwhile improvement in signal purity. Even without it, the QMX already sounds excellent, but it's impressive to see this level of DSP sophistication in such a small, affordable rig.

Filters & equalisation

The parametric EQ is another area where the QMX shines. You can shape your transmit audio with surprising precision, and the onscreen graph updates in real time as you adjust the parameters. For DX work, rolling off the bass and adding a touch of treble gives that classic 'punchy' profile.

On receive, **2.5kHz** feels like the sweet spot for SSB, though the radio will happily go wider if you prefer a more open sound.

CW operators aren't left out either, the QMX offers filters from **50Hz to 500Hz**, giving you everything from razorsharp contest filtering to a more relaxed, generalpurpose tone.

A word on accessories: the new G1JKS microphone

No review of the QMX would be complete without mentioning the excellent new microphone designed by **Dr Dave Pegler G1JKS** - affectionately known for his "Just Keep Smiling" ethos. Dave has engineered a robust,

Photo 1: Operating from Castell Barcelona.

Photo 2: QMX and microphone atop Phialgwm.

travelfriendly microphone specifically tailored for the QMX, and after testing one myself, I can confidently say it pairs beautifully with the radio. Reports on air were consistently strong, with operators commenting on the clarity and warmth of the audio. It feels solid in the hand, built to survive the realities of portable operating, and complements the QMX's lightweight design perfectly. The microphone has now been officially released in many colours, and based on my experience it's well worth a look - you can find it here:

www.ebay.co.uk/itm/137110358550

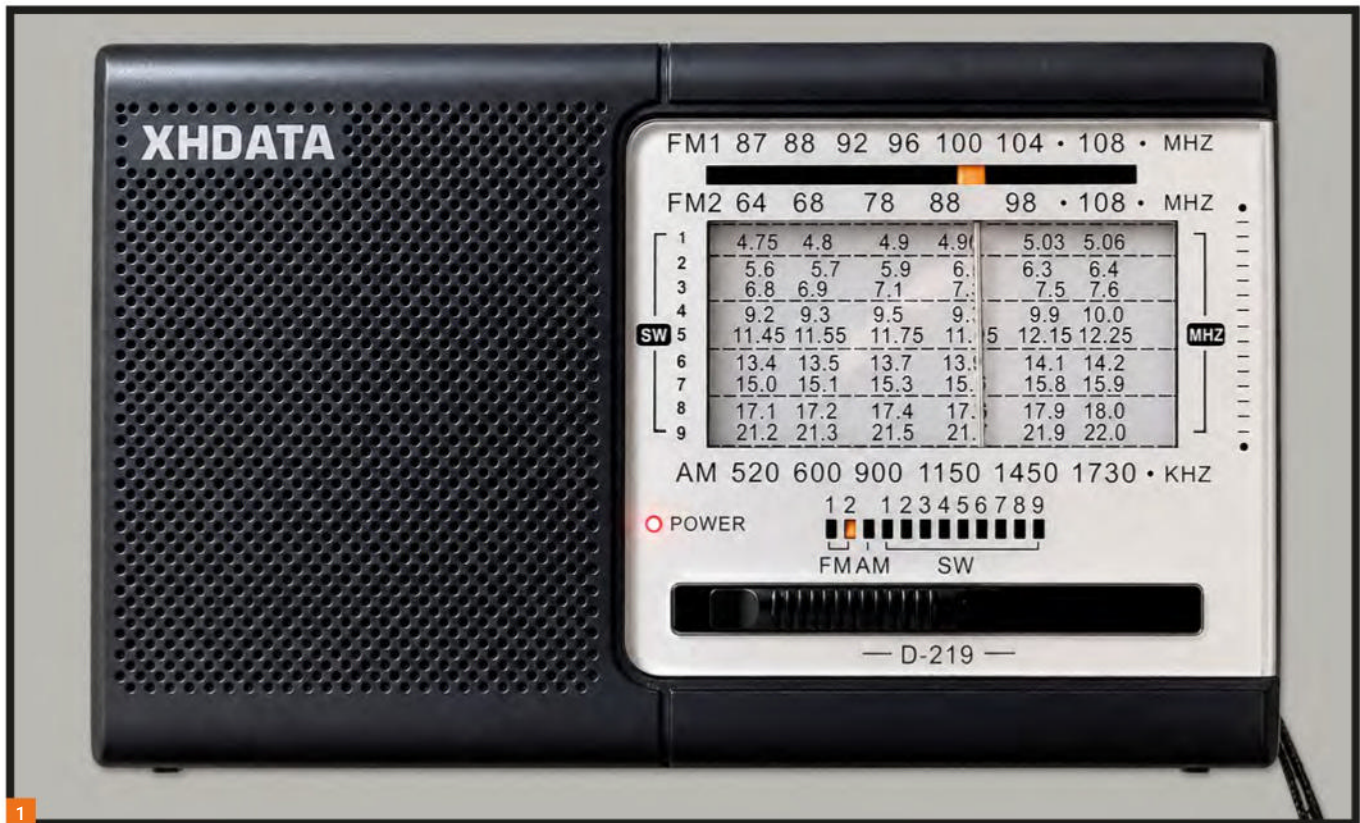
Final verdict: Hans has created something Special

The QMX has become my goto radio for travel, SOTA, and lightweight operating. My Elecraft KX2 still holds a special place in my heart, but the QMX, at a fraction of the price, size, and weight, has carved out its own welldeserved niche.

Hans Summers has done a phenomenal job. His engineering is precise, elegant, and genuinely innovative. The QMX isn't just a good radio - it's a market disruptor.

Lightweight, capable, affordable, and now fully SSBready... The QMX simply works. And it works brilliantly. **PW**

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1

Tony Jones G7ETW
charles.jones125@yahoo.co.uk

I have just bought a transistor radio, the XH D-219, on Amazon. I only needed AM and FM, but for just £8.48 I got SW as well. This Chinese radio is well established in the SWL world. It's not just a bargain, people say it's a genuinely good radio.

Fig. 1 shows my D-219. This is the latest version. See **Table 1** for a summary of the differences between this and the original, of which two models were sold.

Design and controls

Solidly made, the D-219 neither looks nor feels 'cheap'. Plastic body aside, this reminds me of a Sony ICF SW20 (see **Fig. 2**) I once had. D219 design features are

- 12 bands selectable via sliding switch
- 'Analog' tuning indicated by vertical bar that travels across the bands
- Two overlapping FM ranges
- Side tuning and volume controls
- Power-on LED
- Seven section 52cm telescopic antenna with 360° movement
- Internal ferrite bar antenna for MW
- External DC socket
- 3.5mm headphone socket
- On/off switch
- Leaning stand on back
- Battery compartment for two AA cells

The XH D-219

Tony Jones G7ETW reviews a very cheap radio from Amazon. Is it too good for the price to be true?

This really is a clever design: an old-school interface grafted onto an up-to-date DSP radio. Yes, XH could have given the D-219 an OLED display and 'digital', that is numeric, tuning but they were obviously going for 'retro' - and the minimum possible cost!

Powering the radio

The D-219 runs on two AA cells. Battery life is hard to predict. XH don't commit themselves, and other reviewers quote hours to months. I've tried to be scientific about this, using current draw and capacity figures. **Table 2** shows my readings, **Fig. 3** is an extract from a Duracell datasheet.

Assuming modest volume speaker use, 35mA seems a fair operating current to me. With a 1.2V cell cut-off, and interpreting Duracell's

graphs by eye, 100 hours is my guess for battery life. Duracells last 40% longer than 'ordinary' cells, so says their marketing, so this drops to 70 hours for Zinc-Carbon batteries, probably less for 'poundshop' ones.

The DC socket is the coaxial type, clearly marked 5V. A Yaesu FT-817 plug (4mm outside, 1.7mm pin diameter) would, I think fit, but I don't have any to try this at the moment.

The external 5V is 'regulated' - by one diode! But the main chip in the radio takes a maximum 3.6V DC supply, according to the datasheet. Other reviewers report no problems, but have any actually tried this, I wonder? I need to test this properly before I'll just assume 5V is safe to use.

The D-219 has a dedicated on/off switch. Combined volume/on-off controls are cheaper for

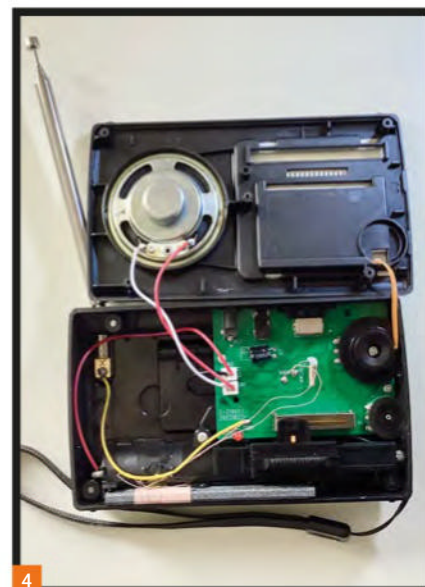
Release	Colours	DC socket polarity	MW range (kHz)	FM ranges (MHz)	Filtering (kHz)	Intended market
2022	Dark green, off-white and grey	Negative	522 to 1620	87 to 108, 64 to 87	9	Asia and Europe
2022	Dark green, off-white and grey	Negative	520 to 1710	87 to 108, 64 to 87	10	USA
2025	Pale green, off-white and grey	Positive	520 to 1730	87 to 108, 64 to 108	1	World wide

Table 1: Version history

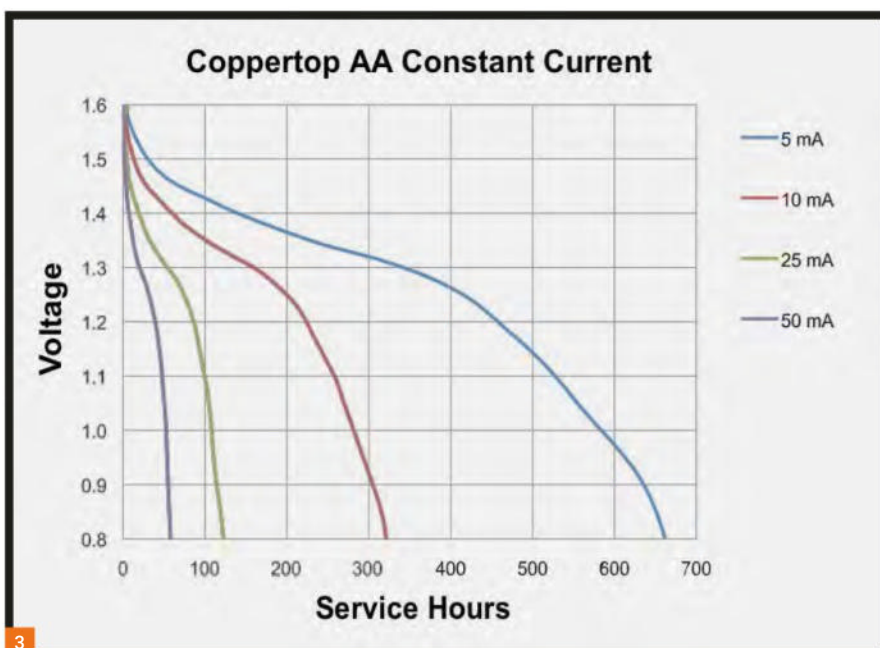
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2



4



3



5

Fig. 1: Front view of D-219.

Fig. 2: Sony SW20 of yesteryear.

Fig. 3: Duracell data.

Fig. 4: Internal view of D-219.

Fig. 5: The Si4825 side of the board.

manufacturers, but the switch is a common cause of failure. By separating these functions, both switch and potentiometer should have longer lives.

Inside the radio

Fig. 4 shows inside my D-219. Fig. 4 shows the other, busier side of the board. The heart of the radio is a Silicon Labs Si4825 chip, invented in 2013. This is a DSP radio-on-a-chip with wide frequency coverage and AM/FM capability.

The other chip is a D2822 audio amp (15V maximum supply; no problem there). Some sellers and reviewers say, or at least imply, that

a D-219 outputs FM in stereo via the headphone socket. Well, it doesn't; the D2822 here is in bridge mode.

The tuning bar mechanism is crude, but ingenious. There is an orange plastic strip, top right in Fig. 4. One end attaches to the tuning potentiometer, the other end disappears into the band display window. As the wiper rotates, this plastic strip pushes and pulls the top of the tuning bar in the front panel.

Sound quality

XH doesn't specify audio power out, but the D2822's datasheet tells us that with a 3V supply,

the chip produces 380mW (mono, bridged). This is plenty of volume for a small unit like this.

The 5cm speaker lacks bass, there is low-level hiss audible through headphones and at high volume, on speaker and headphones, there is noticeable distortion. Is the audio quality 'poor', then, a reason not to buy? No, I'd say. The sound is perfectly adequate for a pocket radio at this and much higher price points.

Reception

With DSP comes tuning 'chop', of course, that staccato sound heard as tuning progresses in discrete steps. D-219s manifest this. Not

Speaker: Volume: Current draw (mA).

Barely audible: 30. Maximum: 55.

Headphones: Volume: (Current draw) (mA)

Barely audible: 18. Maximum: 24.

Tests done on FM, MW and SW. No difference observed.

Table 2: Battery Life

all DSP receivers do; some receivers mute the audio when tuning. Opinions among SWLs are divided on that - some like the pseudo-analogue 'tuning into a station' experience, others prefer their radio's AFC (automatic frequency control) to do the heavy lifting. With a D-219, only when actually tuning is this sound audible. I don't mind it, personally.

FM reception is crisp and clear, and, where I live, the antenna does not need extending. The DAB/FM radios I have are not nearly as good on FM.

The D-219 has two FM frequency ranges to cover the many different FM allocations around the world. FM1, 88 to 108MHz, is the UK allocation, but FM2 includes 70MHz, and there is 4m activity around me. I think I'm unlikely to hear anything, because a 12.5kHz amateur radio signal is very narrow for this radio, but I shall try.

1kHz tuning is precise, despite the band window being just 5cm wide. The tuning wheel turns with enough resistance to make this feel like a nice radio.

The telescopic antenna is not robust - are they ever? I've already got a little bend in the top section. By retracting the antenna with exaggerated care I shall delay the inevitable repair as long as I can.

During the day, indoors, I hear MW stations, but not many. At night I hear more, but I'm not convinced. Systematic testing is needed before I praise or pan the D-219's MW performance.

I'm hearing SW stations too, day and night. But with such analog tuning, I don't know what I'm receiving, except for China Radio International, which booms in on 11MHz. Clipping a 5m wire to the telescopic antenna actually makes things worse, bringing in lots of hum and noise.

Conclusion

The D-219 is a brilliant little radio, despite my MW doubts. It looks nice, it's small, it's light, and it's not a worrisome thing to take out and about. It's a lot of fun.

STOPPRESS

I regret to report that my D-219 has packed up, after six days of careful and light use. The radio won't power on. I suspect the battery isolation switch in the DC socket has failed. I could modify this easily enough, but it is a brand new radio and it did cost me £8.48, so I've returned it to Amazon. What a shame! I don't like ending a review on a low note, but that's what happened. I honestly did like this radio. **PW**



QMX+ QRP Transceiver: First Thoughts

Roger Laphorn G3XBM plays with the QMX+ from QRP Labs.

Roger Laphorn G3XBM

practicalwireless@warnersgroup.co.uk

Because of my poor fine motor skills these days, I decided to buy my QMX+ transceiver from QRP Labs ready built and cased. Years ago I would have built the kit and enjoyed assembling it. Last year I obtained a QDX transceiver, which was excellent for digital modes and unbelievably small.

The QMX+ uses the same firmware as the far smaller QMX transceiver but covers 160m to 6m. Judging by the size and the fact that SMA parts are already fitted, I would expect most people with reasonable soldering skills to be able to build it and enjoy the experience. Be sure to use a suitable soldering iron as with the 6-layer board used heat can be drawn away from joints.

With the software supplied, it covers CW and all WSJT-X digital modes, with SSB due with a later firmware release (*now available – see GW4BML's review in this issue – ed.*). It already has an internal microphone in readiness for SSB. It is a QRP radio with 5W output maximum.

Hans Summers G0UPL makes some very sophisticated kits at very reasonable prices. He once wrote software for the financial industry but has built a very successful kit business. If Hans designed it, you can be sure it is good.

Mine has been used so far on 17m and upwards and I have had no issues at all getting spots and contacts on FT8 from across the world with a

low wire antenna on 10m. In my view the QRP power is fine. As an added precaution, I added a few diodes (suitably rated) in the power lead. The maximum rated supply voltage is 12V, so I played very safe. My power was probably just a few watts!

Among the very many features are:

- Memories to store messages.
- Presets for often used frequencies.
- Protection against high SWR.
- Built-in tools to help building and testing.
- 2 VFOs
- Optional real time clock.
- Small size (about the same as the FT-817 but a different shape).

This is a very well designed transceiver at a very competitive price. If, like me, you no longer feel able to build it, perhaps buy it ready built and cased. To many it will be a low-cost introduction to the hobby. This is a very good SDR based transceiver. For many people it is the only rig they will ever need, especially now that SSB has been added. **PW**

References

QRP Labs:

<https://www.qrp-labs.com>

QMX+:

<https://www.qrp-labs.com/qmxx.html>

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Don Field G3XTT

practicalwireless@warnersgroup.co.uk

The first World Radiosport Team Championship event was held in July, 1990 in Seattle, Washington, United States and was timed to coincide with the Goodwill Games being held that summer in the same city. The Goodwill Games were established by the late **Ted Turner**, media mogul, in reaction to the political troubles surrounding the Olympic Games of the 1980s. The intention was to bring together competing nations, particularly the USA and Russia, in a spirit of goodwill. In 1990, radio amateurs decided to do something similar, to bring together amateur radio operators from the USA and Russia along with participants from other countries, highlighting the international aspects of the hobby.

Teams of two competitors each operated in a unique, one-time contest, created specifically to coincide with WRTC. All of the stations used by the WRTC teams were located at existing amateur radio stations in the Seattle area. 22 teams of two operators each represented 15 different countries. In addition to the two team members, a referee was present at each station to monitor compliance with the WRTC rules.

The event was successful (although the actual Goodwill Games didn't survive) and has been held every four years since (five last time, because of COVID), the second one in San Francisco but subsequently in Slovenia, Finland, Brazil, Russia, the USA again, then Germany and Italy. This year's event will be hosted in the UK, hence I felt it worthwhile drawing the attention of *PW* readers. It's a big deal, with two-person teams coming from all over the world to participate in a radio contest (timed these days to coincide with the IARU Contest in the middle of July). These days special efforts are made to invite not only the world's top contesters (who undergo a selection process based on their results in major contests over the preceding years) but also youth participants – the upcoming generation of amateur radio contest operators. Each team is overseen by an independent referee, to ensure conformance to the rules (which have evolved over the years).

I have some 'previous' with WRTCs, having been a referee in Brazil (2006), a judge in Moscow (2010) and Massachusetts (2014) and a referee again in Italy (2023). One of the key features of these events is not so much the contest itself as the camaraderie – meeting friends who we have probably contacted many times over the radio but never before met in person. The organisers usually put together a programme for the days leading up the contest by way of local visits, dinners, etc and the event always ends on the Monday evening after the contest with the announcement of the results, a formal dinner and local entertainment.



WRTC 2026

Don G3XTT looks forward to this year's WRTC, to be hosted in the UK for the first time.

The 2026 event

This year's WRTC will see competitors, referees and supporters arriving on Wednesday 8 July and departing on Tuesday 14 July. The main location will be Wyboston Lakes Resort in Bedfordshire. The 50 teams will be operating over the weekend from locations throughout East Anglia, from sites that have been chosen to be as similar as possible in terms of propagation, the idea being to 'level the playing field' in order to determine the best operators (normal radio contesting is affected by location, station and antennas, etc). Volunteers from around the country will have helped to build all the stations, Field Day style, with tents and identical antenna systems at each location – a mast with rotatable triband antenna and dipoles for 40 and 80m. The participants are allowed to bring their own gear but power is limited to 100W, and monitored on site.

How does this impact you, the reader? Well, those of you living in East Anglia may already have been approached to help with station building. Those of you elsewhere can have fun working the participants on as many HF bands as possible (80, 40, 20, 15, 10). The callsigns to be used will be a closely guarded secret until minutes before the contest but then all should be revealed. Suffice to say, they will be special callsigns, probably short, and as similar as possible so no team gets a particular advantage. I'm sure spots will start appearing on DX Summit, the Reverse Beacon Network and elsewhere as soon as the contest starts. And who operates from which of the 50 locations will be determined by a draw in the days leading up the contest weekend.

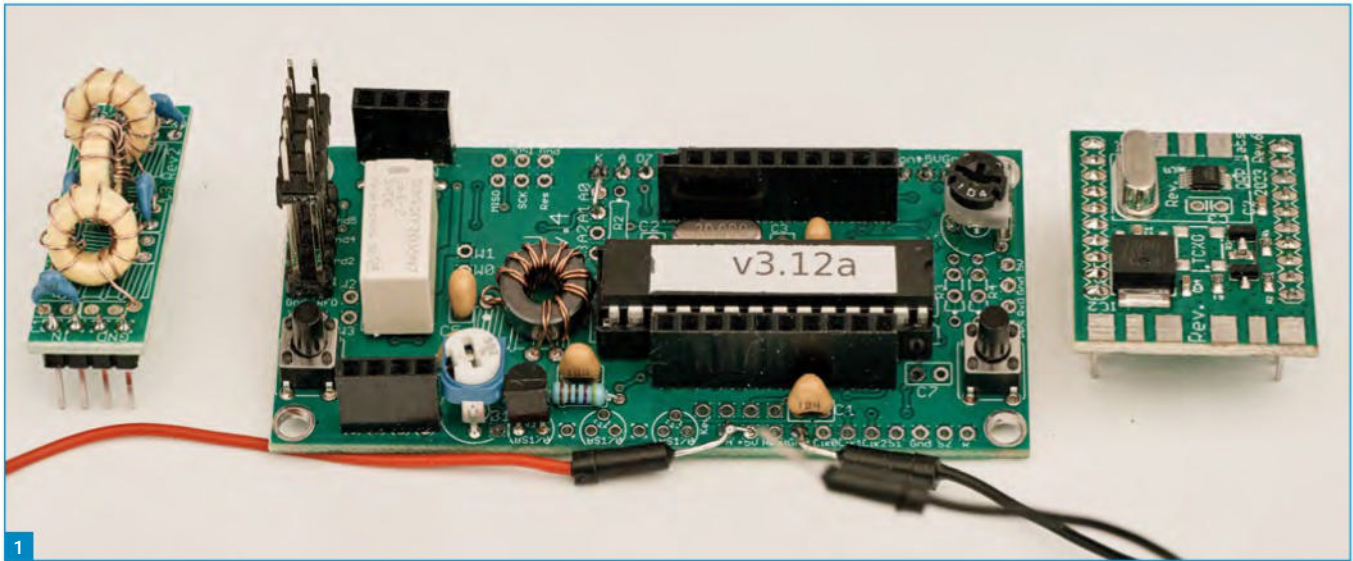


Photo 1: Competitors and referees meet for a pre-contest briefing in Italy, 2023. **Photo 2:** The antenna system at one of the operating locations in Italy – the masts and antennas were subsequently shipped to the UK for WRTC 2026.

Putting on an event of this nature requires a massive amount of logistical effort, raising funds, selecting sites, securing antennas, tents, generators and other hardware, organising the hotel, trips for wives and other visitors and so on. And this time there have only been three years to put all this together, given that the Italian event was delayed by a year. So all credit to the team, led by **Mark Haynes MODXR**, but including many others.

I will not be at this year's event in an official capacity but will attend as a visitor and will do a write-up for *PW* in due course. I'm sure it will be great fun as always and I wish the organisers every success (and a welcome relief afterwards!). **PW**

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Mike Richards G4WNC
practicalwireless@warnersgroup.co.uk

Regular readers will be pleased to hear that I've finally finished building my QRP-Labs Ultimate3S Multi-mode QRSS Beacon Kit. The delay wasn't because it was a difficult kit, but just trouble finding time in my busy diary. When I got around to it, I built the main and relay boards in an afternoon. That just left the filter sets to finish the following day. I had ordered the kit complete with the 6-band switched low-pass filters so I could automatically transmit on multiple bands. Although each filter was a simple three inductor, four capacitor design, each toroid inductor had to be hand wound. This was not a difficult task as even the 80m coils only required 25 turns each.

For those that have not read the history of this project, let me provide a brief introduction. QRSS is actually a very slow speed Morse transmission mode used for sending and detecting very weak signals over long distances. The name comes from the Morse Q code to slow down, QRS. In QRSS transmissions the sending speed is significantly below the speed where it can be recognised by ear. Instead, a spectrum display is often used to recognise the patterns of dots and dashes and decode the short messages. In addition to extremely slow speed, the mode also uses very narrow bandwidths. Clearly QRSS is a very specialist application and hence there's not a lot of activity. When planning this kit, QRP-Labs recognised that the technical elements you need to build an automatic QRSS transmitter can easily be adapted to generate a wide range of other low power, weak signal, modes. In fact, the list of potential modes is huge and the Ultimate3S kit can be configured to transmit all the modes listed in **Table 1**. In

Ultimate3S Multi-mode QRSS Beacon

Mike G4WNC starts by describing this kit and how to build it before updates on RTL-SDR Blog V4 and VarAC.

addition to that vast range of modes, it can also be set to transmit customisable patterns. As you can see, if you want to experiment with just about any of the low power modes, the Ultimate3S makes an ideal starting point. This is why I decided to buy the kit.

The kit

Like all QRP-Labs kits that I've encountered, the project is well thought through and supplied with comprehensive instructions. I will stress however, that it's critically important to read and understand the instructions before you start. There is nothing complicated about the build but, if you've not paid attention, it's easy to solder a connector on the wrong side of a PCB. That then becomes a problem to safely remove and reattach.

The project is modular with options, so you can choose the combinations you need for your application. At the heart of the transmitter is the main board that contains the microcontroller and the PA stage, **Fig. 1**. The PIC microcontroller is supplied pre-programmed so will kick into life as soon as the unit is powered up. One option to note on the main board is the winding of the PA output transformer. You can either wind this as a simple inductor or use a bifilar winding. With a simple winding the single BS170 output power is around 200mW. However, with the bifilar

winding this can increase up to 500mW. It all depends on your application but I suggest using the bifilar winding as that gives more potential for the future. The RF drive in the Ultimate3S is controlled by a pre-set potentiometer so you can easily adjust the power to your desired level.

The frequency synthesiser that generates the transmit frequency is supplied on a plug-in board that fits on to the main board. It was originally an AD9850 based design but has evolved to use the popular Si5351 multiple output clock chip. With the latest model you have the option of a 27MHz crystal reference oscillator, **Fig. 2**, or a more stable TCXO (Temperature Controlled Xtal Oscillator), **Fig. 3**. Both synthesiser options are supplied with all SMD components soldered in place and you only need to attach the two rows of connecting pins. One word of warning here. Be very careful to insert the synthesiser board the correct way around when plugging into the main board. I got careless during the testing phase and plugged mine in the wrong way around; result – one dead synthesiser!

Next board to build was the relay switched LPF (Low Pass Filter) board. This is only required if you need the multi-band option. Construction was simple with only through-hole components to be added. When doing this, be careful of the diode polarity as it's easy to make

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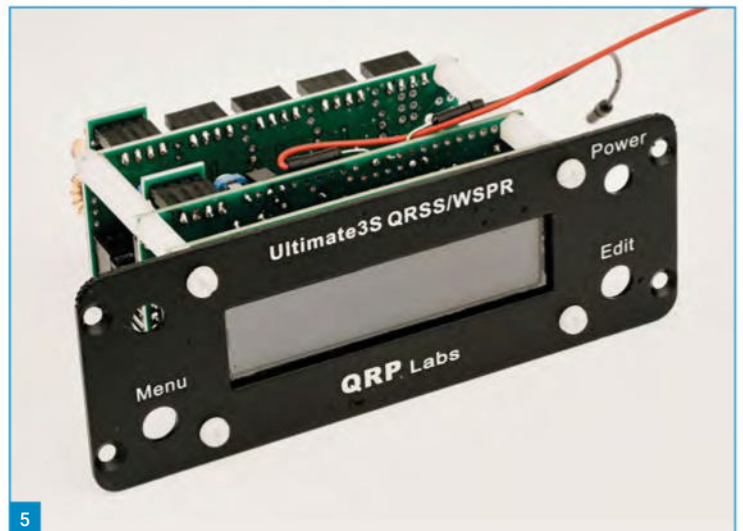
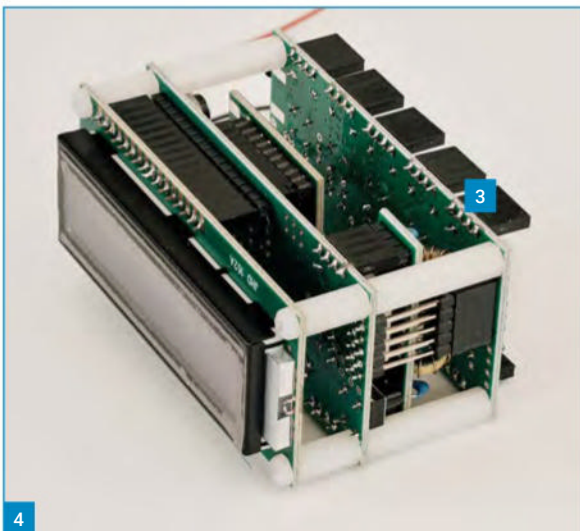
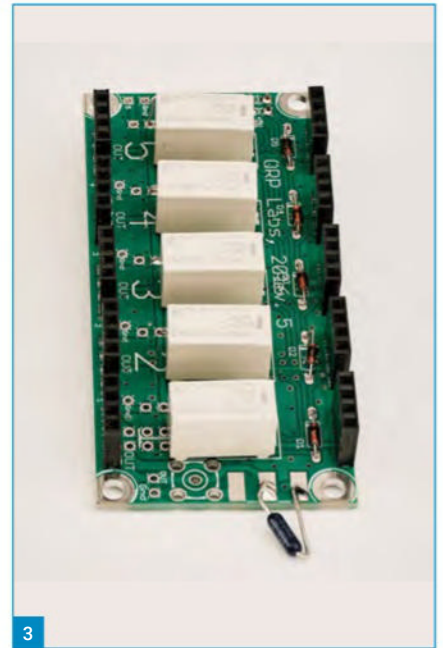
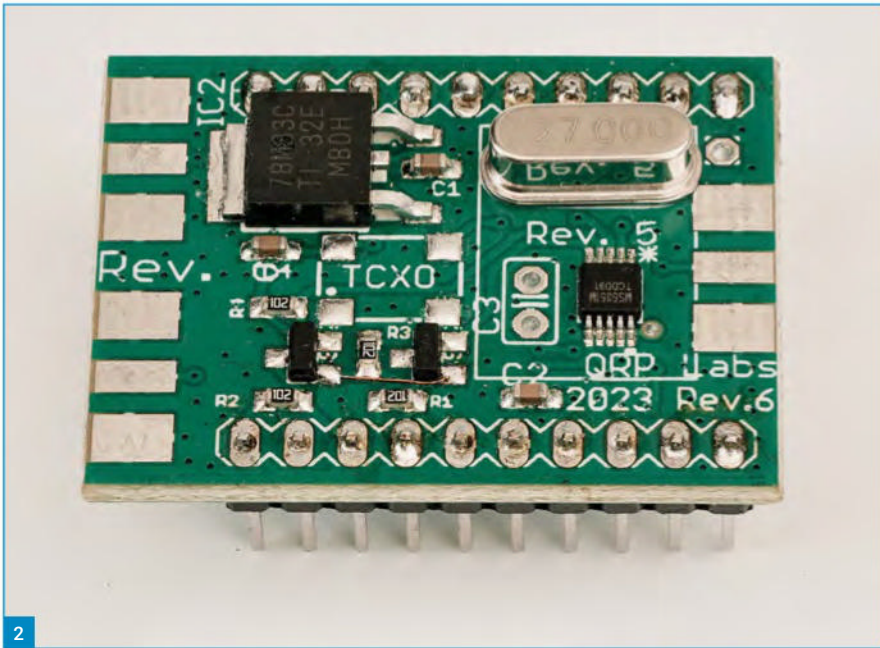


Fig. 1: Ultimate3S main board.

Fig. 2: Ultimate3S 27MHz xtal synthesiser.

Fig. 3: Ultimate3S Relay switched LPF board.

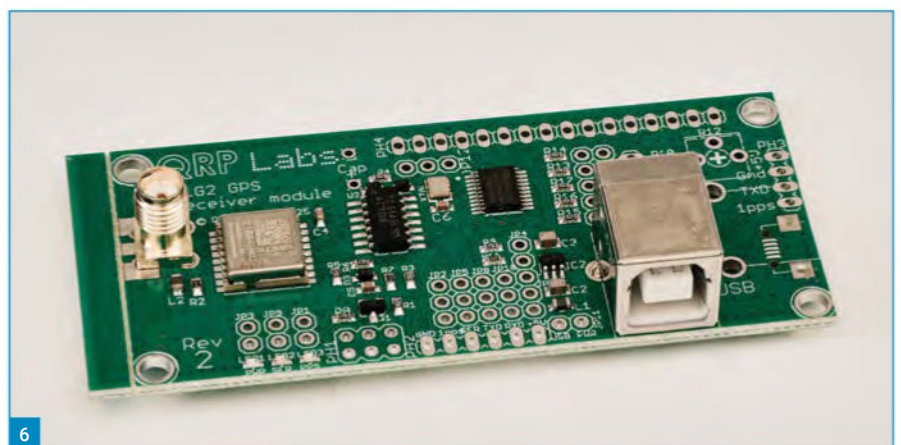
Fig. 4: Ultimate3S modules assembled.

Fig. 5: Ultimate3S mounted on the front panel.

Fig. 6: QRP-Labs QLG-2 GPS breakout board.

a mistake with the small components. As you can see from Fig. 4, the relay board has space for five low-pass filter boards to plug in. The sixth board is mounted on the main board thus providing a choice of six transmit bands.

The most time-consuming part of the filter build is winding the inductors, though this gets a lot quicker once you've wound a couple. One precaution I take, when winding the inductors, is to check the inductance of each unit. There are lots of ways to do this; a popular choice being a dedicated component checker like the LCR45 from Peak Electronic Design. For this



project I used my FA-VA6 Antenna Analyser. This has an excellent component analysis mode where you can check the parameters of an inductor at its operating frequency. One

other tip with the filter boards, is to place and secure all the components before soldering them. I say this because the PCB is quite dense in places and it's very easy to block a

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hole with a blob of solder and it can be quite tricky to clear. Leaving the soldering till the end overcomes that problem.

Assembly

Once the display, main board and LPF board have been populated, the three boards can be joined together using the supplied nylon spacers and screws, **Fig. 5**. This makes for a very neat unit, as you can see. To complete the project, QRP-Kits have a custom aluminium case available. The three Ultimate3S boards mount on the front panel using four nylon screws as shown in **Fig. 6**. The case kit comes complete with all the switches, buttons and connectors required to complete the project.

Controlling the Ultimate3S

With so many transmit options available, the Ultimate3S includes a menu system to set the parameters and an EEPROM (Electrically Erasable Programmable Read Only Memory). The menu is a little daunting at first, but once you work it out, it becomes quite straightforward. The menu options are displayed on the two-line LCD display and navigation employs the two front panel buttons. I won't try and describe it here but, once you've read the process a couple of times in the manual you should be able to get to grips with it. Despite the transmitter's apparent simplicity, you can configure some sophisticated transmit options.

RF power

In addition to choosing a simple or bifilar wound output transformer, power can be increased by paralleling-up BS170s in the PA. There's provision for three BS170s on the PCB and the BS170s are all mounted with their flat face towards the PCB edge, making it easy to add a heatsink. An additional modification would be to increase the PA power supply voltage to 12V. This is allowed for on the PCB with a separate PA power supply pin. In this configuration you should be able to reliably get around 5 watts RF output. However, at those powers, you need to ensure good output matching because the BS170s can be quite fragile when driven hard at higher frequencies.

GPS board option

One more option that really completes the system is the QL2 GPS board, **Fig. 7**. This is an excellent GPS breakout board ready for use with many projects and is supplied fully assembled other than the SMA antenna socket and an optional USB socket. The board includes a voltage regulator and level converters for 5V outputs. The price is just \$23 (£17) plus carriage, which is a bargain! When used with the Ultimate3S, the PPS (Pulse Per Second) and data outputs are extracted. The PPS provides



an accurate timing reference for frequency and timing control and the NMEA data provides the detailed time/date and location information. With the GPS board added the Ultimate3S can self-determine its QRA locator and transmission time slot.

Next time

By next month I will have spent some time with the Ultimate3S and replaced the dead synthesiser board, so I can report on my results.

RTL-SDR Blog V4

Sad news regarding RTL-SDR Blog V4 which is probably the best example of an RTL-SDR dongle. This dongle relies on the Rafael R828D tuner chip which has been out of production for some time now. The team had managed to obtain some stocks of the R828D to keep the line running, but those stocks have now been exhausted. The good news is that the Blog V3 version will continue in production. For the future, the team are working on a new Blog V4L version that will use the new R828S chip. The downside being that this chip only has two inputs so the additional filtering of the old Blog V4 will be lost. However, it will include the HF upconverter that was introduced with the Blog V4. You can expect to see the Blog V4L available in small quantities in the next couple of months, whilst next year we should see the release of the all-new RTL-SDR Blog V5.

In the meantime, I suggest you only purchase from their authorised suppliers as there are

Fig. 7: RTL-SDR Blog V4 Dongle.

counterfeit Blog V4 devices out there. Many of these are just Blog V3s masquerading as Blog V4s and often using poor quality Blog V3s!

The quiet return of VarAC

While FT8 continues to dominate amateur data modes activity, there has been a recent and steady growth in practical keyboard and message-based modes, with the main contenders being VarAC and JS8. If you look at the data on PSK reporter, VarAC is always in the top six most used modes, and it is now treated as standard a selectable mode rather than an obscure niche option.

For many operators particularly those interested in remote operations, portable work or emergency communications the ability to send reliable email-style traffic. VarAC provides that facility.

As to the choice between JS8Call and VarAC, it's quite simple. If you're communicating over the weakest links, JS8Call will probably be the more reliable. However, for all other situations, VarAC wins due to the use of the VARA modem. This is an adaptive modem that continuously assesses the RF link quality and alters its speed and modulation to optimise the connection. As a result, the speed can increase significantly during moderate or good conditions, where it easily out paces JS8Call. It is for this reason that that VarAC is usually the best mode for keyboard-keyboard QSOs. **PW**

QRSS	FSK CW	DFCW
Hell	Slow Hell	FSK
CW	CW ID	WSPR
WSPR-15	Opera	P14
JT9	JT65	ISCAT
TX CW	TX FSK	

Table 1: QRP-Labs Ultimate3S Transmit Modes

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Yaesu FT-891 HF/6m Base/Mobile..... £649.00

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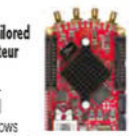
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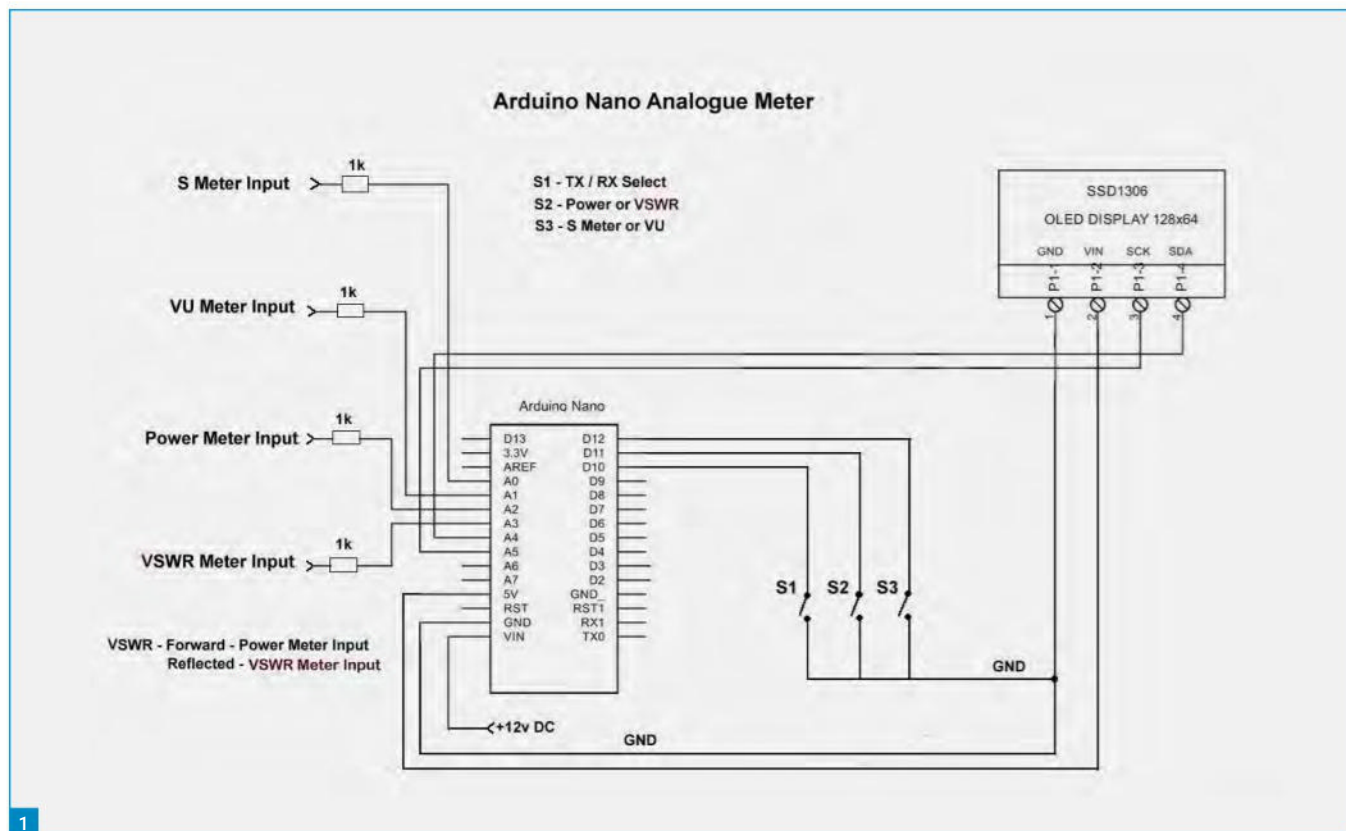
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1

Steve Macdonald G4AQB
g4aqb@outlook.com

In the past I have used lots of traditional analogue panel meters to measure and display various things. I remember the very nice SEW meters that looked modern and attractive. For a while now I had considered using an OLED to display an S meter or other functions. An Arduino Nano would be ideal for this if the necessary software was available. I came across the circuit of a simple VU meter along with the software to drive it. I built this up on a breadboard and found that it works well.

I wondered if anyone had made a similar circuit, but this time for an S meter. After some searching on the internet, I came across an experimental design to display different types of meters, including an S meter, Power meter, VU meter and VSWR meter. The circuit was adapted to use with an Arduino Nano Microcontroller and makes a fun Take 20 project to experiment with.

Circuit

The circuit uses an Arduino Nano and OLED Display and can be used for a single meter or a selection of four different meters for use in a transceiver or similar, **Fig. 1**.

The input for each meter is applied to the appropriate analogue pins of the Arduino Nano. The 1kΩ resistors are optional and

Arduino Nano Analogue Meters

Steve Macdonald G4AQB uses an Arduino Nano to recreate the functions of analogue meters.

added for protection.

- A0 – S Meter
- A1 – VU Meter
- A2 – Power Meter
- A3 – VSWR Meter

Each meter can be selected by switching pins D10 – D12 as below, pin D10 selects transmit or receive depending on the type of meter selected.

- D10 – Transmit / Receive
- D11 – TX selected Power or SWR
- D12 – RX selected S Meter or VU

The switching is done by using miniature DIP switches.

The OLED display module is an SSD1306 OLED Display 0.96in (128x64) The software requires SD1106 drivers installed in the libraries, but my SSD1306 worked perfectly as the drivers are already installed.

Construction

Initially, I built the circuit as a test board to

include switch selection for each of the meters. However, if this is being used as part of another project, then you may only require a single meter, in which case the switching is not required. D10 – D12 would need to be hard-wired as required.

The circuit can be built on a breadboard to try out, but for a more permanent construction, I have used DuPont connectors and copper clad board to build a test board. I used single copper-clad board 9cm x 7cm with the copper side underneath.

The Arduino Nano module is glued to the plain side of the board with a glue gun and the OLED Display mounted on some small stand-off pillars, **Fig. 2**. The switching and input board is built on a small piece of Veroboard with header pins to enable links to the Arduino Nano. Short DuPont connectors are used to link together the pins on each module, **Fig. 3**. I used a small 0.96in OLED on this board. I used a small piece of Veroboard to make the

Fig. 1: Circuit Diagram.**Fig. 2: Completed test board.****Fig. 3: Switching and Input board.****Fig. 4: Shows test board along with Terminal and Breakout board with different sizes of OLEDs.**

switching between types of display on the test board.

Later, I tried using an Arduino Nano Breakout board and Terminal board with larger OLED displays. These can be mounted directly into a project or case.

Programming

The software needed for the Arduino Nano is downloaded from:

<https://tinyurl.com/mrxwtsbe>

The folder 'OLEDMeter' contains the Sketch.

You now need to have a copy of Arduino IDE loaded on your computer. You can find it here:

www.arduino.cc/en/software

Arduino IDE is used to upload the software that you need to the Arduino Nano.

You will also need to select the Arduino Nano library of boards. To do this, start up Arduino IDE and select 'Tools', 'Boards', 'Arduino AVR Boards'. You will then see a list of boards; select 'Arduino Nano'.

Now go to 'Tools', 'Processor' and select 'ATmega328P (Old Bootloader)' if you get errors after compiling, then go back and select just 'ATmega328P' and compile again.

You now need to open the Sketch that you have saved on your computer into Arduino IDE. The Sketch file is the one ending with .ino.

If you are using Arduino IDE for the first, you may need to install the necessary libraries. To do this, look at the Sketch under 'Libraries'. These are the ones with #include at the beginning of each line. Search for these using 'Tools', 'Manage Libraries' in Arduino IDE and download each one. (More information is shown in the comments on the Sketch.)

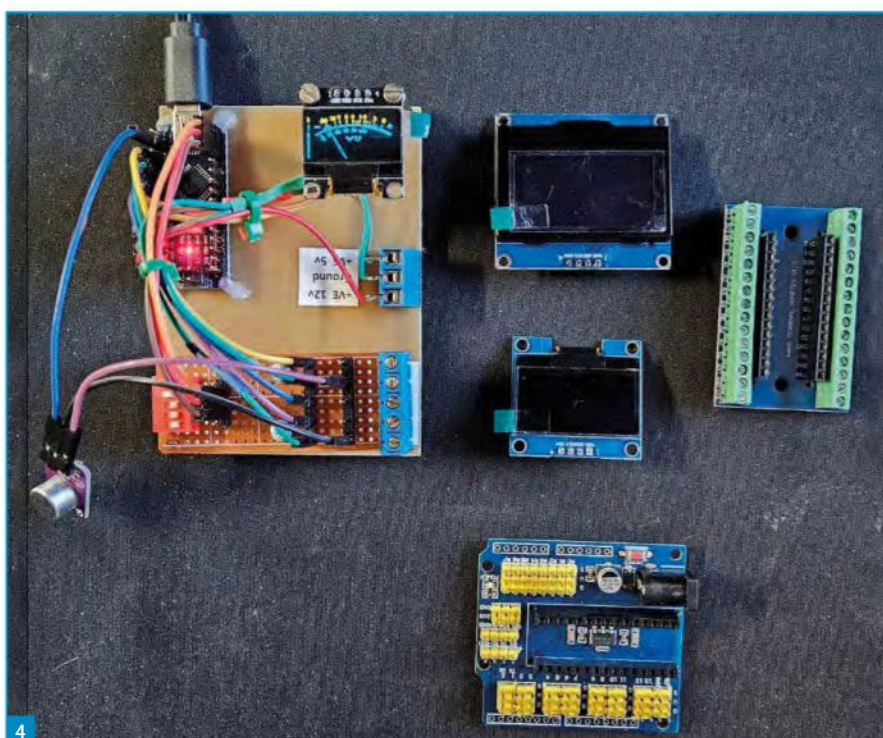
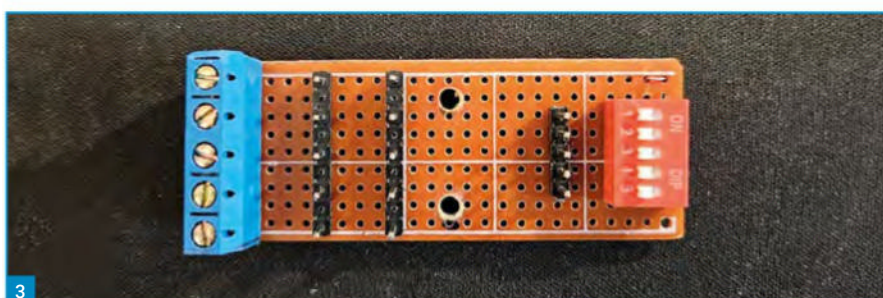
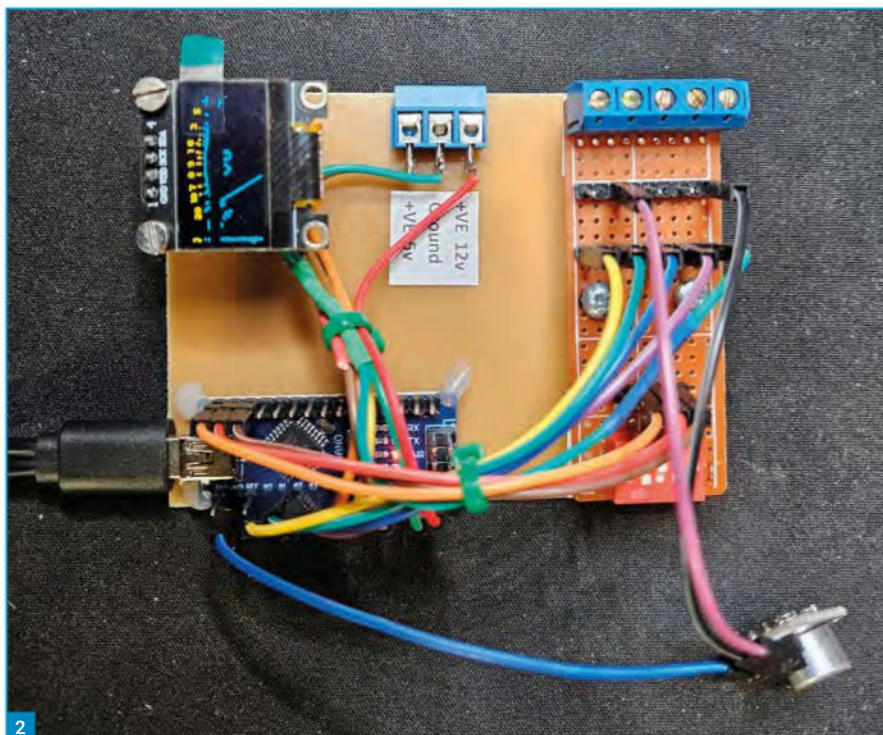
When you are ready, select 'Sketch', 'Verify/Compile'; the code will now be compiled and show up any errors. This may take a few minutes.

Once compiled, connect a suitable USB lead from your computer to the Arduino Nano board USB socket.

Go to 'Tools' and select 'Ports', choose the port that you are using. If you are not sure which port is in use, disconnect the USB lead and look again at the listed ports. The active port will not show, plug the USB in again and it will appear.

Go to 'Sketch' and 'Upload' (This will take a few minutes to first compile again and then upload).

If everything is correct, the Meter Display should light up when upload has completed.



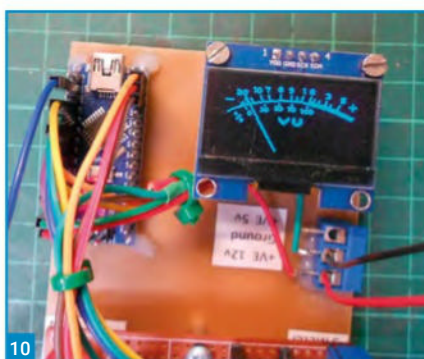
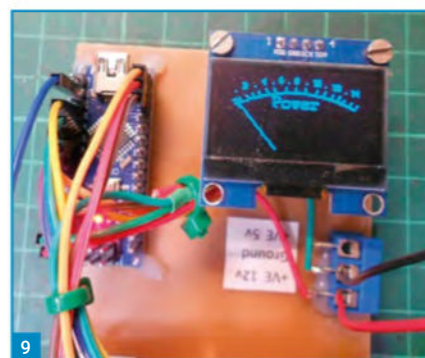
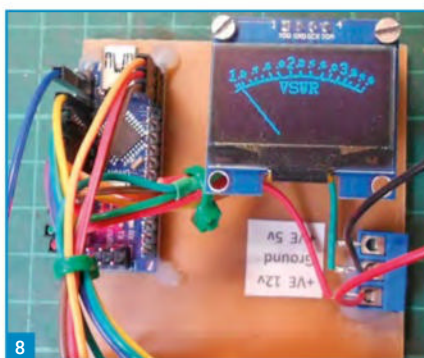
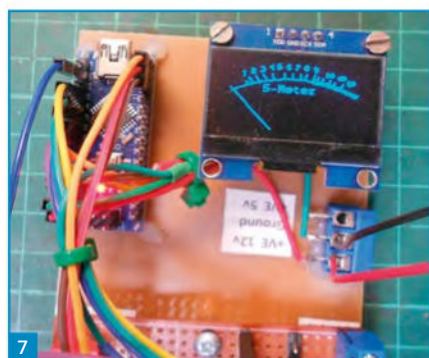
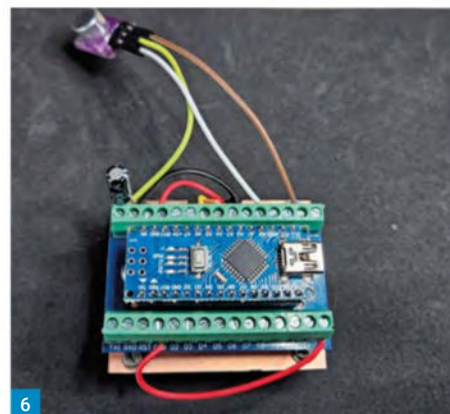
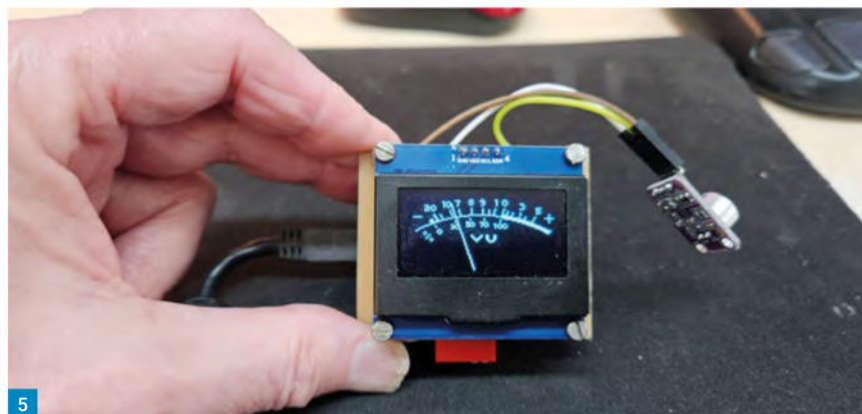


Fig. 5: Larger 1.3in OLED with VU display mounted. **Fig. 6:** Underside view showing the Nano terminal board. **Fig. 7:** S Meter. **Fig. 8:** VSWR Meter. **Fig. 9:** Power Meter. **Fig. 10:** VU Meter.

Testing

The sketch used for this project includes software calculations for each of the meters along with a different graphic for each meter face and measurements. For example, the Power Meter is calibrated up to 15 watts. I have left the Sketch as it is, but for those more knowledgeable, the parameters of each meter can be changed to suit each purpose. The circuit can easily be used for a single meter. An S Meter would use pin A0 for the input and D10 left open. A Power Meter would use pin A2 for the input and pin D10 taken to ground. Other combinations will depend on the settings of the switches. The maximum voltage on the input pins is 5V, care must be taken not to damage the Arduino Nano.

I tested the VU Meter by connecting a MAX4466 Electret Microphone Module to pin A1 and switching D12 to ground. The Electret Microphone Module has a gain control for setting the input. Other meter inputs being used will probably need an external gain control to manually change the sensitivity and calibrate the meter. Note that the VSWR meter needs two inputs, the Power Meter input serves as the Forward voltage and the VSWR input serves as the Reflected voltage. These are taken from a suitable directional coupler. (See Ref.)

Once I had tested the circuit, I then tried some larger OLED displays. As long as the display is 128 x 64 and is the same driver type, the Sketch does not need any changes. I first tried a blue 1.25in OLED and this worked well with the larger display. Next, I tried the larger 1.3in OLED, again this worked well, but the needle moves slower because of the large display. This means that there is a choice of sizes that can be used for your meter. **Fig. 4.**

Mounting the meter

You may want to have the OLED mounted separately from the Arduino Nano as part of a project or mount the meter as a single unit. There are various ways to do this, and I have experimented with different fittings. I have found that the Arduino Nano Termination Board is the easiest way to mount the meter. It can be fitted onto a front panel or into a suitable box. See **Figs 5** and **6**.

Parts List

Test Board

- Arduino Nano v3
- SSD1306 OLED Display 0.96in (128x64)
- S/S Copper Clad board
- DIP Switch
- 4 x 1kΩ resistors (optional)
- Small Veroboard
- Dupont Connectors
- MAX4466 Electret Microphone Module (optional)

Alternatives

- Arduino Nano Breakout Board
- Arduino Nano Termination Board
- Larger SSD1306 OLED

Conclusions

This project gives a choice of different Arduino Nano driven OLED meters for different purposes. **Figs 7** to **10**. They are fun to experiment with and there is also a choice of size and colour. New Analogue meters are still available, but with a limited choice. A digital / analogue type meter gives an alternative option.

References

- DuWayne's Place:
<https://tinyurl.com/2yf6m5du>
 Nano Analogue Meter Code:
<https://tinyurl.com/mrxwtsbe>
 Making a Directional Coupler (MOMGX):
www.youtube.com/watch?v=T6_NHJHSwq0

Steve Telenius-Lowe G4JVG
teleniuslowe@gmail.com

In March 2024 my wife **Eva M9TEL** and I returned to England after almost 20 years living abroad, first in Sabah (9M6), East Malaysia, on the island of Borneo, and more recently on Bonaire (PJ4), a small Dutch island in the southern Caribbean. In both those locations we were lucky enough to have pretty good stations, with beam antennas for 20m to 6m and a 1kW linear amplifier (used when necessary).

We own a couple of flats in Exmouth, the town where I grew up and, while realising we would not be able to establish a competitive station here, we decided to renovate and then move into one of the flats, figuring that in the medium to long term it should be possible to set up a remote station to operate from there.

We sold most of our equipment either in Bonaire or after arriving back in the UK, with the intention of buying a new transceiver after the flat had been renovated. Having enjoyed using an Icom IC-7300 in PJ4, when Icom announced that they would be releasing a MK2 version we decided to wait until it became available before buying. With the new transceiver (see [1]) installed, the DXer in me wondered what could actually be achieved from this unpromising location?

The location

First, a quick description of the location might be in order. The flat is on the top floor of a Georgian building dating from 1795, Fig. 1. It is dual aspect: one side offers views over the Exe estuary, Fig. 2, and provides a clear take-off from north to south via west but, to the east (overlooking the town), signals are blocked by the building itself.

While our living room is around 15m above street level, there is no outside space from which antennas can be suspended and there is no access to the roof. The only possibility is to throw some wire out of the living room dormer window, which has a sloping roof lying immediately below it (Fig. 3).

First attempts

I made up a 12m dipole and simply soldered the two wires to a long length of Aircell 5 coax I happened to have. I am loath to cut coax except when absolutely necessary, so I coiled up the excess cable and tried out the antenna. Its feedpoint was on the exterior window sill and I threw the two wires, each around 2.86m long, to the left and the right along the roof, Fig. 4.

Somewhat to my surprise, the NanoVNA showed a very good dip in the 12m band (Fig. 5) and I found the internal ATU in the IC-7300MK2 easily matched it to 1:1. I was more surprised when I discovered that the ATU also matched the 12m dipole on 15m and 10m. Hmm, the long length of coiled-up coax must be acting as a 'line flattener'.



DXing from an 'impossible' QTH

Steve Telenius-Lowe G4JVG gives some hints as to how to get on the air as a flat dweller.

Initially I made a couple of SSB contacts in the ARRL 10m Contest and one on CW, just to prove that everything was working. However, the very limited antenna was immediately quite obvious: other than the strong signals in the contest I found almost no signals on SSB or CW in the three bands on which I could radiate some sort of a signal.

Although I have always been primarily an SSB operator, with my present circumstances FT8 seemed to be the answer in order to make at least a few DX contacts. Yes, I would prefer to bust DXpedition pile-ups on SSB but realistically that wasn't going to happen with modest power levels and bits of wire thrown out of the window!

Keeping the IC-7300MK2's power down to 15% (i.e. under 15W out) I found I could work some of the stronger FT8 stations on 10, 12 and 15m, although calling any station with a received signal lower than about -06dB (which was the majority

of them!) proved to be a waste of time. However, having never operated any digital mode from England before, every country – even England, Germany or Italy – was a 'new one' for me and, using Club Log [2], I started to keep track of how many DXCC entities I was working.

First problems

In the junk box I found a gash length of coax with a PL-259 plug already on one end that was just long enough to reach from the transceiver to the window sill so, thinking the long length of coiled-up coax would be unnecessarily attenuating my signal, I re-soldered the dipole wires on to the end of this short length of cable.

Mistake! Our flat is part of a development that has fire sensors and smoke detectors connected

Fig. 1: The QTH.

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Fig. 2: The take-off to the west, over the Exe estuary. Fig. 3: The flat. The living room window is the one at the top left. Fig. 4: One of the dipole wires lying on the roof.

to a national careline. The moment I started to transmit the careline started to bleep and I received a call asking if I had an emergency because the smoke detector had triggered. We have had false alarms from the smoke detector before, with steam from the shower (the detector is in the hall, just outside the bathroom) setting it off, so it is clearly very sensitive and obviously RF was also getting into it.

I reduced power to about 10W, but with the same result. I guessed that the long coil of coax used previously had been acting as a 'dirty balun': it was time to use a proper ferrite choke balun.

The balun

I ordered a 1:1 balun rated at 400W from Moonraker [3], Fig. 6, which arrived a couple of days later. At just £19.99 it is excellent value, though the 400W rating is for SSB / CW only: for continuous cycle modes such as FT8 the recommendation is to keep the power down to 50 to 60W: fine, that was my intention anyway.

I found that (as expected) the dipole, with a short length of coax and fed through the balun, was now very much a single-band antenna: the IC-7300MK2's internal ATU would no longer match it on the other bands. Only having access to the 12m band was unnecessarily restrictive, so I bought a 12-metre length of three-core mains cable, stripped off the outer plastic cover and had enough wire to make up new dipoles for 10, 15, 17 and 20m, Fig. 7.

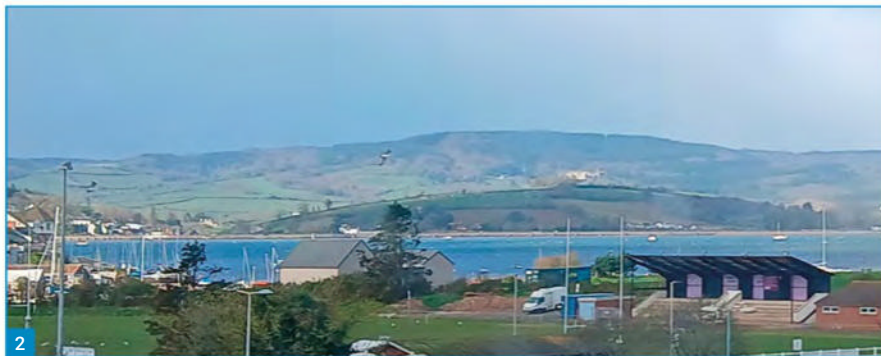
Back in business

Using the Moonraker balun, I started to transmit at the 10W level and received no calls from the careline when using any of the five bands. Changing bands is a bit of a rigmarole, but needs must: I have to bring in the balun and dipole, unscrew the two wires from the brass terminals on the balun, connect the new dipole wires, throw out the wires along the roof outside the window, and use the rig's internal ATU to tune the mismatch to a 1:1 SWR. This final step is necessary because naturally enough each time the wires are thrown out they fall in a different manner, presenting considerable variation in the impedance at the transceiver.

Increasing the power by 2% each time I had tried a couple of bands I eventually triggered the smoke detector again at 40% (i.e. about 40W), so I now keep the power down to about 35W on all bands.

Operating techniques

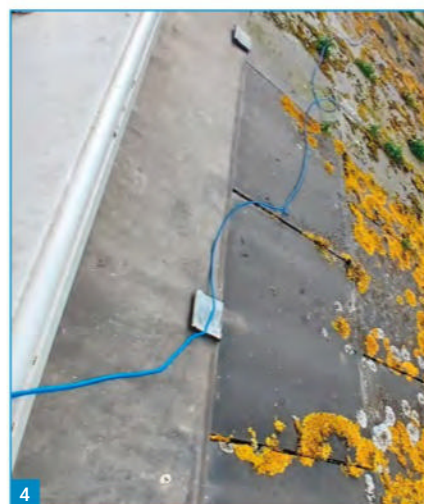
In general it's still difficult to work stations if their received signal level is below about -12dB, though this generalisation does not take into account



the circumstances of the other station. If they are running very low power it could be that their received signal level with me is -20dB or less, yet they are still able to receive my signal (fortunately I have a low noise level and, using JTDX software can decode some very weak signals). On the other hand, some stations being received at +03dB or more simply do not hear me; so perhaps they are running several hundred watts output and / or have extremely high noise levels?

If one is active daily, or nearly so, one gets to recognise the callsigns of stations that are regularly active, in exactly the same way as one does on SSB or CW. However, on FT8 one *also* gets to recognise their expected 'normal' signal level. For example, my old friend **Andy Chadwick 5Z4VJ (G3AB)** is very active on FT8 and was being received at a level of around -15dB to -20dB. When I first saw him decoded I called many times on various bands but Andy never replied: presumably my feeble signal just wasn't making it to Nairobi. However, at 1430UTC on 20 March propagation was such that I was receiving Andy on 12m at a level of -05dB, a good 10 to 15dB better than usual. I called and he replied almost immediately, giving me a report of -10dB. Assuming reciprocity, my signal at 5Z4VJ during 'normal' conditions would probably have been well below the level he could decode.

So, with such limited power and antenna possibilities, it's more important than ever to keep an eye on propagation conditions and recognise when signals are enhanced, so as to give yourself the best chance of making the contact. Incidentally, propagation often improves a day or so *before* geomagnetic storms - a so-



called 'pre-auroral enhancement'. These events are difficult to predict, but you will get to recognise them if you are lucky enough to be operating then, if only because the following one or two days are so poor!

So just *when* is it best to call a particular station on FT8? Unlike on SSB or CW, you can call a wanted station at any time on FT8 as your signal is only 50Hz wide and you can place it anywhere in the 3kHz passband, so you won't be causing interference to the contact in progress. In practice, the wanted station won't respond to you until he completes his present contact, but he *will* be able to see that you have been calling and, if you are lucky, may respond to you immediately after he completes his contact. If you see that a wanted station is sending 'RR73' (e.g. 'G4JVG 5Z4VJ RR73') that means that they have exchanged



133715	Tx	557 ~	G4JVG PJ4NX -15
133730	-17	0.3 645 ~	PJ4NX G4JVG R-23
133745	Tx	557 ~	G4JVG PJ4NX RR73
133800	-16	0.3 644 ~	PJ4NX G4JVG 73
133815	Tx	557 ~	CQ PJ4NX FK52

they may well still be able to decode you. The good news for the flat-dwelling DXer is that whereas you might not even attempt to make a contact with a single-stream station whose signal is -20dB as they would be very unlikely to be able to decode you, a DXpedition running five or six streams, each at -20dB, probably *would* be able to receive you.

A more recent development is the so-called 'Superfox' mode. This allows the DX station to work multiple stations simultaneously but *without* any reduction in signal strength. Instead of each stream being 50Hz wide, the Superfox signal is 1512Hz wide and sounds completely different to the usual warbling FT8 tones. In order to decode a Superfox transmission you must use recent versions of WSJT-X. Your signal transmitted to the Superfox is a standard 50Hz-wide FT8 signal. The CY0S DXpedition to Sable Island in March used Superfox initially, allowing me to make QSOs on 15m and 20m with ease.

Results

My FT8 activity started on 1 March this year and I eventually worked my 100th DXCC entity on 24 March, thanks to a contact with TL8GD (Central African Republic). In the past, with a 'competitive' station, I have contacted 100 DXCC entities in a single day, but it proved much tougher with low power to such poor antennas and I suspect would have been virtually impossible on SSB or even CW. However, DXing from a flat certainly *is* possible using FT8.

Some of the best DX worked in March included K3QJ/6Y, 9Y4DG, D2UY, J88IH, JH1HHC, P4/WE9V, PJ4NX (a personal friend, who emailed me his screen grab of our contact, **Fig. 8**), PJ7/TF10L, PZ5TW, V47JA, VP2EWE, VP2MAA, VP8LP (at over 12,500km the greatest distance worked so far) and YB1TCA. As can be seen, my clear take-off to the west certainly helps with the Caribbean and South America but, in the opposite direction, it took me

reports and have completed the QSO – a good time to call.

Unfortunately some stations send 'CQ' but without responding to anyone. I have no idea why they should do this – it seems completely pointless – but a growing number do. I don't mind if a CQing station doesn't reply to me, because they may not be able to decode me, but I do object if they don't reply to *anyone*. In effect, they are acting as a beacon, so shouldn't be calling CQ. So it may not be productive to call stations that are only calling CQ. Wait until they are actually making contacts before calling.

Working DXpeditions

DXpeditions provide a welcome way of working some of the more rarely-activated entities. Software has been developed to allow DXpeditions to speed up their rate of making contacts by allowing them to transmit several 'streams' of data at the same time, in effect working multiple stations simultaneously. Both the WSJT-X and MSHV software packages allow multi-streaming (although JTDX doesn't).

An important point to note is that, with each additional stream, the DXpedition's signal becomes weaker and there will come a point when you may not be able to decode the DX station even though

References

- [1] 'The New Icom IC-7300 Mk2', Steve Telenius-Lowe, G4JVG, Practical Wireless, March 2026.
- [2] Club Log: <https://clublog.org>
- [3] Moonraker balun: <https://tinyurl.com/4cmrc4az>

Fig. 5: SWR 1.4:1 at 24.900MHz: easily matched with the internal ATU. **Fig. 6:** The Moonraker 1:1 balun. **Fig. 7:** Dipole wires for the five bands 10 – 20m. **Fig. 8:** Screenshot of G4JVG being worked by PJ4NX in Bonaire.

over three weeks to work Denmark and I have still not worked either the Netherlands or Switzerland. Being restricted to 14MHz and higher means that semi-local countries are difficult: while I have worked G stations by ground wave and MDOCCCE on the Isle of Man, I have yet to make a contact with GW, GM, GI, GJ, or GU.

The Czech T80K DXpedition to Palau in the Pacific proved to be one of the easiest contacts made, with the operator responding to my first call (thinking this was a fluke, M9TEL took over the station and they responded to her first call too!). Unfortunately I failed to work the 3Y0K Bouvet Island, TX5EU Austral Islands or XX9W Macau operations but the German J51A DXpedition to Guinea-Bissau was worked easily on all five bands, and the S21ZW Bangladesh DXpeditions also made it into my log.

Whatever your circumstances, even if you think you have an 'impossible' QTH, get on the air – it's worth giving it a try. **PW**

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Keith Rawlings G4MIU
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Hello and welcome to this month's *Antennas*. The Moxon antenna, also called the Moxon Rectangle, is a design first described by **Les Moxon G6XN** and was based on a design by **Fred Caton VK2ABQ**. It is a simple two element parasitic design, which is an adaptation of a Yagi, where the two elements of the array, the driven element and reflector, have their ends bent back towards each other thus forming a rectangle. This can make the antenna around 75% smaller than would otherwise be the case. Being compact the antenna lends itself to construction not only on the VHF and UHF bands but also on HF.

With an impedance of 50Ω a Moxon has a very good Front-to-Back ratio with figures of more than 30dB being claimed along with a forward gain of around 4dBd.

When made of wire on HF they can be quite 'stealthy' and for VHF and UHF when made out of tube they make a compact antenna that is quite strong and which lends itself to portable and emergency use too.

Design of the Moxon has been made all the easier thanks to **Dan Maguire AC6LA** who has written the Moxon Rectangle Generator software. This simple 'App' generates the dimensions for a MOXON rectangle making it very easy to calculate a model for any frequency desired:

<https://ac6la.com/moxgen1.html>

The program takes into account the size of the wire/rod being used and will calculate the dimensions for you, in either Feet, Inches, Metres or Millimetres. It also allows you to select the polarisation of the antenna and what axis the main lobe is on and, in addition, the software can output either an NEC or EZNEC file to assess the design as a computer model.

Operation is simple. Enter frequency required, the wire details, select units, polarisation and lobe, press calculate and the dimensions will appear in the boxes labelled A, B, C, D, E, **Fig. 1**.

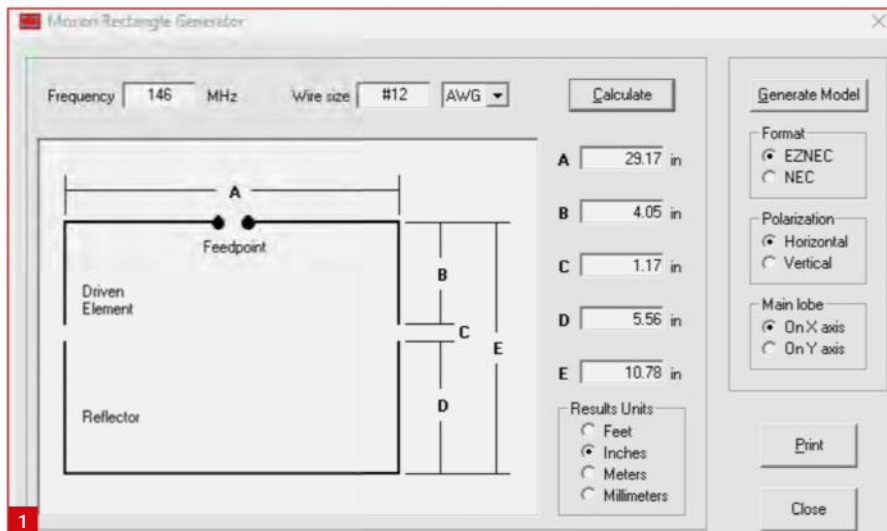
A dual-band Moxon Yagi

Other than a basic dual-band vertical, which is attic mounted, I do not have an antenna for either 2m or 70cm for 'DX' working, i.e. a horizontal antenna with some gain that can be pointed 'somewhere'.

In my workshop I have a few 3m lengths of 1/2in square aluminium bar and some leftover 3mm dia TIG welding rods that are 1m in length. These, I thought, were just asking to be made into an antenna.

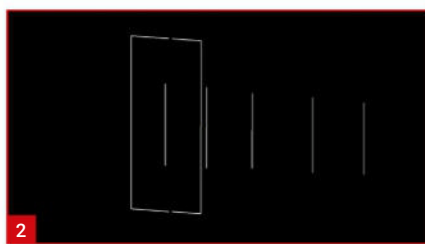
The thought of utilising this material to make a dual-band antenna which would use a single feeder came to mind as did a model for a Dual-Band Moxon Yagi that comes packaged with the AN-SOF Antenna Simulator software! (See **Fig. 2**)

Here the basic Moxon Rectangle has elements



The Basic Moxon

Keith G4MIU describes his trials and tribulations during the recent construction of a dual-band Moxon 'Yagi' antenna.



added to form a 5-element 70cm Yagi with the driven element of the 70cm section positioned so that it couples with the driven element of the 2m section enabling just the single feeder to be used.

I wanted my antenna to be resonant close to the SSB parts of the 2m and 70cm bands but on running the AN-SOF model, I found it was resonating very much higher in frequency, being 1.1:1 at 147.5MHz and 1.1:1 at 442.0MHz.

Rather than reinvent the wheel and design another model I used a feature of AN-SOF called Scaling. Here the 'wires' of a model may be scaled, either up or down, with a value entered by the user to applying a Scaling Factor. I used this to progressively bring the model to resonance on my frequencies of interest which were in the region of 144.500 and 432.5MHz.

Now I had a model with resonances where I wanted them I thought that before I cut any metal I would compare the dimensions of the 2m section with a model generated in the aforementioned AC6LA's Moxgen.

The parameters returned between the two applications turned out to be very close. However, I chose to make tiny alterations of a couple of mm to the width of the elements generated by AN-SOF so that they matched the dimensions generated

by Moxgen. I also ran the Yagi Calculator software by **John VK5DJ** to get an idea of what the dimensions for a 5 ele Yagi might be and again the figures generated by AN-SOF were very close for the reflector and director elements. My Yagi Calculator computation assumed a folded dipole for the driven element and the Moxon Yagi design has a plain dipole element but I took it that as the other elements were close in dimension the driven element would be close as well.

The AN-SOF predicted VSWR of the modified model may be seen in **Fig. 3** and the predicted 3D Radiation Patterns in **Fig. 4**.

I should add that when modelling antennas you have to have some idea of a design before you enter the details into the simulator, it won't design an antenna for you. The initial parameters have to be input by the user and the simulator will then analyse and validate the design. If necessary, alterations can be made and the model re-run.

Something I have been trying recently, inspired from an article by **Tony Golden** of AN-SOF, is to use AI, namely ChatGPT, to design an antenna and then enter the dimensions generated into AN-SOF to validate the design.

So far the results have been encouraging although trying to get AI to generate 'raw' code in AN-SOF ***.emf format that can be directly loaded into the simulator as a complete model has not been completely successful up to now.

Now I had a set of dimensions to work to I set about constructing the antenna. See **Table 1**.

Fig. 1: Screenshot of the MoxGen app.

Fig. 2: Screenshot of the AN-SOF Dual Band Moxon Yagi Model.

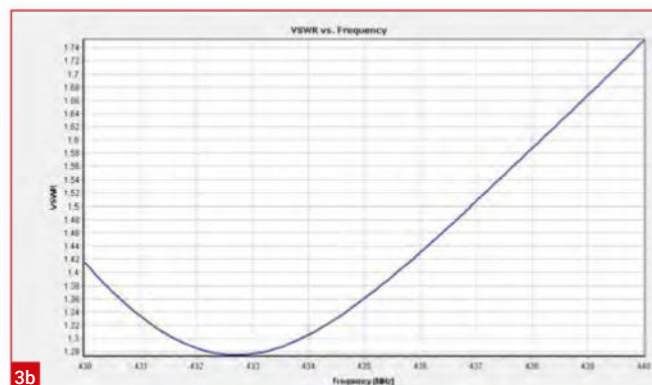
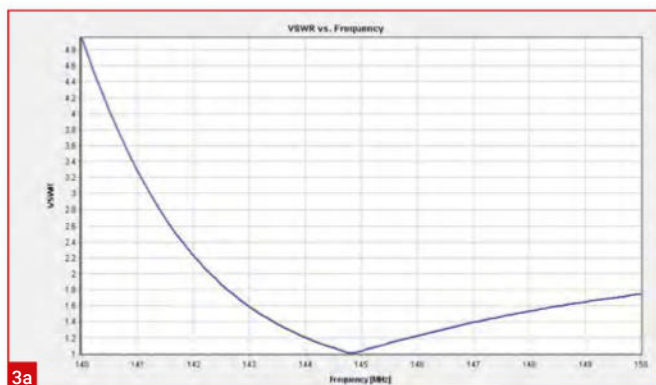


Fig. 3: AN-SOF Predicted VSWR. 2m left, 70cm right. **Fig. 4:** AN-SOF Predicted Radiation Patterns. 2m top, 70cm bottom.

Fig. 5: CAD Design of the Element Mounts.

Fig. 6: Feedpoint. Note the close proximity of the two driven elements. **Fig. 7:** Actual VSWR plots taken from the FA-VA6. **Fig. 8:** Antenna with element spacers fitted before rebuild.

Construction and anguish

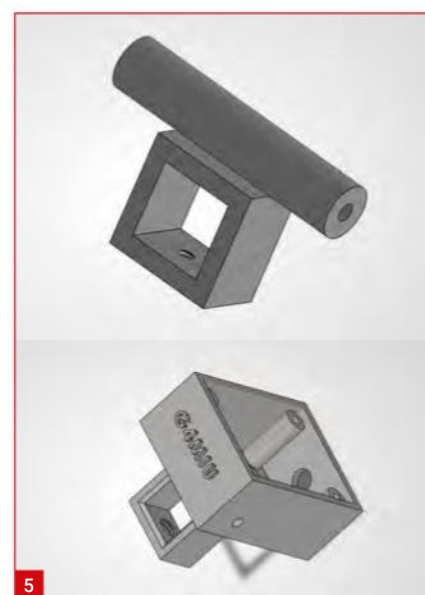
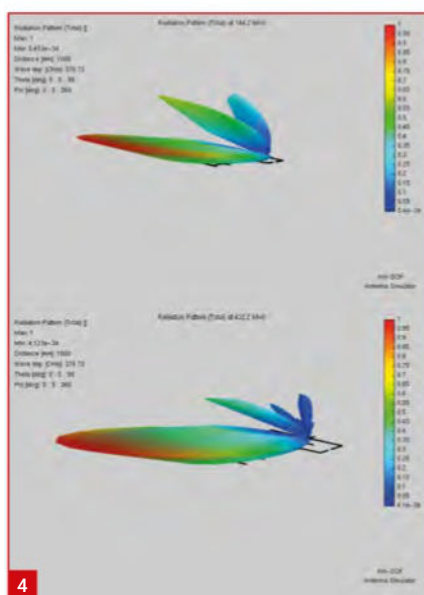
To mount the 3mm diameter elements onto the ½in square boom I decided I would 3D print a series of standoff brackets so that the elements were all insulated from the boom. The CAD design for these can be seen in **Fig. 5** with the element brackets at the top and the junction box for the driven element at the bottom.

The brackets are designed so that they may easily slide over the boom and also be easily positioned/repositioned. They are locked into place on the boom by the use of 6mm stainless steel grub screws as are the elements to the brackets.

The junction box was made to house a terminal block that would grip both parts of the driven elements 'A' and also a pigtail of RG58 coaxial feeder. Once assembled this terminal block would be glued into place using hot melt glue. This would keep the driven elements in position and I intended to use two 3D-printed spacers to keep the gap 'C' constant and also to support both the Driven element and Reflector.

My 3D printer is a Creality Ender 3 Max 3D which has been running almost flawlessly for six years or more. I tend to just use PET-G filament now and I get consistent results with a known setup. So, printing the parts for the antenna would be no more than a formality.

I started by printing the element supports and these came out pretty well, or so I thought, and I then printed the junction box. This print seemed to go well, until I started to clean out the support material (needed to support the cavities in the part), whereby applying firm pressure on the side of the box with my fingers caused the thing to crack despite using 90% infill! I checked all the printer settings and did another and that cracked too. Third attempt I increased the print and bed



temperatures and this seemed to improve things.

Next I cut the boom to just over one metre long, drilled holes at one end for a U bolt in either side of the boom so that it could be mounted either Horizontally or Vertically and then the elements were cut to length.

Using my bench vice I gripped the 2m section elements to form them into shape and I then placed the mounts on the boom and inserted the elements.

The 2m driven element had the feedpoint ends bent back by 12mm to locate in the terminal blocks. These were fitted into place and a length of RG58 cable fitted to the other terminals, **Fig. 6**.

The overall length of the reflector was 1030mm but the rods themselves were just 1000mm long.

I did consider making a bracket to house a joint of some sort to make the element in two sections but I elected to make up the shortfall by the simple expedient of using a terminal block to add a short stub of material to make up the correct length.

The next task was to position all the elements into their correct places and here I suffered more issues with the printed parts slightly cracking when I gently nipped the grub screws up. Clearly I needed to look into what was happening with the printer.

I then took the antenna outside for evaluation, walked through the door and caught the 2m driven element, bent the rod and...cracked the junction box!

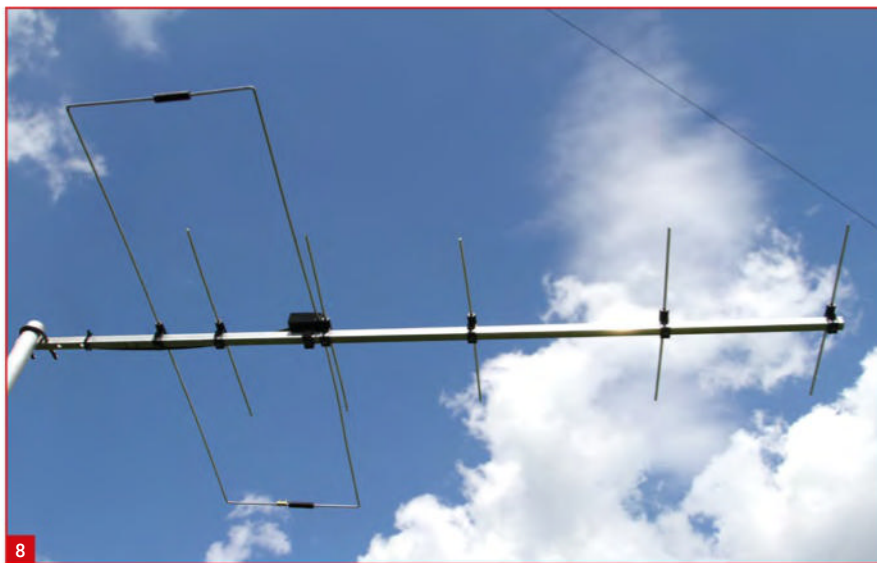
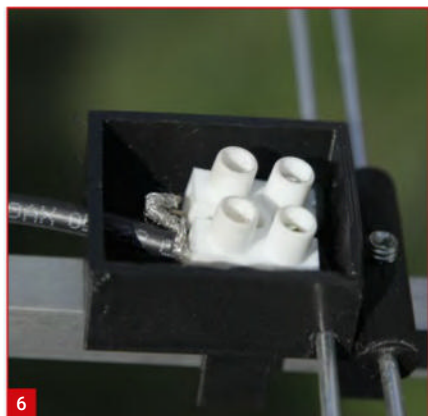
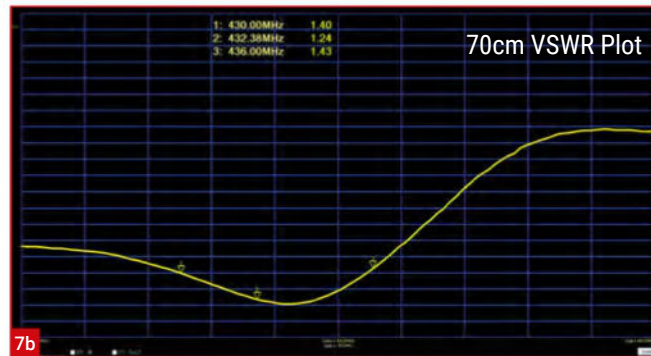
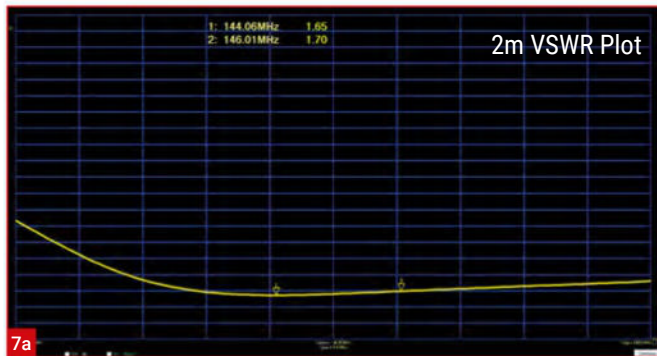
I took the opportunity before printing yet another junction box, to modify it, thickening the walls and making it slightly larger (regrettably).

Fourth time lucky? Sort of, but one of the corners of the print curled slightly! Never mind I'll go with it!

Once the antenna was reassembled I mounted it on a short pole and used my FA-VA6 analyser to evaluate the VSWR.

Initially the 2m VSWR was slightly low in frequency but I trimmed a little under 3mm off of the driven element and this brought the match nicely into band as can be seen in **Fig. 7a**.

I then swept 70cm and found resonance was also low. It should be possible to re-reposition the 70cm driven element to obtain a good match, its position not affecting the 2m section, however, there was a problem. 'Somebody' (!) had remade the new junction box bigger to make it stronger, consequently I couldn't get the correct spacing between the driven elements as they needed to be closer together! Oh dear, what else could I make go wrong!



I got around this issue by trimming a few mm off the 70cm driven element and resultant VSWR can be seen in **Fig. 7b**.

So, everything was looking reasonable at last.

With the adjustments all done I fixed the two spacers into place in between the 2m reflector and driven elements. I checked the matching again and the 2m resonance had dropped out of the bottom of the band dipping at 142MHz. It is well known that the gap between the Moxon elements is critical, hence my design of the spacers was calculated so that the gap would be exactly 30mm. I can only assume that the spacers induced coupling between the elements, which caused a detrimental effect to tuning, as removing them brought the matching back into tune.

However, the design does need some support over this gap so I experimented by removing, in turn, a few millimetres off the elements to try to get the matching point back into the band.

This I did but the distance 'E' reduced from 274.5mm to a mere 222mm. I worried that this would affect the performance of the 2m performance, and it did.

Trying to measure antenna performance in my back garden at V/UHF and at a height I can reach to make corrections is challenging due to the number of buildings in close proximity.

Previous experience while evaluating antennas for these higher frequencies has indicated reflections off buildings. Nonetheless, I set up a signal source and turned the beam to assess the F/B ratio using a TinySA for indication.

2m Section	Lengths	70cm	Lengths	Position on Boom
A	745mm	Reflector	354mm	127mm
B	102mm	Driven	349mm	293mm
C	30mm	Dir 3	304mm	477mm
D	142.5mm	Dir 2	296mm	719mm
E	274.5mm	Dir 1	290mm	925mm
Boom	1030mm			

Table 1: Dimensions

On 70cm the figure was 22dB which is slightly more than AN-SOF predicted. The 2m Front-to-Back ratio was very poor with barely 5-8dB indicated and much less than the claimed 30dB.

I re-built the 2m elements back to the previously calculated figures and minus the support spacers. The F/B increased to 18dB which was clearly an improvement and similar to the AN-SOF prediction. I did not make any measurements to assess forward gain.

My intention was to mount the antenna in the attic, horizontally polarised and manually turning it when needed.

So for now the antenna can stay as it is with the 2m elements without the two spacer/supports.

A 'to do' is to find somewhere to add a choke balun, consisting of a few turns of RG58 over a former.

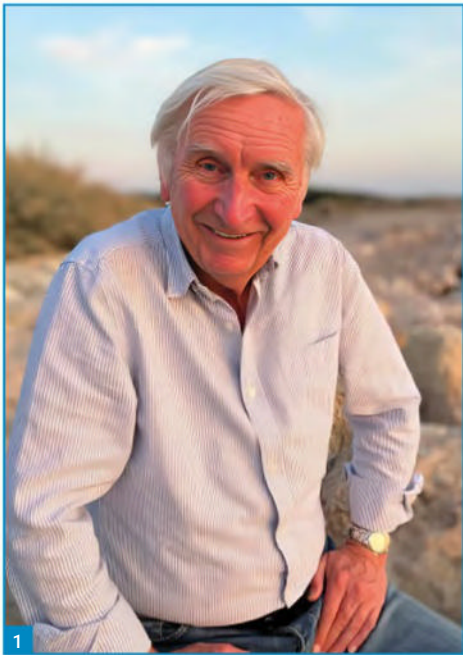
Now I have an antenna I need to set up an SSB transceiver, which will probably be my FT-

857 shifted over from HF operating (I now have another HF/6m set), but in the meantime I have used an SDRPlay to listen around. Local stations are naturally heard well on both bands but the only 'DX' I have caught has been on 2m during a recent opening where a handful of ON and PA stations were heard.

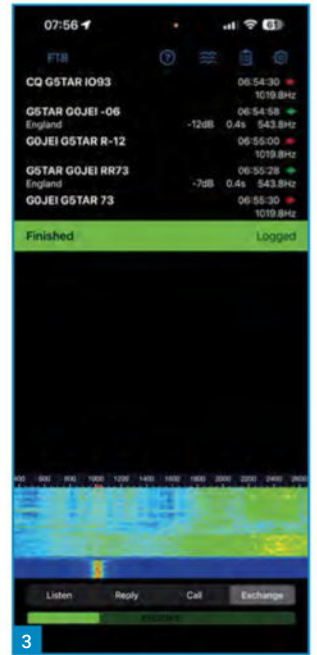
My conclusion is that the antenna has potential but in this case has proven somewhat tricky to commission. I think that the small diameter (or call that flimsiness) of the rods used for the 2m section has made life difficult. The gap between the driven and reflector elements certainly looks to be critical and I don't think the antenna liked my spacers which may have introduced unwanted capacitance.

Not the smoothest of antenna projects this one but I got there in the end! The antenna with the troublesome spacers fitted, and before I re-built the Moxon section, can be seen in **Fig. 8. PW**

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DXCC on any band is always a significant achievement. **Jim Ryan EI3DP, Fig. 1**, recently achieved something quite special, CW DXCC on the QO-100 satellite!

Congratulations Jim! QO-100 sees a significant amount of DX activity and a good number of DXpeditions are often active on the satellite, so Jim's achievement points out what can be done. Jim is currently active on QO-100 using an FT-817, SG labs transverter, Modified Octagon LNB and a POTY feed on an 80cm offset dish.

Jim was a founding member of the East Cork Group EI7M, and a frequent CW operator with the team. He operated EME with the callsign EI7M for several years in the 80s and 90s as well as operating on AO-40 from 2001 to 2003 before the satellite's failure.

Although people sometimes think that because of QO-100 using microwaves it is difficult to get set up for, it can be achieved quite simply. The downlink can be fashioned out of an old Sky Dish and an LNB (some LNBs are better than others!) and there are various ways of producing a 13cm uplink signal. One friend of mine, **John G8CQX**, uses a DX Patrol Up Converter, followed by a Wi-Fi amplifier into an indoor dish pointing through a convenient window. This simple setup achieves a respectable CW signal through the satellite. There are plenty of other ingenious solutions around.

QO-100 can be an option for those who are challenged by space (pun regretted!) for aerials but would like to have a go at working DX. Looking at the QO-100 DX Club website and the rankings page (URL below) shows the leading stations, including **Costa MOHOJ** with 171 DXCC entities worked! <https://qo100dx.club/rankings-dxcc>

CW DXCC on QO-100

Tim GW4VXE starts with a report of a great achievement on the QO-100 satellite.

Again, many congratulations to Jim for getting his CW DXCC on QO-100 and reminding me to mention the possibilities of operating on the satellite for people with restricted space for antennas.

The joy of experimentation!

After all, Amateur Radio has a rich history of experimentation, that's what it's all about! It's perhaps easy, though, to slip into a routine of operating how you've always done and not try anything new, just as it can be in any aspect of life. So, it's great when you see people keen to try something new.

I recently had the pleasure of doing a Zoom talk about 'What's so special about VHF' for the **Yorkshire Mesh Radio Group**. They had lots of questions, engaged well and it was a pleasure to speak with them. But perhaps the greatest pleasure was receiving an email the next day to say that following the presentation, one of the members **Mike Addy G5STAR** (Bradford) had used his Quansheng UV-5K, **Fig. 2**, to get on FT8 for the first time and make some contacts, **Fig. 3**. Although, as many readers will know, the Quansheng does not transmit SSB, with the right firmware in it, it WILL transmit DSB. Mike used this, and his smartphone running an FT8 program, held up to the rig, to make his first contact on 2m FT8 using his X50 vertical antenna on the roof! Mike worked G0JEI a few kilometres away – but in some good conditions a day or two later, Mike

used the same setup to work a station in the Netherlands on 2m FT8.

It just shows what's possible with simple equipment in the right conditions. But perhaps the most important part of the whole thing is Mike wondering whether something would work and trying it! Who knows where an experiment like that might lead.

RADE on your smartphone?

Jef Van Raepenbusch ON8NT reports that he's been helping to test **Lee BX4ACP's** RADE decoder apps for both Android and iOS smartphones. Stability is still being improved, but this looks an interesting approach and could be handy for simple decoding of RADE. You can read more at: <https://freedv.org/rade-android-and-ios-apps>

The 8m band

Paul Farley G7PUV (Sussex) operating on the band as **G9PUV** writes, "The solar cycle dropped much quicker than I was expecting so, after months of silence on the band it's nice to hear some Sporadic E. The 13th produced the first opening to North America because after spotting and working **Tim WW1L** on 50MHz (FT8) I switched to 40MHz and got flagged by his 8m receiver. Later

Fig. 1: Jim Ryan EI3DP.

Fig. 2: G5STAR used his Quansheng and smartphone to make some 2m FT8 QSOs.

Fig. 3: FT8 copy on G5STAR's Quansheng.

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4



5

Fig. 4: GM4ZUK's portable 70MHz station for the 70MHz CW contest. **Fig. 5:** PA9RZ's new antenna system.

that afternoon propagation shifted to the south and I worked EA9IB in Melilla using FT8 before switching to USB and talking to Andy EA7KBX. Three continents in one afternoon isn't a bad start to the season.

"There are two new experimental stations active from the US, WQ2XIL is in FN31 and operating with 90W into a dipole or discone and WQ2XDM in EL98 using a quarter-wave GP and 25W. I'm not

expecting much from them this side of the Atlantic but maybe the Es will surprise us".

Roger Laphorn G3XBM (Cambridge) says he monitors from time to time and has seen both EA3ERE and G8VER on FT8. He's hoping to see a few more stations during the Es season.

The 6m band

Keith Watkins G8IXN (Redruth, Cornwall) said

that he was having a 40m FreeDV QSO with **Roger M6FWV** (Hayle) when they decided to try on 6m. The QSO on 6m worked very well and Keith thinks it's a first for Cornwall!

Phil Oakley G0BVD (Great Torrington, Devon) caught some Es on the band on 12th, 14th and 16th May with 9A, SP, HB9, S5, DL, SV, CT, EA and EA9 all worked on FT8.

As readers of *HF Highlights* in *PW* will know, **Steve Telenius-Lowe G4JVG** (Exmouth, IO80) returned to the UK two years ago after nearly 20 years living abroad. "I had never been active on 6m from England before but, having bought an Icom IC-7300MK2 late last year, I have been waiting for the 6m Sporadic E season to start", Steve wrote. "I caught my first Es opening on 12 May, when I worked S57TW, DK7GH and SP7HKK on FT8, using about 25W to a horizontal wire dipole taped to the top few sections of a telescopic fishing rod.

"I am astonished by how well this simple antenna is working with such low power. On the 13th the propagation had moved to southern Europe and I worked IH9YMC on Pantelleria Island (North Africa), ISOAWZ, two IT9s, four 'mainland' Italians including I/AO5RKB, EA5JNQ, EA6AM, two French stations - plus EI8GS.

"The next day, though, other than local stations calling CQ and getting no replies, I did not see a single station decoded but, on the 15th, the Sporadic E clouds had moved up to the Baltic and Scandinavia. Four Latvian stations were worked plus a single Lithuanian - LY1R - OZ2PBS and OZ1HDF, SM7MBH, TF/WE9G and TF3JB.

"On 16 May the opening had moved on once again, this time down to Iberia, with CT7AIU, two EA7s, EA9ABC for my second North African station, oh, and GW7SMV and GW4SKA.

"As I had never been on the band before, every DXCC is a 'new one' for me and so far, in five days, I have worked the grand total of 18 entities on 6m. I wonder how long it will take me to get to the 154 DXCCs I worked from Bonaire as PJ4DX (though that was with higher power and a beam)!"

Stewart Cooper G4AFF (Hingham, Norfolk) has put his smaller 4/6m Yagi up on a pole. On 8 May, he worked D2UY which was his first TEP of the year and heard D2UY again and XT2AW on the evening of 13 May.

On the morning of 10 May, **Steve Shenstone M5BFL** (Norfolk) worked VK8TEP on the band - an impressive start to the season!

Simon Davis-Crane G7WKX (Liverpool) says he's not had much luck on the band this month, despite decoding a few FT8 stations, he only managed a single contact with M7SGM. He's now installed a dipole for the band at home, so is hoping that will provide a few more contacts.

The 4m band

Allan Duncan GM4ZUK (Aberdeen) took part in the RSGB 70MHz CW contest on 10 May, operating portable from the Cairn O'Mount IO86RW, **Fig. 4.**

Allan made 29 QSOs with the best DX being GU3TUX (IN89). He made some surprising QSOs too, including working **Neil G4BRK** (Oxfordshire) who was using a 40m dipole!

Steve Rawlings G4ALG (Chepstow) writes, "I was active during the May 70MHz CW contest to test my prototype QRP CW transmitter which uses 35MHz radio control crystals in a VXO circuit. A while ago, **Robin G3TKF** kindly informed me that this experimental rig was generating key clicks. So, I used the May event to test my latest modification which uses a dedicated keying transistor to set the keying rise and decay times to about 4ms. Both **Allan G4NNJ** and **Robin G3TKF** confirmed that no key clicks were present and, with 2 watts to a dipole, I also worked **G4ASR**, **G3LVP**, **G0OIW/P** (110 km), **G0LTG**, **G3TCU/P**, **G4CWH/P** (174km) and **G4RFR** (118 km)". Steve writes that the contact with **G0OIW/P** was his 25,000th contact under the **G4ALG** callsign! Steve says he still uses homemade paper logbooks and he is currently on Logbook 15!

The 2m band

Keith G8IXN noticed tropo conditions were up on 26 April when his 1090MHz ADSB started showing aircraft being received beyond the normal distances as well as Belfast Coastguard on the marine band being easily audible. On 2m, Keith was hearing a number of repeaters which are normally inaudible at his QTH.

Jef ON8NT (Aalter) worked **DK1FG** (JN59) on 6 April on FT8 and then next day **MW0AXA** (IO81) on FT8 and **M0GHZ/P** on SSB. On 26 April, Jef worked **OZ2LIN** (JO46) and **GM3SEK** (IO74) and on the following day, **OZ2LIN** again and **F5LMG** (IN88) and **GW4FRX** (IO82).

Robert van der Zaal PA9RZ (Sassenheim) is back on the air with a new aerial system, **Fig. 5**. He writes, "When in late April the bands started to open, a CQ was answered by **MM3ERP** (IO87). He was deep in the noise, but when I heard **MM** I realised I had to turn the beam by 45° and then signals were S8 both ways SSB. The next day, **M5IDX** from **JO02**, near **Diss**, was as loud as a local station and **G0VUH** from **IO93**, **Sheffield**, was very loud too. In the evening I worked **OZ1IIL** (JO47) giving me a new square and next morning, after a QSO with **G6JXA** (IO91), the biggest surprise in ages was being called by my QRP pal **Chris GU3TUX** from **Alderney** in **IN89**! Both of us were using an **FTX1F**, 10W, **Chris** was using a 3 el. Yagi just above the roof of his bungalow... We were both very surprised by the contact and it was wonderful to hook up with an old pal this way! In the May contest, on Sunday, I worked **DF0MU** in **JO32**, **DL5DBT**, **JO31**, **PA1T** in **JO33** and **F8KGU** in **JN19**".

Simon G7WKK mentions SOTA QSOs on 2m (and 70 and 23cm) with various activators, and especially **Peter MW0PJE**.

Steve G4ALG writes, "I continue to take part in

the weekly **Two Metre Tuesday** CW activities. Most activity takes place between 7pm and 8pm, with **G0DJA/P**, **G0SDD**, **G3YPZ**, **G3XIZ**, **G4KKU**, **G4RHR**, **GU3TUX** and **M0GSX** often appearing in my log. I broke my left foot in February, but I'm looking forward to operating /P once I'm fully mobile".

The 70cm band

Jef ON8NT worked **DK0TR** (JO40) and **G4APJ** (IO83) on 8 April.

Robert PA9RZ followed up his 2m QSO with **MM3ERP** with a 70cm contact, although copy was very difficult. He writes, "After the difficult QSO with **MM3ERP**, on the first day of the May contest (144+ with us, 432+ in the UK), the path over the local 'herring pond' was like an open pipeline! The well-known stations in **JO01** and **JO02** like **Andy G4PIQ** (**JO02**) running 10W to his 2m Yagi. The best DX was **Keith G5B** from **Spalding** (**IO92**) and **Anthony G7L** from **Boston** (**JO03**). **PI4GN**, in **JO33**, was weak compared with the Gs. The same applied to **DN2LH/P** in **JO31** the next day".

Steve G4ALG reports, "My main focus on 70cm are the weekly **70cm Friday** CW activities that take place in the evening. I'm grateful for the support of all those who take part in these events, including **G0SDD**, **G1SCT**, **G3YPZ**, **G4NNJ**, **G8EJN**, **GW4MBS**, **GU3TUX** and **M0GSX**".

The 23cm band

It's always good to hear from **John Ashmore G8GXF** (Wolverhampton). John has been using his AOR 8600 MK II receiver to listen on the band, but even with a 10dB attenuator in circuit there is a lot of wideband noise across the band. John wonders whether it's the response of his receiver to some out of band signals. John wonders how noisy 23cm is with other readers?

Robert PA9RZ was QRV during the May contest and found **M1CRO** (JO01) and **G7L** (JO03) very loud, compared to more local stations in the Netherlands and Germany.

Stewart G4AFF has got his 23cm system working with separate RX and TX feeds and an **I0JXX** preamp. **Stewart** writes, "I have installed a secondary relay which places a short on the preamp input on TX, which will hopefully prevent RF ingress/heating/damage (again like last year!). A telephone mast is only 500m away from here to the east so I've also installed an interdigital filter ahead of the preamp which makes a big difference. I run 350 watts to a 67ele so I'm looking forward to working some DX soon!"

During the May contest **Steve G4ALG** says, "I tested my new **SG Laboratory 25 watt PA** using a simple setup in the back garden. I have mounted the PA plus an **SGL transverter** within a waterproof diecast box because most of my 23cm operation will be /P. From the back garden, using a home-made 16 element Yagi, I was pleased to work **M1CRO/P** (265 km), **G4BRK** (82 km), **G3XDY** (260 km) and **G3TCT** (74 km)".

Satellites

Jef ON8NT monitored the **ARISS** contact on 1 April operated by **Sophie Adenot KJ5LTN** to a station in Italy which was to two schools in Italy. On 9 April Jef monitored another two ISS contacts, this time to schools in France and Belgium. From 10 to 14 April there was an SSTV event from the International Space Station, but on 70cm rather than on 2m. Twelve images were sent in the series. There was more SSTV, this time sent from the **UMKA1** satellite on 18 and 19 April, with images of children's drawings.

With **FO-29** back in operation, at least temporarily, Jef ON8NT worked **OM5TE** (JN98), **G1YEF** (IO83) and **ON2ACO** (JO11), all on FT4. **RS-44** provided a good number of FT4 QSOs through the month, including **OZ3AEV** (JO55), **R4HLG** (LO53), **RM9C** (MO07), **WB2VLM** (FN10), **SM3ULU** (JO81), **LY1R** (KO14), **DL/PA3GAN**, **WORPR** (EN34), **AC9DX** (EN45), **EA3TA** (JN11), **EA8EBM** (EN72), **N2YZH** (FN22), **LY4AA** (KO14), **ON2ACO** (JO11), **F8KRK** (JN18) and **PD1B** (JO32). Jef was also active on **JO-97** working **F6HRO** (IN88), **F6KRK** (JN18) and **F1FPL** (JN09).

Thanks to **Patrick Stoddard WD9EWK** (Phoenix) for an update on satellites. He writes, "During mid-May, satellite operators had the opportunity to use three FM satellites that had been activated for amateur use. **David Greenberg 4X1DG** announced on the **AMSAT-BB** mailing list that the **TEVEL2-3** and **TEVEL2-7** satellites would be made available, but that the teams managing these satellites had been struggling with software issues on **TEVEL2-7**. **TEVEL2-7** has been randomly resetting itself, which shuts off the FM repeater. **4X1DG** did not mention how long these satellites would be available.

"The other FM satellite that was activated in mid-May was the **Kuwaiti QMR-KWT 2** satellite. Its V/U FM repeater was scheduled to be active on 16 and 17 May. The initial reports on its FM repeater have been good. We can hope that this satellite will have more activations of its FM repeater. Updates for this satellite have appeared on X from the @orbital_space account".

FM and DABDX

Simon Evans (Twynning, Gloucestershire) took advantage of the tropo on 26 April. He says that when there's an opening, he tends to concentrate on DAB and on the 26th, his best reception was on 5D, with **Antenne DE** from **Wolfsberg** in **Germany** at a distance of 1038km. On the FM band, coverage was similar although distances a little greater.

Final final!

That's it for this month. It's great to have the first of the Summer Es reports in. Perhaps there will be news of a 2m opening next month! Thanks to everyone who has been in touch and please do keep your news coming! **PW**

Broadcasting history

Keith and **Garry** invite you for another roam through the archives.

Keith Hamer

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Garry Smith

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BBC Broadcasting House, London: Pt XI

A Marconi Type SWB4 transmitter was installed on the 7th floor of Broadcasting House for experimental ultra-shortwave transmissions in association with *Marconi Wireless Telegraph Company Limited*, **Fig. 2**. The output was connected by means of a high-frequency feeder line of the concentric tubular type to a coupling box on the roof, immediately underneath the aerial. The array was supported by means of a *triatric* (an insulated stay), installed between two lightning-protected lattice steel masts, each 35ft high.

The configuration consisted of two half-wave aerials with a phase-correcting device in the middle. The transmitter consisted of four units: the main rectifier, the auxiliary rectifier, the modulator, and the oscillator. Power was supplied from the mains at 415V (three-phase, 50Hz). After a voltage step-up by means of a transformer, the supply was rectified in the first unit by three air-cooled valve rectifiers. After smoothing, the DC power output was approximately 1,200mA at 4,000V.

The second unit contained the auxiliary rectifiers which provided the various DC voltages for the earlier stages of the transmitter. A motor-generator set was provided for heating the high-frequency amplifier and modulator valve filaments, but the drive valve was heated by a 6V accumulator.

The third unit housed three stages: a sub-sub-modulator, a sub-modulator, and the main modulator using four valves in parallel. A high-power choke control system of modulation was employed. The frequency characteristic of the modulator system was flat between 30Hz and 9,500Hz.

Vintage loudspeaker advertisement

This month's trip through vintage copies of uncared for newspapers and magazines has gleaned an advertisement by the *Ormond Engineering Company Limited* for their high-quality loudspeakers, **Fig. 1**. The advertisement dates from 24 September 1932. The text has been left in its original format to reflect the spelling, grammar and punctuation of the time.

The *Ormond Engineering Company Limited* was established in 1927 by **Edward Joseph**

Law Delfosse and his brother, **Ormond**. Apart from manufacturing loudspeakers and other radio-related items, they also produced plastic mouldings, toasters and hairdryers. The company was acquired by *Armstrong Equipment* in 1977.

100 years ago: July 1926

This series reveals some of the events, technical achievements and personalities associated with the world of broadcasting from exactly 100 years ago this month.

The first broadcast from a diver under the *River Thames* was made on 5 July 1926. The bed of the Thames adjacent to *County Hall, Westminster*, was described to listeners by **Mr. F. Shield**, a diver from Whitstable, as he saw it during the early evening. He carried a small microphone in his helmet as he moved about under the water. We don't have any specific details as to what he saw, but old prams and supermarket trolleys were probably *not* among his discoveries!

John Logie Baird demonstrated his revamped television system, which was the first to have moving pictures with gradations of light intensity. He persuaded the BBC to radiate some experimental broadcasts from the medium-wave transmitter at *Oxford Street* in London. The *Baird Company* was subsequently licensed by the *General Post Office* to operate its own transmitter (2TV) at *Long Acre* and also an outlet located in *Harrow* (2TW). The licences restricted the output to 0.25kW and specified a frequency of 1.5MHz (200m).

In focus: The BBC Crystal Palace transmitter : Pt IV

In 1934, **John Logie Baird**, the pleasant, absent-minded, large, rather untidy Scot with long hair and steel-rimmed spectacles, continued his experiments at the *Crystal Palace Exhibition Centre*. Baird's 180-line definition was some 24 times better than any of his previous achievements. He chose the Crystal Palace site to locate his laboratory because it was the highest point in London.

Vision signals could not be transmitted beyond a range of approximately 30 miles. Interference from unsuppressed car ignitions tended to cause problems with the signals, as did certain types of electric lighting. After a lot of experimentation, Baird managed to improve his system and eliminated most of this interference.



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The Ormond exhibit also provoked widespread interest at the exhibition. It incorporates the chassis described above, in a figured Oak cabinet of handsome appearance and acoustically correct design. It is supplied complete with Input Transformer and provided with terminals for connections.

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Two or three nights a week, always at around 10.30pm, a chocolate-brown coloured Rolls Royce stopped outside a South London theatre and picked up a vivacious, dark-haired young actress. The journey from the theatre to Crystal Palace was little more than two miles.

Although she didn't give it much thought at the time, the lady in the Rolls was helping to make television history. Her journey ended at the exhibition centre where Baird was conducting experiments with colour television transmissions, **Fig. 3**.

The young lady was to become one of Britain's most televised personalities. We'll reveal her identity in the next column!

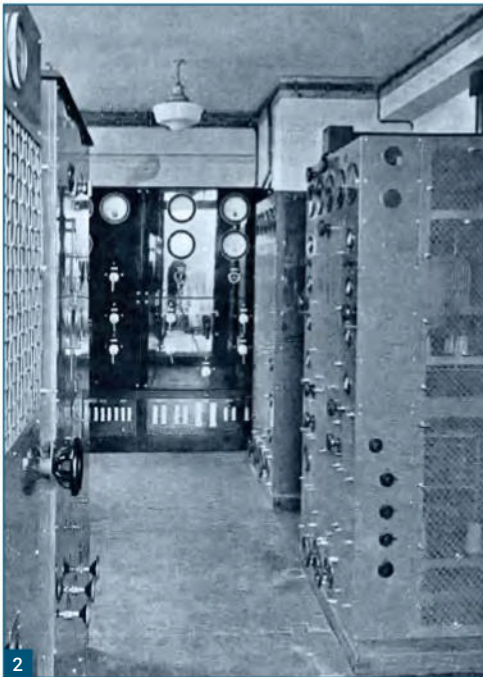


Fig. 1: An advertisement, dating from 24 September 1932, for high-quality loudspeakers, manufactured by the Ormond Engineering Company Limited in London.

Fig. 2: The Marconi Type SWB4 transmitter, installed on the 7th floor of Broadcasting House for experimental ultra-shortwave transmissions.

Fig. 3: John Logie Baird in his laboratory, experimenting with colour television transmissions.



Feedback: BBC Long-Wave Saga: Pt II

We continue the first-hand account of **Dave Porter G4OYX** in Ludlow, Shropshire, about working at various BBC transmitters.

Dave writes: "I am a retired BBC Senior Transmitter Engineer and Acting Station Manager. When all the BBC transmitters were privatised by the government, I was employed by 'Merlin Communications Ltd'. Following the dissolution of this company, I transferred to 'Vtech Merlin Communications Ltd', which, in turn, became 'VT Communications Ltd', and finally, the 'Babcock International Group'.

"I worked at the Woofferton transmitter (known amongst colleagues as 'WOF') for over 30 years. From 1948 to 1998, it was the 'Voice of America' relay station in the United Kingdom and was listed in the WRTH as being operated by the BBC. It's the last remaining HF broadcast station in the UK. My son, **Matt G8XYJ**, works there now as a Transmitter Engineer. Woofferton lies in the civil parish of Richard's Castle, Ludlow, Shropshire.

"I also occasionally worked at the Orfordness transmitter in Suffolk (known by fellow engineers as 'ORF') after 1997. Besides the BBC operating UK broadcast stations, and later the ITA/IBA etc., there was another transmitter operator, namely the government's 'Foreign and Commonwealth Office' (FCO) which had as one of its sub-sections the 'Diplomatic Wireless Service' (DWS)."

Thanks for writing, Dave. There will be more about the *Diplomatic Wireless Service* in the next column.

60 Years of BBC-2: Pt XXVIII

BBC-2 was all set to be officially launched at 7.20pm on Monday 20 April 1964. Nothing had been left to chance, or so everyone thought. However, as a first night, BBC-2 was an utter disaster!

Presenter, **Denis Tuohy**, had been sitting in the BBC bar practising his opening line: "Hello, good evening, here we are". He first realised that problems were afoot when he casually strolled into the production gallery in the BBC-2 Presentation area. He noticed that with less than 20 minutes to go until launch-time, all the monitor screens in the gallery were totally dead. As he wandered back to the bar in *Television Centre* to tell everyone what he had found, a senior executive from the Presentation department raced in to break the awful news. "There's been a power failure, we're cut off. We can't put out BBC-2", he exclaimed. The BBC bar was usually a very convivial place, as the authors found out during an invitation in 1999, but on *BBC-2 Opening Night*, everyone went quiet with shock!

As the lights and television monitors faded to black throughout the whole of *Television Centre* on that fateful night, 36-year-old

Michael Peacock, Head of BBC-2, joined his depressed team at a party on the ground floor for champagne by torch and candlelight!

Service information, Iceland: Pt VII

The Icelandic national public broadcasting service is operated by *Ríkisútvarpið* (RÚV). The organisation was originally known as *Útvarp Reykjavík*. Today, there are two main RÚV radio channels, *Rás-1* and *Rás-2*. The national public television service is known simply as RÚV. A second television channel, *RÚV-2*, is available to broadcast special events. It also distributes online-only channels and programmes for children and the elderly.

Útvarp Reykjavík began broadcasting on 20 December 1930, from their long-wave transmitter at *Vatnsendi* which is also known as *Vatnsendahæð*, located in the south-west region of *Kópavogur*. The site was chosen because the area was uninhabited and could provide a strong, unobstructed signal towards the country's capital, *Reykjavík*.

Two 150m-tall (492ft) steel masts, manufactured by *Telefunken*, were erected with a wire installed between them forming a T-antenna. Broadcasts were on AM, long-wave, initially on 1200m (249.82kHz) with a power of 16kW. Transmission equipment was provided by *Marconi Limited*.

Stay tuned!

The photos are once again from Keith and Garry's collection. Please send archive photographs, information or suggestions for future topics via the email addresses shown at the top of this column. **PW**

Dr Jonathan Hare G1EXG
 jphcreativescience@gmail.com

I have been experimenting with AI to help me develop amateur radio projects. Here I will describe my experiences with two very different projects: i) designing a large air-cored coil for VLF reception (e.g. 60kHz MSF and 77.5kHz DCF) and ii) in part 2 developing projects to use the Icom CI-V control standard for IC-7300 (MK I or MK II) or IC-9700 transceivers such as power control, S-meter and frequency requests, etc.

I will concentrate on using the free version of ChatGPT, but of course there are other 'chat bots' available such as Claude. It is worth signing in to these as they then remember your previous chats, which means you can pick-up on old threads and continue exploring topics later if you want too.

There is a lot of excitement about how AI chat bots such as ChatGPT can help us and transform our digital world [1, 2, 3]. Understandably, much is written by computer programmers and computer experts. My aim in writing these two articles is as an avid 'maker of things' and a keen radio amateur – I am aiming to explore how ChatGPT can help me in practical ways.

Throughout this article I am going to use a (not too serious) 'running score' after each section or paragraph, as a way of expressing if I thought my overall AI experience was helpful (✓) or unhelpful (✗) e.g.

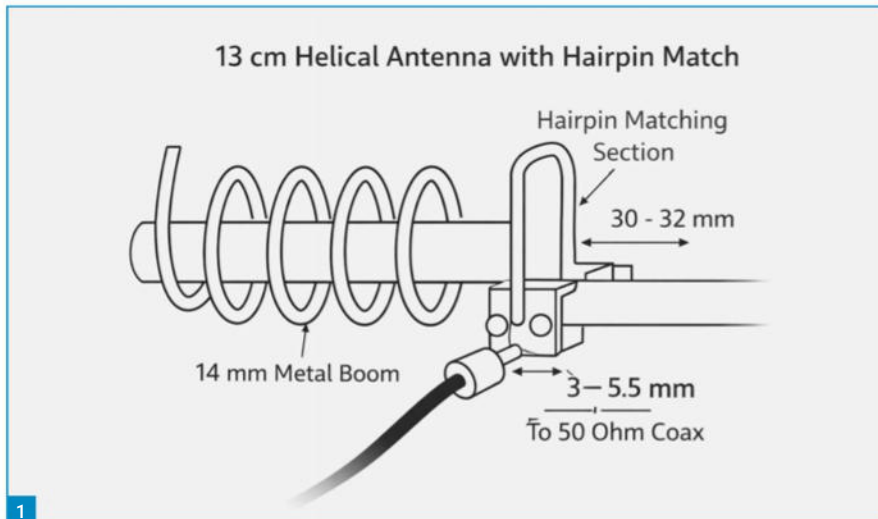
Cumulative Score:
helpful: ✓✓✓ unhelpful: ✗✗

Someone to chat to

In my career as a scientist and in amateur radio I have been lucky to have friends and colleagues who I can regularly ask questions and receive good advice from. But even my best friends don't have the patience (or spare time) to answer the '100-and-1' questions I always seem to want to ask! So, when AI started to appear I wondered if I might use it to ask questions and explore ideas, but that would never get tired or bored. As we will see, I think AI can do this, but currently you really need to know its limitations.

Sir Harry Kroto – radio molecules in space

My friend and mentor **Sir Harry Kroto** [4, 5] was an expert in microwave spectroscopy. He measured radio wave signals produced by the tumbling and rotation of certain types of molecules both in the lab and within molecular clouds in space. His curiosity about the widespread abundance of the radio signatures of molecule such as HC9N and HC11N in space lead ultimately to the accidental discovery of new forms of carbon – the fullerenes – leading to the 1996 Nobel Prize in Chemistry. Harry died in 2016 and I greatly miss his friendship, expertise and



Using AI Assistants such as Chat GPT for Radio Projects (Pt 1)

Dr Jonathan Hare G1EXG has the first part of a two-part article looking at using AI to help with radio-related projects.

wisdom and his incomparable world view. Harry wrote something I think might actually be very relevant to our use of AI:

"I have always found difficulty in formulating questions because a problem generally manifests itself as a kaleidoscope of confusing impressions. It now seems to me however, that once you have worked out how to ask the question, you also know how to answer it." Sir H W Kroto [5]

Books, Google and ChatGPT

In the past we used to look up things in books, journals and magazines. Then search engines like Google allowed us access to 100s of articles which, if we had the time, we could pore through at our leisure. Then AI came along which can now summarise 100s to 1000s of articles quickly and efficiently for us in seconds. At least that's what it seems to be able to do.

AI chat bots such as ChatGPT are language models. They are very good at summarising long documents (web pages, PDFs or word documents). You can also use them to write and correct computer code. They have had some limited success at technical and mathematical problems [1, 2, 3]. Presently the free ChatGPT does not seem to be very good at creating diagrams although it can create flow charts and sketches using alphanumeric symbols (see

Part 2). AI is aware of these limitations, as most chats end with a statement such as "ChatGPT can make mistakes. Check important info ..."

The prompt

The way ChatGPT works is to type in a question or request in a box on the website or App. As we will see, for best results, this 'prompt' needs to have as much information as possible to generate something reliable or useful. A scientist colleague recently told me that industry is now using AI to help create very detailed prompts - some 100s to 1000s of words long – to ensure it creates results of value.

According to ChatGPT the most frequent prompts are for:

- Helping with writing, editing, and communication.
- Learning and understanding complex subjects.
- Generating ideas and creative support.
- Practical advice and how-to's for everyday tasks.
- Information and fact-finding, often instead of traditional search engines.

Reliable data or discussions

Looking back over just the last few months using ChatGPT I have used it over 500 times to explore diverse areas such as: 3D printing

Fig. 1: A helical antenna as drawn by AI.

Fig. 2: A dish with LNB, as drawn by AI.

Fig. 3: VLF coil.

problems, physics, astronomy, coding and radio of course. It has also been very useful for non-technical investigations such as water colour painting or finding out more about Greek history and philosophy as well as providing me with plot and character summaries for **Isaac Azimov's Foundation** novel series. I even found its advice helpful recently for fixing my washer-dryer.

I want AI to help me in my research, to check calculations and to offer areas of interest that I might not have thought of or come across. I don't always expect it to be correct, and I would probably try to follow up any important results it provides me.

AI chat bots can also act as 'sounding boards', allowing you to quickly and effectively explore other areas and so helping you not to get stuck. This allows you to move on much more rapidly, even if some of the data presented to you by the AI may not be correct.

For example, you may ask a question which generates a response, and sometimes AI offers suggestions which lead you to ask a series of other questions. This inevitably forces you to pose your question more carefully and precisely. This certainly focuses your mind and attention, and you learn a lot - you can often explore a topic as if you were chatting to an expert in that area.

I have found that it can 'kick-start' projects, getting me to a starting point much more quickly. As a result, I am finding that fewer projects are now sitting on the shelf waiting to be developed.

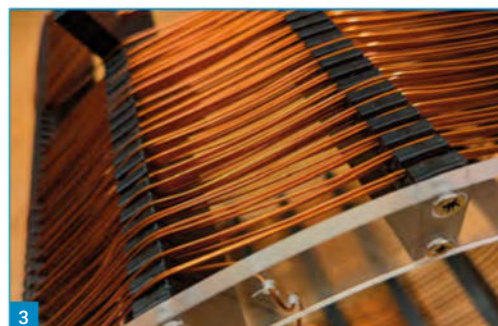
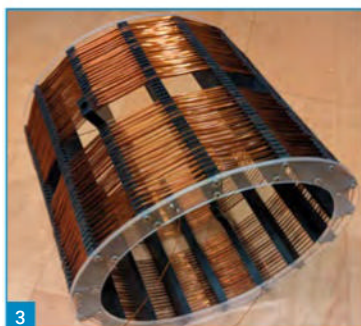
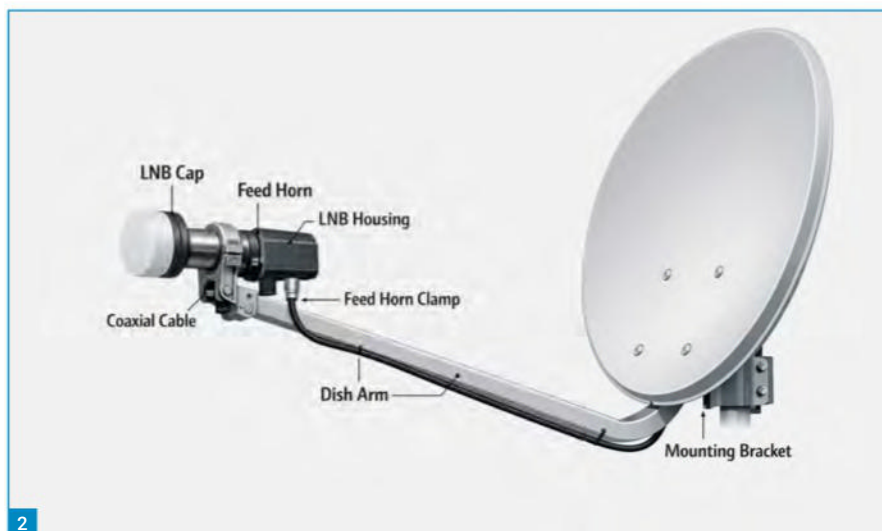
AI generated videos

YouTube is starting to show AI generated videos. Sometime these are a script someone has written but AI is used to get a famous person to present it. For example, **Richard Feynman** (Nobel Prize winning physicist) based videos are starting to appear. I really value the excellent 'Feynman lecture notes' that he helped edit, so I do value [real](#) Feynman videos. The AI versions are basically using Feynman to say other people's ideas - these AI generated videos worry me greatly.

Hallucinations and mistakes: Early days 2022

One oddity is that AI can provide a very convincing well written answer to something, implying that it has everything properly and accurately calculated, even when it has not done this at all!

In Sept. 2023 a colleague [5] asked ChatGPT "is 3743 a prime number?" and it confidently replied:



"Yes, 3743 is a prime number" which is incorrect [6].

Cumulative Score:
helpful: 0 unhelpful: X

I asked the same question in early 2026 and got "No — 3743 is not a prime number. It can be factored as: $3743=19 \times 197$ ". So that is progress ... in a short time.

Some AI chat bots allow you to 'Bolt on' other programs and I am sure if I had used Maths programs such as Wolfram Maths, the chat bot would never have made this mistake. That's fine of course if you can afford it and if you know in advance what you might need.

Cumulative Score:
helpful: ✓ unhelpful: X

Diagrams

At the end of a chat thread ChatGPT will often suggest further areas to explore and sometimes asks if you would like a diagram or graph. When ChatGPT is creating diagrams, it seems to me it is a bit like what you might get if you asked a blind person to try to draw a picture from a description.

In **Fig. 1** you can see the slightly crazy picture it created when I asked it how it would match the approx. 140Ω impedance of a helix antenna to 50Ω. It suggested a hairpin match, however, a 75-80Ω Q-section is usually used. You can see

the diagram it drew is not clear at all. The boom that supports the helix has become disjointed and the diagram does not show a reflector (although to be fair I didn't specifically ask for one). The helix is a series of circles, and the feedpoint is very unclear. AI seems to do slightly better when it draws diagrams less artistically such as using ASCII characters (see Part 2). I guess the developers know that AI struggles with creating diagrams, so they are constantly trying to exercise it by responding to feedback from us, which they hope will teach it to do better.

Another example of just how odd AI diagrams can be, I asked ChatGPT to draw a "clear diagram of an LNB and dish arm". As you can see, **Fig. 2**, it drew a lovely picture and got the parts right, but not the assembly - the LNB is pointing away from the dish!

Cumulative Score:
helpful: ✓ unhelpful: XXX

Using AI as a check

In 2025 I did some consultancy work for a UK energy company and made some heat storage calculations for them. For the first time I decided to use ChatGPT to check my calculations and see if it might inform me if I had overlooked anything.

My calculations agreed with the AI calculations which was reassuring, but there were a few oddities. Firstly, AI didn't say anything about

Given parameters:

- Total turns: $N = 190$
- Coil diameter: $D = 28 \text{ cm} \Rightarrow R = 14 \text{ cm} = 0.14 \text{ m}$
- Coil length: $L \approx (38 - 1) \times 1 \text{ cm} + 0.5 \text{ cm} = 37.5 \text{ cm} = 0.375 \text{ m}$
- Wire diameter: 1 mm (negligible effect on inductance for now)
- Axial winding: 38 sets of 5 turns

We can model this as a **solenoid with grouped turns**, since the 5-turn groups are closely spaced compared to the 1 cm spacing between groups.

Step 1: Approximate formula

For a long solenoid (length \geq diameter) with N turns and length L :

$$L \approx \mu_0 \frac{N^2 A}{L}$$

Where:

- $\mu_0 = 4\pi \times 10^{-7} \text{ H/m}$
- $A = \pi R^2 = \pi(0.14)^2 \approx 0.0616 \text{ m}^2$
- $L = 0.375 \text{ m}$
- $N = 190$

$$L = \frac{(4\pi \cdot 10^{-7}) \cdot 190^2 \cdot 0.0616}{0.375}$$

$$L \approx 1.2566 \cdot 10^{-6} \cdot 5930 \approx 0.00745 \text{ H} = 7.45 \text{ mH}$$

Final Estimate

$$L \approx 7.5 \text{ mH}$$

- Will be slightly lower if you account for **inter-turn spacing** reducing mutual inductance.
- Could be verified experimentally with an LCR meter.

4

Fig. 4: ChatGPT inductance calculation.
Fig. 5: ChatGPT self-capacitance calculation.
Fig. 6: ChatGPT explanation of negative capacitance.

the fact that the calculations were based on theoretical maximum and that real-life values would be considerably less. I was already aware of this, so I was not relying on AI to point it out. However, what was very strange was that the AI showed all the steps of the calculation yet in the top summary box I found it had used a completely different value for this very same energy. This value seemed to have nothing to do with the nicely laid out and well explained calculation! With AI you have to keep your eye out for these kinds of strange anomalies. As AI is used all over the internet, this type of thing can happen anywhere.

Cumulative Score:
helpful: ✓ **unhelpful:** XXXX

Made up links and references

One of the students I mentor uses ChatGPT to help him research and write essays at university. Being a good student, he does go off and check any key pieces of information that AI offers. However, he has told me that AI often suggest references that simply don't exist. This is very disturbing, as we then don't know if the information was bogus (i.e. made up by AI a so called 'hallucination') or just that the web link or reference source AI used was lost for some reason.

Cumulative Score:
helpful: ✓ **unhelpful:** XXXXX

what will be the self capacitance of a 28cm diameter 190 turn coil (38 sets of 5 turns spaced 0.5 cm apart) using 1mm copper wire?

Let's carefully work through this. You want the **self-capacitance** of a multi-turn coil. This is a notoriously tricky problem because self-capacitance depends on the coil geometry, spacing, number of turns, and wire diameter. For a first estimate, we can use **Medhurst's empirical formula**, which is widely used for solenoids. Let's go step by step.

Given Data

- Coil diameter $D = 28 \text{ cm} = 0.28 \text{ m} \Rightarrow$ radius $R = 0.14 \text{ m}$
- Total turns: $N = 190$
- Configuration: 38 sets of 5 turns, spaced 0.5 cm apart
- Wire diameter: $d_w = 1 \text{ mm} = 0.001 \text{ m}$

Step 1: Coil Length

The total axial length l can be estimated:

- Each set of 5 turns \rightarrow approximate axial height per set: $5 \times d_w = 5 \text{ mm} = 0.5 \text{ cm}$
- 38 sets with 0.5 cm spacing $\rightarrow 38 \times 0.5 \text{ cm} = 19 \text{ cm}$
- Add the thickness of 38 sets (each 5 turns = 0.5 cm) $\rightarrow 19 + 19 = 38 \text{ cm} = 0.38 \text{ m}$

So, coil length $l \approx 0.38 \text{ m}$

Step 2: Use Medhurst Formula

Medhurst's empirical formula gives **self-capacitance** C_s in pF:

$$C_s \approx k \cdot D$$

where D is the coil diameter in cm, and k depends on the **length-to-diameter ratio** l/D .

- $l/D = 38 \text{ cm}/28 \text{ cm} \approx 1.36$
- From Medhurst tables: for $l/D \approx 1.4$, $k \approx 7.5 \text{ pF/cm}$

$$C_s \approx k \cdot D = 7.5 \times 28 \approx 210 \text{ pF}$$

Final Estimate

So the **self-capacitance is roughly 210 pF.**

5

Calculations: VLF coils: inductance and self-capacitance

As a relatively simple test project I decided to use ChatGPT to help me design a large air cored tuned circuit for very low frequency (VLF) work. It's something a radio amateur might have made 100 years ago but I wanted to see how AI might help.

I worked at the National Physical laboratory for a year in the 1980's. I had a wonderful time as a 'Time Lord' helping to keep the atomic clocks working and building receivers for the MSF 60kHz time signal. I have kept up my interest in MSF and VLF since. Long Wave ferrite rod antennas (often using Litz wires) can be made to work well at 60kHz by adding extra parallel capacitance. When I was at the NPL we used to log the signal strength of the Rugby signals at Teddington. We saw interesting variations in the signal strength at dawn and dusk. I wondered if the Earth-ionosphere distance was acting as a wave guide at these very long wavelengths, and 'cutting off' at various times of the day leading to phase changes and signal variations when some distance away from the transmitter.

I had made some long-term signal strength measurements using a ferrite rod antenna set up at my home in Brighton, but the permittivity of the ferrite used in the rod antennas often changes with temperature and they can also be de-tuned by magnetic fields. So, to make sure what I was logging was 'real', rather than a temperature change artifact, I decided to

investigate using air cored coils. Even though they are much larger than ferrite rod antennas, they would be more stable in these respects. Like a ferrite rod antenna (and unlike a long wire) such a coil can be rotated to null noise.

I had some nice 30cm diameter Perspex rings that were left over from another job and used them with 3D printed parts to create my large coils. My first prototype was just 22 turns as I also wanted to use it up to 3.8MHz for topband and 80m receiver experiments along with an interesting transconductance preamplifier stage described in *Tech Topics* [7].

Further experiments with a similar size coil led me to a 190-turn coil made up of 38 sets of 5 turns close together (see photo, **Fig. 3**). The aim was to get a high inductance but reduce the self-capacitance of such a lot of wire close together.

Such a coil tuned with a suitable capacitance, should work well for picking up the relatively strong 60kHz MSF signal and might also be used to receive the vintage SAQ 1920's mechanical CW transmitter in 17.2kHz that still transmits twice a year (Christmas and summer messages).

Formulas to estimate the inductance of such a coil are available in classic RSGB sources, such as data handbooks or the RSGB *RadCom Handbook* [8, 9]. Although an approximate value of the inductance is fairly straightforward to do, I was interested to see how well AI might do these calculations. I also wanted to see how well it might tackle estimating the self-

ChatGPT said:

That's a very good question — and the short answer is: **the model "L is constant and only capacitance changes" is slightly wrong in a real LC circuit.** A few very common effects can exactly produce an apparent **negative self-capacitance** even when the frequency measurements are accurate.]

Nothing is "wrong" with your measurements. What's wrong is the assumption that:

- L is constant
- Coil self-capacitance is a fixed lumped element

In reality:

- L decreases slightly with frequency
- Distributed capacitance changes with current distribution

Both effects naturally produce an **apparent negative self-capacitance**.

6

capacitance of such a large coil, something which is not so easy to do 'by hand'.

I used ChatGPT to calculate the inductance and the self-capacitance of the multi-turn coil (ChatGPT used the Medhurst calculation for self-capacitance, see screen grabs, **Figs 4 and 5**) - see both the ChatGPT and real-life measurement data in the table.

Cumulative Score:

helpful: ✓✓ **unhelpful:** XXXXX

190 turn (38 set of 5) turn coil, 1mm enamelled copper wire, 23cm diameter coil, ca 1cm 5-turn spacings

ChatGPT gave an inductance = 7.5mH with a self-cap of 210pF

ChatGPT estimated $C = 940\text{pF}$ for resonance at 60kHz (11nF for 17.2kHz)

Real life Peak meter measurement gave 9.0mH (DC resistance 5 Ω)

Which would give a resonance at 60kHz using $C = 780\text{pF}$ (9.5nF for 17.2kHz)

I found I needed 1050pF (Peak meter measurement [10])

Cumulative Score:

helpful: ✓✓✓ **unhelpful:** XXXXX

What would I expect the self-capacitance of such a large coil to be? Well, a guesstimate might be somewhere between 10pF and 100s of pF. So, ChatGPT's value of 210pF seems reasonable.

Ignoring the damping effect of the resistance on such a large inductance, the capacitance required for resonance can easily be calculated from the standard LC formula [7, 8]. I made up the coils and experimented with the real-life capacitance (variable capacitor) needed to resonate the coils as shown in the table. I coupled into the coil / antenna using two turns around the middle of the coil, the two ends of which simply went to a piece of 50 Ω coax and on to the VLF receiver. Tuning the receiver to 60kHz MSF I found the coil required 1050pF for resonance, while at 77.5kHz DCF it resonated with ca. 656pF [10]. The beauty of using the

time signals of course is that we are sure of the frequency.

For measurement 1: $f_1 = 1 / 2\pi\sqrt{L(C_1 + C_{\text{self}})}$

Which is equivalent to:

$$(2\pi f_1)^2 L(C_1 + C_{\text{self}}) = 1$$

For measurement 2: $f_2 = 1 / 2\pi\sqrt{L(C_2 + C_{\text{self}})}$

Which is equivalent to:

$$(2\pi f_2)^2 L(C_2 + C_{\text{self}}) = 1$$

If you assume the inductance (L) is the same at each frequency, you can solve the equations for the self-capacitance (C_s).

$$(F_2/F_1)^2 = (C_1 + C_s) / (C_2 + C_s)$$

I did this by hand and got ca. 70pF. As a check I then asked ChatGPT to see if it could also solve the equations, I asked:

"An LC circuit with inductance L and capacitance (C + self-capacitance) is resonant at 60kHz with C = 1050pF and 77.5kHz with C = 656pF. What is the self-capacitance?"

And ChatGPT gave minus 67pF, yes -67pF!

When I went back to my original calculations I found I had made a very basic error, and ChatGPT was indeed correct!

Cumulative Score:

helpful: ✓✓✓✓ **unhelpful:** XXXXX

What does a minus capacitance mean!? It appears that at these frequencies the interaction between the sets of five turns and the change of skin depth affects the way the coil behaves as you change the frequency. The result is the inductance is not constant between these two frequencies. If you assume L is constant, the maths will generate a negative capacitance.

When directly asked about this negative capacitance ChatGPT outlined that this could indeed be the case (see screen grabs).

Cumulative Score

helpful: ✓✓✓✓✓ **unhelpful:** XXXXX

References and links

- [1] New Scientist, AI solves historical maths problems, 16 Jan 2026.
- [2] PC Pro, March 2026.
- [3] search YouTube for 'The uncomfortable truth about huge space images' by Astrum (Alex McColgan) (e.g. see 14 min into the video).
- [4] Sir Harry Kroto and the C60 Nobel Prize at the University of Sussex:
<https://youtu.be/yu-zoQidPZM>
- [5] Microwave Rotational spectroscopy, H W Kroto, Dover Publications, 2003, ISBN 9780486495408.
- [6] Andrew Pratt, personal communication.
- [7] Technical Topics, November 1996 and June 2003.
- [8] Radio Data reference book, G R Jessop, 5th Edition.
- [9] Radio Communications handbook.
- [10] Peak LCR measurement meter.

Summary so far

It was very interesting to see how straightforward it was to ask AI to do inductance and self-capacitance calculations. I was impressed by how easy it was to do the dual frequency calculation and realised that ChatGPT provides a very useful check for my own calculations. I was impressed with how it responded to explaining the 'negative' capacitance brought about by assuming the inductance was constant with frequency. Presently it seems to struggle with creating diagrams. So far, I have given ChatGPT equal / helpful good (✓✓✓✓✓) and unhelpful scores (XXXXX).

Next time we will look at using ChatGPT to create code to design projects to communicate with modern Icom transceivers.

The cost of AI prompts

I asked ChatGPT how much a typical prompt cost. Programmers pay per 'token' which is around 750 words. A text only type prompt e.g. "Explain how photosynthesis works in about 300 words" will be about \$0.01 / £0.01. An ASCII type diagram turns out to usually cost a little less, as they are relatively small and so cost about the same price as a text-based answer. A more carefully drawn diagram - like the one of the LNB and dish - are more expensive depending on the detail but typically cost about \$0.04 / £0.03 per image. **PW**

Georg Wiessala

wiessala@hotmail.com

I have to admit my German grammar brain baulked more than a little at the notion of forming the plural of 'Hamfest' as 'Hamfests'. However, the word is now part of the amazingly malleable English language, in much the same way as *Schadenfreude*, *Bildungsroman*, *Kindergarten*, *Zeitgeist*, and *Angst*.

So I'll keep using it like this. After all, there are other linguistic 'car crashes' in our radio hobby, such as 'Swapmeet', 'Hamvention', 'Hamcation' – and perhaps most cringeworthy of them all – 'Buildathon'. Every hobby develops its own colourful idiosyncratic jargon – and ours is no exception, for certain.

This month, I'd like to do something different from reviews and biographies of radio pioneers because we are now about a third into this year's annual crop of radio rallies. This is meant as an extension to last month's short report on the Blackpool Radio Show (*PW* June 2026: 20).

In what follows, I am aiming to recall some of the historical roots of these, our favourite hobby events, look at how they have developed over time (mostly in my own lifetime), find out whether or not it has all gone terribly wrong, and maybe cause some *Angst* about its future, or at least some speculation and concern.

Overall, my argument is that the radio shows of the past and the present are different kettles of fish. They fulfil discrete purposes and happen in the context of changing societies and new hobby communities, whose expectations, attitudes and beliefs they have reflected and shaped in equal measure.

Tomorrow's worlds: the original radio shows

Shows, fairs and exhibitions involving radio, or 'wireless', stand in a long and venerable tradition ever since the medium of radio was invented. If there ever was a 'Golden Age', I would argue we can locate it in the later 19th and early-to-mid 20th Centuries, when Victorian ingenuity met European experimental spirit and competitive US commercial endeavour (**Table 1**).

We have covered this topic in this magazine before (e.g. Caldwell, S: 'Tomorrow's Worlds: Radio and TV at the World's Fairs' *RadioUser* May 2021: 46-48; **Fig. 2**). Those 'World's Fairs' of a bygone era showcased not just radio. They also threw the public spotlight on a wide variety of technological, industrial, scientific and cultural developments. But what you might call early global radio trade shows were much bigger and more ambitious affairs than those today. They championed, for example, the then-new miracle of electricity (Chicago, 1893), the continued use of the Eiffel Tower (Paris, 1889; *The Spectrum Monitor*, October 2024: 19), the spread of



Radio Shows, Rallies and Hamfests: Do we still need them?

Georg Wiessala casts a critical eye over the past, present and future of radio shows, looking at what purpose they can serve in the modern world of amateur radio and how they might fare.

wireless communications (St. Louis, 1904; **Fig. 1**), the emergence of TV (New York, 1939), and much more.

These were truly occasions for early pioneers and near-contemporaries, such as **Nikola Tesla** (1856-1943), **Thomas Edison** (1847-1931) and **George Westinghouse** (1846-1914) to showcase their breakthrough ideas and attract investors.

In Chicago, in 1893, the 'War of the Currents' (AC vs DC) played out, as dramatised in **Graham Moore's** splendid novel, *The Last Days of Night*. The St. Louis Fair (**Fig. 2**) reflected contemporary clashes of personality and animosities between **Guglielmo Marconi** (1874-1937) and **Lee de Forest** (1873-1961). At the venue, the latter outshone the former – literally and metaphorically – in terms of wireless prowess.

From electricity to wireless, and beyond

Grand affairs like the New York 'Radio World's Fair' in 1939/40 (**Fig. 4**) set a precedent for introducing the latest radio equipment; our contemporary shows still do that. **Scott Caldwell** compared the 1939 Fair to today's extensive Consumer Electronics Fairs (2021: 47). The earlier Chicago World's Fair of 1933, based on the theme of 'A Century of Progress', enticed and educated visitors with a special exhibit on amateur radio, complete with the use of a unique callsign (W9USA). And the 'Golden Gate World's Fair' of 1939/40 in San Francisco even had a dedicated shortwave broadcasting station, run by General Electric (GE; W6XBE).

Closer to home, we've had the wonder that was the Great Exhibition at Crystal Palace in

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Fig. 1: A wireless telegraphy display at the famous St. Louis Exposition. **Fig. 2:** Scott Caldwell's 2021 *RadioUser* article on 'radio' at the World's Fairs. **Fig. 3:** A good selection of receivers - ready and working - is a great attraction. **Fig. 4:** An Art Deco poster for the 1939 New York World's Fair, under the theme of 'The World of Tomorrow'. Radio was very much part of that world. **Fig. 5:** It is great to come across items that only reveal themselves as radios upon closer inspection, like at this BVWS show.



1851, with exhibits on wired telegraphy, pre-dating wireless. More pertinently, to mark its Centenary, the Festival of Britain in 1951 sought to stimulate consumer demand in the wake of WWII (1939-1945) – not just through radio and TV, but mainly in design and art. Check out the documentary *The 1951 Festival of Britain: A Brave New World* on BBC Sounds, and you'll grasp the *Zeitgeist*:

<https://tinyurl.com/d74khvjw>

These early radio and technology shows were grandiose commercial, cultural and technical spectacles, with visitor numbers to match, and they were among the birthplaces, test tubes and midwives of radio.

Some of them even offered special exhibition-themed commemorative ('souvenir') radio receivers, such as the RCA Model 40X-56 (1939). Take a look at old issues of *Radio Craft Magazine* for some amazing imagery.

A special souvenir radio? – Now, how about that for an idea for the next National Hamfest?

These historical affairs were inextricably bound to their time, though. They could only happen in an uncritically 'modernist' age of wonder and naïve belief in the inevitability of progress.

In How the Victorians took us to the Moon,

Professor Iwan Rhys Evans sheds more light on these early radio shows in their wider, optimistic, socio-economic climate. It's a fascinating read because it prefigures so many of our current, often misguided, beliefs in the promise of AI and the miracles of digitalisation.

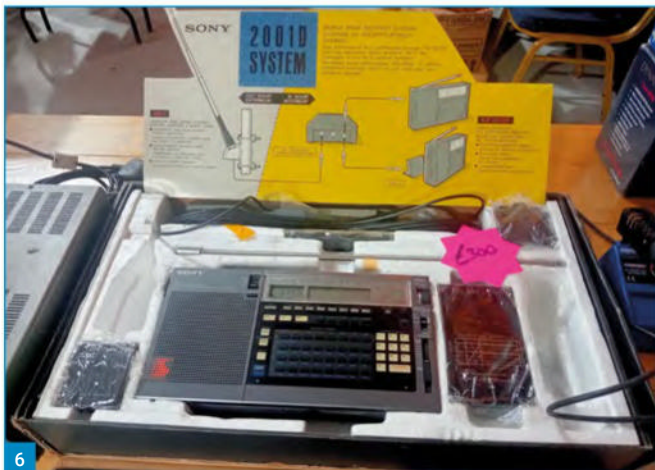
The good, the bad and the ugly

Anyway, I wonder whether the radio shows of our own lifetimes are still engines of progress as well as mirrors of contemporary trends and beliefs in society? In the present, those of us who can remember radio shows at venues like Granby Halls in Leicester, Alexandra Palace or the Stevenage Convention Centre might be forgiven for holding mixed views about the modern incarnations of radio rallies. Maybe this accounts for the decline in visitor numbers

overall. Or is it the lack of appeal to the 'Instagram Generation'?

This begs a more general question: what should a 'good' radio show actually look like? What are the secrets of the long-term success for such events, big and small? What follows are, of course, completely subjective impressions, based on my own attendance at these shows over the last 30 years or so and on my work in helping to compile the relevant listings for *RadioUser* and *Practical Wireless*.

So, what makes up my dream radio show? Well, I feel that there are several essential components – pardon the pun – for a rally that is both commercially successful and enjoyable for all. And this begins long before the actual show takes place. Thorough preparation is the key, as is clear communication to the punters and clubs,



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and ideally, an accessible website for promotion, floor plans, bookings, and so on.

And before I even get there, I like listening to a friendly 'talk-in', i.e. on 2m and 70cm; this whets my appetite no end, while en route, as well as apprising me of any traffic problems, local parking issues or weather developments. I remember doing this in the past, on the M55, on my way to the NARSA Show in Blackpool.

Essential components and catnip

Then there are what I would call indispensable requirements. First, call me *altmodisch* (old-fashioned), but I do like rallies that showcase a goodly number of *actual radios on display*, and which have what you might call the 'knob-fiddle-effect'. This means vintage radios, new receivers, black boxes and SDR receivers; *all working, of course, and connected to power*, plus software and antennas where required, and an unhurried atmosphere overall, which actively invites visitors to give it a go (Fig. 3).

So, 'try before you buy'? Definitely! A bring-and-buy? Not essential, in my opinion, and often just junk.

Fig. 6: What would a radio rally be without those amazing bargains that you will find nowhere else? (NARSA, 2026). **Fig. 7:** Activities such as construction and training during a show can engage the public and bring in new members to radio clubs and societies. **Fig. 8:** Making new friends and learning at a BYLARA stall in 2026. **Fig. 9:** Disorganised and 'junky' displays are the 'Marmite' of radio rallies. My own observation shows that many give them a wide berth. **Fig. 10:** See you at the *National Hamfest* later this year?

Having said that, I have to admit that 'quirky' and unusual items (Fig. 5), and irresistible bargains (Fig. 6), are like catnip to me at any show.

More generally, I would like to see the 'big' traders making *much more of an effort*, in particular on special show-deals, although there are likeable smaller shows and enthusiasts' meetings where it may be preferable to promote local and regional clubs, local businesses, and so on.

I have fond memories of National Hamfests where all this was the case, but I also always enjoy the more intimate local flavour of many regional events, hobby meetings, airshows and similar rallies.

Second, I definitely want to see a rich and engaging programme of side-shows, such as

great displays, self-build activities (Fig. 7), competitions, lectures and demonstrations, Morse tests, events bringing in youngsters, as well as general instructional activities. Lots of brochures and enticing leaflets, free magazines and newsletters are all part of a successful visit for me.

This is exactly where expertise and good practice can be exchanged, contacts can be made, and new recruits can be gained to the hobby, whether you still need Morse code or not.

Third, the presence of local radio clubs, advocacy groups, and specific interest associations can really enrich a good radio show. This is not always possible, but great when it happens. In my experience, this is done particularly successfully at the annual NARSA Show in Blackpool (PW June 2026: 20).

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And – do I even need to say this – a radio show is only *really* complete, in my opinion, when there is a strong presence of the world's best radio magazine!

To be fair, most event organisers and traders do get all this right, and the resulting rallies bring you not just joy and exciting new purchases but also education, fun, inspiration, and new friends and ideas (Fig. 8).

Rocky Horror radio shows and Marmite

However, there are some bad examples. Among the horror shows I have seen are those that one is done with, as a rule of thumb, in less than an hour, because there was so little new or of interest.

First and foremost, these are the radio shows *sans* radios, as it were; Hamfests that consist of rows of *disconnected* receivers; worse still, just tables with brochures. What's the point of that?

Then there are rallies of the 'glorified-car-boot-sale-variety', dominated largely by PCs and IT components, groceries and non-radio-related junk, esoteric second-hand books, and so on. Don't get me wrong, computers and radios harmonise well in nearly all areas of our hobby. However, this needs to be reflected in the actual design and planning of a show. And yes, there is a place, of course, for components, second-hand stalls and accessories; however, in my personal opinion, this should never 'take over' the overall show.

There is a challenge here for the organisers to not allocate stalls higgledy-piggledy on a first-come-first-served basis, but with an overall concept or maybe a 'theme' in mind. Where this is not the case, stalls and displays can quickly disintegrate into disorderly 'junk-tables'.

I think that the latter are like the 'Marmite' of radio rallies: some love them and seek them out especially, others, like me, give them the widest of berths.

To recap, the best examples are shows where software, accessories and hardware work hand-in-hand, for example, when the latest SDRplay receiver, to pick just one product, is being demonstrated to potential customers while connected to the latest software, outside antennas, and so on.

Captive audiences and Bad Apples

Bad cases? Plenty, I'm afraid: traders that don't bother coming at all or don't bring along any actual gear, or just the 'bare minimum' – it's been known. Yes, I understand about spiralling costs, but a radio rally is about so much more than sales. This is the personal dimension of it all, I believe. To use another German word – my final one for now, I promise – it is all about *Kontaktpflege*: the maintenance of contacts in what is, after all, a 'captive' audience. This



means taking your time, having a chat, getting to know old and new customers, linking up with clubs, getting involved, most significantly: *being seen to be there, and to care for the hobby community*.

This is a more intangible investment that simply cannot be measured in pounds and pennies.

More generally, among the 'bad apples' of the radio show world, in my view, are: PCs from the Age of the Flintstones; vegetables for sale or boxes full of damaged old junk.

Not even *radio junk*, to be clear (Fig. 9). Old telephones. Computer games of the 1980s and other horrors. You probably know what I mean...

Closely behind these are rallies that hire out stalls to individuals and organisations which – even at a vast stretch of the imagination – have nothing to do with radio. I remember dragging my long-suffering XYL to a far-away radio show a long time ago, with the lure of a promised 'craft-tent'. This turned out to be a rickety affair containing what can only be described as a dreadful array of kitsch and tat. I tried to argue with her that one man's kitsch is another's treasure, but to no avail. I didn't live this one down for years.

Another bugbear here is of another variety: stallholders who are, shall we say, 'less than knowledgeable'. This is quite rare, in my experience, but happens a little more frequently recently, especially in the accessories trade. Not knowing your aerial connectors, plugs and adaptors, for example, is just embarrassing, as well as potentially bad for business. We all come here to learn, as well as to have fun.

Polemic and conclusion

It is more than possible, of course, that I am looking at this topic 'through rose-tinted spectacles' and that I am allowing my many memories of past events to colour my perceptions, predilections and bad experiences.

And yes, of course I am betraying my age here, in a way, for example, with my preference for things I can 'work' and touch – and not just with a finger on a screen. Plus, I am well aware, of course, that things are constantly moving on in the radio hobby, and that the rallies of the future

will, in all likelihood, be differently organised, showcase a changed range of things and cater to a new kind of audience. And that is absolutely fine. All of the above is a personal picture, and I may have to manage my expectations better.

Nevertheless, it is fun to speculate a bit here, about what kind of impact one or more of the following will, undoubtedly, have on the radio shows of the future:

- The deeper spread of Artificial Intelligence (AI)
- The wider use of remote listening via Web-SDRs/ Kiwi SDRs
- The further integration of SDR technology

These are just a few points. So do we still need radio shows, or has the spread of online shopping made them obsolete now? I would really appreciate your opinions in this matter; please let us know, through the letters-to-the-editor column, what you think. Do you have any positive or negative experiences with radio shows, anything you'd care to share? What does the future hold?

Until next time, and in the hope of meeting as many of you as possible at the next 'Hamfest' (Fig. 10). **PW**

Table 1: Further Reading

BBC Sounds: The 1951 Festival of Britain: A Brave New World:

<https://tinyurl.com/d74khvjw>

Becker, R. (2001) 'Hear and See: Radio in the World of Tomorrow [...]'. *Historical Journal of Film, Radio & TV* 212 (4): 361-378

Caldwell, S. 'Tomorrow's Worlds: Radio and TV at the World's Fairs' *RadioUser* May 2021: 46-48)

Commemorative Radio Models:

<https://tinyurl.com/52mmp2pd>

Rhys-Morus, Iwan (2022) *How the Victorians Took Us to the Moon [...]* (Icon Books)

Jonnes, J. (2004) *Empires of Light: Edison, Tesla, Westinghouse and the Race to Electrify the Home* (Random House)

Moore, G. (2017) *The Last Days of Night* (Simon & Schuster)

Plotnick, R. (2013) 'Touch of a Button' [...] *Critical Studies in Media Communication*, 30 (1): 52-68

Raboy, M. (2016) *Marconi: The Man who Networked the World* (Oxford University Press)

RCA at the 1939 World's Fair:

<https://tinyurl.com/ydczmzkd>

Wiessala, G. (2024) 'Vive la Radio: Paris, Wireless and the Eiffel Tower' *The Spectrum Monitor*, Sept. 2024: 63; Oct. 2024: 19



The William 'Bill' Howlett collection

A historic collection of radio memorabilia looking for a new home.

Don Field G3XTT
 practicalwireless@warnersgroup.co.uk

Here at PW were recently approached by **Mariska van der Bosch** regarding a 1930s archive of material belonging to the late **William 'Bill' Howlett G6PH** of Thornton Heath, Surrey – approximately 180 QSL cards spanning thirty countries, original letters from NBC New York, KDKA Pittsburgh and the British East African Broadcasting Company, and Bill's personal notebook from 1933–1938. The collection was brought to Mariska's attention by her friend **John Bassett**. The notebook is the heart of it. It reveals Bill as a teenager sitting up past midnight logging Puerto Rico on Boxing Day 1933, drawing America as a hot air balloon,

and writing a girl's name – **Patricia Moore** – repeatedly across the pages until it trails off. Mariska writes, "We are looking for the right buyer to keep the collection together, and feel a *Practical Wireless* feature could reach exactly the right people". William Charles Howlett lived at 11 Penrith Road, Thornton Heath, Surrey. Based on a school form reference in the notebooks and the earliest dated log entries (1933), he was in his late teens when the most active period of the notebooks began. He held a Broadcast Receiving Licence and later a Television Licence. His callsign was G6PH, and he was still active in 1947. He had a sister **Winifred**, a father who bet on horse races, and a set of handwritten mottos he returned to across many years.

The catalogue of material extends to five pages and mentions broadcast and amateur radio QSLs received during the two decades 1930 to 1947. It states, "The institutional letters alone represent primary source material for the history of early broadcasting in multiple countries. The notebooks are a self-contained biographical document of a young man in the 1930s for whom a shortwave receiver was a window onto the world". The collection includes station licences, photos, correspondence and a number of philatelic items of interest. The photos on this page give an idea of what is included. Mariska is hoping to see the collection kept together and go to a good home. If you are interested in purchasing this historic collection, please drop Mariska a line at mail@mariskavandenbosch.nl

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145Alive

Dear Don,

I tried to participate in the last 145 Alive event last Saturday, April 18th. I could only manage from 13.30 to 15.00 due to other commitments. In those 90 minutes I heard only two Net Control stations and managed a contact with just one (note, a contact not a full QSO). Where the other station disappeared to I have no idea as he was 5&9 earlier.

After the event I posted on the 145 Alive Facebook page that it had not been a good event for me and that maybe I wouldn't bother taking part next time. I got several replies to my post and a few were highly derogatory, bordering on the offensive (the ones received on Sunday were deleted without being read). I know that social media in general is infested with these sort of people, we hear about them regularly on the news, but I didn't expect it from fellow amateurs.

This greatly affected my, already fragile, mental health such that I spent a very restless night with little sleep. On the Sunday morning I thought about getting a large hammer and smashing all my radios.

I have left the 145 Alive Facebook page and will definitely not take part in any of their events in future. I am now very reluctant to switch my 2m radio on again, certainly on FM and never on a Saturday or Sunday afternoon. Maybe I'll be able to try C4FM or DMR via RF to my local repeaters but I'm not sure.

They say it's good to talk and I feel better now that I've shared this with you.

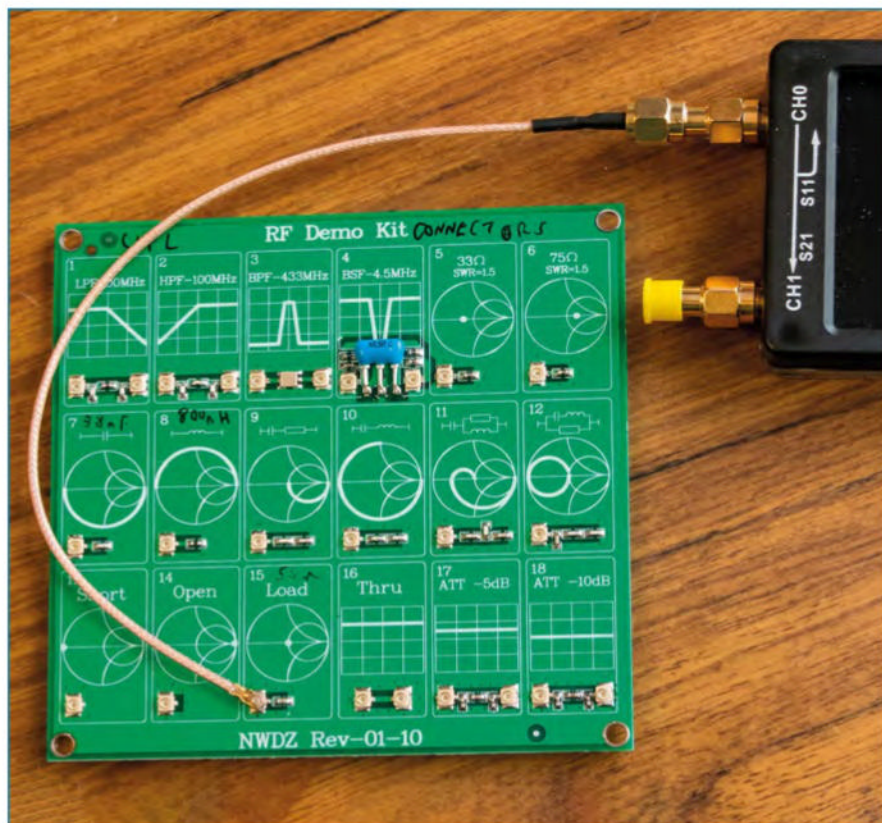
Dave Allsebrook G1VAC
Derby

(Editor's comment: Thanks Dave, but sorry to hear of your experience. These events seem to be proving popular but, unfortunately, it only takes a few bad apples to spoil the whole barrel. Sadly, those concerned are probably not readers of PW.)

VNA Trials

Dear Don,

Vector Network Analysers (VNAs) are useful test instruments with quite capable budget versions now on sale. Here is a simple device for testing, calibrating, demonstrating and learning about VNAs. The board carries a range of independent circuit elements, terminated by



on-board UFL connectors. The example I bought (illustrated) is eBay item 206144929479 and comes with a pair of UFL-SMA leads. It operates as expected with my Nano-VNA. Thanks to **Mike G8CKT** for introducing this equipment in *Practical Electronics*, May 2026 page 20.

Godfrey Manning G4GLM
Edgware

FT8, etc

Dear Don,

I feel very strongly re the comments in the June 2026 copy of *Practical Wireless* by **Pat Watson M1BNH** regarding FT8. I totally agree with Pat that FT8 is not Amateur Radio! I am awaiting the press gang to drag me out screaming and lynch me for this but, enter the Oxford English Dictionary Definition of Amateur Radio and you get and I quote, "The Activity or pastime of using the Radio Frequency Spectrum to transmit and receive messages for non-commercial purposes". Nothing in this definition re via internet connections.

I agree FT8 has its place but can it really be called Amateur Radio? I still construct my own transceivers, including many designs with better spec than modern day transceivers and not a pic chip in sight. Unfortunately, I have copies of *PW* going back to the 1950's and I am of an age where I just remember valves.

Take this scenario. Suppose a war situation breaks out and the internet is shut down, even an act of terrorism, well bye-bye using FT8 but I can still use my genuine Amateur Radio transceiver to communicate.

I know we live in a modern world where modern tech is utilised and people nowadays have very busy lives, mostly communicating via social media or text messages. Walk down any high street bumping into people with a glued mobile phone in their hand and I partly blame this for lack of people on the radio bands. To many and I know this by interviewing many so called Engineers when I had my own business, "Here's a schematic tell me how it works?" They do. "Here is the built board and a soldering iron please fault find it and fix it?" Their answer was

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always "Eh, we don't do that anymore, we swap boards!"

In the 80s it was nothing to go on 2m and chat for hours to a friend, now we use things like text messages or other social media. Have people become afraid to actually speak to each other?

On a final note, should magazines like *PW* (others are available) and its name not carry more constructional projects? I am pathetic at design but excellent at construction and repairs. It actually appears that design as such, is little or non-existent, maybe this is why everything is giving way to FT8. We have an excellent spectrum of bands and it's the old saying "use it or lose it".

Bring on the Lynching Mob.

Andy Sharp G0JIA
Plymouth

(Editor's comment: Thanks Andy, though I'm not sure why you link FT8 and the internet – the two are unrelated. A transceiver capable of FT8 is equally capable of Morse or voice by connecting a key or a microphone. Yes, the internet is used extensively nowadays for linking repeaters and the like – EchoLink, etc. However, as for communicating after an act of war, I rather suspect that, as during WWII, amateur radio would be closed down in such an eventuality. And, yes, I would love to carry more constructional articles but am limited by what I receive. I am always willing to help those who develop projects but find it difficult to write them up.)

Interesting antenna

Dear Don,

I think that you may be interested in my grounded antenna. I'm using an end fed QRP module and some lawn staples. I have attached a photo of the module. It's sold as a QRP end fed module but it's working very well as a receive antenna that is very much quieter than my GSRV. I bought it from TEMU and it cost £6.42. The wire staples came from the same seller.

Dave Warner G4OER
Lincolnshire

Cri de coeur, Log Periodic, 'fun while it lasted'. Your Letters.

Dear Don,

I remember a time long ago when transceivers were in the ascendancy price wise and where ancillary equipment was the opposite. But not anymore it seems. There on page 31 was a ML&S advertisement that featured a Yaesu M70 microphone which cost more than twice the price of a Yaesu FT-4XE. Putting aside those cheap-as-chips Chinese transceivers that appear as regular as night and day, is that the



new norm nowadays?

G4MIU's article (June 2026) about the Log Periodic reminded me of the Sterba curtain and the Lazy H antenna (I'm currently in the process of writing about a now forgotten US ham who was a big fan of both - and rhombics). Sterba curtain arrays were used for VOA transmissions (Voice of America) and of course, being a highly directional broadcasting type antenna, not only used extensively for entertainment and propaganda, but also for other nefarious monitoring and communicational purposes. And why the US ham mentioned was smitten with the Sterba too. As **Keith** points out, the LPDA is an extremely useful antenna - hence its obvious embrace by the military and commercial use. However, not quite so popular with the amateur radio community. Again, as Keith rightly implies, constructing a LPDA is in a different league to knocking up a Yagi - which could probably be accomplished blind-fold. I've not attempted to build a Sterba or a rhombic - space restrictions - but I have hoisted up a Lazy H. Cheap, because it can be fashioned using wire, several dBs gain over a boring dipole, and ideal for intercontinental DX. Perhaps then, no need for a tower and a colossal Yagi? Oh, those Slim Jim's are a fun and easy effective route for VHF/UHF work. I once saw a version that could be rolled up and put in a pocket.

M1BNH's cri de coeur, about the days of yore when amateur radio was "convenience rather than achievement" and that the "days of the true gifted radio amateur are numbered" is, I guess, given where ham radio exists now, a touch understandable. It appears though, that what **Pat** fails to realise (maybe not intentionally or otherwise), is that the current state of amateur radio is not exclusively about licence conditions and whether we can build and maintain our own equipment as we once did. And no, we can't put the genie back in the bottle - internet wise, that it is "not really amateur radio". As for the Scientific Method **Keith** mentions, he may like to know

that this has been partly abandoned in favour of desk-top theoretical shenanigans. That's definitely not a good thing. And yes, lots of people do buy expensive transceivers "they can't set up properly". Likewise, as I've done, bought expensive Smart TV's and Smart this and that, with 'functions' we don't understand.

It is a fact, that it's not only those who have passed the 'current ridiculously low standards' of the amateur radio exams that buy expensive radio equipment. No, on the contrary, hams that passed the RAE many decades ago are also avid buyers of transceivers costing many thousands of pounds. I personally know an old-timer who did exactly that a month ago, he's still reading the operating instructions! Of course, it is the case that if and when standards are lowered, it will inevitably lead to some of the problems amplified by Pat. This state of affairs isn't new. Because a similar thing happened when commercially manufactured receivers and transmitters first hit dealers shelves many decades ago. Most of them abandoned radio DiY and fell hopelessly in love with manufactured gear. They couldn't get enough of it. Suffice to say, there appeared much moaning among the cognoscenti that a such a thing was not in the true spirit of ham radio. That it would "never be the same again".

The 'leadership' of amateur radio isn't an exact science - as the ARRL (Amateur Radio Relay League) for example, found out ages ago. Besides, digging up the blame-game for all the current woes of our hobby is not really the best way forward. It's counter-productive and worse, begets division. Just as driving a car was once a pleasure, but has now become a harrowing and tedious undertaking which sometimes requires the patience of a saint, amateur radio likewise requires its fellowship to have patience, forgiveness and more importantly, when nowadays, technology is both foe and friend to the continuance of ham radio, prejudice of its perceived inadequacies as set out by Pat

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M1BNH, borders on the jejun. As **Don** correctly points out, you have to “accept the hobby for what it is”. But what I do know is this: if amateur radio had remained a predominantly build it yourself equipment activity, where everyone involved is proficient in designing and fully assembling Class AB amplifiers, receivers and transmitters and therefore, been an exclusive clique, then as sure as I can be that the moon is not made of cream cheese and crackers, amateur radio would have disappeared long ago. The point being here, that whether you like it or not, the commercialisation of ham radio via manufactured equipment did transform our hobby. Yes, its commercialisation has changed the traditional methodology of ham-radio. Ditto, the advance of technology. So, was it a price worth paying? Well, the answer to that question is blindingly obvious, right? Oh, ‘fun’ is still out there if you seek it.

In a final attempt to quell Pat’s misgivings about the ‘gifted radio amateur’, there are within our midst a few ubiquitous non-conformists, iconoclasts, rugged individualists and other hopeless idealists who collectively, in a small way, continue to ensure that the basic premise of our hobby - experimentation, building

equipment and so on - will always remain safe in their hands.

**Ray Howes G4OWY/G6AUW
Weymouth**

LoRa Tracker

Dear Don,
Regarding the SOTA LoRa APRS Tracker article in June’s issue of Practical Wireless. Furness Amateur Radio Society (FARS) had a project for club members to build LoRa igates, consequently the Furness Peninsula has a rash of igates (see the map), so come along to South Cumbria and try our local SOTA sites, we guarantee you will be tracked!

**Graham Postlethwaite M0POS
Ulverston**

Various

Dear Don,
On opening June’s *PW* on the *Letters* page I immediately see yet another letter penned by **Ray Howes**. Interestingly he attempts to address this petition for planning free antenna masts/towers etc; more on that later.

As a Volunteer at Bletchley Park in the National Radio Centre I generally sit in reception and talk to visitors about the work done by certain Radio Amateurs, the Voluntary Interceptors or VI’s. Obviously, there are those who are interested in Amateur Radio per se; then they walk into the radio station at the end and see very expensive equipment being used. [In my opinion the sight of that equipment gives the wrong idea about the interest; you don’t need top end equipment to transmit and certainly not top end antennas either]. The showing of a Chinese QRP transceiver, cost about a tenner, isn’t the answer either. You have to be able to use Morse for the QRP stuff.

When asked, I always mention local radio clubs and their ‘redundant’ [junk] equipment sales. I’ve always done very well out of them on the occasion I have bought something; usually receivers because that is my real interest.

However, reading Ray’s put down of ‘Cheap chip tuned Radios’ [**Georg Wiessala**] and his statement “*will never be embraced by serious DX’ers or radio amateurs. Why would they be?*” I found that statement a little short sighted; we all had to start somewhere. I made Crystal sets, then regen. The most successful was the Dutch

13 June 2026

THE ROCHDALE & DISTRICT AMATEUR RADIO SUMMER RALLY: St. Vincent de Paul's Hall, Norden, Rochdale, OL12 7QR. Doors open at 10am with entry still only £3. Usual Traders and caterers will be in attendance. Plenty of free parking. Contact Martin Shore (Treasurer and Rally Organiser) on 07587 709006, or email: rally.radars@hotmail.com

14 June 2026

JUNCTION 28 RADIO RALLY: New venue for 2026. The Post Mill Centre, South Normanton, Derbyshire DE55 2EJ. Doors open 1015. Admission £4. Large and small suppliers and individuals providing new and used equipment, components, accessories and test gear. Free onsite parking, toilets and fully accessible venue. Licensed bar and café serving refreshments. Indoor and outdoor tables available. For more information and to book tables contact j28rally@snadarc.com or visit: snadarc.com

20 June 2026

INVERNESS & DISTRICT ARS GM NORTH RADIO RALLY: Glachbeg Croft Centre, Allanglach Wood, North Kessock, IV1 3XD. Open from 10am, BBQ, raffle, bring & buy tables, shack open. Possibly operating into the night as it is the equinox. Campervan pitches & camping by prior arrangement. Email: invernessradiosociety@gmail.com

21 June 2026

EAST SUFFOLK WIRELESS REVIVAL (IPSWICH RADIO RALLY): Kirton Recreation Ground, Back Road, Kirton IP10 0PW (just off the A14). Doors open at 9.30am and the entry fee for visitors is £3. The venue has free car parking. Trade tables are from £10. There will be trade stands, a car boot sale, a Bring & Buy, special interest groups, GB4SWRHF station and an RSGB bookstall. Catering is available on site. Contact Kevin G8MXV, 07710 046 846. www.eswr.org.uk

26-28 June 2026

HAM RADIO 2026: Messe, Friedrichshafen. www.hamradio-friedrichshafen.com

5 July 2026

NEWBURY RADIO RALLY: Newbury Showground, next to junction 13 of M4 motorway in Berkshire, RG18 9QZ. This is the 38th year of The Newbury Radio Rally and is the ideal event for anyone interested in radio communications, computing and electronics. There will be a display area with an amateur radio station, exhibits, special interest groups, clubs and societies. Open to sellers at 08.00hr and visitors at 09.00hr. Massive Free parking. Entry is £4 visitor, £15 seller's pitch. ADVANCE BOOKINGS (with discount) can be made via [the website \(below\)](http://the website (below)). On-site catering. Disabled facilities. Email: NewburyRally@nadars.org.uk www.nadars.org.uk

5 July 2026

BARFORD NORFOLK RADIO RALLY: Barford Village Hall and Green, Barford, Norwich, NR9 4AB and doors open at 9am for visitors.

Rallies & Events

All information published here reflects the situation up to and including **22nd May 2026**. Readers are advised to always check with the organisers of any rally or event before setting out for a visit. To get your event on this list, email the full details, as early as possible, to: practicalwireless@warnersgroup.co.uk

The event features trade stands, car boot sales, bring and buy, charity raffle, repeater groups, catering and free car parking. Entry £3.00 per person - under 16s free of charge. Traders from 8am with outside pitches available on the day & Limited number of inside hall tables which must be prebooked. Details from:

<https://norfolkamateurradio.org/barford-2026> or David G7URP radio@dcpmicro.com

11 July 2026

HUMBER FORTRESS DX AMATEUR RADIO CLUB - RADIO RALLY 2026: Welwick Village Hall, Northfield Lane, Welwick, Nr Hull, HU12 0SH. Doors open from 10:00am. General admission: £3.50 per visitor (under-14s free).

Fully disabled-friendly access. Free local parking. Refreshments available - including our ever-popular bacon sarnies. We have a limited number of tables available, so early booking is strongly recommended. For more information or to book a table Email Rally@hfdxarc.com <https://hfdxarc.com/booking-form-2026>

12 July 2026

MCMICHAEL RADIO & ELECTRONICS RALLY 2026: 09:00 entry (08:00 for Trader Set-up). This year the Rally is being held at a new venue: White Waltham Airfield, Maidenhead, SL6 3LW White Waltham Airfield is home of the West London Aero Club (WLAC) and is one of the oldest and best known airfields in the country. The airfield is situated just three miles from the M4 (J8/9) and six miles from the M40 (J4). Central London is only 35 miles away and easily accessible by train or taxi.

The Airfield site provides a large, level and accessible space for the increasing expansion of the rally, offering more space for Visitors, Stall Holders, Traders, Car Booters, Catering and visitor parking. Blue Badge parking is also available. Entrance Fees: Visitors - £4 per person, Traders - £15 per Table (includes entry for two people). Traders - Large Pitches (Double) £30. The West London Aero Club will be providing on site catering for breakfast and lunch and will also be running a Licensed Bar including local Rebellion Beer. Berkshire Lowland Search and Rescue will be providing a First Response service. Dogs are welcome, but please keep them on a lead at all times.

Email: General Enquiries: rally@radarc.org Traders: traders@radarc.org Telephone: Colin Ashley 07706 512505 <https://mcmichaelrally.org.uk> www.facebook.com/McMichaelRadioRally Instagram: [@mcmichael_radio_rally](https://www.instagram.com/mcmichael_radio_rally) Twitter: [@McMichaelRally](https://twitter.com/McMichaelRally)

19 July 2026

LINCOLN SHORT WAVE CLUB SUMMER RADIO RALLY: The Festival Hall, Caistor Road, Market Rasen LN8 3HT, Admission £3, Doors open 10am, Indoor event ample free parking. Over 50 tables of traders and special interest groups. Hot refreshments including our famous bacon butties. Card payments accepted. Tables £10. C

Steve M5ZZZ, 0777699069 Email: m5zzz@outlook.com

25 July 2026

WILTSHIRE RADIO RALLY: Kington Langley Village Hall and Playing Fields, Nr Chippenham Wilts, SN15 5NJ. 9am to 1pm - Indoor and outdoor trading with 4 acres for outdoor sellers. Admission Buyers £3, Outside Traders £10 per pitch. Indoors £10 per table. Sellers welcome from 7am. Large Parking area. Catering and toilet facilities.

www.chippenhamradio.club Email chairman@chippenhamradio.club

26 July 2026

GRAND FIELD DAY: Willesborough Windmill, Willesborough, Kent, TN24 0LG. Please do not bring food or drink to the site. This Field Day was conceived during early 2021, with the aim to arrange an outdoor get-together to blow away the COVID-19 Blues, to welcome old and new Radio Amateurs alike, to encourage and support new 'Hams' in particular, and, above all, to put a name to a face and HAVE FUN! Sellers/Demonstrators pre-checked with me (G0GCQ) arrive from 08:30 to set up. Bring own tables & any power source you require. Public arrive from 9:00. FREE ENTRY. Event finishes at 15:00. Public to leave. Traders/demonstrators to have left the field by 16:00 Hrs. Café & toilets on site. Operating stations / demonstrations. First aid facilities.

More info from John G0GCQ.

9 August 2026

FLIGHT REFUELLING ARS HAMFEST: Cobham Sports and Social Club Ground, Merley, near Wimborne, Dorset BH21 3DA. 9am to 3pm. Admission £5 (includes parking). Talk-in on 145.550MHz. Onsite catering and bar. No dogs except assistance dogs. Indoor and field pitches. Car boot sellers and field traders welcome from 7am.

frars.co.uk

14 August 2026

31ST ANNUAL MINI_RALLY NIGHT: Cockenzie & Port Seton Amateur Radio Club. Community Hall, Main Hall, Port Seton. Bring along your own "junk" and sell it yourself. Tables on First Come First Served basis. Entrance fee £4 for everyone. Rise in entrance fee is due to rising costs. 1800 to 2100.

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Rotor [2x ECC83 I think], mains powered too. Excellent little receiver. There was also the surplus market; I favoured the R107 and later a B40c I also had for 16 guineas [£16.16s.00d] or in today's coinage £16.80. Great receiver; learnt a lot about fault finding with that one when the BFO packed up. Grid resistor 100kΩ replaced with 150kΩ. Still worked. Flogged it for £20.

These Cheap chip radios aren't the best and you need a bit of skill to actually resolve a target station. However, menu driven can be a pain but decent filters are king, AM/FM/USB & LSB/CW and other variants can't be wrong.

All you need Mr Howes, is patience and fingers of a safe cracker [which, at 76 years old and arthritic I no longer have] but patience is the key. I still use one as a standby receiver.

The audio from these tiny devices is good and even better if you take a sniff and put it through a processor. £20 to start in a long hobby that can lead to further events in your life, such as professional electronics work; what's not to like. Then again TV Dongles are also available to start with and you can achieve further knowledge of using computers too. Add a 50MHz mixer chip up front and you'll have access to short wave too.

Then there's that Petition as Ray and later in the column, **Tim Kearsley G4WFT**, mention. There's no way we'll ever be able to build towers in the middle of a residential area without let and hindrance; it's common sense. On applying for permission to build, having provided detailed plans etc we'll pay good money for a

Council refusal and all for obvious reasons.

I looked at the original post, blinked again and moved on. That Petition, doubtless for the good of the person who placed it, will never achieve the required number of signatures. Even if it did it would probably be heard at God knows what hour at night in the House with a minimal number of somnambulist MPs who'll just put the dampers on what they'll not understand or care about.

The answer is to be inventive. I have two 10m Roach Poles, one supports my EFHW, the other a 40m quarter wave that sees me out on 80 to 6m. Both are supported by Bungee Cords fixed to my fence. The base slips into a flowerpot. The answer is they are not permanently fixed. I also have a 2m/70cm colinear on the house stack and a 4m vertical in the rear garden. Coming down soon is my experimental active antenna. I also have a long wire sloper for Number Station work.

I've lived in this house 44 years, second owners. I have never had a complaint about my antennas. The best complaint was interference on the day we moved in. I was on my own, my wife giving birth the same day. I unpacked my 9R59DS and ran a length of wire up the garden. Before I brought the receiver down to plug in and use on the kitchen counter top the 'next door but four' knocked on my door.

She was complaining about interference from me. I asked her how and she said 'off that wire'. Not me says I indicating a floating end of the wire in the kitchen. She then said the equipment was in the garden shed where the other end was tied. Showed her that too and she went away

disappointed. My then two-year-old son chipped in with "that's showed her!" No idea where that came from but he was right.

I never did listen that night; my parents turned up from Ilfracombe to help and of course my two year old was absolutely thrilled with a new home and being put to bed by his grandparents.

The next complaint was from a bloke from the private block of flats next door. He was fed up with his BT supplied telephone answering machine answering me on 6m [10W USB]. Interestingly it part resolved the transmission. He arranged a visit from BT and the technician knocked to tell me the outcome. The telephone lead from the Block Terminal measured 6m. Not my fault he assured me. He cured it with a simple filter at the BT end.

So cheap radios to start in the hobby and lumps of wire and fishing poles used as antennas; it's all so very simple.

Paul Beaumont G7VAK
London

Ladies in Radio

Dear Don,

Having read your *Keylines* in the latest *PW*, my local club The Felixstowe and District Amateur Radio Society (FDARS) has just unanimously re-elected **Sarah Jones 2E0ISJ** at the AGM as our chair. To my knowledge she is our only lady member out of over 40.

John Sones M0AAO
Ipswich

Next Month

in the UK's best & only independent amateur radio magazine...



USING AI ASSISTANTS SUCH AS ChatGPT FOR AMATEUR RADIO PROJECTS – Part 2: Dr Jonathan Hare G1EXG completes his overview of using AI in amateur radio projects.

TUTORIAL – MORE IMPEDANCE: Jeff returns to continue the topic of impedance.

ROBERTS RADIOS: Tony Jones G7ETW gets to grips with four Roberts radios from days of yore.

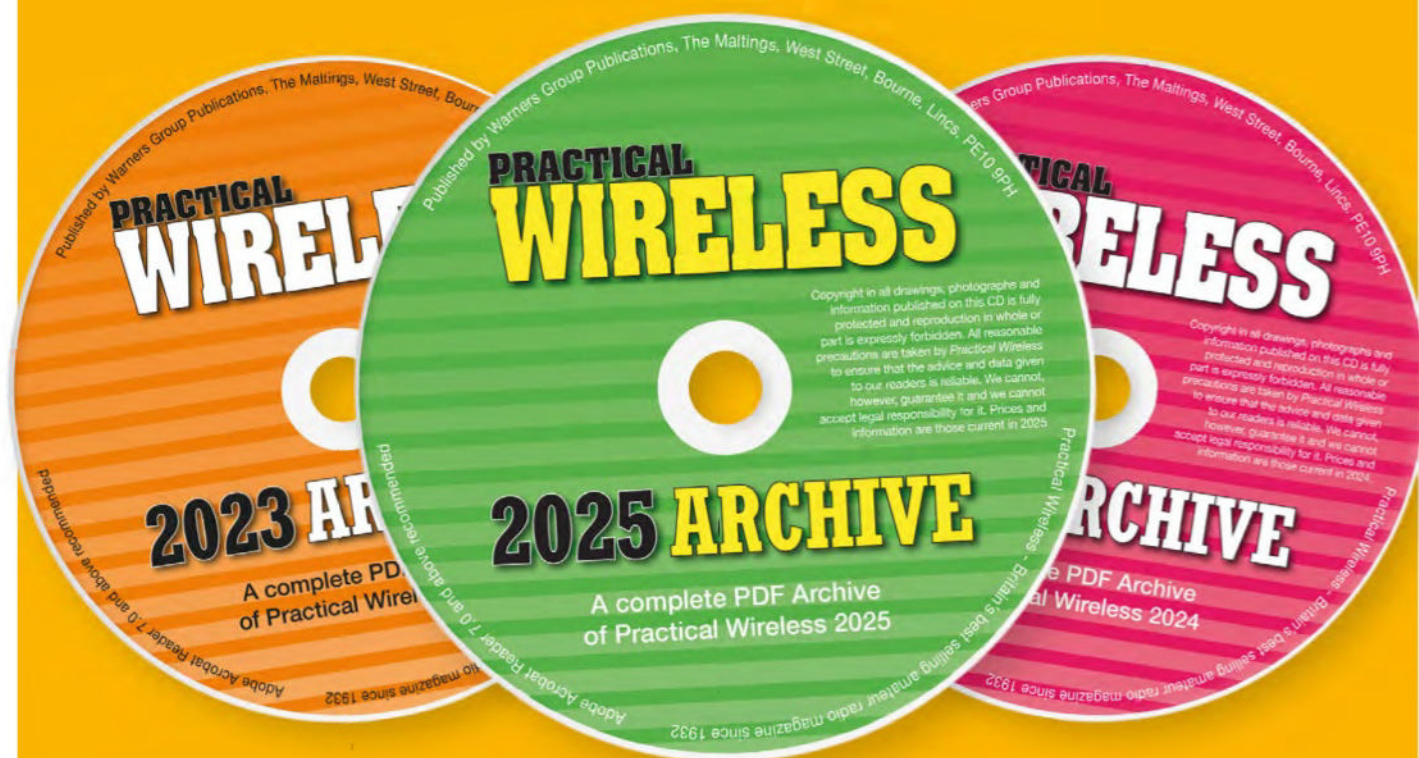
THE PHONETIC ALPHABET: Tony Jones G7ETW discusses the origins of our current Phonetic Alphabet.

MICROWAVE AMATEUR RADIO – MORE ACCESSIBLE THAN YOU THINK: Tim Daniels G7KTP starts a new series explaining the ins and outs of getting active on the microwave bands.

And several projects that were previously trailed but have, for space reasons, yet to appear: *Renovating a Classic Rubidium Frequency Standard, Getting Comfortable with Using dBs, Shack Control Unit and Home Made 3 Section Wind up Mast.*

There are all your other regular columns too, including HF Highlights, World of VHF, Data Modes, Antennas, The Morse Mode, Vintage TV & Radio, What Next and Amateur Radio on a Budget as well as your Letters, the latest News and more.

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