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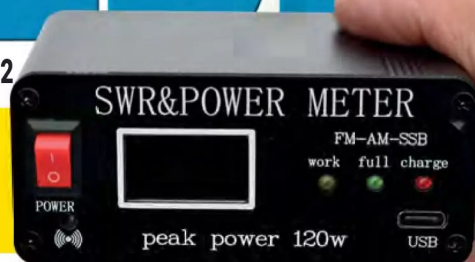
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JULY 2023

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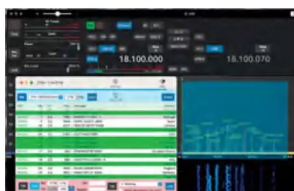


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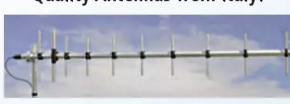
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Keylines

As well as enjoying the start of the Sporadic E season on the 6m band, I've recently given a talk to the Mid-Somerset Amateur Radio Club and also attended the CDXC (The UK DX Foundation) AGM and Convention in Loughborough. This is always an enjoyable event, and especially so this year when we had in-person presentations by **Ken LA7GIA** of the recent Bouvet Island DXpedition and **Lubo OM5ZW** from the 3B7M team. There is more on our News pages.

Using a RIB

One of the big topics during the open discussion at the CDXC Convention was the use of RIBs. See 'A Revolutionary DXpedition' in this month's *HF Highlights* column. The concept is being pioneered by **George AA7JV** and involves taking a self-contained 'Radio in a Box' to a remote island and operating it from offshore. The idea being that this potentially offers a way of activating remote islands where, for example, overnight stays are prohibited, access is challenging or, in the case of many of the islands currently under the jurisdiction of the US Fish & Wildlife Service, no human visits are possible other than those by certified officials.

The discussion brought out many and varied opinions as to whether such an operation was in the spirit of amateur radio DXpeditions. Some thought there was no issue, as what we want to work is an island or country from which the RF is emanating, and we don't care where the operators are located. Others felt that this was definitely against the spirit of keeping rare entities rare, whether for political, geographical or other reasons.

There are also practical issues, of course. Activating a remote Pacific island to make it workable from, say, Europe, actually requires some extensive antennas – an 'antenna in a box' is hardly likely to do the trick. And, ideally, high power, which begs the question of how to keep a generator refuelled while staying offshore!

Incidentally, there are some wonderful anomalies regarding access to some of these islands. Navassa Island in the Caribbean is a case in point. The US authorities severely restrict authorised visits but it is well known that Haitian fisherman routinely visit and stay on the island!

... on the Air

Of course, you may well consider the above discussion irrelevant in the context of your own amateur radio experience. DX chasing is something of a niche activity. So what operating do you do? One very popular programme is Summits on the Air (SOTA), and that has spawned several others – Parks on the Air, Castles and Churches on the Air and so on (not to mention Islands on the Air, but



that one goes back a very long time indeed). All of these are valuable in encouraging on-air activity, which is all to the good because day-to-day ragchewing seems to have pretty much disappeared from our bands nowadays, largely, I suspect, because WhatsApp, email and so on have taken its place. I recall a friend in a flat in London with a vertical antenna on the roof so he could chat with his brother in the USA at least once a week. But he transferred those chats to Skype when it became available at zero cost.

And a couple of our Letter writers this month are wondering what happens to the multitude of 2m and 70cm handhelds that appear to be sold nowadays. Do they simply gather dust in a cupboard? At least we have some good news this month (see **Tim Kirby's** VHF column) about an effort to promote FM activity at VHF. My friend **Don Beattie G3BJ**, who for several years was Secretary and then President of IARU Region 1, tells me that our VHF and UHF bands are under massive threat nowadays from commercial interests that are eyeing them. Even to the extent of using SDR technology to monitor our usage and discovering, not surprisingly, that contests and FT8 apart, there is very little activity most of the time. This is something that should concern us all.

This Month

One of the issues faced by many of us nowadays is the prevalence of QRM from nearby electronic devices. This month **Joe Chester M1MWD** starts a series on how to get out and about to escape the problem. His suggestions may well help you plan that SOTA activity, or simply encourage you to get back on the air generally if you were otherwise despairing. Anyway, do read his column and enjoy!

Don Field G3XTT

Editor, *Practical Wireless* Magazine

Read more radio news and reviews at www.radioenthusiast.co.uk/news

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

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This month's *Letters* cover thoughts on near fields, activity levels, promoting the hobby and more.

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HISTORY Inside the Bijou Three receiver
Archive pictures of this 'cheap and efficient' model from the PW vaults!

GOING DIES
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PEOPLE The face behind the callsign
Nobby Styles G0VJG and his ambitious Rockall expedition

HISTORY The General Coverage Receiver
1970s multimode receiver for the 550kHz to 30MHz range remembered

RALLIES & EVENTS
Hamfest is OFF, but there's still plenty more to do!

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Newsdesk

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

New from Icom

Icom has also announced details of the ID-50E, a new dual-band D-STAR digital transceiver to complement their popular ID-52E model. The ID-50E is a compact VHF/UHF dual bander with both D-STAR (Digital Smart Technology for Amateur Radio) and FM dual modes and looks very much like the ID-51E/PLUS.

Further information is on the ID-50E product page on the website. Icom UK expect to see this model this Summer.

They will confirm the final product features, cost and confirmed availability as soon as they have them.

<https://icomuk.co.uk>

The HM-249 is a new simple hands-free kit designed for vehicle operation using selected Icom mobile radios. This new product consists of a main PTT button with RJ-45 modular connector, a remote PTT button, and a microphone.

- It is compatible with selected Icom digital and analogue two-way radios and LTE and Amateur radio mobiles (IC-2730E, ID-4100E, ID-5100E).
- Installation of the HM-249 is straightforward with each PTT and the microphone having a 3M type seal on the back to let you attach it to your desired position.
- The large PTT switch button also has a screw hole for a solid attachment.
- The HM-249 is now available for sale with a suggested retail price of £108.00 inc. VAT.



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CDXC 2023 CONVENTION HEARS 3Y0J & 3B7M STORIES DIRECT FROM TEAM LEADERS:

Saturday 13 May saw the CDXC (The UK DX Foundation) AGM take place at the Link Hotel in Loughborough, followed by an afternoon of presentations.

The day started with a chance to catch up with old friends and make new acquaintances over a coffee while swapping stories of DX made and, in some cases, "the one that got away". The formalities of the AGM followed and at the conclusion the topics of reaching DXCC Honor Roll and operating DXpeditions with a Rig in a Box approach were discussed. Both topics produced lively debate.

The afternoon talks commenced with one of the most waited for DXpeditions in recent years 3Y0J. CDXC were the first UK group to have this presentation from **Ken LA7GIA**, Bouvet Team Leader, who flew into the UK to give the talk in person. Attendees were given an in-depth account of conditions sailing to the island and the difficulties encountered on arrival with landing and equipment transfer.

Don G3XTT gave a fascinating guide to radio publications over the years and how those still on the shelf have morphed from other magazines. Plenty of happy memories of attendees' youth were rekindled.

James M1DST explained his hi-tech solutions to creating a 21st century shack. He showed how almost anything in the shack could be remotely controlled even almost going so far as to raise his pneumatic mast remotely (technically doable but questionable from a safety point of view!).

The last talk of the afternoon was from **Lubo**

OM5ZW & Sylvia OM4AYL about the recent activation of St Brandon 3B7M. They gave an account of the lengthy licensing process, the station layout, equipment used and contacts made. Weather also played its part on St Brandon causing damage to some antennas. Lubo explained how the island was being affected by global warming and the loss of the old building used for operating on previous trips as it had been wrecked in a recent cyclone.

In the evening a dinner was held and the chat continued in the bar until closing time. CDXC Chairman **Chris G3SVL** said, "this was probably the best Convention we have put on and we especially want to thank Ken, Lubo and Sylvia for travelling from Norway and The Czech Republic respectively".

The photo shows Ken LA7GIA and Lubo OM5ZW.

20TH EDITION OF THE GLOBAL RADIO GUIDE (SUMMER 2023) NOW AVAILABLE:

While the world looks on in awe at dazzling displays of aurora, reaching ever closer to our planet's equator, radio hobbyists are equally excited at the impacts our sun's increased activity has had on the radio spectrum. From enhanced propagation on the higher HF bands, to more frequent auroral activity on medium wave and even hobbyists tuning in to the ionosphere itself through 'natural radio', Solar Cycle 25 is proving to be quite the motivator for radio hobbyists to reach for their radios. If you want to know where and how to tune-in, Gayle Van Horn W4GVH's bestselling *Global Radio Guide* (now in its 20th edition for the Summer



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of 2023) has all the details to make sure you miss none of the action. This electronic book is available worldwide from Amazon. The price for this latest edition is US\$8.99.

IRTS 90TH AGM WEEKEND AND SHANNON BASIN RADIO CLUB RALLY:

After months of preparation as the host for the 90th Irish Radio Transmitters Society AGM weekend, Shannon Basin Radio Club was delighted to welcome radio and electronics enthusiasts to Ballinasloe, Co. Galway, Ireland over the weekend of 29/30 April. The weekend's events featured a mix of club and IRTS-run activities in addition to handing out over €2,000 in raffle prizes over the course of the weekend. The line-up included a series of technical talks and the radio show/rally both organised and run by Shannon Basin Radio Club, the IRTS Gala Dinner celebrating the 90th anniversary of the Society, and the 90th IRTS AGM itself. On the Saturday, the well-attended technical talks featured an enthralling recount of the Irish-based EIDX group's DXpeditions. Of particular interest was their recent adventure in Antigua operating as V26EI. Enda EI2II described the fun and challenges involved in establishing their operations base for the trip which was far from the picture postcard view typically associated with Antigua. IRTS Youth Officer Niall EI6HIB then talked about the wide range of activities to help promote and encourage youth involvement in the hobby. Rafal EI6LA shone the light on RTTY; the second oldest digital mode. In the final talk, Jeffery EI7IRB spoke about TinyGS; a LoRa based satellite ground station. Jeffrey showcased the merits of this project as a gateway into amateur radio and a perfect mix of science, technology, engineering, and mathematics combining radio, Internet of Things, and space.

Later that evening, special guests Senator Aisling Dolan, RSGB President John McCullagh MBE and his wife Grace, in addition to all the guests were welcomed to the packed IRTS Gala Dinner. Keith EI5IN (Shannon Basin Radio Club PRO) acted as MC for the evening. Following the presentation of the IRTS Awards later that evening, Shannon Basin Radio Club held the first of two raffles of the weekend. Nine prizes thanks to the very generous sponsors Ballinasloe Credit Union, Shearwater Hotel, and Andy EI7IOB were handed out to lucky winners that evening.

Following a very late night, club members were back on site before 7am the next morning in preparation for the eagerly awaited radio show. Over 25 traders and clubs set up in preparation for the rush making it one of the largest radio shows in Ireland this year. The club was delighted to welcome amateur radio and CB clubs and enthusiasts from all over Ireland and further afield.

The final event of the weekend; the 90th IRTS



AGM then commenced at 2pm. Congrats to Enda EI2II who was installed as the new IRTS President and to the new committee. Among the many awards presented, Shannon Basin Radio Club was honoured to be awarded the Shandon Trophy for the leading station in the 2m restricted section of the IRTS VHF/UHF Field Day, the IRTS HF Shield for highest scoring Single Operator EI station in the UKEICC DX SSB contest, and the IRTS IOTA Trophy as the leading EI/EJ station in the 2022 IOTA Contest. The club wishes to thank all the traders, clubs, and everyone who travelled to Ballinasloe for the weekend. They greatly appreciate and want to thank their excellent sponsors and club member volunteers that helped ensure it ran as smoothly as possible.

CQ HALL OF FAME INDUCTEES: Every year at the Dayton Hamvention, CQ Magazine inducts new members into its various Halls of Fame. This year's inductees include:

CQ DX Hall of Fame:

Arecio 'Al' Hernandez K3VN – Al has been deeply involved in DX expeditions to many rare and difficult to reach destinations. Al is a prolific public speaker and author. He is an expert in electromagnetic interference and compatibility and holds seven patents in the field.

Adrian Ciuperca KO8SCA – Adrian has been on 30 DXpeditions, including the recent 3Y0J expedition to Bouvet Island. He actively promotes amateur radio to young people in places that he visits and is frequently the voice or face of various trips to the amateur community, appearing on interview shows and writing about the adventures. He is also the tech support for 4U1UN, the amateur station at

United Nations headquarters in New York City and can frequently be found operating there. CQ Contest Hall of Fame

Kirk Pickering K4RO – Founding member, past president and past vice-president of the Tennessee Contest Group; webmaster of TCG website; has hosted many new contesters at multi-ops from his home station; three-time US winner in ARRL Sweepstakes CW/QRP category and regular top-ten finisher in multiple contests; past editor and columnist for *National Contest Journal*.

Ken Claerbout K4ZW – Accomplished tester. A driving force in the ongoing training and mentoring of students at ET3AA, the radio club at the Addis Ababa University School of Electrical and Computer Engineering. He has served in multiple positions for the YASME Foundation and is past president of the Potomac Valley Radio Club. In that role, he began a series of contesting-related webinars that has morphed into today's Contest University.

Bernhard 'Ben' Buettner DL6RAI – Avid tester and contest administrator who has operated from 49 different DX entities. Co-founder and past president of the Bavarian Contest Club (BCC), Ben helped develop and maintain the club's DX cluster, the first in Germany. He is also a past director of the Worked All Europe DX Contest (WAEDC). Ben is also a former member of the CQWW Contest Committee, served as IT manager for WRTC-2018 in Germany, and has been a beta tester for Win-Test contest logging software. *(tragically, shortly before the announcement of Ben's award, he died in a tower climbing accident in Aruba - ed.)*

CQ Amateur Radio Hall of Fame

Andrew 'Andy' Andros W0LTE (Silent Key), and brother **Theodore 'Ted' Andros W0URN** (SK), founders of Hy-Gain Corp.

John G. 'Jack' Curtis K6KU (SK) – Revolutionised CW keying by developing circuitry for an iambic memory keyer and putting it on a chip. The chips were later integrated into many commercial transceivers.

Gerald 'Jerry' Lawson WA6LVN (SK) – Pioneer of home video games, helping to develop the first cartridge-based video game controller, which allowed users to switch between multiple games. Also one of the few African-American engineers working in the computer industry as the first video games were developed.

(it is a shame that only one of the above is a non-US amateur but perhaps inevitable given that CQ is a US magazine - ed.)

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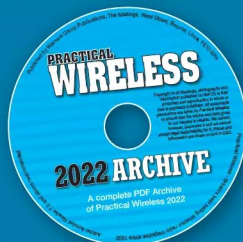
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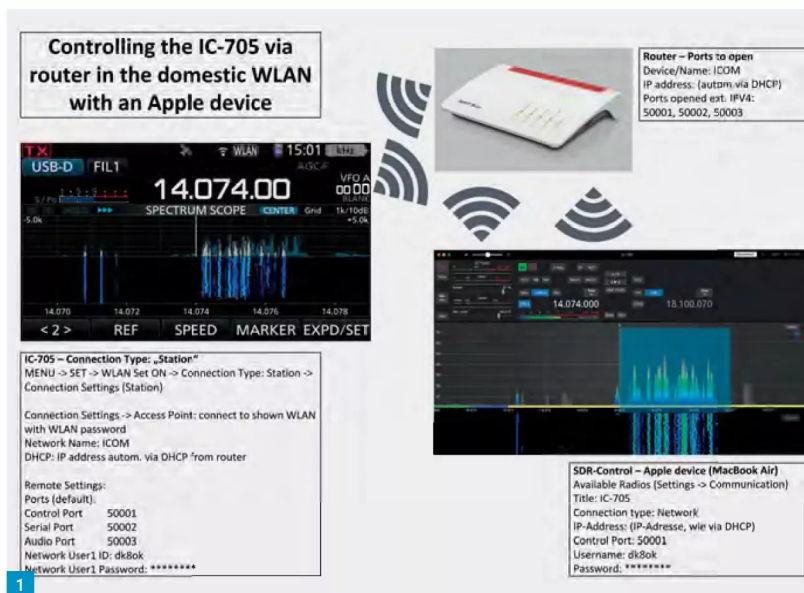
Nils Schiffhauer DK8OK
dk8ok@gmx.net

Small as it is, the IC-705 continues to represent the biggest innovation in the market for industrial amateur radio transceivers since its introduction in 2020. With this transceiver, Icom has consistently combined excellent receive and transmit data [1] with modern interfaces such as USB, WLAN and Bluetooth, while at the same time keeping its dimensions and weight low – even with a Li-ion battery attached! – in an exemplary manner. But it only delivers 10 watts? “If the transmitting power were generally limited to 30 watts”, wrote the British antenna expert (*Antennas for all Locations*, RSGB) **LA Moxon G6XN**, as early as 1982, “probably little would be lost, but much would be gained”. And at that time, the rise of digimodes, which were to see the light of day only in 1998 with PSK31, was not yet being considered.

No more ‘Rat King’ necessary: IC-705 can also be operated via WLAN

The IC-705 is a perfect combination of a manually operated transceiver with a touch display and an integrated WLAN module that can be connected to the domestic WLAN as a modem and controlled completely wirelessly within its coverage area. The only thing missing was the appropriate software, which the Japanese traditionally have a hard time with. This is where the sensational *SDR-Control* for Icom for all Apples from Macs to iPads to iPhones comes in, which **Marcus Roskosch DL8MRE** has brought to the market with noticeable professionalism, but also enthusiasm for amateur radio, for Icom and for Apple alike [2]. Why not for Android, too? Marcus: “I stopped Android development completely about two years ago. Such an app would only work on a very small part of Android devices anyway. I use a lot of things that Apple has cast into hardware, for example the FFT routines, for FT8 and ‘Metal’ for drawing the waterfall. There is nothing like that on Android and you would have to do everything by hand and in software. And Android support was a nightmare because of all the different devices and customisations from manufacturers.”

What makes SDR-Control so extraordinary that it is even worth buying an Apple terminal for it alone is that, in combination with the IC-705, it offers completely new perspectives and an easy introduction to amateur radio – especially in FT8/4. This is exactly what I would like to focus on in this article. Because anything else would be the echo of the detailed (English-language) manual or would interfere with **Michael Reichardt DL2YMR**, whose videos are an almost indispensable starting aid [3]. For example, to get the combination into the home WLAN – don’t worry, it’s easier than you think!



Dream Team: Icom IC-705 and Software SDR-Control

With SDR-Control, Marcus Roskosch DL8MRE has written an ingenious piece of software that leaves nothing to be desired for the active radio amateur, especially with an IC-705. For example, it integrates digimodes just as seamlessly as logbooks and (electronic) QSLing. **Nils Schiffhauer DK8OK** is enthusiastic.

Digimodes: PSK31 celebrates Silver Anniversary

Before that, however, a brief look at the past quarter century of Digimodes:

Digimodes 1.0 started in December 1998 with PSK31 by **Peter Martinez G3PLX**, whereby the audio connection (transmit/receive) to the PC initially still required a separate DSP card from Motorola or Texas Instruments for around US\$150.

Digimodes 1.5 relied on soundcards already integrated in the PC and frequency control via RS-232 or even printer interface. The tangle of cables that had to be made individually for each transceiver (‘rat king’) was legendary, the correct levelling took time, and the market for interfaces between transceiver and PC (hum loops!) grew and grew.

Digimodes 2.0 replaced the many cables with a single USB interface for controlling the transceiver and forwarding audio on both the receive and transmit sides.

Digimodes 3.0 now uses first LAN for everything, then, finally completely wireless, WLAN, including access to the internet. And that’s for the complete

control and audio transmission for receiving and transmitting.

Three Devices – three Apps with Synchronisation via iCloud

Now, at least with the IC-705, this future is here, and SDR-Control offers access to it in three flavours, each of which has a different range of functions, which Marcus, by the way, keeps expanding at a remarkable rate:

SDR-Control for iMac and MacBook; among others with spectrogram (‘waterfall’), FT8/4, BPSK31/63/125, QPSK63/125, RTTY (baud rate and shift arbitrary), HF-FAX/reception with frequency list as well as matching standards, CW decoder, logbook, PSK reporter, connection for MIDI controller.

SDR-Control for iPad; with spectrogram (‘waterfall’), FT8 and CW, logbook, PSK reporter, etc.

SDR-Control mobile for the iPhone; including FT8, CW and D-STAR, but without a spectrogram.

Many functions, such as the logbook, are automatically synchronised via iCloud and can then be accessed on any terminal in their current form.

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Fig. 1: With these settings, the IC-705 with SDR-Control goes via WLAN to the router, via which the transceiver can then be completely operated with an Apple device in the entire radius of the WLAN.

Fig. 2: These are the settings of IC-705 and the SDR-Control software on the terminal, so that it can connect the transceiver in direct WLAN contact – for example on a Field Day. Fig. 3: The IC-705 is logged into the router at home and can be operated from there via its current IP address via the Internet, for example, with a public hotspot or via an iPhone connected to a private router (try it first with your own WLAN!). Fig. 4: FT8 on 17m, and immediately SDR-Control sets to the correct frequency, starts decoding after clicking RX and presents the results as a list (left) as well as on the spectrum.

Comfort functions such as DX Cluster display with transfer of an entry, including frequency and mode by double-clicking, band plans, network statistics, VFO memory locations, voice and CW memory as well as look-up of callsigns are among the other conveniences.

Each of the three apps is optimised for the respective device, i.e. has an adapted range of functions, which depends among other things on its display format and is therefore largest for iMac/ MacBook, and each app is to be purchased separately. With each of these three apps, the IC-705 can be operated in different ways, whereby everything is done via three virtual UDP ports instead of via cable – control (UDP50001), CI-V data (UDP50002) and audio via UDP50003:

via WLAN directly between terminal and transceiver for remote control without any network within their WLAN range, for example on a Field Day (IC-705: Connection Type -> Access Point Connect), Fig. 1.

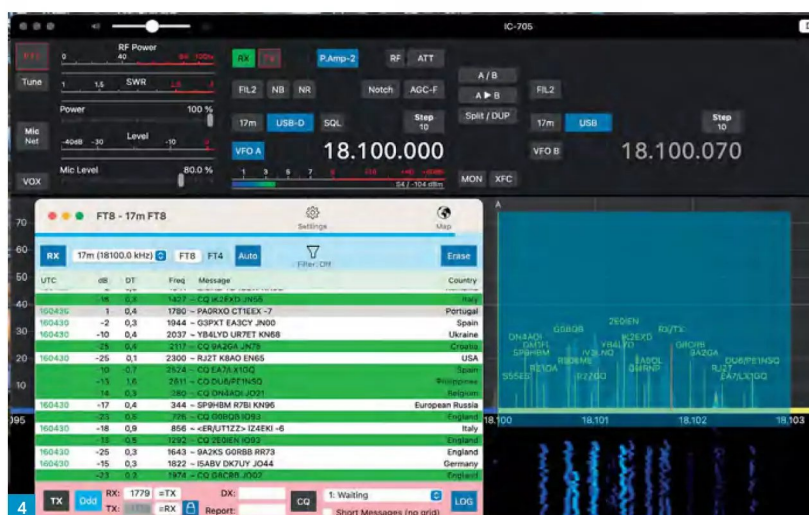
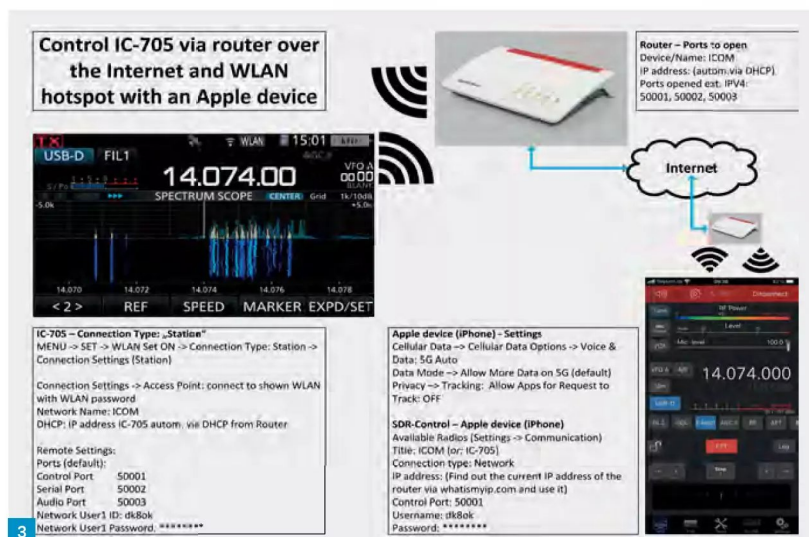
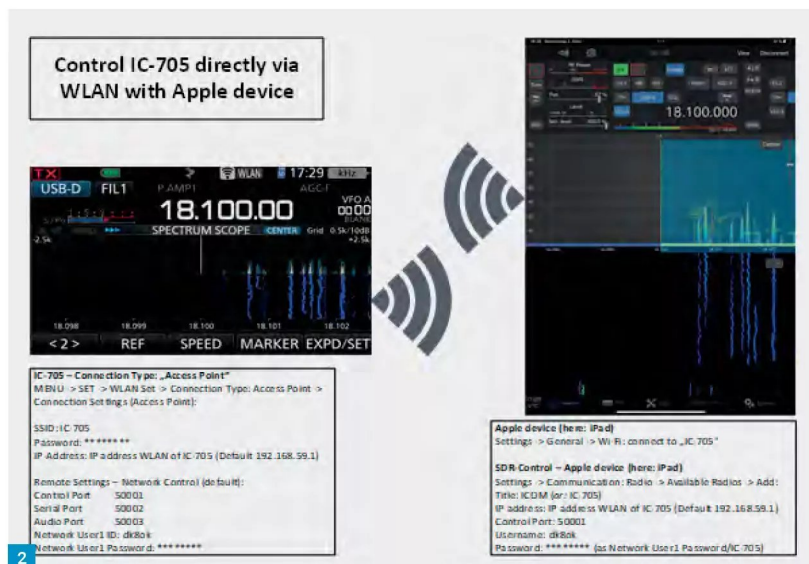
within a (home) WLAN network, whereby the Apple device and transceiver must both be connected to the router (IC-705: Connection Type -> Station), Fig. 2.

via the Internet, whereby the IC-705 must of course first be connected to a router via WLAN and the Apple device can be connected to a WLAN again. Fig. 3.

The illustrations show only one possibility for each connection, but the settings can vary depending on your router and provider. Marcus recommends not using a repeater network ('mesh') for WLAN, but at least in FT8/4 it worked for me with two repeaters, so that the same network appears connected three times in the IC-705. With CW, on the other hand, this may become critical. However, remote control via the internet has been prohibited in Germany until now ...

Focusing on FT8/4

From the colourful bouquet of transmission modes such as CW (with a powerful decoder!), RTTY, PSK31, HF-FAX and FT8/4, I concentrate here on the latter because it offers the most op-



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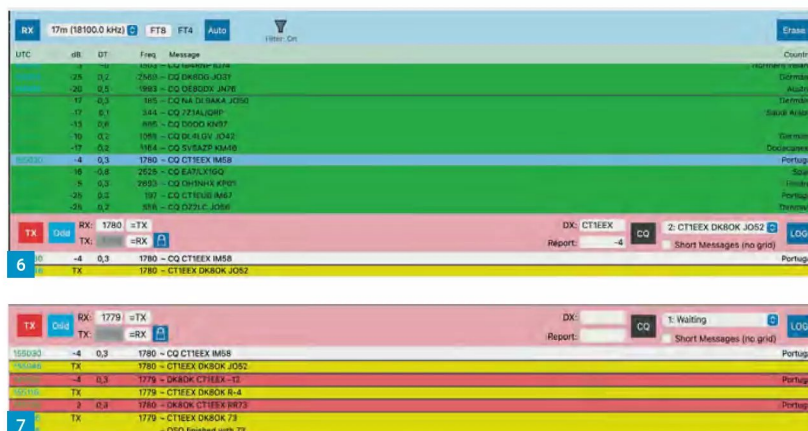


Fig. 5: All received FT8 stations within a few minutes on 15m are shown by the rotating globe. **Fig. 6:** Double-click on CT1EEEX's CQ call in the receive window ..., **Fig. 7:** ... whereupon the data is taken over in the transmit window and in the next round the call is answered and, in this case, the QSO is processed immediately as well as completely ...

portunities with my configuration of just 10W EIRP. Selecting FT8 or FT4 and the amateur radio band via SDR-Control simultaneously switches the transceiver to the correct settings, including the band plan-compliant frequency within this band. After clicking RX, decoding begins, and if desired, the spectrum is immediately provided with the decoded callsigns on their frequency, **Fig. 4**. Also, the received stations can be shown with their location on a map or a virtual globe, **Fig. 5**, and here, at the click of a mouse, even more information about this callsign can be seen, including whether and, if so, you have worked it, when, on which band and in which mode. In the list of decoded stations, stations already worked (here: CT1EEEX) and CQ calls can be marked in different colours. The filter function, here switched off, offers the possibility to restrict the display to CQ calls only, to hide certain callsigns, prefixes or countries (blacklist) or to show only receipts with certain content (whitelist).

Amateur Radio by just a few Mouse Clicks

In **Fig. 6**, I have set the filter in the receive window (RX) so that only CQ calls are displayed. Then I double-clicked on the entry 'CT1EEEX'. As a result, the callsign and the SNR value as well as the appropriate audio transmission frequency (1780Hz) are set in the lower transmission window (TX). On the next round, the software automatically calls CT1EEEX with DK8OK and the locator JO52, see the second line in the transmit window with the TX display leading. **Fig. 7** then shows CT1EEEX responding and giving DK8OK the SNR value of -12.



DK8OK responds in turn and gives -4dB. CT1EEEX has heard everything and ends the QSO with RR73. DK8OK transmits a fast 73 afterwards; the QSO is finished. Automatically (or manually) the successful QSO is entered into the logbook, **Fig. 8**. Up to this point it was only necessary to double-click once on CT1EEEX's CQ call. Everything else was fully automatic from then on!

But is that still amateur radio? When everything is fully automatic from the CQ call to the log entry? If you look at the distribution of operating modes in Club Log, you will get a clear answer (see below). And certainly, digimodes have contributed to a revival of amateur radio. Despite their only small band segments, the overwhelming majority of amateur radio activity worldwide takes place with transmission powers that are often below 10W EIRP and thus on this side of the limit above which personal protection in electromagnetic fields must be demonstrated [in Germany, at least]. Moreover, other forms of communication are not prohibited for this reason. Perhaps a saturation effect will occur at some point, and we will return to vinyl LP – ahem to ragchewing in CW and SSB ...

If you do not reach the called station immediately in the first call, but it first accepts another ('... answered somebody else'), my calling stops until the DX station calls CQ again. To call again then automatically showing '...continuing after ... calling CQ' – up to six times in succession as default, which can be changed. This way, such a QSO runs fully automatically and without errors. Even the upload of the new logs is done with a mouse click, among others to LoTW [4] of the ARRL (with certificate to be copied in), QRZ.com [5], Club Log [6] and eQSL.cc [7], the latter including QSL dispatch and receipt, **Fig. 9**. By the way, the log data can also be completed with one click through various web services, preferably through the free HamQTH [8].

PSKReporter: Where am I Heard and How?

Not only for antenna comparisons and especially with low transmitting power, but we would also

always like to know how our own call arrives in the wide world. Some digimodes, such as FT8/4, offer an excellent tool for this, when radio amateurs and listeners automatically forward their own reception logs to the PSK Reporter website, as is also possible with SDR-Control. This is extremely successful, and up to more than 9,000 monitors occasionally report up to over a quarter of a million observations, per hour! Within two hours of a March afternoon, FT8 was far ahead with 3.2 million reports, followed by FT4 with 260,000 reports. WSPR, which once led the field, had 43,000 entries, while the mother of all digimodes, PSK31, had only 50 entries. In total, the team around **Philip Gladstone N1DQ** collected about 35 billion spots in the last nine years. This treasure trove of data is increasingly attracting the interest of scientists. Philip wrote to me: "In the summer we will move to another server. Then queries will also be possible not only about the activities of the last week, but over any period of time". SDR-Control offers an automated query, the result of which is available as a list, **Fig. 10**, or on a world map, **Fig. 11**. If I call up the reception reports of the signals from DK8OK, I can read in the signal column exactly with which SNR which station received me at which distance. **Fig. 12** shows the analysis of a good 7,000 SNR reports that DK8OK received in mid-March between 160m and 10m, with a focus on 30m to 10m, of course.

Chasing the Fox: What about DXpeditions?

DXpeditions often use a special mode of operation (Fox/Hound or F/H), which enables them to multiply their throughput. To do this, they select a range of the corresponding band that deviates from the standard frequencies, which must be selected manually with SDR-Control. Select 'Manual' in the RX window, for example 18,095kHz instead of 18,100kHz. Generally, the call is made in split mode. In WSJT-X mode, the DX station ('Fox') transmits between +300Hz and +900Hz within the audio passband, while the callers ('Hounds') fight for a contact in the range of +1,000Hz to +4,000Hz.

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Fig. 8: ... until the likewise automatic entry in the logbook of SDR-Control. Fig. 9: If you upload your log to eQSL.cc with SDR-Control, the free-of-charge exchange of electronic QSL cards is only a matter of seconds. Fig. 10: Extract from the reception reports collected by the PSK reporter from DK8OK's transmissions in FT8 within half an hour on 10m. A click brings up details of the corresponding report.

The calling station may then switch to the DX station's transmit frequency, but it does not have to. Yes, the bandwidth must then be set accordingly. SDR-Control offers a maximum bandwidth of 3,600Hz with the IC-705 (FIL1 – set IF Filter Width to maximum with the right mouse button). Marcus has not yet built this DXpedition procedure into SDR-Control, so you still must do it manually.

10WattsandG5RV: Does it Work at All?

Despite all the theory, all the practice and highly efficient modulation types such as FT8, the effectiveness of low power is widely underestimated. After I had worked and confirmed even North Korea, P5, in RTTY with 5W on a 3-element Yagi, I now only work with a maximum of 10W EIRP. The drop compared to a station with 100W transmit power on a 3-el beam is about three S-points. Sounds a lot, but since FT8 can often automatically decode signals that the human ear capitulates to, it loses its horror, especially with the currently smiling sunspot activity. Since propagation between the DX station and me and me and the DX station are often similar, I can take the received signal from the DX station here as an indicator of how I arrive over there.

Nevertheless, working with low power is initially unfamiliar to many radio amateurs. But here the beginning is easy: the practitioner goes from the 10m band down through the bands and checks where the strongest activity is. Why start at the top? Simply because the external noise is lower there and the efficiency of the antenna is usually higher. If you answer CQ calls from stations that show an SNR of about 0dB \pm 5dB in FT8, you will usually reach them and get an impression of the current conditions from their reports. CQ calls and the subsequent view in PSK Reporter (see above) also help here.

Those who plan strategically for DXCC (100 countries) can use the professional and free email service of NOAA's Space Weather Prediction Center [9] with reliable forecasts for the next three days, which can then be supplemented and supported with various web services - such as the comprehensive site of **Serge Stroobandt, ON4AA** [10], the site of KC2G [11], which is based on a comprehensive evaluation of current ionograms, or with VOACAP Online [12] or Propdy, which uses the ITU algorithm, Fig. 13 [13].

An evaluation of my first 233 QSOs with SDR-

Date	Call	Band	Freq	Mode	Country	Name	Rst Sent	Rst Rcvd	Comment	Continent	DXCC	CQ ZL	ITU ZL	Qth
2023-03-04 15:11:15	CT1BEX	10M	16.01780	FT8	Portugal		-4	-12		EU	272	14	37	IA58
2023-03-04 15:34:14	IK3BIX	12M	21.141910	FT4	European Ru...		8	-16		EU	54	16	19	KO46
2023-03-04 15:36:59	N2ZY	12M	24.919520	FT4	USA		-4	-16		NA	291	6	6	EA63
2023-03-04 15:34:22	REKLE	12M	24.9200...	FT4	European Ru...		0	-15		EU	54	16	19	KN75
2023-03-04 14:30:37	SV3ALW	10M	28.181570	FT4	Greece		9	-8		EU	236	20	28	KM17
2023-03-04 09:55:14	RAFOO	15M	21.141800	FT4	European Ru...		4	-14		EU	54	16	19	LO33
2023-03-04 09:34:07	GJOKYZ	20M	14.081560	FT4	Jersey		8	-8		EU	122	14	27	IN83
2023-03-01 12:07:44	SV3BLX	12M	24.916350	FT8	Greece		12	-17		EU	236	20	28	KM17
2023-03-01 12:05:44	RU3PM	17M	18.102300	FT8	European Ru...		1	-14		EU	54	16	19	KO94
2023-02-26 16:01:52	R3DDM	15M	21.141490	FT4	European Ru...		9	-6		EU	54	16	19	KO95
2023-02-27 18:18:22	SA4ALL	20M	14.081500	FT4	Spain		8	-5		EU	281	14	37	IM89
2023-02-27 14:58:45	HA5SP	20M	14.076110	FT8	Hungary		-7	-4		EU	239	15	28	
2023-02-27 14:47:44	YO4DG	15M	21.141730	FT4	Romania		4	-1		EU	275	20	28	
2023-02-27 14:47:14	SV3RIA	15M	21.141730	FT4	Greece		-6	-12		EU	236	20	28	KM17
2023-02-27 13:38:59	TF3VG	12M	24.917370	FT8	Iceland		-4	-9		EU	242	40	17	HP94
2023-02-27 10:19:16	RY2B	12M	24.916320	FT8	European Ru...		-7	-24		EU	54	16	19	KO85
2023-02-27 09:28:52	EC3JA	20M	14.081960	FT4	Spain		0	+0		EU	281	14	37	JN00
2023-02-27 05:28:29	LY3BH	20M	14.081190	FT4	Lithuania		6	+9		EU	146	15	29	WO24
2023-02-27 09:15:14	EA7RV	17M	18.101180	FT8	Spain		5	-11		EU	281	14	37	IM87
2023-02-26 17:31:00	G8XGT	30M	10.138540	FT8	England		-5	-20		EU	223	14	27	JO02
2023-02-26 16:07:14	RW6HP	12M	24.920070	FT4	European Ru...	Anatoli Viktor...	8	-12		EU	54	16	19	UN14
2023-02-25 12:38:59	YQ4GY	15M	21.141600	FT4	Romania		-11	-18		EU	275	20	28	KN43

Call	Date	Time	Band	Freq	Mode	Country	Name	Rst Sent	Rst Rcvd	Comment	Continent	DXCC	CQ ZL	ITU ZL	Qth
2200	2023-03-04	15:11	10M	16.01780	FT8	Portugal		-4	-12		EU	272	14	37	IA58
2201	2023-03-04	15:34	12M	21.141910	FT4	European Ru...		8	-16		EU	54	16	19	KO46
2202	2023-03-04	15:36	12M	24.919520	FT4	USA		-4	-16		NA	291	6	6	EA63
2203	2023-03-04	15:34	12M	24.9200...	FT4	European Ru...		0	-15		EU	54	16	19	KN75
2204	2023-03-04	14:30	10M	28.181570	FT4	Greece		9	-8		EU	236	20	28	KM17
2205	2023-03-04	09:55	15M	21.141800	FT4	European Ru...		4	-14		EU	54	16	19	LO33
2206	2023-03-04	09:34	20M	14.081560	FT4	Jersey		8	-8		EU	122	14	27	IN83
2207	2023-03-01	12:07	12M	24.916350	FT8	Greece		12	-17		EU	236	20	28	KM17
2208	2023-03-01	12:05	17M	18.102300	FT8	European Ru...		1	-14		EU	54	16	19	KO94
2209	2023-02-26	16:01	15M	21.141490	FT4	European Ru...		9	-6		EU	54	16	19	KO95
2210	2023-02-27	18:18	20M	14.081500	FT4	Spain		8	-5		EU	281	14	37	IM89
2211	2023-02-27	14:58	20M	14.076110	FT8	Hungary		-7	-4		EU	239	15	28	
2212	2023-02-27	14:47	15M	21.141730	FT4	Romania		4	-1		EU	275	20	28	
2213	2023-02-27	14:47	15M	21.141730	FT4	Greece		-6	-12		EU	236	20	28	KM17
2214	2023-02-27	13:38	12M	24.917370	FT8	Iceland		-4	-9		EU	242	40	17	HP94
2215	2023-02-27	10:19	12M	24.916320	FT8	European Ru...		-7	-24		EU	54	16	19	KO85
2216	2023-02-27	09:28	20M	14.081960	FT4	Spain		0	+0		EU	281	14	37	JN00
2217	2023-02-27	05:28	20M	14.081190	FT4	Lithuania		6	+9		EU	146	15	29	WO24
2218	2023-02-27	09:15	17M	18.101180	FT8	Spain		5	-11		EU	281	14	37	IM87
2219	2023-02-26	17:31	30M	10.138540	FT8	England		-5	-20		EU	223	14	27	JO02
2220	2023-02-26	16:07	12M	24.920070	FT4	European Ru...	Anatoli Viktor...	8	-12		EU	54	16	19	UN14
2221	2023-02-25	12:38	15M	21.141600	FT4	Romania		-11	-18		EU	275	20	28	KN43

Date/Time	DX Call	Country	Freq	Band	Mode	Signal	Distance
11 min 42 sec	R9GM	European Ru...	28075.9	10 Meter	FT8	-16	21902.3 Km
14 min 42 sec	KATJY	United States	28075.9	10 Meter	FT8	-22	7269.1 Km
15 min 34 sec	UA9PG	European Ru...	28075.8	10 Meter	FT8	-14	3008.2 Km
16 min 10 sec	EA7LZ	Spain	28075.8	10 Meter	FT8	-16	2200.5 Km
18 min 7 sec	TA2AFA	Asiatic Turkey	28075.9	10 Meter	FT8	-20	1927.8 Km
18 min 10 sec	PY2BL	Brazil	28075.9	10 Meter	FT8	-22	10002.1 Km
18 min 10 sec	CT1BQ	Portugal	28075.9	10 Meter	FT8	-17	1884.3 Km
18 min 39 sec	CT208RWS	Portugal	28075.8	10 Meter	FT8	-18	2044.4 Km
18 min 40 sec	R4DM	European Ru...	28075.9	10 Meter	FT8	-18	2552.7 Km
18 min 42 sec	TA1NGE	European Tur...	28075.8	10 Meter	FT8	-19	1913.3 Km
18 min 42 sec	TA2ED	Asiatic Turkey	28076.3	10 Meter	FT8	-16	2348.6 Km
18 min 39 sec	EA5XA	Spain	28075.9	10 Meter	FT8	-14	1709.0 Km
19 min 28 sec	EA7KMT	Spain	28075.9	10 Meter	FT8	-20	2081.4 Km
19 min 36 sec	TF3PKN	Iceland	28075.8	10 Meter	FT8	-21	2243.7 Km
19 min 37 sec	K4PI	United States	28075.9	10 Meter	FT8	-17	2423.0 Km
20 min 37 sec	EA5VK	Spain	28075.9	10 Meter	FT8	-14	1749.9 Km
21 min 35 sec	CT1FAW	Portugal	28075.9	10 Meter	FT8	-24	2131.0 Km
22 min 6 sec	RY7G	European Ru...	28075.9	10 Meter	FT8	-16	2584.0 Km
22 min 9 sec	EA1HCJ	Spain	28075.9	10 Meter	FT8	-23	1841.7 Km
23 min 9 sec	EA4AY	Spain	28075.9	10 Meter	FT8	-20	1694.2 Km
24 min 37 sec	UR1	European Ru...	28075.9	10 Meter	FT8	-13	2202.9 Km
24 min 39 sec	NS4Y	United States	28075.9	10 Meter	FT8	-24	7240.7 Km
25 min 6 sec	RD4AN	European Ru...	28075.9	10 Meter	FT8	-16	2354.7 Km
25 min 37 sec	K0EOO	United States	28075.9	10 Meter	FT8	-18	7000.5 Km
25 min 37 sec	OE1TDA	Austria	28075.9	10 Meter	FT8	-14	645.4 Km
26 min 37 sec	EA4HJL	Spain	28075.9	10 Meter	FT8	-12	1695.7 Km
27 min 37 sec	W0RRP	United States	28075.9	10 Meter	FT8	-17	7064.8 Km
28 min 34 sec	SV8KOM	Greece	28075.8	10 Meter	FT8	-18	1834.8 Km
29 min 9 sec	K0OP	European Ru...	28075.9	10 Meter	FT8	-18	7525.3 Km
30 min 5 sec	KI4IV	United States	28075.9	10 Meter	FT8	-13	7423.2 Km
30 min 37 sec	EB5KT	Spain	28075.9	10 Meter	FT8	-17	1651.6 Km
31 min 36 sec	K4EM	United States	28075.8	10 Meter	FT8	-18	7347.1 Km
31 min 37 sec	UA8BDJ	European Ru...	28075.8	10 Meter	FT8	-13	2289.1 Km
31 min 7 sec	RK4H	European Ru...	28075.8	10 Meter	FT8	-17	2671.4 Km
10 min 5 sec	IT9HCS	Sicily	28075.9	10 Meter	FT8	-21	1695.4 Km

Control is also interesting. Fig. 14 shows the ratio between my signal and that of the DX station: on average DK8OK is almost 12dB below. However, at the same time you can see a wide range, which, depending on the band, antennas, and conditions, leaves many individual chances even for DX stations that dip below -15dB. While my focus was on stations with at least -10dB, the evaluation of

the more than 7,000 DX reception reports of my signal by PSK Reporter (Fig. 12, see above) shows that I could have been more courageous here. This would be a maxim that could be applied to the entire topic of '10W EIRP and FT8/4', because these digimodes are media that let an algorithm decide about reception. And this algorithm can often do more and is more objective than a human ear.

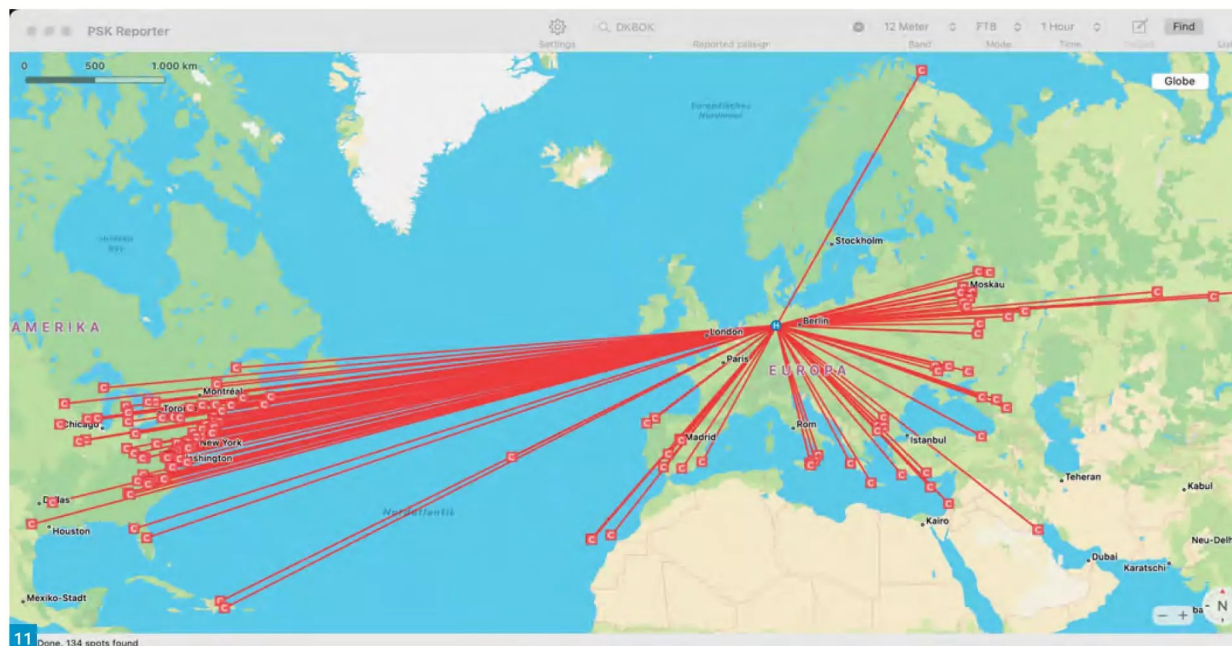
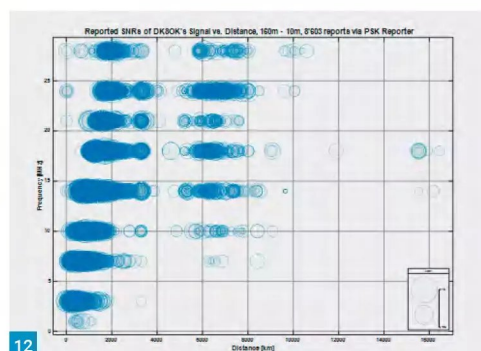
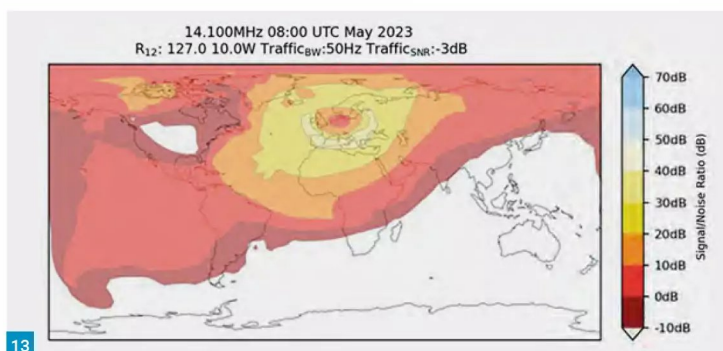


Fig. 11: One hour on 12m on a weekday in mid-March 2023 reveals 134 reports via PSK Reporter, including a lot of DX.



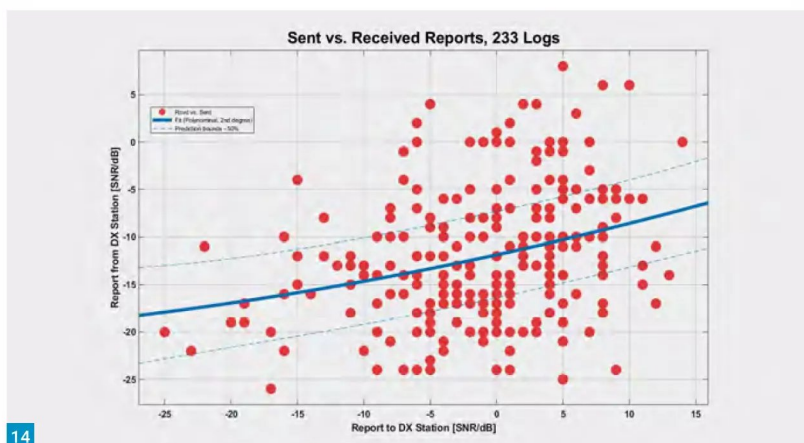
12



13

References

- [1] Adam Farson VA7ON/AB40J dedicates a complete microsite to the IC-705 and his objective metrological test report of 53 pages: <https://t1p.de/wpe33>
- [2] <https://roskosch.de/sdr-control> depending on the version 45 to 120 euros, which are worth every penny, and not only in my opinion.
- [3] especially for logging into the WLAN: <https://t1p.de/emzt0>
- [4] free of charge and without ARRL membership: www.arrl.org/quick-start
- [5] www.qrz.com
- [6] <https://clublog.org>
- [7] www.eqsl.cc
- [8] www.hamqth.com
- [9] <https://t1p.de/5r19k>
- [10] <https://t1p.de/y2f1k>
- [11] <https://prop.kc2g.com>
- [12] www.voacap.com/hf
- [13] <https://soundbytes.asia>



14

Fig. 12: A good 8,500 reports of the signal from DK8OK (10W EIRP) were collected by PSK Reporter within just under 14 days from 160 to 10m. The reported SNRs ranged from -26 dB to +16 dB at distances between 10km and 17,000km. Fig. 13: This is how Propdy sees the FT8 contact possibilities from Hanover with 10W transmit power on a morning in May, in accordance with ITU Recommendation ITU-R P.533-14. There's something going on! Fig. 14: How does my signal (Report from ...) arrive when I give the DX station a report of x SNR/dB (Report to ...)?

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Roger Dowling G3NKH
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Paul Heiney MOHWV

Roger Dowling G3NKH meets broadcaster, writer, Atlantic yachtsman and novice farmer Paul Heiney.

The date was 4 July 2005 and writer and broadcaster **Paul Heiney, Figs 1 & 2** was a happy man. As the Newport, Rhode Island sky exploded into a dazzling display of celebratory fireworks he had just completed the OSTAR single-handed transatlantic yacht race from Plymouth, in a time of 35 days, 14 hours and 19 minutes. Of the 34 starters, no fewer than 16 failed to complete the challenging 3,000 mile voyage. Paul's time was twice that of the victor but that didn't matter. He had never been in the race to win it; only to execute a voyage well made.

But Paul's story starts a long way from the sea, in Sheffield where he was born in 1949. It may be that sea salt was already coursing through his veins. He came from a seafaring family on the Yorkshire coast in Bridlington, where his family often went on holiday.

At grammar school, Paul was expected to go on to university – probably to study physics, a subject he had always enjoyed – but this didn't

appeal. His ambition was to join the BBC as an engineer but he failed the obligatory colour blindness test (the BBC was expanding its colour television coverage at the time) and got himself a job at Birmingham Repertory Theatre as a stagehand. This was followed by a spell working for **Bernard Miles** as a lighting operator at the Mermaid Theatre in London.

Still keen to join the BBC, Paul successfully applied for a job as a sound recordist at Ealing Film Studios. This proved an excellent training ground when he applied in 1971 to become a 'station assistant' at the newly created Radio Humberside local radio station. BBC local radio stations were always under-funded, so that station assistants were positively encouraged to work on both sides of the microphone if they had the aptitude. Paul seized the opportunity, and

soon had his own popular programme of music, chat and current affairs.

The next big stepping stone was to become a reporter on Radio 1's *Newsbeat* in 1974, followed by a couple of years as a reporter for the *Today* programme on Radio 4.

Then came a move to television, when in 1978 he became a reporter and co-presenter alongside **Esther Rantzen** on BBC1's top consumer show *That's Life*, **Fig. 3**. Other television shows followed, including *In at the Deep End* and *Watchdog* for the BBC and the primetime *Countrywise* on ITV.

Sailing

Paul was a keen sailor from an early age. His first maritime experience, as a six-year-old with his **Uncle Jack** in a wooden rowing boat

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Fig. 1: Paul MOHWV at his QTH.

Fig. 2: 'Ayesha' crosses the start line of the 2005 OSTAR. Fig. 3: Paul with Esther Rantzen and fellow That's Life presenter Chris Serle.

Fig. 4: Farming with Suffolk Punches.

Fig. 5: Can Cows Walk Down Stairs?

in Bridlington harbour, nearly ended in disaster when they failed to notice until the last moment that the substantial *Bridlington Queen* pleasure boat was heading directly in their direction. A few years later, his hero would become **Francis Chichester** who won the first single-handed transatlantic race in *Gypsy Moth III* in 1960, long before the introduction of modern aids such as GPS navigation that yachts take for granted today.

The ambition to take part in the 2005 OSTAR was stimulated when Paul and his wife, radio presenter and journalist **Libby Purves**, acquired *Ayesha* of St Mawes in 2001. A modest 36ft ketch, *Ayesha* was already a seasoned performer under a previous owner, having successfully journeyed through the Panama Canal and along the 2,000 mile Chilean coast before finally reaching Antarctica.

The first big test of the boat – and its crew – came two years later when Paul and Libby decided to enter the 2003 AZAB (Azores and Back) race organised by the Royal Cornwall Yacht Club, a distance of some 2,400 miles. The aim was to complete the race rather than win it, and they achieved this objective in the fairly leisurely time of just over 24 days compared with the winner's 15. "We have always been cruisers rather than racers," explained Paul. "I've never been vaguely competitive. Whatever instinct it requires, I just don't think I possess it."

Then came the single-handed OSTAR race of 2005, described vividly in Paul's book *The Last Man across the Atlantic*, followed in 2011 by a voyage that was altogether more poignant. A few years earlier, Paul and Libby had tragically lost their son **Nicholas** – himself a fine young sailor and a talented poet – at the early age of only 23. To reconnect with happier memories of his son on a voyage he would have liked them to have undertaken together, Paul embarked on an epic 18,000 miles round voyage, partly solo, to Cape Horn on the southern tip of South America. On this occasion, the boat was a 38ft cutter *Wild Song*, and Paul's moving and thought-provoking account of the voyage is the subject of his book *One Wild Song: A Voyage in a Lost Son's Wake*.

Paul's most recent long voyage, again in *Wild Song* but with a shiny new engine and keel, was to Iceland. One objective of the voyage was to observe that most likeable of seabirds the Puffin. As Paul relates in his book *Farewell, Mr Puffin*, it proved a surprisingly difficult challenge.



Amateur Radio

"I'd been keen on radio since I was a youngster," Paul told me. "In my back bedroom at Sheffield I used to build my own receivers – nothing more complicated than two-valvers as I always used to use headphones. I became a really enthusiastic short-wave-listener." Living on the top of a hill, he was ideally placed and he loved tuning around the globe. "You were guaranteed to get Radio Moscow on anything, even a dustbin lid."

There was no opportunity at that time to think about getting an amateur radio licence, though as he developed his interest in sailing Paul did

take out a maritime mobile SSB licence. This was a boon during his solo OSTAR voyage. Perhaps because he was an only child, Paul never actually felt loneliness during the long voyage but he did often feel bored, when all was going well and the boat was sailing itself. At such times his regular 14.00MHz SSB radio sked with some of his fellow voyagers gave welcome relief from the monotony.

But these communications were of course limited in range and it was not until Paul met top yachtswoman **Jeanne Socrates KC2IOV/VE0JS** that his interest in amateur radio became



rekindled. In 2012/13, the 70-year-old British sailor had become the oldest woman to sail single-handedly non-stop around the world. *"She told me what a pleasure it was, in the middle of the ocean, to be able to chat with radio amateurs all over the globe,"* said Paul. The outcome was that he enrolled for a series of excellent distant learning courses organised by **Steve Hartley G0FUW** and his colleagues at Bath & District Amateur Radio Club and became the proud owner of the call **M0HWV** in 2015 in readiness for any future long-distance marine adventures.

At his home QTH in Suffolk Paul uses an Icom IC-718 covering all bands from 160m to 10m using either an end-fed long wire or 40m vertical. For maritime mobile, he has a Yaesu FT-450D 160m to 6m radio with an inverted dipole strung from the masthead as needed.

Farming

In 1990 Paul embarked on an adventure that was on the land rather than the sea. He had long been fascinated by the sturdy Suffolk Punch, once the most popular workhorse breeds in East Anglia due to its strength and good temperament. So he decided to become an organic farmer and devote the next ten years of his life to ploughing, sowing, reaping and mowing a 36 acre farm using Suffolk

Punches rather than tractors, **Fig. 4**. He wrote a diary of his activities for *The Times*, as well as producing several books and a couple of videos. I asked Paul what he had learned from the experience and how it compared with modern farming using tractors. He thought for a moment and said wryly, *"It's the most romantic imaginable way – of losing money hand over fist!"*

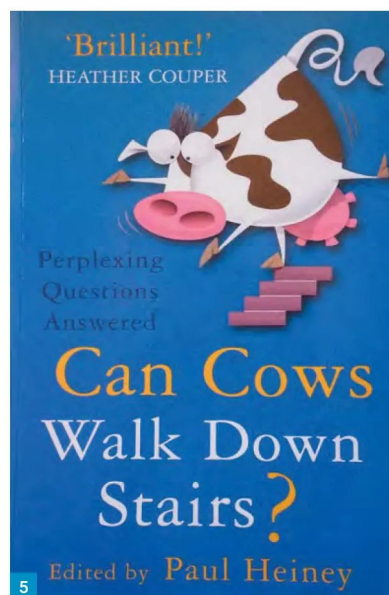
Other Books

In addition to his books on a sailing theme, Paul has numerous other books to his credit. One of his most popular is *Can Cows Walk Down Stairs*, **Fig. 5** which draws on the knowledge of scientists all over the world to answer the sorts of intriguing questions to which one might despair of finding answers.

Other books demonstrate the wide range of topics that have captured Paul's imagination over the years. If you have always struggled to light a barbecue, head for *Playing with Fire: The Art of Chopping and Burning Wood*. Interested in hogs? Try *A Pig called Alice*.

Telling a Story

Sailing, farming, writing, Puffins, film-making... As we chatted, I was struck by the sheer range of Paul's interests and activities. The common theme of them all is essentially that of telling



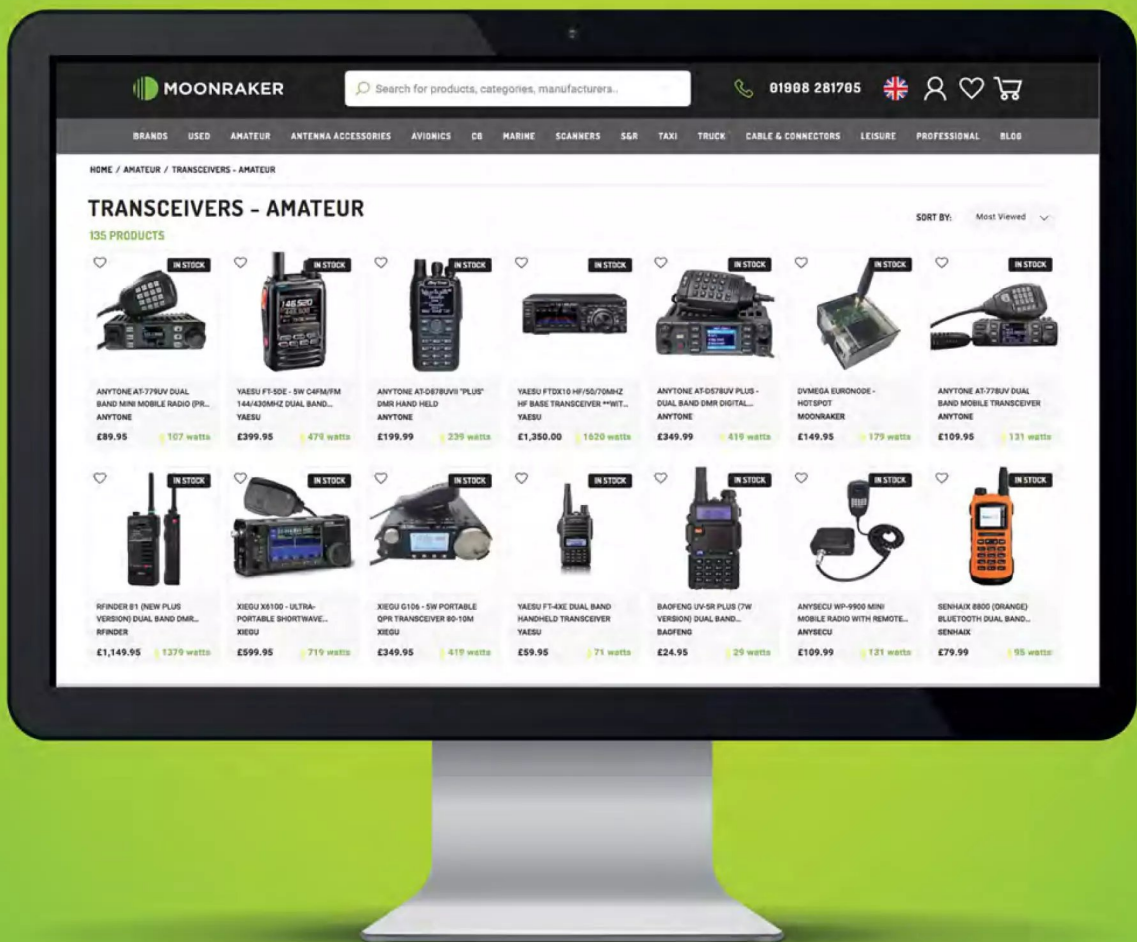
a story – what it's like to sail the Atlantic; what's involved in farming with horses rather than tractors. Paul clearly sees his role to be that of a communicator.

That's also the essential attribute of any radio amateur, so how appropriate that Paul should also now be M0HWV. **PW**

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Just imagine amateur radio being commemorated on a British commemorative postage stamp. Wouldn't that be amazing? Sounds fanciful? Not really, unlike the UK where the Royal Mail demurs to issue a commemorative stamp depicting amateur radio's historic links with radio communications (preferring instead to promote the likes of *Star Trek* and *Thomas the Tank Engine*), many other more enlightened countries have long since abandoned that mentality, gifting amateur radio worldwide exposure on a commemorative stamp each time it's stuck on an envelope or put in a stamp album.

Countries with Amateur Radio Stamps

Here then, is a small listing of those countries who have dared to buck the UK trend and issued amateur radio related stamps: USA, Pitcairn Islands, Greece, Norfolk Islands, Bhutan, United Nations, Ecuador, Israel, Spain, Columbia, Dominica, Uruguay, Slovenia, Solomon

Celebrating Amateur Radio on Stamps

Ray Howes G4OWY, an established stamp dealer, recommends chasing amateur radio themed stamps as a relaxing alternative to DX chasing!

Islands, Poland, Luxembourg, France/Antarctic Territories, Switzerland, San Marino, Sweden, Austria, Vietnam and Germany. Currently the complete listing has grown to 130 or so.

In passing, you may find like I did that it's much easier to collect amateur radio themed stamps than collecting those elusive DXCC awards. I gave up that heroic struggle after putting the easier ones in the logbook long ago. My advice then, for those whose patience tank is usually on the low side (like mine), is to consider collecting radio themed stamps. Anyhow, amassing 300+ QSLed countries is a big ask with a G5RV. And some of them are about as rare as a Blue Moon. Collecting stamps is less stressful too.

Philately

Even if you're not a philatelist (a posh name for a stamp collecting buff), don't lose heart. It's not mandatory. After all, many of my stamp buying clients (I've been a stamp dealer for 60 years – and long since given up collecting stamps to put in a stamp album – I only collect now, to sell), collect thematics exclusively. Another posh philatelic term for postage stamps that feature trains, planes, famous painters, butterflies, churches, fruit, or of course, amateur radio. Just an interest in radio is all that is needed – not the complex knowledge of how the mechanics of collecting stamps operates. When I began collecting stamps while at junior school, my knowledge

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of stamps was on a par with my then knowledge about the fundamentals of astrophysics. Which was nought.

For the CW Op

For the CW cognoscenti out there, don't fret stamp theme wise. Several countries have issued commemorative stamps featuring, yep, you've guessed it, a Morse key. During 1995, Royal Mail issued a set of stamps commemorating communications (unsurprisingly, no mention of amateur radio), two of which featured **Guglielmo Marconi**. Two other Royal Mail sets commemorated the BBC (1972) and the ITU (International Telecommunications Union). If you were to stray away from just collecting only amateur radio themed items, perhaps to expand a collection into a larger and more esoteric assembly, there are many other postage stamps that depict radio in all its different guises, including radar, vintage radio, telegraphy, commercial radio stations and so forth.

EKKO Stamps

Yet another theme, although this would be more difficult to put together, are **EKKO** radio reception

stamps (this company also devised a cute marketing ploy to flog an album they sold to put their stamps in). They were printed and beautifully engraved by the *American Banknote Company* during the 1920s, but were not actual postage stamps. These stamps, euphemistically called *Cinderellas*, would be sent out by US (Mexican, Cuban and Canadian broadcasters were also roped into this listener report activity) commercial radio stations (purchased from **EKKO**, based in Chicago) to whoever confirmed a listener report to them and pre-paid 10 cents. In the US, back in the early wild-west days of AM radio, broadcasters were eager to know where their audiences were located. Hence the **EKKO** stamps (other competitors existed). Each stamp would be overprinted with a *Verification Reception Stamp* indicator. Similar to an amateur radio QSL card.

Both endeavours are complementary, both being radio orientated. From a cost point of view, the **EKKO** stamps are more expensive to collect than amateur radio themed stamps. The former can be five to twenty pounds each. The latter, much cheaper. Fifty pence and up. I once had ample stocks of the **EKKO** variants, but foolishly sold them all to an American stamp dealer friend about

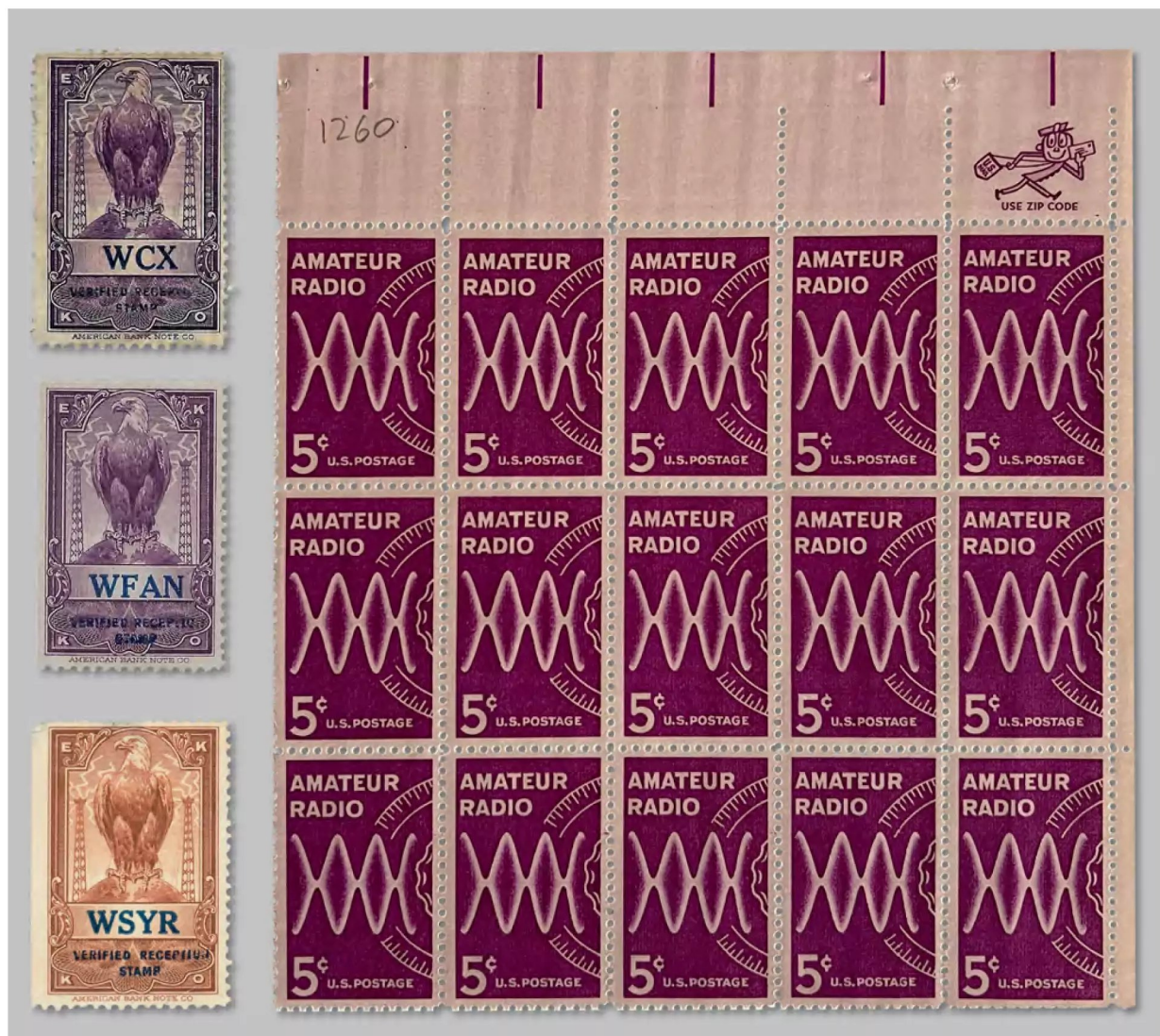
20 years ago. I was in the US on a summertime New York jolly (I don't recommend a winter time visit), so delivered them personally. I do occasionally find them in stamp collections. But alas, rarely. Most sellers of these items are US based, incurring high postage costs if purchased.

Sources

eBay, is an obvious first place to locate amateur radio themed stamps, including the elusive **EKKO** stamps. But somewhere else, and where I purchase many stamp collections, is via a monthly general sale at a local auction house. There is bound to be one of these somewhere near where you live. The best place to find out is **easyLiveAuction.com**, an online auction house. Just sit down with your preferred libation and scroll. Buying from a local auction is better, though. You get to rummage through the lots. Yippee! And you might be lucky and bag a bargain lot of amateur radio featured stamps. If so, just keep those and put the rest back into the next upcoming auction. If you buy online, there will be no rummaging. But an auction house will arrange a look through a lot on your behalf if you ask.

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An Investment or Fun?

From an investment point of view, the stamps described here won't provide you with the cash to pay off your mortgage any time soon, or enable you to swan off on a DXpedition for a week or two to a place where it's warm and sunny all day. But with that exotic DXpedition still in mind, you could instead, if you're feeling carefree that is, chance your arm and invest in some stamps from the early GB Victorian era or perhaps chuck some cash at the US 1847 first issue of postage stamps on cover (philatelic terminology for an envelope). One of which sold recently for half a million pounds. I kid you not. I did bid, but I got cold feet.

And unlike chasing the DX, no need to be sat in your shack for hours racking up the electricity bill. Stamps are an alternative fun factor. The fun of the chase and the thrill of completion. Like DXCC but without the competitive signal wars and the stress of losing out to a stranger sat on a rock out

in the Pacific Ocean. However, a similar thing can happen in the stamp world. Losing out to a higher bid online, or pulling your hair out because you missed an auction sale down the road. That happens to me frequently. But there are always more stamps around the corner. As a young lad one of my rules of collecting was never to collect things that can become too collectible, like beer mats, FDCs (First Day Covers, with stamps affixed) and stamps. But rules are meant to be broken.

Besides, my howling orchestra of guilt wrenched me from the whole idea that collecting stamps was a fool's paradise. I had boxes chock full of them. Still do. For me (putting aside my stamp trading activities), these little miniature works of art are, without doubt, an oasis of calm. Therapeutic. And I'd discovered, long before I was handed an amateur radio licence, that out there in stamp-land my then newly found hobby of amateur radio was being commemorated on stamps.

Not the UK of course. But I didn't really care back then. One of the first I came across was a USA (1964) 5c issue. So enamoured, I bought three sheets of them. My excitement gathered momentum when, over time, more and more countries issued stamps celebrating the exploits and altruistic aims of amateur radio. I kept on buying.

At one point, all I had left was my own personal collection. What was left of it. Not to worry, as most if not all radio themed stamps are easy to obtain via dealers, local auctions or online. Barring some items, most of these stamps are relatively cheap and do turn up fairly frequently at auction. And buying them won't cost an arm and a leg. You'll still have enough cash left over to buy another rig, or whatever else takes your fancy. So why not jump in and join the chase? It's fun. Compared to battling the cut and thrust of DXCC, perhaps a complementary radio stamped themed *DX Century Club* is the way to go. Happy days. **PW**

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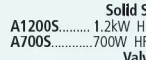
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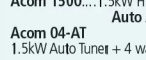
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The C2V Innovative Mini-Meter

Richard Constantine G3UGF evaluates a tempting VSWR/Power Meter from China.

As a teenage Short-Wave Listener, I had never heard of a voltage standing wave ratio (VSWR) meter. I don't recall the amateurs I visited having such devices. Most of them seemed to tune their ex-Lancaster bomber or various other ex-war department and semi-lethal homebrew transmitters for maximum anode current flowing through the final power amplifier (PA) valve. The aim, to feed maximum RF to mainly random length wire antennas or open-wire doublets. Ex-government thermocouple ammeters were commonplace. Others used lash-up RF sense field strength meters, either in the shack or remote at the bottom of the garden. How far we've come from those heady days.

While the hand drawing of a full circuit diagram of a transmitter with component values featured in my RAE exam and much practised in the back of my school exercise books, standing wave ratio wasn't on the curriculum. Maybe I missed it at night school or it wasn't considered of importance. End-fed long wires and valve transmitters were much more forgiving back then than early transistor PAs.

MiracleMeter

The first meter I ever saw was a KW of Dartford, owned by a friend. Having constructed a three-band fan dipole fed with coax he used this magic meter to trim the dipole legs, so as maximise transmitter output and minimise RF feedback in his bedroom. He could determine whether the antenna was inductively or capacitively reactive, too long or too short and where exactly in the band his antenna was resonant. It was a revelation.

Based on the Wheatstone principle and more correctly named a reflectometer not a 'Swaaar' meter, my early attempt to copy his was based on the self-powered Moni-Match taken from a gifted 1961 ARRL manual and third edition RSGB Handbook, the 'bible' that accompanied me through my college years.

Homebrew Copy

Practically, a VSWR meter has only a few components, in my case a sensing wire pushed though some air-spaced TV coax, an OA91 germanium diode and capacitor to rectify the RF at one end of the sense line, coupled to a moving coil meter with a potentiometer to earth.

At the other end of the wire, a terminating resistor, the value chosen to match the impedance of the coax, switchable for dual 75/50Ω impedance, **Fig. 1**.

What I've described only measures RF travelling in one direction and the amount of sensing of RF depends on the length of the line, related to the frequency of the transmission. Being relatively short and self-powered, 1.8MHz performance was meagre while on 28MHz it resulted in a bent meter needle as it banged against the end stop!

To work out a forward-to-reflected ratio you either need two identical sense lines with

identical, accurately matched diodes working in opposition, ideal for a twin meter display. Or one line and reverse the diode polarity. The industry standard built like a tank and most famous meter of all, the Bird 43, still requires the user to manually reverse the polarity of the diode located in a special housing known as a slug. In place of flexible coax it uses a silver-plated coaxial tube running between the input/output sockets. Many years later I became the proud owner of such a device and later fitted an additional peak envelope power (PEP) circuit board plus battery to measure SSB RF without having to whistle. The photo, **Fig. 2**, shows the meter under review alongside a couple of those classics.

Today VSWR/Power meters come in all shapes, sizes, colours and prices to tempt buyers. Modern transceivers, stand-alone devices, manual and auto tuners, no longer use sense wires. Typically, RF pick-up is done via a fine wire wound around a small toroid that's slipped over the coaxial transmission line. RF is diode rectified as before. The power metering in a stand-alone device is commonly in series with a set of switched/calibrated range resistors to earth. In this way it not only displays VSWR ratios but also power level in switched calibrated ranges indicated on the meter dial.

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Fig. 1: Inside a classic VSWR meter circa 1960s.

Fig. 2: Original KW VSWR meter 75/500, C2V

Digital VSWR Power meter, Bird 43 with PEP

board. Fig. 3: C2V front panel – switched on.

Fig. 4: Inside the C2V software-controlled meter ferrite toroid sensing.

As this is a review of a rather unusual meter from China I don't intend to go deeper into the fascinating mysteries of VSWR and power measurement. However, I would strongly encourage anyone who wants to know more to get their hands on the latest version of the RSGB's *Radio Communications Handbook*, now 12th edition (how time flies). I'm not on commission but every shack should have one on the bench for reference and next to their also excellent *Yearbook*.

Peak Power for Peanuts?

If you've followed my thread, you'll now begin to understand why I looked with incredulity at what comes next.

A few months ago, I began to notice a new meter offering from China available from multiple export agents and at differing prices. What attracted my attention was the front panel legend, 'Peak Power 120W' and 'FM-AM-SSB'.

As someone who once had a customer return a faulty VSWR meter because it only worked on SSB when he spoke and now owning a Bird peak reading watt meter for SSB, I couldn't believe what I was seeing.

Was this new low-cost device really a peak reading (PEP) meter with a digital display, designed for SSB and available for prices between £30 and £50 delivered?

Proof of the Pudding

On arrival it was smaller than anticipated at 87 (W) x 62 (D) x 37mm (H) excluding SO239 sockets. Its casing is the ubiquitous black alloy two-part extrusion common to many Far East devices.

It has an internal 1A capacity battery, USB-C for both charging and software upgrade, on/off switch and three coloured, battery state LEDs. The small 25mm (1in) display isn't exactly high definition but perfectly adequate, even if the information is rather small.

At switch-on it briefly shows the software version and then readout of forward and reflected powers, SWR ratio and the power actual being transmitted plus battery voltage, all at the same time, **Fig. 3**.

It has one more trick and that is a high VSWR audible alert from a piezo sounder. This could be a blessing or a curse if you're operating while others sleep or are of a nervous disposition – it can take you by surprise.

The final photo, **Fig. 4**, shows the internals of the meter.



Yes or No?

Based on the old principle of if it looks to be too good to be true, it's unlikely that it is true, did it work? In short, the answer was both... Yes and No.

Despite the inference on the front panel that pushes the bounds of advertising, it's not a PEP wattmeter. It is a conventional device. What did I really expect for the price?

It's compact and easy to transport for portable use and the simultaneous display of all the information is both interesting and convenient. It appeals for QRP, portable and homebrew use. It could be handy for setting up antennas, outdoors etc.

It has no protective feet and I would definitely advise sticking some on to prevent scratching of other items. I particularly like those small clear low-profile pill sized, cupboard doorstep ones that come on a strip from DIY stores, very handy to have.

The unit claims coverage from 1.8-50MHz. My checks against other forms of metering to hand indicated a difference in measurement of between 0.2-0.6 watts across the various bands. Not enough to be of real concern and likely due to the internal software averaging up or down. The discrepancies didn't seem quite linear or

NEWS EXTRA

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Students receive weekly work packages via an on-line classroom and have access to weekly on-line tutorials. Each student is allocated to one of the remote tutors who provide feedback and additional guidance. There are weekly quizzes to check on progress and at the end of the course there are a number of mock exams. There is no charge for the training but applicants must work through some pre-course material and complete a quiz to be eligible for a place. This focuses on the 'new' Intermediate topics that were introduced to the syllabus in 2019. The aims of the pre-course classroom are to make sure applicants can use the BBDL systems, and to ensure that they are ready for the current Full training syllabus. Each student will need to provide their own RSGB Full Licence textbook and arrange their own exam at the end of the course. Advice will be provided as part of the course. The deadline for course applications is Tuesday 25 July. To request full details and an application form, please e-mail BBDL Team Leader, **Steve G0FUW**, via g0fuw@bbdl.org.uk

THE CW WAY OF LIFE: Chris Rutkowski

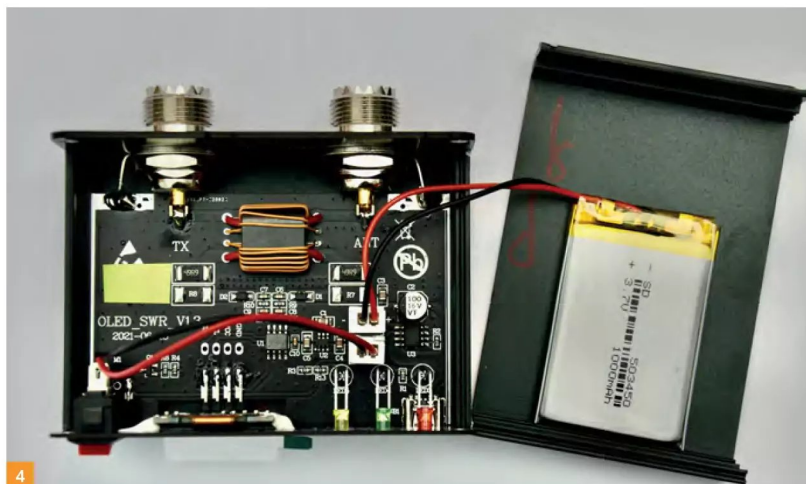
NW6V recently released a great book about Morse Code called *The CW Way of Life*. He provides 232 pages full of meaningful and entertaining content that is well written. Chris first takes readers through the basics of CW and operating with a straight key. He talks about how we approach process and understand Morse Code. Do you want to explore a unique approach to strengthening your copy skills? Then try his chapter on Code Talking. He gives us a special way to notate code, some drills, and a whole section on Morse Code lingo, including standard exchanges, protocols, and operating etiquette! Finally, he leads us through advanced key training, looking at bugs, paddles and the rest. Available through Amazon, this is a great book for anyone interested in the original digital. £22.34 in paperback and £7.18 as a Kindle download.



2



3



4

consistent across the input power ranges or frequencies but again not enough to put me off.

To conclude, it's neat, appealing, reasonably well made and presented. It's relatively cost effective for what it provides and you can use it in the dark. Personally, I don't need yet another one to add to my growing historic collection. However,

if you've read this so far, it might just be right for you.

Oh, and by the way... never ones to let the grass grow, in the time it's taken to evaluate this item there's now another version with a larger colour display that does the same job ...for more money... of course. **PW**

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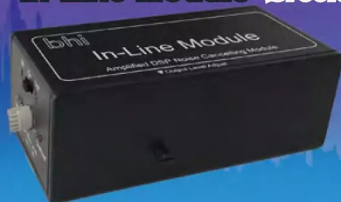


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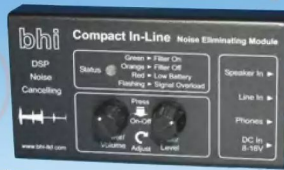


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E & O.E.



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gw4vxe@icloud.com

145 Alive!

In a packed column **Tim Kirby GW4VXE** reports a very busy month on VHF/UHF from 40MHz through to 481THz!

On the afternoon of 23 April, the FM portion of the 2m band was really buzzing with activity. A series of nets around the country, co-ordinated by **Tim Hughes G5TM** attracted a great deal of activity, resulted in a lot of fun and some surprising contacts into the bargain.

Tim co-ordinated 17 different net frequencies, run by volunteer stations generally in good locations on high ground. With the net control stations well located, many stations with simple setups were able to call into at least one of the nets and many to more than one. A number of the net controllers were able to work each other.

Tim kindly put together a summary of the event. A total of 465 stations were logged and there were 587 check-ins to the nets. 382 of the stations were from England, 47 from Scotland, 34 from Wales, one from Jersey and one from the Republic of Ireland. 24% of the stations taking part were Foundation Licensees. The busiest nets, in terms of stations logged, were Lancashire, 97; West Midlands, 73; West Sussex, 50 and East Sussex, 49. Of the 48 English Counties, 46 were activated, just the City of London and East Yorkshire (East Riding) were missing. G0CNN/P worked six of the different net frequencies, while GW7HJN/P, M0ABT/P and M0VOK/P worked five different nets. The longest distance contact logged was from M0EUK/P in County Durham to M0ABT/P in East Sussex, a distance of 465km – good going on FM!

David M0TPT was at 1000ft ASL from Dunstable Downs, operating one of the nets, and got 27 stations in the log, with the best distance being 123km.

Graeme Stoker M0EUK writes, "I operated the northeast England station along with **Keith G4ITR** on 145.450 [Fig. 1]. We operated from IO84XT, 1500ft up in the North Pennines, about 20m west of Durham city. We departed good weather conditions in Newcastle to a very damp and foggy portable site, right up in the clouds.

"It was an amazing event, with 35 contacts made from the Scottish Borders down to JO00 on the south coast. The bulk of stations on frequency were around the north-east and North Yorkshire, and we welcomed a couple from West Yorkshire too who made plenty of contacts up into the NE".

Dom Wilkinson 2E0WHQ writes, "I was located at Barbury Castle, about five miles south of Swindon. The location has an elevation of 250m AMSL and I use it regularly when taking part in the RSGB FMAC & UKAC contests. My setup was my Icom IC-910H radio, running 50W, powered by a 110Ah leisure battery. The antenna was a Diamond SG7900 mounted on top of my Total Mast Solutions 17m pneumatic mast, which is permanently fitted to my Toyota Land Cruiser. Directly under the SG7900 was an Icom AG-25 masthead preamplifier, which was powered directly, via the coax from my IC-910H. The preamplifier worked absolutely fantastically, bringing up the weaker station by several S-points. The mast wasn't even up at full height, I'd decided to

keep the top section retracted, as I wasn't sure what the wind was going to be like. As it happened, the weather was glorious, so I really didn't need the additional height anyway.

"I was set up by 12:00 local, which gave me an hour to do some testing and have a couple of QSOs before the event. At the end of the official event, at 15:00 local, I still had stations calling me and wanting to continue, so I stayed on working them and getting them to work each other and finally went QRT at 17:00 local".

Fraser Wenseth MM0EFI put on a very impressive activation, Fig. 2. Here's what he wrote, "I ran a 2m FM net from the top of Mount Battock (778m SOTA GM/ES-032) IO86PW on Saturday. I only lasted an hour and 45 minutes due to the extreme cold (which I was prepared for). There was snow on top and the rime ice was building up on the wire fence as the afternoon went on.

"I logged 24 contacts, which is a 2m FM record for me from a SOTA summit in Scotland. Got lots of the guys talking to one another as well. I'd promoted the event on the SOTA reflector and that got at least six other activators out on SOTA summits across Scotland. My best DX was 198km to **Ian M1CPP**, who was running 5W into a rubber duck attached to his FT-818.

"My station was an ancient but bombproof Yaesu FTM-10, using the head unit as a mic. and powered by an 8400mAh LiFePO4. Had a 4-ele-

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Fig. 1: Keith G4ITR prepares the 11 element yagi that he and Graeme M0EUK used during the 145 Alive event from the North Pennines.

Fig. 2: Fraser M0EFL had snowy conditions to contend with during 145 Alive.

Fig. 3: Preparing the 2m array at Europa Point, Gibraltar are ON7EQ and ON500.

Fig. 4: The 70cm EME system of Bryn GW4ZHI.

ment beam that weighs just 100g and also a Slim Jim on a 4m mast. Oh, and I mountain biked and hiked a 16-mile round trip to get up there in time for the event".

Ed Spicer M0MNG wrote, "My QTH was Chantry Post near Storrington in West Sussex, 190m asl. The locator is IO90SV. There may have been slight lift conditions as evidenced by the mist along the horizon looking northwards. My best DX was G2TO near Cambridge. I would have liked to work this club station, but it didn't actually count as a valid QSO because we didn't manage to exchange details directly. **Gary M6KVK** at the Hogs Back on the A31 in Surrey kindly passed on greetings messages between G2TO and M0MNG. It was noticeable that the moments G2TO was at his strongest (51) coincided with the sound of aeroplanes flying over. So, I assume our contact was mainly aircraft scatter.

"This is a really fun non-contest activity event, and I am looking forward to the next one. The radio was my first ever transceiver (bought second-hand years ago, and it was old then!), the Kenwood TM-701E, putting out 25W to a 7/8ths whip on top of my car".

Paul Haygarth M0TZR wrote, "**Norman G4WKT** and I took part from high ground in County Durham (Stang Top IO94AK 1700ft ASL) approximately 50 miles from my home QTH. There was mist and thick fog which lasted all day... but this didn't dampen our spirits!

"We arrived at Stang Top a couple of hours earlier than the start of the event to get some contacts into the logbook. When the event got started, we found **Graeme M0EUK** and **Keith G4ITR** on 145.450MHz in charge of the Northeast Net control. We called in to the Net and then the fun began... We spent the next couple of hours being passed around stations all over the Northeast. Graeme and Keith did a great job in Net control. Including the Northeast Net and others... we worked around 35 stations, roll on the next one!"

As you can tell, '145 Alive' generated a lot of interest and excitement on the 2m band. Although it's not the first time such an event has been run, it was certainly the most popular to date. At the end there were a lot of people asking when the next one would be. Tim G5TM plans to have them every three months or so and dates and details will be announced on the '145 Alive Activity Event Group' on Facebook. It's clear that this event attracts some people who are not interested in taking part in the 2m



and 70cm FM UK Activity Contests run by the RSGB – I sense the word 'contest' puts some people off.

But, if you can't wait until the next '145 Alive', remember to call CQ on 145.500 from time to time and keep an ear out there – you never know who you might hear. Congratulations to Tim G5TM for the idea and to everyone who took part in the April 145 Alive!

Transatlantic DX on the FM Band

Paul Logan wrote with a few details of the first logging of transatlantic DX on the FM (88-108MHz) band, the first confirmed instance of which was on 26 June 2003. Paul writes, "Signals were received by myself here in Northern Ireland from New Brunswick, Quebec and Newfoundland in Canada and from Maine, New York and New Hampshire in the USA.

"During that E season myself and other TV and FM DXers were regularly observing weak carriers on various North American TV vision frequencies – regularly getting up to 67MHz – but the evening of 26 June 2003 was a whole different level of opening. There are more details here:

<https://band2dx.webs.com/tafm03.htm>

"There's a video of the first US signal across, WHCF Bangor, ME on 88.5 (note the brief meteor scatter from Radio 2 on the Isle of Wight!):

www.youtube.com/watch?v=ga56hsHvTCg

"In an extraordinary opening lasting almost ten minutes, I received 92.9 CKLE in New Brunswick:

www.youtube.com/watch?v=qy4Nnhet6SY

"Since 2003 I've observed a further nine openings toward North America – mostly short-lived affairs – the greatest being 26 June 2009 (hour long duration) with signals from Pennsylvania, New York, New Jersey, Massachusetts, Rhode Island, Maryland and astonishingly Alabama at 6456km. A recording of a local news report during that reception was sent to the station concerned and confirmed in writing by the actual newsreader – who needless to say was somewhat surprised! I have a QSL Letter from 90.7 WVAS in Montgomery, Alabama:

<https://tinyurl.com/3r9r4axs>

"The dates of the Band II transatlantic openings I have recorded are:

26-6-2003: Canada and USA

20-7-2003: Canada

26-6-2009: Canada and USA

31-5-2010: Puerto Rico

17-6-2014: Puerto Rico

8-7-2018: Canada

21-6-2021: Canada and Greenland (50 watt station for almost an hour on 88.5!)

1-7-2021: Canada

22-7-2021: USA

15-6-2022: Canada"

Paul continues, "Apart from myself there have only ever been two other transatlantic receptions recorded from the European side; at the end of the big night in 2003 Newfoundland was received by **David Hamilton** in Ayrshire, Scotland and in 2010 the Dominican Republic was received by **Mike Fallon** in Sussex, England (During that opening I was receiving Puerto Rico).

"Since 2021 **Larry V01FOG** in Newfoundland

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has been monitoring on the other side and has quickly shown that paths between there and Iberia are almost semi-regular during E season. That path seems a lot more regular than any further north between Ireland and North America.

"The highest transatlantic MUF that I have ever observed has been 105.9 from Newfoundland to my location in Fermanagh on 1 July 2021 – the opening lasted around 10 minutes."

The 8m Band

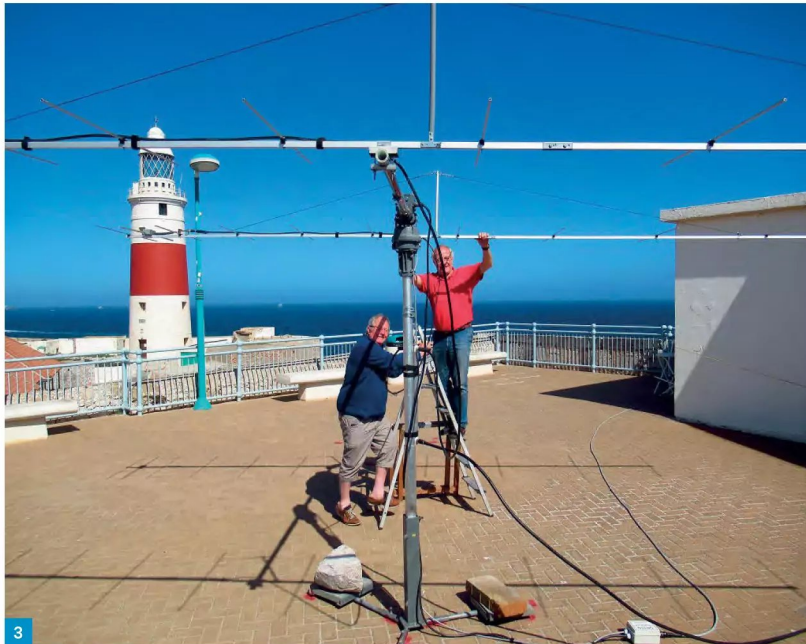
Roger Laphorn **G3XBM** writes that the Es season has started on the 8m (40MHz) band, with reports on his 2.5W FT8 signal. On WSPR, with a 50mW signal, Roger has been heard in Portugal by **Hugh Cocks**, and using 2W he has been received in Germany. Hugh, who appears on the PSK Reporter website as HC02, had heard SV1DH testing with 10mW of WSPR. ISM level of WSPR looks very encouraging. Thanks to **Paul Farley, G7PUV** for passing on the information from Hugh.

The 6m Band

I swapped emails with **Robert 3B9FR** after I copied him – briefly – on 6m. Robert said that he had got going on 6m earlier in the year and has enjoyed the TEP propagation. He has worked a few US stations, but also Mexico, Cuba, Guadeloupe and Puerto Rico. He has worked many stations in Asia and Oceania by F2, including New Caledonia, Guam, VK8, Indonesia and Vietnam along with very many stations in Japan. In Europe, Robert has worked Norway, Sweden, Eire and a few G stations. Robert runs around 85W to a 6-element quad on a 23-foot boom. The antenna was sponsored by the UKSMG.

Kevin Hewitt ZB2GI made some nice TEP QSOs from the GARS club station over the month, including 7Q7CT (KH66), PR7AB (HI22), PR7AP (HI23), PR7AR (HI23), PY5QW (GG54), PY7AN (HI21), PY7DJ (HI21), PY7RP (HI21) and V51MA (JG87). From home, using the 'magic broomstick' antenna – Kev has been very active on Es, making many QSOs into DL, G, GW, LX, ON and PA.

Steve PJ4DX reports that 6m was much quieter in the second half of April and first half of May when compared with previous months although there was a good opening from Bonaire to Australia, New Zealand, Fiji and New Caledonia on 24 April. As of 10 May the only Sporadic E to Europe that Steve saw was when IK4MGP and 9A6R were decoded (though not worked) on 7 May. Hopefully the band will start opening properly soon. Best DX worked between 10 April and 10 May were: 5Z4VJ, CO0RRC (IOTA NA-086), K6RO (Cal), KH6HI, KH7TV, TR8CA, V31MA, VK4ADC, VK4CZ, VK4KEE, XE2JA, XE2W, XE2YWB, ZL1AKW, ZL1RS, ZL1SG and ZL2MF. The only 'got-



way' (new DXCC decoded but not worked) was ZR1ADI. Just after Steve sent his report in, he worked HK0/PY7XC for an all-time new one.

Ian Bontoft G4ELW (Bridgwater) enjoyed a good Es opening around Europe on 24 April, and an SSB QSO with EA6MR, running 20W to a dipole in the loft.

Tony Collett G4NBS (Cambridge) caught his first Es opening of the season on 22 April, working IT9JNR (JM67) and IH9YMC (JM56) in the late afternoon. On 24 April, Tony worked 7X2RF (JM16) and then around 2100UTC there were some EA3/EA5 stations coming through, along with D2UY. On 26 April, Tony worked E7, S5, 9A and YU in an opening just before 1300UTC. Next day, Tony worked 4U1A (JN88) along with UT3WX (KN19) as well as OK, OM, OZ, SP, SM, LA, DL and HB9 in a lunchtime opening. During the 12 May opening, with Tony operating as GR4NBS, he worked HA, OK, OM, YO and UX0DL (KN18) around 1630UTC.

During the 11 May UK Activity Period, Tony found the band very noisy and just about managed to work GI4SNA.

Here at **GW4VXE** (Goodwick) the first Es QSO in the log was IS0BSR (JM49) on 24 April. I was pleased to work 7Q7CT (KH66) later that day, with 3B8FA having been seen weakly for a period or two as well. Next day, the band opened to the south again, with 7X2RF (JM16) worked around 1100UTC. I was particularly pleased to work ZS6NJ (KG33) for a new country from Wales and country 100. It was quite a memorable QSO, as I made it, remotely, from the dentist's waiting room! Aside from ZS6NK (KG46) worked on 26 April, there have been some weak decodes from 3B8FA and 3B9FR. There have

been some strong but short openings to South America, with good signals from PY and LU – generally when I have been out of the shack. So far, nothing from North America this season although there have been plenty of contacts around Europe.

The 4m Band

Alerted by Spanish broadcast stations on Band II, **Simon Evans G6AHX** checked the 4m (70MHz) SSB calling frequency on 26 April and worked EA4KM (IN80) – an early start to the Es season at this frequency.

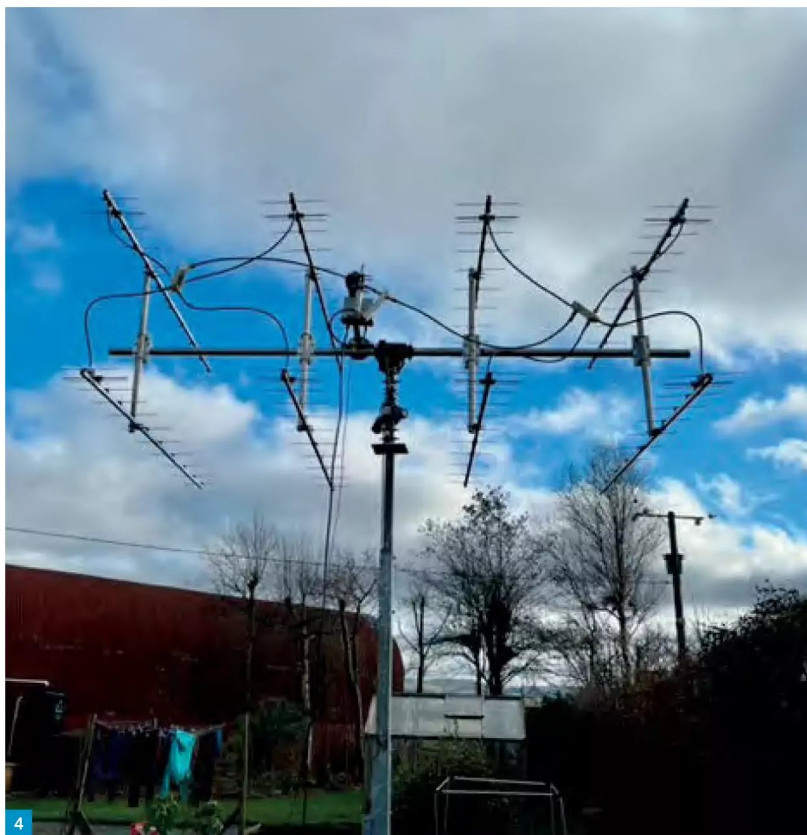
The 2m Band

Kev ZB2GI writes, "Gibraltar Amateur Radio Society hosted a 2m & 70cm EME activation from Harding's Observatory at Europa Point on 14 to 17 April. GARS are grateful to **Jean-Jacques De Rey ON7EQ** and **Jack Debouche ON500** who drove from Belgium to Gibraltar with all the equipment and expertise required to operate EME. Jean-Jacques manufactured the 2m 11-element Yagis and much of the ancillary equipment [Fig. 3].

"The EME activation was dedicated to the memory of our friend **Hans De Beer ON5AEN** who passed away in October 2021. Hans visited Gibraltar with Jean-Jacques in 2015 when they operated Meteor Scatter during the Perseids". The log is very impressive with around 150 stations worked on both JT65 and Q65-60, including G4URT (IO82) and G8RWG (IO91).

On 6 May, Simon G6AHX worked five stations in the Europe-wide contest, his best DX being F4KJP/P (JN29).

During the 2m FT8 Activity Period, Ian G4ELW



worked F6IFX (IN87), GU0UVH (IN89), F4FET (JO00), EI2FG (IO61) and F4BKV (IN95). Ian wins the award for the first 2m Es QSO reported to the column, on 8 May, when he worked EA5BY (IN98) on FT8. Shortly afterwards Ian worked F4HBY (IN97), either on tropo or perhaps even backscatter from the Es.

Andy Adams GW0KZG (Letterston) had a listen during the 2m FT8 Activity period and heard a couple of GM stations, but wasn't able to raise them. He did work GU0UVH (IN89) – not the easiest path from Pembrokeshire!

The 70cm Band

It was great to hear from **Bryn Howell-Pryce GW4ZHI**, who wrote, "Since moving from the Thames Valley to mid Wales (near Aberystwyth) eight years ago, I've been gradually improving my station. The QTH is not perfect for VHF and above by a long way as I have the Cambrian mountains to my east but I have a clear take-off to the south, west and north. The east is a bit more of a challenge. I'm QRV on 4m, 2m and 70cm tropo and MS and on 70cm EME where I have just put up an array of 8 x 12 element Yagis from Dual running QRO. I'm attaching a photo of them [Fig. 4]. I had been on 2m EME but the winds here make it more of a challenge so I've abandoned it, at least for the time being. So far the 70cm EME system seems to be working well

and the initials are gradually building up".

On 70cm EME, ZB2BU, operated by ON7EQ and ON500, made around 20 QSOs using 2 x 19 element Yagis, an F9FT PA and an Icom IC-7000.

Tony G4NBS noticed some very high sun noise at the start of the UK Activity Contest on 9 May and says he wasted some time trying to find where the noise was coming from – and then the penny dropped! The highlight of the session was working OV3T on SSB on aircraft scatter. During the FT8 Activity Period on 10 May, there was lots of doppler and reflections from planes and weather – making some decodes very difficult, despite strong signals. Tony made 83 QSOs in 31 locators in four hours. He didn't see much from GI or GM, owing to the weather, although he was glad to work EI8KN and EI4ACB (IO62) as well as GI6ATZ, GI4SNA, MM0CEZ and GM8MJV. Things were better to the east, with OV3T being a consistent signal through the session. DJ8MS (JO54) was the best DX with DL5FCW (JO40), DL9DBF (JO40), DH7IF/P (JN49), DF4IAE (JN49) and DF2VJ (JN39) also being nice contacts.

The 481THz Band

Roger G3XBM continues some local CW tests on the band. He has downloaded the Spectran software onto his PC, but hasn't yet tried out any cloudbounce tests.

Satellites

Jef VanRaepenbusch ON8NT monitored two schools contacts made by the ISS, on 7 and 22 April. Jef worked EB4FWC using FT4 through the FO-29 satellite on 7 April.

Patrick Stoddard WD9EWK writes, "On the weekend of 6/7 May, we had several of the Israeli TEVEL satellites open for use. I made contacts on five of the eight satellites, and didn't hear three of them (TEVEL-1, TEVEL-2, TEVEL-8). I used narrow FM on the TEVEL uplink frequency 145.970MHz, which appeared to help me get through. And, on some passes, other signals were passing through the TEVEL satellites – stations using SSB or CW on RS-44, when it was also in view as a TEVEL satellite was passing overhead. This meant the FM signals intended for a TEVEL satellite were also heard through RS-44. Maybe we will have more opportunities to use the TEVEL satellites, after several of them were activated and successfully used by hams around the world.

"At the end of April, I drove to California to give a presentation on satellite roving with **Endaf N6UTC/MW1BQO**. We had a nice crowd at the meeting, along with others attending via Zoom. After the presentation, Endaf and I drove about 200 miles northwest of Los Angeles, for a day of operating on the CM94/CM95 grid line. We worked several FM and SSB satellite passes, and even made some terrestrial contacts on five bands (2m, 1.25m, 70cm, 33cm, 23cm) using Alinco's DJ-G7T (2m/70cm/23cm) and DJ-G29T (1.25m/33cm) FM handheld radios".

FM and DAB

Simon G6AHX monitored signals from Spain up to 107MHz on 26 April, with many showing RDS data, allowing Simon to identify them using their PI code.

Paul Logan writes, "The E season got off to a decent start this year. Five days of E skip reaching Band 2 were observed here. 26/27 April and 8 May were particularly good. On the afternoon of the 26th after various regions of Portugal and Spain were received a few weakish signals popped up from Fuerteventura in the Canary Islands – probably a mixture of E skip and a very extensive tropo, which was going on at the time between the Canaries and Iberia proper. The usual beacon of RNE Clasica on 87.7 suggested an open path. Distance from here in the 2900km rang, a good 1200km further than average E distances observed on the FM band (usual one hop limit is around 2300 to 2400km).

"Also, it's interesting to see F2 rumbling on with an opening on the late afternoon of 25 April bringing a slew of US fire traffic from Massachusetts and Connecticut on 33MHz."

That's all there's room for this month. Many thanks to everyone who has been in touch – please keep the information coming. **PW**

Tony Smith G4FAI
g4fai@btinternet.com

In late 1944-early 1945, as the Allied armies closed in on the enemy homeland, American Office of Strategic Services (OSS) agents were sent into the heart of Germany, to obtain and send back military and other intelligence to assist the Allied advance.

They were also to establish relationships with anti-Nazi elements, especially underground labour groups within the Reich, who had indicated to the OSS that they would help to shelter and aid agents dropped behind enemy lines.

However, conditions were very different from those in the occupied countries, where resistance groups and individuals provided organised help in the form of safe houses, escape routes, parachute reception committees, and so on.

Resistance within Germany was mainly passive and fragmented, motivated by political, religious, or personal reasons, resulting in private attitudes rather than any positive action. For an OSS agent, it was a hostile and dangerous environment, and certainly one where a radio operator with a clandestine radio would need to be very careful when setting up his or her station to communicate with London without being detected, apprehended and shot on sight.

Another problem was that the police or Gestapo frequently stopped men on the street to check that they had appropriate authority for being there, and that they were not deserters, escaped Allied prisoners, or other persons with hostile intent.

German Nationals

To minimise the risk of detection, the OSS concluded that agents needed to be natural German speakers, equipped with faultless (forged) documentation. They should wear authentic German clothing and have convincing reasons for being wherever they went on their missions; and that only German nationals would meet this criterion.

There were a number of anti-Nazi refugees in Britain who had escaped from Germany before the war, and some who had lived most of their life here. Some of them were carefully researched and checked for their anti-Nazi opinions and their suitability and willingness to return to Germany as spies. They also needed to have a knowledge of the local dialect where they were to be dropped and be familiar with the area.

Disgruntled prisoners of war were another possible source of recruitment, but extra care had to be taken in case a possible candidate lied about his anti-Nazi views in the hope of finding a way to get back home to Germany.

All those identified as suitable were finally asked if they were prepared to parachute blind into such a mission without any initial support when they landed. Around 200 accepted this proposition and were recruited as OSS clandestine



OSS Radio Spies in Germany 1944-45

Tony Smith G4FAI relates a little-known tale from World War II, with details of the communications used.

agents. Once selected, they were given eight weeks training at an OSS Mission Training School in Ruislip.

First Mission

At midnight on 2 September 1944, the first agent parachuted into Germany from an RAF Lancaster bomber. **Jupp Kappius** had fled to England in 1937 after being placed on the Gestapo's wanted list for political reasons. His task was to organise a campaign of sabotage in the industrial Ruhr. He had no radio and relied on his wife, posing as a Red Cross nurse, to carry reports to Switzerland which were relayed back to the UK.

Later, agents were dropped from American A-26 Invader fast twin-engine bombers, flown by 492nd Bombardment Group, 8th Air Force based at Harrington Airfield in Northamptonshire. They had a crew of three, the pilot, navigator and turret gunner, and carried up to two agents with their parachutes and equipment in the bomb bay adapted for the purpose.

The aircraft were stripped of all accessories not necessary for their long flights, including guns and IFF equipment, to increase their range and speed, and flew singly over occupied Europe at low height to try to avoid German radar.

Concern

On 11 September the American First Army entered Germany at Aachen, encountering unexpected high resistance from the enemy. It was now more important than ever to have military in-

telligence about their plans and activities and the OSS missions were mustered to go to Germany.

At the same time there was concern about how they could send messages and information back to the UK. The use of existing clandestine radio sets with wire aerials was included in the plan, but a more secure form of radio-communication was about to be introduced.

Joan-Eleanor

Lt Cdr Stephen Simpson, a USN officer attached to the OSS in London, who had worked for RCA before the war on radio transmission technology, conceived the idea of a radio system that could be used undetected inside Germany. He visualised that an agent on the ground could speak directly to an operator in an aircraft circling overhead, with a narrow, conical, radio beam linking them which was virtually invisible to enemy direction-finding stations.

He sought the help of an RCA colleague, **De Witt R Goddard**, who was given a commission in the Navy and immediately flown to London. Together, with the co-operation of the USAAF, they produced a transceiver small enough to be concealed on an agent, together with a larger set, connected to a wire recorder, to be installed on an aircraft.

The sets were jointly designated 'Joan-Eleanor'. Joan was named after a close friend of Simpson, an officer in the WAC, and Eleanor was named after Goddard's wife. In operation, Joan was on the ground and Eleanor in the aircraft.

The aircraft needed to fly at high speed to avoid

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Photo 1: Douglas A-26 Invader. As used to parachute German OSS agents into Germany in 1944/45. (Courtesy Jonathan Verschuuren)

Photo 2: De Havilland Mosquito with USAAF markings. As used for OSS Joan-Eleanor radio contacts over Germany. (National Museum of the US Air Force) **Photo 3: Joan transceiver (SSTC-502) with plug-in antenna.** (Source unknown)

anti-aircraft fire and circle at up to 35,000ft above the agent on the ground. The aircraft selected for this role were British De Havilland Mosquitos flown by the USAAF in close co-operation with the OSS.

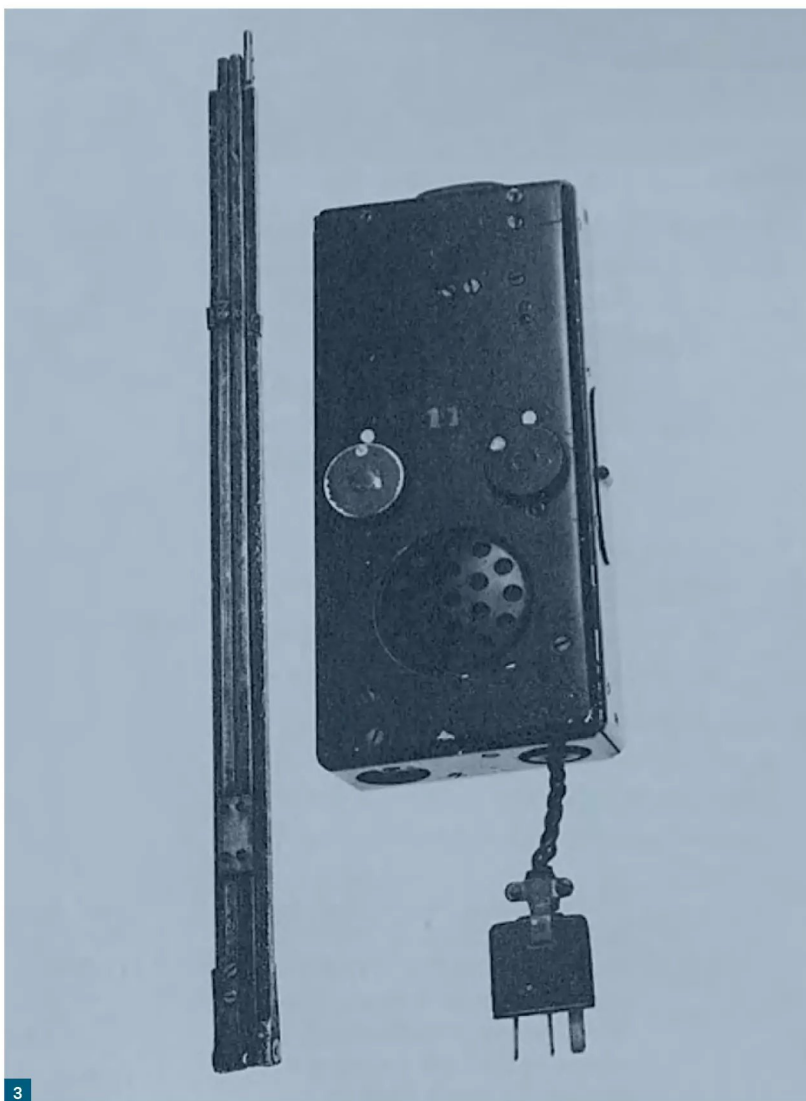
Vital Statistics

Joan (SSTC-502)

- Circuit – Two triodes acted as a super-regenerative receiver and as an oscillator for transmission. Two further valves acted as microphone amplifier and modulator.
- Operating Controls – One for regeneration and one for fine tuning.
- Audio – Earphones (earbuds).
- Dimensions – Length, 6½in (16.5cm); Width, 2¼in (5.7cm); Depth, 1½in (3.8cm).
- Weight – One pound (0.45kg).
- Power supply – Two long-life D-cell batteries for the valve LT filaments, and two 67.5V batteries for the HT anodes, all contained in a separate small pouch.
- Operating frequency – Originally 250MHz and changed later to 260MHz when the enemy developed a receiver capable of receiving at 250MHz.
- Range – Up to 30 miles (48.28km).
- Antenna – plug-in horizontal dipole. The operator had to turn to align the antenna with the aircraft as it circled above him. Strict timing was also necessary. The aircraft needed to be over the agent's location at a pre-arranged time to be sure it did not miss the contact. A signal lamp was used to help the aircraft confirm the location of the agent before establishing contact. In a few instances, agents had not received sufficient instruction on the proper alignment of the antenna and failed to make contact with the aircraft.

Eleanor (SSTR-6)

- Circuit – Superheterodyne receiver with two RF stages, two limiter stages and an FM detector.
- Wire recorder – Up to 20 minutes direct recording time.
- Weight – 40lbs (18.14kg).
- Power supply – Four 6V wet cells providing LF for the valve filaments and driving a dynamotor producing 340V HT.
- Antenna – Retractable, lowered approximately 30in (76cm) beneath the aircraft when in use. Four types were tried during tests; a directional array; a directional dipole rotated manually by the operator; an omni-directional crossed dipole; and an omni-directional vertical. The directional di-



- pole appears to have been mainly used.
- Self-destruct – In case of a forced landing by the aircraft, explosive charges were installed to destroy the J-E equipment to prevent it getting in the hands of the enemy.
- Makers of Joan-Eleanor equipment – Citizens

Radio, Freed Radio Corp., Dictagraph Corp., and Signal-U Mfg. Co.

- Top Secret: J-E was a carefully guarded secret until 1976, when the CIA declassified *The War Report of the OSS, Vol II*, which had originally been written in 1947.

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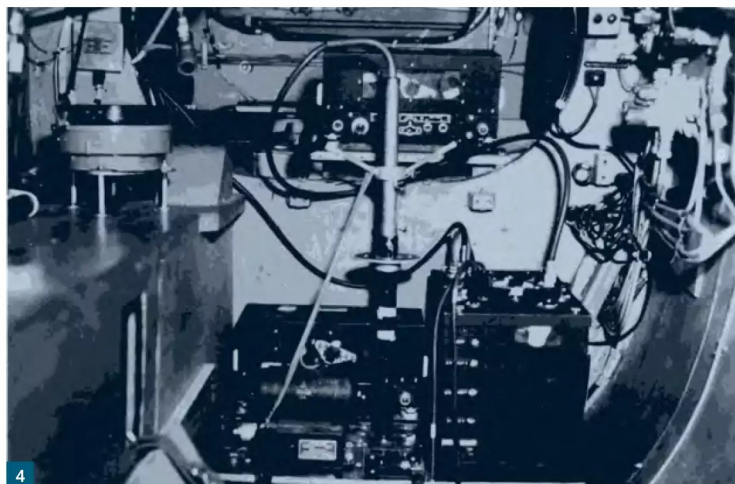


Photo 4: Eleanor transceiver and wire recorder installed in a Mosquito. (Public domain)

Photo 5: SSTR-1 suitcase radio, widely used by OSS agents during WW2. (Source unknown)



Missions

The clandestine activities of the OSS German teams are outside the scope of this article, but a number are described in detail in the reference material listed below; some were successful, some were not. In essence, in late 1944, 100 missions comprising 200 agents, recruited mainly from the German exile community in London, were infiltrated into Nazi Germany.

There were two types of mission. The first was infiltration with the purpose of contacting anti-Nazi organisations or individuals to encourage resistance, to obtain military and other relevant information, and transmit it back to London. Some were parachuted in, and others were smuggled in by sea or by land routes from surrounding countries. Some had J-E equipment, and some had conventional HF W/T equipment. Instructions to the teams with HF sets were sent to them in the field via coded messages in BBC broadcasts.

The second type of mission, designated 'Tourist', involved parachuting small teams into Germany to gather specific military and other information, with instructions to make their own way back through enemy lines within a week or so to report on their observations. Some of these missions were also equipped with Joan transceivers.

J-E Flights

The Joan-Eleanor activity lasted from the first J-E equipped Mosquito flight on 15 November 1944 to a final, aborted, flight on 1/2 May 1945. The war ended on 8 May 1945, and all J-E activities over Germany were closed down.

During this period, there were 89 J-E flights, mainly into Germany, of which 38 had successful contacts with agents on the ground, 43 failed to make contact, five were aborted, one was a supply

drop, one was cancelled and one failed to return to base (missing in action). **Stephen Simpson**, originator of the system, flew as the J-E operator on 13 of the flights. During contacts, the aircraft did not fly directly over their target but off-centre to disguise the location of the agent.

W/T Still Needed

Although the J-E system facilitated direct and undetected operator-to-operator speech exchanges, it had some disadvantages. They could only take place by prior, precisely timed; arrangement and they could not always take place at all for a variety of other reasons. Weather conditions could be unfavourable, there could be heavy defensive anti-aircraft fire in the area, the ground site chosen by the agent might be unsuitable in terms of surroundings or topography, which could attenuate the signal, or the agent might have been captured or unable to meet the rendezvous for other reasons.

If there was need to send an urgent message to London it was necessary to fall back on wireless telegraphy (W/T) and, despite the risk of discovery, some of the OSS teams carried W/T equipment instead of J-E, while two teams, code-named CHAUFFEUR and SULTANE, had both J-E and W/T. The most prolific team was DOCTOR, which sent 52 messages by W/T in the 43 days they were inside Germany. It has not been possible to identify the equipment they used but it was almost certainly the SSTR-1 (Strategic Services Transmitter Receiver Number 1) 8-15W HF CW transceiver, often carried in a suitcase, which was widely used by OSS agents in the occupied countries during the war.

Fascinating Stories

This article has focused on the radio aspects of the J-E and associated missions but has inevitably included some details of other aspects of the operations. Because they were organised by the OSS, and the agents involved were not Allied personnel, stories of their achievements are perhaps not so

well-known in Britain as those of the British SOE in occupied Europe.

Not surprisingly, although the OSS top brass who conceived and initiated the operations overcame their initial doubts about them, less senior staff, the rank and file who carried out the detailed arrangements, including the flights to Germany, were not always so happy to be working with people they considered to be enemy aliens.

It is, however, an intriguing story and for those interested in the history of espionage, the reference material below provides a wealth of fascinating and very detailed information.

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- *German Anti-Nazi espionage in the Second World War*, by Jonathan S. Gould, pub Routledge, 2019.
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- *The 25th Bomb Group (Rcn) in World War II*, by Norman Malayney, pub Schiffer, Atglen, PA, 2011.
- *The SOE 1940-1948*, by M.R.D. Foot, pub BBC, 1984.
- *Joan and Eleanor*, an OSS Technology Film:
www.youtube.com/watch?v=0lrDzGmpXbs
(Detailed information about the installation and operational procedures of the J-E system.)
- *SSTR-1*, WW2 training film for OSS operatives on covert missions.
<https://tinyurl.com/4h4ydx3w>
- *Decision before Dawn*:
www.youtube.com/watch?v=-Z9cl5fGEI8

(A movie made in 1951, based on a true story, with a few variations for dramatic effect. Tells the story of a 'Tourist' mission of anti-Nazi German PoWs who parachuted into Germany, and the hazards they faced returning through enemy lines to report back to the OSS.) **PW**

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Fixing holes for the drive are located with the paper template included with it. The S-meter is fitted to the right, **Fig. 4**. Holes are punched to take the controls under the chassis, as in **Fig. 5**.

An aperture is cut in the chassis to take the flywheel and drive. Holes are positioned for aerial and earth sockets, etc., and under each section of the ganged capacitor: Each coil needs a 1/4in. dia. hole and they will be placed as in **Fig. 5**.

The chassis flanges are fixed to the panel with chromed bolts, the bottom of the chassis being 1/16in. higher than the bottom of the panel, to allow for the cabinet flange.

Leads are soldered to the bottom tags of the variable capacitor, and passed down through the holes mentioned. Capacitor and drive spindles are carefully lined up and joined with a flexible coupling. Spaces or extra nuts are needed under the capacitor, to raise it.

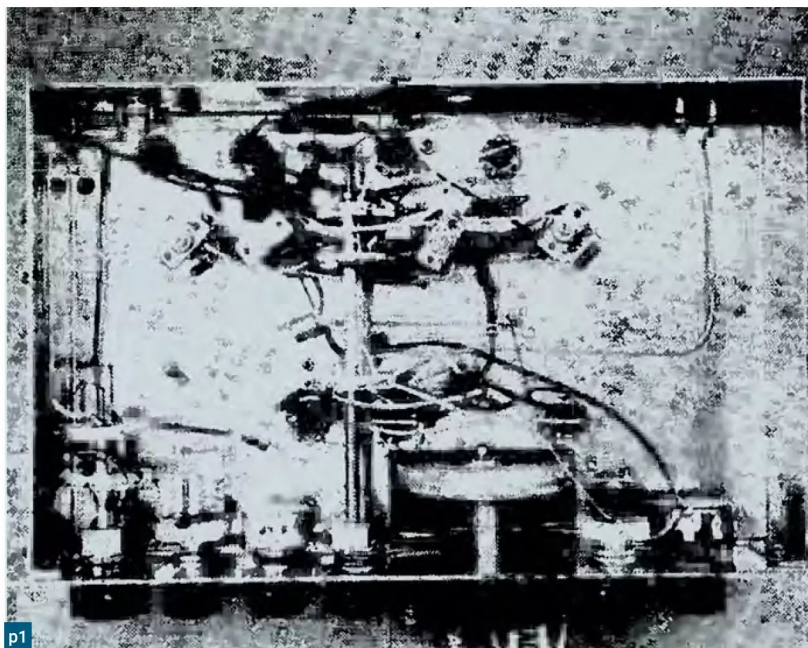
Space is left for a PP9 battery, **Fig. 4**. When the audio panel is completed, it is fitted a little clear of the chassis as in **Fig. 4**. This is done with two bolts with extra nuts. One bolt also provides the earth return connection from amplifier positive to chassis. The i.f. and S-meter amplifier panel is secured with two small brackets, **Fig. 4**. This allows all cores and underneath wiring to be reached, with short connections where necessary. Positive is returned to the chassis at a bracket.

The small b.f.o. and produce detector panel is also fixed with two brackets, **Fig. 4**. The b.f.o. coil core is reached from the underside, so it is necessary to have a short adjusting tool, or make one, from a strip of paxolin or insulated rod.

Bandswitch

This has a mechanism with moving stop, which is placed to give four positions. The three wafers are placed with their identification marks all the same way, and are threaded on the shaft. The screwed rods are then put in, with spacers allowing the wafers to come approximately as in **Fig. 5**.

Each wafer is three-pole four-way, and the switch cannot work if any is reversed, or has its rotating section wrongly placed on the shaft. If there is any doubt about its operation, this will be clarified by examining a wafer, and checking with a meter, with the switch in each of its four



General Coverage Receiver (Pt II)

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positions in turn. Also test the receiver with the three coils for one band only actually connected, with the switch in the appropriate position.

The front wafer is S1, S2 and S3. S3 is nearest the chassis, and wired to VC1 (and VC4). Tr1 base goes to S2 as in **Fig. 5**. The remaining section is S1, used for aerial.

The central wafer is S4, S5 and S6. Tr1 collector goes to S4, Tr2 emitter to S5, **Fig. 5**, and again the tag nearest the chassis has a short lead through to VC2.

The rear wafer is S7, S8 and S9, Tr2 emitter and collector going to S8 and S7, positioned as in **Fig. 5**, with a short lead from VC3 to the remaining section S9, near the chassis. This allows short leads where required.

Coils, etc.

These are positioned as in **Fig. 5** for short leads on the h.f. ranges, while keeping similar coils well separated. The wiring is largely duplicated

from one band to the next, as follows:

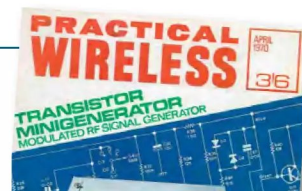
Blue (Aerial) Coils. 1 and 9 joined on all, and to chassis. 7 joined on all, and to C1. C1 goes directly from S.W.1, pin 7, to chassis, **Fig. 5**. S1 tags, S2 tags and S3 tags are then wired in sequence to 8, 5 and 6, of S.W.1, S.W.2, S.W.3 and M.W. coils.

Yellow (Mixer) Coils. Ail tags 1 to chassis. Tags 8 joined and to C3. Tags S4, S5 and S6 then go to 9, 5 and 6. for each range, as before.

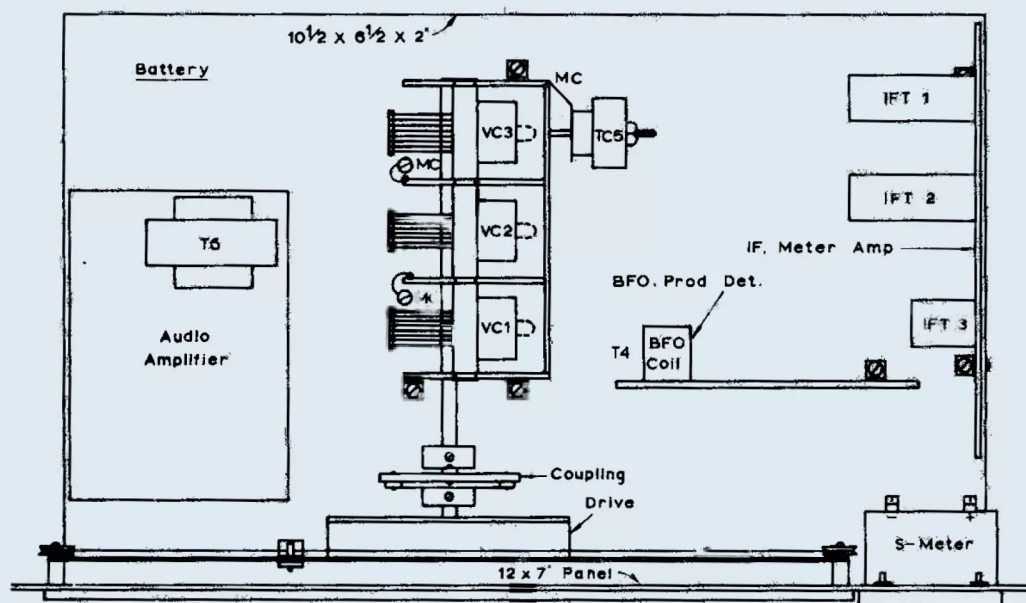
Red (Oscillator) Coils. Tags 8 joined, and to 2 on i.f.t.1. Tags 7 to C6 at S.W.1 (**Fig. 5**). S7, S8 and S9 to tags 9, 5 and 1. Padders as described, and in **Fig. 5**.

Chassis returns for S.W.1 and S.W.2, including those via capacitors C1, C5 and C6, must be very short and direct. For these ranges, 20 s.w.g. connections are suggested, with 26 s.w.g. for the lower frequency coils. Different colours of 1mm sleeving will help identify the leads.

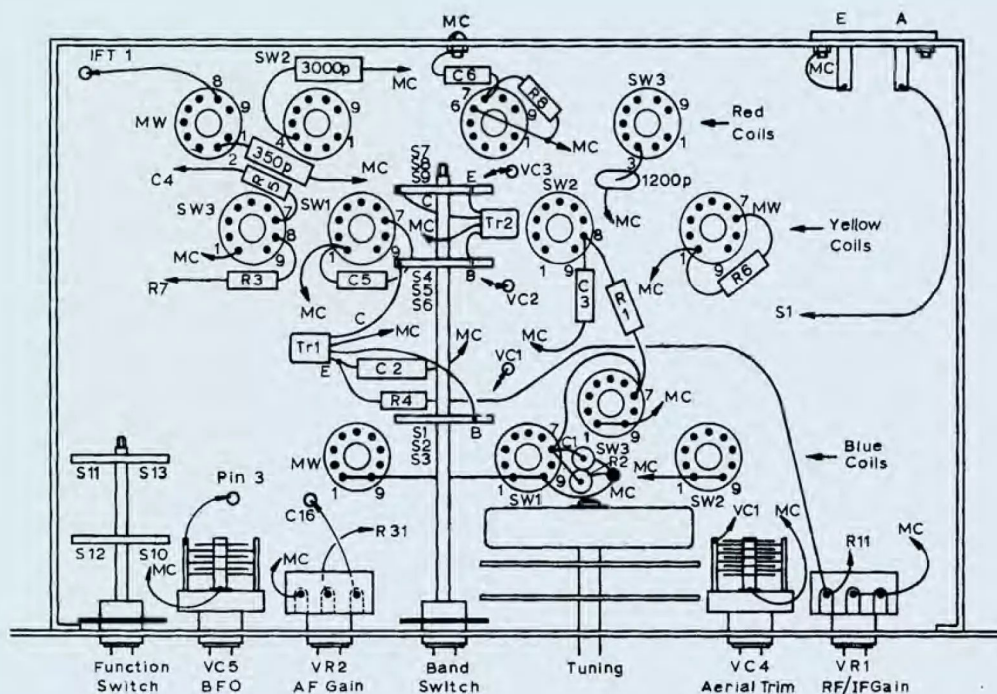
This month we have the second and final part of the general coverage receiver project, a fairly typical constructional project from the late 1960s / early 1970s.



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4



5

Coils were placed to allow a screen between blue and yellow types, but this was found unnecessary. Shorting type wafers to earth all unused windings are not available in the three-pole type. Small absorption effects were found to arise at about 12, 17 and 24MHz. Since

12MHz is available on both S.W.1 and S.W.2, this may be neglected. The others would be cured by using shorting wafers. This would require more wafers, as they are only available in two-poles per wafer type. Alternatively, the offending coils could be placed in the cans

supplied by the maker, for screening.

Tr1 and Tr2 are close to their connecting points, and with each the shield lead goes to the chassis. Actual wires are emitter, base, shield, collector, in line and with extra spacing for the collector lead. Individual mixer coil

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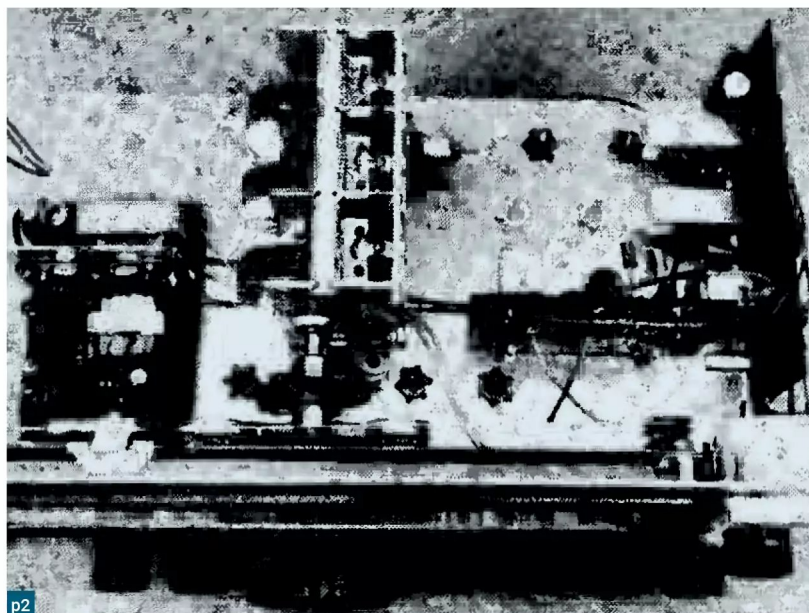


Fig. 4: Layout of main components on the top of the receiver chassis. Fig. 5: Layout and part wiring of components on the receiver underside. Fig. 6: I.F. amplifier and meter amplifier board. Fig. 7: The audio amplifier board. Fig. 8: Product detector and b.f.o. board.

Photographs 1 and 2 show underside and above views of the complete receiver.

other items as shown. A check should be made against Fig. 2 as required. R18 to R21, Tr5 and the meter may be omitted until later.

Audio Amplifier. Figure 7 shows components and wiring. The heatsink is fixed with two ½in. or similar bolts, and a tag under one nut serves as chassis return. Extra nuts are put on, and the finished board can then be clamped to the chassis, with a little clearance.

Tr11 and Tr12 occupy clips bolted to the heatsink. The connections given for T5 are for the particular transformer listed, and if an alternative is fitted, the maker's data should be followed.

A black flexible lead with negative battery clip runs from C26. The lead Y supplies the i.f. amplifier. VR2 slider runs to R31.

The whole amplifier can be tested by taking an audio input to R31, with battery positive as earth return.

If the receiver is to be temporarily or permanently used for ordinary a.m. reception (speech, music) only, VR2 can be fed from diode D2 via a capacitor, as described.

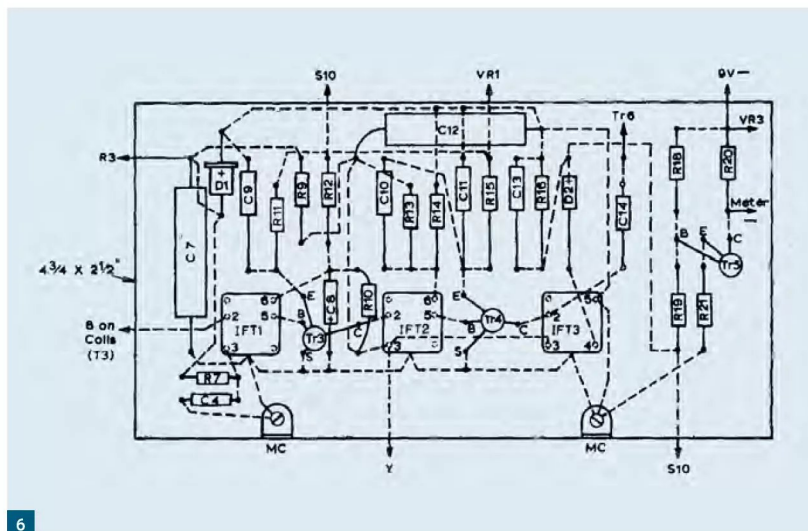
Product Detector and B.F.O. connections are shown in Fig. 8. The completed panel again mounts vertically on brackets, and is placed to allow quite short leads from C14 and VC5. A hole is necessary under the b.f.o. coil to reach its core.

The circuit provides a.m. detection when the b.f.o. is off, and the function switch breaks this circuit, Tr6 and Tr7 run from the reduced voltage available from Y at the i.f. amplifier. The b.f.o. receives the regulated supply from the 5-6V Zener diode. When the completed panel is fixed in place, remove the temporary coupling capacitor used to give a.m. reception from D2, if previously fitted.

IF Alignment

The intermediate frequency is 465kHz. If a signal generator is available, loosely couple it to the base of Tr2, and rotate all the cores for best results with a 465kHz input. A c.w. signal will operate the meter, so i.f.t. cores can be adjusted for best meter reading. Input should be kept well down.

With a modulated signal from the generator, adjustments can be for maximum audio output, with gain controls at maximum; or for maximum battery current, shown by a meter in one lead.



trimmers are not shown in Fig. 5 for clarity. These are soldered directly from pin 1 to pin 6 on each yellow coil, the plate adjacent to the adjusting screw-head going to 1 (chassis).

Constructional Points

Amplifiers and product detector with b.f.o. are assembled on insulated eyelet board having holes at 0.2in. centres. Plain board could be drilled to suit.

Some 26 s.w.g. tinned copper or similar wire may be used throughout, with 1mm sleeving. It is helpful to identify external and other connections by colour, and to use red for chassis (positive) and black for negative circuits.

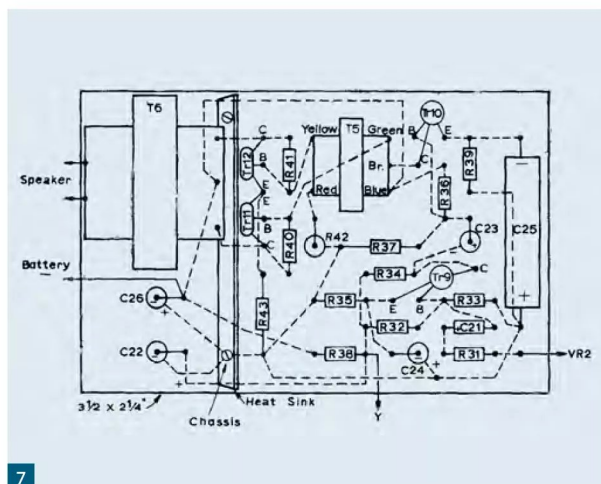
Short pieces of sleeving will also identify

transistor leads when these are fitted. Black is suggested for base, yellow for emitter, and red for collector.

I.F./Meter Amplifier. This is the largest unit, shown in Fig. 6. It mounts vertically by two brackets used as chassis return. Figure 6 shows the "top" of the board, with i.f.t.s, resistors, etc. Wiring under the board is shown with broken lines.

It is convenient to fit the i.f.t.s first, with central holes to reach the cores later. All the cans are earthed. If each component and lead is marked with coloured pencil as fitted and soldered it will be easily clear what has been done, and nothing is likely to be omitted.

Later, leads are passed through the chassis to the function switch, 8 on oscillator coils, and



Input must again be kept well down.

If no generator is available, a stable signal should be tuned in (such as a BBC transmission, with a very short aerial). The five cores are then carefully adjusted for best results.

A properly shaped core adjusting tool is best employed for the i.f.t.s. Final alignment should be with a weak signal. These cores are then left and need no further adjustment.

BFO

With VC5 half closed, and the b.f.o. switched on, a strong heterodyne should be heard when the b.f.o. coil core is rotated with a tool. Ignore any weak whistles produced at other core settings, and place the core so that it is at the central or zero beat position. A whistle, which rises in pitch, will then be heard if VC5 is opened or closed. During these adjustments, a steady carrier should be present, from signal generator or transmission.

RF, Mixer and Osc

It is necessary to describe adjustments to only one range, as each range is dealt with separately.

TC5 is about two-thirds or so closed. Its setting primarily determines band limits at the high frequency end of the band. The red coil core is adjusted to obtain a suitable band limit at the low frequency end of the band.

The coils are normally packed with the brass screws set right in, so it is as well to unscrew them all so that roughly 1/2 in. of 6BA rod projects, to begin. Set VC4 (aerial trimmer) about half closed, and rotate the cores of blue and yellow coils for best results, near the l.f. end of the band (ganged capacitor nearly fully closed). Tune to the h.f. end of the band, this time adjusting the yellow coil trimmer for best results.

Repeat these adjustments, as necessary, for

suitable band coverage, and best performance. VC4 will not need continuous adjustment, when the blue cores are suitably placed, but this trimmer is helpful when changing aerials, or bringing up weak signals.

Notes on Operating

The dial reads 0-500, to log particular s.w. transmissions, etc. s.w. reception, especially on the h.f. bands, varies greatly from hour to hour, daily, and has seasonal and other variations.

For normal reception, put the function switch to a.m. with a.v.c. When very strong transmissions overload early stages, VR1 must be turned back. VC4 is simply peaked for best results, and should never be fully open or fully closed.

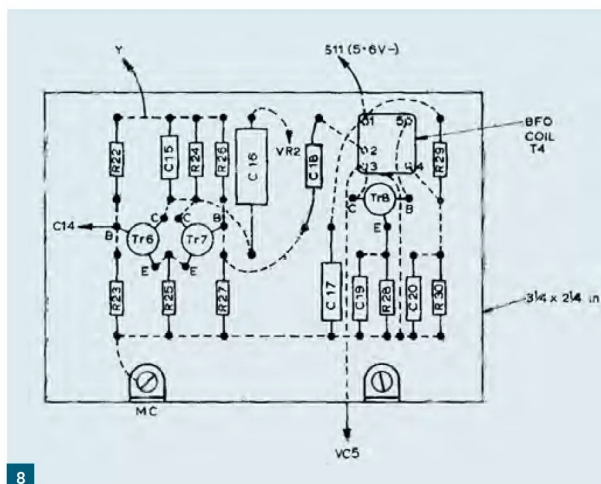
In some cases manual control of r.f. gain only is required, and 3rd and 4th positions of the switch provide this, the latter with the b.f.o. on. In the 4th position, s.s.b. and c.w. do not control gain via the a.v.c. circuit. In the 5th position, these signals provide a.v.c. bias.

With the switch in the 5th position, c.w. and s.s.b. can be resolved over a considerable level of signal strengths. Rotating VC5 one way or the other, from the central or zero position, will resolve an s.s.b. signal, the direction of rotation depending on whether upper or lower sideband is being transmitted. With exceptionally strong or local signals, gain must be reduced with VR1.

With c.w., the b.f.o. acts as a pitch control, and may also be above or below the carrier frequency, as giving best results.

In all cases VR2 controls volume, and it is as well to keep current peaks down to 30-40mA or so, which should give ample output.

S14 can be closed during noisy static conditions, or when wearing headphones. The limiting is fairly heavy, to avoid blasting on phones.



VR3 should originally be set at about its middle position, with VR1 at maximum gain. With no aerial, and no signal tuned in, adjust VR3 for zero on the S-meter. If wished, VR3 can be made up from one or more resistors in series with a potentiometer of lower value, though using 5kΩ as shown is not too critical when adjusting zero.

For very long distance reception, one of the numerous external short wave aerials of improved type may be used – a dipole, doublet, tuned end-fed wire, etc.

For general results, any end connected wire may be taken to the aerial socket. It will probably be found that a long wire is best avoided for medium and low frequencies.

A telescopic 30in. or similar aerial, fixed to the case but insulated from it, will give very good results over medium and high frequencies, though naturally not with extremely remote stations. A flying lead from the aerial can be taken to the aerial socket, or directly to the fixed section of VC1.

With some frequencies and transmissions, adding an earth will bring about no significant improvement. With other signals (such as weak Top Band amateurs) adding an earth will increase volume very considerably.

Other Points

R38 and R9 are chosen to drop just over 3V with a current slightly in excess of 10mA. Since D1 maintains 5.6V, 3.4V must be dropped with a 9V supply. The fairly high resistor values are to help reduce current lost through D1.

Though the values shown should prove satisfactory with 10% resistors and some variation in the actual controlled voltage of D1, a stabilised supply may no longer be obtained, when the battery voltage falls even slightly. If so, R9 should be slightly reduced. Battery drain, with no signal, should be about 20-25mA, with VR1 at maximum. **PW**



1
Joe Chester M1MWD
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Preppers

Joe Chester M1MWD starts a new series, looking at US Preppers and what they have to teach us about off-grid operating.

To start with, I have a question. Are you a Prepper? Ehh...never heard of it? No really? As you saw recently, I'm just back from the Orlando Hamcation – a square mile or two of radio equipped RVs and campers. And nearly every one of them is home to a Prepper. No not a weird pet, but people getting ready for the Apocalypse, the end of times, a zombie revolution, or just the chaos of a world with no internet. This last seems strange to my ears. Was not the technology of the internet (datagrams, IP addressing, and routers) designed specifically to work around local or even regional breakdowns in the communications infrastructure? But I digress.

My Big Idea

The thing all those RV people have in common is sophisticated mobile or portable amateur radio stations. And they use them regularly, possibly far more than the average radio operator in these islands. There is a reason for this, which I will come to a bit later. So, I thought, in the interest of the readers of this journal, that I would become a prepper – note the small p, for I am not signing up to join a pseudo-religious group (which, I have to admit, is what some really enthusiastic and committed Preppers can appear to be). What I mean is that I am going to detail my route

into a sophisticated portable station, an off-grid station, of the type I saw in some of those caravans in Orlando. And it's going to be quite a journey, which will start with basic equipment, some of which you probably already have, and eventually will end up, via portable data modes, with sending messages via satellites from a portable radio station (hopefully!). Exciting! There is much to talk about.

When the idea for this project first occurred to me, I was sitting under a clear blue cloudless sky, with temperatures in the mid-30s, in a field in Orlando. It seemed to me that I had most of the equipment I would need, and that it was just a case of assembling the few pieces I already had. But back at base camp, in a snow bound apartment, the list of equipment I would need got longer and longer. As did the list of things I would need to be able to do on-air, many of which I had never attempted previously. And /P too. I haven't done JS8Call, or Packet, for example, which my Prepper friends use routinely. And my /P operations were mostly limited to the 80, 40 and 20m bands. But the off-grid operators used the entire spectrum,

depending on conditions. Which implies the need for all-band, all-mode capability, both transceiver and antenna system. Not to mention the vast collection of software I would need to set up and operate. The full list was a page long, double column, not counting feeder cables and connectors. Whew!

Issues to Tackle

First up, let's go back to an old issue – the all-mode, all-band portable transceiver. It never ceases to amaze me, and some others to whom I have spoken, that this is a bit of a unicorn. Currently the FT-818 (recently discontinued by Yaesu) and the IC-705. And that's it. Both QRP rigs, but that's not really an issue for now. But why the need for HF and V/UHF in a single rig? It's about 2m/70cm SSB, as we'll see later. Finding a linear to match a QRP rig is also an issue. For /P I don't think we need a kilowatt, but surely there is a demand for 50 or 60 watts, or a hundred at most, especially on SSB? Let me be clear, the main issue here is low current draw. Out portable, off grid, the total amount of energy available is limited. And this, of course,

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Photo 1: The FT-818.

Photo 2: The IC-705.

Photo 3: A typical Go-Box.

Photo 4: US off-grid luxury!

Photo 5: Set up and ready to operate.

has to cover all the equipment in use. So, a boat anchor of a valve amplifier is out of the question. But there may be a solution to this issue.

This project is also driven by another major issue in amateur radio operations today – interference. The background noise levels, especially on the lower HF bands, are driving many licensed amateurs towards portable operations and away from urban home stations. I am one of those. Living in an apartment complex, I have a complete ban on the erection of any kind of antenna. On the one or two occasions on which I have set up temporary antennas, the background noise level was so bad that I heard almost nothing. So /P is the only chance I have to operate. I should also mention that this is not a backpack project; I am not going mountain climbing (unless there is a convenient public transport solution, as in Switzerland last year!). But of course, SOTA and similar operations could probably use much of the station equipment I am assembling.

The requirements list for this project includes an all-band, all-mode portable transceiver for a start, to be able to use SSB on all bands, from 160m up to 70cm. Part of the fun of is working out how to use the equipment to achieve the goals of the project, which can be generally stated like this – to establish two-way communications, both data and voice, and maybe even images, from an off-grid portable station. We will also need to discuss antennas, power sources and propagation issues. The latter are important to understand the best communications solutions and paths as conditions change. The prepper community understands these issues and has provisioned accordingly. You have only to look at a few of their websites to see how thorough is their preparation.

Let's take as read that /P HF SSB is relatively simple to achieve. I have written quite extensively about portable QRP DXpeditions in the past, using my KX3. I powered this with LiFePO4 batteries, using antennas such as my Buddipole, an end-fed wire antenna, or my AX1. These outings were more or less successful, depending on conditions. And the KX3 had a distinct advantage for these excursions, in that it has a great built-in ATU. But the KX3 has limited functionality on 2m/70cm, via installation of a transverter board (the power output of which is very low, which would add another box, a VHF linear, to my setup). So,



reluctantly, as a first step, I will need to invest in one of the two previous transceivers. Which one?

Choosing a Transceiver

I have read the reviews of these two transceivers in this magazine (FT-818 December 2019, IC-705 December 2020) and elsewhere, and discussed this with friends who use these radios. I have also consulted the well-known Sherwood table of receiver performance. I didn't find a report about the FT-818 on this table. The IC-705 sits about mid-table, with an IMD of 88dB, a bit lower than the 100dB achieved by my KX3, and not far off that of my IC-7300. But I don't think that the -12dB difference will be that noticeable out portable. I'm not necessarily building a contest station, so absolute performance values are not needed. The IC-705 can deliver 10W, with an external power source; the FT-818 is max 6W – a difference, but hardly a game changer. And at 10W output, it only needs 5A at 12V, ie 60W of power, so it's miserly. But there is one overriding factor. An issue which I have also mentioned previously – ergonomics, the ease of use of the human interface. And here the IC-705 has a distinct advantage for me. For I have been using an IC-7300 as my base rig for the past five years, so I am familiar with the usability issues of this user interface; and the IC-705 has the same graphical interface. In addition, the latest firmware upgrade for the IC-705 has added a very interesting and very desirable feature, highly useful for portable data operations in particular. More on this later. So, an IC-705 is on the way. And the IC-7300 is now redundant, and available to a good home (contact me by email if you know of one).



Other Gear & Modes

And finally, for this introduction to my new project, let me say two more things. The first is about some of the other equipment I already have, various antennas, tuners, batteries, etc, and my RFinder analogue and digital VHF radio. All these will find a use as I set up the various experiments and demonstrations in support of this project. And the second is that the IC-705 will also add D-STAR to the mix, as well as the DMR in the RFinder. I am under no illusions here – digital modes, which rely on repeaters, gateways, or the internet in any form may not be suitable for communications in the event of a large scale disaster.

But there is no reason not to investigate what is possible with these modes off grid. The next few steps are mainly about getting the IC-705

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set up, and testing it out in various portable operations over the coming few weeks. And also thinking about the next steps I want to take into the world of off-grid amateur radio operations. As a preview, there is also a very exciting new development on the horizon, which I briefly got to see recently, and which will add a huge new set of opportunities for off-grid operating. Should be fun.

More about Preppers

A brief few words about Preppers. They are often dismissed as obsessives, in America, buying into a cult of weapons and the breakdown of civilisation – TEOTWAWKI (go on, you work it out!). In comparison, the UK Preppers seem more like explorers packing for a trip to a neighbouring planet, storing food supplies and seeds. Much of the advice on many Prepper sites is relevant to SOTA activators, as well as off-grid operators, such as first aid kits, warm clothes, storm proof matches, batteries, etc. And bring a can/bottle opener!

The ones I met in Florida were for the most part, serious amateur radio operators (see [1], just two examples out of many which shows this aspect – there are also a huge number of related YouTube videos, many by licensed amateurs), who have established fabulous mobile stations in their RVs, stations I for one would be proud to own. And far from sitting back and waiting for the aliens to land and wreck everything, many of them are first on the scene of natural calamities throughout the USA, and even some emergencies overseas. RAYNET and AREN provide similar services, although without the weapons! Which probably, in effect, makes these organisations preppers! And let's throw another acronym into the mix while we are here – EMCOMM, emergency communications.

So, in a sense, everyone is at it. If you have a functioning portable or mobile station, you are ready (for what, who knows?!). I will say more about RAYNET and AREN in a future piece. Thankfully, we in these islands have not had as many of the extreme natural events that are rather more common in the States. Until now, at any rate. The story of amateur radio operators setting up communications services after Hurricane Katrina is well known. As is the story of many US amateurs keeping a go-bag/box by the front door, just in case. We don't have similar traditions over here. But who knows what the future holds.

At its most basic, the prepper assumption is that there is some kind of disaster. What kind, natural or manmade, is irrelevant. The preppers



find themselves caught up in this disaster in some way. Again, the details don't really matter. Now if we leave aside stockpiling food and other supplies, and yes weapons too, the major requirement is for communications, both within the disaster zone, and with the 'outside' world, to seek information and help. An easy way to envisage this is like the movie *War of the Worlds*. Aliens land on Horsell Common, and start to march on London, wrecking everything in their path. You are somewhere along this general path, so you pack up, relocate to a safe place, and set up your off-grid radio station.

With this, you can keep in touch with what's happening, move on if you need to do so, get help with any issues you may have, and perhaps relay messages from others. This project is about designing that off-grid, self-

sufficient radio station, and equipping it with various useful facilities to enable local communications and also more distant QSOs, with stations outside the 'disaster' zone.

It promises to be an interesting project.

References

[1] <https://tinyurl.com/9fxrruua>
<https://tinyurl.com/2tky3cr4>

TEOTWAWKI

Hint: the two Ts are the, and one of the Ws is world – got it? And it's a phrase in common use by people in general in the USA, and not just by Preppers. I had many conversations with friends while I was over there, who are convinced that we are nearly there already. **PW**

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Steve Telenius-Lowe PJ4DX
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Welcome to the July *HF Highlights*. The 28MHz beacon report for April was compiled by **Neil Clarke G0CAS**, who reported that DX paths continued to deteriorate throughout April. The exception was to South America, where LU4AA 28200 was heard every day and OA4B and YV5B, also on 28200, were heard on 28 days. In North America 4U1UN and W6WX 28200 were logged on only five and two days respectively although the W5 call area beacons were heard on 12 days. The VK6RBP 28200 beacon in Western Australia was heard on only five days in April, compared with 17 in March. From the Middle East, 4X6TU 28200 was heard on 27 days, 5B4CY 28219 on 29, and YM7TEN on 19 days. A few small isolated Sporadic E openings took place but we had to wait till the 26th and 27th before there were sizeable openings covering most of Europe (in 2022 the first large Sporadic E opening took place on 28 April). Regular beacons heard via Sporadic E included ZB2TEN 28170, OE3XAC 28188, DL0IGI (very strong) 28205, OY6BEC 28235, LA5TEN 28237, C30P 28256, DK0TEN 28257 and SK7GH 28298 plus a number from Italy especially IZ8RVA 28240.

The Month on the Air

T30UN (Tarawa, Western Kiribati) was reported in this column last month but continued to operate until 30 April. The group had problems with several generators and, according to reports on the *DX World* website, was sometimes operating a single 100W transceiver powered by a truck battery. Nevertheless, T30UN made an impressive 123,000 QSOs, mainly on FT8.

www.dx-world.net

Also mentioned last month was the operation from Niue, E6, by two Polish operators, SP9FIH and SP6CIK. From Niue they went on to Rarotonga in the South Cook Islands from where they were active as E51WEG and E51CIK respectively from 13 to 28 April.

4W1A from Timor-Leste, **Fig. 1**, was a surprise operation by three members of the Lagunaria DX Group. It was a 'recce' trip in preparation for a much larger operation, which is now planned for November. Running against the trend of many recent DXpeditions, 4W1A did not operate at all on FT8, but they did make 43,000 QSOs on CW and SSB (with a few on RTTY) between 10 and 22 April using only wire antennas. The activity in November promises to be an impressive showing.

In stark contrast, VU7W, operated by **Yuris YL2GM**, mainly used FT8 when he operated from the Lakshadweep Islands from 15 to 28 April. He explained that very high local noise levels caused by LED lights and switch-mode power supplies at his hotel made CW operation very difficult – and SSB totally impossible.

Looking Back

Steve Telenius-Lowe PJ4DX and his contributors report plenty of recent activity, but the coming month looks like being quiet in terms of DX.

DX0NE was yet another one-man DXpedition, operated by **Gil 4F2KWT** from Pag-Asa, aka Thitu, Island, **Fig. 2**. This island is in the Philippine municipality of Kalayaan, which geographically forms part of the Spratly group and therefore counts as the Spratly Islands for DXCC purposes. DX0NE operated on FT8 and CW between 28 April and 7 May. Spratly is the most difficult part of the world to work from Bonaire and I had not even been able to hear any of the previous Spratly DXpeditions on SSB or CW during the last nine years. This is where really FT8 comes into its own, though, because DX0NE was far too weak to even attempt a QSO on CW but I did manage two FT8 contacts on 14 and 24MHz.

5X2I was also a one-man DXpedition, in this case by **Pista HA5AO**, **Fig. 3**, from near Kampala, Uganda. Pista was on the air from 24 April to 9 May.

To celebrate the Coronation of **HM King Charles III**, all UK stations could operate using the special prefixes GR, MR or 2R between 1 May and 30 June by applying for a 'Notice of Variation' to their licence. During the evening of 1 May I contacted around 25 such stations on the bands between 10 and 28MHz, using FT8. A totally unscientific survey indicated that only around one in ten of stations in England who were active on FT8 on HF during that evening were using the special prefixes. (Stations in the other UK nations are less likely to apply for such special prefixes simply because their 'normal' call signs are rarer than the special ones!)

Congratulations to *HF Highlights* regular **Victor Brand G3JNB**, **Fig. 4**, who celebrated his 90th birthday in May. Victor has now taken a step back from HF DXing on CW to concentrate more on the new digital mode VarAC, where he has been operating using his Coronation special call sign **GR3JNB**.

For IOTA enthusiasts, **Cezar VE3LYC** was active as **3D2LYC** from Yanuca Island in the rare OC-189 group in early May. He wrote a blog during his operation, which can be read at:

<https://3d2lyc.weebly.com>

A Revolutionary DXpedition

From 10 to 24 June (precise dates weather dependent) a highly unusual and revolutionary DXpedition is scheduled to be taking place. VP6A will be on the air from the rare DXCC entity of Ducie Island (IOTA OC-182) on 1.8 to 50MHz, using CW, SSB and FT8. So far, so normal. What makes this expedition so extraordinary is that it

will be an almost entirely remote operation.

George Wallner AA7JV is sailing to the island in his yacht *Magnet* with two other amateurs, **Gregg W6IZT** and **'Snow' KN4EEI**. Once there they will set up five stations on the island using 'RIBs' (Radios in a Box – see *HF Highlights*, *PW* June 2021), but they will be operating from *Magnet*, anchored just offshore, using a UHF link. Not only that, but 15 more amateurs will operate VP6A remotely from their home stations in North and South America, Europe and Asia. The three 'local' operators will land on Ducie once a day to refuel the generators and carry out any necessary maintenance, but they will not be camping on the island.

RIBs have been developed with the assistance of the Northern California DX Foundation as an environmentally-friendly way of allowing DXpeditions to take place with minimal human impact in sensitive areas as well as allowing multiple operators to take part in DXpeditions without the difficulties and expense of travel.

www.ncdxf.org

July DXpeditions

At the time of writing there are no major DXpeditions scheduled for July. This is not unusual, as most organisers of DXpeditions tend to plan their operations for periods around the spring or autumn equinoxes, when HF propagation can be expected to be at its best. However, the RSGB IOTA Contest takes place on 29/30 July so there will certainly be a number of island DXpeditions on the air around the end of the month. IOTA is the RSGB's most popular HF contest, so why not have a go? Take a look at the rules at:

www.rsgbcc.org/hf/rules/2023/riota.shtml

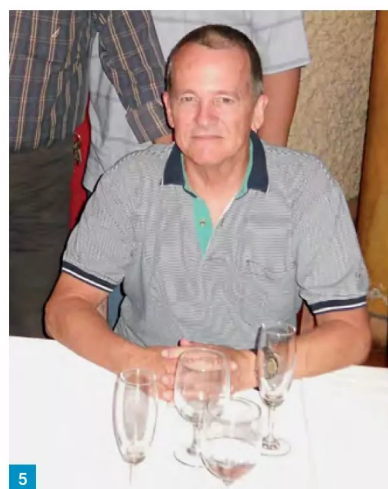
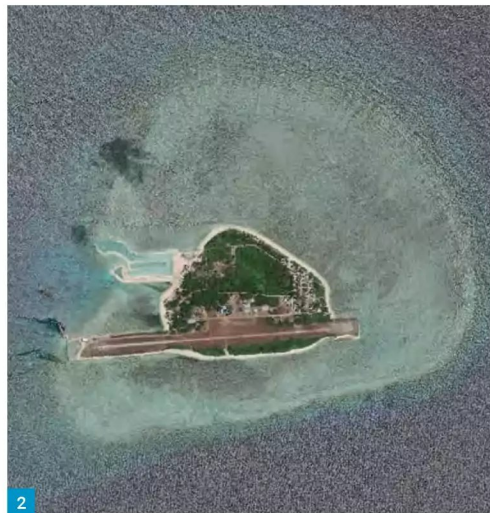
and some tips for newcomers to this contest can be found at:

www.rsgbcc.org/hf/information/iotaahelp.shtml

Readers' News

We welcome another new contributor to this column, **John Fitzgerald G8XTJ**, who wrote after returning from a two-week trip to Riverside, California, from where he was active as W6/G8XTJ. John said, "I have been on from there many times but have always found it a struggle to work Europe with 100W [from an] IC-7000 to a W3EDP end-fed. Not this time, especially on 24 and 28MHz... Mostly worked 1500 to 1800UTC, around my breakfast time. I was amazed and gratified: I normally work **Allan GM4ZUK** on 144MHz!"

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Jim Bovill PA3FDR reckoned "It has been a good month for new or uncommon DX, including Samoa (5W1SA), Chile (CE2SU), Tajikistan (EY8MM) and Hawaii (KH6PE). In addition to Hawaii I also managed to log new USA states Alaska (KL7TC), Arizona (W7MD) and Oregon (KL7OR) to complete my working of all USA states. And finally to end on a high note, on my last session of the month I completed a QSO with a fellow ham in Vietnam (3W3B). This was only my second contact with that country in almost 40 years in amateur radio; the previous one only two months previously with XV9K." I also worked **Bruce 3W3B** on 14MHz FT8 in May, having had the pleasure of meeting him in person on a visit to Laos some years ago, **Fig. 5**.

Kev Hewitt ZB2GI wrote that he "had the pleasure of meeting fellow PW and HF Highlights reader **Cess Davies GW3OAJ** at Europa Point. Cess was born in 1928 and served in Gibraltar as an 18-year old. We had an interesting conversation about amateur radio and Gibraltar." During the month Kev operated portable from Coaling Island, from the GARS club station, where he

Fig. 1: Typical market scene in Timor-Leste. Fig. 2: Pag-Asa or Thitu Island is one of the Philippine-occupied islands in the Spratly Islands group (Photo: NASA). Fig. 3: Pista HA5AO has been operating from Uganda as 5X2I. Fig. 4: Victor G3JNB recently celebrated his 90th birthday and is active on VarAC and CW. Fig. 5: Bruce 3W3B enjoying a dinner in Vientiane, Laos. Fig. 6: Results of 28MHz FT8 activity by Kev ZB2GI on 30 April. Fig. 7: OS8D out portable on 5 May. Fig. 8: The location of EA5/G4VZV's recent seven-day operation.

made over 240 QSOs on 21MHz SSB, as well as from his home station. **Fig. 6** shows the results of Kev's 28MHz FT8 operation on 30 April from his home station, using an Icom IC-7300 with a 5m wire connected via a 9:1 balun.

Etienne Vrebos OS8D continues to be busy while out portable, **Fig. 7**, activating many of Belgium's 2600 castles for the WCA award. In April he made around 650 QSOs, about 80% of which were castle activations. Etienne says he is very near to having activated 100 castles in under four months and that he is "addicted completely to that part of our hobby". Etienne highlights two QSOs in particular: he was called by AX5PAS in South Australia when operating portable with just 80W and a dipole, and IT9/OP8L, a good friend of

Etienne's who was operating from the top of Mt Etna, using 20W and a vertical.

Ken Churms EA5/G4VZV wrote "I've just got back from EA5 near Alicante and hope to be there again in another three weeks time [i.e. in early June – **Ed**]. On Thursday 4 May whilst operating my sack trolley station I achieved the most incredible results in a seven-day period of radio, 70W output and the quarter-wave vertical wire running up the small 6m fibreglass pole in a sleeve attached to the trolley. I worked 105 Pacific stations (mainly VK and ZL) but also **Jim E51JD** in Rarotonga, Cook Islands, twice in the seven days of operating." The picture in **Fig. 8** is of Ken's operating location and portable station, with the antenna lowered ready for returning to his accommodation.

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Owen Williams G0PHY "only had one DX contact this month, mainly due to a two-week holiday in Cornwall. This coincided with a solar disturbance and the aurora was reported visible from Penzance. The contact I had was an early morning (0453UTC) one on 7MHz with CO0RRRC on IOTA NA-086 (Cayo Coco Island) celebrating 30 years of the Russian Robinson Club by a multi-national team. There's a link to a write up by **James KB2FMH** on the DX World website. 3D2LYC on Yanuca Island, OC-189, was a good strength on 21MHz on the last day of his activity but I could not break the pile-up." dx-world.net/co0rrc-cayo-coco-island-na-086

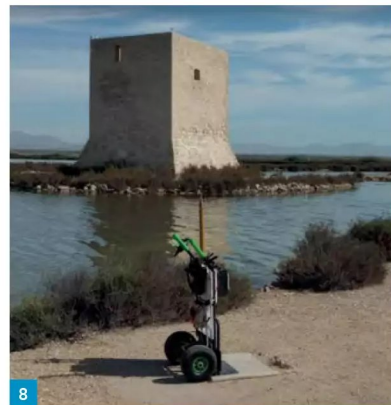
Tim Kirby GW4VXE, operating with his club callsign **GW4MM**, found that conditions have been changing quite rapidly over the last month, with much less to be found on 10m. "The evening openings deep into the USA on 15m continued for much of the month, although they seem to have got poorer in the last couple of days, requiring a move to 20m. I've been expecting to see some Es

on 10m, but interestingly, sometimes when 6m is open, 10m has been very quiet. It might just be activity (I should check 11m at the same time!) or it might be something else. I have been enjoying the late evening long path openings into Oceania (around 2100UTC) and have a number of QSOs in the log with VK2GR on 17 and 20m. I've heard him on 10m too, but very weakly,"

Band Highlights

John W6/G8XTJ: 7MHz SSB: ZS6CCY. 14MHz SSB: JH4UYB, KH7M, SN7Q, ZM4T 21MHz CW: G0SDD. 21MHz SSB: RA3RCL. 24MHz SSB: EA5JL, EI0CL, ISZSS. 28MHz SSB: BI4VIP, EA5S/M, CT9/UR9IDX, DK3EE, F2GL, G0FWX, GM4ZUK, LZ1WZ, OZ6CM PD1RK, UT5EL, YU1JW, ZL3TT.

Jim PA3FDR: 10MHz FT4: W4ARK. 10MHz FT8: CN8DN. 14MHz FT4: 9Y4DG, KH6PE, RV0APH, VK3AUX. 14MHz FT8: 3W3B, BOCRA, XE2W. 18MHz FT4: BV1EK, JR5XPG, KG7V, KL7TC,



YB1DMK, YE3ESW. 18MHz FT8: BG7SAY, DS4FWI, JI7VNJ, UA9YAD. 21MHz FT4: 5W1SA, 9K2HN, AA9RR, JF0JNU, KG7V, K6RO, KP4JFR, LU8EKC, VK5PO. 21MHz FT8: A71FJ, BA7LUI, EY8MM, JA8IZP, KL7OR, KP2/KD9TAW, PU1REC, RA9YES, VK2FAB. 24MHz FT4: JA4FKX, N0OG, TR8CA, YB9RPF. 24MHz FT8: BA3KY, CX1VH, JA2FJP. 28MHz FT4: 4L4DX, 7Q7CT, A71AE, CE2SV, HZ1SK, JA6FIO, PU6NEM, YB1RET, ZS4JAN. 28MHz FT8: 6M0MM, JH7OUW, OD5KU, R0SAU, UN7MBV.

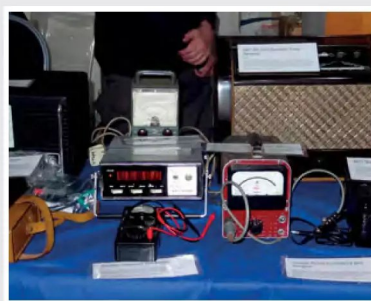
Kev ZB2GI: 7MHz FT8: C07GTE, CX2CC, HK3W, HP1AVS, KP4CT, N0FW, N7GFB, OA4BAQ, PY2BW, PY4LS, VK6JX, XE3A, YB0AZ, YV5LMW. 14MHz SSB: VK2GJC, VK3OZY, VK4KUS. 21MHz SSB: 4X6TT, 5P5FI (EU-125), 6Y5CB, 7X3WPL, C08NMN, KP4TG, N0GJW, PP1WW, PT2EM, UR9MC, VP9IN, YV5YJC. 21MHz FT8: B5/B1LEF, BA7LIP, BH8ESR, C07QC, VJ6X, VK100, VK2HMC, VK3DEN, VK4BLE, VK5DOC, VK6IR, VU2MSA, YB2CXZ, YB5MB, YD9HJD, YE1NZ, ZL1BBW, ZL3TE. 24MHz SSB: 9K2NH. 24MHz FT8: VK6DW. 28MHz SSB: PR6T, PY2GJ, PY3PDR, V51MA, VP8LP. 28MHz FT8: 4X1QQ, AB0VD, CE2SV, C03NR, CX4DZ, HI8RMQ, HK1J, HK3W, HK5WML, HP1RY, JA1ILA, JA2BDR, JA7QVI, JA9FPI, JH3EDG, K6VPV, K7AIE, LU3DXZ, PP5ZB, PU2YWR, PY3TP, PY4AVS, PY6TS, VE7BV, YS1RR. 28MHz FM: KF4WE.

Etienne OS8D: 14MHz SSB: 4L4DD, 8P6NW, AX5PAS, VQ5Q. 18MHz SSB: 4W1A, JY7FD. 21MHz SSB: E6AF, JK1AUH. 24MHz SSB: 4W1A, H31W, XF30. 28MHz SSB: 3B8GL, 4L1BB, 4W1A, PR6T, PY4EK.

Tim GW4MM: 14MHz CW: DU7ET, TI5/N3KS, VK2GR, VK6GX, Z30HS4A (what a call!). 18MHz CW: E29TGW, FY5KE, VK2GR. 21MHz CW: 9Y4WARD, C08NMN, CX5FK, FY5KE, KP4/N2IC, PJ2ND, TI5/N3KS, VK6T, YD2UWF. 24MHz CW: A71/RN1B, FP/DK7LX, FY5KE, UN7TX. 28MHz CW: FP/DK7LX, JT1CO, OA1F, OY1CT.

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 September issue the deadline is 11 July. 73, Steve PJ4DX. **FW**



For many radio enthusiasts and amateur radio operators, the Norbreck Castle Hotel Exhibition Centre Hamfest in April each year is a highlight of the annual show calendar. I am no exception, having visited this venue, on and off, for more than a decade now. The first NARSA rally was held in the year of my birth, at *Belle Vue*, Manchester, in 1962. I felt even more drawn to it this year, as the date was my name day, 23 April 2023; St. George's Day.

The venue was, once more, the splendidly faded glory of the *Norbreck Castle Hotel Exhibition Centre* by the Seaside in Blackpool. This was the 59th NARSA exhibit, and was run jointly by more than 50 Northern clubs around the themes of amateur radio and DXing, computers, and general electronics. The exhibition manager was **Dave Wilson MO0BW**.

Over the years, the NARSA event has evolved, in two main ways: first, there is a focus on the progressive side of the hobby, with Special Interest Groups (SIG) being especially present here, often building and exhibiting equipment that is not available commercially. Second, this is a great way to meet many representatives from a plethora of local and regional clubs and associations. There are plenty of opportunities to speak to everyone at leisure, exchange hints and tips, re-establish old contacts and make new ones, with both associations and key individuals. During the lifetime of this rally, as far as I can

Norbreck 2023 Nice to be Back!

Georg Wiessala enjoys his 'local' radio show, reporting back from the 2023 Blackpool Rally of the Northern Amateur Radio Societies Association

tell, the number of larger traders in attendance has slowly but inexorably declined. The notable exception this year was LAMCO – thank you very much guys, for making the effort, and what a great display!

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While many bigger names stayed away, small and medium traders and club stands were very much in evidence at this show. I would go as far as saying that this foregrounding of the local and regional aspects of the hobby is now what makes Blackpool unique. This focus makes the whole experience a much more intimate affair; there is no rush, no fighting for the best view of traders' displays and, above all, no undignified shuffling. Many in the hobby are bemoaning this lack of attendance of those larger radio firms displaying the latest gear, and a part of me agrees with this. However, because this show is run by a

non-profit-making association of 50 radio clubs, this changes the flavour of the event completely, bringing it back to, arguably, what the main point of a radio rally is: less of a feast of radio commerce but with plenty of room for demonstrations of new ideas, concepts, solutions to problems and constructions. I found that this aspect especially came to the fore this year in the vintage radios and antennas sector, with much hands-on learning and sharing of good practice visibly going on during the show. Therefore, the great joy of a rally like this lies in the ways you can chat to stallholders and operators about their latest discoveries, get hints and tips on that thorny issue you have been wrestling with in the shack, and make contact with fellow enthusiasts. If the hobby is serious about rendering itself more relevant to the younger generation, this is exactly how to do it.

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Yes, I would like to continue attending at least one of the larger events, such as Friedrichshafen, Dayton and Newark (cancelled for this year), but it is at these smaller gatherings, and in the presence of so many smaller clubs and networks, that I truly get the most out of this great hobby. Another good example is the swapmeets of the British Vintage Wireless Association (BVWA), which I reported on earlier in the year.

In this context, I spoke to quite a few radio friends during this show, with a twofold purpose: first, I did want to learn more about some technical aspects, such as Amateur Television (ATV). This I did at the stall of the *British Amateur Television Club*, and from their magazine, *CQ-TV* (Autumn 2022). I also enjoyed visiting the stand of the *UK DX Foundation (CDXC)*, to learn more about its outreach, DXpeditions and activities.

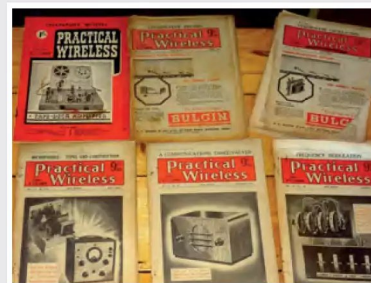
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However, I placed an emphasis on stopping by the stands of smaller, regional clubs from the Northwest of the UK, and in the process, I learned about their current concerns. I understand better now how many clubs in my region are active in the areas of education, youth recruitment, disaster mitigation, and post Covid-19 help to local communities, and how there are discussions around new (digital) transmission modes and SDR equipment.



ment, discipline on-air, QRM and the encroachment of what many see as 'non-radio related' topics into the hobby. All extremely interesting. Following the obligatory bacon barm and coffee, I returned to the Ballroom of another age to dance a little with the chaps who ran the Bring-and-Buy.



It was back after a break, which might explain the rather small number of items on display; or I may have simply visited at the wrong time. Let us hope this area returns to full strength next year. The next NARSA Rally is on 24 April 2024, and this will be the event's 60th Anniversary.

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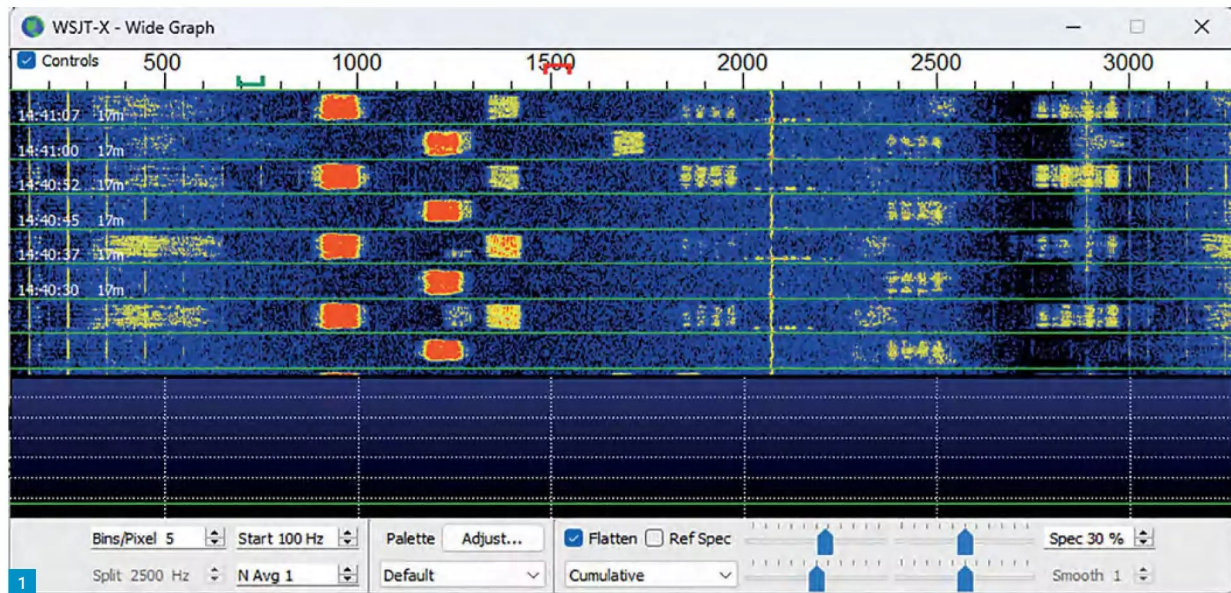
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Mike Richards G4WNC

practicalwireless@warnersgroup.co.uk

FT4 and more on SDR

I like to keep an eye on operating trends via PSK Reporter and have noticed that FT4 activity has been enjoying increased popularity of late. I also noticed I hadn't covered FT4 for a while, so now is an excellent opportunity to put that right!

As you can guess from the name, FT4 is very similar to and has been derived from the hugely popular FT8 mode. FT4 was originally designed with contesting in mind and is optimised to support high QSO rates. The most obvious change is the 7.5-second Tx/Rx cycle instead of the 15 seconds required by FT8. However, there are more changes under the bonnet, including 4-tone continuous phase frequency shift keying (CPFSK) and an increased bandwidth requirement of 1.6 times. The net result is a mode very similar to FT8 that's a bit wider, twice as fast, with a sensitivity loss of only 3.5dB.

For those that would like to try using FT4, here's a run through the basic configuration. All the standard rig control settings remain the same, and you select FT4 from the mode menu. However, it is worth adjusting the Wide Graph window to give the best view of the spectrum and band activity. The settings in the User Guide work well as follows: Bins/Pixel = 5, Start = 100Hz, N Avg = 1. You can also drag the right-hand side of the Wide Spectrum display to stop at the top end of your rig's audio passband, **Fig. 1**. While you can extend this to beyond 3kHz, most of the everyday activity seems to be concentrated below 2kHz. However, this will change under contest conditions, and you should expect to extend the top end to 3kHz and beyond, if your rig can manage it.

This month **Mike Richards G4WNC** has an update on FT4 activity plus his continuing dive into SDR technology where he's delving into spectrum displays.

As with FT8, the Wide Frequency graph has two sideways square brackets to indicate the current transmit and receive frequencies. The green marker shows the receive frequency while the red is the transmit. For best results, I recommend taking time to locate the best, clear transmit frequency. Once you've done this, press and hold the Shift key and click the mouse on that frequency. Next, tick the Hold Tx Freq box on the main WSJT-X panel, **Fig. 2**. That will fix your transmit frequency for all your contacts. If you have difficulty making contacts, you can change to an alternative Tx frequency using the Shift/Click technique.

Today I spent some time operating FT4 on 10m and found I was churning through QSOs at a surprising rate. My 10 watts of RF and Butternut HF-9V vertical soon had me in contact with Japan, Brazil, Indonesia, Yemen and many European stations.

Spectrum Displays

One of the most obvious differences between a traditional analogue receiver and an SDR receiver is the apparent ease with which spectrum displays are produced, **Fig. 3**. These provide an excellent way to view band activity and usually come with the facility to click-tune. By that, I mean you can place your cursor over a signal in the spectrum display and click to tune to that station. This is a very powerful

facility that will quickly become second nature. In addition to providing tuning aids, spectrum displays are often used to show and adjust IF and audio filtering. As they are so important to SDRs, I'll describe how spectrum displays are created and how to optimise the associated controls.

The theory behind digital spectrum displays comes from **Joseph Fourier**, whose pioneering work in mathematics led to the development of the Fourier series. This showed that any waveform could be reconstructed by adding sinewaves of the appropriate amplitude and frequency. This, in turn, led to the development of a mathematical method called the Discrete Fourier Transform (DFT). This takes an input as a series of measurements, just like our SDR's Analogue-to-Digital Converter (ADC) output. These measurements are in what's known as the time domain, i.e. we measure how the signal changes over a period of time. The Fourier transform converts these measurements to the frequency domain by extracting the amplitude of each component frequency contained within the signal.

The Fourier transform is used extensively in many forms of signal processing and has triggered significant development to find the most efficient algorithms for the conversion. These algorithms are grouped under the banner of Fast Fourier Transforms (FFT). Instead of

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Fig. 1: WSJT-X FT4 Wide graph display.
 Fig. 2: WSJT-X Hold Tx Freq check box.
 Fig. 3: Receiver spectrum display (SDR Console).
 Fig. 4: FFT bins. Fig. 5: Hamming window shape.
 Fig. 6: Using SDR# Studio to display the FT8 band activity.
 Fig. 7: Slow speed waterfall showing 20m activity.
 Fig. 8: High-speed waterfall reveals Morse code.

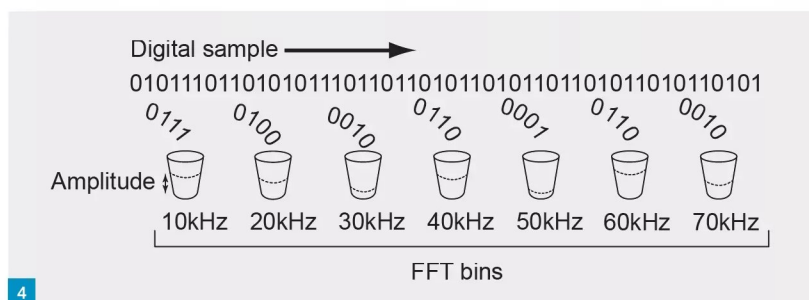
trying to handle a continuous stream of ADC data, the FFT takes in batches of data for analysis. The number of data points sampled is known as the FFT size and controls the ultimate frequency resolution of the FFT. For example, if we take the data stream from our high-end SDR that covers 0 to 55MHz and set the FFT size to one million, the FFT resolution would be $55\text{MHz}/1 \text{ million} = 55\text{Hz}$. In practice, the FFT would create one million memory locations, each containing a number representing the signal level in each of the 55Hz wide bands. These memory locations are commonly called bins, and I've illustrated the process in **Fig. 4**. The value in each bin is then displayed graphically to produce the spectrum display.

One important caveat with FFTs is that the supplied samples must start and end with the same value for the FFT to work correctly. This is necessary because the FFT treats the sample as a loop and iterates over this loop many times to extract the frequency information. If the start and end values don't match, there could be a sharp discontinuity, like a key click. That discontinuity would introduce many harmonics and smear the display. In practice, the simplest way to consistently match the start and end values is to fade the values to zero at each end of the sample. This process is called windowing because it's similar to the signal passing through a shaped window, **Fig. 5**. There are many ways to shape a sample's fade to zero, and the choice depends on the application. The most popular windows for spectrum displays are the Hanning and Blackman variants.

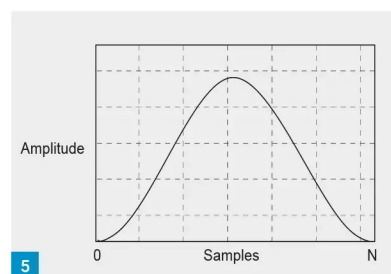
Using and Adjusting FFT Displays

Most receivers allow you to alter the FFT size and window function, but care is required for the best results. As with most things in life, FFT adjustment usually involves compromises. As you increase the FFT size, the frequency resolution increases, but so does the refresh time and the processing load. The result could be a more detailed display with a slower refresh rate. A more powerful processor can help, but adjustment will always be a compromise.

When selecting your FFT size, you should also consider your screen resolution. There is no point in increasing the FFT size to be significantly greater than the number of pixels available in the display. If you do, the display software will simply rescale the FFT output to



fit the available pixels. The exception is those SDRs that feature a zoomable display. In many cases, when you zoom the spectrum display the FFT size remains unaltered, but the scaling between the FFT and the screen is changed. In that case, you may want to set the FFT size for the zoom level you most commonly use. For example, if you're monitoring FT8 you might want to see the entire FT8 allocation spread over much of the available display, **Fig. 6**. For this display using SDR# Studio, I used an FFT size of 262,144. Another important point to note is that the chosen FFT size should always be a factor of two. Most programs control this by giving the user a selection of predefined FFT sizes to choose from. The selection of factor two values is important because the FFT will run faster.



Many spectrum displays also include an averaging facility. This can be used to suppress the flickering often found in a raw display. While the control is sometimes called averaging, attack and decay controls are also used. These controls treat rising and falling signals differently, thus enabling fine tuning of

the display's appearance. However, you should beware of straying too far from the default settings, or you could be suppressing some signals.

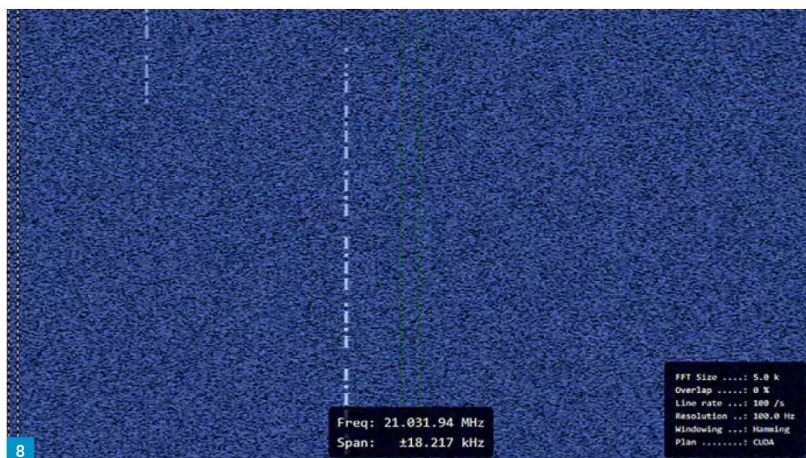
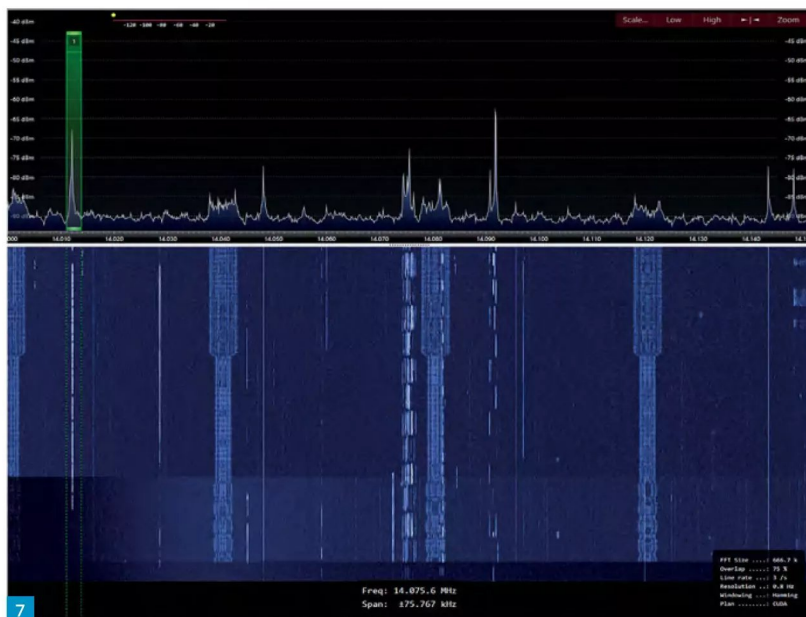
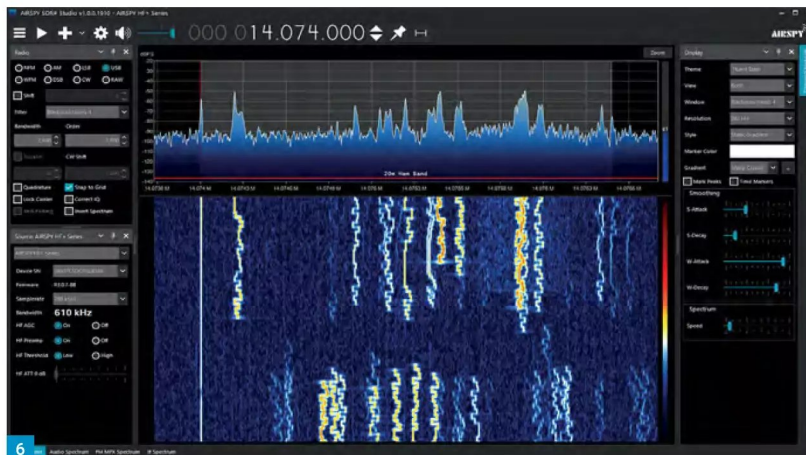
The window type is not particularly critical for general listening as you will notice little practical difference between the popular Hamming and Blackman variants. The only time window choice becomes important is when measuring closely spaced signals on a quiet band. In this case, it's worth experimenting with different windows to minimise any smearing between FFT bins.

Waterfall Displays

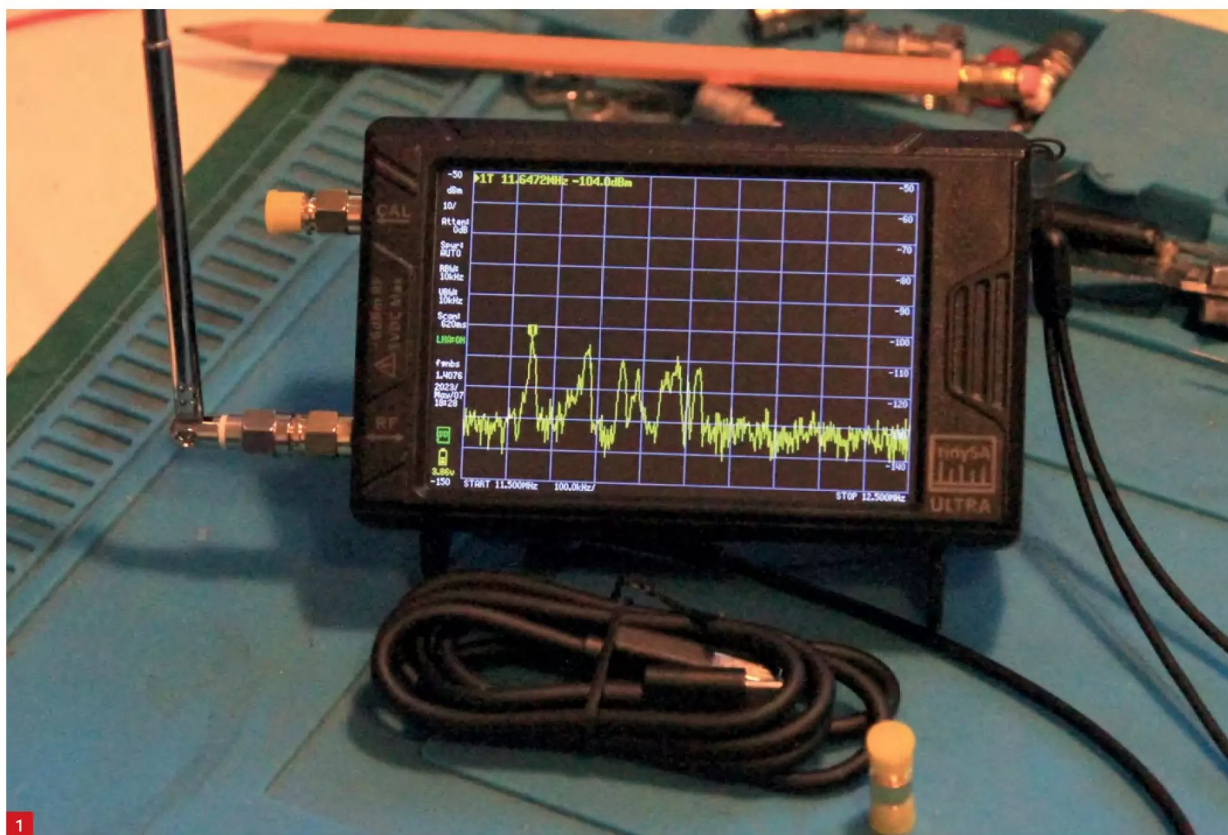
The standard spectrum display is excellent for live signals, but the waterfall display provides a different view of the same data. The key difference is that the waterfall shows how the spectrum changes over time. The waterfall display is created by taking snapshots from the spectrum display and displaying the result on a single line. Instead of the vertical plot of the spectrum display, the waterfall shows amplitude using a combination of brightness and colour for each pixel. In a typical display, colours at the red end of the spectrum are used for the highest value, while cooler blue tones are used for the weaker signals. Many programs include a range of user-selectable colour schemes, but the default blue through to red seems a natural choice. While the waterfall normally uses the same window and FFT size as the main spectrum, there are some waterfall-specific adjustments you can optimise for the best results.

Adjusting Waterfall Displays

The main adjustment is to set the sensitivity of the waterfall. This is normally set to give the clearest display of the desired band, with the strongest signals peaking into the red. You will find that the sensitivity often needs to be readjusted as you change bands. The next important adjustment is the waterfall speed, which determines the scrolling speed and can be adjusted to reveal different aspects of band activity. For example, a very slow setting can be ideal for spotting occupied frequencies where one side of the QSO is too weak to copy. I've shown an example in **Fig. 7**, which shows 20m band activity where the dashes indicate active frequencies. At the other end of the scale, with a very fast waterfall speed, you can see the waveform of the modulated signal. In **Fig. 8** I've shown a fast waterfall that reveals the Morse code as it's sent. Some display systems will also include averaging or attack/decay setting that can be trimmed to improve the visibility of the desired signal. **PW**



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Keith Rawlings G4MIU
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TinySA Ultra Spectrum Analyser

Keith Rawlings G4MIU invests in a TinySA Ultra and uses it to find sources of QRM.

I guess like many other amateurs, I tend to have devices or gadgets in some form or another that I wonder what I ever did without. For me one of these 'gadgets' is a Spectrum Analyser. A spectrum analyser is used to measure the magnitude of an input signal over frequency. There are various types of spectrum analyser, for example those used for audio or optical use. The TinySA-Ultra to be discussed here measures input in the RF spectrum.

The spectrum analyser displays frequency on its horizontal axis and the amplitude of signals on the vertical axis. In many ways a spectrum analyser looks like an oscilloscope. However, these plot amplitude on the vertical axis but time on the horizontal axis.

There are many applications where a radio amateur can put a spectrum analyser to good use, but, just like VNAs (Vector Network Analysers), they were traditionally very expensive and, in many cases, rather large. This has changed and there are a number of cheaper analysers available brand new at very affordable prices. Those from Rigol and Siglent spring to mind, as does the much cheaper RF Explorer. If we wish to go even cheaper and still have reasonable accuracy, there is now the TinySA

and for a bit more the TinySA-Ultra.

My first SA was a Texscan AL60, which was a bit dodgy when I got it. It got me going in spectrum analysis but eventually gave up the ghost and while I was pondering a repair an HP8559A in an HP182T mainframe came my way.

This spanned the frequency range 0.01-21GHz and was a marked improvement over my AL60. The HP has served me well over the last 30 years or so but is showing signs of age. While it is still good electronically, mechanically it is suffering a bit. It has spent many years on my workbench but also been transported 'into the field' on countless occasions and despite taking care with it, it inevitably got a few knocks.

Presently, I find that the input attenuator switch has problems and I now have to use an external attenuator, the tuning control has a nylon gear that has broken making tuning

'interesting' and other switches have minor intermittent problems.

Finding a Replacement

I had considered replacing the HP with something a bit more modern such as a Rigol or Siglent model but really couldn't make my mind up on what model, what additional 'plug-ins' to have and how much to spend! Realistically I don't really have the requirement for anything special nowadays and after many months of dithering I put the idea of a new bench top SA to one side.

After reading Michael GW7BBY's description of the TinySA in the July 2022 *PW* (thanks Don for reminding me of the issue!) I decided that, for now at least, I would go down this much cheaper route as I figured that this little device would do for day-to-day work and I would still had the 8559 if I needed it.

After further research it appeared that

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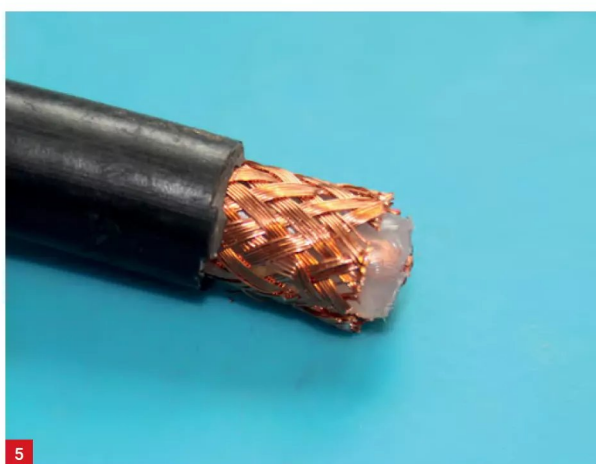
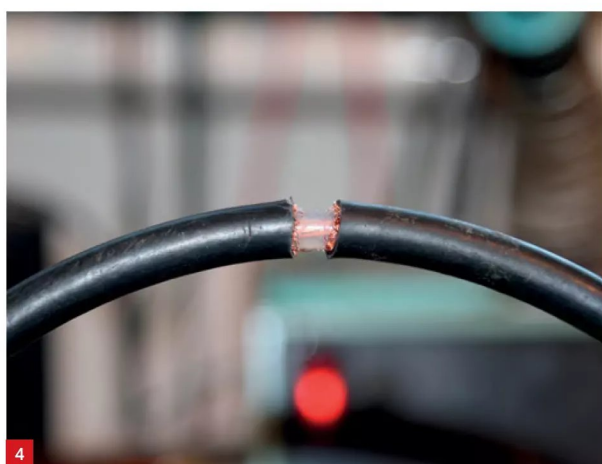


Fig. 1: TinySA Ultra on 3D Printed Stand. **Fig. 2:** Shielded Loop, which can provide a 30dB null. **Fig. 3:** Cheap PL259s are good enough in this application. **Fig. 4:** One end of the cable does not connect to the inner of the PL259. **Fig. 5:** Cut in the outer braid of the coax cable at the apex of the loop. **Fig. 6:** Map depicting DF

there was going to be a TinySA with improved features, and after further delaying a purchase, I eventually bought a TinySA-Ultra from Mirfield Electronics. Mirfield are an authorised dealer for the genuine **Erik Kaashoek** developed TinySA. There is no point me reinventing the wheel and fully describing the TinySA as GW7BBY has already made a fine job of this in the aforementioned issue of *PW*. I will just give an overview of the TinySA-Ultra and, spread over a couple of months, describe some of the antenna related jobs I have recently put my TinySA-Ultra to.

Main Points

The Ultra, **Fig. 1**, has a 4in screen, increased from 2.8 on the TinySA. It has a spectrum analyser frequency range of 0.1-800MHz or

when in Ultra-mode up to 6GHz. It is possible to observe signals up to 12GHz (Max input level +10dBm). When not being used as a spectrum analyser an AM/FM modulated Signal Generator function may be selected with sine wave output between 0.1-800MHz or square wave up to 4.4GHz and for indication, an RF test signal output up to 5.3GHz. Switched resolution bandpass filters from 200Hz to 850kHz are provided as is an inbuilt 20dB selectable LNA. An input step attenuator from 0dB to 31dB is included and the colour display shows a maximum of 450 points (with a colour waterfall available). A MicroSD card slot has been provided for storing measurements, settings and screen captures. Also included is an inbuilt ability to listen on the frequency of the current active marker. There is an inbuilt signal generator, which is used for automatic self-test and input calibration.

The Ultra can be connected to a PC via the USB port where it becomes a PC-controlled Spectrum Analyser or Signal Generator. When PC controlled a much larger number of scan points are available. The internal rechargeable battery will provide over two hours of portable

use. The signal generator feature cannot be used as a tracking generator with the Ultra due to the fact that the spectrum analyser and generator functions are not available at the same time.

There are however some penalties when measuring in Ultra mode: Firstly, there is an increase in scan time, which can then lead to a failure capturing very short duration signals. There can be higher Local Oscillator leakage from the RF connector, failure in capturing scanning signals such as from an external sweeper and there may be false signals displayed with complex or wide signals.

It is easy to change Ultra-mode by way of the menu but I have found there is little to lose by having ultra-mode permanently selected.

The Ultra comes supplied in a smart box with two 320mm RG174 size SMA male patch leads, SMA female-to-female coupler, 300mm telescopic antenna with Male fitting USB-C lead, wrist strap and guitar plectrum.

For My Ultra I have added a couple of SMA Male/Female adaptors to use as sacrificial connectors due to SMA connectors having a limited number of cycles, and a handy 3D printed desktop stand taken from the TinySA IO group files section.

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QRM and Unwanted Noise

It is a sad fact of life that much of today's modern electronic equipment is capable of radiating an inordinate amount of unwanted noise. Whether due to poor design, deliberate omission of vital filtering components, or flawed technology those amateurs living with nearby neighbours are likely to suffer some form of locally generated interference. The TinySA-Ultra can be used to good effect in 'sniffing out' sources of QRM.

Within 100m of where I live I have estimated that there are at least some 60 dwellings. This makes my noise levels here incredibly high and it is also difficult to pinpoint an individual source of QRM.

From a personal point of view it is now somewhat pointless to go around and try to cure sources of noise because I have found that as soon as one is fixed then another crops up somewhere else.

So rather than chase my tail around the neighbourhood (and probably becoming more unpopular than already I am!) I limit myself to tackling more prominent issues with nearby noise sources and trying to negate the more distant problems as best I can using other methods such as antenna noise cancelling and magnetic loops for reception.

When searching for QRM, a sensitive receiver such as a portable AM radio or something like an FT-817 can be used. Once a location has

been found, hopefully the homeowner will be amenable and allow the problematic appliance to be identified. Temporarily switching off may prove the point and hopefully you may then resolve a problem by negotiation.

The TinySA-Ultra is an excellent tool for this as it provides graphical evidence of a source of unwanted emissions on its spectrum display and also the ability to listen to it via headphones.

Although I have not yet tried it in tackling a real QRM issue, I think that with the LNA selected the TinySA-Ultra may also be sensitive enough to take the place of a portable radio when looking to nail down the QRM location.

Antennas

We are now, at last, coming to the antenna part! To detect all of this noise we need suitable antennas, and here I include EMC probes as antennas.

I have found that when just using a simple whip antenna noise sources can often merge into each other, so in a dense QRM environment, some form of directional antenna will be of benefit to pinpoint a noise source. On the lower frequencies a portable radio with a ferrite rod antenna should be able to give some directivity but by the time we get into the HF bands a small Shielded Loop antenna, Fig. 2, can be an effective 'sensor', which will be very cheap and simple to make.

Also, we may have a need to narrow down where noise is being radiated from a particular point on a board and for this the TinySA-Ultra may be used to good effect using some RF/EMC probes and these can also be cheap and simple to make.

Shielded Loop

To get going, this month I shall describe making a shielded loop suitable for QRM hunting. All we need will be a 1m length of good quality RG213 coaxial cable with thick braid, two PL259 plugs (I bought cheap threaded ones Fig. 3), an SO239 'T' adaptor and some heatshrink sleeving suitable to go over the RG213.

After first sliding the shrink tubing over the cable it will need to be fitted with a PL259 in the conventional way on one end and on the other end the cable is fitted to the PL259 making contact with just the outer braid and no connection to the centre conductor, Fig. 4.

Note: For this application I have not soldered the outer braid to the PL259 but instead just screwed the connector on.

We then need to make a good clean cut in the outer braid at the exact centre of our length of cable so that there is a gap of about 20mm at what will be the top of the loop when formed, Fig. 5. Once done, place the heatshrink over the gap and heat it into place.

All that needs to be done now is fit the two PL259s to the T adaptor and fit a cable from a radio to the branch of the adaptor. You will now have a directional antenna with maximum gain off the ends and a null off the face with around 30dB of difference between the two, making a very effective antenna for locating local noise.

Once made the loop may be mounted onto a piece of electrical conduit that acts as a handle. The loop easily provides a 90° null of 30dB on the HF bands with similar results to beyond the 2m band.

Pinpointing sources of unwanted noise will vary with the environment but I find the technique depicted in Fig. 6 works well. Starting at position A, take a bearing on the QRM by turning the loop (I find it easier to look for a null in the noise). After taking a note of the bearing, move to a position such as B and take another bearing.

Hopefully this will give a bearing to walk down (depicted as yellow in Fig. 6) while at the same time gently rotating the loop to keep the null in the correct direction.

Invariably as the loop is taken past the QRM location the null point will 'swing' around and hopefully the source has been found! It isn't always as simple as this and more often than not further bearings will need to be taken but this is the basic idea.

I will continue with this topic next month, see you then! **PW**

Read more radio news and reviews at www.radioenthusiast.co.uk/news



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This piece is about a CB radio I was given, a Midland (Alan) 78 Plus. Now don't scoff please; a radio is a radio and 11m technology has come a long way since the eighties.

This radio, now called a 'Pro', is a premium product costing around £80. As **Fig. 1** shows, it doesn't look much different to the CBs we had when (and sometimes slightly before) Mrs Thatcher did her sums and realised legalising CB would bring in a lot of VAT.

CB Radios Today

So have CBs changed? Well, yes and no. Power remains 4W and the channel knob still clunks round in sets of 40 channels 10kHz apart. (Or so I thought. More later.) UK legal modes are AM and FM, even SSB (but not on this set). The speaker is still pathetic, but you now get a nice LCD display.

This is a 'multi-norm' CB for use in different countries. With 'UK' selected – a power-up option, **Fig. 2a** – it has two sub bands toggled by the AM/FM button. 'UK' on the main display now (**Fig. 2b**) gives the UK-only channels starting 27.60125MHz. 'EC' brings up the CEPT (original USA 'mid' 40) channels starting at 26.965MHz.

10m on a CB

Tony Jones G7ETW 'repurposes' an old CB radio for the amateur 10m band.

I do hope you're still with me, because now it gets interesting from an amateur radio perspective. Among the selectable country modes are two that offer 4MHz of coverage from 26.5MHz up. 'PX' (Poland Export) does the 'zeroes' (frequencies in tens of kHz) and 'RU(ssia)' does the 'fives'.

This is amazingly useful, but an unwary operator could break the law just about anywhere! However, for (trusted) us, this makes available the entire 10m band.

Implementing 10m

Implementing PX mode gave me ten sets ('a' to 'I', no 'k') of 40 channels. So far, so good. But despite the display indications, transmit was disabled.

Googling, I saw on the Riggix site that this radio has three relevant jumpers. My board did not match the one pictured but more Googling led me to a CB blogger called 'Simon the Wizard' who kindly sent me a link to one of his 'mods' pages where my board was featured.

Fig. 3 shows my board with the jumpers as standard. To enable 'PX' mode, jumper 3

(marked as 'OPT 3') needs to be opened (ie no connection made). OPTs 1 and 2 are one big blob on my board, but I didn't need to change them so I left well alone. See **Fig. 4** for the completed job.

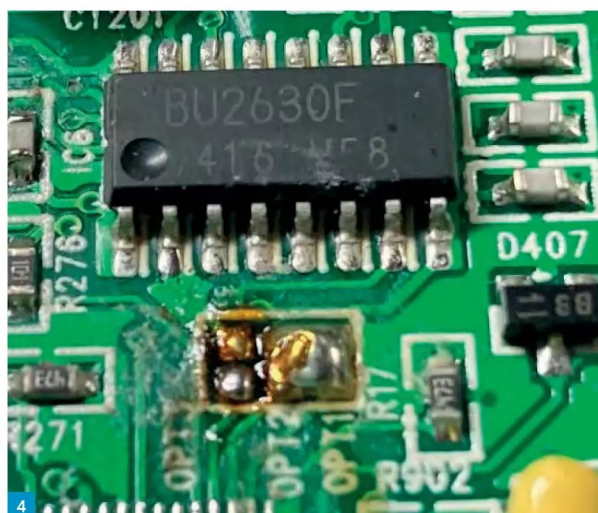
Evaluating the Mod

First the good news: the mod works, see **Fig. 5**. In a dummy-load test transmission across the club shack the radio sounded good on the 1com IC-756.

AM/FM selection works and power out on FM is 3W. If I turned up the 'regulator' control (see **Fig. 6**, potentiometer RV1), I daresay I'd get a bit more, but running any radio at the absolute maximum is never a good idea.

Tuning up and down I noticed something odd. Each 40-channel block took up 450kHz. Systematic testing revealed that some channels jumped 20kHz and others were out of sequence.

Puzzled, I put the radio back in UK mode and checked the standard, un-modified EC channels only to see precisely the same thing. Channel 3, for example, should be 26.995MHz but is



actually 27.005MHz. 26.995MHz is allocated to CB, but as a hidden or 'alpha' channel. And channel 23 is 27.255MHz, 30kHz above channel 22, with channels 24 and 25 lower in frequency!

This is a hangover from when CB was extended from 23 to 40 channels in the 1970s. Most CB sets still don't have frequency displays so the user would never know.

Conclusion

An Alan 78 Plus (and many other similar CB sets I expect) is modifiable to do 10m, QRP with AM and FM. I found it an easy job, with no need for modifications to RF circuitry or firmware. 3W is

not a lot to play with, but for a QRP man like me, that's OK.

I can't deny this channel mishmash is a bit of a nuisance. But for the few frequencies around 29.2MHz I could use I've made up a channel

table and stuck it on the radio. It's no different to using old-school PMR sets with just channel numbers after all.

Not bad, I'd say, for a radio that cost me nothing! **PW**

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At one time or another every radio amateur aspires to buy a matching speaker for their radio transceiver or receiver. Just about every amateur radio manufacturer has produced matching speakers for almost all their individual radios. And where they haven't, an audio manufacturer has neatly stepped in to take advantage of this gap in the market.

Matching or 'companion' speakers were pretty basic from the 1940s to the 1990s, most consisting of a single four to six inch (100mm to 150mm speaker) sometimes round but quite often elliptical in shape in an otherwise empty wood or steel box with a perforated grill over the speaker. And they weren't cheap either – the matching MS-4 speaker for the Drake R-4 and TR-4 series cost around US\$100 back in the 1960s. (US\$100 in 1965 is equivalent today to almost \$950! [1])

In the early 1970s I bought a used Drake TX-4B transmitter and R4B receiver – my dream radios back then. After a few months of searching I managed to find an MS-4 for about 80 quid and was ecstatic.

After the initial thrill wore off, I tried it against the discarded mono speaker from the family au-

Using Old Home Theatre Centre Speakers for Amateur Radio

Amateur radio speakers can be expensive. **Steve Ireland VK6VZ/G3ZZD** explains how used home-theatre speakers can provide a cheaper, better sounding alternative.

dio system. My dad had built this from thick particle board, used a six inch Wharfedale speaker and stuffed the cavity with speaker wadding. The homebrew speaker had a full, clear sound to me – unlike the tinny-sounding MS-4, which was quickly put away in a cupboard.

Now a lot of people who have used a MS-4 speaker will probably be horrified about my opinion – unless they have swapped one out with a decent bookshelf hi-fi speaker of similar impedance.

So began a pattern in my radio operation which lasted for the next 40 years. Over this time my choice of hi-fi speakers used for radio became

further refined. Any matching speakers that came with a radio into the shack got compared against this benchmark. And every time the matching speaker quickly got put away or sold off.

Up to about six years ago the benchmark was an Akai SW-393 three-way hi-fi speaker. Then I came across an internet article by **David K3DAV [2]** about the benefits of using a centre speaker from a home theatre for radio. My hearing had begun to deteriorate – too much low-band DXing and loud rock music – and I was looking into ways of improving the audio fidelity of my HF transceivers, so listening for several hours straight was less fatiguing.

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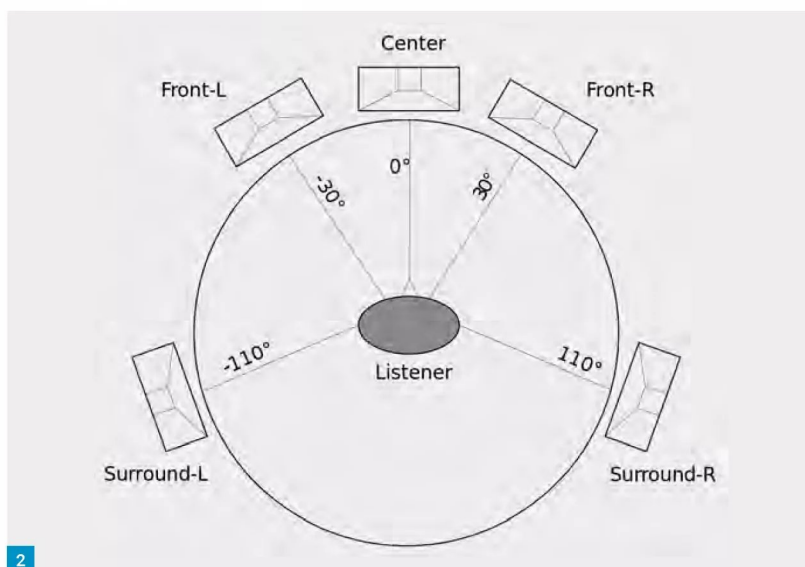


Header photo: My IC-7610 with Mission m7c centre speaker. Wood blocks are used to raise it above the IC-7610's case, to allow air to flow freely into the radio. Fig. 1: Mission 75C speaker in use at VK6VZ. This is switched between my TS-830S and Ten Tec Orion, using the Digitech audio switch on top of the speaker. Fig. 2: Typical 5.1 home theatre surround speaker configure. Diagram courtesy of Kamina, Wikimedia Commons. Fig. 3: My Mission 75C with the speaker cloth removed, showing the twin mid woofers, tweeter and quality of build.

Like me, David had been using bookshelf hi-fi speakers but was looking for something better that would aid signal clarity on weak signals among noise and static on his Icom IC-746Pro. He looked at what US amateur radio dealers were selling and ended up purchasing a reputable, well-known add-on speaker. To quote him: "I was not happy. I reconnected my little bookshelf speaker and it sounded much better".

David tried a few other add-on speakers and the matching speaker for the IC-746Pro, but without success. "They were OK but lacked a certain amount of natural tone quality found in voices. The sound was always too tinny, or too bassy, or muddy, or flat with poor voice ranges...blah, blah, blah... I got tired of searching and kinda gave up for a while".

This sounded all too familiar to me. Like Goldilocks, David and I were both searching for the speaker that was 'just right'.



K3DAV was also an audio/video enthusiast and had a home theatre system with high definition TV and hi-fi surround sound, often known as a five-point-one (or 5.1) surround system, Fig. 2.

Five-point-one systems [3] use a speaker configuration consisting of front (left and right) speakers, a centre speaker, two rear (left and right) surround speakers and a low frequency speaker, better known as a sub-woofer, for LF special effects. This quintaphonic system evolved from the quadrophonic one of the early

1970s and was first used in the 1976 movie 'Tommy' (as in Pinball Wizard).

The first five speakers are the '5' and the sub-woofer is the 'point one' in the system's name. The most important speaker when it comes to speech is the centre speaker, which is designed specifically for the dialogue of a film. One day, watching the movie *Top Gun*, K3DAV listened to the voices coming out his from centre speaker and had an idea. He linked his centre speaker up to his IC-746Pro and was amazed at the results.

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A home theatre centre speaker of 1990 vintage – when watching films at home really caught on – generally consists of two 140mm diameter mid-range ‘woofers’, separated by a 70mm tweeter and all electrically linked by a three-way inductor-capacitor (LC) crossover network. This network is where the magic happens.

Typically, the network is designed so the two mid woofers range is limited from around 50 to 3,500Hz – perfect for reproducing SSB, FM, AM or CW. In the case of the tweeter, only audio frequencies from 2.5kHz to 25kHz will be passed to it – which in the case of amateur radio speech modes is NOT going to be much. Furthermore, any frequencies above 15kHz are rolled off anyway.

As K3DAV wrote: “It is a nice balance for voices. The soft level of the tweeter adds just the right amount of ‘highs’ to complement the two mid woofers, which do 80% of the work. But the hiss and high frequency static sounds are not heard”.

Finding a Centre Speaker

K3DAV had an Optimus PRO-CS-5 centre speaker in his home theatre setup, which after putting it into his radio setup was replaced with a comparable Polk one.

It was around 2015 or so when I read David’s article, when my main HF radio was a Ten-Tec Orion 2. This had nicer audio than its predecessor Elecraft K3 and I was very keen to find a centre speaker to try out on it.

The Australian equivalent of the UK’s *Preloved*

online site is called *Gumtree* and I carefully searched it. While Optimus and Polk speakers were non-existent, I found an advert for a home theatre centre speaker of similar specifications to the PR-CS-5 from a UK company called Mission Electronics [4].

Doing some searching on the internet, I discovered Mission, founded in 1977, were a company whose products were favoured by UK and Australian hi-fi buffs. I quickly rang up the speaker’s owner and purchased a Mission 75C centre speaker [5] from him for about £50 UK, **Figs 1 and 3**.

The next day I hooked up the 75C – and was amazed. I had bought the matching speaker for the Orion 2 (a Ten-Tec 307) as part of a package and previously thought it sounded quite decent. On both SSB and CW, the Mission 75C was so much clearer and cleaner – exactly in the way K3DAV had described.

As a radio amateur for almost half a century and former *Ham Radio Today* editor I am not easily impressed (and indeed am rather cynical) but this speaker was the ‘bee’s knees’.

Subsequently, I tried several smaller, lower quality and cheaper centre speakers, owned by friends. These often only had single speakers, of 50 to 80mm in diameter, and sounded poor in comparison to my Akai hi-fi speaker, let alone the 75C. The only way was to ‘go big’ and buy one with a couple of 110 – 140mm mid-woofers and a tweeter in the middle.

A few years back I sold the Orion 2 to buy an Icom IC-7610. As this had dual receivers and can be used for diversity, I bought a pair of reputable, new Behringer 1C monitor speakers to go with it. But after a comparison between the 1C and the 75C, the Mission ruled supreme and the Behringer on the main receiver got the boot.

I then did some searching on Gumtree again and found there were several big Mission home theatre speakers for sale – and the prices had dropped considerably! I picked up a sleek Mission m7c1 [6] for £15 (UK), which now sits on wooden blocks atop the IC-7610 – and the Mission 75C is switched between my antique TS-830S and back-up Orion 1.

Do yer ‘Toby Jugs’ (ears) a favour and find yourself a used centre-speaker. Alright, guv’nor?

References

- [1] CPI Inflation Calculator: <https://tinyurl.com/btcv35u>
- [2] K3DAV isn’t currently active in amateur radio, but you can currently find a copy of his article at Simone IW5EDI’s website: <https://tinyurl.com/s6ztev4p>
- [3] See Wikipedia: <https://tinyurl.com/55eatjkn>
- [4] www.mission.co.uk
- [5] Mission 75C specifications can be found at: <https://tinyurl.com/55n9t5jy>
- [6] For Mission m7c1 specifications, see: <https://tinyurl.com/muxe229r>

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Originally published in Germany this is the story of **Erhard Steiniger** (b.1920) who joined the German army in 1940 and spent most of the war on the Eastern Front as a signaller. It is a very graphic account of the day-to-day life of an ordinary soldier who found himself fighting in appalling conditions during the Russian winters. Erhard was born in the German speaking part of what was then Czechoslovakia (now the Czech Republic) known as Sudetenland. He makes the point that pre-war Czechoslovakia was a multi-ethnic country with a large population of Germans, Slovaks, Hungarians, Poles and Ukrainians as well as Czechs. He felt that he was an oppressed minority and welcomes the annexation of Sudetenland in 1938 by **Hitler**. He leaves school in 1936 to work in a warehouse but in 1940 is conscripted to join the army and is posted to Brittany.

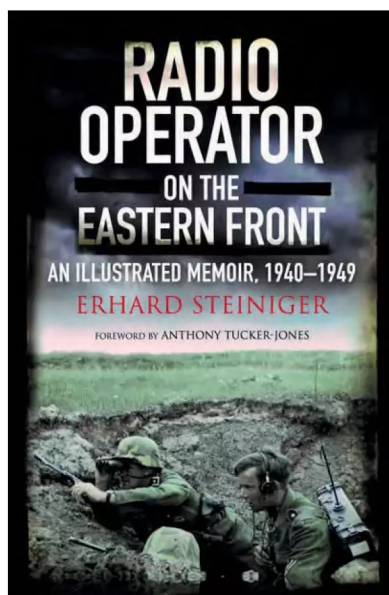
This rather pleasant posting is short-lived and in February 1941 he is sent to East Prussia (now the Russian enclave of Kaliningrad). In April 1941 he takes part in the invasion of Lithuania, which had been an independent country between the wars but had been seized by the Russians in 1940. Erhard describes being greeted as liberators because the Lithuanians disliked the Russians invaders. Erhard's role as a field signaller was to carry either a 17kg radio or its equally heavy battery pack. Signallers worked in pairs with signals sent by telephony over short distances up to four kms or by Morse for longer range communications up to 10 kms. The main equipment used was known by the soldiers as DORA 2. It was the Torn.fu.d2, which was introduced in 1936 and built by Telefunken. The radio transmitted between 33 and 38MHz and could transmit on 100 different channels.

In June 1941 Hitler unleashes Operation Barbarossa, his plan to invade Russia and make it part of the Nazi Empire. Erhard and his company push on through Lithuania, into Latvia and then enter Estonia. Again, they are greeted as liberators by the people of the Baltic states. He does not flinch to describe the horrors of war, the terrible wounds suffered by soldiers, the loss of many of his colleagues, food shortages, disease, mud and lice. The book is profusely illustrated with over 120 original photographs of people, places and most profoundly the graves of German soldiers who were buried where they fell in combat.

Erhard was a proud German who believed in what he was fighting for. At times he reflects on how the Germans were viewed after the Second World War and feels that German soldiers were brave professionals who fought

Radio Operator on the Eastern Front

David Harris reviews an account by an ordinary soldier of life in the German Army as a radio operator.



Radio Operator on the Eastern Front. An Illustrated Memoir 1940-1949

by Erhard Steiniger.

Greenhill Books. 2021. £25. Hbk. 303 pp.

ISBN 9781784386184

www.greenhillbooks.com

well but just happened to be on the losing side. The Germans press on and there is a lot of detail about the capture of the Estonian islands of Muhu, Saaremaa and Hiluma by amphibious landings. The book could have benefited from the inclusion of a few maps as the geography of the Baltic states and the Eastern Front is not that familiar to British readers. In the book he refers to the German names for places but the translator has included an appendix of their modern equivalents. Likewise, the German army ranks and their British equivalents are also listed.

The German army keeps moving eastwards to Russia along the Gulf of Finland and then overland to Tikhvin, which is south east of Leningrad (St Petersburg). At this point Leningrad is surrounded and besieged for two years. However, the Russians counterattack

and the Germans begin to retreat to the Volkhov Front. The Germans find themselves on the west bank of the Volkhov River facing Russian troops on the other side of the river. The Germans lack adequate winter clothing and face temperatures of -30°C . The troops dig in for a long winter and he describes the problems of trying to find enough firewood to keep warm.

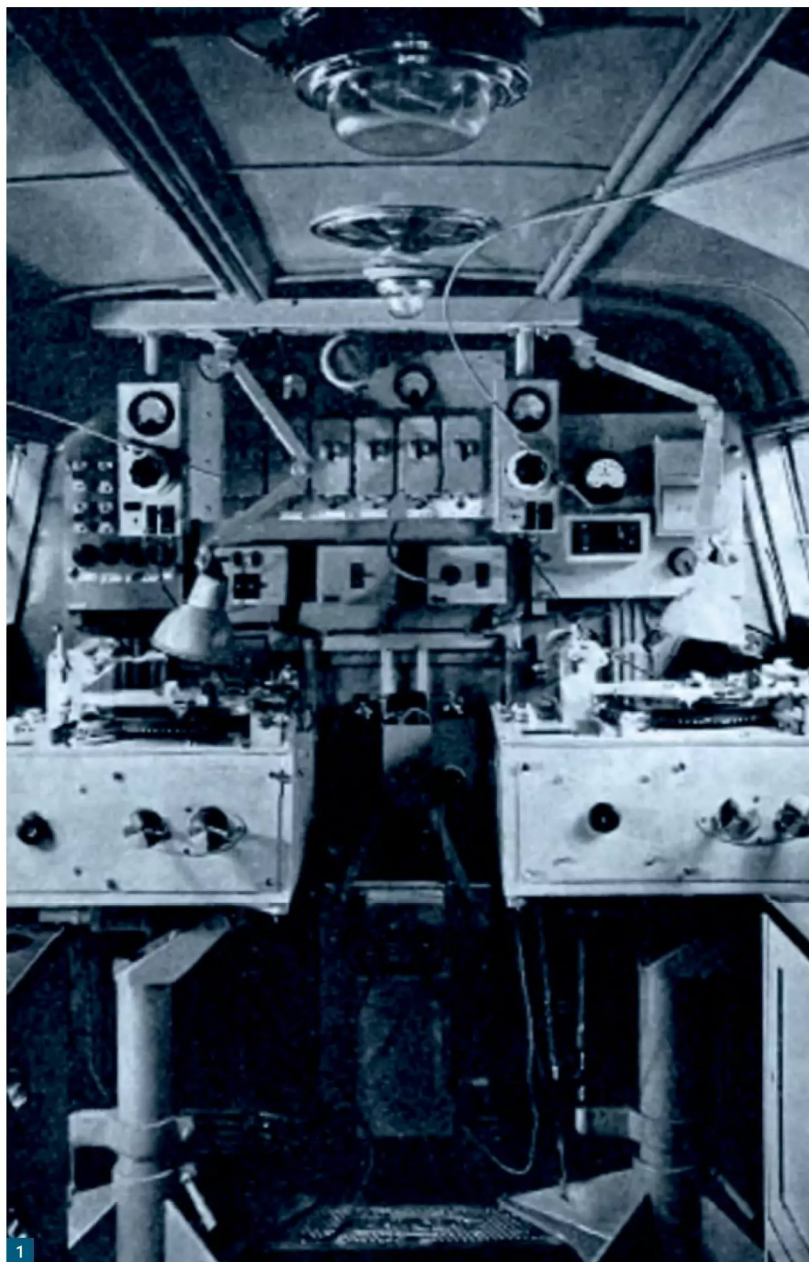
In May 1942 he goes on leave for the first time since October 1940. He returns to the front but the tide of the war has changed with the Germans now encircled as the Russians try to lift the siege of Leningrad. Erhard is wounded and taken to a field hospital. He soon returns to the frontline and by January 1944 the Russians have broken out of the Oraniebaum pocket (an area of Russia on the southern side of the Gulf of Finland, west of Leningrad). This area was not captured by the Germans who now find themselves in retreat. In the second half of 1944 ethnic German refugees are also heading west as the Russians advance with Latvia and Lithuania being occupied once again by the Russians.

The Germans finally retreat to Königsberg (Kaliningrad) from where he goes on leave again in January 1945. The war seems lost for the Germans following on from the success of the Normandy invasion of June 1944 and the collapse of the Eastern Front. He is posted to Silesia (now part of Poland) and finally ends his military career as a hospital orderly in Freiburg.

At the end of the war he returns to Czechoslovakia but is seized by Russian occupiers and sent to Siberia where he works in a labour camp until 1949. During his incarceration he is able to communicate with both his mother and girlfriend who have survived the war. On his release from Russia he is given a very hard choice – does he want to move to East Germany to be with his mother or to West Germany where his girlfriend now lives. He chooses life in the west.

We are not told much about his life after 1949 other than that he started writing the book in 1981 for his children. It is a compelling account of the realities of war told from the viewpoint of an ordinary soldier. **PW**

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In 1937, there were 14 commentators in total from broadcasting services operating in Argentina, Belgium, Czechoslovakia, Denmark, France, Germany, The Netherlands, Hungary, Japan, Norway, Sweden, Yugoslavia and the USA. Ten representatives were positioned in soundproof cubicles at the Guildhall. The structure was 100ft. long and weighed 15 tons. It was erected on top of a public platform positioned outside the Guildhall, facing the Abbey.

Each reporter was able to hear, through headphones, not only his own commentary but also the superimposition of the various 'effects' microphones. Special telephone kiosks, built nearby, gave each commentator immediate contact with his own broadcasting organisation.

Each foreign commentary was fed direct to the G.P.O. International Trunk Exchange. The sound effects picked up along the route were passed from the Home Control Room to the Foreign Control Room for use as a background for the commentaries. The broadcast of the Abbey service itself was fed to overseas broadcasting systems in the same way. The other four commentators were allocated positions opposite Buckingham Palace.

For many years, it was the BBC's practice when dealing with important outside broadcasts, to install every piece of equipment in duplicate. That principle, in spite of the enormous amount of apparatus involved, was maintained at the Coronation. A large number of telephone lines were taken over from the Post Office, and each one terminated in such a way that instant changeover could be made in the event of an emergency.

A complete breakdown of the Abbey Control Room would have stopped transmission, not only of the Service but of the entire procession commentary. Although that was an extremely remote possibility, the Engineering Division couldn't simply ignore it. A radio-link transmitter was installed on the roof of the Abbey, by means of which the whole of the broadcast would have continued, even if the worst had happened!

The BBC provided output for the soundtracks for use with news films, both of the Abbey ceremony and of the procession. In order to obtain a complete, permanent audio record of the procession for the sound archives, apparatus in one of the BBC's mobile recording units was pressed into service, **Fig. 1**. A second, temporary recording unit was installed in an office overlooking Admiralty Arch. As the procession passed by, hidden microphones picked up the sounds, which were recorded on a series of discs, **Fig. 2**.

BBC Coronations (Pt III)

Keith Hamer and **Garry Smith** continue the special series looking back at the BBC's coverage of Coronations since 1937. There is a Coronation vintage television advertisement from the archives. Also featured are the continuing sagas of the BBC Cymru-Wales Centenary and 100 years of BBC Scotland-Alba. And they continue the series about the development of Swiss Radio and Television since 1933. In addition, a reader has kindly posed a challenge regarding 198kHz transmissions!

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Fig. 1: Apparatus in one of the BBC's mobile recording vans used for the 1937 Coronation.
 Fig. 2: A temporary recording unit in 1937, installed in an office overlooking Admiralty Arch.
 This was used to record sounds on a series of discs.
 Fig. 3: An advertisement published on 30 April 1937, for the *Coronation H.M.V. Television*.
 Fig. 4: Part of the BBC 5SC studio at 202 Bath Street, Glasgow. Scotland's first radio station opened at 7.00pm on Tuesday 6 March 1923.
 Fig. 5: The plaque commemorating the first programme exchange via the EBU/UER Eurovision Network on 6 June 1954, discovered by the authors during a visit to Montreux in 2010. The transmission featured the *Fête des Narcisses* (Narcissus Festival).
 Fig. 6: The Rumantsch SRG-SSR RTR studios in Chur (Kanton Graubünden), Switzerland, during a visit by the authors in August 2014.

Vintage Coronation Wireless Equipment

This month's trip through vintage copies of uncared for newspapers and magazines has gleaned an advertisement for the *Coronation H.M.V. Television*, Fig. 3.

The text has been left in its original format to reflect the spelling, grammar and punctuation of the time. This is the full description of the *Coronation H.M.V. Television* originally featured in an advertisement, dated 30 April 1937:

"WATCH THE CORONATION PROCESSION IN YOUR OWN HOME AS IT IS ACTUALLY TAKING PLACE

"H.M.V. Television is designed by the Engineers responsible for the successful Television Broadcast System adopted by the B.B.C.

"HIS MASTER'S VOICE TELEVISION can bring to you in your own home, in sight and sound, the Coronation Procession as it actually takes place, for as little as 60 gns. cash or at the rate of £1 per week (with small deposit).

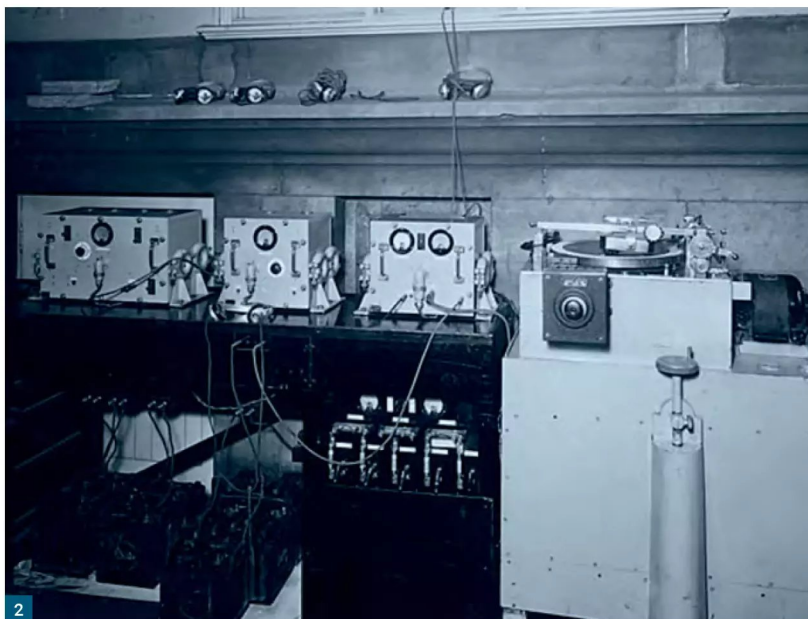
"HIS MASTER'S VOICE Television Receivers can be installed in most homes in a few hours. Prices include Television aerial, installation of aerial and receiver and FREE MAINTENANCE FOR ONE YEAR.

"FILL IN COUPON FOR FOLDER GIVING FULL DETAILS

"To His Master's Voice 106A Clerkenwell Rd., London, E.C.1

"Please send me His Master's Voice Television folder giving details of your special Television offer. I shall be under no obligation to purchase."

The advertisement featured striking graphics showing a family settling down to watch the Coronation on their new television where the picture was projected onto an angled screen. It also included eye-catching, and somewhat scary, flashes of energy emanating from the Alexandra Palace transmitter, plus an illustration of the gilded State Coach travelling along the processional route at Hyde Park Corner.



With a price tag of 60 guineas, it certainly seemed to be an enticing offer as it included not only the television set itself, but also the installation and set-up, the aerial and its erection, plus free maintenance for one year. These days, it would probably cost around £100 just to have an aerial installed, though 60 guineas in present prices would, of course, be considerably higher!

BBC Cymru-Wales Centenary, Part III

When the BBC 5WA Station began on 13 February 1923, the original aim was to broadcast programmes that would appeal to a Welsh audience. However, most of the programmes were produced in London. There were some local news bulletins, along with limited programmes from Cardiff, including talks, religious services, classical music performances and educational broadcasts for schools, some of which were in Welsh.

In 1923, only about 200 receiving licences had been issued. This was probably due to the cost of a typical wireless receiver being around £7, which equates to more than £540 in today's money! Not surprisingly, there were many more listeners tuning-in for free by using home-made cat's whiskers crystal sets.

From the first tentative steps, recording facilities gradually increased, with staff moving to the larger Park Place premises and numerous other buildings, such as local chapels. Despite the growth of broadcasting facilities available in Wales, some staff at the BBC were not entirely satisfied with the station's service area. In 1929, the BBC said: *"There is a cry for a broadcast service which will cover the whole Principality. The listener in Caerphilly has friends in Bangor who cannot hear the programme which pleases him. The*

singer from Tonypandy is not heard in Cardigan."

Broadcasts were transmitted 'live' and very few 5WA archive recordings exist due to the high cost of making wax discs or using Blattnerphone steel tapes. The earliest recording relating to Wales to be found in the archives is the speech by **Lloyd George** during the opening ceremony of the Caernarfon National Eisteddfod in July 1934. The festival, traditionally featuring the Eisteddfod Archdruid and the Gorsedd (Throne) Ceremony, initially became a firm favourite with Welsh listeners when the first Royal National Eisteddfod of Wales was broadcast on 3 August 1924.

The *Radio Times* reported that the **Prince of Wales** would be attending the annual folk music and dance festival, which was held in Pontypool. The BBC have covered the international event every year since then and it is now the third largest annual Outside Broadcast, rivalled only by Wimbledon and Glastonbury. The festival is broadcast in both Welsh and English.

The establishment of the BBC Welsh Region in 1935, coupled with the opening of the Bangor Station in the same year, boosted BBC Wales radio output significantly, in both northern counties, and among rural communities in general. Bangor revelled in the opportunity to create a host of new programmes, more distinctively Welsh in nature and firmly rooted in the traditional way of life. *Ymryson y Beirdd*, *Welsh Rarebit* and *Noson Lawen* (often featuring the **Triawd y Coleg Singing Trio**) were just some of the new programmes from the Bangor Station, with light entertainment and variety shows being especially popular.

The detective series *SOS Galw Gari Tryfan*, first broadcast in 1948, ran for several years and proved a big hit among listeners.

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BBC Scotland-Alba Centenary, Part III

The first radio station in Scotland began at 7.00pm on Tuesday 6 March 1923, from 202, Bath Street in Glasgow, **Fig. 4**. Listeners tuning-in to the *BBC 5SC Station* heard the skirl of *Hey! Johnnie Cope* on the bagpipes, after which **John Reith**, the General Manager of the British Broadcasting Company, leaned towards the microphone and announced: “5SC, the Glasgow station of the BBC, is calling”.

The walls of the studio were draped with curtains to eliminate echoes and the resident grand piano was used extensively in early broadcasts.

Robert Dunnnett was the BBC's first officially accredited War Correspondent in Scotland. Originally from Cockburnspath in the Scottish Borders, he reported on the first enemy attacks on Scotland during the early weeks of the Second World War. He later became the BBC's observer with the British First Army in North Africa and was the first British radio reporter to cross the German border in September 1944.

In more recent years, the station became known as *BBC Radio Scotland*. The first broadcast was on 17 December 1973. The station operated on a part-time basis when it became possible at certain times of the day to ‘opt-out’ from *BBC Radio 4* programmes. *BBC Scotland* began as a full-time station on 23 November 1978, originally on 585kHz, MW.

Today, BBC Scotland operates two radio stations covering the nation, one in English, the other in Scottish Gaelic (*Gàidhlig*). The English-language station provides a 24-hour service and is available on 92.5-94.7MHz FM, 810kHz MW, DAB blocks 11B, 11C and 12D, plus various digital television platforms and the *BBC Sounds* application.

BBC Scotland also operates two regional stations. *BBC Radio Orkney* and *BBC Radio Shetland* opt out of the national station to broadcast a 30-minute local news programme on weekdays. During the winter, the two opt-outs are supplemented by an additional hour-long programme.

In addition, BBC Scotland provides opt-outs from regional news studios located in Selkirk, Dumfries, Aberdeen and Inverness in order to provide local news and weather bulletins.

The other radio service affiliated to BBC Scotland is the Scottish Gaelic-language station, *BBC Radio nan Gàidheal*. This station broadcasts for the majority of the day on 103.5-105MHz FM, and simulcasts Radio Scotland's MW service at other times.

The Rise and Fall of 198kHz

Pat Bracken 2M1CKE has written to see if we can do any detective work regarding the potential decline of transmissions on 198kHz.

Pat writes: “Hallo and thanks for your PW articles, always well-researched, interesting and a

good read, including the old adverts for radio and television equipment.

“Regarding transmissions on 198kHz and the reports of its demise, I just thought I would mention that the WRTH lists STFT using PSK on the same frequency. I think they also used to have it on MW frequencies. France also does it with PSK on LW, but no-one else as far as I know. One account I heard was that being able to hear the 198kHz signal would be an indication in a nuclear war for the Royal Navy ‘bombers’ (nuclear-armed submarines) to confirm that the UK government was still functioning!”

“I once saw an ISWL publication describing in detail all the different types of STFT transmissions. You can hear them on short-wave, and the various VLF signals, but I've never had the gear for such monitoring.

“It would be very interesting if you could dig down in your archives and uncover all sorts of history and images of old sites, personalities and equipment. Good luck, Pat Bracken 2M1CKE.”

Thanks Pat for your interesting letter, and somewhat daunting challenge. We will certainly start digging around in our archives, so stay tuned, but possibly not on 198kHz!

Service Information: Switzerland, Part V

We mentioned in the June column that SRG-SSR were involved in the formation of the *European Broadcasting Union (EBU) / l'Union Européenne de Radio-télévision (UER)*. The organisation, now entirely based in Geneva, was officially inaugurated on 12 February 1950. Today, the EBU's unrivalled expertise and technical facilities in Switzerland have resulted in the organisation becoming the nerve-centre for the exchange of programmes between radio and television services not only within Europe, but around the world.

The first programme exchange via the EBU/ UER *Eurovision Network* was on 6 June 1954. The beautiful Swiss ‘ville’ of Montreux, nestling on the shores of Lac Léman, became the venue for the first transmission and featured the *Fête des Narcisses* with its flower-bedecked processional floats. The first Eurovision viewers eagerly watched on four million television sets in homes, bars and shop windows in Germany, Belgium, France, the United Kingdom, Italy, The Netherlands and, of course, Switzerland. The authors discovered a commemorative plaque during a visit to tranquil Montreux in 2010, **Fig. 5**.

The first *Eurovision Song Contest* was held in 1956 and came from the Teatro Kursaal (Casino Theatre) in the tranquil Ticino city of Lugano in neutral Switzerland. Seven countries took part: Switzerland (SRG-SSR), Belgium (INT), West Germany (ARD), France (ORTF), Luxembourg (CLT), Italy (RAI) and The Netherlands (NTS). In true typical style, the United Kingdom (BBC) didn't



take part because they missed the entry deadline set by the EBU. Austria (ORF) and Denmark (DR) also missed the first Eurovision Song Contest.

The first event, which was held on Thursday 24 May 1956, included two songs from each country, otherwise it would have been a very short programme! It lasted, in fact, one hour and forty minutes. The winner was **Lys Assia** who represented Switzerland with the song *Refrain*. The other Swiss entry, also performed by Lys Assia, was called *Das Alte Karussell*. The whole concept of such a show was conceived at an EBU meeting in Monaco in 1955. The programme was originally intended for a radio audience because there were so few television receivers in Europe in 1956. Television cameras were also in short supply but fortunately, by looking at the original footage, it appears that at least two were conjured up in time for the ‘live’ transmission. Lys Assia also represented Switzerland in 1957 with a song called *L'enfant Que J'étais*, which came joint 8th with Belgium. The UK entry was placed 7th with **Patricia Bredin** singing *All*.

In 1953, regular German-language television transmissions started from Zürich with one hour each evening, five days a week. This immediately attracted 920 people to purchase a television licence. A year later, in 1954, programmes in French were broadcast from Geneva. For the Italian-speaking region of the Ticino, programmes were re-broadcast with Italian subtitles until dedicated Italian studios were brought into service in 1958. This resulted in 50,000 licences being issued during the first year. Television test transmissions had already been radiated as early as 1939 from studios in Zürich.

In 1960, the four national services were renamed *Schweizerische Radio- und Fernsehgesellschaft (SRG)*, *Société suisse de radiodiffusion et télévision (SSR)*, *Società svizzera di radiotelevisione (TSI)*, in the Ticino, and *Societad*



Svizra da Radio e Televisiun (Rätoromanisch). The re-branding was to reflect the addition of television services. In 1964, the **Swiss Federal Council** allowed television advertising as a means of keeping licence fees down. In 1966, the three main languages were each given a second radio channel. This was intended to deter listeners in Switzerland from tuning-in to new foreign commercial stations. Also in 1966, a dedicated Rumantsch-language unit was created in Chur, the capital of Kanton Graubünden. The authors visited the **SRG-SSR RTR** studios in August 2014, **Fig. 6**.

Time-sharing allowed some programme hours on the new German-language channels to be used for the Rumantsch service. In 1968, one year after the UK, colour television began. The number of licences issued topped one million.

In 1978, the radio channels introduced stereo transmissions. Five years later, in 1983, the Federal Council relaxed the Swiss media legislation to allow local private and commercial radio stations. SRG-SSR countered this potential threat to their monopoly by launching a third set of channels, targeted at a younger audience. During 1991, SRG-SSR underwent wide-ranging changes. The organisation re-formed itself as a private association, structured as a holding company under Swiss company law. The name, *SRG-SSR idée suisse*, was introduced in 1999. In 1992, *Radio Rumantsch* was separated from the German-language radio broadcaster, which had been responsible for the production of Rumantsch programmes since 1938. In 1994, the Rumantsch television service was renamed *Radio e Televisiun Rumantscha*.

In 1997, SRG-SSR started digital broadcasts via the *Hot Bird* satellite, located at 13° East. Programmes are encrypted due to copyright restrictions. Since 2016, all television channels via satellite are in HD. All radio stations and the Swiss HD television news channel, *SRF info*, are currently available free-to-air via satellite.

On 3 June 2019, SRG-SSR began a phased permanent switch-off of all their television transmitters as part of a series of cost-cutting exercises. This was in response to the results of a referen-



dum in 2018, which called for the abolition of the licence fee, known as *Billag*. Since then, SRG-SSR television channels have only been available via digital cable, the internet and satellite. Although all Swiss television transmitters were initially switched off, some have now been brought back into service due to reception problems in certain regions.

The main SRG-SSR television channels are currently known as *Schweizerische Radio- und Fernsehgesellschaft* (*SRF-1*, *SRF zwei*, and *SRF info*, German language), *Radio Télévision Suisse* (*RTS-1* and *RTS-2*, French), and *Radiotelevisione svizzera* (*RSI La 1* and *RSI La 2*, Italian). The Rumantsch-language station, based in Chur (Kanton Graubünden), is known as *Radiotelevision Svizra Rumantscha* (*RTR*). There is currently only one channel which broadcasts *Televisiun Rumantscha*.

There is quite an eclectic selection of radio stations in Switzerland provided by SRF, RTS, RSI, RSR and SSaTR (Swiss Satellite Radio).

SRF: *Radio SRF-1*, *Radio SRF-3*, *Radio SRF-4 News*, *Radio SRF Virus*, and *Radio SRF Musikwelle*.

RTS: *La Première*, *Espace-2*, *Couleur-3*, and *Option Musique*.

RSI: *RSI Rete Uno*, *RSI Rete Due*, and *RSI Rete Tre*.

RSR: *Radio Rumantsch*.

SSaTR: *Radio Swiss Classic*, *Radio Swiss Jazz*, and *Radio Swiss Pop*.

DX-TV & FM News

The latest DX news, plus details of changes to broadcast television and radio services, is available online via the *Radio Enthusiast* website by searching for the *Latest Articles* section.

www.radioenthusiast.co.uk

Stay Tuned!

Please send archive photographs, information or suggestions for future topics via the email addresses shown at the top of this column. All photos this time are by the authors or from their archives. **PW**

Read more radio news and reviews at www.radioenthusiast.co.uk/news

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Classified Adverts

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VINTAGE FIREWORK COLLECTOR. Do not light the blue touch paper and burn British Heritage, private collector will pay cash and collect from anywhere, licensed explosive storage. Call Tony on 07956 506300

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VALVES AND ALLIED COMPONENTS? For free stock list and/or advice, Please contact me: Geoffdaves337@gmail.com Telephone 01788 574774

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REPAIRS TO RECEIVERS, TRANSMITTERS ETC. New/old, valve/transistor. Call 07903 023437 for details. www.kent-rigs.co.uk

TO ADVERTISE IN CLASSIFIED ADVERTS

Contact Kristina Green Tel: 01778 392096 Email: kristina.green@warnersgroup.co.uk

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VALVE TESTER, Taylor mode 45C and 50 assorted valves. All in good condition. Buyer collects. £50. Contact Mr Ashford: 01353 663362 **CAMBS.** YEASU FT101ZD in perfect working order, fabulous condition for year, with matching FC902 A.T.U. and SP901 speaker, £600. complete with spare valves etc. Phone Tim: 07542087030 **DEVON** (Collection Only)

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

TO ADVERTISE IN BARGAIN BASEMENT Contact Kristina Green Tel: 01778 392096 Email: kristina.green@warnersgroup.co.uk

Rallies & Events

All information published here reflects the situation up to and including **19th May 2023**. Readers are advised to always check with the organisers of any rally or event before setting out for a visit. The Radio Enthusiast website www.radioenthusiast.co.uk has the latest updates, please check it regularly. To get your event on this list, e-mail the full details, as early as possible, to: practicalwireless@warnersgroup.co.uk

10 June

ROCHDALE & DISTRICT AMATEUR RADIO SOCIETY (RADARS)

SUMMER RALLY: St. Vincent de Paul's Hall, Norden, Rochdale, OL12 7QR. Doors open at 10 am with the entry fee still only at £3 (CR|FP).

rozallin@gmail.com
dave@cardens.me.uk

11 June

JUNCTION 28 RALLY: Alfreton Leisure Centre Bowls Hall, Church St. Alfreton, DE55 7BD. Trader Bookings are now being taken. Opening at 10:15, traders will have access from 08:00. Everything is indoors. £12.00 per table (all provided) admission is £3.00 per person. As usual, we will offer 100 tables for traders, including dealers, manufacturers, and large and small suppliers providing new and used equipment, from vintage and military to the latest technology, including SDR, TV, DX, HF, VHF, and Microwave. Lots of components, tools and accessories, from tiny capacitors through chips, cables and connectors to large antenna masts, plus books and magazines. Local and national or specialist clubs represented, RSGB, RAIBS, G-QRP, BRARS, plus this year the Worked All Britain Awards Group will be holding their AGM and Awards Presentation. So there is something intended for everyone. There were more than 400 visitors last year. For a booking form, location map, and so on, see the URL below:

www.snadarc.com
secretary@snadarc.com

11 June

MENDIPS RALLY: Farrington Gurney Memorial Hall, Church Lane, Farrington Gurney, Somerset BS39 6TY. Tables in the hall and car boot on the field; entrance is £2; the doors are open at 9.30 am; traders from 7.30 am.

Tel: 07870 168 197
mendipsrally@hotmail.com

18 June

EAST SUFFOLK WIRELESS REVIVAL (IPSWICH RADIO RALLY):

Kirton Recreation Ground, Back Road, Kirton IP10 0PW (just off the A14). Doors open at 9.30 am, and the entry fee for visitors is £3. Trade tables are from £10. B4SWRHF station. (BB|CBS|CR|FP|RSGB|SIG|TS)

Tel: 07710 046 846
www.eswr.org.uk

23-25 June

HAMRADIO FRIEDRICHSHAFEN

<https://tinyurl.com/3n4jpfrx>

25 June

NEWBURY RADIO RALLY: Newbury Showground, next to junction 13 of the M4 motorway in Berkshire, RG18 9QZ. This is the 34th year of The Newbury Radio Rally, and it is the ideal event for anyone interested in radio communications, computing and electronics.

There will be a display area with an amateur radio station and exhibits. Open to sellers at 8.00 am and visitors at 9.00 am. Entry is £3 for visitors and £15 for a seller's pitch. (CR|CS|D|FP|SIG) Advance Bookings (with discount) can be made via:

www.nadars.org.uk/rally.asp
NewburyRally@nadars.org.uk
www.nadars.org.uk

2 July

BARFORD NORFOLK RADIO RALLY:

Barford Norfolk Radio Rally Barford Village Hall & Green, Barford, Norwich, NR9 4AB.

Opens 0900 (traders from 0800) featuring trade stands, car boot sales, bring and buy, raffle, repeater groups, catering and free car parking. Entry £2.50 per person / under-16s free. Outdoor large pitches £8 (no need to book), indoor tables £10 each (booking essential). (BB|CBS|CR|RF|TS)

radio@dcpmicro.com
www.norfolkamateurradio.org

16 July

MCMICHAEL RADIO RALLY (RADARC/BBRC/BARC):

Co-organised and hosted by the Reading and District Amateur Radio Club (RADARC), Burnham Beeches Radio Club (BBRC), and Bracknell Amateur Radio Club (BARC). Entry from 9 am (traders set up 8 am). Entrance fees have been kept to last year's rates of £3 per person and £10 per table for traders.

Berkshire Lowland Search and Rescue are providing a first-response service. No Dogs other than assistance dogs are allowed on the events field.

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23 July

FINNINGLEY ARS RALLY 2023:

Belton Rd, Sandtoft, Doncaster, DN8 5SX. Near J2, M180. From 10 am. (CB|CR)

<http://www.g0ghk.com>

30 July

WILTSHIRE RADIO AND CAR

BOOT SALE:

Kington Langley Village Hall and Playing Field, Kington Langley, Wilts. SN15 5NJ. Starts at 9 am and finishes at 1 pm. Entry is £2. Traders Welcome. Indoor tables £10, Car booters £10, Vans £15.

Chairman@Chippenhamsradio.club

6 August

KING'S LYNN AMATEUR RADIO CLUB 33ND GREAT EASTERN RADIO RALLY:

Gaywood Community Centre, Gayton Road, King's Lynn, Norfolk. PE30 4EL. NGR TF638203. Doors open at 9 am. Admission is £2.50. Traders from 7 am, outdoor pitch £8; indoor £10 per table. (BB|CR|FP|TS)

rally.klarc@gmail.com
www.klarc.org.uk

6 August

BATC CONVENTION FOR AMATEUR

TV 2023 (CAT 23) PART 1:

CAT 23 will take place on Sunday 6 August, as a meet-up, show and tell, test and fix it, and bring and buy event, from 10.30 am to 4 pm. Full ATV and Microwave test facilities available for QO-100, 5.6GHz FM, Portsdown, MiniTiouner, Ryde, power amplifiers and preamps.

11 August

COCKENZIE & PORT SETON ARS

28TH ANNUAL MINI-RALLY NIGHT:

From 6-9 pm. Community Centre, Main Hall, Port Seton. Bring along your own 'junk' and sell it yourself. Tables on a First-Come-First-Served basis. The entrance fee is £2 for everyone (CR|DA).

01875 811 723/07795 100164
bob.gm4uyz@talktalk.net
www.cpsarc.com

13 August

FLIGHT REFUELLING AMATEUR

RADIO SOCIETY HAMFEST:

Radio, electronics & computers. Cobham Sports & Social Club Ground, Merley Park Rd, Ashington, Broadstone, Wimbomborne, BH21 3DA. Entry £4. Note: No dogs, other than assistant dogs, are allowed on site. (CBS|CR|FP|L|TS).

<https://www.frars.co.uk/hamfest>

20 August

RUGBY AMATEUR TRANSMITTING

SOCIETY ANNUAL RADIO RALLY:

Princethorpe College, Princethorpe, Rugby, CV23 9PY. Admission £3 NGR: SP395710 Lat/Long: 52.336N 01.421W Open 10 am to 4 pm; 8 am for sellers (CR|CBS).

Tel: 07956 855816
rally@rugbyats.co.uk
www.rugbyats.co.uk

20 August

LINCOLN SHORT WAVE CLUB SUM-

MER RALLY:

Festival Hall, Caistor Road, Market Rasen LN8 3HT. Doors Open 09.30. Adm. £2. Free parking, Refreshments, Tables £10. (CR|FP).

Tel: 07777699069
m5zzz@outlook.com

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Your Letters

Send your letters to: Practical Wireless Letters, Warners Group Publications plc West Street, Bourne, Lincs PE10 9PH
E-mail: practicalwireless@warnersgroup.co.uk

General Coverage Receiver

Dear Don,

If you're thinking of replicating the General Coverage Receiver (May page 32 and this issue) – don't! At least, not with AF117 four-lead transistors. Many of the RF transistors of that generation (with a fourth lead for the screened case) are self-poisoning and won't work now even if new-old-stock in a still-sealed package. The AF117 seems more prone to failure than the OC170 and, sadly, Mullard brand are particularly troublesome. This was an anticipated effect of filling the case with a passivating gel. Tin whiskers grew through the gel from the case until they reached and shorted to the transistor junction. If only one electrode is affected, you can get away with disconnecting the screening lead. However, most have multiple shorts, rendering the transistor useless. A failing transistor in an existing circuit can sometimes be identified by microphony – give it a sharp tap (fingernail will do) and hear a click in the loudspeaker.

Try instead a substitute that's not prone to this failure. The AF178 is available in quantity from The Audio Out Shop, The Old Rectory, Arlais Road, Llandrindod Wells, Powys, LD1 5HE. They are £1.50 each plus £2.99 post/packing. There's no VAT to add but the total order must be at least £5. If you must have a transistor in the same case as the AF117, then a few of the 2SA70 are still available at £1 each. Cheques payable to **J Rothman** (and mention my recommendation!).

Jake is an experienced audio expert who writes regularly in *Practical Electronics* and has always been most helpful whenever I've contacted him. He offers a range of new-old-stock vintage components.

Godfrey Manning G4GLM
Edgware

Using Solder

Dear Don,

I have a tale of woe, and I caution others to be careful.

For years I have been using Multicore solders, as did my employer. When that solder ran out recently, I bought two reels of unbranded, supposedly 60/40 solder through Amazon. Thus began a sorry and frustrating time of dry joints, not sticking to the terminal or the other party to a soldered joint. I lost a whole day to this prob-

lem before ordering proper solder, again from Amazon. Everything was immediately cured and work resumed. So, do not buy unbranded solder, get the real thing! Yes it's expensive, but so is damaged equipment or lost time. Goodness knows what was in it, or the flux, which gave off clouds of smoke.

Geoff Theasby G8BMI
Sheffield

VHF/UHF Activity Level

Dear Don,

Ron Piper G4LMN raises a valid point in June *PW* about the activity level at VHF/UHF, for much of the time there is simply silence apart from occasional repeater idents.

UK Foundation holders are limited to just 10 watts at VHF/UHF while over in Belgium Foundation holders are permitted 50 watts at these frequencies. The increased power doubles the range of stations, more signals can be heard and as we know activity breeds activity.

Having empty bands is a sure way to lose them, giving Foundation a power increase would provide a much-needed boost to the VHF/UHF bands.

Trevor Essex M5AKA
Chelmsford

BVA, Aerials and Bits

Dear Don,

When we joined the EU, the demise of the likes of the BVA and RMA (Radio Manufacturers Association) was inevitable. They and others were trade cartels, strictly banned by EU law and rightly so as they existed to protect their members' excess profits by ripping off the public. Trade restraint as it is known, is forbidden. Generally, this has been good for consumers, ie us, by promoting competition and forcing down prices. Also, it used to discourage innovation. Why try to make something better when one could offer the same old product, even if in a different box, to a public that didn't have a choice? There are inevitably exceptions. It occurs to me that the end of the fixed price of books enabled supermarkets to discount the best sellers, depriving proper bookshops of needed profits, so they could stock a wide variety of titles, and also unlike supermarkets they will order in books not

stocked on request. One cannot have everything!

As to aerial articles, I agree with **Andrew Redding** that both *PW* and *RadCom* could be renamed *Aerials Monthly* (and other things)! However, I do not understand all his comments about there being nothing above 100MHz. The FM broadcast band is packed out with stations, not all legal. Did he mean 144MHz? (ie the Amateur allocations?)

Finally, I don't know the current RAE syllabi, I took the last of the straight to full exams, but the only maths I needed was Ohm's law, and how to add the height of an aerial to the height of the mast, to see if it was permitted near an airfield!

Philip Moss M0PBM
Surbiton

Problem with Pages coming Loose

Dear Don,

Like G4NQQ I too have recently experienced pages of *PW* coming loose, especially the cover. I have successfully reattached the pages by using a thin stream of contact adhesive (the one in the yellow tube!) along the spine and carefully resetting the loose cover pages back to the original setting. Problem solved.

Des Walsh EI5CD
Cork, Ireland

Proselytising Ham Radio etc.

Dear Don,

Well, it was heart-warming to see (G8BZL May 2023) that I'm not the only person to question the "constant stream of 2m and 70cm handhelds" etc that pour forth from the usual big four culprits. So, I'm feeling much better now.

Echoing Graham's comment, there was a time when I would leave a pile of *PWs* and *RadComs* in the waiting room each time I visited my dentist, a solicitor or a doctor. Then, a while back when it got around that a virus or some other malevolent bug might or could be lurking within the pages in any magazine, I was politely informed that henceforth if I left them on their premises they would be "put into the recycle bin immediately" (with surgical gloves on?). Oh, as G8BZL pointed out about 'school clubrooms', I used to donate them there too. Until I was asked to desist because of 'serious health and safety issues'.

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★ Star Letter ★

The Star Letter will receive a voucher worth £20 to spend on items from our Book Store, or other services offered by Practical Wireless

Thoughts on the Near Fields

Dear Don,

In early 2020 recommendation from the International Commission on Non-Ionizing Radiation Protection (ICNIRP) became part of the licence conditions. The ICNIRP report is not light reading.

The RSGB's reaction has been to produce a 'better estimating application' and many documented standard antenna models. The work undertaken by the RSGB is not trivial, the results are a detailed, extensive piece of work undertaken by talented and dedicated individuals. The antenna models cover many classic and standard antennas, the spreadsheet version 11d covering a few more than the current on-line web application. So, pick your application, your standard antenna and Bob's your uncle, fill in the form save, print the file and everyone's a

winner. However, there is a 'snag'; many amateurs would be delighted to have the implied real estate and compliant neighbours allowing installation of that full size doublet, inverted 'V', dipole, trapped vertical or any of the 'basic' models listed on the applications.

Many amateurs, myself included, have to be content with 'the random wire', or the 'not quite big or high enough doublet', or heavily loaded verticals that are more mobile whip than a 'proper' antenna; and we still get a buzz from working a station from 'somewhere else'. Such antennas of opportunity are not easy to model and are probably beyond basic analysis. There is a need for a parallel approach to deal with real life configurations that is based on measurement.

As an amateur radio enthusiast of some

six decades practice and a retired engineer I tend to believe what I can measure. In January *RadCom* published a design, by **John Hawes G8CQX**, for a device and a calibration method to indicate when the local field is over the limit. The G8CQX design was, sadly, beyond my own workshop's facilities but looked encouraging.

Commercial 'EMF' instruments used by professionals are 'eye watering' expensive; they seem to be a calibrated antenna probe attached to a spectrum analyser-like instrument. Is there a possibility of designing suitable antenna probes that could be accurately copied and used with lower cost analysers like the TinySA?

I feel that we need to do something better than 'a standard antenna' model, not just for the small backyard situation but for occasions when a station is operating as a public demonstration. We ought to be able to show expertise and confidently show that what we are doing is safe and within our licence requirements.

Surely this is an opportunity for those with the right facilities to create a suitable design, a kit and possibly a calibration service. If the price points are 'right' every amateur radio operator would want one!

John Fitch G8EWG
Eastbourne

And yes, I suppose G8BZL has a relevant point about the necessity of featuring 'primitive equipment that belongs in a museum' within the pages of *PW*. And he's right, that most youngsters see this sort of stuff as 'worthless junk'. Most teenagers (and some adults whose world seemingly revolves around a SmartPhone) wouldn't give it a second look. But there again, knowing about our past is or can be instructive for knowing about our future. We have to know where it all began, right?

While in nostalgic mode, I noted that in the **David Harris** article (same issue) "*Edison held over 1000 patents and also developed the light-bulb*". Yes, he did help develop it, sort of, but a far leap from inventing it. I mention this, because many younger people when reading the word 'develop' confuse it with the word 'invented'. Two completely different things. It was in fact, **Sir Joseph Swan** who invented and patented the first electric light bulb in 1860, 20 years before Thomas Edison. During 1878, Swan received another patent for an improved light bulb, suspiciously similar to a light bulb that Edison obtained a patent for in the USA. Actually, it was a copy of Swan's improved lightbulb. The ever entrepreneurial Edison subsequently ran an advertising campaign claiming it was his own work, when it wasn't.

Continuing on with the nostalgic theme, it was **Charles Wheatstone** working with **Sir William**

Cooke (incidentally, he built a telegraph system during 1837 and it was Wheatstone, not **Alexander Graham Bell**, who had the first idea for a 'telephone' and gave it its name), who invented the electric telegraph several years before **Samuel Morse** claimed he did. Morse fought tooth and nail with his version of the truth that he was the actual sole inventor of the electric telegraph, when he was plainly not. However, Morse did succeed in convincing the US patent authorities otherwise. Much the same as Edison did with his spurious electric lightbulb 'invention' claims and his other baseless claim that he'd 'invented' the world's first movie camera. He didn't. **Le Prince** did.

On another subject, yet again, the ogre of mathematics is in the arena. As I mentioned in a previous letter, it's not an absolute requirement nowadays in particular, that amateurs in general need a working knowledge of calculus in all its colourful permutations. But as G4GLM points out, 'compound interest' is of special importance if only to get the biggest bang for your buck when you're trawling through the labyrinth of bank-speak. So no, you may not need algebra but there again, you may not need a lifebuoy, but one day you might.

Lastly, before I pop off, as G4LMN notes, it is concerning that the 'silence on VHF and UHF' continues. That 'these bands may be lost'. So what do the buyers do with all those VHF/UHF

handhelds that are constantly bought (it's not environmentally friendly)? Trophies? Ornaments? Just for monitoring purposes? Just FM listeners?

Ray Howes G4OWY/G6AUW
Weymouth

Maths

Dear Don,

Another superb letter from my old buddy **Mike White G4HZG**.

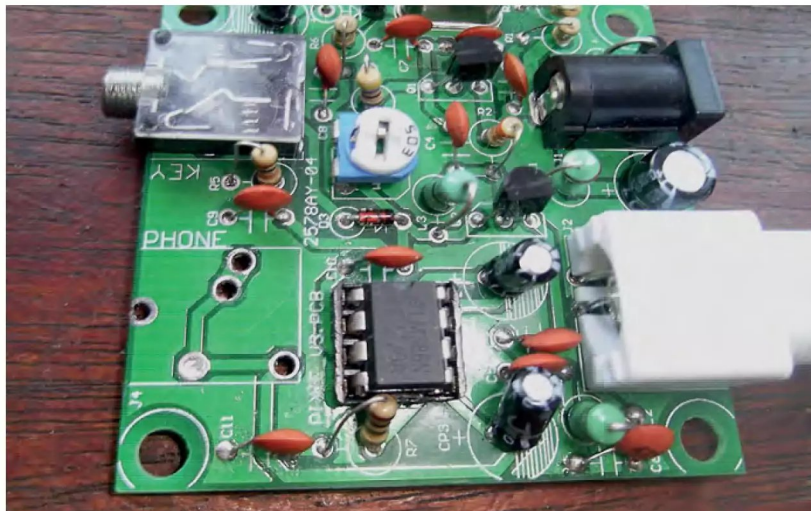
I'm now approaching 80 turns on my personal toroid. I only mention this to put my own experiences of maths lessons at school in context against the comments Mike makes about the teaching of maths in school today.

I was at Secondary Modern School from 1954 to 1958 leaving, as most of us did back then, without any educational qualifications.

I enjoyed most of the subjects we were taught, which in those far off days included music, art, drama and many other subjects which do not seem to have much priority today. But four hours a week were sheer misery – double maths – i.e. two hour lessons rather than one hour! The teacher was, I understand, an ex-RAF navigator, who fired facts at us like a machine gun allowing little time and even less patience for those of us who didn't 'catch on' quickly. (Most of the class!)

I got bitten by the radio bug around 1956, and it's still biting me as I write. After leaving school

Read more radio news and reviews at www.radioenthusiast.co.uk/news



I had a very brief sojourn into the Radio and TV trade, which I realised with some sadness was perhaps not for me. Almost by accident, I became a Psychiatric Nurse, qualifying in 1965. The Eleven Plus was the last exam I ever failed.

Having got my first professional qualification under my belt, I set about training for the RAE, with some trepidation about the maths requirement. My lecturer was fortunately a man I had greatly admired, having met him when I joined the first wireless club in the world, the now very sadly defunct Derby and District Amateur Radio Society. Those readers of my vintage will have 'twiggid' that I am referring of course

to the legendary **Fred Ward G2CVV**.

When Fred got around to the calculation of the properties of tuned circuits, involving square roots, quadratic equations etc, my heart sank a little but then the 'lightbulb' moment happened. It suddenly all started to make sense!

As I progressed in my own professional field and entered the world of NHS management, I found myself becoming increasingly involved in statistical issues and manpower planning. But by then I had a BBC computer (remember those?) and a pocket calculator, and I at last slayed the beast of applied maths!

So, I agree with Mike, it's all down to the teach-

ing of maths. As I have frequently said to budding licensees, if I could do it, anyone can do it! You just need to grasp a practical application for all the theory!

Ivor Wilkinson G4RJA
Hilton, Derbys.

PIXIE

Dear Don,

Just a quick note to mention that if anyone buys a Pixie QRP transceiver, I bought one at the Blackpool Rally and assembled it but it didn't work.

After checking for solder bridges and bad soldering and a bit of head scratching I had an answer, so to prove it I unsoldered the headphone socket.

The problem was the circuit board, the track went to all pins of the socket so putting in the headphone jack shorted the audio to earth. I had destroyed the socket to get it out so needed to use wires to another socket.

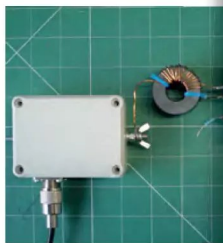
After many attempts to get a good photo this will help to explain it. The copper track needs cutting to isolate the two through holes near where it says PHONE as they short out the audio to earth.

It may help someone who bought a Pixie V3.PCB and wondering why it doesn't work. Check it as there seem to be many manufacturers.

Bill Kitchen G4GHB
Ashton-under-Lyne

Next Month

in the UK's best & only independent amateur radio magazine...



MAKESHIFT PSU: Billy McFarland GM6DX describes how to repurpose a PC power supply for amateur radio use.
THE UMPP-1 MORSE PADDLE BY GM0EUL MORSE KEYS: Daimon Tilley G4USI reviews a small paddle key that offers great performance at a sensible price.
QUANSHENG UV-K5 REVIEW: Keith Rawlings G4MIU reviews a bargain 2m/70cm handheld from China.
VALVE & VINTAGE: Michael Jones GW7BBY/GB2MOP discusses the issues involved in working with AC/DC sets, using the Eddystone 840A as an example.
TRIGGER WARNING, IT'S TRIGONOMETRY: Godfrey Manning G4GLM shows why trig matters.
BUILDING AN UNUN FOR AN EFHW: Mike Dunstan G8GYW explains how to build your own UNUN for an end-fed half-wave antenna.

There are all your other regular columns too, including HF Highlights, World of VHF, Antennas, Book Reviews, Vintage TV & Radio, What Next, The Morse Mode, Amateur Radio on a Budget and Data Modes as well as your Letters, the latest News and more.

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* Microphone M-1: Optional

* Photo shows the FTDX101MP

*1 3DSS: 3-Dimensional Spectrum Stream

*2 ABI: Active Band Indicator

*3 MPVD: Multi-Purpose VFO Outer Dial

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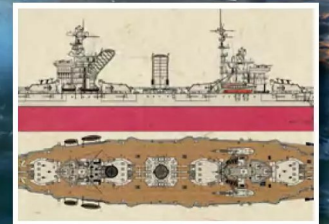
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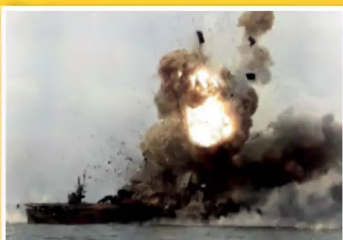
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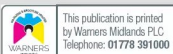
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▼ USS Carolina pitching in heavy seas while screening Task Force 38.3 off the Philippines, 12 December 1944

Welcome

While the battles on the ground in WWII have rightly been recognised as key events in the war, those fought at sea had an equally important role. Sea was the route by which American matériel kept Britain and the Soviet Union fighting in the darkest days of WWII. Without those supplies the war effort would have run dry, the population out of food and the efforts of those on the ground and in the air would have been in vain. There were four key areas – the Atlantic crossing to Britain; the Arctic run to supply the Soviet Union; the Mediterranean where British, Italian and German forces fought it out; and the Pacific, where the Allies took on the naval might of Imperial Japan. In this special, 132-page collector's edition bookazine, we take a look at the key naval battles and the ships that fought them.

While sea battles typically involved destroyers, cruisers, and in the Pacific especially, aircraft carriers, here we are looking at the role and specification of the battleships, the mightiest ships of all. At the start of WWII, the most powerful navies arguably belonged to Britain and Japan, but it didn't take the USA long to outbuild both, thanks to its vastly superior industrial capacity. Meanwhile, the German ships were a danger in the Atlantic and North Sea to both shipping and Britain's warships, which made it a priority of the Admiralty to send as many to seabed as fast as possible.

Here you will find 85 battleships and pocket battleships, with schematics for each class, a build history and their role in WWII. They are organised by country and then by class, such as the Queen Elizabeth class, where the ships had similar characteristics. There are specification panels for all classes and the ships where they differed from each other.

At the start of each section we take a look at the strategic situation for each of the navies represented here: Great Britain, France, USA, Soviet Union, Germany, Italy and Japan. Various treaties in the 1920s and '30s had restricted what could be built and so, on the eve of WWII, some navies were still equipped with WWI-era dreadnoughts. These were hastily upgraded as the main threat soon became apparent – that of attack from the air. After the early war clashes between ships, it was the aircraft carrier war in the Pacific that became the focus point, and finally, towards the end, the battleships were lending their awesome weaponry to support landings in France, Italy and the Pacific islands.

To conclude this special collector's guide to the battleships of WWII, we take a look at naval museums and floating warships around the world for you to visit; battleship models you can build; online naval simulations to play; and finally, how to take your interest to the next level by collecting naval militaria.

Duncan Evans, Editor

ALLIED BATTLESHIPS

Starting with the British Queen Elizabeth class battleships, the *Valiant*, *Elizabeth*, *Warspite*, *Barnham* and *Malaya* these are the warships that held the empire together while it was assailed on all front. Then we move on to the French fleet and the controversial way it was dealt with by the Germans, French and British. After 1941 the industrial might of the USA came into play, building ship after ship to turn the balance of power at sea. Then there are the ageing Soviet ships, trying to hold off the advancing Germans.

BRITISH SHIPS

- 7 Introduction
- 8 Queen Elizabeth class: HMS *Elizabeth*, HMS *Warspite*, HMS *Valiant*, HMS *Barnham*, HMS *Malaya*
- 12 Revenge class: HMS *Revenge*, HMS *Resolution*, HMS *Royal Oak*, HMS *Sovereign*, HMS *Ramillies*
- 16 Nelson class: HMS *Nelson*, HMS *Rodney*
- 18 King George V class: HMS *King George V*, HMS *Duke of York*, HMS *Prince of Wales*, HMS *Anson*, HMS *Howe*
- 24 Renown battlecruiser class: HMS *Renown*, HMS *Repulse*
- 26 Admiral battlecruiser class: HMS *Hood*

FRENCH SHIPS

- 33 Introduction
- 34 Courbet class: *Courbet*, *Jean Bart*, *Paris*
- 36 Bretagne class: *Bretagne*, *Provence*, *Lorraine*
- 38 Dunkerque class: *Dunkerque*, *Strasbourg*
- 40 Richelieu class: *Richelieu*, *new Jean Bart*

AMERICAN SHIPS

- 46 Introduction
- 47 Wyoming class: USS *Wyoming*, USS *Arkansas*
- 48 New York class: USS *New York*, USS *Texas*
- 50 Nevada class: USS *Nevada*, USS *Oklahoma*
- 52 Pennsylvania class: USS *Pennsylvania*, USS *Arizona*
- 54 New Mexico class: USS *New Mexico*, USS *Mississippi*, USS *Idaho*
- 56 Tennessee class: USS *Tennessee*, USS *California*
- 58 Colorado class: USS *Colorado*, USS *Maryland*, USS *West Virginia*
- 60 North Carolina class: USS *North Carolina*, USS *Washington*
- 62 South Dakota class: USS *South Dakota*, USS *Indiana*, USS *Massachusetts*, USS *Alabama*
- 66 Iowa class: USS *Iowa*, USS *New Jersey*, USS *Wisconsin*, USS *Missouri*

SOVIET SHIPS

- 72 Introduction
- 73 Gangut class: *Oktyabrskaya Revolyutsiya* (*Gangut*), *Marat* (*Petropavlovsk*), *Parizhskaya Kommuna* (*Sevastopol*)

BATTLESHIPS OF WWII



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AXIS BATTLESHIPS

The Kriegsmarine was always of secondary importance to Hitler which meant it was at a significant disadvantage compared to the Royal Navy. The focus was on sinking Allied merchant shipping, rather than confront the British battleships. It was Italy in the Mediterranean and especially Japan in the Pacific that were the major Axis naval powers. Once Germany's capital ships had been put out of action and Italy had been knocked out of the war, it was in the Pacific that the naval campaign would finally be resolved.

GERMAN SHIPS

- 81 Introduction
- 82 Scharnhorst class: *Scharnhorst*, *Gneisenau*
- 84 Bismarck class: *Bismarck*, *Tirpitz*
- 88 Pocket battleship class: *Scheer*,

Deutschland, *Admiral Graf Spee*

JAPANESE SHIPS

- 97 Introduction
- 98 Kongō class: IJN *Kongō*, IJN *Haruna*, IJN *Hiei*, IJN *Kirishima*
- 102 Fuso class: IJN *Fuso*, IJN *Yamashiro*
- 104 Ise class: IJN *Ise*, IJN *Hyuga*
- 106 Nagato class: IJN *Nagato*, IJN *Mutsu*
- 108 Yamato class: IJN *Yamato*, IJN *Musashi*

ITALIAN SHIPS

- 116 Introduction
- 117 Conte di Cavour class: RM *Conte di Cavour*, RM *Giulio Cesare*
- 118 Andrea Doria class: RM *Andrea Doria*, RM *Duilio*
- 120 Littorio class: RM *Littoria*, RM *Vittorio*, RM *Roma*



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KEY NAVAL BATTLES

Whether it was the hunt for a German commerce raider, an attack on a home port, or a massive air and sea battle in the Pacific, these are the key naval battles of WWII that featured battleships.

28 Raid on Taranto

The daring raid on the Italian port by British forces wrought havoc on the Italian fleet and forced a change of strategy for the rest of the war. Japanese visitors to the scene made careful note of how the British had done it.

42 Sink the Bismarck

After the German's had sunk the ageing pride of the Royal Navy, HMS Hood, the Admiralty was going to stop at nothing to exact revenge and send the heavily armoured and dangerous German ship to the seabed.

76 Midway

It was the pivotal battle in the Pacific where the outnumbered American forces took a huge gamble and managed to get the upper hand against the Japanese. The balance of power was finally starting to shift.

92 Battle of Leyte Gulf

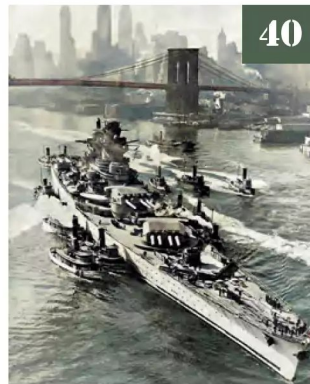
An overly complex plan by the Japanese was part of the problem that resulted in snatching defeat from the jaws of victory and setting the Americans on the path to victory.

112 The Battle of the Atlantic

It raged from the dawn of WWII to Victory in Europe day itself. For six years the Kriegsmarine tried to strangle essential supplies and war matériel being shipped to Britain. From the early days of catastrophic losses to the breaking of Enigma and Allied mastery of the waves, this is that story.



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NAVY MEDIA

Take your interest in all things battleships and nautical to the next level with museums to visit, games to play, models to build and militaria to collect.

125 World of Warships

If you want to experience all of the thrills with none of the peril of grand naval battles against other enthusiasts, then there's nothing better than the online game, *World of Warships*, available for PC and consoles.

126 Navy museums

Let's head around the world for naval museums and preserved battleships. Here are 10 of the top attractions you can visit to experience life on board these leviathans of the seas.



128 Collecting navy militaria

From actual fixtures and fittings from famous ships, like portholes, signs, equipment etc, to the uniforms and badges of the sailors who manned them, this is how you can own a piece of battleship history and start building a collection of naval militaria.

129 Battleship models

You've read about them, simulated them and maybe even visited a few, now how about building some of the most iconic battleships to ever sail the seas? Here are a selection of scale models from Airfix that allow you to recreate classic wartime battles, but in miniature.

130 Competition

How would you like to spend the day on a warship? Well that's the prize for 6 lucky winners in our competition. Enter online and 3 readers will win pairs of adult tickets to HMS *Belfast*, the floating warship museum in London, all courtesy of the Imperial war Museum.



▼ The iconic HMS *Hood*, known as the *Mighty Hood*, was sunk by her nemesis *Bismarck*, to the consternation of the British public and Admiralty alike



British battleships

Words: Mark Wood

At the commencement of hostilities in 1939, the Royal Navy was still the largest and most powerful in the world, able to call on over 1,400 vessels. There had been significant developments in both air and sea power since World War I and it became obvious that a second war would severely test the fighting capacity of the Royal Navy across the oceans of the globe, yet it was not until the late 1930s that the Admiralty set to work to upgrade Britain's ageing fleet.

Until the late 1930s Britain had relied upon a fleet of previous generation capital ships, most of which had seen service during WWI. The Queen Elizabeth class of five dreadnought battleships was completed during the first two years of the war and was designed to act as a rapid response squadron to counter enemy capital ships, being the fastest warships at that time. Between 1913 and 1917 a further five superdreadnought battleships of the Revenge class were launched and as with the Queen Elizabeth class, they were ordered during the pre-war arms race with Imperial Germany and were to be an updated design based on the *Iron Duke* blueprint with heavier armament. The Revenge class was originally intended to consist of



▲ HMS *Barham*, one of five Queen Elizabeth battleships built for the Navy, was launched in 1914 and commissioned the following year

eight vessels, but one was cancelled and the remaining two were redesigned as the *Renown* class with modifications to armament and protective armour.

The post-war years saw drastic restrictions to warship design imposed by the constraints of the Washington Naval Treaty of 1922. The original G3 battlecruiser design, approved six months after the signing of the treaty, contravened the agreement and was adapted to become the lead ship of two, christened Nelson class battlecruisers. Although reduced in size, the ships were

armed with 16in guns to maintain parity with the recent American Colorado and Japanese Nagato class warships. While the Nelson class were of a superior design to their predecessors, the trade-off for heavier armament was a reduced speed and the ships were considered ungainly.

The 1922 moratorium on large shipbuilding was continued by the 1930 Naval Treaty of London and a design that had been commissioned in 1928 was suspended. In 1935 it was reactivated and updated to become the King George V class of battleships of which five were built. The plans proposed a ship with far heavier belt armour and, with a nod to the age of sub-surface weaponry, improved anti-torpedo protection.

Perhaps the most revered of WWII Royal Navy ships, HMS *Hood*, was the only ship of the proposed four of the Admiral class battlecruisers to be realised. Despite its iconic status, *Hood* was acknowledged to be a flawed design on joining the fleet in 1920 and the remaining three were abandoned in favour of a new construction type.

As Europe teetered on the precipice of a new global conflict, Britain's Navy faced the threat of a more modern style of maritime warfare with a fleet that was already on the verge of obsolescence. ■

Artist rendition of the deadly force capable of being delivered from an obsolete plane ▼



Raid on Taranto

Words: John C Pursley

Before the war the British possessed strategically important locations in the Mediterranean and were very concerned about the Italian naval build-up.

Although at the time, the British Royal Navy was the strongest sea power afloat, it was spread out across the globe, and had no modern battleships. The number of Italian Regia Marina (Royal Navy) capital ships stationed in the Mediterranean theatre outnumbered British vessels, but the British did have an aircraft carrier, whereas the Italians depended upon airbases surrounding the contested waters.

Taranto, Italy was the home port of the First Squadron of the Regia Marina fleet. Their force consisted of six battleships (two of the modern Littorio class and their older ships had been extensively modified), seven heavy cruisers, seven light cruisers and 13 destroyers.

Although the Italians commanded a strategic central position, the British had bases at the western and eastern ends of the Mediterranean whose forces could, if brought together, pose a significant threat to the Italian fleet.

The base locations became a real problem for Britain when the war began,



▲ Italian Naval harbour positions around the Mediterranean in 1940

especially in June 1940 when fighting between British and Italian forces in North Africa broke out. Both sides now needed to transport men, equipment, and supplies onto the African continent.

For the Italians the challenge was minimal as they only had to cross one of the narrower parts of the Mediterranean. The British, on the other hand were not so fortunate and their options limited to two less than satisfactory choices. They could expose their ships to attacks from Italian air, surface naval ships, and submarines

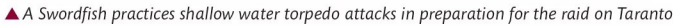
by traveling down the European coastline, through Gibraltar, then making a lengthwise crossing of the Mediterranean, past Sicily, and Italy.

The second choice was safer but time consuming and would expend a considerable amount of fuel as the route to Egypt required sailing down the entire west coast of Africa, back north along the east coast, through the Red Sea and the Suez Canal. The situation was compounded after France was invaded by the Germans which eliminated French naval assistance. The British could not sit by and lose the war in Africa simply because of supply problems. They had to do something to counter the Italian advantage.

The Italian posture in the central Mediterranean offered the opportunity to defeat the Royal Navy, except for two serious issues with their fleet. The Italians did not have enough oil to maintain their ships at sea for long periods as would be necessary to gain naval superiority in the Mediterranean and they lacked confidence needed to threaten or engage in a sea battle.

Planning the attack

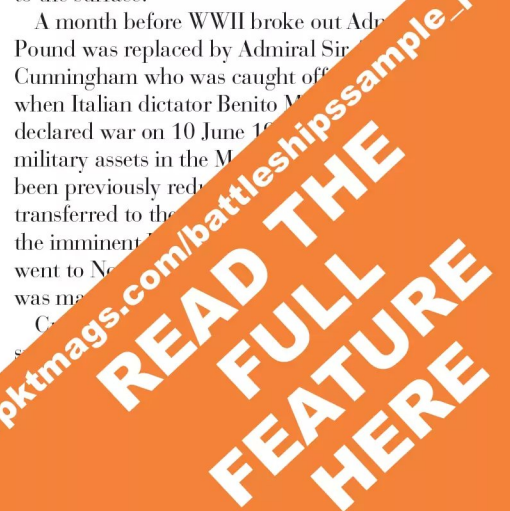
Attacking the Italians at Taranto was not a new concept as the idea of launching



The Fairey Swordfish was one of aerial warfare's improbable heroes. Entering service in 1936, it looked like a relic from WWI. In an era of all-metal monoplanes, it was a fabric skinned, two-seater biplane.

The shallow waters of the Italian port posed a significant technological challenge as British aerial torpedoes could only be dropped into water at least 75ft deep lest they hit the bottom. The harbour at Taranto was only about 39ft.

Killed: 59 • Wounded: 600
2 fighters lost • 3 ships disabled • 3 ships damaged



▼ A side profile of Dunkerque highlighting her forward facing armament



Dunkerque class

DUNKERQUE

It was 20 years after the Bretagne class before France commissioned further battleships, leading to the *Dunkerque* being laid down in 1932. This ship was very different from anything that had come before and was heavily influenced by the Washington Naval Treaty and the other treaty battleships around the world. Like the British Nelson class, *Dunkerque* had all her armament facing forward in two massive turrets, each of which housed four 330mm (8in) guns. Her armour was designed to counter the German *Deutschland's* 283mm guns and she had a top speed of 29.5 knots, far faster than the older designs of dreadnoughts that had previously served France. *Dunkerque* was launched in 1935 and entered service in 1937. With all her main armament facing forward, her fantail was an ideal launch point for aircraft so she had a catapult on her stern and carried two float planes to assist spotting for her guns and other general duties.

The outbreak of war saw *Dunkerque* serving in the Force de Raid alongside her sister ship *Strasbourg*, three light cruisers and eight destroyers. This force was based at Brest and was sent forth on the opening day of the war to counter any chance of a surprise naval attack from Germany's Deutschland class pocket battleships. The battleship was used on convoy work and joined HMS *Hood* in patrols to try to hunt down *Scharnhorst* and *Gneisenau*. Patrolling off Iceland highlighted defects in the design of *Dunkerque* and she had to drop to 10 knots to avoid damage due to her limited freeboard and light construction. On 11 December 1939, like many other French battleships, *Dunkerque* carried part of France's gold reserve to



▲ Side profile of Strasbourg

Canada and escorted troop ships back again. In the Spring of 1940 *Dunkerque* moved to the port of Mers-el-Kébir and she was here when France surrendered.

When the British fired on the French fleet, *Dunkerque* was tied up facing the wrong way so could not bring her guns to bear. The crew quickly loosed the anchor and manoeuvred to try to fire on HMS *Hood*. Although *Dunkerque* fired off several salvos, none hit the target. *Hood* was more accurate and the French battleship was hit by four 15in shells. These shells damaged the ship's rudder and the final shell destroyed one of her boilers and took out electrical power so her crew were forced to beach the ship to prevent her sinking. Most of the crew were evacuated and repairs began with the intention of allowing the ship to limp home to Toulon. On learning of this the British launched aircraft armed with torpedoes that caused further, extensive damage and the ship would have been lost by a hit to the magazine had her Captain not had the foresight to flood it at the first sign of British aircraft. After further emergency repairs the ship crawled back to Toulon for more permanent repairs.

When the Germans and Italians decided to seize the Vichy France ships, her crew opened the dock gates and tried to flood

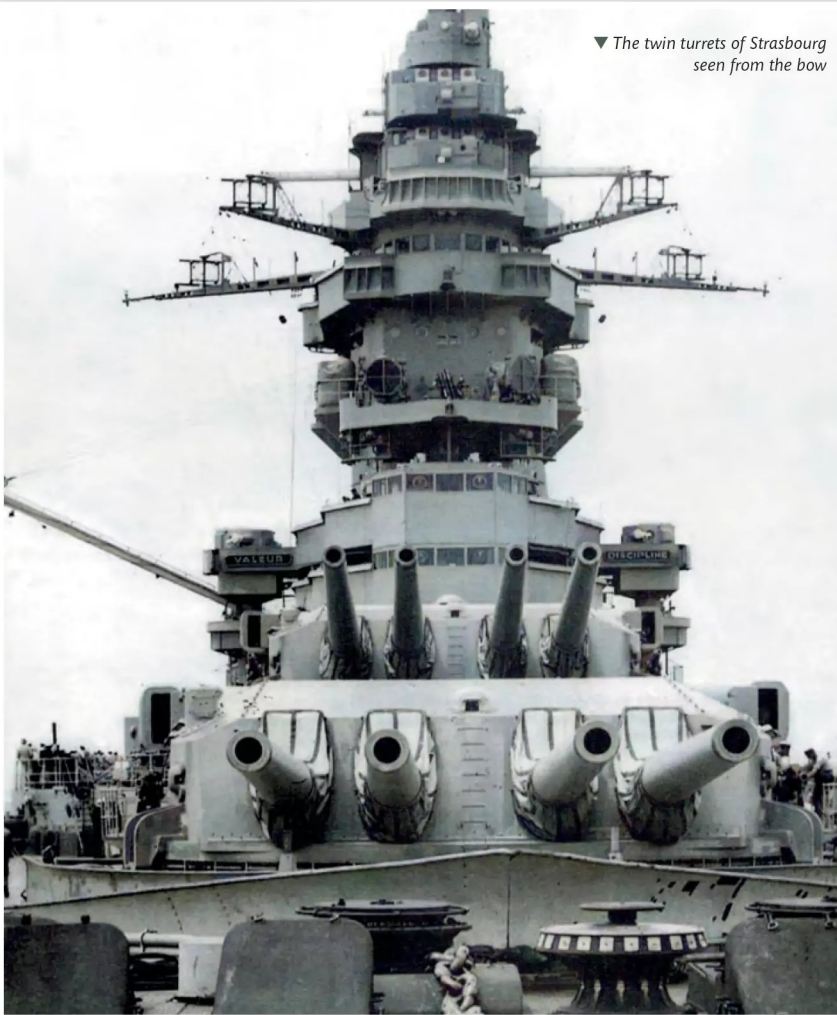
and sink the ship. By the time the Italians reached the battleship she was declared a complete loss and the Axis began to scrap her in situ but it was not until 1958 that the final remains of *Dunkerque* were sold for scrap.

STRASBOURG

The second ship of the Dunkerque class, *Strasbourg* was similar but not identical to her sister ship. It was decided to increase the armour thickness of the ship during construction and so she boasted an extra 58mm of armour on her belt and an extra 12mm of armour thickness on her decks. The combination of these increased her displacement by an extra 1,200 tons. *Strasbourg* was laid down in 1934 and launched two years later. She entered service with the French navy in 1938 and joined *Dunkerque* in April 1939 as the 1st Battle Squadron. *Strasbourg* received two identification stripes on her funnel in comparison to *Dunkerque's* one to allow the two vessels to be quickly told apart. At the outbreak of war *Strasbourg* completed her duties in tandem with *Dunkerque* until October 1939 when she joined HMS *Hermes* and a pair of destroyers to patrol the central Atlantic. Although the patrol was mostly uneventful, *Strasbourg* did



▼ The twin turrets of *Strasbourg* seen from the bow



SPECIFICATIONS

Dunkerque

Class: Dunkerque
Displacement: 26,500 tonnes
Length: 214.5m (703ft 9in)
Beam: 31.08m (102ft)
Draft: 8.7m (28ft 6.5in)
Speed: 29.5 knots
Range: 14,537km (9,033 miles)
Crew: 1381-1431 men
Armament: 8 x 330mm guns • 16 x 130mm guns • 8 x 37mm AA guns • 32 x 13.2mm AA MGs
Armour: Deck - 11.5cm (4.5in), Waterline belt - 22.5cm (8.86in)

SPECIFICATIONS

Strasbourg

Class: Dunkerque
Displacement: 27,700 tonnes
Length: 214.5m (703ft 9in)
Beam: 31.08m (102ft)
Draft: 8.7m (28ft 6.5in)
Speed: 29.5 knots
Range: 13,888km (8,630 miles)
Crew: 1381-1431 men
Armament: 8 x 330mm guns • 16 x 130mm guns • 8 x 37mm AA guns • 32 x 13.2mm AA machineguns
Armour: Deck - 12.7cm (5in), Waterline belt - 28.3cm (11.14in)



▲ The sleek bulk of *Strasbourg* when newly commissioned

successfully capture the German merchant ship *Santa Fe* on 25 October.

Strasbourg was ordered to Mers-el-Kébir in April of 1940 following an abortive operation to Norway to defend that nation against the Germans. *Strasbourg* returned to the Mediterranean to undertake patrols against Italian shipping following Mussolini's declaration of war against the Allies. Following France's

surrender, *Strasbourg* was one of the many battleships in Mers-el-Kébir when the British issued their ultimatum. *Strasbourg* was moored with her stern facing the sea so she had to slip her moorings and she headed for open waters along with four destroyers. Although damaged by some near misses, *Strasbourg* managed to clear the harbour and elude the British. Debris had entered her boiler room, slowing

Strasbourg to no more than 20 knots and leaving her with black smoke belching out. On realising their quarry was escaping, the British launched a series of carrier aircraft attacks, all of which missed and *Strasbourg* managed to reach the safety of Toulon. *Strasbourg* became the flagship of the Vichy French navy and underwent repairs and refit in 1942 including the fitting of radar.

In November 1942 the Germans moved to seize the remaining French fleet in Toulon but to prevent this the crew of the *Strasbourg* sabotaged and scuttled the ship. Any equipment that might have been of use to the Germans such as rangefinders and radios were smashed with sledgehammers and the boilers were lit, with the water feeds cut off to cause them to explode. The ship's seacocks were opened to flood the ship and scuttling charges were detonated to prevent her being easily refloated. The Italians refloated the ship anyway but decided to scrap her due to her poor condition.

Following the Italian surrender, the ship returned to Vichy hands and moored in the Bay of Lazaret where she was sunk by gunfire from the USS *Nevada* during Operation *Dragoon*. Refloated once more she was used as a testbed for underwater explosions before being scrapped in 1955. ■

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