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PIONEERS OF RADIO | The story of Edwin Armstrong and his regenerative receiver

THE FACE BEHIND THE CALL

We have a chat with the radio retailing legend, Martin Lynch

The PW 70MHz contest

News of this popular event that takes place in a few weeks time

Ham Dashboard revealed

A web tool that's bound to be of interest to UK radio amateurs

REVIEW An in-depth look at the Uniden Bearcat BCD260N

Another high-performance receiver from Uniden, but this time it's a base station

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Keylines

I didn't operate a lot of radio this month, although I did make an effort to work GR2HQ (the RSGB HQ station) on as many bands as possible in the IARU Contest. Our lads have been trying very hard in recent years to beat the German HQ station, but the German amateurs always turn out in great numbers to boost the score of their national effort. Time will tell whether GR2HQ managed it this year. Meanwhile, on the same weekend, several GB-prefixed stations were operating to test out equipment and locations for next year's World Radio Teamsport Championship event, which will be held in the UK for the first time, in East Anglia, over the same weekend (of the IARU Contest). I plan to carry more news of this forthcoming event in future issues – although I realise that many *PW* readers have little interest in contesting, this will be a big deal for the UK, with competitors and guests arriving from all over the globe. And the organisers will be looking for on-site help in a number of capacities and not just from contesters. Personally, I have been part of WRTC events in Brazil, Russia, New England and Italy and am very much looking forward to seeing it on our own soil for the first time. Do contact the organisers or look out for news, if you think you might be able to help in any way.

CDXC Convention

Apart from operating, I very much enjoyed attending this year's CDXC Convention, held in Bicester. The Convention talks and dinner are open to all and it would be great to see more participation in what is invariably a great day, not only for meeting old friends but also the programme of talks. This year's were V73WW by **Jamie M0SDV**, an update on WRTC (see above) by **Mark M0DXR**, the VK9CV expedition by **Lubo OM5ZW** and **Miro OM5RW**, and 'ten years in Bonaire' by our very own **Steve G4JVG (PJ4DX).**

The annual CDXC Convention is open to all (although only CDXC members are allowed to vote at the AGM), so why not look out for next year's event in due course.

Mission Impossible

I recently watched the last *Mission Impossible* film and was amused to see the vital coordinates being sent on what looked like a Yaesu FT-101ZD, by keying the microphone. Anyway, it seemed to work!

National Hamfest

The National Hamfest is looming, being early in September this year (see details in our *News* and *Rallies* pages). This is still the premier rally in the UK (who remembers the Granby Halls in Leicester and then Donington Park?). Make a note in your

diary! Which reminds me that my first RSGB rally was at the Royal Horticultural Halls in London. Later it was at Alexandra Palace and then moved to the much more modern and spacious National Exhibition Centre on the outskirts of Birmingham. Unfortunately, that venue proved far too expensive to stand the test of time, but I remember it well.

Face Behind the Call

We have a different author for this month's *Face Behind the Call* – sadly **Roger Dowling G3NKH** has an eye problem which is making life difficult for him. But **Jim Lee G4AEH** has stepped into the breach to interview none other than **Martin Lynch G4HKS**. I hope you enjoy it – Martin's tale is an amazing one. Funnily enough, at the CDXC Convention (see above) I was talking to one of the attendees who lives in Matlock and used to have a Saturday job at Lowe Electronics. That took me back! But, of course, there were many UK amateur radio retailers back in the 1970s – Martin has done well to survive and prosper and we wish his sons well as they continue with the business.

PW 70MHz Contest

September sees the running of the annual *PW* 70MHz contest, organised yet again by regular *PW* contributor **Colin Redwood G6MXL**. Our contests are very much geared up to the contest 'novice' although obviously hardened contesters are encouraged to take part, but our entry system makes it easy for newcomers to send in their logs in a variety of formats. More participation is always welcome and many rigs these days cover the 4m (70MHz) band. Why not have a go?

Don Field G3XTT
Editor, *Practical Wireless* Magazine

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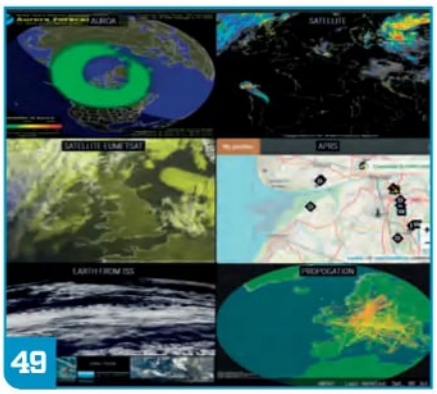
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Newsdesk

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

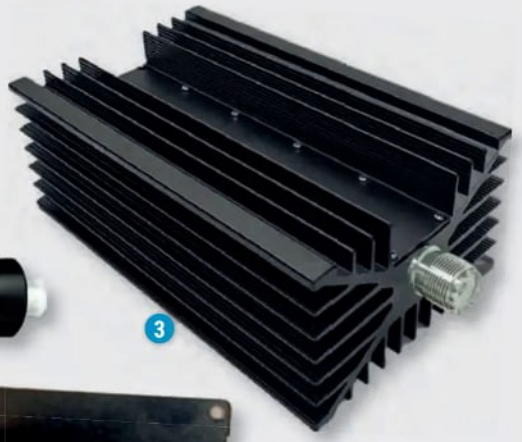
New from Martin Lynch & Sons

1. High Performance JBALUN 1:1 Isolators: RF currents on the coax shield, often called 'Common Mode RF' are a frequent cause of interference, receiver and desensing, and unexpected RF radiation from your station. The JBALUN 915, a 1:1 ferrite choke aims to solve this problem cleanly and effectively across the HF spectrum. The JBALUN 915 is a feedline isolator incorporating a 1:1 ferrite choke within a corrosion-resistant, anodised aluminium housing. Designed for use with 50Ω coax, it covers the complete 1.8 MHz to 30 MHz HF band and is rated for a substantial 500W PEP power handling. Connect via the SO239 connectors; it is an easy inline solution for any station.

2. 3-Port SDR Switch (0–70MHz, 100W Rated): With MFJ no longer in the market, many radio amateurs have found themselves missing certain useful accessories, particularly the MFJ-1708 SDR switch, which allowed safe integration of an SDR with a traditional transceiver by protecting the SDR during transmit.
ML&S now stock a range of high-quality alternatives from SDRSwitch.com. These devices are designed to safeguard your SDR by automatically disconnecting it during transmission, giving you confidence when operating your setup.
Using an SDR switch can also breathe new life into older rigs by enabling them to benefit from the advanced filtering and visual spectrum display features found in modern SDR platforms such as the SDRplay.

3. JLOAD-200PL RF Dummy Load, 200W, DC-520MHz, SO239: Dummy loads are indispensable in the modern ham shack—critical for safe, accurate tuning and testing without radiating RF on the air. The JLOAD 200PL, a 200-watt, DC–520 MHz resistive load with an SO 239 connector, offers hams high-power capability in a compact, air-cooled package. This is a 50Ω RF termination designed to safely absorb up to 200W continuous output from DC through 520MHz.

1. High Performance JBALUN 1:1 Isolators
2. 3-Port SDR Switch (0–70MHz, 100W Rated)
3. JLOAD-200PL RF Dummy Load, 200W, DC-520MHz, SO239



4. Acorn Dual-Band Ham Antenna
5. ACOM L-PROT 2000 Lightning Protector

Constructed around a robust aluminium heatsink with passive cooling, it features a standard SO239 fitting for wide compatibility. With a well-controlled impedance and low VSWR, it ensures safe operation during testing without requiring fans or special cooling.

4. Acorn Dual-Band Ham Antenna: Handcrafted in the UK, the Acorn Dual Band Ham Antenna offers a compact solution for 2m/70cm (145/440MHz) operation. Built with nitinol memory wire and housed in 3D printed PETG, this versatile whip is available in BNC male, SMA male, or SMA female configurations, making it a convenient and clever antenna option for handhelds, scanners and SDR users alike.

5. ACOM L-PROT 2000 Lightning Protector: Lightning and static discharge present serious risks to amateur radio installations. The new ACOM L PROT 2000 offers robust protection for HF stations, handling up to 2kW of RF power and safeguarding equipment through an integrated multi-layer protection design.
www.hamradio.co.uk

U3A AND AMATEUR RADIO: The U3A is the University of the Third Age, focused folk who are no longer in full time work but who want to continue to be active and learn together. John McDonald G8PJC of Wokingham U3A believes theirs in the only U3A group to offer the study of amateur radio:
https://tinyurl.com/4r5zbjnf
Wokingham U3A was formed 35 years ago and the various subject groups are doing something to celebrate the event in a way related to their subject. Their challenge is to contact 35 local Groups via radio (a radio amateur who happens to be a member of the local U3A Group). If you'd like to make contact, please contact John at **johnpmcdonald@btinternet.com** to arrange a sked. Contacts will receive a QSL card. He will be using the u3a callsign G5UTA.

23CM RESTRICTIONS TO BE IMPOSED IN EUROPE: The 67th CEPT Electronic Communications Committee (ECC) Plenary Meeting held 24-27 March approved ECC Decision (25)01 restricting Amateur and Amateur Satellite operation in the 23cm Band (1258-1300MHz) with effect from 27 December 2025.
The meeting minutes record:
6.2 APPROVAL FOR PUBLICATION OF DRAFT ECC DECISION (25)01 ON GALILEO AND ITS PROTECTION IN 1258-1300MHz FROM RADIO AMATEUR
The WG FM Chairman introduced the draft ECC Decision (25)01 on Galileo and protection measures in 1258-1300 MHz in Annexe 06 to 026, which was endorsed by WG FM for publication by the ECC.
24 administrations indicated their intention to implement this Decision, while one administration indicated their intention to implement it partially. Germany stated that they have to determine how to implement this Decision at the national level. The United Kingdom informed the meeting that it will implement Decision 1 (designation of the frequency bands for Galileo) but will not apply the technical conditions on amateur and amateur-satellite in Decision 2.

Q5 WORLDWIDE HAM RADIO: Founded and hosted by **Kevin Thomas W1DED**, Q5 Worldwide Ham Radio is *"a modern, multi-channel media platform for amateur radio - because how people engage with content has changed. Some read. Some listen. Some scroll. We meet operators where they are, delivering thoughtful stories, sharp interviews, and curated insights across Substack, YouTube, podcast platforms, and more.* "We take the craft seriously: strong writing, compelling photography, and real editing - not just content for content's sake. Our job is to inform, inspire, and elevate the conversation - so hams can focus on what they do best: innovating, operating, and keeping the spirit of amateur radio alive".
www.q5hamradio.com

ARMED FORCES DAY: On Saturday 28 June members of the Riviera Amateur radio Club took part in the celebration of Armed Forces Day. They used the callsign of GB8AFD from a member's house in Torquay. The event used SSB and FT8 to make contacts into mainland Europe and as far away as Japan and the USA. The VHF section's best contact was at a distance of 168 miles as well as contacts into Devon and Hampshire. The event was very enjoyable and their next event will the celebration of the Battle of Britain The photo shows the HF station being operated by M7NZL and G6TEQ.

FRONT RANGE 6 METER GROUP Q65 ZOOM PRESENTATION: The Front Range 6 Meter Group recently hosted an informative Zoom presentation by Hasan Schiers N0AN and Rick Hall K5GZR, that explored the Q65 mode within WSJT-X. The conversation also included topics such as Earth-Moon-Earth (EME) operations, the latest software enhancements, antenna optimisation, signal decoding strategies, and station safety. A video of the presentation is available on the Front Range 6 Meter Group YouTube channel at:
www.youtube.com/watch?v=pRoD6UgetyM

HAMSCI METEOR SCATTER QSO PARTY: Call for Operators and Monitors HamSCI – The Ham Radio Science Citizen Investigation – is preparing for a series of upcoming meteor scatter (MS) experiments. Operating was due to take place during two well-known meteor showers: 11/12 August, 0000 to 2400 UTC, for 48 hours (Perseids) and again on 12/13 December (Geminids).
This is a combination 'special event' and a contest to generate contact data during meteor scatter events using 10m and 6m. Contest rules can be found at:
www.hamsci.org/msqp

REAL-TIME MOON TRACKER V2.0.1 RELEASED: Hannu Eloranta OH2LHE has announced the release of Real-Time Moon Tracker v2.0.1. The web-based moon tracking tool at the URL below can display the moonrise and moonset of two locations simultaneously, useful for EME operators to determine common moon times.
Updates include the option to display the time in local time in addition to UTC, and a time cursor, which displays the current time.
https://eloranta.github.io

FURNESS AMATEUR RADIO SOCIETY MEMORIAL ACTIVITY SESSION: One of the long-time members of the society sadly passed away last year, it was decided by the committee it would be fitting to hold an activity session in **Ivan G3IZD's** memory.
Wednesday 9 July was settled upon for an outdoor event on Birkrigg Common, near Ulverston in Furness, as Ivan often took his radio to this location. We were lucky that after all the recent poor weather it turned at to be a lovely evening. Members of the society attended with a varied assortment of radio equipment. **Mike M0MJX** used FT8 from his car on 20m.
Les 2E0LBI set up a dipole for 40m from his van where he had three QSOs on SSB as well as three on 2m FM. **Mark 2E0HZK** enjoyed a 2m FM contact into Colwyn Bay as well as contacts on 70cm C4FM. **Jim M0KYL** manged 2m QSOs using his roof mounted vertical as well as a homemade eight element he was keen to try out.
Nick G0HIK and **Chris M0KPW** enjoyed operating on 23cm using FT8 and FM.
Also, member **Simon G1ZIM** called in from home to work us on 2m.
Several other members were in attendance without radios but keen to be there.
It was an interesting evening with varied equipment and a fine memorial to Ivan G3IZD (SK).

Ivan operating when Furness Amateur Radio Society held a mini DXpedition to the island of Islay back in 2011.

HALIFAX AND DISTRICT AMATEUR RADIO SOCIETY NEWS: The Halifax and District Amateur Radio Society (HADARS) once again played a crucial role in ensuring the smooth operation of the Cragg Challenge 2025. This event, which includes a series of physically demanding challenges, takes place on the infamous 8km climb, renowned as the longest continuous climb in England. Popular with cyclists and walkers the terrain presents significant communication challenges due to numerous blackout areas caused by the valleys and hills, making normal communication coverage difficult.
This year HADARS has significantly enhanced the service provided to event organisers by successfully isolating sources of interference experienced in previous years. A greatly improved talk through system, centred around the latest Yaesu FT-500 provided by and expertly set up by **Max Townend G4SDX**, has notably increased the system's overall performance and reliability. Max set up the repeater station at Mount Skip between Old town and the village of Midgley. This essential station offers a commanding view of the entire course, making it an important part of the communication strategy. The elevated position of Mount Skip allows for better signal propagation, thus removing most of the blackout issues caused by the valleys and hills. HADARS provide essential communication support to motorcycle marshals and the ambulance service, ensuring that assistance can be dispatched swiftly in the event of an emergency. By using strategically placed checkpoints along the route, messages can be relayed efficiently despite the difficult terrain. In addition, HADARS plays a key role in keeping event organisers informed with real-time updates from across the entire route. This continuous flow of information is crucial to the smooth operation of the event, enabling organisers to make timely and well-informed decisions.
The society's efforts not only support the safety and coordination of the event but also provide a valuable training ground for less experienced amateur radio operators, highlighting the practical importance of this engaging hobby.
In addition, the 2025 HADARS Club BBQ was a wonderful success, filled with good food, great company, and plenty of radio chat to go around. A huge thank you goes to **Colin 2E0HQJ** and his wife **Diane** for their incredible generosity in hosting the event. Their warm hospitality provided the perfect setting for a relaxed and thoroughly enjoyable day with fellow enthusiasts. Thankfully, the forecast rain held off, adding to the day's good fortune.
The food was expertly cooked by **Colin** and **Hardy G5HWB**, while M0LLY, **Richard Constantine G3UGF's** mischievous puppy, happily helped herself to a couple of dropped sausages, much to everyone's amusement.
A particularly special moment came when Club Chairman Hardy presented Colin with a beautifully engraved and framed plaque, in recognition of his many years of dedicated support to HADARS. The presentation was both a heartfelt thank you and a fond farewell, as Colin prepares to relocate to another part of the country for his work. It was a well-deserved tribute to someone who has contributed so much to the club over the years.

The photo shows the repeater used for the Halifax & Districts ARS Cragg Challenge.

4TH GW SOTA S2S PARTY, 14 JUNE 2025: This was the 4th year for the GW SOTA Summit-to-Summit Party and it is firmly established on the Social Calendar as an event that is inclusive and welcoming to all. The event was once again held on a field, on high ground just south of the town of Llanfair Caereinion, near Welshpool. It has a campsite a quarter of a mile away, nearby hotels, a smorgasbord of SOTA summits, and good road links to the Midlands and the Northwest.

A huge number of SOTA activators operated from the hills in Wales and beyond. **Lee 2W0LPU** and **Joe M7JPU** set up a station and operated as chaser from the field. **Graham GW5GDP** operated from his car on Eglwysilan Common near Caerphilly, and made some remarkable contacts to activators on 2m FM. The 2m, 70cm and 23cm bands were buzzing with activity. HF propagation was very poor and many of us regretted not being able to speak with our friends further afield, but this is the nature of HF. A particular highlight for me was working **Lyra**, **Ben GW4BML's** 4-year-old daughter, who used the MW0MWX club callsign from the summit of Allt y Main, under Ben's supervision. **Allan GW4VPX** made a presentation to two activators who had reached SOTA milestones on the day: **Kevin MW0KXN** achieving mountain goat (1,000 points), and **Phil G4HQB** who achieved 2x mountain goat.

John 2W0ILQ (14x Shack Sloth and friend to many) was presented with an Easter egg by Ben who wished him a Happy Easter, John's regular valediction.

This year we were joined by **John G3WGV**, co-founder and President of the SOTA award scheme, who gave a short address reflecting on the growth of the scheme from the original concept over 20 years ago.

The raffle was a great success, with generous donations from Yaesu, Icom, SOTAbeams, the SOTA Shop, **Roger Dallimore**, and more. First prize, a Yaesu FT-4XE, was won by John 2W0ILQ. Altogether, the raffle along with a very generous donation from **Lincoln KK6ONL** raised £630, which was donated to support the running costs of the SOTA award scheme.

Thank you Ben GW4BML for making this such an enjoyable day. The photo shows G3WGV and GW4BML.

NH 2025 National Hamfest

NATIONAL HAMFEST: This year's Hamfest will take place over the weekend of 6/6 September at Newark Showground, NG24 2NY. Online ticket sales are available.

The organisers look forward to seeing familiar faces and welcoming new visitors to join them for an unforgettable experience. Stay tuned to the website and social media channels for all the latest news and updates.

www.nationalhamfest.org.uk

WORKED ALL BRITAIN AWARDS (WAB): The new Summer Saunter award is being extended to include an Autumnn Amble. The rules will be as before, but it will hopefully encourage people to continue to be active.

There is now a rota of volunteers to act as regular net controllers from 10:30am UK clock time. Other nets will run on an ad hoc basis, whenever activity is planned.

Details, as always, on the website:

www.worked-all-britain.org.uk

WRTC 2026 Paddle Key

The Begali WRTC 2026 LTD key is a unique Expedition Model with a frosted white ceramic Cerakote© coating. It is being sold to promote and support the 2026 World Radio Teamsport Championship, to be held in the UK. This Italian treatment gives it an elegant finish.

The WRTC 2026 logo is engraved on the top turret, celebrating the special event in the UK. It's an actual engraving, not just a stamp, done by a renowned Italian factory. £399.95 from Moonraker. There are also cheaper single- and dual-paddle keys available via the WRTC website, £69 each, though not from Begali of course:

https://tinyurl.com/2s4ekrfp

GB2RRM, INTERNATIONAL MUSEUMS ON THE AIR: International Museums on the Air event 2025 was supported by the Huntingdonshire Amateur Radio Society (HARS) Special Event Station Team operating callsign GB2RRM from Ramsey Rural Museum Cambridgeshire over the weekend of 28/29 June. As a Club we enjoyed getting back to the spacious Museum grounds which for the last 18 years has provided us with minimal QRN whilst operating from the location.

HARS members under **Steve G1KWF's** control arrived at the Museum on the Friday afternoon to set up the station amongst the agricultural farming equipment at the Museum. Steve took the decision to operate out of a one-sided gazebo this year due to the hot weather that was forecast. The HF equipment consisted of our usual frame mounted IC-7200 putting out 100W into the LDG AT-200ProII and a full sized G5RV antenna mounted at about 15m above the ground, we next turned to our VHF/UHF set up using the IC-821HE into a Colinear antenna for 2m and 70cm.

The logbook showed 103 HF contacts. During the weekend our operators contacted 11 Museums

with a tally of 13 countries which included the Netherlands, Germany, Luxembourg, Belgium, France, Denmark, Sweden and Italy and some inter-G stations. Highlight was working **Martin OZ9MSD** on his 40W SDR radio connected to a Cobweb antenna 2m above ground in his garden plus we worked 81 years old **Manfred DL3MBL/BM** (Bicycle Mobile) under a bridge for shade NW of Hamburg. Over the weekend we had plenty of visitors call in to see us operating out in the field including Club Members, Licensed operators and members of the public who walk through the Museum grounds to come and find us. The photo shows M0VTG, M5KVK and M0OFF.

Smart New Operating Features

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Simply Touch the displayed Channel Bar to Quickly Start Communications
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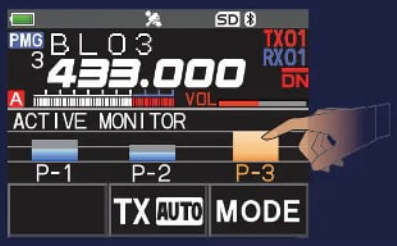
- Register the current display frequency into PMG with one press of the "PMG" key.
- Simply press the "PMG" key to instantly display the receive status of the registered frequencies in a Bar Graph (Activity Monitor).
- Touch & Go Operation allows quickly starting communication by touching the displayed target channel bar.



79 channel Band Scope

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- Select the number of channels from 79ch/39ch/19ch by touching the displayed channel number.
- Touch & Go Operation allows immediately moving to the frequency and starting communication by touching a displayed channel bar.

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1

Georg Wiessala
wiessala@hotmail.com

The Uniden Bearcat UBCD260DN

Georg Wiessala looks at yet another scanner, but this time more of a 'base station' model.

It's been a good year for scanning so far. A few months ago, I took a good look at the Uniden Bearcat UBC160DN hand-portable scanner (*PW* June 2025: 8-11), still a relatively new kid on the block, as it were. And in last month's edition (*PW* August 2025: 9-14), I introduced the Alinco DJ-X100 scanner, which offers some advanced decoding features (e.g. ACARS). I feel certain that these two handheld scanners will appeal to different kinds of scanner enthusiasts, depending on the functionalities – analogue or digital – desired.

The Uniden Bearcat UBCD260DN (**Fig. 1**) is the first larger base station scanner to fly across my busy shack desk this year. Here, the term 'base-station' refers primarily to the radio's external form factor. Naturally, you can also take this radio on the road with you or install it in your car; some of the supplied accessories (**Fig. 2**) have been included just for that purpose. What I mean is that this is not a handheld radio; 'base-mobile' is probably an apt description of this scanner. A few previous reviewers have called the UBCD260DN the 'big brother' of the UBCD160DN, and I am inclined to agree.

The wide frequency coverage, basic functions, key layout, user interface, and menu system of the UBCD260DN are indeed very similar to the UBC160160DN, with just a few overall functional differences. I assume that the 'U' in 'UBCD260DN' signifies 'UK', to distinguish this model from its American cousin, the Uniden BCD260DN, which is being marketed stateside under 'police scanners':
https://tinyurl.com/mck53vmn

Fig. 1: The new Uniden UBCD260DN Digital Scanner (courtesy Martin Lynch and Sons Ltd.).

Introduction and key features

The English manual describes the UBCD260DN as a 'digital scanner'. It is a solidly machined piece of gear measuring 184mm (W) x 151mm (D) x 56mm (H), without projections, and weighing in at 1,524g (ca. 1.5kg), which is surprisingly hefty, I thought. As standard, it comes with a short telescopic whip aerial, a vehicle mounting bracket with associated hardware, a three-wire harness, and a car accessory power cord (Fig. 2).

The LCD is of the dot-matrix type, with 64 rows and 28 columns (= 8,192 individual pixels). You can change the display colour to something more or less garish, choosing from seven available shades. This is down to personal taste; black digits on a green or yellow background generally work best for me, but you may find another colour better suited to your eyesight. The UBCD260DN covers 25-1300MHz with gaps (to be precise: 25-512MHz, 758-824MHz, 849-869MHz, 894-960MHz, and 1240-1300MHz).

Overall, this is a complex and sophisticated base station scanner with a wide range of useful and attractive features for the scanner user. If I had to choose five 'standout functions', some of which are highlighted in the scanner manual (pp. 5-7) and on the Uniden website, I would most likely emphasise the following, because these would be important to me if I were to look for a new scanner:

1. The UBCD260DN covers AM, FM, WFM, and FM'B' ('Broadcast'), and it receives signals in the DMR, dPMR and NXDN transmission protocols.
2. The scanner offers a maximum of ten custom search ranges and 23 service-search (SVC) searches, i.e. straight away, out of the box, you can get going in under five minutes.
3. The 'band scope' mode permits the radio to search a range of bookended frequencies and offer a real-time display of what it finds.
4. A quick-search function allows you to search from the frequency you are currently tuned into, or channel, or input a frequency value to start from.
5. The record-out function enables users to route audio output from this radio to a (voice-activated) external recording device or PC software. This renders possible a sustained automatic monitoring, for example, of a Maritime Safety Information Broadcast (MSIB) or any other more irregular transmission.

The Uniden UBCD260DN decodes DMR (Digital Mobile Radio) and the (ICOM/ Kenwood proprietary) NDXN (Next Generation Digital Narrowband) modes where these are used. Alpha tagging is possible, meaning you can name your saved frequencies and channels

via brief descriptions of no more than 16 characters. The UBCD260DN also resolves DCS (Digital-Coded Squelch) and CTCSS (Continuous Tone-Coded Squelch System) tones, which are used to cut out any unwanted interference.

What is more, the scanner offers a wide variety of flexible searching and bank scanning features and an advanced memory management system, which I cannot go into detail about here; consult the handbook for this; it is written in clear English. What I will say, though, is that there is little left to be desired for the serious VHF/ UHF monitor here. In the UBCD260DN, memory organisation is based on memory 'banks'; however, this radio does not support Direct Memory Access (DMA) technology. As a reminder, DMA is a kind of computer input and output (I/O), where a DMA Controller (DMAC) shifts data between a main memory and the I/O devices (cf: *Oxford Dictionary of Electronics & Electrical Engineering*, 2018: 149; *RadioReference Wiki*).

There are some *YouTube* videos out there demonstrating how relatively easy it is to use this scanner (e.g. by M0FXB: URL below). It is important to note that, contrary to some unclear online claims, the UBCD260DN is not a trunk tracking scanner. It receives and resolves DMR and NDXN (see above), as transmitted by *conventional (non-trunking)* communication systems. The Uniden UBCD260DN does not support trunking or other digital modes, such as APCO P25.

https://tinyurl.com/5r595n67

The UBCD260DN in operation

The Uniden UBCD260DN was ready to be used, out of the box, in less than ten minutes. I tried the 'Service Search' (SVC) function first, for ease and lazy convenience. While not all the pre-set channels in the unit I tested are relevant for the UK (e.g. the German 'Freenet' on 149MHz, Dutch CB, European Maritime), most of them are, and, in any case, it is nice to have the non-UK ones included for holidays, and so on. Therefore, with a minimum of setup faff, you can find something to listen to almost straight away.

I tried the PMR446 and dPMR (**Fig. 3**) from low-power devices first and was soon rewarded with signals from local ramblers, rock-climbers, small businesses and leisure-boaters here in the Northwest and Lake District. Moving over to amateur (Ham) radio, the regional mountain goats were evident on our local summits here, while shack sloths participated from home, mostly on 2 metres and 70 centimetres. Plenty of clear signals came in from deep inside Cumbria and further afield. In fact, I found that the UBCD260DN proved very sensitive on these bands. Moving on to maritime radio, my local

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Maritime Safety Information Broadcast (MSIB) from Holyhead Coastguard (formerly Liverpool) came in loud and clear, and in recordable quality (**Fig. 4**).

I hooked the radio up to a voice-activated recording device in order to be able to leave it running on one frequency for the entire day and return to a neatly compressed chunk of recording of the day's action. This worked very well for weather forecasts, for example. It would, of course, be even nicer if future scanners in this price range were to offer this facility as a standard on-board feature and build in a mini-SD card reader for this very purpose; however, this is not on the cards any time soon, I think. The only model I can think of that did ever offer something similar was the ICOM IC-R20 wideband receiver, which, as my friend and former *RadioUser* author, **Anne Reed**, informs me, is still going strong with many hobbyists.

My main scanning interest lies in Airband monitoring, and the UBC260DN did not disappoint. Like the UBCD160DN, it was very sensitive in the 118-136MHz range, and beyond, and it delivered many weaker, more remote signals from automated aeronautical services such as ATIS. I took the opportunity to read up on ATIS in **David Smith's** excellent *Air Traffic Control Handbook* (Crécy Publishing, 2021) and further consulted the *2025 UK Airband Frequency Guide*, compiled by **Rick King** (**Fig. 5**; **www.ukafg.co.uk**). This yielded many frequencies that I had not been able to receive before in better quality (see also the next section about antennas and accessories). Other Airband publications are available, of course.

Receiving non-voice signals

The Uniden UBCD260DN can receive some types of data signals within its frequency scope, with VHF ACARS (Aircraft Communications Addressing and Reporting System) being the obvious choice. The main VHF ACARS frequencies can be found online. I used

131.525, 131.725, 131.825, and 136.750MHz. In the USA, the relevant frequencies are 131.550MHz, 130.025MHz, and 129.125MHz. Bear in mind, though, that this scanner does not *decode* VHF/ UHF utility signals. For this, you will have to connect a suitable decoder, either in hardware or software, to see what is going on.

If you do want a scanner with a built-in ACARS (and/or AIS) decoder, the only one I can think of at present is the Alinco DJ-X100 (*PW* August 2025: 9-14). I used both a vintage hardware decoder (the AOR ARD-2 ACARS/ NAVTEX Decoder) and my favourite PC programs to resolve ACARS signals. I have included a screenshot of the *Black Cat* and *Zorns Lemma 11.42* software ACARS decoders side-by-side, to illustrate the reception quality that can be achieved with the UBCD260DN (**Fig. 6**).

In my opinion, there was no perceptible difference between these two software options, and there are some others too. Excellent as it is, *Zorns Lemma 11.42* never made it to an English version and is hard to get hold of nowadays; it is not being updated anymore, as far as I can tell from the German source (ZL: Wetter):

www.MeteoSoft.de

Black Cat ACARS Decoder:

https://tinyurl.com/4f3xzubs

Zorns Lemma11.42 (Review: *RadioUser,* February 2020: 63-66)

www.meteosoft.de/html/zorns_lemma.html

https://tinyurl.com/p9amazhs

www.youtube.com/watch?v=XVqU_vmeP64

In general, the Uniden UBCD260DN proved to be extremely sensitive and stable in the reception of selected data signals such as ACARS transmissions; more so, when hooked up to a good external antenna, for more of which, see the next paragraph.

Antennas, accessories and PC control

In my opinion, a good base station scanner such as the Uniden UBCD260DN deserves, at the very least, a high-quality and durable telescopic aerial, such as the brilliant but older *Sony RHS1000* antenna component kit, covering from 75 to 1800MHz. More generally, you cannot go far wrong with a well-made external antenna. You might prefer one that is cut to the band(s) you wish to check out, for example, the Military Airband. However, for many scanner owners, a general-purpose wideband scanning antenna will already be a marked improvement over the telescopic antenna that comes with the set or a 'rubber-duckie' type.

I put a wideband discone out on my balcony and easily tripled the number of signals coming through in a matter of minutes. The one I used was the spanking 'Scanking' from Moonraker (25-1300MHz; **https://tinyurl.com/36pzen99**). There are many other suitable discone

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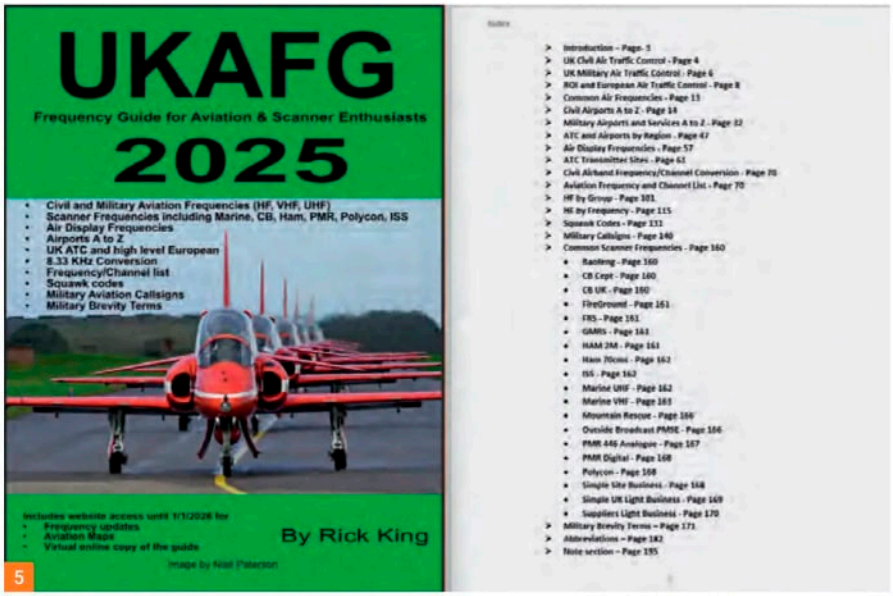

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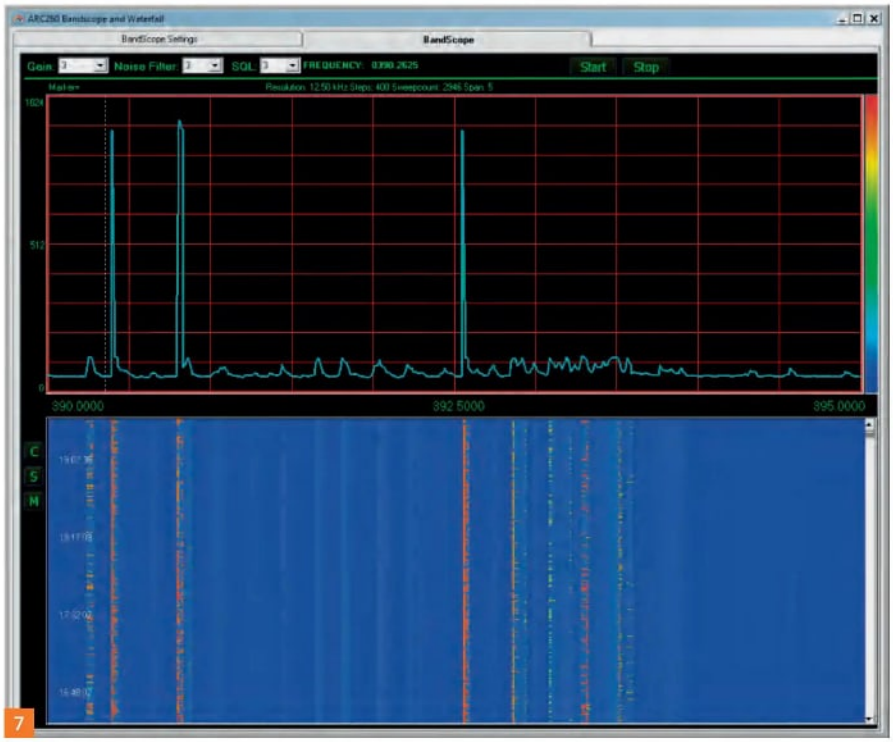
Fig. 2: The UBCD260DN is rich in accessories. Fig.3: I captured a few dPMR signals, depending on the time of day and week . Fig. 4: Receiving Maritime Safety Information Broadcast (MSIB) from Holyhead (formerly: Liverpool) Coastguard (BBC News: www.bbc.co.uk/news/topics/cg729vz7w1zt). Fig. 5: The *2025 UK Airband Frequency Guide (UKAFG)* is an essential resource for UK Airband monitors (https://ukafg.co.uk/product/ukafg-frequency-guide-2025) (courtesy Rick King). Fig. 6: ACARS reception is easy with the Uniden UBCD260DN, but you will need external decoders. I used *Black Cat ACARS Decoder, Zorns Lemma 11.42, Friture* and the *Blackwood Designs* Digital Level Meter .



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Reading and Resources:

Uniden BCDN260DN (USA):
https://uniden.com/products/bcd260dn
King, R. (2025) UKAFG:
https://ukafg.co.uk/product/ukafg-frequency-guide-2025
Radio Reference UK:
https://radioreferenceuk.co.uk/frequencies.php
Radio Scanner Club (Facebook):
https://tinyurl.com/4rsehhhz
Review (M0FXB Ham Diary):
https://tinyurl.com/42rf5nkx
RTL SDR.com: 'Monitoring Airband Comms' (Part 1):
https://tinyurl.com/5ekver8w
Uniden (USA):
https://uniden.com/collections/scanners
Uniden ARC 260 software (Butel, €39.95):
www.butel.nl/shop/uniden/59-arc260-software-download.html
Uniden UBCD160DN User Manual:
www.uniden.info/download/ompdf/BCD260DNom.pdf

Fig. 7: The ARC260 software package has a simple waterfall display.
Fig. 8: The AOR ARD-2 is how I used to receive and decode ACARS (and NAVTEXT). The UBCD260DN is a step change compared to the vintage technology – but the latter is still enormous fun to use.

antennas out there, for instance, from Diamond. If age-related hearing loss is an issue for you, consider getting a good pair of headphones or an external speaker, possibly a noise-cancelling model, such as from British maker bhi – you know where you are with those:
https://tinyurl.com/57xbb4kd

In terms of computer control, the UBCD260DN may be linked to your setup via a USB cable. The software package many will use to operate this scanner is *ARC260*, distributed by *Avera*, *Butel*, and a handful of other radio and PC traders (From ca. €33 at the time of writing). The ARC260 software package offers features such as memory bank management, an editor for search ranges, support for Windows Clipboard, an easy-fill option, a facility to export Data to the CSV (comma-separated value) data format, plus 'web-catcher' and 'frequency-import' functions. ARC260 can also be used for the Uniden Bearcat UBCD160DN portable model. Interestingly, there is also a nice waterfall scope feature here (**Fig. 7**).
Avera:
www.avera.eu/software-arc260.html
Butel:
https://tinyurl.com/2x6jr3wf

Overall conclusion

The Uniden UBCD260DN is a very solid performer on all the bands it has been designed to receive. I found it especially sensitive on dPMR (Fig. 3) signals, and the Civil and Military Airband. For the general scanner enthusiast, there is very little that this radio still leaves to be desired. Spend some time learning how to use its flexible searching, shortcuts, scanning and memory functions, and add some meaningful accessories, and you will have built yourself a very capable home or mobile monitoring station for VHF and UHF signals from 25 to 1300MHz.

I liked the ease of use and straight-out-of-the-box ethos pervading this radio, compared to some older equipment (**Fig. 8**). Using the UBCD260DN, the scanning novice will not be fazed and will achieve some good early scanning results very quickly; and the seasoned hobbyist may tailor the scanner's many useful functions exactly to their needs over time, especially in terms of search features, alpha-tagging, direct-entry functions, favourites lists, memory editing, settings, and much more. PC control via software adds a further, very convenient and meaningful dimension to the management and usability of this scanner.

At the time of writing, the Uniden UBCD260DN retails at Moonraker for £375. My warm thanks go to **Justin Godefroy** and **Georgia Hill** for the kind extended loan of the review model and for fielding my follow-up questions.

Surely, I must have cleared Moonraker out of new scanner models to review for now, but one can never have enough scanners, I am sure you'll agree. See you soon. **PW**

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Friedrichshafen 2025

Don Field G3XTT
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The editor heads to southern Germany for this year's Ham Radio event.

Friedrichshafen – the home of the airship. This where Zeppelins were made and still are – one operates regular tourist flights over the surrounding area. There is also a Zeppelin museum to visit in the town.

I was last at Friedrichshafen in 2023 and my report appeared in the August issue of *PW*. This year, I'm delighted to say, both the RSGB and Yaesu were there and I thought attendance was quite strong, though maybe not back to pre-COVID levels (last year's attendance was apparently 11,300 from 58 countries, while initial reports from 2025 are that there were 11,600 – 300 more).

One of the very positive aspects was an emphasis on youth. As well as Worldwide Young Contesters and Youth on the Air, several exhibitors were running constructional activities for young people and there was also a Youth Camp, with attendees camping in one of the exhibition halls and taking part in a variety of activities including, as far as I could gather, direction finding, construction, Morse and more. This attracted over 100 young people, mostly German I think but a great initiative.

This year's 'theme' for the event was Remote Radio – Connecting the World, focusing on how radio operators are no longer required to be in the same place as their equipment in order to be able to transmit successfully.

Products

The products on show ranged from the mundane (components, connecting leads, etc) to the sophisticated and high-tech. In the latter category I would put the latest products from the 4O3A stable. This company, started and run by **Ranko 4O3A**, has, over the years, introduced a number of innovative products, albeit for the serious DXer and contest station, rather than for the average radio amateur. This year, among other products, they were showcasing an 11-way automatic antenna switch and a control unit (the Station Manager) that will connect to your radio(s), antenna(s), rotator(s), computer(s) and linear amplifier(s) to permit full control from a single screen. There was also an amplifier with two 2kW modules, that can be run separately (for example in a multi-station contest environment) or together!

FlexRadio were showing not only their 8600 range of SDR transceivers, but also a new product by way of their Aurora transceiver, which generates 500W of RF on transmit with 90% efficiency and weighs just 8kg. To prove the point, they had (literally!) a brick on a Morse key while the radio produced 500W into a dummy load. The transceiver barely got warm while the dummy load was dangerously hot!

QRP Labs were showing their QMX+, which has recently been enhanced by owner **Hans Summers G0UPL** to include SSB. This was by no means a straightforward design modification but the design process has been explained by Hans in a video that is available on YouTube:
www.youtube.com/watch?v=6FheeAv3src

If you are not up to building one of the QRP Labs kits, you can buy the fully assembled QMX+ transceiver. The price for the kit is $125 so even paying extra for a ready-built unit looks like a bargain compared with the cost of high-end transceivers from the main manufacturers. It's QRP (5W) of course, but then so are the next two I'm going to mention in their basic form. I gather many buyers order the ready-built unit and Hans reports that he has seven people working with him in Turkey (where he lives with his Turkish wife), building over 200 transceivers a month.

Next up is the FTX-1 Field from Yaesu. Not yet

Photo 1: There are regular ferries across the lake from Romanshorn to Friedrichshafen. Photo 2: A welcome at the door to the Messe, where the event is held. Photo 3: The 4O3A 'Station Manager' Photo 4: Airships are still seen above the area. Photo 5: Your editor ran into old friend and RSGB President Bob Beebe GU4YOX while walking to the hotel. Photo 6: Pre-release versions of Yaesu's new FTX-1 generating lots of interest. Photo 7: The Flex Aurora. Photo 8: The Olliter SDR transceiver. Photo 9: The man himself, Ranko Boca 4O3A, with the newly-launched twin amplifier.

available in the UK unfortunately (I believe there are delays with CE accreditation) but on show at Friedrichshafen and attracting plenty of attention – a worthy successor perhaps to the aging FT-817/818, as I mentioned last month. Our reviewer is waiting with bated breath to get hold of one. QRP (10W) out from the head unit but 100W out if that is fed into the SPA-1 RF Power Amplifier. Sadly, as far as I am aware, there is no extension lead currently available to put, for example, the head unit under your dash and the other unit in your boot, although I gather it is easy enough to make your own.

Another rig of note is the Olliter OL-SD20A, along with its bigger brother the OL-SD300A. These, and the company producing them, were new to me but, then, it seems that anyone can produce an SDR rig nowadays! The two models are a 15W one and 300W one. This latter is a curiosity in my view – most linear amplifiers nowadays (except those intended for the US market, where different rules apply) will produce full output from a modest input, while 300W hardly qualifies as high power.

And talking about high power, OM Power, as well as their well-known range of high power valve amplifiers, had a 2kW amplifier for 2m

(the OM2002W) and a new 1800W amplifier (the OM1800S) for 160 through 6m at the show, both solid-state. The latter should be in full-scale production later in the year.

There were plenty of other HF and VHF amplifiers in evidence too, from Acom, RF-Power, Elecraft and Hilberling, to name but a few.

Among the other suppliers on hand were old friends bhi, but there was no sign this year of Kenwood. And while I ran into representatives of Martin Lynch & Sons, Moonraker and LAMCO, none of those vendors had chosen to exhibit at the show.

On the software side, I was interested to see hamlog.online, a Cloud based logging solution which can also interface to your radio. It includes award tracking and management and digitally signed HQSL. This not the first such Cloud-based offering for logging but, in a way, I'm surprised there aren't more. Not only does it mean you can access your log from anywhere but it also protects you from losing your log when you have a computer crash – a good friend was telling me over dinner at the show that he had lost his entire log when exactly that happened.

There were plenty of other trade exhibitors, of course, such as DXpatrol (showing their QO-100 products), Brandmeister (DMR products), Mastrant (good quality ropes for guys, etc), Messi & Paolini (coaxial cable), Momobeam and other antenna vendors, and newly-launched RF Meca Filters offering low and high power lowpass filters with excellent specifications (the 70cm LPF for example, has a blocking filter for 2m signals, making it especially useful for activities such as VHF Field Day).

I should perhaps also mention the M17 Foundation, which *"is developing open source hardware and software and offers a complete digital radio protocol for data and voice, made by and for amateur radio operators"*. More information here:
https://m17foundation.org

Flea Market

There was the usual flea market, filling a little over one hall – a shadow of how it used to be after the fall of the Iron Curtain when Russian amateurs used to arrive each year with vans full of ex-Soviet military comms equipment! The equipment on sale included many classic radios (from Drake and Collins, for example), individual components of all sorts, and a plethora of useful (or not!) gadgets and ancillaries of all kinds.

Clubs and Societies

As always, DARC (the German Society) had pride of place as well as hosting several activities within the overall programme. The ARRL (USA) had a large stand, with its President and General Manager in attendance. Ditto the RSGB, who also had their usual extensive bookshop. Several of the various European and Middle Eastern societies seem to be able to secure funds from their national tourist authorities, to promote not only amateur radio in their countries but more general tourism. And in a number of cases there were also free nibbles and local alcoholic beverages as give-aways – it was noticeable that late on each day some of the visitors to the CDXC (the UK DX Foundation) stand, where I was spending some of my time as CDXC President, were more than a little inebriated!

Yes, CDXC were there as part of the so-called DX Plaza, where you could also find the 'other' CDXC (the French Clipperton DX Foundation), Islands on the Air, the European DX Foundation and others, including several groups advertising forthcoming DXpedition operations.

Other national clubs represented included Belgium, Holland, Italy, Romania, Japan, Qatar and Czechia, just as a few examples. The Bavarian Contest Club, as usual, were much in evidence as well as hosting a contest dinner on the Saturday evening. **Andy G4PIQ** was there to promote WRTC 2026 – the World Radio Teamsport Championship – which will take place during July 2026 in East Anglia.

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Photo 10: Graham Somerville of bhi, a reliable presence at the show. Photo 11: The Icom IC-7760. Photo 12: The DX Patrol ground station for QO-100. Photo 13: The Brandmeister DMR stand. Photo 14: The JNCRADIO MC-750 portable HF antenna system from Chelegance.
Photo 15: Andy G4PIQ promoting WRTC 2026, which will be held in East Anglia.
Photo 16: Some wartime gear on sale in the flea market. 17: The RSGB bookstall. Photo 18: Lots of constructional activities were in evidence. Photo 19: Two young children embark on a direction finding hunt.

Talks & Presentations

As always, there was an extensive programme of talks, presentations and forums. What surprised me this time, though, was that quite a number were in German although Ham Radio is very much an international event. But English-language ones included a Portable GUI Tablet FT8 Transceiver (by WB2CBA and W5BAA), The Propagation of Decametric Waves – HamDXMap: Your DX Companion (F5UII), Meeting of Earth-Moon-Earth Enthusiasts, Remote Radio – Connecting the World (DL3GBE) and The ENIGMA and Other Historic Cipher Machines (W1TP, PE1BXL and PE1RRT).

Summary

If you've never been, you really should put it on your 'to do' list. It's nearer than going to the USA for Dayton or Visalia, and there are always plenty of Brits in evidence, especially in the beer garden at lunchtime! It's not the easiest location to get to but the setting is fantastic, with views across Lake Constance (or the Bodensee, depending on which language you are using!). I flew from Bristol, via Amsterdam, to Zurich, where it's easy to catch a train to Romanshorn, followed by the ferry across the lake – all easier than it may sound! Others from the UK drove or flew to Memmingen in Germany where they hired a car or took the train. Other possibilities exist too and many visitors turn the trip into a fully-fledged holiday. And there is camping (usually motor caravans) at the exhibition site, which always turns into a great social event of an evening. **PW**


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1

Edwin Armstrong

Tony Jones G7ETW relates the troubled history of Edwin Armstrong, radio pioneer.

This article is about **Edwin Howard Armstrong**, born in New York in 1890. I could just as easily have called it 'Development of the Domestic Radio Receiver in America'. It's a big, convoluted story and I have omitted much detail. But I've got the flavour of Edwin, pictured in **Fig. 1,** and his life, I think.

Transmission of voice and music was arguably first achieved by a Canadian, **Reginald Fessenden**, in 1906. Others say it was American **Lee de Forrest** in 1907. Less than 20 years later commercial (AM) broadcasting began, with Westinghouse's station KDKA in Pittsburgh. In the first third of the twentieth century, radio was not just a new, exciting thing, it was THE new, exciting thing, the way to make (and lose) fortunes, and Edwin did both.

Before Edwin: The Crystal set, the Audion and the Tuned Radio Frequency receiver

Fig. 2 shows a 'grid Audion', a kind of thermionic valve, being held by its inventor Lee de Forrest. He developed this from an earlier rectifier device (of his) and was awarded US patent 879532 on 18 Feb 1908.

This wasn't a very good valve, but in the early 1900s it was all there was. As a schoolboy and student, Edwin knew it well.

Ernst Alexanderson (Swedish) invented the 'Selective Tuning System', aka TRF, and was awarded US patent 1173079 on 22 Feb 1916. **Fig. 3** is a picture of a three-stage TRF (with no audio amplification). TRFs were more sensitive than crystal sets, but came with two disadvantages: multiple Audions were needed, adding cost, size and complexity to radio sets, and TRFs were hard to use because each RF stage had to be separately tuned.

1913: Edwin invents the Regenerative receiver

In 1913, still at university in his final year, Edwin invented his 'Regenerative Receiver' and in October that year he applied for a patent. On 6 Oct 1914 he was awarded patent 1113149.

Edwin's patent was all about positive feedback ('Regen', he called it), which increased an Audion's effective gain significantly. In Edwin's Regen receiver, only one Audion was needed. **Fig. 4** shows a modern Regen.

Irving Langmuir (American) made a similar patent application also in October 1913, and in March 1916 **Alexander Meissner** (German) and Lee de Forrest applied for two more. De Forrest's claim was based on a controversial entry he'd made in a 1912 workbook.

Legal cases round 1: the Regen

In 1919 Edwin sued de Forrest for infringing his Regen patent. He had to wait because the US government allowed no patent disputes to go through the courts during WW1.

On 17 May 1921, the District Court of Columbia found in Edwin's favour. When a US Patent Office 'Interference Board', operating independently, delivered the same verdict, he was delighted. But he and de Forrest were unable to reach agreement on compensation due, and de Forrest appealed the Patent Office's finding in the same district court. On 8 May 1924, much to everyone's surprise, de Forrest won.

1920: The Superhet receiver

In 1917 America entered WW1, and Captain Armstrong was assigned to the US Signal Corps in Paris. With Marconi's **Henry Round**, a pioneer in radio direction finding, Edwin worked on detecting small signals by changing their frequencies. This 'heterodyning' was not new, **Reginald Fessenden** (pictured in **Fig. 5**)

Fig. 1: Edwin Armstrong.
Fig. 2: Lee de Forrest.
Fig. 3: An early TRF receiver.
Fig. 4: A regenerative receiver.
Fig. 5: Reginald Fessenden.

had coined the term and published a paper on it in 1905.

Edwin, once back in America, applied for a US patent called a 'Supersonic Heterodyne' receiver on 8 Feb 1919. On being awarded US Patent 1342885 (8 Jun 1920), Edwin immediately sold it to Westinghouse.

Did Edwin have déjà vu over this? He should have, because Frenchman **Lucian Levy** (pictured in **Fig. 6**) had been working on similar lines for years and obtained a French patent in 1918. And **Walther Schottky** (German) – he of the diode and ribbon microphone fame – filed for a similar patent in 1918.

In 1920 Levy sold the US rights to AT& T and in 1927 applied for a US patent, initiating another Interference Board process. History repeated itself, and Armstrong lost again.

1922: The Super-Regen

In 1921 Edwin discovered what he called 'Super-Regeneration'. This tamed the Regen's wilder excesses (too much feedback caused a receiver to radiate interference) and in 1922 he sold this improvement to RCA for $20,000 plus some stock.

1924: Back to Superhets: The Radiola

Working for RCA as a consultant Edwin produced an improved, more user-friendly Superhet with a combined RF and IF tuning knob and RCA began selling this as the Radiola, pictured in **Fig. 7**. This was hugely successful; RCA refused to licence it to other radio-makers until 1930.

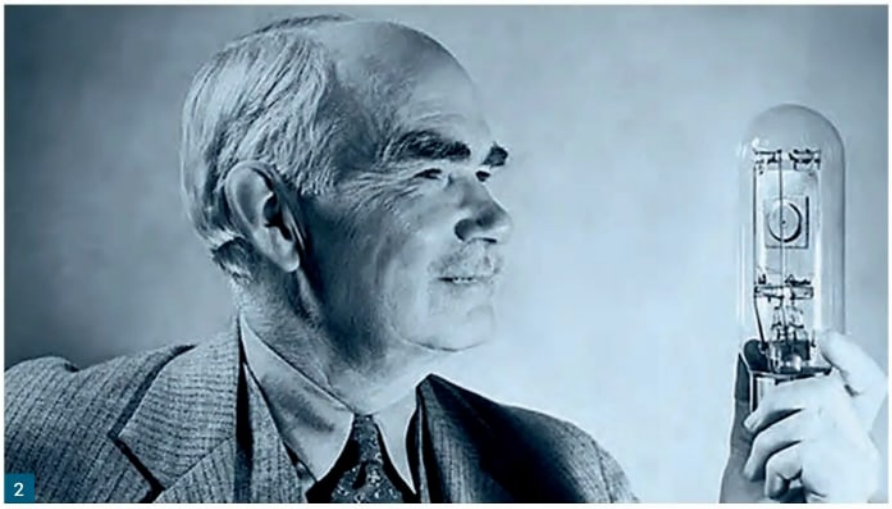
1928: Edwin starts again

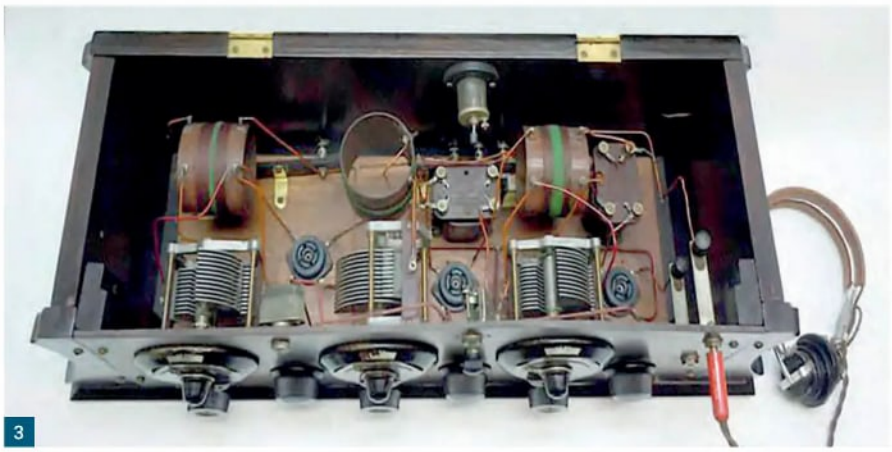
In 1928, with almost all of his patents lost, Edwin began researching frequency modulation and by 1933 he had four FM-related patents numbered 1914069, 1941066, 1941067 and 1941068.

In 1934, Edwin presented FM to RCA's **David Sarnoff**, pictured in **Fig. 8.** Sarnoff was interested, and funded Edwin for a year while range and quality tests were done. But despite FM's proven benefits, Sarnoff said no to FM.

In 1936, Edwin demonstrated FM to the FCC (created in 1934), and they were impressed.

In 1937 Edwin built the world's first FM station W2XMN operating on the newly established 'Apex' band (42 to 44MHz) which the FCC had created for higher-quality AM broadcasting experimentation.





The FCC did tests and carried out studies. They deliberated and held hearings, and in 1940 they gave their support to FM. Commercial FM broadcasting on 42 to 50MHz began the following year.

In 1940 RCA offered Edwin one million dollars for licences to use his FM patents, but he turned them down because he was already receiving 2% on sales from other companies. RCA consequently went down their own inventing path, and implemented FM in ways that did not – they said – infringe Edwin's patents. What else could they do?

FM post WW2

In 1945, RCA complained to the FCC that 42 to 50MHz was unsuitable for commercial broadcasting because of its susceptibility to tropospheric propagation. Despite Edwin's objections, RCA won the argument (perhaps because they were right!) and the FM 'band' was moved to where it is today.

This was a body blow to Edwin. All of his and his supporters' equipment became obsolete overnight and the head start he'd painfully achieved in FM's future was lost.

In 1948 Edwin sued RCA and the National

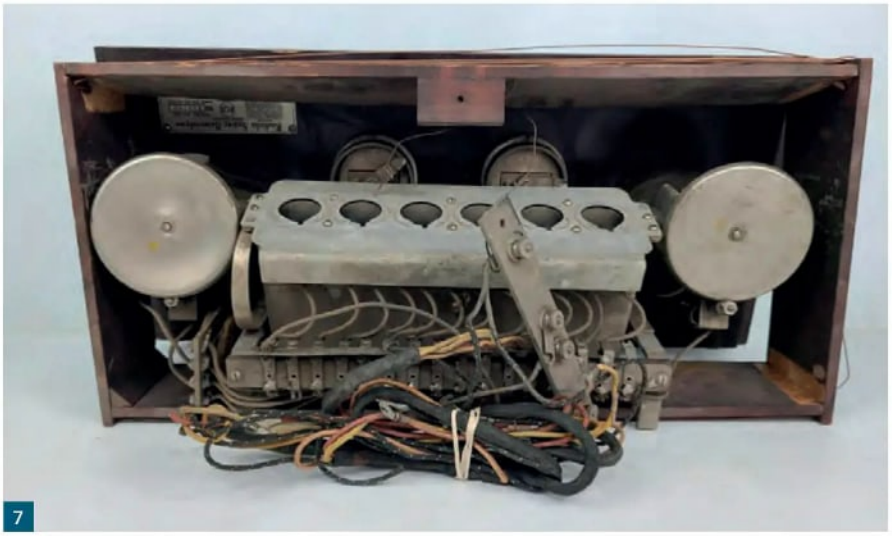


Fig. 6: Lucian Levy. Fig. 7: The Radiola. Fig. 8: David Sarnoff. Figs. 9 & 10: Edwin, Marion and her 'portable' receiver.

Broadcasting Company of America for illegal use of his patents, and six years later, he won, receiving damages of one million dollars.

This money was of no use to him whatsoever, because he was dead.

The only Good News

In 1922, Edwin, at that time 'up' in the inventing game and a millionaire, married **Esther Marion McInnis**, who was David Sarnoff's secretary at RCA. Edwin built her the 'world's first portable radio', as shown in **Figs. 9 and 10**.

She stayed with him through the ups and downs. In 1953, when Edwin was almost broke, she asked him to settle his cases and refused him access to their retirement money – it was in her name – for more legal works. Enraged, he hit her with a poker.

She left him, and he never saw her again. On 1 Feb 1954 he removed an air-conditioning unit from the wall of their thirteenth floor New York apartment, climbed out onto the ledge, and committed suicide.

Marion inherited Edwin's FM patents, and went back to the courts. It took 13 years, but she was successful in lawsuits against Motorola, RCA and Zenith. I have not been able to find out how much she won in damages, but the sum must have been sizable. Perhaps more importantly, Marion succeeded where Edwin had largely failed in protecting his professional reputation.

Conclusion

Being an inventor has always been a high-risk occupation, but back then it was essentially gambling. You could hit on a new idea, put the work in, develop and refine an invention and patent it, then end up with nothing.

Edwin was a great electronic engineer, but he was no businessman. He was brought up very religious, so perhaps he was too much of a purist, too high-minded for the 'Wild West' days of radio development. Someone should have taught him how to quit while he was ahead. **PW**

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Martin Lynch G4HKS

Jim Lee G4AEH takes a look at the life of the amateur radio retailing legend who is Martin Lynch G4HKS.

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"Martin would do much better if he concentrated on lessons and spent less time selling bits and pieces in the playground." That may not be verbatim but it is the gist of one of **Martin Lynch's** school reports. The precocious schoolboy who went on to become 'the guvnor' of a world-renowned amateur radio business, was a salesman and entrepreneur from a very early age.

His first 'store' was a corner of the school playground, where he would sell anything for which his school mates were prepared to hand over money. His move into soft drinks at around the age of ten, was an enterprise too far for his mother. It was after Martin had turned the Lynch family bathroom into an orangeade mixing and bottling plant that Mrs. Lynch became far from happy with her permanently sticky and orange-stained bath.

Martin is reminiscing about those early days in the Martin Lynch & Sons (ML&S) showroom in Staines-on-Thames where we are surrounded by shelves packed with highly desirable amateur radio equipment. The ever-expanding stock rooms – i.e. any available space that is not the showroom – house around a million pounds' worth of transceivers, handhelds, antennas and notably, power supplies. Lots of them. *"We have to buy them by the hundreds"*, says Martin.

Hard times

When he opened the first shop in 1990, **Fig. 1,** Martin promised the family that he would probably give it all up within 20 years. When that time actually came around, the business was growing so fast, he was reluctant to stop. His vision back then was to be 'the best ham radio store' in the UK. He likes to think that is still the case and says the reviews support that. *"I just wanted to be really good at what we did from the very start. It's actually really difficult putting it into practice, and every person's different. I always say to my guys, always put yourself in the position of the buyer."*

Now, 35 years after getting Martin Lynch and Sons off the ground, the business is stronger than ever. However, that was not always the case. After a boom in the numbers of licensed amateurs who had crossed over from CB in the 1980s, the nineties saw a wave of people leaving amateur radio. That meant fewer customers buying radios. The result was a two thirds drop in sales at ML&S and the closure of many of Martin's competitors. He recalls the manager of one of them handing him the keys to his shop with the words, *"It's all yours. I'm off"*.

Martin places the blame on the fledging internet of the mid-nineties that was changing attitudes to communications. Die-hard radio amateurs were keeping faith in RF but many others decided to go online, leaving the hobby in their droves, he claims. People were turning up at ML&S to sell their entire stations. The signs first became apparent on a trip to the Dayton Hamvention where people wanted to discuss the internet rather than radio. For Martin it was a depressing vision of the future of amateur radio and his business.

His response was to turn to another of his passions, motorbikes and scooters. He moved out of the double-fronted store in Northfield Avenue in Ealing to smaller premises, smaller even than his first shop. It may have given the impression that he was going backwards, but his intuition was that the scooters would shore up the radio side of the business. He was proved right.

At the same time, the RSGB and other interested parties were sharing Martin's concerns about the future of the hobby and the search started for more attractive and 'easier' ways of getting into amateur radio. Changes to the exam structure and

Photo 1: Martin Lynch G4HKS with a model of his first shop, now on display at the Staines showroom. Photo 2: Dan Lynch 2E0HKS. Photo 3: Henry Lynch, the creative wizard behind the ML&S YouTube site.

scrapping the Morse code qualification were part of the results. When things eventually improved, ML&S was one of the few radio dealerships to survive the downturn in the market.

Never one to stand still, Martin contacted all the major amateur radio manufacturers for their opinions on the viability of moving ML&S to larger premises. After a positive response, he took over what was initially a wreck of a building in Chertsey, west of London and spent a lot of money putting it right. Having sold the scooter business, the new premises proved to be a worthwhile investment and radio sales rocketed within a year. The move to Staines came later in 2015.

In the beginning

The continuing success of ML&S is down to a business philosophy that was born in a schoolyard and a sticky, orange-coloured bath. It continued at the age of 16, when he took up an engineering apprenticeship at Racal BCC in Wembley in North West London. Working in electronics and communications was his dream job after first becoming interested in radio at the age of 12. He became hooked after he returned from school one day to find that he had been gifted a receiver by his uncle **Dixie** who had a TV and radio business. It was an old R1155 which he was told had come from a Lancaster bomber.

When he switched it on, Martin found it was tuned to Top Band where the first amateur he ever heard was G3KDL, a member of the Harrow Club which he also ended up joining. The R1155, which had been painted an odd shade of blue, led to Martin becoming fascinated by all things radio. Before gaining his first (Class B) licence he was a shortwave listener for many years.

Martin Lynch G4HKS has been serving the world of amateur radio for more than half his life and says he still won't sell something if the customer is not completely happy with it.

In fact, so absorbed was he in the hobby that visitors to his parents' house would be unaware that they had another son because he spent every waking hour in the garden shed playing radio.

It was inevitable then that he would follow a career in radio and communications. Not only was Racal providing Martin with a good grounding in electronics and communications, the company unwittingly handed the part-time entrepreneur another money-making opportunity. When he realised that he had 900 potential customers in the three factories on the site, he managed to obtain a number of very large Philips television sets and sold them to colleagues. His evenings would be spent delivering those really heavy sets, complete with massive cathode ray tubes, up the stairs of blocks of flats around North London. He was younger and a bit stronger then, he says.

Radio legends

Those Philips sets were retailing for about £250 in the 1970s, so even with a Lynchy mates' rate, it would have been a very lucrative, if back-breaking, exercise. However, it didn't stop at television sets. Another perk of working for Racal was the opportunity to buy up ex-military Racal kit. He had spent time working on the production line actually building some of it, the Clansman range in particular. *"I was doing all this between the ages of 16 and 21. And of course by then I was also working for **Bernie** and **Brenda**."*

The legendary Bernie Godfrey G4AOG and Brenda G4VXL were proprietors of the Amateur Radio Exchange (ARE) in West London. Bernie died aged 96 in 2023. In a tribute on the ML&S website Martin wrote, *"Bernie and Brenda were the mavericks and market disruptors in the retail section of the industry and that's where I learned a lot, joining them full time in 1980. They helped to smash the price fixing cartels that were so prevalent at the time and*

became the leading amateur radio suppliers for licensed operators in the UK".

Photo 4: Tony M0TNY out portable, testing some ML&S goodies.
Photo 5: Martin trying, perhaps, to sell Jim Lee, author, a Hilberling setup!

Cheeky young thing

The Amateur Radio Exchange (ARE) was a couple of streets away from Martin's home, and it was there that he spent every spare penny on radios that wasn't being spent on motorbikes. On a visit to the shop one afternoon, it was a moment of brazen cheek that would set Martin on course to opening his very own shop in that very same street, Northfield Avenue. He told Brenda that he thought the ARE display window was so poor, it was letting the company down. Brenda took it very well and told him to get on with it, if he could do better. So he did. Bernie and Brenda were so impressed by his efforts that they offered him a part-time job.

At the time he was still a Racal apprentice, but also running discos at weekends. Motorbikes had joined television sets on his sales list. Now he also had a Saturday job at ARE, and finally able to employ the Lynchy business acumen on fellow radio amateurs. It was working so well that Brenda phoned one day to say they loved the way he operated and would like him to join full time.

At first he was reluctant to leave that dream job at Racal, so he gave Brenda what even he considered was a silly figure for a wage. He thought he would hear no more but within half an hour Brenda was back on the phone asking when he could start.

Leaving Racal was like leaving his family behind. Martin recalls riding away from Wembley with a tear in his eye but in his heart of hearts he knew that he was never really cut out to be an engineer.

It turned out to be a very good decision. He was well looked after by Brenda and Bernie. He loved the work, talking to customers and honing the same passionate approach to selling that he has to this day. *"My whole attitude to sales is long term. I don't sell something to somebody and think, I've made that sale and I don't care if they come back or not… I don't want them walking out the door with something they're not happy with. Of course, we've got our knockers and you can't please everybody all the time but overall we are very good at what we do. And my two boys have maintained that standard and that makes me really happy."*

Family affair

Those two boys are his sons **Dan** and **Henry**. Martin is at pains to point out that ML&S has always been a family business. The clue is in the name – **Martin Lynch and Sons.** For the last four years it's the sons who have been running the company while Martin has gradually taken a back seat. Although he has 'retired' to a seaside bungalow in North Devon, as the name over the door, managing director and major shareholder, Martin still has a say in the big decisions. He travels from Devon to Staines a few days a month but apart from the fact that he's not in the shop very often these days, the operation has changed little. It is getting busier though.

In fact, it's so busy that Dan and Henry head a team that's grown to 16 other employees. In a niche market like amateur radio, a business has to be doing well to support a staff of that size. Despite concerns about the need to encourage more (younger) people into amateur radio and the current financial constraints on all of us, at ML&S sales of amateur radio equipment are as strong as ever.

Dan Lynch 2E0HKS (**Fig. 2**) was brought fully into the company in 2013 after a career selling motorbikes. His interest in bikes was piqued as a youngster when his dad opened the motorbike and scooter shop to support the radio business.

Prior to entering the family business full time (both he and Henry had been 'helping out' in the various stores since childhood), he had gained a business degree and worked as a business development manager. Dad Martin realised that Dan's skills were exactly what were needed to secure the future of ML&S, so his first job was to look at ways of doing things better and more efficiently. How to handle new product launches and how to better do the job for their customers were all part of his responsibilities.

While Dan's role keeps him more or less in the background of the operation, his younger brother Henry is the person that customers deal with directly when placing orders online or by telephone. He is also the technical and creative genius behind the ML&S YouTube channel which has almost 25,000 subscribers at the time of writing.

Henry (**Fig. 3**) arrived full time at ML&S in 2021, at the height of the COVID-19 pandemic. Using skills learned on a media course at Bournemouth


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University, he has produced more than 650 different videos for the ML&S YouTube site. Viewers all over the world regularly log on to see demonstrations of new products and operating hints and tips from the likes of Martin G4HKS, **Dave M0TPT**, who is also the purchasing manager and the sales manager **Tony Wiltshire M0TNY/ZB2TY**. In fact, so popular are the videos that Tony et al find themselves recognised by viewers all over the world when they travel on business.

Tony M0TNY has been with ML&S for 16 years but not always as sales manager and video star. His role fronting many of the videos came about when the previous video presenter **Jonathan Sawyer M0JSX** left the company. He admits it's been a steep learning curve *"but somebody had to fill the gap"*.

Before joining ML&S he worked in project management at Carphone Warehouse. Fortunately, he was already licensed as M0TNY before he moved into amateur radio sales, or he may have been turned down for the job. He says that even the world's greatest salesperson would struggle without the ability to discuss antennas, band conditions and the like with fellow amateurs. These days, if he likes a potential new employee and they're not licensed, the company will work to get them a callsign.

There is however, at least one exception to that rule. Henry Lynch has been around amateur radio all his life, but says work has kept him too busy to do the exams yet. He has promised to get a callsign in the very near future!

If you're wondering how Tony comes to hold the Gibraltar callsign ZB2TY, he has dual nationality. His mother was born there and he visits the Rock as often as he can find the time. Time on the air back in the UK is usually spent demonstrating radios in the store or out portable (**Fig. 4**) acquainting himself with equipment he will eventually be selling.

In his 16 years at ML&S Tony has had a ringside seat to a wealth of advances in technology and changes in the radio market. When he first started in 2009, most sales were made in store. The internet accounted for only a very small number. When COVID-19 hit in 2020 and the store had to close, there was a deluge of orders via the website from radio amateurs forced to stay at home and the sizeable number of people who returned to the hobby. The size of the orders was increasing as well. *"Whereas customers would come in to the shop and spend a couple of grand, on the internet you'll find that someone will quite happily spend five, even ten thousand pounds,"* says Tony. *"There's a huge confidence in the internet now."*

Henry Lynch handles those online orders. He estimates a 50/50 balance between in-store and web sales currently although he expects that to change over time with more sales being done online. *"They can see a video online, order the thing and have it at their door in the next day."*

That is a trend that could have consequences for the future of the ML&S showroom but Henry and the team say they will do all they can to keep it open. Open Days and the YouTube channel have a role to play in that. According to Tony Wiltshire, the videos make the team more approachable so customers feel more comfortable visiting the store.

On Open Days, usually held in November, customers travel from all over the UK, and abroad. Dan Lynch recalls one customer travelling from Barbados. *"They flew in to Heathrow and after ten minutes in a taxi, they were here."*

Martin Lynch and Sons has evidently become an international operation. Being so close to Heathrow, customers from all over the world regularly turn up straight from the airport. Website orders are despatched daily to Australia, New Zealand, the Middle East and all over Europe. There is no advertising in foreign radio journals though. It's all down to word-of-mouth and the YouTube channel, says Tony Wiltshire.

The changing face of radio

The move towards SDR platforms and digital transmission certainly keeps the ML&S team on their toes. Tony himself has joined the growing number of people who operate their radios remotely, and not just for noise or antenna space reasons. He says that more people feel inclined to spend time with their families while still being able to operate digital modes or CW on a tablet, for instance. Tony enjoys sitting with his wife while operating his radios remotely from their sofa. *"For us as retailers, it's a big learning curve and it's sometimes a difficult one to keep up with"*, he says.

Looking ahead

The future for the 'guvnor' is to adjust to his new life in a Devon bungalow where he has come to love the life and the people. Once Martin has the house in shape, he plans to establish a station to get G4HKS back on the air and benefit from all that sea water. He's also recently become engaged to be married and there's a big birthday coming up next year. He still plans to make the eight-hour round trip to Staines every so often, not only to check in on the store but also to play with his grandchildren.

The future of ML&S itself is now in the hands of Dan, Henry and the rest of the team in Staines. How the business will look in another 35 years will be down to changes in the nature of the amateur radio market, advances in technology and the people who will remain in or take up the hobby.

The plan so far, is to remain a family business, where everyone in the company has a part to play. Henry Lynch thinks the future is bright, but without the sticky orange presumably. *"It's not like Dad will be completely absent. He has 30 years' experience running the business, so we will still have his guidance. But day-to-day, he's built it up in such a way that we can carry on with the same ideas and philosophy about great customer service. Most radio amateurs in the country are going to know Martin Lynch and Sons and have an idea of the service that they're going to get from us. Now it's all about keeping up that reputation."* **PW**

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1

Raspberry Pi 64-Bit and Radio Software

This month, **Mike Richards G4WNC** has advice on how to get the best out of the latest Pi operating system.

The introduction of the Raspberry Pi 5, as shown in **Fig. 1**, prompted the Raspberry Pi team to update the Pi Operating System, bringing it up to date with some of the latest developments in Linux operating systems. While this was precisely the right approach, the changes created problems for the amateur radio community and other groups that employ mainly enthusiast-developed software. Much of the popular software we use for data modes and other aspects of amateur radio activity was originally written a few years ago. While the most popular systems enjoy continuous improvement, these updates typically consist of extensions or modifications to the core software. They rarely undergo a complete rewrite, as happens with commercial software. As a result, when the operating system introduces significant changes to core components, such as the window handler or audio system, this can lead to unstable performance or the complete failure of our legacy applications. This is what has happened with the changes introduced with the Bookworm release that supports the Pi 5 and Pi 500. Here's an explanation of the three main problem areas.

Graphic Interface: When using the graphic user interface (GUI) or desktop, the windows you see on screen are displayed and managed by a Windows server. The use of a dedicated server provides a standard set of instructions that software applications can use to access and manipulate the screen. The latest operating system has changed the Raspberry Pi windows server from X-Windows to Wayland. While Wayland is undoubtedly the way forward and should be used for new applications, some legacy software will fail to work with Wayland. The adoption of Wayland by Pi was also incomplete at launch, and some areas were known not to work. For this reason, the Pi team included a straightforward method to revert to X-Windows. More on this later.

Page Size: The memory page size was changed from 4kB to 16kB in the latest OS. Computers divide the available memory into blocks, each of which can be accessed with a single instruction. Changing from a 4kB to a 16kB block or page size results in faster memory access because each instruction transfers four times as much data. For the Raspberry Pi, this results in an overall speed improvement of approximately 7%. However, older software doesn't recognise the new page size, and this can result in either a complete failure to launch or seemingly random segmentation faults and crashes.

Audio Server: As happens with the GUI, Linux operating systems employ a server to provide convenient access to the Linux sound system. In the Bookworm release, the audio server was changed from PulseAudio to PipeWire. PipeWire is a later alternative, which is claimed to be PulseAudio compatible and is designed to provide more stable audio with improved latency. After testing several amateur radio applications, I've noticed a variety of audio issues, including transmit audio failing at random. Once I switched from PipeWire to PulseAudio, these problems were resolved.

Fixing the Operating System

If you want to experiment with amateur radio software on the Pi 5, I recommend reverting the Windows and audio servers and reducing the memory page size. The Pi team have made most of these changes straightforward, as I'll show you here.

Before implementing these modifications, please ensure the operating system is up to date by executing the following line in a terminal session: **sudo apt update && sudo apt full-upgrade -y && reboot**

This line will update the package list, install updates for all packages that have updates available and finish by rebooting the Pi.

Reverting from Wayland to X-Windows

Here's a step-by-step guide:

1. Open a terminal session and enter:
   sudo raspi-config
2. In the panel that opens, **Fig. 3**, select Advanced Options and choose A6 Wayland.
3. Next, choose item W1 X11
4. Click Ok, and exit raspi-config
5. Reboot.

Reducing the page size to 4kB:

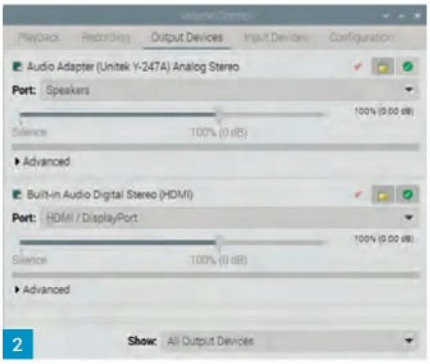
1. Open a terminal session
2. Enter the following:
   sudo nano /boot/firmware/config.txt
3. This will open the config.txt file for editing
4. Use the arrow keys to move the cursor to the end of the file, after [all]
5. Add the following line: **kernel=kernel8.img**
6. Press Ctl + x then y followed by Enter to save the change and close the file.
7. Reboot your Pi and open a terminal session.
8. Enter: getconf PAGESIZE
9. This should return 4096 indicating a 4kB page size
10. If you see 16384, you probably made a mistake editing config.txt, so check that file.

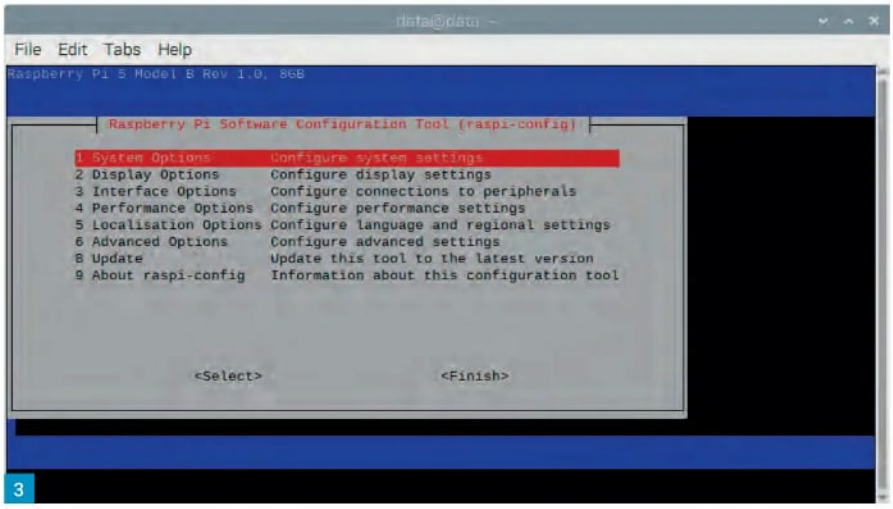
Changing from PipeWire to PulseAudio

Unlike the Windows server and page size, there is no simple changeover system to revert to the previous audio server. As you can't run PipeWire and PulseAudio servers concurrently, we need first to remove PipeWire and then install PulseAudio. I've shown the steps to do this here:

Remove PipeWire: **sudo apt purge pipewire pipewire-audio pipewire-pulse wireplumber**

Install PulseAudio: **sudo apt install pulseaudio**





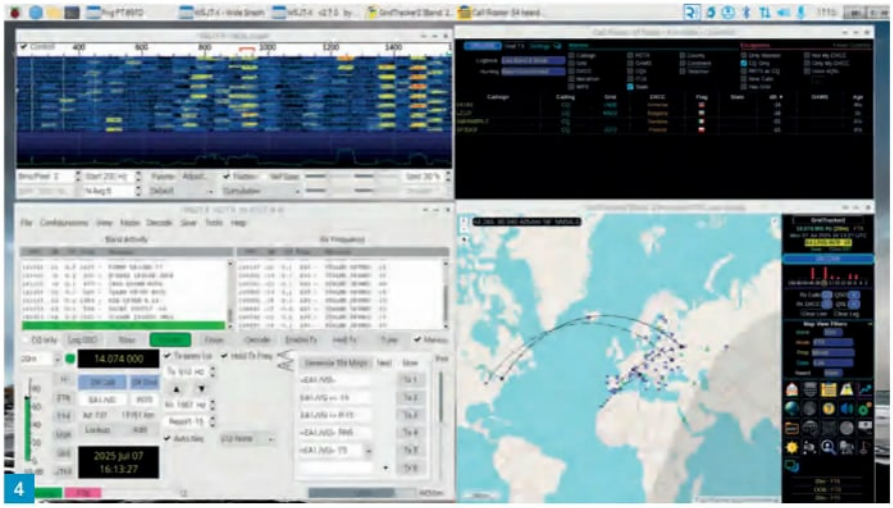


Fig. 1: Raspberry Pi 5.
Fig. 2: PulseAudio Volume Control app.
Fig. 3: Raspberry Pi configuration panel.
Fig. 4: Raspberry Pi 5 running WSJT-X and GridTracker 2. Fig. 5: Web-888 receiver front.

pulseaudio-utils pavucontrol

NB: This also installs the control application PulseAudio volume control, which provides a GUI for controlling PulseAudio, **Fig. 2**.

Now set-up Pulse Audio to run as a service that starts when the Pi boots:

systemctl --user enable pulseaudio
systemctl --user start pulseaudio

While switching to PulseAudio may resolve audio issues with older software, it may also cause some new software that relies on PipeWire to fail to function correctly.

The PulseAudio volume control that you have just installed is a useful utility that lets you monitor and adjust audio levels through the Pi (or other Linux PC). It takes a bit of getting used to, but it is worth spending some time with.

WSJT-X Linux Audio Soundcard Selection

If you've used WSJT-X on a Raspberry Pi or other Linux-based system, you may have noticed the huge list of audio devices. This can be somewhat daunting for those new to Linux. The long list is not due to a problem with WSJT-X, but rather a feature of the Qt Framework that's used to build the WSJT-X graphic interface. You may be wondering how the list can be so long, when you only have one or two sound sources connected. The extended list is because the Qt library lists all the available 'personalities' that are available for each sound device. For amateur radio use we usually connect an external soundcard or use the soundcard in our transceiver. In each case, you should look out for entries that begin alsa_input_usb and alsa_output_usb.

New DataModes microSD Card

For those who prefer not to make operating system changes manually, I've just released a new DataModes microSD card. This card utilises the latest Raspberry Pi Operating System, modified to support X-Windows and PulseAudio servers, as well as a 4kB memory page size. I have also pre-installed the following amateur radio software:

- WSJT-X
- GridTracker 2
- FLDIGI
- FLRIG
- QSSTV
- CQRlog
- SparkSDR

I have also installed other general-purpose software, including the full LibreOffice suite. In **Fig. 4**, I've shown a screenshot of a Pi 5 running WSJT-X with GridTracker 2. You can order the new card from my webshop at:

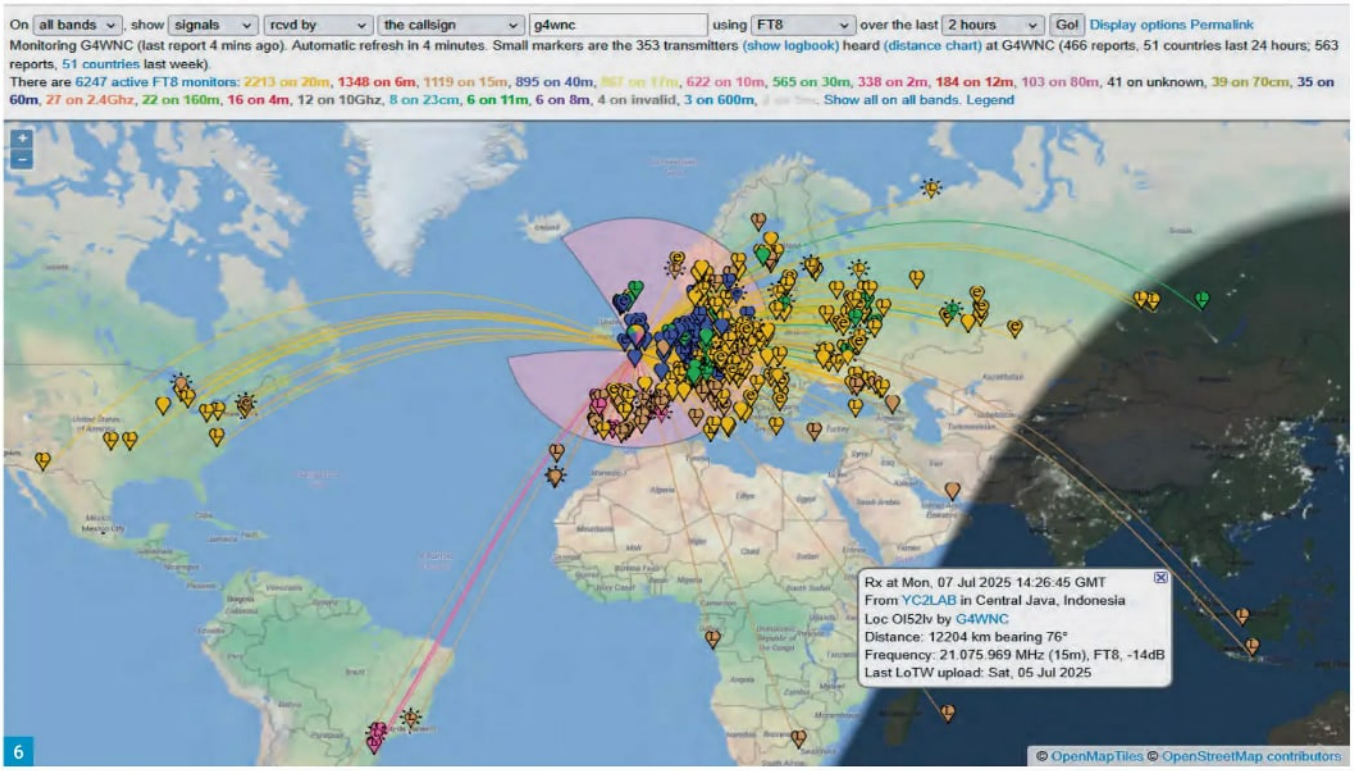
www.photobyte.org/shop-2

The price is £14 inclusive of free UK first-class postage or £3 for worldwide postage.

Web-888 receiver availability

I've recently made my Web-888 receiver **Fig. 5**, available for readers to share. As a reminder, the Web-888 receiver is a development of the popular RX-888 MkII. That device used an LTC2208, 16-bit Analogue to Digital Converter (ADC) running at up to 130MSPS (Million Samples Per Second) to digitise the entire bandwidth

from 0 to 60MHz and send it over a USB-3 port for processing by SDR software on a PC. The Web-888 takes the same digital front-end but adds a Field Programmable Gate Array (FPGA). This does all the heavy processing and provides a web interface to the receiver. As is common with modern direct sampling SDRs, the Web-888 supports multiple receiver slices. In the current software, 12 separate 12kHz wide receivers are provided, and these can be tuned anywhere in the sampled spectrum. All the facilities and receivers are accessed via a standard Gigabit Ethernet port. Because each receiver is only processing a 12kHz slice of spectrum, its data can easily be



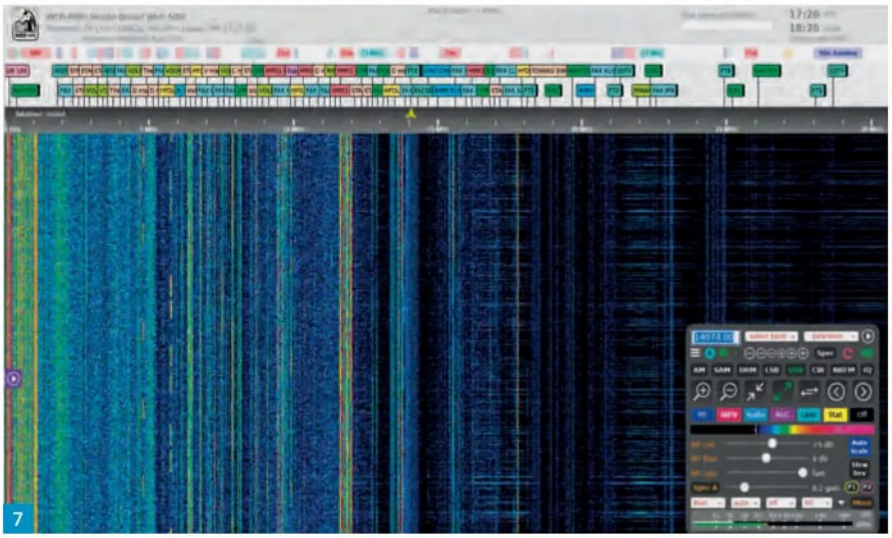


Fig. 6: Web-888 receiver FT-8 reports from PSKreporter. Fig. 7: Web-888 web access receiver display.

carried over a standard internet connection, thus making the receiver ideal for remote operation. The 12 channels can be utilised in many ways, thanks to the inclusion of data modes processing tools. I've recently had my RX-888 configured to provide WSPR reports from the LF and HF bands. This is a useful exercise as you can easily observe the changing band conditions and spot potential DX openings. If you look at the results on wspr.rocks, you can search up to 5,000 results over an extended period of up to three weeks to spot trends. However, you are not restricted to WSPR spots as you can set the 12 receivers to monitor a selection of modes and bands. This makes the WEB-888 a very powerful reporting tool that will provide unattended propagation monitoring for your station. **Fig. 6** shows FT8 reports from my Web-888 receiver. At the moment I have my WEB-888 configured with five receivers monitoring FT8 on 40m to 10m and another three receivers monitoring WSPR on 20m, 15m and 10m. The remaining receivers are available for readers to share.

WEB-888 access: To access and use my receiver, you should connect using a web browser to: web888.pi-hacks.com:8073 When you open the link, you will be asked for the password which is: **DataModes**. Once accessed, you can tune anywhere in the 0-30MHz sampled frequency range, **Fig. 7**. While the decoded spectrum is only 12kHz wide, you can still see the full 0-30MHz spectrum and waterfall display. The antenna is currently a Wellbrook ALA-1530. I will keep the receiver online as long as possible, but it will inevitably be off-line occasionally.

VarAC Version 12 released

Following the recent update to address a Microsoft issue, the team have now officially launched the full VarAC Version 12. In addition to the usual bug-fixes, the latest version introduces a full bi-directional email gateway. That means you can now forward emails from HF to Vmail and back again. This has been achieved by integrating SMTP and IMAP email protocols into VarAC. Add this feature to the facility to store HF emails with intermediate stations and you have a powerful system for communicating with remote or isolated locations. This could be very useful for emergency communications. As an additional refinement the system can provide an email alert when a Vmail arrives that needs attention.

The new version has also introduced a change to the Call-ID and SNR exchange process for stations meeting on the calling channel. This exchange now occurs after the stations have QSY'd away from the calling channel. Another interesting addition is the Multi-node cluster setup. VarAC now lets you simply set up several instances of the program on different bands. This can be used for example to relay VMails from one band to another.

That's it for this month but I'll probably come back to VarAC V12 in a later column. **PW**

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Overview
The Topbytes Morse Trainer is a **compact, self-contained CW practice unit** with a feature set designed to make learning Morse code accessible, adaptable, and engaging. Housed in a durable enclosure with a **colour touchscreen display**, it enables easy navigation through practice modes, settings, and even built-in games. Its **USB-C rechargeable battery**, onboard speaker, and **3.5 mm key input** mean it's ready to go right out of the box–whether you're practising at the desk, outdoors, or between QSOs at a club night.

Touchscreen Display: The full-colour, user-friendly interface makes mode selection and adjustment intuitive–ideal for those less keen on menu-diving or cryptic button sequences.
Paddle and Straight Key Support: The inclusion of a standard 3.5 mm jack allows users to plug in their own Morse keys, offering a more realistic feel than simple touchscreen-based alternatives.
Customisable Practice Settings: You can tailor **WPM** (words per minute), **tone frequency, and character spacing** to suit your current skill level. This makes it useful both for slow learners and those training for high-speed contesting.
Audio Output: Useful for routing CW tones into a transceiver, amplified speaker, or external logger for added versatility.
Games and Drills: Onboard interactive games add an element of fun while helping reinforce reflexive recognition of characters and words.
Wi-Fi Enabled: Perhaps most impressively, the trainer includes Wi-Fi support for **over-the-air firmware updates** - a rare and forward-thinking addition for this class of device.

In Practice
Initial use of the **Topbytes Morse Trainer** is refreshingly straightforward. The unit powers up quickly, and the interface is immediately intuitive. Within minutes, you can select a practice mode, plug in your preferred key, and begin tapping away. The built-in battery easily handles extended sessions, and its compact form factor means it's well-suited to portable use, whether on a park bench or a field-day table.
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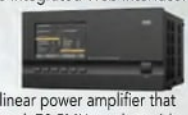
Acom 500S



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A high power DC regulated Switch Mode power supply, providing up to 30amp maximum current.Comes with Over Voltage, Current Limiting and Short Circuit Protection. **£79.00**

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Super Lightweight Metered PSU 48-50 Amp, 9-15V DC power supply **£120.00**

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The QJE QJ1830SC is a high-quality 30A linear power supply designed to provide reliable and stable DC power for a variety of radio communication and electronic applications. **£109.99**

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Low-RFI AC Power Supply for HF Transceivers Small, light, easily portable high-power DC supply which has low AC input to DC output coupling. This is critical to minimise RFI due to common-mode currents often found with temporary antennas such as end-feds or verticals. **£69.95**

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12V 50Ah LiFePO4 Lithium Battery... **£129.95**

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Compact Desktop Power Supply sets the new standard for high quality..... **£419.95**

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Optimum supporting tool for heavy photography softboxes, strobe lights and Bowens video lights **£95.00**

Heil Sound

ML&S are the official UK importer for Heil Sound headphones and microphones

Pro-Set 7 Headphones ..... **From £269.95**
Pro-Set 6 Headphones ..... **From £134.95**
Pro-Set IC Headphones..... **£169.95**
Pro-Set Elite 6 Headphones..... **£174.95**
Pro-Set Elite IC Headphones **£189.95**
Pro-Set 3 Headphones **£109.95**
PR-781 Microphone **£189.95**
PR-40 Microphone ..... **From £299.95**
PR-40 Microphone New All Black Version **£299.95**

4O3A Noise Cancelling Headset NC-1 BT

Offers ideal suppression of external noise in any situation. Thus, thanks to ANC (active noise cancelling), you can perfectly concentrate on quiet and weak signals even in noisy environments and are less distracted. In hectic contest operations, this can be a clear advantage!..... **£279.95**

Shack Clock. Special Offer £19.99

Shack Clock Pro. Only £29.95

New Bits & Bobs! See Web for info.

EFHW KIT 200W 49:1 Unun for making your own end-fed half wave antenna. **£85.00**
SDR Port Switch 0-70MHz 100W RXin RXout **£199.00**
Azuloop DF-72 Antenna System **£625.00**
Triple base magnetic mag mount SO 239 ..... **£45.95**

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Dr Colyn Baillie-Searle GD4EIP
practicalwireless@warnersgroup.co.uk

Where it all Started

Dr Colyn Baillie-Searle GD4EIP relates his early steps into the amateur radio hobby.

Like many others, my interest in short-wave listening led to becoming a radio amateur. However, while some have fathers who were amateurs, others probably knew a friend or friends who were one but my father was an artist and not technically minded. This is my story on the road to becoming an amateur.

I was born in Uxbridge, England and in 1953 we all went to Durban South Africa. Every Sunday I was made to go, with my sister, to Sunday school. I must admit I did not pay much attention to the lessons but instead became very friendly with another attendee called **Graham** and spent time chatting. One Sunday he informed me that he had a radio he would like to swop for a couple of Dinky toys. The following Sunday I came along with two Dinky cars and we did the swop.

When I arrived home later that morning I told my dad I had a radio and showed him the radio and headphones in my hand. It did not look much but my father knew it was a crystal set. So we set about installing an antenna and an earth, eventually moving an arm over some coiled wire and then twiddling a piece of wire onto a little tub of a crystal we picked up a station. I was amazed and wanted to know how it worked, so I took it to pieces, drawing out where everything went and then rebuilt it. I went to the library in Durban and got a book on crystal sets and found out that the crystal on my radio was germanium. I then followed up reading books on crystal sets and eventually my father took me to a radio shop called A1 Radio and bought me components to build crystal sets with diodes as we know them today and a variable capacitor

Our neighbour at that time was a scout leader and an amateur, **Denis Logan ZS5OJ**, who told me he could teach me the Morse code in a day. He had rhymes for each letter, like *"can you find it"* for F and *"how long is it"* for L. By the end of the day I knew the Morse code in rhyme form. I then spent some evenings listening and watching him working stations. I wanted to be able to listen to these stations and my parents bought me an Eddystone general coverage receiver. In Durban there was amateur radio club and I became a member of it and was given a short-wave listener number. I enjoyed myself listening to short wave radio, receiving commercial stations from all over the world and I would write a report to these stations. Often these commercial stations would send me a card in return with information about the station. It was a great thrill receiving this information. After being with Denis I wanted to become an amateur and was told I had to be 18 before I could apply.

A house move

In 1961 we moved from the flat to a large house and up the road was another amateur, **Frank Wood ZS5FW**. Every evening, after supper I would visit him and spend time playing radio and between 7pm to 7.30pm he would copy the ship-to-shore weather forecast in Morse code. He said that once I was 18 and could copy this weather forecast, I should apply for my amateur licence. That year I started an apprenticeship with a factory called SMD. Their technical director was also a well-known amateur called **Dave Larson**, whose last callsign was **ZS6DN**.

I was now over 18 and applied to become an amateur. I completed the application form, which had to have two references. Later two official gentlemen came to my parents' house to interview me and my parents. Before they left, I was informed that I could apply for the test and hopefully become a radio amateur. I was still copying the weather forecast and after a few months, Frank said I should apply for the Morse test. In those days, there was no theory test, only a Morse test. I took that on a Saturday Morning May 1962 and passed. A few weeks later I received my amateur call, ZS5VF. Frank

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gave me a Morse key and a transmitter, and together with my Eddystone receiver I was on the air. The first year one had to do CW at only 50 watts. That did not bother me, I was active.

My first station

Photo 1 shows my very first station; the transmitter on the left was an ex-aircraft transmitter and operated between 2 and 10MHz. I have forgotten its type number.

It was a few years before I had an all-band transmitter. I bought a Geloso VFO, it was just a just a variable frequency oscillator with a 6L6 output valve. I built a transmitter using this VFO with an 807 output valve, I now had a 100 watt all band transmitter. A little while later an amateur friend was selling a KW transmitter with a NC300 amateur band receiver. Once again my father came to my aid and bought it for me and I could now do CW and phone on all bands.

I completed my first degree in 1968 and came to England for one year post graduate experience. I returned to South Africa at the end of 1969. It was not long before I had to pay my annual amateur fee, which we had to do at any post office. I went to a post office not far from the house where I could pay my one Rand for the year's licence. Behind the counter there was a young girl who was going to serve me. I did not think she would know what an amateur licence was so I asked her to call her boss, **Victor**, who was an amateur. I paid for the licence and then Victor and I went outside for a chat. During the conversation, I commented on the young girl behind the counter saying that she looked very nice and I asked him to go and ask her if she would like to go out with me. She agreed and little did I think that one day she would be my wife. There was ten years difference between us. It was not long before she knew what an amateur was.

Building a Heathkit

We had been going out for a couple of years when I decided I needed an all-band transceiver instead of having to operate a separate transmitter and receiver. I went and bought myself a Heathkit HW101 kit. Heathkit equipment was very popular and of excellent quality. Every evening I would collect my girlfriend, **Ann**, and bring her home for a meal and then the intention was to spend the evening with me. That was what she must have thought. I do not think she knew what she was in for. After supper we would go to my study/shack and she would have the Heathkit HW101 instruction book and I would have all the bits and pieces to assemble the set. Ann would read the instructions and I would do the practical assembly. Eventually after a week it was completed and functioned very well.

And a CW contest

Ann's next introduction to amateur radio was once again after I picked her up from work when she was going to stay the weekend with me. However, I had forgotten about the big November CW contest. I got up in the early hours of the following morning and went on in the contest, forgetting all about Ann although she must have been around. I was on the radio all day and night and completely forgot about Ann. My father took her home on Sunday evening. I next saw her two days later and surprisingly I did not get any earache. That was a good introduction into amateur radio.

We got engaged in 1973 and married in 1974. We were going on honeymoon to the Drakenburg and what came with us in the car was my faithful Heathkit HW101 with a Hustler antenna attached to the rear of the car. On the way, I was chatting with an amateur who invited us to pop in for tea and cake. Ann said *"NO"*, so we did not go, but travelled to our destination.

Over the years Ann has always assisted in antenna erection and eventually she managed to pass the C&G exam and was a proud possessor of the MD0DMV amateur call.

Time has moved on from the Heathkit days and my latest station is now the Yaesu FTdx101MP with an Acom 1000 linear, **photo 2**.

In summary, I was very lucky to meet a young girl at the post office who eventually became my wife, put up with my radio amateur hobby, shared my interest and we had a very happy 51 years together. I do not think many young ladies would have put up with me and amateur radio. **PW**

Photo 1: The author's first station.
Photo 2: Current station.

Colin Redwood G6MXL
practicalwireless@warnersgroup.co.uk

The 17th Annual Practical Wireless 70MHz Contest

Colin Redwood G6MXL invites readers to participate in the Practical Wireless 70MHz Contest.

The 17th Annual *Practical Wireless* 70MHz Contest takes place on Sunday 14 September 2025 from 1300 to 1600UTC.

The contest is split into two sections. The low-power section with a power output limit of 10W enables everyone to compete on an equal basis with other low-power stations. The high-power section allows stations to run up to the full power permitted by their licence. You may operate as a fixed or portable station.

For those new to the 4m band, the *PW* 70MHz contest is a great introduction to the friendly nature of contesting found on the band. Certificates will be distributed by email.

Equipment

The choice of equipment at 70MHz (4m) continues to improve, with many SSB and CW transceivers now covering the band, in addition to HF and 6m, available from the main manufacturers. The UK version of the older Yaesu FT-847 also covers 4m and can often be found second-hand.

Transverters are still used by some 4m operators and are available from a number of sources. Most use an intermediate frequency (IF) of either 28MHz or 144MHz, taking the 28MHz output from a transceiver and mixing with a local oscillator to give 70MHz for transmit and vice versa on receive. Transverters usually require drive levels much lower than the full output power of most HF and VHF transceivers, sometimes as little as a few milliwatts. You may need an attenuator unless your main transceiver has a low-power output to suit your transverter.

A number of FM transceivers for 4m are available from several manufacturers including Anytone, MyDEL and Wouxon.

Antennas

Many stations will perhaps be using nothing more than a simple dipole or quarter-wave vertical. A number of suppliers now offer commercial 4m Yagis and Moxons.

Vertically polarised antennas are generally used for FM and AM operation. For SSB and CW, most stations use horizontally polarised antennas. For those who like building antennas, there are a number of designs for the 4m band on the *PW Antenna Collection Archive Disc*.

Operating

I'd suggest spending some time on FM and AM in addition to SSB and CW. If you are unfamiliar with the 4m band, you could be surprised at just how many stations are using these modes.

In recent years there has been increasing activity from the continent in addition to activity from almost all parts of the British Isles, including a number of EI stations. It is easy to miss out on contacts simply by not rotating directional antennas in all directions. Don't forget that slow QSB (fading) is a common occurrence on the 4m band, so you may miss a station altogether if you don't rotate a directional antenna a number of times during the contest. The QSB can cause stations to disappear for a minute or two and then re-appear.

Entries

Don't forget to submit your entry after the contest. Although electronic entries via e-mail are preferred and make the task of the adjudicator much easier, legible paper entries continue to be welcome. The email address for logs is **entries@pwcontest.org.uk**

Do make a note in your diary now. The 17th *Practical Wireless* 70MHz Contest takes place on **Sunday 14 September 2025**. If you plan to use batteries, don't forget to charge them a day or two before. Remember to put a reminder in your diary to submit your entry to be received by **Tuesday 30 September 2025**. Let's hope for some good weather and propagation on the day so that we can all have a really enjoyable time.

The 17th Practical Wireless 70MHz Contest Rules
www.pwcontest.org.uk

1. General: The contest is open to all licensed radio amateurs, fixed stations or portable, using SSB, CW, AM or FM in the 4m (70MHz) band. Entries may be from individuals or from groups, clubs and similar organisations**.** The duration will be from 1300 to 1600UTC on 14 September 2025.
All stations must operate within the terms of their licence and only transmit within the 4m licensed allocation. Stations using transverters are reminded to be careful not to transmit out of band.
Subject to licence conditions, split frequency operation is permitted for the purpose of working stations in countries with different 4m allocations. Cross-band contacts where either station is not operating between 69.0 and 71.0MHz will not count for points.
Entrants must observe the band plan for their country and keep clear of normal calling frequencies such as 70.200MHz. Entrants must avoid using any frequency that is obviously in use for non-contest purposes. **The 4m band is not an exclusive amateur band in many countries. Contest stations must allow all other users (including non-amateur users) of the band to carry out their activities without hindrance.**
The station must use the same callsign throughout the contest and may not change its location. Entrants not operating as a fixed station must use the /P callsign suffix.

2. Contacts: Contacts will consist of the exchange of the following minimum information:
(i) callsigns of both stations (**including any /P suffix**)
(ii) signal report, standard RS(T) system
(iii) serial number: a 3-digit number incremented by one for each contact and starting at 001 for the first contact
(iv) locator (i.e. full 6-character IARU Universal Location for the location of the station).
Information must be sent to and received from each station individually and contacts may not be established with more than one station at a time. Simultaneous transmission on more than one frequency is not permitted.
If a non-competing station is worked and is unable to send his full universal locator, his location may be logged instead. However, for a square to count as a multiplier (see rule 4), a full 6-character locator must have been received in at least one contact with a station in the square.
Contacts via repeaters or satellites or using any digital voice modes (including D-STAR, Fusion and DMR) and data modes or machine generated modes, such as FT4, FT8, JT65, PSK31 and RTTY, are not permitted. The use of the DXCluster, ON4KST chat or similar is limited to setting up contacts and not for requesting or passing reports, serial numbers or locators, which must only be exchanged on the 70MHz band.

3. Power: In the low-power section, the output power of the **transmitter** or **transverter** final stage must not exceed 10W PEP. If the equipment in use is capable of a higher power, the power shall be reduced and measured by satisfactory means. Stations cannot rely on feeder loss to meet the 10W power limit. In the open section, stations may use whatever power they are permitted to use by their licence conditions.

4. Scoring: Each contact will score one point. The total number of points gained during the contest will then be multiplied by the number of different locator squares in which contacts were made (a square here is the area defined by the first four characters of the universal locator).
Example: 52 stations worked in IO81, IO90, IO91, IO92 and JO01 squares; final score = 52 × 5 = 260.
Only one contact with a given station will count as a scoring contact, even if it has changed its location, e.g. gone /M or /P. If a duplicate contact is inadvertently made, it must still be recorded in the log and clearly marked as a duplicate (not necessary in computer logs submitted by email).

5. The log: Logs must contain the following information for each contact:
(i) time (**UTC - NOT BST**)
(ii) callsign of the station worked (**including any /P suffix**)
(iii) report sent
(iv) serial number sent
(v) report received
(vi) serial number received
(vii) locator received (or location).
The preferred form of a log is a computer file in REG1TEST, .edi, adi or .log formats sent by e-mail. This may be generated by contest logging software such as MINOS or EI5DI's SDV, provided it contains all the information listed above. Alternatively, a file in any other suitable format (such as the spreadsheet available on the contest website) or in plain text provided each of the items above is separated by a separating character such as a comma or tab are acceptable. Give the file a name including the station callsign (e.g. g6mxl-p.txt), and send as a standard e-mail attachment to
entries@pwcontest.org.uk
e-mail entries will be acknowledged within eight days. If there is any problem with your entry, you will be contacted by e-mail.
Log sheets and covering information sheets for paper-based entries are available for downloading from the contest Web site
www.pwcontest.org.uk

6. Entries: The covering information listed below must be provided with each entry. The preferred method of submitting this is by the use of the online facility on the website. Alternatively, the information may be written in the email message to which the log file is attached. For entries sent by post, it should be written on a separate sheet of A4-sized paper.
The information required for every entry is:
(i) name of the entrant (or of a club etc. in a group entry as it is to appear in the results table and on the certificate
(ii) callsign used during the contest **including any /P suffix** (e.g. G6MXL/P)
(iii) name and address for correspondence
(iv) location of the station during the contest
(v) full 6-character locator as sent during the contest
(vi) whether single or multi-operator (a single-operator is an individual who received no assistance from any person in operating the station, which is either his/her permanent home station or a portable station established solely by him/her); if multi-operator, include a list of operators' names and callsigns
(vii) a full description of the equipment used, including transmitted PEP output power
(viii) if you are entering the low-power section and the transmitting equipment (including any transverter employed) is capable of more than 10W PEP output, a description of the methods used (a) to **reduce** and (b) **measure** the output power
(ix) antenna used and the approximate station height in metres above sea level (ASL)
(x) if you receive or send a report of poor-quality signals (e.g. wide/splattering), full details of the complaint, including time, callsign, nature of complaint and actions taken **during** the contest to investigate and resolve
(xi) the following declaration must be included in the e-mail text or written and signed by the entrant: *"I confirm that the station was operated within the rules and spirit of the event and that the information provided is correct"*.
Failure to supply the required information may lead to loss of points or disqualification.

Entries & other information
Entries by email must be sent to
entries@pwcontest.org.uk
Paper entries should be sent to:
Practical Wireless Contest, c/o Colin Redwood G6MXL, 53 Woodpecker Drive, Poole BH17 7SB.
Entries must be received not later than Tuesday 30 September 2025. Late entries will be disallowed.
Any other general comments about the station, the contest and conditions during it are welcome. Photographs relating to the operation may also be sent by email. They may be used for publication in *Practical Wireless* or on the contest website.
You will be asked, with your entry, to agree to the holding and processing of your entry and to the publication of the results.

7. Miscellaneous: When operating portable, obtain permission from the owner of the land before using the site. In particular observe any restrictions on access. Always leave the site clean and tidy, removing all litter. Observe the Country Code.

8. Poor-quality signals: Make sure that your transmitting equipment is properly adjusted and is not radiating a broad or poor-quality signal, e.g. by over-driving, excessive speech compression or low voltage supply. On the other hand, be aware that your receiver may experience problems due to the numerous strong signals it will have to handle and that this may lead you to believe that another station is radiating a poor signal. Before reaching this conclusion, try heavy attenuation at the received input. The use of a high-gain RF pre-amplifier is likely to worsen strong-signal problems so if you do use one, it is best to be able to switch it off when necessary.
If after making the checks above, you are certain that another station participating in the PW 70MHz contest is radiating poor-quality signals, please call the station, giving your callsign, and tell them about the problem. You cannot expect a station with a poor-quality signal to do something about it if they are unaware!
If you receive or send a report of poor-quality signals (e.g. wide/splattering), you must record on the cover sheet full details of the complaint including time, callsigns of stations involved, nature of complaint and actions taken **during** the contest to investigate and resolve.

9. Adjudication: Points will be deducted for errors in the information sent or received as shown by the logs. Unmarked duplicate contacts in paper-based logs will carry a heavy points penalty. Failure to supply the complete information required in rule 6 may also lead to deduction of points. A breach of these rules may lead to disqualification. In the case of any dispute, the decision of the adjudicator will be final.

Steve Telenius-Lowe G4JVG
teleniuslowe@gmail.com


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Looking Forward

Conditions have remained unstable but September should bring better propagation.

Welcome to the September *HF Highlights*. In last month's column we said that the sun had been very active in May and early June. Well, it continued in the same vein, with sunspot region 4114 releasing an X1.2 class solar flare on 17 June, followed in the early hours of 20 June by an X1.9 solar flare. Both flares led to HF blackouts on the daylight side of the world.

Regular readers of this column will know that between 2013 and 2024 I lived on the island of Bonaire and was active as PJ4DX. That callsign was re-issued this year to **Paul Veldkamp Waalen PJ4SON**, who plans to use it in contests and special events. Paul sent me a picture, **Fig. 1**, of the new antenna he and **Jan PJ4HOT** have put up at their station in the Bonaire *mondi* (bush). It is a 17-element 4-band antenna from GXP-Antennas in Poland. In June Paul wrote: *"I haven't tested and used it yet. First finalising the total assembly, I expect that I'll do the first tests on Sunday. The assembly is straightforward, no real problems, it is only a lot [to do]. SP7GXP team packed the antenna for transport perfectly, no damages, very smooth."*

At the end of June Paul was testing the new beam on 14MHz, with strong signals reported in Europe that generated big pile-ups on SSB. He was also using the new antenna on the VarAC digital mode.

https://sp7gxp.pl

Congratulations to K4BAI

Staying with the Bonaire theme, as reported in the August 2025 *PW* (on page 8), **John Laney III K4BAI** (**Fig. 2**) has been inducted into the Heritage CQ Contesting Hall of Fame. While John does operate using his own callsign from his station in Columbus, Georgia, he is much better known as PJ4A, a special contest call from Bonaire. John is a CW specialist but does also use SSB and I had the pleasure of operating several SSB contests with John and others while residing on Bonaire. Incidentally, John is a US High Court judge and still working at the age of 83.

QSL from Yesteryear

In recent years, amateurs looking for a contact with the DXCC entity of Tristan da Cunha and Gough Island have had to wait for the rare visits from intrepid DXpeditioners who had made the long sea journey from Cape Town in order to activate the island. Most recently this was **Yuris Petersons YL2GM** (see the July *HF Highlights*), who was active as ZD9W for a month back in 2023. There is one resident amateur on the island, **Andrea (Andy) Repetto ZD9BV**, but he had not been active for a number of years.

At the end of April, though, it was reported that Andy was active once again on CW and SSB, using 100W from an Icom IC-706MkII to a vertical antenna. I contacted ZD9BV at least once in the 1980s but the QSL card shown in **Fig. 3** is from a QSO I made with him on 4 August 1998 at 1840UTC on 21MHz SSB, when I received a (presumably genuine!) report of 54 from Andy. In 1998 solar activity was low; it was less than two years into the new sunspot cycle, Solar Cycle 23. At the time I was living in Stevenage in Hertfordshire and was using a 15m dipole about 30ft high.

On 23 June, the *DX-World* website reported a 'good news story' about Tristan: **Bob Schenck N2OO** of INDEXA and **Ken Claerbout K4ZW** of the YASME Foundation have been working together to provide ZD9BV with a completely new station. Thanks to donations and financial assistance from Icom, DX Engineering, WiMo, INDEXA, YASME, N3FJP and UX5UO, a new IC-7300, power supply, antennas including a Hexbeam and multi-band vertical, rotator, cables, logging software and new QSLs are on their way to Andy.

dx-world.net/zd9bv-tristan-da-cunha

Along with Gough Island (where there is a South African weather station), Nightingale Island and the appropriately-named Inaccessible Island (**Fig. 4**), Tristan forms part of the British Overseas Territory of Saint Helena, Ascension and Tristan da Cunha. With a population of only around 250, it is the most remote inhabited island in the world or, as Andy puts it, *"the loneliest place on earth"*.

What to look for in August-September

The Rebel DX Group's operation as T30TTT from Tarawa in Western Kiribati started on 7 June and is expected to remain active almost daily, mainly on FT8 and FT4, until mid-September.

Notwithstanding the security situation in the Middle East, a team from Slovakia led by **Michal OM2DX** plans to operate as E44OM from the West Bank in Palestine from 12 to 24 September. We wish them safe travels.

The big German DXpedition group that previously operated as P29RO in 2022, T2C in 2023 and C21MM last year, is planning a major DXpedition from Weno Island in Chuuk State, part of the Federated States of Micronesia. They have received the callsign V6D (**Fig. 5**) and plan to be on the air from 22 September until 6 October. This is quite a difficult path from the UK, but expect decent signals when propagation allows, and some great operating from this team.

v6d.mydx.de

The month on the air

Nobby G0VJG was active as FO/G0VJG from Bora Bora from 11 to 27 June. By 13 June he had made 1000 QSOs, using FT8, SSB and CW, but at that stage few contacts with Europe.

David DL7ZM was active once again from Turkmenistan as EZ/DL7ZM between 14 and 21 June. This was not a DXpedition but part of his work as a radio propagation researcher at the university in Ashgabat. His licence restricted him

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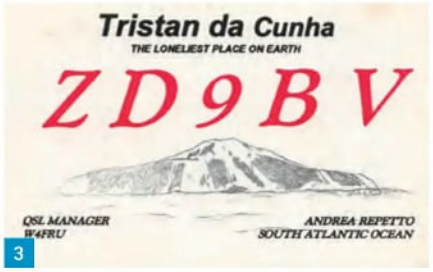

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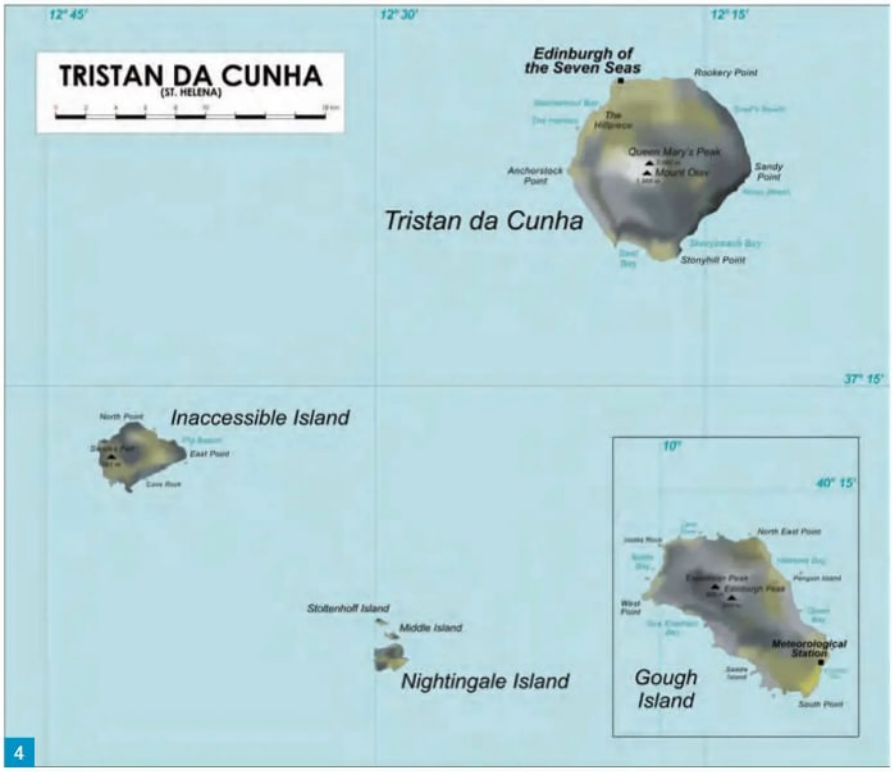

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Fig. 1: The new 17-element beam at the PJ4SON station. Fig. 2: John Laney III K4BAI, recently inducted into the Contesting Hall of Fame. Fig. 3: ZD9BV QSL card dating from 1998. Fig. 4: Map of Tristan da Cunha and its outlying islands. Fig. 5: Look for V6D operating from Chuuk in Micronesia in September. Fig. 6: Award issued to Etienne OS8D for working 500 Russian *oblasts*.

to CW and SSB transmission on fixed frequencies in the 28 and 50MHz bands only.

KD2RSF was active as JW/KD2RSF from the JW5E club station in Svalbard from 28 June to 2 July, mainly using FT8.

Between 30 June and 6 July the World Wide Award 'Sprint' event took place, with numerous stations, mainly using the 'WWA' suffix, on the air making contacts 'contest-style'. The UK station was GB2WWA and just a few of the stations being worked in Europe on a typical day were CR2WWA, DA0WWA, SN4WWA and SX0W. Over 740,000 QSOs were made, world-wide, during the event.

hamaward.cloud/wwa/award

Eric GM5RDX is active as J38DX from Grenada on FT8 and SSB as this column is being completed. He started late on 6 July and is expected to stay on the island until the 13th.

Readers' news

Etienne Vrebos OS8D sent in a photo of the RDA award, **Fig. 6**, achieved for contacting 500 Russian districts, or *oblasts*, from his home station. It took him a few years to get to that level but, meanwhile, Etienne has now worked 850. However, Etienne reckoned this was *"a poor DX month, propagation wasn't good: made only 360 QSOs as OS8D/P by motorcycle and 610 from home, together not even 1000 QSOs."* Much of Etienne's activity is out portable on his motorbike, activating the many World-Wide Flora and Fauna (WWFF) and Parks on the Air (POTA) counters in Belgium. *"I get that new pleasure to activate WWFF and POTA, with the new FT-891, smaller and lighter than the FT-710 I use in the car, and easy to put in the side bags of the motorcycle. As already said, it allows me to go where cars are not allowed or not even getting through some forest routes,* **Fig. 7**. *No hill climbing with the car but OK with the motorcycle, and disturbing nobody (I presume)..."* (The OS8D/P antenna support can just be seen at the front of the motorbike, but this is almost a covert antenna and a case of not being able to see the fibreglass for the trees – ***Ed***.)

"Castles were easy to work (except for the Royal Palace), POTA and ONFF are sometimes challenges, but I really like it. I will never reach the highest ranking as I only started some weeks ago, and some guys / girls have been working WWFF and POTA for more than ten years. I do not forget my castles where it all started, but reaching the 500 is OK for me. Of course, when there is a castle within the boundaries of a park or an ONFF I'll take it too.

"That's a long story but new activators are difficult to persuade; could a reason be the upload programs? Logging the stations you just worked is not a problem, even with pen and paper as I do when activating by motorcycle (not a single place any more in my motorcycle bags) but once at home you'll have to follow very strict rules for each entity activated, WCA / GMA, ONFF, POTA, BOTA and so on... It's not always easy and many times I need more time to upload than the activation itself."

Jim Bovill PA3FDR thought that *"Two things were very noticeable this month, the almost total absence of activity in the 10m and 12m bands, both for DX and local EU stations, and the general low level of activity on the FT4 mode on all bands. The results for the 10m band were identical when I switched from my standard long-wire antenna to the MFJ-1796 6-band antenna (it has 10m but not 12m), so most likely a propagation, not an antenna, problem. Fortunately, the lower HF bands, especially 15m, were very active and allowed me to enjoy some good DX, including good openings*

to South America and Asia, with many QSOs from Japan... I have restricted the number in my report to stations a great-circle distance of 9500km or more from my location. This is a purely arbitrary cut-off; I use a simple Python program to calculate the true great-circle distance using the Japanese stations' latitude and longitude obtained from QRZ.COM. This is more accurate than the distance given by WSJT based on a station's locator."

Owen Williams G0PHY also reckoned that *"Band conditions continue to be poor and [my] activity was restricted to 14MHz. The recent Canada contest produced only two contacts with Canadian stations and they were in New Brunswick and Newfoundland. The same contest last year produced 13 contacts across Canada from Prince Edward Island to British Columbia. However, the World Wide Award sprint at the beginning of July gave plenty of contacts, but mostly in Europe."*

It was good to hear from **Rhodri Morgan M0RHO** again after a long time. He wrote: *"Myself M0RHO, my XYL M6MQD, **Andy G0JZW** and his XYL **Rose** stayed in a disused MoD radar station on the Dorset coast* **(Fig. 8)** *for a week and played radio* **(Fig. 9)**. *We had to lock ourselves into the compound each night... it was all rather surreal but great fun. Bands were abysmal for a few days then our persistence was rewarded with Canada and USA!"*

Martin Burch VK4CG, who moved from England to live near Brisbane in Queensland, wrote during the depths of winter, when the overnight temperature dropped as low as 7°C! *"When I first moved to Australia I wondered what all the fuss was about, coming from the Northern Hemisphere, but after a couple of years of hot summers and acclimatising I was shivering like everyone else!"* he said. Martin uses 100W to a multi-band vertical antenna and his report in 'Band highlights' below shows what is being worked with relatively simple equipment from the other side of the world.

Tim Kirby GW4VXE, usually operating as **GW4MM** on CW, has had another quiet month with limited HF DX being worked. He writes, *"Daytime absorption has put paid to lower frequencies during the day, but 15m has occasionally come up with some goodies. BG0DLA seemed to be an enormous signal all through the All Asia CW contest. UK8AXA was a new one (from GW), also worked during the All Asia contest. Just occasionally too, you'll think the band is dead, see one signal and it's some DX – just now BA4TB was the only signal on CW here."* Tim also writes that for the last few days, he's been restricting himself to 100W – it's been too hot in the shack to have the amplifiers on!

28MHz beacons

Neil Clarke G0CAS brings us his 28MHz beacon report for the month of June. Overall Sporadic E appeared to be somewhat down when compared with June 2024 but, saying that, it did have its moments particularly from 3 to 5 June, when over 20 European beacons were heard each day. The only other day that happened was the 19th. The best day was the 4th, with 24 beacons logged, followed by the 3rd, with 23. Looking at the direction of the openings, Iberia did the best with ZB2TEN 28170 heard on 26 days. Italy also did reasonably well, with IQ8BB 28260 heard on 28 days and IZ8FFZ 28270 on 24 days. Other beacons from Italy were heard, but very infrequently.

Moving further north to central Europe, DL0IGI 28205 was logged on 16 days while OE3XAC 28188 was heard on 17 days. From Poland, SQ4HWI 28193 and SR5TDM 28216 were heard only once, on the 5th and 11th respectively. Things were worse towards Scandinavia: SK7GH 28298 was logged on five days while OH9TEN 28267 and OH5TEN were only logged on two days and one day respectively. Even OH2B 28200, which belongs to the world-wide beacon network and transmits with 100 watts at the commencement of its transmission, was only heard on eight days.

Conditions beyond Europe were no better, where the only reliable path was down to South America, where LU2DT 28193 was logged on only 25 days (whereas most months it is heard near enough every day) and PY4MAB on 16 days. Even 4X6TU 28200 was logged on only 17 days and ZS6DN 28200 on six days. Worse still, no beacons were heard at all from North America or Australia.

Fig. 7: OS8D/P activating a WWFF and POTA from deep within a Belgian forest on 10 July. Fig. 8: The disused MoD radar station in Dorset. Fig. 9: Rhodri M0RHO operating from the old radar station.

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).

Etienne OS8D (HB): 14MHz SSB: 4K3ZX, EP2PG. **18MHz SSB:** 8A1K, JL8PZO. **21MHz SSB:** 4K3ZX, 9M2ODD/P, HS0ZLV, TO0WWA, YB1SCY, YB7ONC.

Jim PA3FDR (MS) 7MHz FT8: HB0/HB9FXF. **10MHz FT8:** OY/K4LT, TA4SSK. **14MHz FT4:** A61MW, WB4OSS. **14MHz FT8:** 4L7T, 9K2WA, KA2G, UA9ZCC. **18MHz FT8:** 7Q6UJ, A65RW, BG0HP, BG1FQQ/8, E21EIC, HL5BLI, JA3XPO/P, JH1JNJ, JH5AVM, KV4AA, PP105ASN, PT2ND, PY7ZZ, R9YQ. **21MHz FT4:** 5Z4VJ. **21MHz FT8:** 9K2ES, A71AH, 7Z1BM, BD7KWO, BG9HSU, BI1OSM, CX2CN, JA2VMU, JA4DND, LU1ASP, PY2SAO, PY4PTO, PY5CC, R9YQ, YC8RDG, XQ1KZ. **24MHz FT8:** CO8LY. **28MHz FT8:** 9K2HN.

Owen G0PHY (HS): 14MHz SSB: FY4JI, K2J, N4W, VE9XX, VO1RAC.

Rhodri M0RHO (SM): 7MHz SSB: HB0/SP7VC, EN0U, TM2WWA, VO1RAC. **14MHz SSB:** KB1WAM, WA4WZQ.

Martin VK4CG (MS): 7MHz SSB: C91CCY, K6ODI, N7EKD, WA7LNH. **14MHz SSB:** EA8BS, EA8NF, IK5SRF, W3BV, W5IB, W9WJ, ZL4CZ.

Signing off

Thanks to all contributors. Please send all input for this column to teleniuslowe@gmail.com by the 11th of each month. For the November issue the deadline is 11 September. 73, Steve G4JVG. **PW**

Keith Rawlings G4MIU
keith.g4miu@gmail.com


1

Reader Feedback

Keith Rawlings G4MIU's mention of attic antennas in a recent column has generated quite an avalanche of feedback.

Hi and welcome to this month's *Antennas*. I am going to take a break from the series on VNA's and cover some of the reader feedback I have received during the last few months.

My description of the Attic Doublet back in March seemed to interest a number of readers and I have been surprised at how many amateurs are using an antenna of some fashion in their attics. I have reproduced a selection of correspondence, which I hope you will find interesting.

Andrew Green 2E0GYI wrote: *"I was interested to read your column in the March* PW *about the indoor doublet antenna.*

"After getting my licence in 2020 and being new to transmitting (previously a SWL) I was looking for an antenna to get me started. By coincidence in the July 2020 RadCom *I saw a design for an attic mounted slinky doublet and decided to build it. This was the first issue I received after getting my Foundation licence in the June and joining the RSGB soon after. The article was good timing as I was eager to get on the air and needed some kind of HF antenna. It seemed an easy way to get started so I built it. I have now built an outdoor vertical which I telescope up when using it and then down when not. This being possible as it is on a 10m fishing pole*

"Despite having this outdoor antenna I still have the slinky as a back-up for when weather conditions mean my outdoor antenna has to be lowered. It is basically two Slinkys attached to the rafters joined in the middle, exactly the same as your design, fed by 350Ω twin feed. The RadCom *plan also encouraged you to make your own balun, which I did. As you say, using an ATU it tunes from 40m to 10m quite satisfactorily and I have had good results from it. The furthest I have worked on it so far is Brazil. I never use more than 50W power from the radio with it being indoors. The worst band for received noise is 40m where I get about S7 at night.*

"One thing I would like to question about the article is you mention that having the feeder near to or touching objects is not exactly ideal. On mine I ran the twin feeder down and through the ceiling into a cupboard in the radio room. Then the balun is attached in the cupboard and RG58 coax the short distance to the ATU on the desk. Would I be better moving the balun up into the attic and having a longer coax run through the ceiling and loft insulation?"

I replied to Andrew that if everything is working OK, I would leave it alone. Nearby objects can cause imbalance on the two wires causing radiation off the line which may, in turn, cause RFI. This is true for transmit and also receive where nearby noise may be picked up on the line.

Also, the line may well be radiating as part of the antenna, so ideally, it should be well away from anything that may affect it, but that said, if all is working OK and you are happy with it, leave as is! Andrew's antennas may be seen in **Figs 1**, **2** and **3**. Thanks Andrew.

From **Dick M5DIK:** *"thoroughly enjoyed your article in* Practical Wireless *as regards indoor antennas, very informative, well written!* (Thanks Dick, your cheque is in the post!)

"You asked for comments as regards our experiences with attic antennas. I have been licensed for 25 years and throughout that time have used as my main antennas half-wave dipoles in the loft for 20, 15 and 10m.

"During that time I have worked exclusively on SSB running 100W contacting over 150 countries. They have included to the west Canada, Colombia, Brazil, Argentina, and Chile, St Helena, to the South Egypt, South Africa and to the East Japan, China and Taiwan to name just a few.

"There is a myth that if the antenna is in the loft, it is not as efficient as if it was outside - I don't agree with that theory. My loft space isn't huge and the 20m dipole has both ends bent but that doesn't seem to compromise the performance. What is noticeable is that the dipoles are directional and favour an East-West path, but that would be the same if they were

Fig. 1: 2E0GYI attic Slinky dipole.
Fig. 2: 2E0GYI balun.
Fig. 3: 2E0GYI 30ft garden vertical.

outdoors - I guess that is the nature of dipoles!

"Amateurs new to the hobby are to some extent brainwashed into thinking that to work DX the only solution is a tower, a beam and a very large linear. Undoubtedly that configuration will help you to work DX but as we both know there is a lot more to it than that!

"The key is to listen at the right time and tune your antenna as best you can - eventually you will work DX and I suspect it's a lot more satisfying than cranking up the linear although extremely frustrating at times!"

I can't disagree. Don't be put off if the only antenna you can use is modest or less than ideal. As we know, any antenna is better than no antenna at all and, as Dick describes, good results may still be had with a simple antenna.

Richard Graham commented: *"I too have a backup antenna in the attic - mine is a full length 20m dipole - and I usually only use it for QRP stuff with my QCX Mini or my QDX kit but recently I hooked up my G90 to it to test a pal's new paddle and then that evening I found that my super-duper OLED TV had thrown a wobbly and was doing all sorts of strange switching things. Now it may just have been a coincidence but the end of my dipole is only a few centimetres from my off-air TV signal distribution amp and I just wonder if the 20W of RF zapped the TV via the TV aerial connection. In any case I won't be trying that again just in case. Luckily the TV is still under warranty and in due course a TV repair man (didn't know they still existed) came and took it away for a fortnight to fix it."*

When I wrote the article I mentioned a couple of safety related comments but didn't think to include the possibilities of RF damage to a TV due to the close proximity of a TV antenna. While I appreciate this may not have been Richards's problem it is perhaps something to bear in mind when using an attic antenna.

A few 'Thoughts' from **John Ashmore G8GXF** on Aerials in the Loft: *"I have two half-wave dipoles in the loft. One for 28Mc/s and one for 14Mc/s, both connected to a 1:1 Balun and 50Ω Coax feeder down to the 'Shack / Bedroom'. It's an idea from the Wolverhampton Radio Club website:*

https://wolverhamptonars.co.uk/fan-dipole

and F7FE 'all Bands Dipoles' page 13.55 RSGB Handbook 4th Edition 1968 ish.

"Your use of a doublet and open wire feeder for the loft is simpler and cheaper. Only one aerial wire and let the rig sort out the SWR with the Auto-ATU.

"I think it would have been a better Idea for me to do that (No cutting of wire in the loft and rechecking the SWR) up and down the ladder!

"As you know there is limited space/height in the loft, and only one aerial can have the 'Sweet' spot. The more wires you put in the loft, the less space to work in.

The dipoles interact with each other and other stuff (the TV aerial and the TV coax, Mains wiring for the bedroom lights. And they all help to pick up RF noise as well). One aerial that can do several bands (with the rig's ATU) stops all that.

"From what I've read/seen the 300 / 450Ω feeder needs to be fed with a 4:1 Balun, to give a better match to the aerial/feeder. I would have done that, but if your 1:1 balun works 'Don't Fix it'."

Thanks for your thoughts, John. The 1:1 Balun I used was what I had to hand at the time but I agree with you that a 4:1 would be a better choice and is something I am going to look at when time allows.

Readers will remember **Paul M1CNK** has been experimenting extensively with Vertical Coaxial End-Fed Dipoles. Towards the end of April this year Paul forwarded to me details

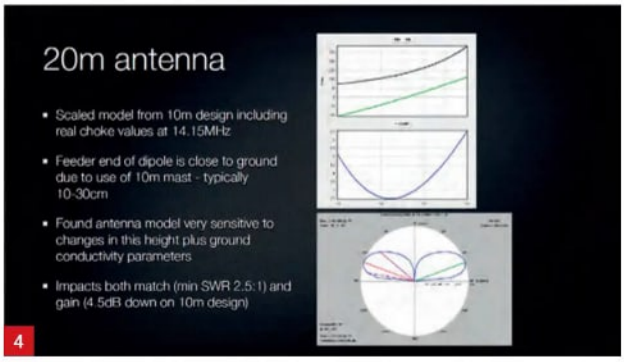


Fig. 4: Excerpt from Paul M1CNK Itchen Valley Radio Club presentation. Fig. 5: Braintree and District Amateur Radio Club June Antenna Clinic with Chairman Dave G0DEC at the controls. Fig. 6: The excellent 'Arrow' Dual-Band Sat Antenna set up to be tested at the club's test site.

of his exploits with a 15m band version of the vertical, which he reports as 'working pretty well'.

Paul gave a talk on his exploits with the Vertical Coaxial End-Fed Antennas, and his story in developing them, to the Itchen Valley Radio Club. He sent me a pdf copy of the presentation. See **Fig. 4** for an extract, and a link to the full document may be found on the Itchen Valley Club's website. Bottom of this page:

https://tinyurl.com/mtsv2tay

Thanks Paul, please keep in touch.

From **Michael Hall M0GVY:** *"Just read you excellent article in this month's* PW *and it brought back memories of doing something similar 15 years ago. My XYL's hate of wires meant for my first HF aerial, it needed to be concealed, so the attic was an obvious choice. Not knowing about fan dipoles and doublets back then, many club members suggested a large loop and ATU. So, I made a loop which runs around the edges of the attic and up and down both gables and is made from microbore copper tubing. This tubing is easy to bend by hand and comes with a PVC coating, offering some protection. The ATU is an SGC type, so remotely controlled, and is fixed at the start and end of the loop at the top of one of the gables. The result is a very quiet receive, usually S0 or S1 on 40m upwards, and on FT8 I have now contacted over 100 different countries and 38 US states. An Rpi reads the control lines from the ATU and via a simple Python script displays the ATU tuning status at any one time. My rig, an FTdx10, sits in a cupboard upstairs and I operate it remotely via a portable PC, from anywhere in the house.*

"For my next attic project, I plan to use some Ampro hamsticks and make a collection of 20m, 15m and 10m dipoles. Some initial testing outside shows that they work very well if given enough height from the ground."

Michael later went on to add that a friend had a similar attic loop that was tuned by an SGC230 remote ATU and had similar success. He says *"Connections to the loop are to the white isolator on the SGC and the earth lug on the casing. For the loop size, mine is 10m x 8m (size of attic) and the roof angle and height of the centre beam is low, so not possible to stand in the centre, one of the reasons I don't go up there very often. Tracking the microbore up the eves to the apex or centre ridge will provide better vertical elements to the loop, something my friend has more success with, as he has a high apex roof."*

Due to space reasons I was not able to repeat Michael's full message but he was kind enough to supply me with details of the interface he uses with the Rpi/SG230 as I have an SG231 which should be similar. Both of these units are long out of production but I'd guess that most modern remote/auto ATU's could be substituted without too much trouble although it would be worth estimating the range of impedances the ATU would be seeing and making sure that the one chosen is up to the job.

Well, I hope you found this interesting and my thanks to all of you who contacted me with information regarding your attic antennas, I'm sorry I didn't have room to fit you all in. It is always interesting to hear about readers' antennas, attic located or otherwise. It is fascinating to hear about the ingenuity many amateurs use to get some 'metal' in the air.

Antenna related plug

The last couple of photos this month, **Figs 5** and **6**, show the Braintree Radio Club's annual June 'Antenna Clinic' meeting where members get a chance to use some of the club's test equipment to check out their antennas! It is a great social evening and one which always seems to throw up a few antenna, how can I say, 'surprises'!

www.badars.co.uk

With the computer and myself presently overheating I will see you next month. **PW**

Broadcasting history

Join **Keith** and **Garry** once again for a stroll through the archives.

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

BBC Broadcasting House, London: Part I

This month, we begin a new in-depth series giving an account of the early days of *BBC Broadcasting House* in London.

Built of Portland stone, Broadcasting House was officially brought into service on 2 May 1932, the same year that *Practical Wireless* began with a cover date of 24 September!

The first broadcast was actually on 12 March when *Henry Hall and the BBC Dance Orchestra* took to the airwaves. The BBC's previous headquarters at *Savoy Hill* were becoming totally inadequate due to the planned expansion of radio services. The doors of the *BBC 2LO London Station* were officially closed for the final time on 14 May 1932.

The tendering process for the construction of Broadcasting House began in July 1928. By the autumn of that year, the BBC had completed all the arrangements for the building of a new headquarters in *Portland Place*, London, situated between *Oxford Street* and *Regent's Park*, adjacent to the iconic *All Souls' Church*, designed by **John Nash**.

Broadcasting House was designed to have numerous studios with improved acoustics and almost perfect soundproofing. Construction work began in October 1930, **Fig. 2**. It is interesting to note the advertising hoardings for *Wrigley's Chewing Gum*, *Rose's Chocolates*, *Andrews Liver Salt*, *Johnnie Walker Whisky*, and the 1929 film, *Thunder*, starring **Lon Chaney**. The hoardings acted as a security barrier.

Vintage coronation ST&C advertisement

This month's wade through vintage copies of ragged newspapers and magazines has divulged an advertisement by *Standard Telephones and Cables Limited*, **Fig. 1**. The advertisement dates from June 1953. The text has been left in its original format to reflect the spelling, grammar and punctuation of the time.

The designation letters on the map refer to the various sound and vision links provided by ST&C Limited. It should be borne in mind that *BBC* and *General Post Office* engineers also had a huge role to play in providing essential circuits and equipment for the 1953 Coronation.

This concludes our special series of rare Coronation advertisements which began with the May 2023 issue.

City & Guilds update

Following our recent mention about *City & Guilds Certificates*, **Dr. Tim Strickland G4EOA** has written about his first-hand knowledge of the subject. Tim writes: *"Dear Keith and Garry, as usual, I enjoyed your column in the April edition of* PW *and the wide coverage to various topics. With regard to the old style 'Radio Amateur Exam' (written answers and subsequently multi-choice questions), you indicated that City & Guilds Certificates are not recognised by many organisations nowadays.*

From the perspective of a former 'Trustee of City and Guilds', a former 'Chief Examiner (Radio, 271)' and from someone with a career in radio and technical education established from C&G qualifications, I can confirm that City and Guilds provides a vast range of qualifications across the spectrum of vocational education – 'Engineering', 'Hospitality and Catering', 'T Levels' (also called 'Technical A Levels'), 'Construction' and 'Hair and Beauty', to name but a few, see:
www.cityandguilds.com
All are highly regarded within their industry and many form the basis of pre-requisite knowledge required for entry to higher education, employment and promotion. Like many radio amateurs, I started my career by taking City and Guilds qualifications which served me well, as they continue to do for others today.

Thanks for a great column. It's the first thing I turn to when PW *arrives by post! Dr. Tim Strickland, G4EOA."*

Thanks, Tim, for this important update.

100 years ago: September 1925

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

An experiment was conducted on 7 September to transmit the opening speech by the French prime minister and notable mathematician, **Paul Painlevé** from the *League of Nations Assembly* in Geneva.

Peter Murray James, **OBE**, better known by his professional name, **Pete Murray**, was born on 19 September 1925. At the time of writing, and at the age of 99, he is still active in the world of British broadcasting. The presenter and actor is best known for his career with the BBC, including programmes on the *Light Programme*, *Radio 1*, *Radio 2* and *Radio 4*. In the 1950's, he became one of Britain's first pop music television presenters, hosting the rock-and-roll programme, *Six-Five Special*. He also appeared as a regular panellist on *Juke Box Jury* as well as occasionally presenting the BBC's coverage of the *Eurovision Song Contest*. On Boxing Day 2022, he presented a two-hour programme on *Boom Radio* alongside his friend and former television *Continuity Announcer*, **'Diddy' David**

1

The CORONATION Route
A FOCUS OF INTEREST TO TELEVIEWERS AT HOME AND ABROAD EQUIPMENT BY *STANDARD*
***Standard's* CONTRIBUTIONS TO THE CORONATION TELEVISION NETWORK**
A *Standard's* *direct contribution to the Coronation included a special sound reinforcement system in Westminster Abbey and sound reproduction and dissemination with public address facilities along a major part of the route controlled by the Ministry of Works.*
B *Special large tube coaxial television cable between London and Birmingham by* ***Standard*.**
C *Standard* *coaxial television cable between Birmingham and Manchester.*
D Standard vestigial side-band television equipment on the Birmingham-Manchester section of the network.
E *The latest London to Wenvoe link includes* ***Standard*** *coaxial cables.*
F *At Wenvoe, television sound transmitter by* ***Standard*.**
G *Standard* *microwave television radio link relaying all programmes between Manchester and Kirk o'Shotts.*
H *At Kirk o'Shotts, a television sound transmitter also by* ***Standard*.**
J *Under contract to the B.B.C.,and as a direct contribution to the Coronation, S.T.C. were solely responsible for relaying the Coronation Television programmes from London to the Continent. Equipment which was installed and operated by S.T.C. comprised five* ***Standard*** *portable S.H.F. radio links as supplied to the B.B.C. for numerous outside broadcasts since 1950. Monitoring equipment by* ***Kolster- Brandes Ltd.****, an S.T.C. associate.*
Standard Telephones and Cables Limited
Registered Office: Connaught House, Aldwych, London W.C. 2
TRANSMISSION DIVISION, N. WOOLWICH, LONDON, E.16

Hamilton. David's nickname 'Diddy' was given to him by his close friend, **Ken Dodd**, because of his diminutive stature.

The *Berliner Funkturm* (*Berlin Radio Tower*) began test transmissions on 25 September. It was brought into regular service one year later on 3 September in time for the *Große Deutsche Funkausstellung* (the *Great German Radio Exhibition*). Today, it is officially classed as a 'protected monument'.

The rise and fall of 198kHz: Part XXII

The long-wave carrier frequency used by the Droitwich transmitter was originally 200kHz (1500 metres). This changed to 198kHz on 1 February 1988, to comply with the allocation of European frequencies set out under the *Geneva Plan*. The power was 500kW. In 1972, the 100kW Russian transmitters in Moscow, Leningrad and Irkutsk also broadcast on 200kHz.

The carrier frequency at Droitwich was controlled by *Rubidium Atomic Frequency Standard Apparatus* housed inside the transmitter building. This enabled transmissions to be used as an *off-air frequency standard*. For long-wave, a *T-aerial* was used, suspended between two 213m-high (approximately 700ft) guyed steel lattice masts positioned 180m (590ft) apart.

There were also two guyed *mast radiators* at the site. The northerly mast supported the transmitting aerial while the southerly structure was a passive reflector causing the RF signal to form a cardioid pattern.

60 Years of BBC-2: Part XVIII

In 1964, the programme schedule on Wednesdays was called *Encore Night*. In other words, a complete evening of repeats. Things are still the same more than 60 years later! BBC-2 attempted to sell viewers the idea of repeats by mixing programmes from their own network with some from BBC-1, stating, quote: *"The word 'repeats' is almost the wrong word to use because, as the 625-UHF public grows, these second showings will, for many people, become the first performance"*. Well, perhaps back in 1964 they had a point.

On the first Wednesday evening of BBC-2 (22 April), there were repeat showings of the BBC-1 programmes *Who, Me?*, *Charlie Chaplin*, *Nation Out Of Balance* and *Look Again*.

Service information, Switzerland: Part XXXI

During the 1960's and 1970's, SRG-SSR expanded their facilities in many new locations. Today, in addition to the large facilities in Zürich, Basel and Bern, there are 17 regional studios including those in Chur, St. Gallen, Aarau and Luzern. The regional studios are specifically located in order to cover the four national languages – German, French, Italian and Rumantsch.

Over many years, the authors have often strolled around in the peaceful vicinity of the Luzern studios without realising it, until a visit in August 2023. The main entrance is only distinguished by an unassuming red plaque showing *SRF* (*Schweizer Radio und Fernsehen*) although, to be fair, there is a large *SRG SSR* sign high above street-level, **Fig. 3**.

Fig. 1: An advertisement by *Standard Telephones and Cables Limited* in June, 1953, detailing their contribution to the television network for coverage of the Coronation.
Fig. 2: Construction work for *BBC Broadcasting House* in London began in October 1930.
Fig. 3: The Swiss SRG-SSR regional *SRF Studios* in Luzern, photographed during a visit by the authors in August, 2023.

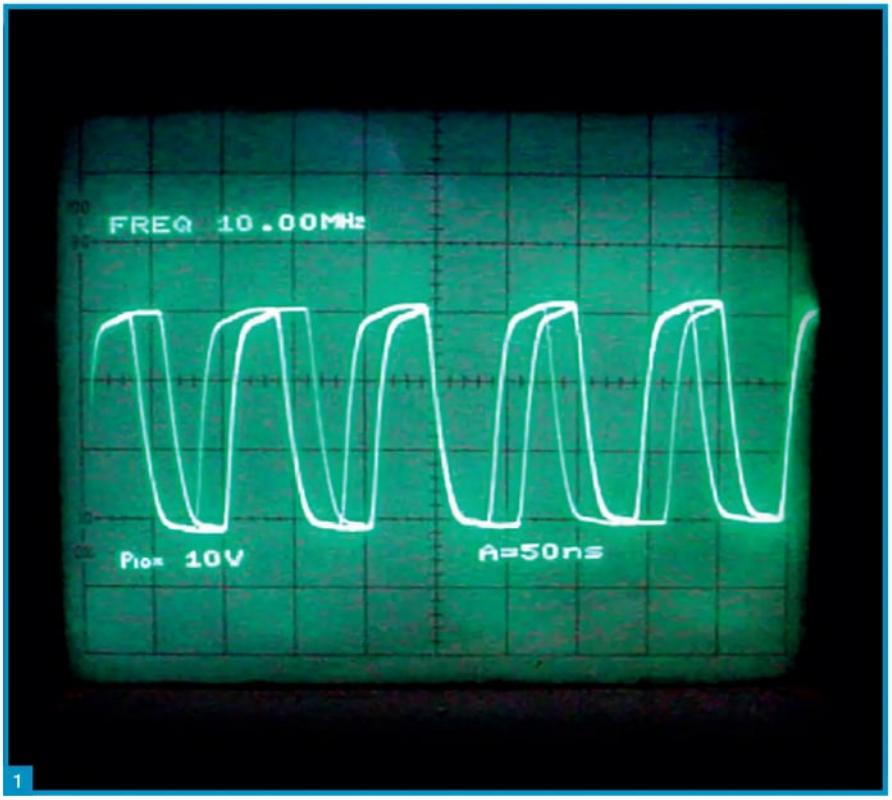
2

3

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**

Eric Edwards GW8LJJ
gw8ljj@gmail.com



1

A GPS disciplined 10MHz Frequency Standard

Eric Edwards GW8LJJ builds a handy frequency standard.

An earlier GPS project was published in the May 2019 edition of *Practical Wireless* with the proposal of using an NE0-7N GPS module. I ordered a lot of these from three sources but I was sent NE0-7M types. The difference being with the ones sent, when the power source was removed the information was lost. It was found that the '7N' was no longer available and the dealers supplied the '7M' types instead. Rather than send them all back (after several communications), about 30 of them, I decided to use them with a battery mounted on the module. The battery, CR2032, was mounted in a holder and connected to the on-board super capacitor via a 1N4148 diode for reverse protection. This worked well provided the battery was not removed or run flat. If it did happen (and it does), the NEO-7M had to be reprogrammed from the (U-Centre) software. This was easy but an inconvenience.

Version 2.10M

This new project uses an NEO-M8N GPS module, which has an on-board memory so that no battery or other power source is needed to always be on. I found an earlier NEO-M8N that I had programmed (downloaded the software) about seven years ago. I plugged it in to my PCB jig and powered it up from the shack 12V power supply. It produced the 10MHz sinewave at the output of the test jig. I had programmed it to produce 10MHz both locked and unlocked and it did exactly that after seven years.

This NEW NEO-M8N is larger than its earlier module and it also has a built in UART so there is no need to use a separate UART module for connecting between the PC USB port and the GPS module because it has a mini-USB socket on the module ready to be plugged into the PC USB and it allocates a port number.

Purpose

A known accurate frequency source is a very useful addition to the shack as it can be used to calibrate frequency counters (frequency meters) and also used as a reference for the counter and for transceivers that have a reference input. The frequency chosen is 10MHz as that seems to be a popular frequency used for reference.

How accurate is it?

The accuracy of the project described when locked is governed by the GPS signals that are being sent out from many satellites. There are two settings when placing the data into the GPS module. One with the GPS antenna connected which provides an accuracy of 1Hz and another that relies on the internal TXCO (temperature compensated crystal oscillator). With both selected, the 10MHz signal is still available even when the GPS signal is lost due to the antenna being disconnected or faulty. The frequency selected is stored in a 'flash' memory so no back-up battery is required, and this can be from 0.25Hz and up to 10MHz.

The GPS device

This is the GPS receiver and the type used is the u-blox GNSS NEO-M8N module, which suits the purpose very well for this application. The -8N type was chosen because it has an SMA GPS antenna socket fitted, a PPS (GPS output) pin and a flash memory.

The concept

There are several designs seen using the GPS modules where the output frequency is taken directly from the module. This is acceptable for lower frequencies but above 2MHz there is phase distortion. The photo at **Fig. 1** shows this distortion when the 10MHz is taken direct from the output of the GPS module. The scope shows the amplitude of 10V but it is 1V per vertical division. The 10V per division is shown for use with a times ten (X10) scope probe. I have chosen to use 2MHz as the base frequency and multiply to 10MHz by using a frequency multiplier integrated circuit (ICS501) set to multiply by times five. This produces a stable 10MHz signal (as far as I can tell with my test gear) and an OpAmp is used to adjust the output voltage level and change the impedance to 50Ω. This is done with a high frequency OpAmp (LT1227) and then it goes into a simple five-pole low pass filter (LPF) to produce a clean 10MHz sinewave (**Fig. 2**) with no harmonics (**Fig. 3**). The tests were carried out on my shack test gear and are as accurate as my test gear allows.

Placing the required frequency in the GPS module

If the module with or without a full kit is supplied by me, it will have been programmed to provide 2MHz for the locked and unlocked

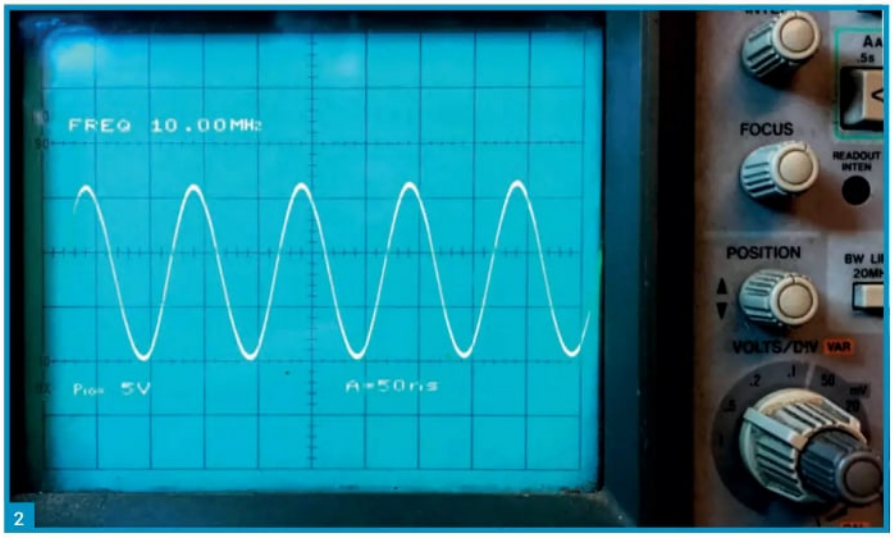
Fig. 1: Phase distortion on 10MHz signal.
Fig. 2: A clean signal after going through the LPF
Fig. 3: No harmonics remaining.
Fig. 4: Circuit diagram.
Fig. 5: 2MHz square wave.

frequencies. There is software involved which is simple to use. Those of you that want to load the GPS module can download the software at the 'U-blox u-center'. The GPS module will be pre-loaded if obtained from me.

The circuit diagram

The circuit is shown at **Fig. 4**. The main component is the GPS module and the type used is a Ublox GNSS NEO-M8N module as this has a flash memory so no back up memory battery needed and the GPS antenna (SMA) connector is pre-fitted along with a dedicated pin for the PPS (GPS output signal).

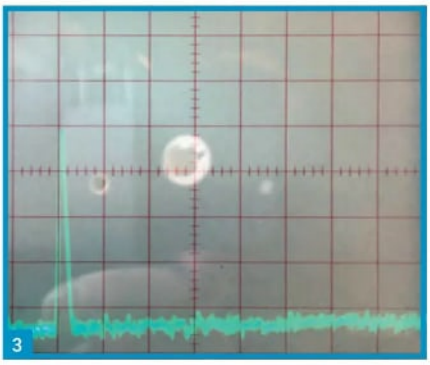
The PPS signal from the GPS module has been selected to provide a 2MHz square-wave with a duty cycle of 50% at 3V pk-pk (**Fig. 5**). There is a test point on the PCB to check this. The PPS signal is connected to a frequency multiplier (ICS501). This integrated circuit is a PPL (Phase Locked Loop) and is an SOP8 type that I have placed onto an adaptor to convert to DIL (Dual-In-Line) so it can be used with the standard through-hole PCB footprint. The output with 2MHz applied provides a 10MHz sinewave at 1.5V pk-pk waveform at the reference output. As a filter is required to remove, or greatly attenuate any harmonics, the signal output from the multiplier needs to be converted to low impedance and the gain adjusted. This is carried out via the next stage, which is an OpAmp (LT1227), a high frequency OpAmp normally used for video applications. The output from this amplifier is placed at 50Ω for the sending impedance to the five-pole LPF to provide a clean 1.5V pk-pk sinewave with no appreciable harmonics.

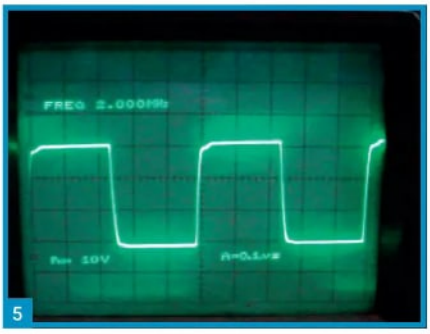


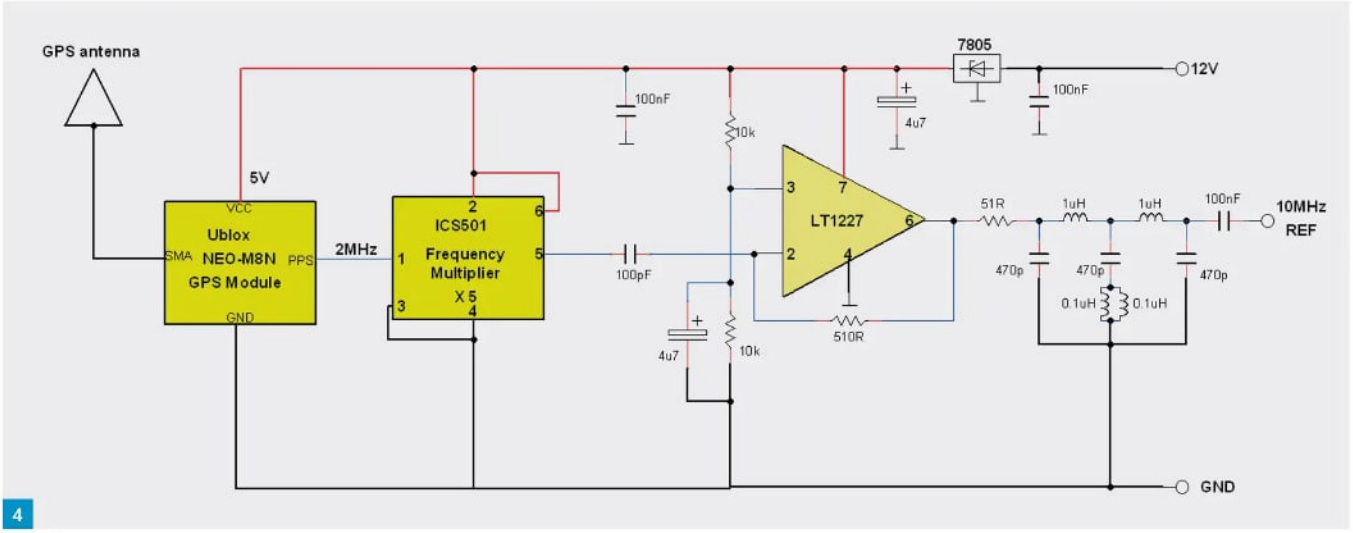
The PCB layout

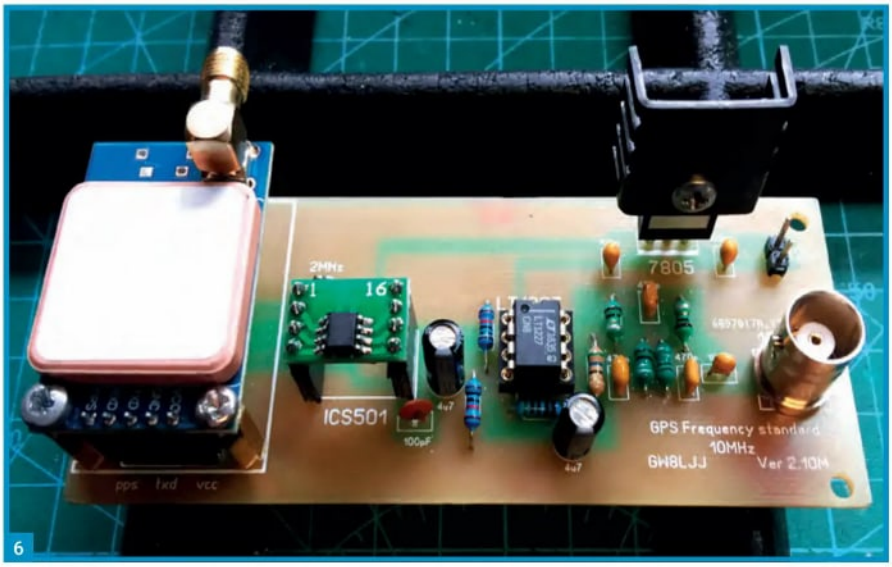
The PCB layout is shown in **Fig. 6**. The NEO-M8N GPS module is shown on the left of the PCB. The only ones available when ordering have an antenna fitted on the top of the module. The antenna is of little use, especially indoors, but as it is firmly attached no attempt has been made to remove it. It makes no difference to the reception when the outdoor antenna is used. The module is shown mounted on a socket and supported with two pillars (metal stand-offs). This is done for convenience of being able to remove the module if needed. The module, however, can be soldered directly to the PCB using the pins as supplied on the module. If this is wanted, the fitting holes in the PCB will need to be enlarged from 0.6mm to 0.9mm, which can be done prior to despatch and upon request.

The IC (ICS501) next to the GPS module is also supplied to be plugged into a socket on the PCB. The same enlargement of the PCB fitting holes for this IC pre-fitted onto an adaptor with DIL pins so that the DIL pins can









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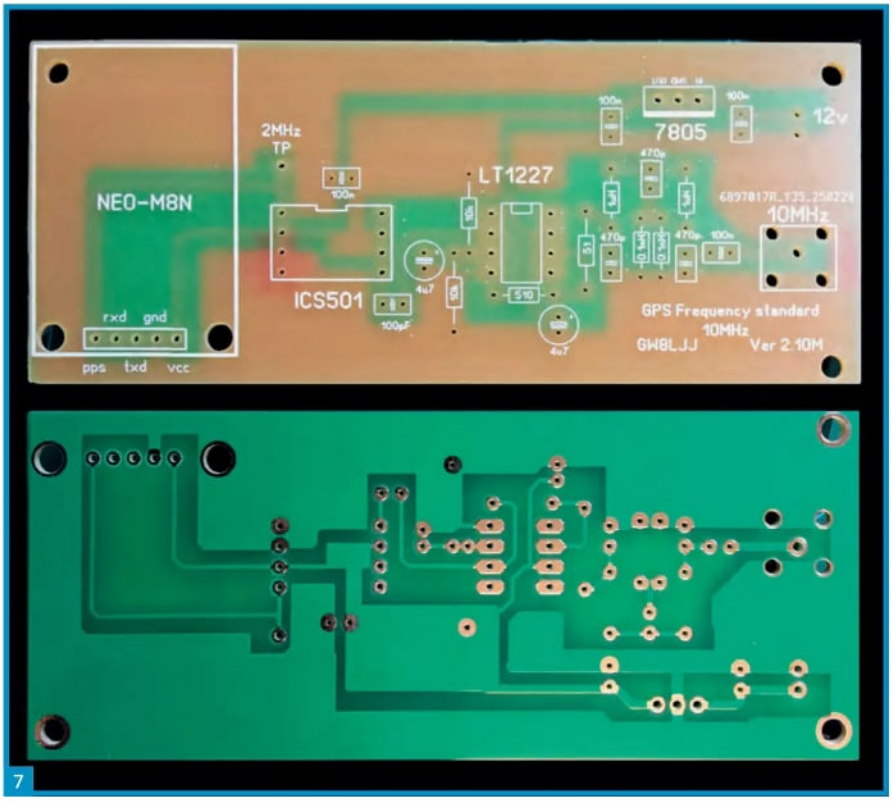

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Fig. 6: The populated PCB.
Fig. 7: The PCB itself.

Parts list for the V2.10M GPS Frequency Standard

PCB	Commercially made with silk screening	1
NEO-M8N	GPS module (programmed) NB: The one supplied has an on-board antenna, but an outside antenna is needed because the one attached has very limited capture. These were only available at the time of ordering.	1
ICS501	(SMD) fitted on a DIL adaptor board and tested.	1
LT1227	Op Amp (DIL)	1
7805	5V regulator (Observe fitting position)	1
100nF	Capacitor Multilayer Ceramic 2.54mm spacing	4
4.7µF	Electrolytic capacitor 2.54mm spacing	2
100pF	Disc capacitor 2.54mm spacing	1
51Ω	Resistor 0.25W 5%	1
10kΩ	Resistor 0.25W metal film 1%	2
510Ω	Resistor 0.25W metal film 1%	1
1µH	Inductor	2
0.1µH	Inductor (2 in parallel to provided 50nH approx)	2
470pF	Multilayer ceramic (471k). 2.54mm	3
8-way socket	IC socket for LT1227	1
Pins & Socket	Two pins for 12V supply and sockets for GPS and ICS501 modules	Set
Heatsink	Used for 7805 regulator	1
BNC	PCB mount socket	1
Stand offs	12mm male/female metal standoffs with screws and nuts	2

A 'picking list' will be supplied upon request with all parts priced at the cost of the parts and input postage to me (no profit). An antenna will be needed (not supplied by me) and the connector on the antenna may need to be changed to an SMA plug if one is not fitted.

be soldered directly onto the PCB if preferred. A request is necessary for this at no cost.

This IC is the frequency multiplier to bring the 2MHz square-wave output (Fig. 5) from the GPS module to a 10MHz sinewave. This output is taken to an OpAmp (LT1227) chosen because it is a high frequency type normally used in video circuits. The gain has been set and the output impedance to 50Ω. The output at pin 6 is taken to a simple five-pole LPF to provide a clean 10MHz sinewave. The LPF may be considered overkill as the GPS will normally be used as a direct connection to a counter, transceiver or other device that needs a calibrated reference.

Do it yourself!

If you want to put in your own frequencies and build it up on your own PCB, or perhaps obtain the PCB from me and any other parts but do the rest yourself, you will need to download the main u-blox for communicating to the GPS module to be able to put in the required frequencies. Email me for the complete details if required. I can also supply the PCB Gerber ZIP file if you want to make your own PCB.

Is there a kit?

A full kit of parts which includes the PCB and all the parts that are to be fitted is available.

Construction

The PCB (**Fig. 7**) has a copper groundplane and the components leads are quite close to it; care has to be taken not to have any solder bridges. This should not be a problem to those with average soldering experience, but it will be prudent to check for any solder bridges before applying the 12V. **PW**

References

- GPS module: Datasheet U-blox 8 GNSS modules.
- ICS501 multiplier IC: Datasheet.
- LT1227 OpAmp: Datasheet

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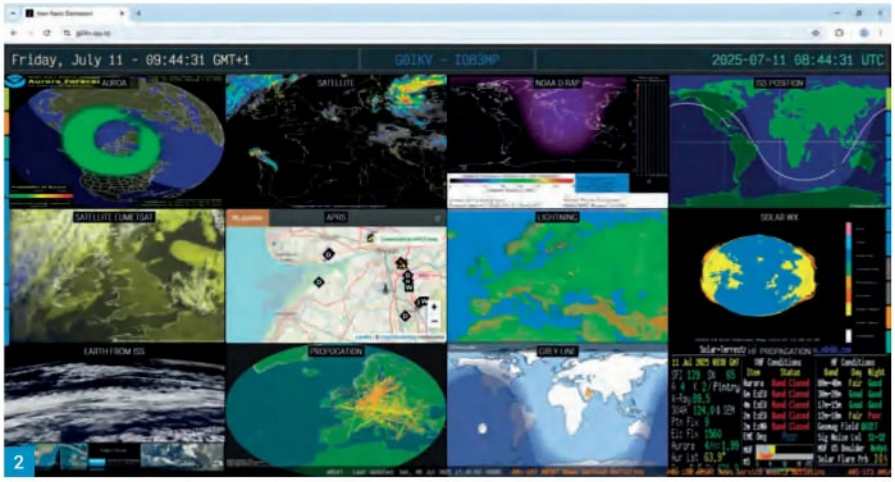
HamDashboard

David Southworth G0IKV introduces readers to a practical web tool for UK radio amateurs.



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As UK amateurs, there is no shortage of tools and resources to support our hobby. There is always that temptation to add an extra gadget, and I was looking for a clock or dashboard, but rather than another Raspberry Pi or device with another plug in PSU I wanted to see what was online, and that's where HamDashboard comes in, a lightweight, web-based dashboard that provides at-a-glance information for the active amateur.

Originally developed by Canadian amateur VA3HDL, HamDashboard has become a well-regarded tool in North America, particularly among EMCOMM (US RAYNET equivalent) groups and field operators. It's open source, actively maintained, and refreshingly easy to use. I've now adapted the project specifically for UK use, with local data sources, weather feeds, and content relevant for the UK.

What is HamDashboard?

HamDashboard is a single web page that pulls live amateur radio-related data. It can include:

- Real-time APRS maps
- Solar and space weather conditions
- HF and VHF propagation forecasts
- Local weather updates
- A greyline map, moon data, and more

All of this is displayed on one clean, customisable screen. Because it runs entirely in the browser using just three small files, you can host it locally, put it online, or you can access my version here:
https://g0ikv.qsy.to

A UK-focused version

The original version by VA3HDL is geared towards North American operators, with default weather, maps, and data feeds aligned accordingly. I've updated the configuration to better suit the UK:

- APRS
- Weather Maps
- Lightning Data

There are plenty of ways to customise the dashboard by adding new sources or swapping out panels. The main view uses iframes to display external content, but not all websites can be embedded in this way. To check if a site will work, you can use a tool such as:
https://iframetester.com

Even if a site can't be embedded, you can still link to it using the side buttons, which can be customised with your own shortcuts or resources.

No setup required—just use the online version

If you don't fancy downloading or editing anything, the simplest way to get started is just to visit:
https://g0ikv.qsy.to

You can even personalise by entering your callsign and preferences, and they'll be saved locally in your browser for the next visit. No accounts, adverts or tracking.

Photo 1: The setup screen.
Photo 2: HamDashboard screen.

Prefer to experiment? Run it locally.

For those who prefer to host things themselves, it's as easy as:

1. Download the files from:
https://github.com/VA3HDL/hamdashboard
2. Unzip the folder and open index.html in your browser.
3. Customise config.js if you want to fine-tune the layout or sources.

You don't need to be a programmer; just basic editing of a text file is enough. You can download my UK configuration as an easy starting point, from my page just click the bottom right 'Sources' button.

Using

Because it's browser-based, it runs on almost anything - desktop, tablet, even a smart TV. It's at its best on a larger screen.

Contributing and credits

Full credit goes to VA3HDL for developing and maintaining this project. It's a fine example of open-source amateur innovation, and **Pablo** has been very supportive in the true amateur spirit.

Final thoughts

We're fortunate in amateur radio to have a global community sharing ideas and tools. HamDashboard is a great example of that - flexible, practical, and adaptable. I hope this UK-focused version proves useful.

If you give it a go, do let me know how you get on, or how you'd improve it. **PW**

John Rowlands MW1CFN
practicalwireless@warnersgroup.co.uk

Marconi: The Early Russian Experiments

John Rowlands MW1CFN raids the Marconi archives for an insight into some interesting experiments in Russia.

On 12 December 1901, **Guglielmo Marconi** claimed that, while he was positioned in St. John's, Newfoundland, he successfully received the Morse letter 'S' sent from Poldhu, Cornwall on several occasions during transatlantic signalling tests. For his receiving apparatus, Marconi used a kite from which to suspend his wire antenna.

Three years later, during mid-1904, the Russian government expressed an interest in using Marconi's nascent wireless technology. Russia's own wireless pioneer, **Alexandr Popov**, had by this time been working with the Imperial Navy for the best part of a decade, successfully developing ship-to-shore communication over distances of at least several tens of kilometres. But Popov was effectively sidelined in Russia, no doubt by Marconi's chutzpah in advancing his own, patented communication system which, a decade later, was being deployed across Russia and the world.

Experiments were arranged in Russia, supervised by the military, using balloons sometimes backed up by kites to suspend the wire antennas. The deployment scenario anticipated by the experiments is not clear; while 'field stations' are mentioned on a couple of occasions, the report's conclusion instead mentions 'permanent' antenna support. In the absence of masts, expensive and difficult to erect, or suitable mountain landscapes, which were limited, large wire antennas, especially for temporary military stations of any duration, could only be elevated by means of balloons or kites at the time.

My recent examination and translation of a small number of Russian-language documents in the Bodleian Marconi Archive allows us to piece together how the experiments were conducted – and whether or not they were successful.

Russian wireless experiments

The wireless experiments, in which Marconi himself seems to have taken no part, took place between Volkovskaya field, St. Petersburg – an area that hosts an enormous Lutheran cemetery – where the Marconi spark-gap transmitter was sited and a receiver at Narva, then in Imperial Russia (now in Estonia). The distance between the two sites was a mere 130 versta (Russian: верста), a then common Russian measurement unit, equivalent to 1.067km; not a great separation, given the earlier transatlantic success, though for that, a ~13kW transmitter had been used. Transmitters in use for the Russian experiments were more aimed at semi-transportable deployment and so were likely to have been relatively low power units; sadly, there is no record of the actual power used.

St. Petersburg was itself an important location, where the Russian Royal Family had their palace

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estate of Tsarskoye Selo, later equipped with its own, little-known wireless station that seems, from other Marconi archive documents, to have been a favoured receiver of test transmissions from the Carnarvon VLF station in north Wales, even during the developing Russian Revolution of 1917.

St Petersburg was also an important military base and had a military balloon school ('Aeronautical Park'), established in 1885, where convenient supplies of good-quality material and personnel skilled in its deployment were available for the wireless experiments.

Balloons of the time could have been of cotton, silk or 'goldbeater's skin', the outer membrane of a (typically) cow's intestine. It is not presently known which of these was used for the wireless experiment balloons.

Balloons were then commonly inflated with hot air, hydrogen gas, coal gas, ammonia or steam. For the Russian wireless experiments steam, fed by pipe from storage vessels, was used to fill balloon envelopes that were typically 100-125m^3 in capacity (~6m in diameter, assuming a largely spherical balloon, which was usually the case), with occasional use of much larger envelopes up to 700m^3 (~11m in diameter). The balloons were tethered by means of net-like rigging surrounding the envelope and then, fully aware of the possible adverse effect of using wire cable, by hemp rope to the ground.

Station configuration

Thanks to sketches drawn on the experiments' report document, we can know with certainty how the elevation and antenna systems were put together. The antenna was a vertical wire with a symmetrical capacity hat – a form of T antenna.

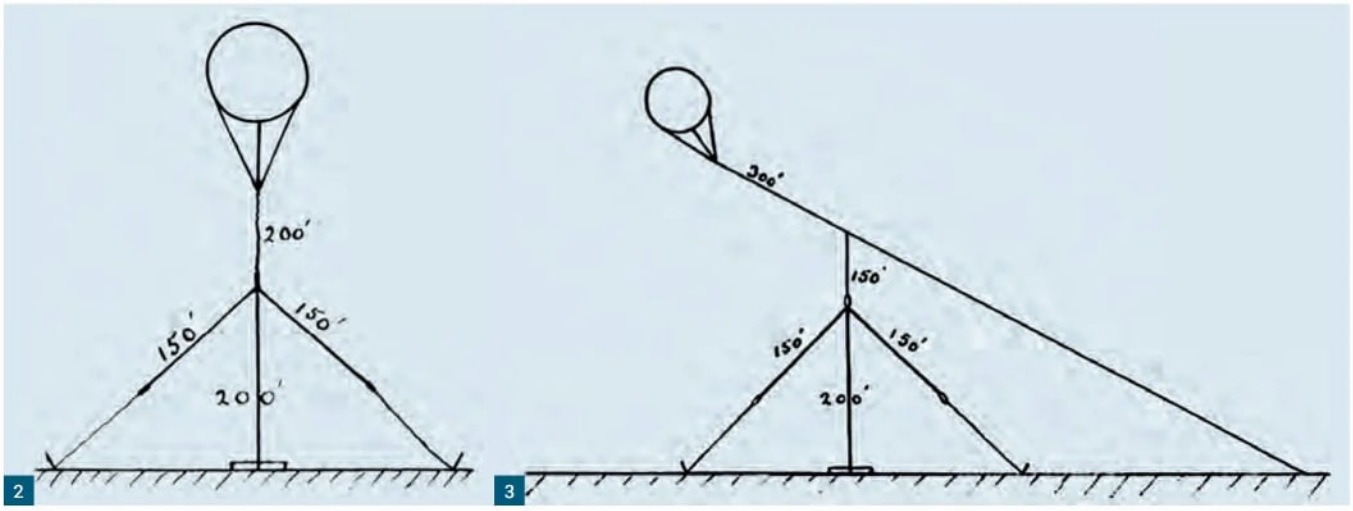
The ground connection for the antenna was by means of an 'earth mesh' that included zinc plates of '3 x 6' dimension; the units are not stated but could have been either English inches or vershki, 1 vershok being equivalent to 1.75 inches, so a potential plate dimension of up to approximately 13 x 27cm.

25 of these plates were laboriously installed radially around the base position of the antenna by 17 men hand-digging over seven hours into 'very gravelly' earth with the 'flagstone' (bedrock) lying only 'a foot' (likely the English unit) under the surface, making for very poor RF ground conditions! The plates were connected by wire to a central connection. RF ground conditions at St. Petersburg, infamously built on a former estuarine marsh - 100,000 serf workers are estimated to have died in its construction - would have been considerably better, even 200 years after its draining.

The overall dimension of the ground system was not recorded but the sketch shows the ground wires connecting to the zinc plates (which may have been zinc-plated sheets of thin steel, as are known to have been used in Marconi's later commercial stations) were short and, scaling from the drawing, formed an approximately 30 foot (9m) radius.

Marconi obtained his 'four-sevens' (number 7777) patent for 'syntonic' (tuned) wireless in 1900, but used non-tuned apparatus for his 1901 transatlantic experiments after abandoning a tuned system he had tried first - a change that, serendipitously, likely allowed him to hear higher-frequency emissions. It is not known whether a tuned system, then still fairly crude in its ability, was used for the 1904 Russian experiment; a note of interference with reception from a station nearby in Narva when St. Petersburg reduced its output power is briefly mentioned in the report. The antenna dimensions can naively be taken to indicate a frequency in the MF range, from around 150kHz to a few hundred kHz.

Marconi himself was inconsistent over the years in reporting the frequency he used for his 1901 transatlantic experiments, with modern efforts to analyse the Poldhu antenna arriving at similarly



wide values between ~450kHz and 820kHz, though the signal heard by Marconi may well have been emission above 2MHz, according to at least one modern researcher.

The overall arrangement for the Russian experiments was much the same as that used for the 1901 transatlantic messaging in their use of balloons and kites to lift a wire antenna, as was the general MF frequency in use.

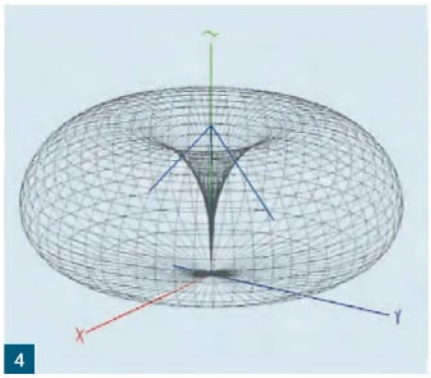
The report details that the transmitter (known as the 'simple Marconiev system' in Russia) used a spark gap of 60mm, supplied by two coils with 16 accumulators. The solar cycle was around halfway towards a maximum at this time. Communication at this frequency would, at any stage of the solar cycle, be a challenge and certainly during the midsummer daytime, which is when these cobwebs of tangle-prone ropes and wires were necessarily deployed.

Results

And this is indeed what the experiments found. Just as for the 1901 transatlantic experiment, the lifting balloons themselves were buffeted by disruptively gusty winds. Maintaining a steady flow of steam to keep them aloft seems to have been the biggest headache, taking a good part of the day to obtain a stable lift and then only for a couple of hours. On a later attempt three kites were connected in series in an abortive attempt to lift the antenna, despite a good wind. The addition of a fourth kite led only to the line breaking!

The use of the larger, 700m^3 balloon seems to have improved matters by 2 July, the balloon being kept aloft for over six hours and signals from St. Petersburg being heard in the 'detector telephone' (headset) between 7:45pm and 9pm. Signal strengths were sufficiently good to successfully receive Morse by tape machine.

On a subsequent day, a thunderstorm caused trouble as the whole antenna-lifting system tended to lie close to the ground owing to very strong winds and the conditions, of course anyway, very poor – not to say dangerous – for listening-out



for weak radio signals! The following morning, at 07:40, 'a 50mm spark gap, two coils and ten accumulators' were used to send from Narva and the signal – or some hint of it – was heard in St. Petersburg. A Morse tape ('inker') machine was brought into service for this extended test, but the signals were weak and the message badly corrupted as a result.

Another problem evident from the tests was the instability in the transmitters themselves, though at times, later in the tests, all became stable such that a complete telegram message, apparently from a firm of lawyers, was successfully received at Narva and transmitted back to St. Petersburg. Though further testing during the onset of heavy rain successfully passed another telegram to and fro, signals were eventually lost. It was noted that the 'insulation of the antenna' and the spark itself appeared normal during the rain.

From all this came the conclusion of the Russian military supervisors that *"communication with Marconi field station instruments using appropriate networks and receiving transformers is, generally speaking, possible over a distance greater than 30 miles"*. From 22.5 hours of antenna lifting, commencement of wireless tests was only possible for 13 hours in total. It should be noted that Popov had successfully achieved a reliable communication distance, using his independently-developed system, of at least 30 miles by January 1900 in the wider efforts to free the grounded

Fig. 1: Alexandr Popov, who developed wireless apparatus entirely independently of Marconi at almost exactly the same time. Popov is acknowledged to have been the first to use distinct antennas for transmission and reception. A fair assessment might conclude Popov and Marconi were both the 'fathers' of wireless communication.
Fig. 2: Balloon-lifted receiving antenna used at Narva for reception from St. Petersburg. This was a second iteration, the balloon and its rigging being more widely-separated from the antenna. Original 1904 sketch in Oxford Bodleian Special Collections, Marconi Archive document MS.Marconi.197, item 20.
Fig. 3: Original sketch of the antenna and lifting arrangements at St. Petersburg. MS.Marconi.197, item 20.
Fig. 4: MMANA-GAL modelled radiation pattern, dominated by vertically-polarised radiation, for the balloon-raised sloping T antenna at 800kHz. Peak gain is approximately 1.3dBi at an elevation of 28°.

Russian coastal battleship, *General-Admiral Apraksin*.

The staff responsible for the tests – **Captain Leontyev, Staff Captain Sokoltsov, Staff Captain Przhevalinsky** and the representative of the Marconi Company, **Vladimir Ottomarovich Baranov** – finished their report with the inevitable words: *"As the experiments described here have shown, balloons and even the tried-and-tested kites are not suitable as a permanent means of lifting the antenna and can serve this purpose only under favourable mereological conditions. As for the kites, with the weight of the entire antenna rig being about 1 pood (16.4kg), they should be considered completely unsuitable for lifting it"*.

And that is where the account ends. For the moment, interrogating archives, whether remotely or in person, to learn more about experiments like this and the subsequent deployment of wireless across that vast country is, sadly, impossible. **PW**

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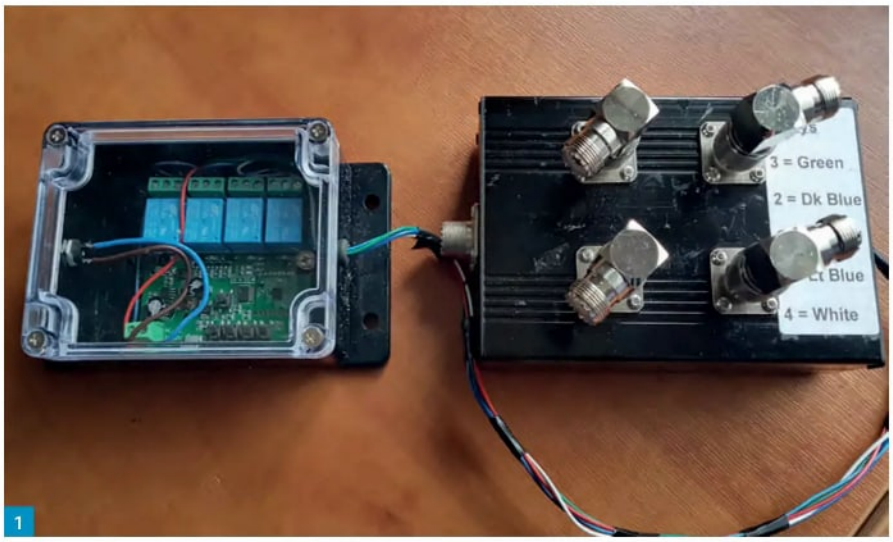

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One transceiver and multiple aerials

Terry Genes G4POP describes a 4 Way Remote aerial switch for transmit or receive aerials.

I enjoy experimenting with aerials and often have two or three on test, but I already have three coaxial cables passing through the shack (bedroom) wall (one for my VHF/UHF collinear on the chimney, one for my 'Wellgood' receive loop and just one for HF). I really did not want to drill more holes in the wall, so perhaps a remote switch was the answer?

On exploring the internet, I discovered, to my horror, the price for a 4-way remote switch to be a few hundred pounds.

At this point AliExpress came to the rescue as they had both a relay operated 4-way coax switch and a Wi-Fi module which with a bit of ingenuity I could utilise and for a very moderate cost.

My junk box provided a redundant metal case left over from my Hermes Lite 2 transceiver when I fitted it to a 55mm case and for a few pounds I purchased a plastic waterproof enclosure for the Wi-Fi unit from Amazon. The remaining plugs and sockets were already in stock.

Total cost to me was about £40.00 but if all the parts had to be purchased, I think it could be built for approximately £55.00, far better than £400.00 plus for a commercial one.

COAX switch 1.5kW - £22.00

There are several choices of this board according to the additional parts the builder may require, I purchased the PC board with mounted relays and diodes.

https://tinyurl.com/y689ctyc

Wi-Fi relay module £10.00

This pre-assembled module is programmed and ready for use and only required connecting to the relay board and power.

https://tinyurl.com/yc7c66th

Wiring

Be careful about polarity of the power wiring. The diagrams for both boards are not very well identified, so be aware that Common is Positive (+) on the relay board and the inner connection of the Wi-Fi board is also Positive (+).

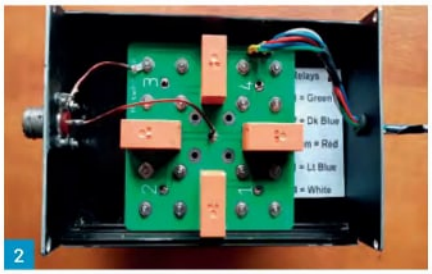
Connections from the COAX relay board are to the 'normally open' (NO) connection on the Wi-Fi relays.

Software

Using the eWelink software (URL below) with its 'Keyboard shortcuts' app it's possible to configure each aerial to a switch and control it from any smartphone or computer and keyboard shortcuts.

https://ewelink.cc

I have four aerials activated by 'Alt' + 1, 2, 3 & 4 on my keyboard with the interlink function turned on. As an aerial is selected the last activated is turned off.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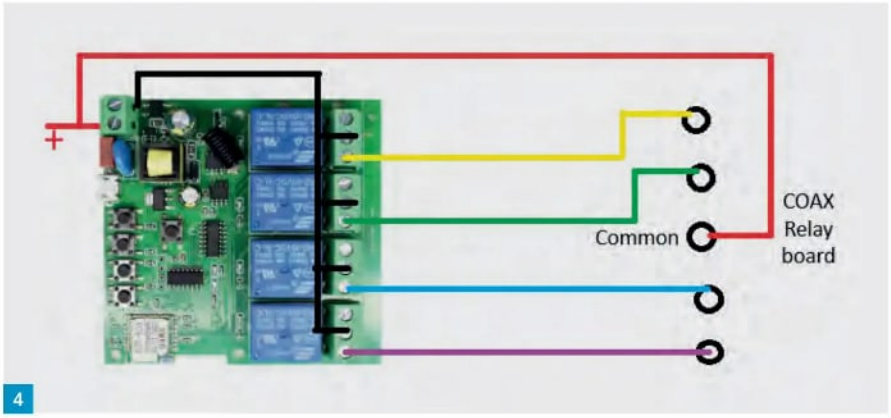

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Finally

The range of the Wi-Fi connection is well over 100ft and control can be by any smartphone, PC or tablet equipped with Wi-Fi. The coax switch is rated at 1.5kW, but I was not able to test that claim as I never run more than 100 watts.

This could be used to switch between four directional aerials such as Beverages N, E, S & W.

By the way, my log page (plug!) is at:

www.log4om.com

A nice weekend project that has made my setup tidier and more controllable. **PW**

Fig. 1: The completed unit. Fig. 2: The coax unit. Fig. 3: The Wi-Fi unit. Fig. 4: Wiring.

Tim Kirby GW4VXE
gw4vxe@icloud.com

What do you think of the Es season so far?

What with summer Es and tropo, **Tim Kirby GW4VXE** has plenty to report.

I suspect some readers, brought up, like me, on the sketches of Morecambe and Wise might be tempted to reply with a one word answer, 'rubbish'!

Of course, it's never that simple. If you miss the openings, which after all, can be pretty fleeting, then you tend to surmise that it's been a poor Es season and on the other hand, if you manage to catch some openings and make some contacts, then you tend to have a more positive view of things.

Generally, I think there's a sense that the Es season started later this year and has been of poorer quality. On 6m there has been a fair amount of single-hop Es around Europe, which has provided a fair amount of interest if you're interested in those sorts of contacts (always enjoyable to me). Again, on 6m there have been fewer long-haul openings around the Summer Solstice to the West Coast of the USA or Japan. That's not to say there haven't been ANY openings, there just haven't been as many as say, two or three years ago.

On 2m there have been one or two good lengthy openings which actually were quite special and unusual. There have been a couple of notable Chordal Es openings which are by any accounts unusual. **Paul Pasquet G4RRA** who has been consistently active over the years singled out the Chordal Es opening into Russia to being one of the best chordal Es openings he'd seen in 35 years (in that time, Paul thought he had seen around five chordal hop openings). Perhaps though, the excitement on 2m was confined to quite a short season (hopefully I'm wrong and by the time you read this, there will have been a series of excellent openings during July!). Certainly, at the moment it seems that 2m openings have died off.

It's interesting to consider why the Es seasons differ from year to year. I had always harboured a sense that Es seasons at Sunspot Maxima tended to be poorer. **Dave Butler G4ASR** writing on Facebook called that into question, suggesting it was an 'urban myth' (my words, not Dave's!).

I swapped some messages with **Dave Edwards G7RAU** who runs the 'Live MUF' system (URL below) and says that as a result of this, he has a lot of data relating to Es openings going back 30 years or so. Dave says that if he ever gets a chance to analyse the data, there might be some interesting conclusions to be drawn – but given the volume of data involved, it will take a lot of doing. For what it's worth, Dave felt that the previous three solar peaks had shown diminished Es activity, as a number of us do, but it's hard to prove it.

www.g7rau.co.uk

Urban myth or not, what do you think? I'll be happy to publish any thoughts you have. As I was writing this though, I thought about the positive correlation that the 2m 'chordal' openings had been noted this year. Pure chance, or something else?

Former collieries on the air

Andy Green 2E0GYI writes, *"I thought I would write in that I took part in the Former Collieries on the air 2m event on the evening of 18 June 18:00 to 21:00 local time. I activated the former Dodworth Colliery near Barnsley and was able to make use of the height of the former spoil heap which has been landscaped with trees and grassland. I used a Quansheng UV-K5 and a Baofeng UV-5R with their rubber duck aerials. My contacts included **Andrew 2E0SEL** at Emley Moor Colliery and **Paul G4CLJ** near to Lofthouse Colliery Wakefield although he wasn't actually at the site. A few other contacts were made. Not a busy evening but with the weather being nice and sunny it was a pleasure to be out doing my first official portable activation".*

Fig. 1: Dave G4FRE operating as GX0FRE/P from the Isles of Scilly. Dave isn't hiding – it was so that he could see the screen on his laptop!

Aircraft scatter

Jef VanRaepenbusch ON8NT has been enjoying learning about the mode and recommends a YouTube video from **John G3XDY** (URL below) which covers how to use the Airscout program to identify the size and position of suitably placed aircraft. Jef also mentions some notes from **Ian GM3SEK** (second link) on how to link Airscout and the program wtKST which is a simple user interface to the ON4KST online chats. Jef says it's a learning process using those applications to make contacts and he definitely needs more practice!

www.youtube.com/watch?v=vj8ExlzLWJk
https://gm3sek.com/2020/01/31/wtkst-download

Radio astronomy

Jef also mentions a talk on 'An Introduction to Radio Astronomy' with **Bernard ON4CGX**.

Bernard explains some of the mysteries of the subject and talks about some experiments that you can do yourself using equipment you probably already have:
www.youtube.com/watch?v=3HnULYp2IFQ

The 6m band

Dave Robinson G4FRE operated from the Isles of Scilly as **GX0FRE** in early June, **Fig. 1**. Dave was running QRP to a wire dipole, but nevertheless gave some lucky people IN69, a grid square which is rare on most bands. On 1 June, Dave decoded stations from 5B, OD and 4X as well as some longer DX from CE, LU, CX and PY.

On 4 June Dave completed QSOs with ten stations in I, DL, PA, 9A and OE. To my shame, Dave could hear me at **GW4VXE** (Goodwick) but sadly, with the busy band, I could not hear Dave's QRP.

Jef ON8NT (Aalter) was very excited to have half a QSO with LU1WFU (FE64) on 15 June but unfortunately, the RR73 was not received. Jef could hear other LU stations but could not work them. Other highlights in Jef's log are 5B4AMX (KM65) on 1 June; CT3HF (IM12) on 2 June; NR2C (FN03), N4QS (EM56), K0TPP (EM48), K2DH (FN13), K8CX (EN91) and N8DX (EM79) on 3 June; S01WS (IL46) on 5 June; TA4ZES (KM66) on 6 June, EA8BS (IL18) on 11 June; EA8AE (IL18) on 13 June; CN2GS (IM85), EA8DOX (IL18) on 15 June; EK/RX3DPK (LN20) and TA7AZC (KN90) on 18 June; EA9QD (IM75) and UN3M (LO61) on 19 June; 7X2CY (JM26) on 24 June and EK/RX3DPK (LN20) on 30 June.

Phil Oakley G0BVD (Great Torrington) was happy to work some new squares over the month. Some of his more interesting contacts include CN2JA, NP4EI, KP4EIT and MJ/OP2D on 7 June and TA8AT and TA7AZC on 18 June.

Roger Lapthorn G3XBM (Cambridge) has been concentrating on using FT8 on the band using 5W to a big wheel and is getting some great results. Roger says he was spotted in South Korea on FT8! He's also been heard in the Caribbean and the USA with lots of openings around Europe and the Middle East

Ian Dowse G0DYW (Leighton Buzzard) mentions working some new squares in Turkey during the month with the highlights being 9K2HS (LL39) on 18 June and 9J2FI (KH43) on 10 July. Ian runs 130W to a 4-element beam at 10m.

Dave G7RAU (Lizard) feels the band has been disappointing but there have been a few openings to North and South America as well as to Japan and China, although fewer than normal. Dave mentions a big opening to HK/HC/PZ and the Caribbean on 3 June. The opening started early evening and was still going beyond midnight although by then not so many stations were active. Dave says that D2UY from Angola seems to be audible most days which


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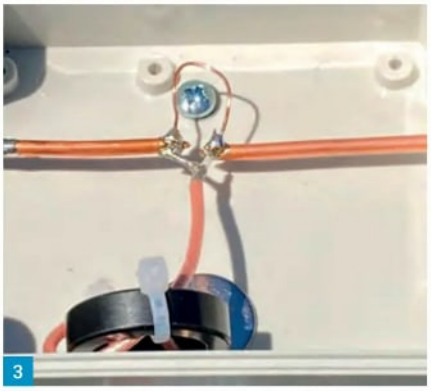
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Fig. 2: Steve G4ALG's 70cm portable station for the 70cm CW Friday sessions. Fig. 3: Hairpin match used by Steve G4ALG for his new 70cm Yagi. Fig. 4: SSTV received by Jef ON8NT from the UMKA-1 satellite.

is a surprise. Dave enjoyed operating with the Blacksheep contest group during the 50MHz Trophy and especially working into the Caribbean on CW and SSB.

Andy Adams GW0KZG (Pembrokeshire) has only been active on a few occasions but found the band open to CT, EA and ZB2YN on 24 June; NP4BM (FK68) and HB0/DL2SBY on 25 June; YO2LGK on 28 June and several Italian stations on 2 July.

The 4m band

Jef ON8NT runs 10W from an IC-7300 to a V-2000 tribander, tuned with the rig's internal ATU. Stations worked include SP8WW (KN19) on 1 June, 9A5M (JN95), EB7KA (IM86), EA6SX (JM19), LA6GKA (JO29) on 3 June; 9A6R (JN83), HA6ZB (KN07), LA9AKA (JP20), HA7TM (JN97), YO9IE (KN34) and SP9MQU (JO90) on 4 June and G4GFI (IO91) by tropo on 19 June.

The 2m band

Roger Greengrass EI8KN (Co Waterford) caught the start of an Es opening on 19 June and says he managed four stations before he had to go out for the day! IZ7AUH (JN80), IW7DEC (JN81), IZ7QVD (JN81) and SV8/OE2UKL.

Jef ON8NT lists stations over 400km and mentions G4LOH (IO70), M0GHZ/P (IO81) and G0LTG/P (IO81) on 3 June; IT9AHH (JM78) and IZ8WGU (JM88) on 4 June; DK1FG (JN59) on 6 June, HB9EFK (JN46) on 9 June and GW3TKH (IO81) and TM22REF (IN88) on 15 June.

It's great to hear from **Tim Hague M0AFJ** (Helston) who says he's finally got something to report after what he feels has been an unimpressive Es season! On 19 June, Tim caught a good opening to Italy and Croatia. The opening started around 0830UTC and lasted around an hour with some big signals. Tim worked the following: IW3GJF (JN55), IW2EQR (JN45), IW7DEC (JN81), I3FEX (JN55), 9A2RI (JN65), 9A2WA (JN83), IK3OBX (JN65), IZ3QFG (JN65) and 9A3ST (JN85). Tim says that he missed the SV8 just as the band closed. He worked F4VTP (JN14) and F6GRA (JN04) on tropo.

Tim took part in the June Backpackers contest from his portable site near Redruth in Cornwall and says that activity was dire! He made 33 QSOs in three hours although there was a little bit of DX around. Tim heard an HB9 at good strength but wasn't able to make the QSO with 20W. Before the contest Tim heard two HA stations but they had gone by the time the contest started! Tim's best DX was ON4EI/P at a distance of 680km.

Phil G0BVD worked GW4YCT/P and GW8OVZ/P during the Backpackers contest on 15 June.

Peter Atkins G4DOL (Dorset) says that it's his first year on 144MHz using FT8 (although I'd remind newer readers that Peter is a very experienced DX operator going back a fair few years!). Peter says he's caught some shorter

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openings on Es but also some interesting tropo contacts as well. Some of Peter's Es contacts include SP9EMF (JN99) on 4 June; 9H1TX (JM75) on 14 June; SV8/OE2UKL (KM08), IW7DEC (JN81), I2XAV (JN44) and IK4CBO (JN54) on 19 June. Also on 19 June, Peter found some good tropo to the south, working F4VTP (JN14), F6GRA (JN04), F1RHS (JN03), F6CIS (IM94), F4FMB (IN86) and F5PHW (IN87). On 22 June, Peter worked F5GHP (IN96), F5OYM (JN13), F4ILK (IN97) and F5HIJ (IN95), then on 30 June EA2XR (IN83), EA1NL (IN52) and EA1G (IN73); 1 July EA2DR (IN83), EA2BFM (IN83), EA1U (IN83), F6GPT (IN94), F4IVG (JN05), F4EEJ (IN95), F6HYF (IN86) and F4VTP (JN14) and finally on 5 July EA1IT (IN73) and F4EEJ/P (IN95).

Dave G7RAU found the band good to northern Spain on 18/19 June working an EA2 in IN91, although he'd left the rig on while he'd been at work and it had logged stations in IN70/IN71/IN72/IN82 with the propagation then moving east towards JN23/JN24/JN25/JN35. Dave managed to work 13 Italian stations in the I2/I4 areas although the band had been better earlier in the day. Dave also caught the end of the Es opening and worked 9A, E7 and YO. Dave says that the band was very good to EA8/CT9 in early July and he worked EA8CSB (IL18) who was using 10W to a vertical. While Dave was at work, his PC heard stations in IM12, IL18, IL27, IL28 and IL38 as well as CT stations in IN50, IN60 and IN61 along with lots of Spanish stations.

Ian Bontoft G4ELW (Bridgwater) says that at a recent club meeting in Taunton, they connected up an SDR to a cheap collinear and left it running monitoring 2m FT8. At the end of the evening, they checked what it had heard and as well as some local stations, they were astonished to see that it had received a signal from Italy (either meteor scatter or some Es, I expect). Ian says that he feels this shows what can be achieved with very limited setups, if you have a mind to try things out. At home, Ian worked EA2XR (IN83) and F6IFX (JN08) on 18 June and IW7DEC (JN81), IU0PVM (JN63) and IZ7QVD (JN81) on 19 June.

Steve Rawlings G4ALG (Lydney) says that his most recent portable activity on 2m was from the Forest of Dean in Gloucestershire for the Two Metre Tuesday CW activity on 8 July. Conditions were a bit above average and Steve was pleased to make eight QRP contacts using 5W to a home-made dual-band Yagi with four elements on 2m. Of the eight contacts six were two-way QRP, including G0DJA/P (JO03) at 239km, G3TYB/P (JO01) at 233km and G3YPZ at 210km.

The 70cm band

Jef ON8NT worked GW4HDF (IO81) on 11 June.

During the super tropo to the southwest in early July, Dave G7RAU worked EA8CSB who was using 10W to a vertical aerial.

Steve G4ALG went portable on 11 July, **Fig. 2**, and worked five stations: M0GSX, G3YPZ, G8EJN, G4RHR and M0BTZ. Steve writes, *"In June, I decided to start building a 12-element 'long Yagi' for the band* [**Fig. 3**]. *After trying unsuccessfully to get a good match with a folded dipole driven element, and then a straight dipole, I eventually settled on a slightly shortened dipole with a 'hairpin' match. By varying the length of a short loop of wire across the feedpoint, I found it easy to obtain a good match into 50Ω, as indicated on my Nano VNA H4 vector network analyser"*.

The 23cm band

Jef ON8NT heard the GB3MHZ/B beacon on 17 June and on 18 June worked G0JJG (JO02) on FT4 and F4HRD (JO00) on FT8. Jef uses 10W from his IC-9700 to a Wimo flat panel.

Dave G7RAU worked EA8CSB who was running 1W to a vertical aerial. Dave runs 50W to a 35-element Yagi on the band.

Steve G4ALG mentions that the next 1296 Alive activity period will be on 31 August between 1100 and 1400 UTC. There's a Facebook group for the activity at:
www.facebook.com/groups/3598227720309266

FM and DAB

Paul G8MAZ writes, *"A couple of friends and myself have been trying to decide which receiver to use for DX'ing DAB. Your contributor **Simon Evans**, July 25's FM and DAB column, suggests that he has the capability to select (tune to) a specific multiplex, '6A' in this case, and stream a particular station. Just what we want to do. Would Simon be willing to share information on the equipment he is using? Receiver, antenna etc"*.

Simon kindly replied as follows: *"In order to receive DAB DX I have a second hand RSP1A with a program called QIRX:*
https://qirx.softsyst.com

*"That's their website and the full version which I recommend allows you to install it on two PCs. It's written by a German guy called **Clem Schmitz**. The full version costs around 20 euros.*

"The DAB ensembles [5A to 13F] can be scanned individually, or continuously if you want to have it run over night. QIRX also has a map on which it displays the transmitter sites. Each transmitter has a unique TII code if you keep the QIRX database up to date.

"My 2m/70cm vertical happens to be a very good omni antenna for these frequencies. It's a Comet GP3M [still available from a dealer]. I also have a 5-element beam on a rotator which came from Blake UK:
www.blake-uk.com

"A DAB aerial for DXing needs to cover 174Mhz to 239Mhz. Not all do! The website Wohnort has comprehensive details about each countries DAB services.

"That's my setup but there is a Free version for DAB DXing which I haven't tried. called Abracadabra".

Simon received FM signals from Latvia, Lithuania and the Azores on 25 June. TVP Antenne 2 from the Azores is Simon's best DX at 2452km. On DAB, Simon has received the

new Irish DAB service, which is running on 5B and 7C, 5B comes from Mount Oriel and 7C from Three Rock Mountain. On 12 July, he was receiving some French DAB signals although he says it was nothing unusual.

Satellites

Jef ON8NT monitored the ISS schools contact on 9 June. On 27 and 28 June, Jef used the new UMKA-1 satellite to receive SSTV featuring children's drawings. Jef says this is much harder than decoding SSTV from the ISS because the transmit power is much lower, **Fig. 4**. Jef worked OZ3AEV (JO55) and PD5JOS (JO21) on FT4 using the RS-44 satellite.

From Arizona, **Patrick Stoddard WD9EWK** writes his usual interesting summary of satellite activity in North America. *"**Pierre VE3KTB** has been at the Eureka weather station in the Canadian Arctic, and has planned to work satellites as VY0ERC. Pierre received a 70cm preamplifier for the VY0ERC satellite station, but has had issues getting on the satellites. He should be up there until the end of July, so maybe we will hear from him on the satellites.*

*"**Tyler N5UC** (ex-WL7T, KL7TN, and K5TDN) paid a quick visit to grid EL58, at the mouth of the Mississippi River in Louisiana. EL58 is part of the 488 continental USA grids for the ARRL's Fred Fish Memorial Award on 6m, along with AMSAT's Gridmaster award for satellite operators. Tyler worked both 6m and satellites from there, and then went from Louisiana to northern Alaska operating from grid BQ30. Again, N5UC is working 6m and satellites up there.*

*"The last weekend of June (28-29 June) was the ARRL Field Day This year's event had a bonus - two ISS crew members working passes as NA1SS during Field Day. NASA astronauts **Nichole Ayers KJ5GWI** and **Jonny Kim KJ5HKP** took turns on the NA1SS microphone throughout the weekend. This was the first time NA1SS appeared in Field Day since 2022. ARISS reported that **Kjell Lindgren KO5MOS**, who was on the air during the 2022 ARRL Field Day and throughout his 6-month ISS tour, was helping Nichole and Jonny prepare to be on the radio for this year's Field Day.*

"I caught Nichole on the microphone Sunday (29 June) morning near the end of Field Day. Just before 1600UTC, the ISS was passing down the west coast of North America. I heard stations from Vancouver in Canada to central Mexico, along with stations throughout the western USA. Lots of stations were calling for NA1SS. I heard four stations work NA1SS, and then I had my opportunity to get through and make a contact. After my contact, nine other stations worked NA1SS before my LOS. You can hear the activity on that pass in this video":
https://youtu.be/7gBXLm5le_w

That's it for this month – thanks to everyone who has contributed. Please keep your emails coming. See you next month. **PW**


10

Further tweaks to a multiband HF dipole

Ken Ruiz ZB2MD offers a follow-up to the linked dipole in November 2024's PW.

Ken Ruiz ZB2MD
practicalwireless@warnersgroup.co.uk

Please refer to the antenna as described in *PW* Nov 2024 p22-24. Matters rarely stand still. I have continued the illustration numbering from the original article.

The linked dipole described there remains my principal antenna for 10 - 30m. For 40m I use an end-fed half-wave (EFHW), which only outperforms the multiband dipole on 40m itself. Looking at my 40m coverage using PSK reporter, it is very obvious my EFHW has the ability to project my signal over greater distances.

I am now loading the dipole for 30m differently than was described originally, terminating both dipole ends in a 4mm socket, see **Fig. 10**.

Rather than replace the outermost section of the dipole with a loaded segment for 30m, I instead add a suitable section which just hangs vertically from this socket as in **Fig. 11**. No part of the original dipole needs to be disturbed.

These coils weigh 40g each, and are held in place merely by the friction between the 4mm plug and socket, see **Fig. 12**. This manner of adding 30m is much quicker than replacing the outer section of the dipole.

The Meserve reference I gave for a website to determine the value of these loading coils was not so useful in this situation. The site suggested that, using a 50mm diameter plastic pipe, I should have a coil of 12 turns of 1.5mm dia wire.

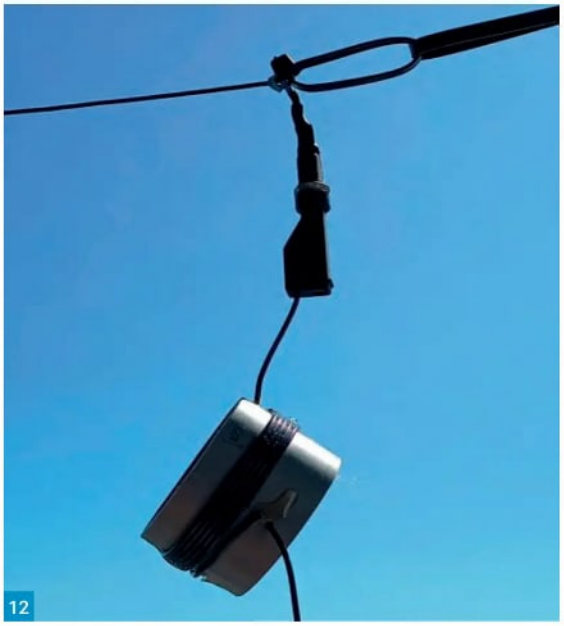
This caused the antenna to resonate at too low a frequency, and removing a turn at a time I ended up with each 30m loading coil of 6¾ turns. At my QTH these vertical ends are sitting inside a balcony end, with rebar less than a metre away from four sides of a cube. Much experimenting is required.

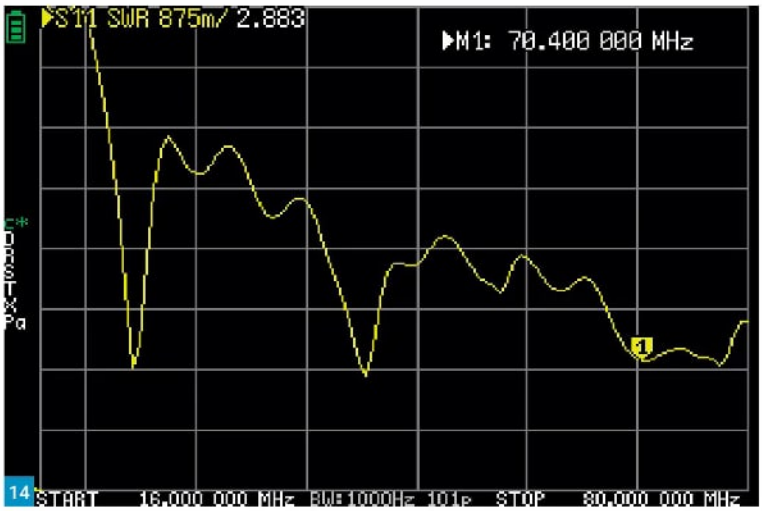
More bands - again!?

I cannot fathom why this had not occurred to me before. You may remember that a dipole for 40m can be used on 15m. A centre-fed dipole can be used on odd harmonics of the design half-wavelength frequency.

- Consider the 50MHz and 70MHz bands
- Divide the frequency by three - 16.67MHz and 23.33MHz
- The closest bands are 17m (18MHz) and 12m (24MHz) bands

To configure the linked dipole for the 12 and 17m bands, please refer to the original article. Note that the original dipole when working on 10, 15 or 20m is a standard centre-fed dipole, when





working on 12 or 17m it is a very-mildly off-centre fed dipole.

Figs 13 and **14** show SWR plots resulting from my nanoVNA. For ease of comparison, both (horizontal) frequency plots run from 16 to 80MHz, and the SWR scale (vertical) runs from 1 to 8.

In Fig. 13 we see the SWR response from the linked dipole set for the 17m (18MHz) band, and fed approx. 42% from one end.

- We see the first dip at 17.72 MHz, with an SWR of 1.9
- The next dip is at 34.56 MHz - 2.73
- The next dip is at 50.56 MHz - 2.88 - Spot on 6m!
- The next dip is at 68.48 MHz - 1.43

Note we are seeing resonances at odd AND even harmonics.

In Fig. 14 we see the SWR response from the linked dipole set for the 12m (24MHz) band, and fed approx. 40% from one end.

- We see the first dip at 24.3MHz, with an SWR of 2.83
- The next dip is at 45.44MHz - 2.65
- The next dip is at 70.44MHz - 2.88 - Spot on 4m!

No adjustment of the dipole arms was required, and in any case doing so would affect performance on all the HF bands. My Yaesu FT-710's built-in ATU easily tuned these to an SWR 1:1 on both 6 and 4m.

Fig. 10: Dipole end terminated by a 4mm socket. Fig. 11: One of two loading coils for 30m.
Fig. 12: One of two loading coils for 30m in place.
Fig 13: SWR plot, 16 – 80MHz with the linked dipole configured for 18MHz.
Fig 14: SWR plot, 16 – 80MHz with the linked dipole configured for 24MHz.

How reproducible these results are would require extensive testing in all manner of situations. My circumstances are unlikely to be generally representative, being on the eighth floor of a block of flats with the antenna sitting in the slot between the railings of my balcony and the underside of the balcony above.

Reading numerous sources on the Interweb suggests that a dipole used on the third harmonic of the design frequency has a six-lobed, almost omnidirectional radiation pattern. I have been using this for some weeks, and have been switching back and forth from the arrangement here and my dedicated 6m (flowerpot) antenna. So far, I cannot distinguish one antenna from the other. It would take loads of comparative testing, particularly on such a fickle band as 6m, to be able to derive any statistically meaningful conclusions. This is a hobby, not a thesis.

A similar experience on 4m, but with openings being fewer on this band I have not been able to make as many comparisons as on 6m.

I am not proposing this is a great solution for everyone, and I need no convincing that the performance on either band would be outperformed by a 9-ele Yagi. In my circumstances, changing from any HF band to either 6 or 4m previously meant swapping the feeder from the HF dipole, and connecting it to and hanging the 6 or 4m (flowerpot) dipole.

With this setup, moving from any band to any other is a question of making or breaking the relevant 4mm plug connections. It sounds as though it could be useful when operating portable too, with a simple, single light and inexpensive wire antenna covering all bands from 30 – 4m. **PW**

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SINAD

Dear Don,

Phil Moss describes a method of measuring SINAD based on measuring the whole-spectrum audio output of a receiver receiving RF with and without a modulating signal. I think this was the 'x db quieting' method, where x was often 20.

The methodology I covered is indeed not the same. It is more complicated because it takes account of the AF harmonic distortion resulting from the handling (de-modulating, filtering and amplifying) of the modulating AF. This is the 'and distortion' element of SINAD.

The broken via on my first board did not 'surface' anywhere else and I wasn't able to wire a link. On a single or even two-level board, I could have, but this board has four levels. I had a very good look, believe me!

And not guilty, say I, to the reference to SMA sockets. My short-lived sig gens had BNCs, but I'm sure that's the only RF connector I included in the text."

Tony Jones G7ETW
Southampton

Dear Don,

I must defend **Tony Jones'** SINAD article, after I read **Phil Moss's** letter. SINAD stands for Signal-to-Noise-and-Distortion ratio, as Tony said. To measure distortion your need a good filter which has at least a 40dB notch. With the correct bandwidth.

SINAD is closely related to the Total Harmonic Distortion plus Noise (THD+N) measurement. SINAD is essentially the inverse of THD+N, expressed in decibels (dB).

There are a few ways to measure receiver sensitivity:

Measuring on a Voltmeter scaled in dB's, connect to the audio out of the receiver with no RF signal, then increase the RF signal level until you get 20dB quieting.

Same setup with an AM modulated tone as 80% adjust the RF so you get 10dB difference between modulation on and modulation off (RAF did it this way on 243MHz guard receivers).

With the advent of narrowband FM, a better way had to be found. FM detectors are the noisiest of all, so all radio communication test sets used SINAD, Marconi 2955 R&S CMT 52 and 94. This knocks Tony's comment *"Nor have I seen this is professional equipment"* into a cocked hat!

Test sets also have weighted filters too, so you can measure SINAD to known standards. 300Hz to 3KHz filter is one of them and can be switched in or out.

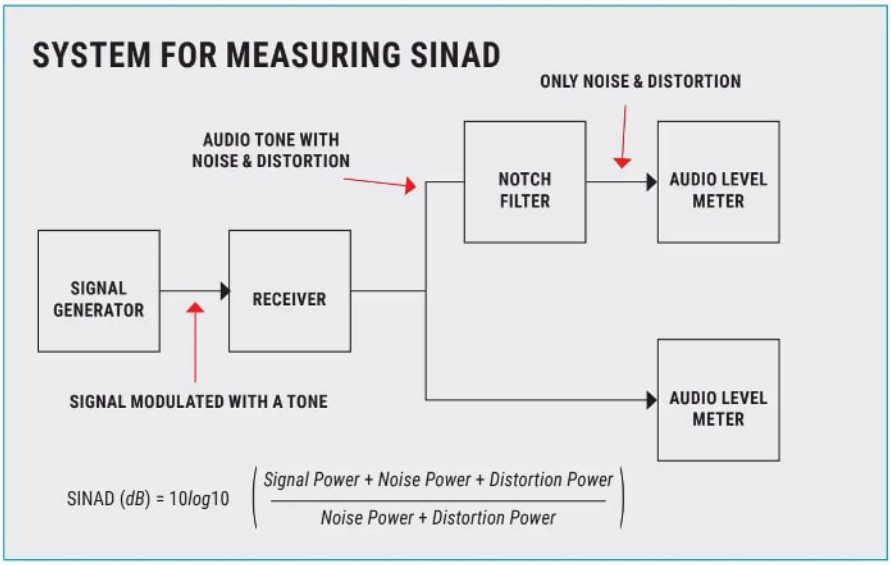
These test sets also allow you to have a wide filter to read off distortion, this is needed for optimising the match on IF crystal filters, you tune for minimal distortion. Typically, lest than 1%.

A ratio of 12dB on a SINAD meter is typically around the point you can clearly hear speech on a radio; all be it noisy!

My only criticism, Tony showed a kit that is no longer available, if we can get the Gerber files from **Paul Knox**, this would make a good construction project for *PW*.

Figs were found on the internet:

Andrew Lenton G8UUG
Torquay



The 'chain of causality' and Kraus: Antennas

Dear Don,

A few days ago I misplaced the AVO8, not to worry, I dug out the 34461A. It is probably OK as it agrees with the AVO8 but I cannot stand it 'whining on', it has a fan.... perching it on a mound next to the McMichael 471AC that is amusing me at the moment it is splendid for sorting out high value G2 resistors and leaky capacitors. I managed to actually listen to the wireless for a few minutes.... it struck me that the 'tone' was superb. That took me back to listening to Rabat in Morocco and enjoying the sounds. Then, there was the place where I heard my first radio amateur (on top band).

There was not a lot audible on Medium Wave. It strikes me that a channel or two might be spared for the amateur service because of the availability of little radios (MW only).

Then there is the matter of sound, some loudspeaker tutorials might help some people. Most of my knowledge came from **Olson**: *Elements of Acoustical Engineering* and one of my mentors used to be part of Tannoy. However, I compromise. One thing I have noted.... cardboard cones sound like cardboard and plastic cones sound much better and discussions about speakers can 'go nuclear'.

On another subject, the cardboard and foil Yagi has brought a smile to my face. After about a week I found the aside in **Kraus**: *Antennas* that I remembered, on page 238. The diameter of a rod functionally equal to the width of the strip is one half of the width of the strip. why mention this? I do not seem to recall strips being catered for in antenna simulator software. Not that it makes much difference, sometimes it helps to taper the

elements at the feedpoint so making the feed ends a bit 'pointy' might bring things closer to the simulation.

Every time I set eyes on a roll of aluminium foil it makes me think about pasting a loop to the wall....

By the way, the most fun I had was the three EF50 TRF in *PW*. Having some spare EF50s and a good junk box helped.

William Blankley G8CMK
St Leonards on Sea

(PS: a square tube of side = g, the radius of the equivalent tube is 0.59g (same source))

Receivers

Dear Don,

I have just read the letter from **Allan Murray** in the August issue of *PW* about receivers. Like Allan, I too do quite a lot of listening and also miss the *RadioUser* magazine.

I am also a member of the BDXC (British DX Club) who publish a monthly magazine. Whilst there aren't many technical articles in their magazine about antennas and such like, there is always a good round up of what's been happening on the shortwave and broadcast bands,

Perhaps Allan would like to have a look at their website if he hasn't already.

https://bdxc.org.uk

Chris Murphy M0HLS
Derby

On a Budget

Dear Don,

I was a little surprised to read the recent letter from **Kenneth May G4APB**, in the August edition, concerning my recent article in *On a Budget* regarding the build of an 80m CW transmitter, to the design of VK3YE.

Of course, we are all entitled to our opinions, including Kenneth, but here are a few reasons why readers might 'be bothered' to build it, which I hope will encourage others.

1. I don't see how a single band CW transmitter, that can cover the whole CW segment is 'too limited'. The use of a Crystal Resonator to provide such coverage is a huge advantage over equally simple crystal-controlled rigs. With QRP, frequency agility is a real advantage.

2. Simple transmitters, like this, are a key stepping stone in our learning. If we want to construct our own gear, and I know that there are plenty who do, including 16,000 members of the G-QRP Club, then starting with simple gear allows us to learn and develop. I was fortunate enough this year to win the G-QRP Club Construction competition with a homebrew ten-band HF transmitter, with a built-in battery and ATU for /P use, both also homebrew. I could NEVER have achieved this without first building simple projects such as the one featured as part of my personal development.

3. If our hobby is not to just be consigned to operating a commercial rig, then these sorts of projects are critical to start people on the construction journey, and to help them understand how their commercial gear works.

4. Cost. This is an article in a series entitled '*Amateur Radio on a Budget*.' I think a transmitter, that fits in a mint tin and is capable of many hundreds of contacts, yet costs about £10 to build is a good fit! Many people, old and young alike, face constrained budgets. Indeed, **Ray Howes'** letter in the same edition describes how he has resisted the temptation to splash £1,599 on the new Yaesu portable rig.

5. QRP is fun!

6. Simplicity is fun!

6. Construction is fun!

Finally, to Kenneth's comments about the designs of VK3YE and my reproduction of his circuit diagram. Kenneth questions its reliability, but as I said in the article, I built and use this rig quite frequently, making hundreds of contacts with it, so I can vouch for the circuit - that is reliable enough for me!

Daimon Tilley G4USI
Wiveliscombe

Daimon Tilley G4USI
practicalwireless@warnersgroup.co.uk

1

Re-visiting a classic: the Shimizu Denshi

Daimon Tilley G4USI revisits a rig that was first reviewed in PW in 1982 but still has its attractions.

In this month's *On a Budget* I have decided to re-visit a reasonably rare yet capable HF transceiver from the 1980's, the Shimizu Denshi SS-105S. I bought mine a couple of years ago from eBay for a bit less than £150 – and I absolutely love it, using it frequently.

Founded in 1972 by **Mr Minokamo Shimizu**, Shimizu Denshi is a corporation still in existence today, producing power transformers. Beginning in Japan, production later moved to China. For reasons I have not been able to ascertain, but perhaps Mr Shimizu was an amateur, they produced a limited number of amateur radio transceivers which were available part-built to be finished as a kit of parts and pre-assembled PCB's.

Versions

Two versions were made available, the SS-105S with 10W of RF output (**Photo 1**,) and the SS-105D, which, using an external supplied amplifier, provided 100W. The rigs are capable of SSB, CW and FM (with an optional board) and covered bands 500kHz wide, in the ranges beginning at 3.5MHz, 7MHz, 14MHz, 14.5MHz, 21MHz, 28MHz, 28.5MHz, 29MHz and 29.5MHz. Additionally, a crystal could be fitted to an AUX position on the band switch.

My version – the SS105-S – was the most common and provided 10W out on each band, drawing 3A at 13.5V. About the size of a shoe box, the rig weighs in at around 5kg, and a carry handle is fitted to one side, presumably for portable use.

The front panel is a lovely analogue design and contains controls for AF Gain, RF Gain, a Send / Receive Switch, RIT, Band change, Mode change, a Tune (Drive) control for both RX and TX power output, and switches for measuring either RF Power or ALC, a 25kHz crystal marker (optional) and a Power switch. Also on the front panel are a microphone socket, and headphone Jack.

On the rear panel are an SO-239 antenna socket, power supply port, jacks for key and external speaker (in addition to the built-in unit) and an on/off 'final mute' switch, which reduces RF power output to just 100mW for transverter use (see later.)

There are also sockets for taking the 10W output, feeding it into the external 100W amplifier and then putting the 100W back into the radio, through the Low Pass Filters, and back to the antenna socket. These two sockets are jumpered in my picture, just under the antenna socket. Beneath this jumper are phono sockets for a separate RX antenna, RF Output, and a connector labelled 'Remote' used for remote control of the external 100W PA or transverter. When these are not in use, then pins 8 and 9 must be shorted on the remote connector. The RF Output is used in conjunction with the 'Final Mute' switch. Turning this switch to 'OFF' places 100mW of RF output on the RF phono socket, intended to drive a transverter or similar.

No CW keyer is included, as is typical of this period, so I either use a straight key, or one of my Kanga external keyers. Sidetone and semi-break-in are available, however. Options available at the time included a 500Hz CW filter, a Noise Blanker, the Crystal Marker / calibrator, and two FM modules, one for RX and one for TX. The manual indicates that a hand microphone, a headset with microphone and an X-260 transverter for 50MHz and 144MHz, and an X-407 transverter for the 430MHz band, were also available. My own model has none of these options fitted. I make use of the excellent vintage Datong FL3 audio filter for CW filtering.

During my research I found that *PW* had reviewed the rig in the October 1982 edition. I remember this edition quite well, because it was the 50th anniversary edition and had a shiny gold cover (**Photo 2**). The magazine cost 85 pence then, and the review can be found on pages 53 to 56 and was written by **Geoff Arnold G3GSR**, the *PW* Editor at the time.

The manuals are available online, one covering operation and alignment, and the other covering assembly of the pre-populated PCB's. However, these are not an easy read and the circuit and block diagrams are cluttered. This is hindered by the component values being handwritten next to the symbols. I thought this may because the versions I found were copies of copies, but even Geoff Arnold commented on how poor the originals were.

As Geoff pointed out in 1982, the rig is a single-conversion transceiver, using a 9MHz IF and an LC-tuned VFO which covers 5 – 5.5MHz. Geoff points out that the 100W version was not available in the UK, but the internal Low Pass Filters (LPFs) were rated at 100W for the version that has the 100W amp mounted externally. Because of this, the power crazed among you could make use of this and fit a power amplifier in this manner, making use of the internal low pass filters, and this opens up the possibility of using cheap PA modules from China which often come without LPFs.

Rallies & Events

All information published here reflects the situation up to and including **27th July 2024**. 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**

5/6 September
NATIONAL HAMFEST
George Stephenson's Hall, Newark Showground, NG24 2NY. A limited number of camping pitches are being made available for those who wish to camp on the Newark Showground during the event.
www.nationalhamfest.org.uk/

24 August
TORBAY AMATEUR RADIO SOCIETY RALLY: Trade stands, Catering, Bring & Buy. Doors open 10am - Entry fee £3.00. Large level site with FREE Parking.

20 September
EAST MIDLANDS HAM AND ELECTRONICS RALLY: Beckingham Village Hall, Southfield Lane, Beckingham (nr. Gainsborough), DN10 4FX. Doors open 9.30am - 3pm. Hot food and refreshments available. Free car parking behind the hall, disabled parking near entrance.
Traders setup from 7am. Well-behaved dogs on a lead at all times please. More information and trader booking at:
www.emerg.uk/rally

5 October
50TH WELSH RADIO RALLY: Run by: Blackwood and District Amateur Radio Society (GW6GW), at Llanwern High School, Hartridge Farm Road, Newport, NP18 2YE. South Wales. Entry: Traders at 7:00am Public at 09:30am, Raffle 12:30, Admission £3.00. Trader, RSGB Books, Talks/Lectures, Bring and Buy, Refreshments,.
Michael Rackham GW4JKV
Tel: 07976368250, 01495 226149
welshradiorally@gmail.com

10 to 12 October
RSGB CONVENTION: Kents Hill Park, Milton Keynes.
https://rsgb.org

12 October
DARTMOOR RADIO CLUB RALLY : The Autumn Dartmoor Radio Club Rally will be held at The Yelverton War Memorial Hall, Meavy Lane, Yelverton. Devon, PL20 6AL on Sunday 12 October 2025. Free on-site Parking. There will be the usual Bring and Buy, Trader Stands and Refreshments available Doors open at 10:00hrs. Admission is £3.00. Contact Roger: Tel: 07854 088882, 2e0rph@gmail.com Always check the Club website before setting out:
www.dartmoorradioclub.uk

7 December
MID DEVON AMATEUR RADIO & ELECTRONICS FAIR: The 2025 Mid Devon Amateur Radio & Computer Fair will be held on Sunday 7 December at Winkleigh Sports & Recreation Centre from 09:00 – 13:00. Entry £3 per person, no charge for partners & under 16s. Easy access from the A3124, free parking, free WiFi, hot food and refreshments available.; A chance to pick up hard-to-find electronic components, two-way radio and computer hardware. **Traders please book ASAP**. NOTE - this year a maximum 4 tables per booking, we may remove the 4 table pre trader restriction after 1 October if the rally is not fully booked. Mains electricity available on request.
Phil G6DLJ 07990 563147
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https://rsgb.org/main/news/rallies

The skip zone etc

Dear Don,
Yes, as **Colin G6MXL** points out in his *HF Propagation* piece (August 2025), when in short trousers spinning the dial on my AR88, I too, often wondered why I could hear stations from 'Europe', but couldn't hear stations closer to home. A bit of research and a book or two later, the apparent mystery was solved. The skip zone was the culprit. And for some reason, I'd thought that radio waves couldn't propagate through water (and whether radio waves travelled forever in space). And as a consequence of reading a book my dad bought at a local charity shop (authored by a bloke named **Tesla** - I didn't have a clue who he was then), Mr Tesla appeared to be implying that radio waves could be 'harvested' to access free energy. My late dad thought that it was a great idea. Pointing out, that such a claim might lead *"to not having to pay any more electricity bills". "Just think of all the cash we could save",* he excitedly exclaimed. But sadly, 65 years later, my late dad's expectations have still not materialised. Everyone is still paying electricity bills. I also remember that Mr Tesla had mentioned zero-point energy. Again, I didn't have a clue what that was about either. Nor my dad. But I do now. On that subject, anyone one there heard about the 'Dean Drive'? An over-unify type device (invented by **Norman Lorimer Dean**). Dismissed at the time by the usual suspects as a non-starter, and described disingenuously as a 'fantasy drive'. The Dean Drive and other similar devices are rarely given credence mainly because they challenge the Conservation of Momentum dictum. Might such a machine unlock the 'space-drive' problem? Well, current rocket propellants ain't going to get us to infinity and back any time soon.

Back to Colin's article, line of sight propagation was a bit bewildering when back in my AR88 days too - finding out that a VHF signal can and does transverse an optical horizon. Once thinking that a VHF (or at UHF) radio wave once over the optical event horizon (more transmit power/dB naturally increases the event horizon), simply disappeared. It doesn't. It keeps on going and going, inversely proportional to distance. Unless ground absorption inevitably takes its toll.

And via more book reading, Meteor scatter, Tropo, Sporadic E and Auroral propagation widened my RF ambitions. But that didn't happen until I got a licence to cause some havoc here and there. You live and learn. By your mistakes. As for Solar flares and Sunspots, there is unfortunately, some misleading information about the predictability of Sunspots and their actual mechanisms. Ditto, Solar flares, with regard to what is colloquially known as 'space weather'. Space weather has more to do with coronal mass ejections than the popular oft-quoted solar flares as being the main protagonist. Plenty of evidence supports the fact that solar flares are not the primary cause of interplanetary geomagnetic storm disturbance that now and again causes power-grid outage mayhem here on our 'blue-dot'. It is the case that solar flares (CME's and solar flares are interrelated) play a minor, rather than a major role, in the causal event effects of Earth's space environment. And our planet's weather.

Be it because of space restrictions or whatever, it is both short sighted and plain wrong to decry those who are forced to hop aboard ham modes of the non-traditional kind to stay on-air. Why should someone give up something they love to do, when another alternative conduit in the ham radio hobby is wide open to them? Besides, as **Don** points out, ham radio offers a kaleidoscope of opportunity. If that has to mean internet type ham radio, digital voice, a home hotspot and so on, why not embrace it? The 'Old school amateurs' will always be with us. Those who are new school amateurs now, will one day, be

old school amateurs in the future.

Lastly, G1EXG's service history of an IC-706Mk IIG, might entice others to follow in **Jonathan's** footsteps, to become the beginnings of a new trend.

Ray Howes G4OWY/G6AUW
Weymouth

***(Editor's comment:** Thanks Ray. What always amazes me about propagation is how soon after the advent of radio (wireless!) we had mastered much of it, but we still can't manage to predict it day to day!)*

Home Repairs

Dear Don,

I have repaired hundreds of radios over the years, look me up G8UUG on qrz.com.

I do have a lot of test equipment and computers to help me. Even if I did not have £200k worth of equipment, I could still perform the repairs.

- You can buy a Tiny Spectrum Analyser which doubles up as an AM/FM signal generator for £60. So buy two.
- A good variable power supply £50
- Dummy load and Watt meter £150 for 1kW
- Surface mount workstation with hot air £180
- Good light and bench with head magnifying lenses.
- RF pick off so you do not blow your amp up
- SINAD meter on your PC

And you are all set up. What is missing is the Knowhow, as few amateurs build much nowadays. I could write an article or two on fault finding and setting up a repair work bench.

Andrew Lenton G8UUG
Torquay

Cheap Radio Gear

Dear Don,

Alan G3XOI in the May issue mentions a Codar AT5 as a cheap way into radio. I don't think one could be made at a profitable price and who only wants 160 and 80m these days, plus it's AM. There is a cheap way by doing what I do, buy the stuff other people walk past if you are prepared for tatty gear and have to work on it.

For instance, I recently bought five Pye Bantams for £6. Luckily one already xtalled for 70.26MHz tx and rx and one a tx xtal on 144.450MHz. Convert one as I did in the 1980 *PW* with my circuit details how to get it on 70.260MHz from the original 83MHz.

My Wireless 19 Set, tatty, very modified for £105 with much work needed as featured in the 2017 *PW*. I later made mine plug-in xtals for stability on tx and easy to find the QRP frequencies. I don't want to drift into another QSO. 2 Watts out.

Years before that an unknown tx the dealer thought was 160 and 80m. I paid £5, it turned out to be a T.W. TopBander. Tatty and a modulation problem.

Buy a cheap valve and build a one valve tx, I have a BT61 out of a non-working oscilloscope I was given, I have xtals for 5.262MHz and 7.030MHz.

Or get a Pixie. Mine is on 5.262MHz, 350 milliwatts out and I had a few QSOs with one at 180 miles and a SWL report from Utrecht at 220 miles for that contact.

We have supposedly done the radio exam to learn about the inner workings of radio so put that new knowledge to good use. Build, convert, modify!

Bill Kitchen G4GHB
Ashton-Under-Lyne

Radio in old age

Dear Don,

A word of encouragement. I hope? For **Allan Murray** and others of any age.

I was in a similar position aged 74 and not academically inclined. I used The Lockdown to gain my Foundation Licence through **Pete** and his team at Essex Ham.

At 76 I got my Intermediate Licence with the help of **Steve Hartley** and his team at Bath Distant Learning and **James** and **Barry** at WVARS (my local club).

Help is readily available.

Dave Blencowe 2E0INJ
Kelmarsh

***(Editor's comment:** Congratulations on your achievement Dave - and, yes, there is a lot of help out there. The Essex and Bath courses, especially, are excellent.)*

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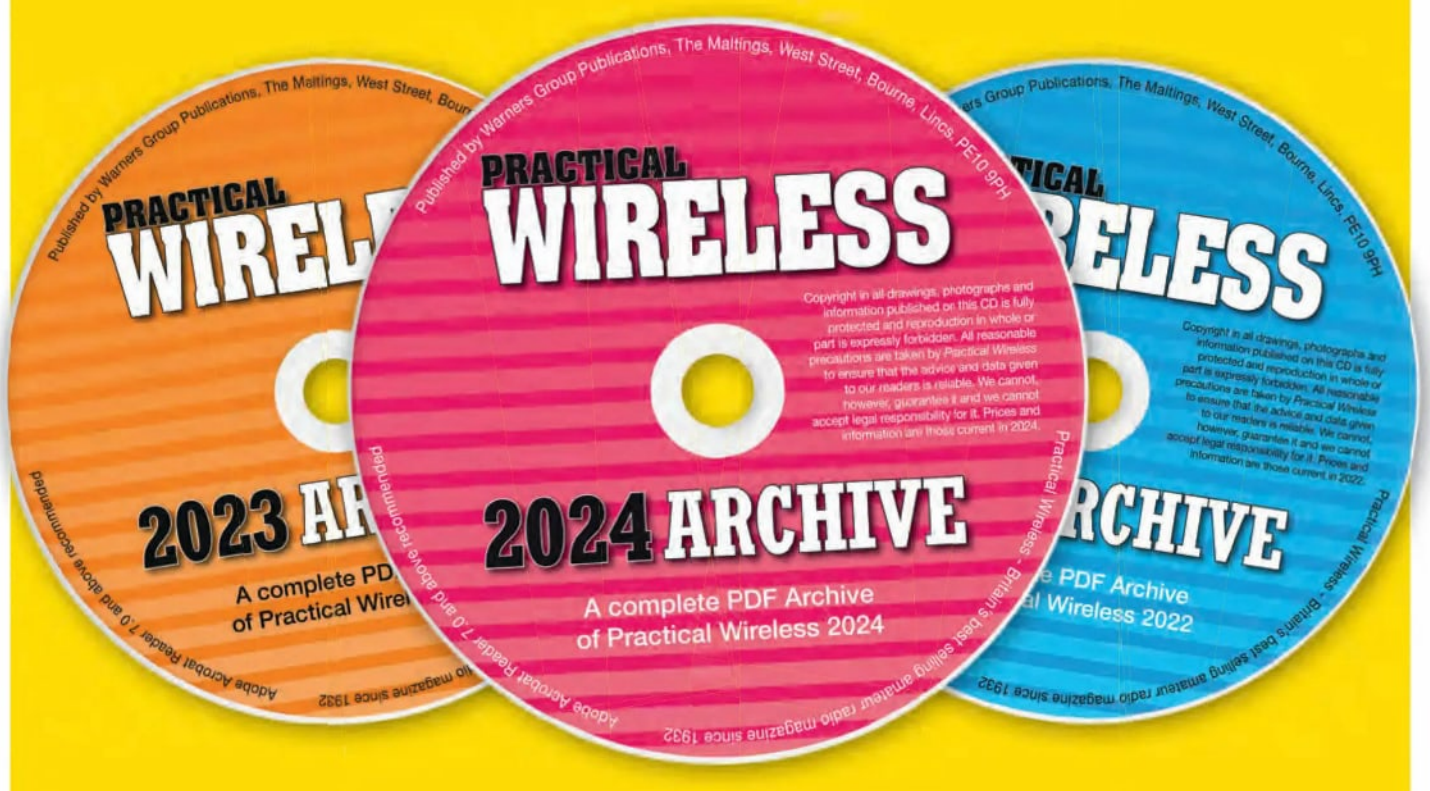

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