

Radio ZS

Volume 79, Issue 5 - May 2026 Mei



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Radio ZS



The Journal of the South African Radio League
Die Tydskrif van die Suid-Afrikaanse Radioliga

“Advancing the Spirit of Amateur Radio Through Innovation”

YOU are the SARL!

Volume79, Issue 5 - May 2026 Mei

Editor: Dennis Green, ZS4BS radiozs@sarl.org.za

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On the Cover. The home-brew hex-beam project driven by Matt, ZS6MDV and used at the Sandton Field Day station.

Op die Voorblad. Die tuis-gebroude hex-beam projek, bestuur deur Matt, ZS6MDV en gebruik by die Sandton Velddag-stasie.

Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the South African Radio League and the South African Radio League cannot be held responsible for incorrect information published.

South African Radio League Suid-Afrikaanse Radioliga

Founded 20 May 1925 /
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The National Body for
Amateur Radio in South
Africa and Member Society
of IARU Region 1
Die Nasionale Liggaam vir
Amateur Radio in Suid-
Afrika en Lidvereniging van
IARU Streek 1
<https://mysarl.org.za/>

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Phillip van Tonder, ZS6PVT

Karel Bezuidenhout, ZS6WN





They shall grow not old, as we that are left grow old:
Age shall not weary them, nor the years condemn.
At the going down of the sun and in the morning
We will remember them.

Hulle word nie oud soos ons wat bly vergrys,
Die jare sal hulle nie raak nog die tyd se eis.
En, soos die son sak of die more ontvou,
Eer hul herinnering - Ons sal onthou.

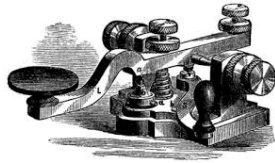
Johannes Venter, ZS6HVN
Brian Best, ZS5SB
Seppie (Joseph) Jooste, ZR1JOJ



Amateur Radio News

Well done, Team Africa!

Raoul, ZS1C reports that the results for the RSGB Commonwealth Contest, run on 14 and 15 March, have just been released. He says, "As part of Team Africa, I am proud to say Team Africa came third world wide. I was able to achieve the highest score for Region 1, outside of the UK and overall, seventh place. Congratulations to our Team Africa members and all the winners. To Australia, the overall winners, congratulations!



I have been elected join the RSGB's Evans Committee to promote the contest in South Africa and I do hope to get more Morse Code operators to dust off the Morse transmitting keys, get on the air and prepare to take part in next year's Commonwealth Contest, one of the oldest Morse Code contests with a long, colourful history, starting in 1931." See page 8 and 9.

<https://rsgb.org/main/radio-sport/commonwealth-contest/early-history/>

Contest Log Upload – announcement

The SARL Contest Working Group has implemented a contest log upload page on the mysarl website. It can be accessed via the contest resources page.

How it works - you enter your call sign, your e-mail address and then select the contest the log is for and then browse and link your log file. Pressing the upload file button submits your log. Once your log file is uploaded you will receive an immediate e-mail from contest@sarl.org.za confirming the

upload.

The upload is now available for all the SARL's own contests as well as those sponsored by the West Rand Club. Other club sponsored contests will be added when clubs request their addition.

For now, the use of the log file upload page to submit contest logs is optional. Submission of log files via e-mail will remain available during the rest of 2026.



We have a Vacancy

James Archibald, ZS6NS, the SARL coordinator for the IARU Intruder Watch has indicated that he is stepping down after many years of service. James, thank you very much for the work you have.



The SARL is looking for someone to take over the IARU Intruder Watch coordinator.

If you are interested, please contact the SARL Secretary at secretary@sarl.org.za.



Working Groups and Coordinators

Amateur Radio Today: Hans van de Groenendaal, ZS6AKV artoday@sarl.org.za.

ART Relays: Louis Veldkamp, ZR4DJL and Andy Cairns, ZS6ADY

Awards: Tjerk Lammers, ZS1J

Contest WG: Johan Bezuidenhout, ZS6JBZ; Gerhard Coetzee; ZS3TG; Phillip van Tonder, ZS6PVT; Karel Bezuidenhout, ZR6K, Karel Bezuidenhout, ZS6WN; Phillip Fischer, ZS6FY; Danie Schmetler, ZS6DPS

Database: Colin de Villiers, ZS6COL

Forum: Bradley Phillips, ZS5Z; Roger Conroy, ZR3RC and Andy Cairns, ZS6A

IARUMS: Vacancy

QSL Manager: Gert du Plessis, ZR6GRT

RAE and Training: Donovan van Loggerenberg, ZS2DL rae@sarl.org.za

Regulatory WG: Hans van de Groenendaal, ZS6AKV; Leon Lessing, ZS6LMG; James Archibald, ZS6NS and Peter Leonard, ZS5PL

Reno Faber Station: Alistair Skudder, ZS6S

Repeater Co-ordination: Philip van Tonder, ZS6PVT

SARL Beacon Project Manager: Brian Jacobs, ZS6YZ

SARL Hamnet: Brian Jacobs, ZS6YZ; Michael Taylor, ZS1MJT; Andrew Gray, ZS2G; Roy Walsh, ZS3RW; Rickus de Lange, ZS4A; Keith Lowes, ZS5WFD; Gert Botha, ZS6GC and Leon Lessing, ZS6LMG

SARL/ICASA Liaison: Hans van de Groenendaal, ZS6AKV; Nico van Rensburg, ZS6QL and Colin de Villiers, ZS6COL

SARL News/SARL Nuus: Dennis Green, ZS4BS; Dave Reece, ZS1DFR; Rory Norton, ZS2BL; Andy Cairns, ZS6ADY; Vivian Dold, ZS6VD; Herman Erasmus, ZS6CTA; Paul Johnson, ZS1S; Irene Myburg, ZS6IEA; Deon Erwin, ZS1ZL; Christo de Witt, ZS3CDW, Hannes Enslin, ZS6JDE and Kevern Burger, ZR2BK

SARL VHF and Above Records: Paul Smit, ZS6NK

Swap Shop: Rassie Erasmus, ZS1YT

Youth/Jeug: Koos Fick, ZR6KF

Radio ZS Awards

The Gary Immelman RA Heritage Award Floating Trophy awarded by the SARL Council for the best article of a historic nature describing an event that occurred more than five years previously or an interesting personality that has played an important part in the development of Amateur Radio in years gone by. Donated by Gary 1993.



The JJ Pienaar Trophy awarded by the Editor for the best article published in Radio ZS during the past year.

The Radio ZS Shield awarded by the Editor to a South African Radio League affiliated Club or member who best supported Radio ZS during the year. Donated by the Port Elizabeth Branch in 1966.

Radio ZS

Radio ZS is a forum for South African Radio League members to share their amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on e-mail are especially welcome. Material may be submitted in MS Word, Open Office or rtf format, using Calibri 12 pt and English (South Africa). Material may be e-mailed to radiozs@sarl.org.za. The League cannot be responsible for loss or damage to any material.

www.sarl.org.za/public/RadioZS.asp.

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The 2026 SARL National Convention - The Willows, Port Elizabeth

At 18:30 on Friday 1 May, PEARS will welcome you to the 2026 National Convention at the Boma at the Willows Resort in Port Elizabeth. There will be gin and tonic and wine sponsored by Meridian Wine Merchants and Fitch and Leedes. You are also welcome to bring your own drinks.



AGM registration will start at 08:00 on Saturday 2 May in the foyer of the Conference Centre with tea and coffee to start your day. The AGM will start at 09:00. The Partners programme will also start at 09:00 and is a visit to The Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) with a chance to feed the Penguins.



PEARS will provide a boerie roll for lunch and at 14:00 there will be a talk and demonstration of Meshcore at the Boma.

The Awards Dinner will be held in the Conference Centre from 18:30 onwards. There will be a cash bar and sponsored wines.

The registration form for the National Convention is available at <https://mysarl.org.za/sarl-agm-2026/>, click on the link and fill in your details. Friday evening is R150 per person and Saturday evening is R250 per person, pay the amount into the SARL bank account and upload a copy of the PoP on the registration form.

The 2026 SARL National Convention Booklet and the electronic proxy form have been available since Thursday 2 April 2026.

The National Convention takes place over a long weekend, so book early. There are various accommodation options to choose from chalets, cottages; rondavels; bungalows and caravans and camping. For all the information, visit the website at <https://thewillowspe.co.za/>. Or make use of one of the many accommodation webpages, like Lekkerslaap.



Come on, do the right thing - see you in the Friendly City in May 2026!





The Commonwealth

Commonwealth Contest



This is to certify that

Africa

3B8XF 5Z4VJ ZS1C ZS2M

Achieved

3rd in the

Commonwealth Contest 2026

Commonwealth
of Nations

Congratulations, Evans Committee of Commonwealth Radio Societies



The Commonwealth

Commonwealth Contest



This is to certify that

ZS1C

Achieved

7th in the High Power Single Operator
Assisted Section of the

Commonwealth Contest 2026

Commonwealth
of Nations

Congratulations, Evans Committee of Commonwealth Radio Societies



ZS100SARL and the 2025 SARL Centenary Marathon QSO Party

Celebrating 100 years of organised amateur radio in South Africa

In 2025, the South African Radio League (SARL) celebrated its 100th anniversary - 20 May 2025 to 19 May 2026.

1925 saw the birth of the South African Radio Relay League. At the outset membership was strictly restricted to experimenters in possession of a licence and capable of conducting two-way telegraphic communication. In 1926 there was a membership of 90, all experimenters actively engaged in transmission work. QTC was the first printed magazine issued by the League in May 1928. In 1947 the word Relay was dropped and the SARRL became the South African Radio League (SARL).

In 2025 the SARL has over 1 500 members, presents two radio amateur's exams (RAE) per year, runs a QSL bureau, publishes a weekly HF Happenings newsletter and a monthly Radio ZS magazine. The SARL transmits a weekly news bulletin and the on-air magazine programme called Amateur Radio Today. The SARL runs several local and international contests to promote the radio

amateur hobby. The SARL represents South African radio amateurs at the South African Regulator as well as in IARU Region 1.

The SARL Centenary Marathon QSO Party

In conjunction with the 100th anniversary of the SARL, the SARL Centenary Marathon QSO Party ran as a year-long operating event starting at 00:00 UTC on 1 January 2025 and ran through to 23:59 UTC on 31 December 2025.

Participating amateur radio operators worldwide worked South African amateur radio stations.

Operators who submitted their logs containing QSOs made during 2025 with South African amateur radio stations received Gold, Silver, Bronze and Participation certificates depending on the number of stations and special event call signs contacted.

Operators who wish to submit their 2025 operating log (in ADIF or excel format) to

(Continued on page 11)





(Emergency Power from page 10)

sarlcentenary@sarl.org.za have until 30 June 2026 to apply for an award certificate.

Centenary Call Sign ZS100SARL

During 2025 the SARL, with the aid of its members and associated clubs, was on the air with a special event call sign ZS100SARL. Two-way QSOs were made using CW, phone and digital on 160, 80, 60, 40, 30, 20, 17, 15, 12, 10, 6, 2 metres and 70 centimetres. All QSOs were uploaded to the ARRL Log of the World, QRZ.com, Club Log and the SARL SA-QSL systems.

Operating Activity

4 332 QSOs were logged during the year, 353 CW, 425 SSB, 11 FM, 9 FT4 and 3 534 FT8 QSOs. Theunis, ZS2EC was responsible for 3 561 of those QSOs.

3 051 unique call signs were worked across 115 DX zones. Bands worked 160 m to 70 cm.

324 South African stations

Why RaDAR

Eddie Leighton, ZS6BNE

RaDAR, an acronym for Rapid Deployment Amateur Radio. It says, exactly what it is. RaDAR is an outdoor activity, a little different to any other amateur radio activity. We often say, "When all else fails, amateur radio is there to fill the gap" or in many other ways some like to promote amateur radio through various slogans. But, do we really prepare ourselves, "to fill the gap?"

Imagine, you have been asked to join a search and rescue team as a communicator. The team needs to do a search for a lost group of hikers deep in the mountainous wilderness where direct VHF or UHF communications, usually used by the search and rescue team, is rendered useless as a result of the terrain.

As the communicator you will certainly be experienced in knowing what equipment to carry, how long the operation may take and fit enough to keep up with the team. More than just the communications equipment, food, water, shelter and various clothing for any weather condition.

You most certainly would have taken part in regular RaDAR exercises and be able to handle

2727 DX QSOs

Confirmations

2 693 QSL on LotW

3 035 confirmed QRZ.com

Awards received

The QSL requirements for WAZS on SA-QSL were met and a certificate received

The ZS100SARL call sign achieved QSLs with 100 DXCC entities and has received a DX Century Club award from the ARRL.

QSL activity

QSLworld.com was used to send out an e-QSL card to all call signs contacted (1 card per station)

The ZS100SARL QRZ.com page is active, including its ClubLog OQRS QSL card request link.

ZS100SARL QSL cards can be requested via ClubLog OQRS or by e-mailing QSO details and a request to sarlcentenary@gmail.com

RaDAR



Rapid Deployment Amateur Radio

message traffic efficiently and accurately. You will be fluent in CW and voice procedures including the correct phonetics and Q-Codes. You will understand maps and coordinates and be able to use them for navigation with a plan for a safe return, hopefully together with the lost hiking group.

On your return your whole communications diary, together with messages handled, need to be

(Continued on page 12)

(Wht RaDAR from page 11)

documented and logged, accurately. Administration of communications is as important as the communications themselves and open to scrutiny.

You may see opportunity to use satellite communications and up to date with all the orbit information and available pass times. This may become a lifeline. In the event of no cellphone reception, no direct VHF / UHF communications and bad shortwave propagation. Certainly, in the case of HF (Shortwave communications), NVIS will be your friend.

Some may argue that digital communications are the answer but that just adds to the complexity and weight not to mention power requirements. It has its place but do not bank on using FT8, it has

zero value in this regard. In fact CW is about your best bet. You need a team back home ready to exchange information with you and they would need to be a community regularly practising these scenarios. We have lost the belief in using the most basic methods of communication under extreme circumstances.

When last did your community make themselves available for such an exercise?

Are you ready to "fill the gap?"

In the rules for the SARL National Field Day, you will find Class E Ultra Light Portable Field Station. Light weight self-contained stations, operating QRP or low power. The operator must carry (port) the entire station, antenna included, to the operating site. The distance carried must not be less than 1



The South African Radio League broadcasts a news bulletin each Sunday in Afrikaans and English at 08:15 and 08:30 Central African Time respectively, on HF and various VHF and UHF repeaters around the country. The bulletin is relayed on EchoLink and AllStar Node 53511 by Johan, ZS6JPL. The audio bulletins can be downloaded from <https://sarlnews.podbean.com/> while the text bulletin is available at <https://mysarl.org.za/sarl-news/>.

You are welcome to join us every Sunday morning for the weekly radio programme Amateur Radio Today at 10:00 CAT. The programme can be heard on VHF and UHF repeaters countrywide and is relayed on 7 115 kHz lower sideband by Louie, ZR4DJL. In Bloemfontein, you can listen on the 145,7625 MHz repeater at 08:15 and at 10:00 CAT. In Cape Town, you can listen at 10:30 CAT on the 145,700 MHz repeater, with EchoLink to ZS1DCC-R by Dave, ZS1DFR. A rebroadcast by Andy, ZS6ADY, can be heard on Monday evenings at 19:30 CAT on 3 620 kHz.

We invite Clubs and individuals to submit news items of interest to radio amateurs and shortwave listeners, in both English and Afrikaans where possible, by uploading the news item at <https://mysarl.org.za/news-inbox/> or by sending items to news@sarl.org.za no later than Friday morning preceding the bulletin date.

Die Suid-Afrikaanse Radioliga saai elke Sondag nuus bulletins uit in Afrikaans sowel as Engels om 08:15 en 08:30 Sentraal Afrika Tyd onderskeidelik op HF sowel as op verskeie BHF- en UHF-herhalers. Hierdie uitsendings word ook via Echolink en Allstar Node 53511 herlei deur Johan, ZS6JPL. Die oudio bulletins kan afgelaai word vanaf <https://sarlnews.podbean.com/>, terwyl die teks bulletins by <https://mysarl.org.za/sarl-news/> afgelaai kan word.

Luister elke Sondag oggend om 10:00 Sentraal Afrika Tyd na "Amateur Radio Today." Daar is 'n herleiding op 7 115 kHz laer syband deur Louie, ZR4DJL, en verskeie herleidings op BHF en UHF frekwensies regoor Suid Afrika. In Bloemfontein kan jy om 08:15 en om 10:00 SAT op die 145,7625 MHz-herhaler luister. In Kaapstad kan jy om 10:30 SAT luister op die 145,700 MHz-herhaler met Echolink na ZS1DCC-R, danksy Dave, ZS1DFR. 'n Heruitsending aangebied deur Andy, ZS6ADY vind op Maandae aande om 19:30 Sentraal Afrika Tyd op 3 620 kHz plaas.

Ons nooi Klubs en individue uit om nuusberigte van belang vir radioamateurs en kortgolf-luisteraars in te dien, indien moontlik in beide Engels en Afrikaans, deur die nuusberig op te laai by <https://mysarl.org.za/news-inbox/> of die items te stuur na news@sarl.org.za, nie later nie as die Vrydagoggend voor die bulletin datum.

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EXPERIMENT WITH ANTENNAS



IT'S A HOBBY AND A LIFELINE!

Ham radio is a fun hobby that connects you to people locally and globally, and it's a vital resource in emergencies when other communication systems fail.





From FT8 to CW: A Modern Path Back to Morse Code

Philomen Leonelli Jr., WM6Y (CWops #2280)

I never thought I would become a CW operator.

I was introduced to amateur radio early, thanks to my father, Phil, WF6L, who was eager to share his love of radio with his ten-year-old son. I learned the basics young and earned my license after the FCC restructured the amateur licensing system in 2000. At the time, Morse code felt like the barrier between where I was and where I wanted to be as an operator. When the FCC later dropped the Morse code requirement, I celebrated, but life had already begun to pull me in other directions. School, work and outside interests slowly took over and before long I had faded from the airwaves and become an inactive amateur.

Two decades later, my return to amateur radio came through FT8. My father reintroduced me to the hobby by showing me this weak signal digital mode at what was effectively the bottom of the solar cycle. By all conventional wisdom, propagation should have been poor. Bands were quiet, sunspot numbers were low and many operators had resigned themselves to limited activity. Yet on the screen in front of us, signals were appearing from all over the world.

What struck me immediately was not just that contacts were being made, but who was being worked. My father was seeing and working DX that he had not seen or heard in years. Stations that had been completely absent during traditional SSB and CW operating suddenly reappeared, decoded cleanly out of the noise. All of it was happening at power levels and signal strengths that would have been considered unusable before. Watching FT8 pull coherent exchanges from what sounded like pure static felt almost like cheating, but it was undeniably 'real radio.'

The ability to make reliable contacts under objectively poor band conditions and with modest stations was fascinating. FT8 stripped away much of the mystery surrounding propagation. Gray line effects, band openings, signal-to-noise ratios and path reliability became visible in real time. Instead of guessing whether a band was open, I could see it. Instead of wondering why a signal was not getting through, the data told me. That clarity reignited my curiosity and before long I was

upgrading my license from Technician all the way to Extra.

FT8 did not replace real radio for me. It explained it. Understanding timing, synchronization, signal paths, decoding thresholds and noise floors gave me a deeper appreciation for RF fundamentals than I had ever gained through voice operation alone. It forced me to think analytically about antennas, power and operating strategy. That foundation, built during one of the quietest points in the solar cycle, would later become critical in my transition to CW.

My journey toward CW truly began in an unlikely place, Santa Rosa Island.

Santa Rosa Island is one of the eight Channel Islands off the coast of Southern California and part of Channel Islands National Park, administered by the National Park Service. The island sits roughly forty-one kilometres off the coast of Santa Barbara and is accessible only by boat or plane. What



Philomen Leonelli Jr., WM6Y, operating at the NX6T contest station, also known as "Nashville," during a contest operation circa 2018. NX6T has long been a premier Southern California contest club and this image reflects PJ's involvement in high-level multi-operator contesting during this period. Photo by Philomen Leonelli Jr., WM6Y.



An Elecraft KX2 transceiver deployed on Santa Rosa Island as part of a portable HF operation. The KX2's small size, internal battery options and strong performance made it well suited for island activations and field use. Photo by Philomen Leonelli Jr., WM6Y.

makes it especially interesting to radio operators is that it lies in the rare grid square CM93, making it a highly desirable location for grid chasers.



A compact portable CW station used on Santa Rosa Island, featuring an MTR-3B QRP transceiver, a Palm Morse Code paddle and a lightweight portable battery. This minimalist setup highlights efficient, low-power CW operating from a remote island location. Photo by Philomen Leonelli Jr., WM6Y.

Around that same time, grid chasing, at least on HF, had taken on new life with the ARRL Grid Chase in 2018. It pushed operators to get creative, chase rare locations and operate from places they might otherwise overlook. Looking back, I believe the Grid Chase played a meaningful role in motivating operators like me and I think it would be wonderful to see it return someday.

I was first introduced to the Channel Islands by a friend on a camping trip. At the time, I had no intention of operating. I brought along only an HT for emergency use. Santa Rosa Island felt both familiar and alien similar to the mainland yet completely removed from it. The quiet, isolation and raw beauty were unforgettable.

When I later realized the island sat in CM93, everything clicked. I knew I had to go back with HF equipment and operate from there.

Operating from Santa Rosa Island is an exercise in patience and planning. The trip involves a three-and-a-half-hour boat ride followed by a three-kilometre hike to the campsite, carrying everything you need. There is no cell service, no power and no safety net beyond what you bring with you. Winds occasionally exceed forty kilometres per hour, sometimes making antenna deployment impossible. Emergency help is hours away. If you forget something, there is no turning back.

Over multiple trips, I experimented with different radios, antennas and modes. FT8 proved effective, especially for QRP and poor conditions, but it came at a cost. Power consumption was high. Running a laptop continuously and transmitting full fifteen second cycles drained batteries quickly. On one trip, I hauled an FT-891, an MP1 Super Antenna and a Bioenno battery across that three kilometre hike. I learned a valuable lesson. Lightweight matters.

Those Santa Rosa Island trips forced me to rethink how I operated. I began reading extensively about QRP, minimalist field setups, SOTA and POTA. A consistent theme emerged. CW enables simplicity.

CW equipment is lighter. Power requirements are minimal. No laptop is required. Fewer failure points exist in the field. For someone operating from remote unforgiving



(Continued on page 17)



(From FT8 to CW from page 16)

environments, CW was not just appealing. It was logical.

For the first time in my life, I wanted to learn Morse code.

Like many before me, my search for a starting point led directly to CW Academy. Every path pointed there and the praise was universal. I can now say without hesitation that CW Academy changed my life as a radio operator.

CW did not come naturally to me. Progress was slow and often frustrating. But through structure, accountability and encouragement, things began to click. My level one mentor, Buz, AC6AC and my level two mentor, Ed, K6HP, were instrumental.



Philomen Leonelli Jr. (PJ), WM6Y, operating from his father Phil Leonelli's home station, WF6L. The photo captures a relaxed operating moment, with special guest Savannah contently sitting on WM6Y's leg while he is on the air. This station has played an important role in PJ's continued activity when operating remotely or away from his own shack. Photo by Phil Leonelli, WF6L.



An Elecraft KX2 set up for portable operation on Santa Cruz Island. Photo by Philomen Leonelli Jr., WM6Y.

They provided not only technical instruction but also perspective, patience and motivation.

CW Academy taught me far more than just copying characters. It taught discipline, listening skills and confidence. Through failure, repetition and eventual success, I began to see CW not as a barrier, but as a craft.

Another pivotal moment in my CW journey came through contesting with NX6T.

My father brought me to the NX6T contest site in Fallbrook, California, affectionately known as 'Nashville,' in honour of Nash Williams, W6HCD. I was surrounded by experienced CW operators running at speeds that felt completely incomprehensible. I could not copy a single thing, but I was captivated. The rhythm, intensity and teamwork were unlike anything I had seen in amateur radio.

My Elmer, Dennis, N6KI, sat next to me and patiently walked me through the basics of CW contesting. I understood it from a technical perspective, exchange structure, rate and strategy, but I simply did not yet have the skills to

(Continued on page 18)



A linked dipole antenna installed on Santa Rosa Island, oriented toward Santa Cruz Island. This antenna supported portable HF operations in a challenging island environment, providing reliable performance while allowing for quick and flexible band changes in the field. Photo by Philomen Leonelli Jr., WM6Y.

(From FT8 to CW from page 17)

participate. Still, that experience planted a seed. I knew this was something I wanted to do someday.

Today, I sit here copying CW comfortably at thirty-five words per minute and participating in contests with confidence and joy. That still feels surreal to say.

Along the way, I was given the opportunity to give something back by teaching a CW Academy class. Stepping into the role of advisor allowed me to share not only technical knowledge, but also the lessons, struggles and small victories that come with learning Morse code. Watching students' progress from hesitation to confidence was incredibly rewarding and it deepened my own appreciation for CW as both a skill and a community.

Teaching through CW Academy was an amazing experience and one I am deeply grateful for. Serving as an advisor reinforced just how impactful

the program can be. Anyone with an interest in CW, whether as a student or a future advisor, should strongly consider CW Academy as a place to start. While my current time commitments prevent me from teaching at the moment, the experience left a lasting mark on me and I am thankful to have been a part of it.

Today, I do the best I can to operate CW. Like many amateurs, my time on the air is shaped by family commitments and the demands of everyday life. Operating is no longer about marathon sessions, but about making the most of the time I do have. I try whenever possible to jump into the CWTs, even if only for ten minutes and focus on getting my ten contacts. Those short bursts of operating keep me sharp, connected and motivated.

Much of my operating today is done remotely from my father's station, which allows me to stay

(Continued on page 19)



(Technical Symposium from page 18)

active even when being physically in the shack is not possible. I also continue to participate in contests with NX6T to the best of my ability. ARRL Sweepstakes, in particular, holds a special place for me.

I continue to operate FT8 and other digital modes as well. They do not overtake my CW operation. They supplement it. I also make a point to work as many POTA stations as I can, fully appreciating the challenge and excitement faced by the operators activating those parks. Having operated in remote and demanding environments myself, I understand what it takes to make those contacts happen.

I want to be clear. FT8 is not the enemy. FT8 brought me back to amateur radio. It motivated me to upgrade my license. It led me to portable operations and ultimately to CW. Without FT8, I might never have returned to the hobby at all.

Now, CW has become my quiet, focused space. There is something deeply satisfying about sitting in a calm state, copying code and making contacts. It is simple, elegant, efficient and deeply human.

If there is one message, I hope others take from my journey, it is this. Do not dismiss digital modes. They can be a gateway, not a replacement. Sometimes the path to CW does not start with a key. Sometimes it starts with a computer screen.

Did you miss the SARL Technical Symposium?

If you missed the SARL National Technical Symposium on 12 April or want to revisit some of the presentations, log onto the AMSATSA webpages and view videos of all the presentations or scan the PowerPoint presentations or download them.

The videos can be watched by clicking on the YouTube URL's. Visit www.amsatsa.org.za for all the symposium material as well as Amateur Radio Today, SARL news in English and Afrikaans and other interesting reading.

Looking back, my path from FT8 to CW was not accidental. Each step built skills and understanding that made the next step possible. For anyone curious about CW but unsure where to begin, there is a practical and accessible path forward. For me, that path ultimately led to CW Academy, which provided the structure, mentorship and encouragement needed to turn interest into real operating ability.

The path does not require abandoning digital modes or making a sudden leap into CW. Digital modes can build understanding. Portable operation creates motivation. Contesting builds fluency. Mentorship sustains progress. Taken together, they form a clear and repeatable route from curiosity to confidence.

Philomen Leonelli Jr., WM6Y, is an amateur radio operator, musician and educator. Licensed since 2001, he is active on the air and enjoys continually improving his operating skills. He teaches math and science in juvenile hall and values education as a tool for growth and opportunity. Outside the classroom, he pursues music education and percussion as a hobby, blending technical curiosity with creative expression. He can be reached at pleonelli@fastmail.fm

Het jy die SARL Tegniese Simposium gemis?

Indien jy die SARL Nasionale Tegniese Simposium op 12 April gemis het of sommige van die aanbiedings wil herbesoek, besoek die AMSATSA-webblaaie en kyk video's van al die aanbiedings of skandeer die PowerPoint-aanbiedings of laai dit af.

Die video's kan gekyk word deur op die YouTube-URL'e te klik. Besoek www.amsatsa.org.za vir al die simposium materiaal sowel as Amateur Radio Today, SARL-nuus in Engels en Afrikaans en ander interessante leesstof.





An All-Band EmComm Go-Kit

Randy Richmond, W7HMT

QST, August 2024

This portable station is housed in a surplus steel instrument case and takes very little time to deploy.

In deciding which equipment to include in this go-kit for compactness, I knew I wanted an all-band radio. For the sake of having a reasonable communications range, I wanted a 100 W radio. Additional factors helped narrow my options to the Yaesu FT-857D; the first was its best-in-class idle current consumption of 0,6 A and the second was its chassis size, which allowed the base chassis to reside in the bottom of the case. Thirdly, the remote-control head could be placed wherever it is convenient to operate.

The FT-857D lacks a built-in antenna tuner, but built-in tuners typically can only tune to a 3:1 impedance mismatch. For Emcomm deployment, an antenna tuner capable of tuning a 10:1 impedance mismatch would give me greater flexibility, so I added the LDG Electronics YT-100 tuner designed specifically for the FT-857D. It also lacks a built-in USB audio/sound interface, so I included the Tigertronics Signalink USB interface, which enables the station to send and receive data using software modems running on the host PC.

Because much of today's Emcomm communication relies on Winlink for text and data communications, I wanted to fit a small laptop in the case and my Dell Inspiron P25T fit this bill. The laptop's built-in battery is only good for less than 4 hours, so I added a small 120 V inverter to the equipment powered by the station's 13,4 V battery. Modified sine wave inverters are very compact, but because the waveform is essentially a square wave, the harmonic RF emission can interfere with HF communications. Therefore, I selected a sine wave inverter.

I also wanted the station to have a self-contained power source. I selected lithium iron phosphate (LiFePO4) for compactness and weight reduction.

I wanted to run the equipment in voice receive mode from the batteries for more than 24 hours, which dictated a capacity of 15 Ah or more. I chose to use eight 38120 (aka "Headway") cylindrical cells of 8 Ah each, arranged in two parallel strings of four series-connected cells with a total capacity of 16 Ah. I also needed a battery management system because I did not use an off-the-shelf 12 V LiFePO4



This all-band go-kit includes a radio, antenna tuner, laptop, battery management system, accessories, safety features and more.

battery. I selected one that allowed configuring set points and monitoring cell voltage and battery state of charge using a Bluetooth app.

Emcomm Station Go-Kit Contents

The steel case houses the following:

- ◆ Yaesu FT-857D 100 W all-band, all-mode radio with detachable faceplate
- ◆ LDG Electronics YT-100 100 W antenna tuner capable of tuning up to 10:1 impedance mismatch
- ◆ Tigertronics Signalink USB radio interface
- ◆ USB CAT cable for PC control of the FT-857D
- ◆ A small-footprint Windows 10 laptop/tablet for running digital modems and Winlink Express software
- ◆ A small sine wave inverter for extending the duration of the laptop's battery
- ◆ 12 V fan to circulate air within the case
- ◆ 16 Ah 13,4 V LiFePO4 battery pack with Bluetooth-enabled battery management

(Continued on page 21)

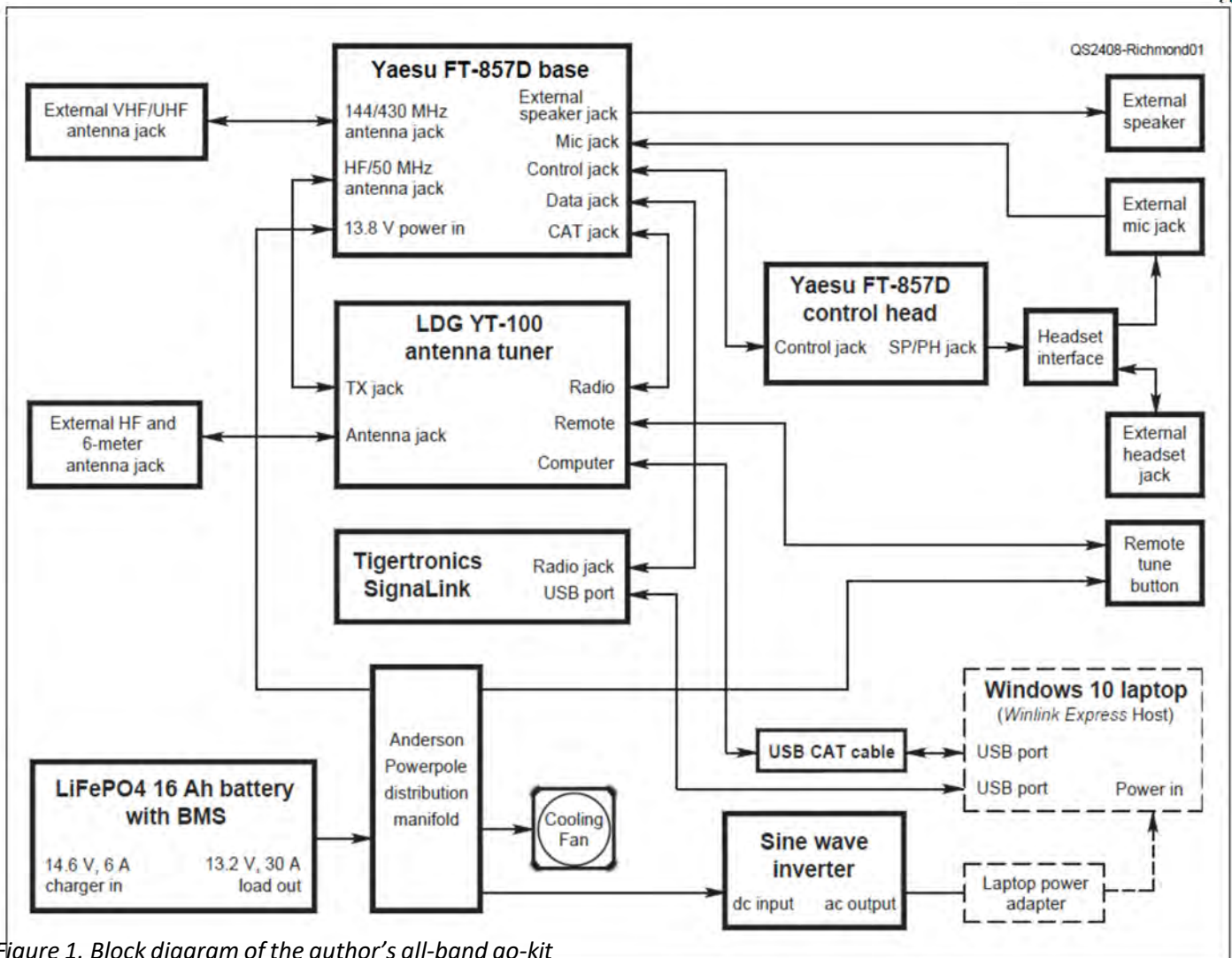


Figure 1. Block diagram of the author's all-band go-kit

(Emcomm Go-Kit from page 20)

system

Two separate plastic cases carry the following:

- ◆ Dual-band VHF/UHF handheld and spare battery
- ◆ Microphone and headset for use with the FT-857D
- ◆ Laptop 120 V power supply/charger
- ◆ LiFePO4 battery charger (for recharging the station's battery pack from 120 V AC)
- ◆ USB-powered LED workspace lighting
- ◆ NMO mag-mount base with dual-band mobile VHF/ UHF antenna
- ◆ RAM® X-Grip® mount for mounting the steel case when deployed, to give easy access to the hand-held
- ◆ Coax, wire and ground stakes for a double inverted-V 80/40-metre NVIS antenna (4,5 m collapsible mast is carried separately)
- ◆ A pack of ICS and other forms, clipboard, pens and pencils used for Emcomm

recordkeeping

- ◆ Vest, hat and badge to identify myself as an Emcomm volunteer

Construction

One of my primary goals was to operate the equipment with minimal setup. Emcomm volunteers seldom control their operating environment, so being able to operate either standing or seated, with easy access to the radio's control head, speaker and microphone and the CAT and Signalink USB cables, was desirable. To achieve this, I 3D-printed a hinged mag-mount "nest" and bracket for holding the detachable control head at various angles and orientations.

The radio equipment could fit within the larger of the two compartments of the steel case. However, with interconnecting cables, it was a challenge. I fabricated 3D-printed PETG brackets to hold the radio base and antenna tuner, which

(Continued on page 22)



(Emcomm Go-Kit from page 21)

helped.

Having experienced the dangers of high-current batteries, I wanted to ensure that the batteries would be well insulated from the steel case. Fortunately, a half-size plastic ammo box fit nicely into the smaller compartment. I 3D-printed PETG spacers and covers to hold the cells, battery management system anderson Powerpole connectors, combined voltmeter and USB power outlet and 30 A circuit breaker that also serves as the main power switch.

The FT-857D comes with a hand mic, which works fine when the station operates in quiet environments. But in a noisy environment, a headset with a noise-cancelling mic is preferred, so I added a Kenwood-style headset jack adjacent to the mic connector to accept a Heil HTH-K headset and built an interface to adapt it to the FT-857D's mic and speaker jacks. Adjacent to the mic and headset jacks are a remote button and LED for the antenna tuner, allowing me to initiate tuning more easily.

A hinged aluminium plate covers most of the main compartment and its wiring. A 12 V fan is mounted to the plate to help ventilate the case and dissipate heat during operation and I also drilled ventilation holes in the top of the case near the handle.

The FT-857D has two antenna ports: one for VHF/UHF and one for HF and 6 metres. Two short coax jumpers terminated in UHF female panel connectors are secured to holes drilled at the bottom of the case, where they can be accessed more easily for deployment. Caps cover these external connectors when they are not in use.

The case's lid comes in handy as a base for the mag-mount dual-band VHF/UHF antenna. The inside of the lid is padded to protect the laptop that sits under the lid when the case is closed. Also



When not deployed, the go-kit is compact and weighs 16 kg

stowed in the lid are small magnetic signs attached to the case showing my Emcomm team affiliation and call sign. The case dimensions are 44,45 × 29,21 × 19.05 cm. It weighs a hefty 16 kilograms, but the weight helps keep it stable for operation.

Deployment

Upon arriving at a deployment site, I remove the lid and set the laptop and case on a table. I then attach the detachable control head to the adjustable hinge, adjust it to face me and secure it with a bracket. The mag-mount VHF/UHF antenna is attached to the lid, coax is secured to the case's external VHF/UHF antenna connector and the lid/antenna is placed in a suitable location. I place the double inverted-V 80/40-metre NVIS antenna outdoors and attach the centre peak to the 4,5 m telescoping mast with a coax balun at the top. The

(Continued on page 23)





(WSPR from page 22)

Signalink and CAT USB cables are connected to the laptop and the laptop is turned on (for extended operation, the laptop's power adapter is plugged into the inverter inside the case). I turn on the battery circuit breaker switch, which activates the radio's power button. Finally, I attach magnetic mount signs with our team's name and my call sign to the case. The go-kit is ready for operation.

All photos by the author.

Randy Richmond, W7HMT, grew up in the land

mobile radio (LMR) industry. His father, the original owner of the W7HMT call sign, owned a two-way radio service shop. It was not until 1986, when Randy was established as an electrical engineer working for the LMR manufacturer Zetron, that he got his amateur license. Later he received his Extra-class license and began designing off-grid power systems for telecom applications. Now in his retirement, Randy is the Team Lead and Assistant Emergency Coordinator for the North Bend, Washington, ARES Team (NBAT). He can be reached at w7hmt@arrl.net.

50 MHz 6 METERS – THE MAGIC BAND

Where VHF Meets HF Behavior

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 - Solar Peak Only!
 - Rare on 6M – True Worldwide DX
 - ~150–260 miles up
- Sporadic E (Es)**
 - Unpredictable – BIG DX
 - ~60–90 miles up
- F Layer**
 - ~150–260 miles up
- Meteor Scatter**
 - Brief "Ping" Contacts
- E Layer**
 - ~60–90 miles up
- Aurora**
 - Buzzy / Distorted Signals
 - CW & Digital Preferred – SSB Very Difficult
 - Northern Paths
- Ground Wave**
 - Local (0–50 miles)
- Tropospheric Ducting**
 - Stable Paths –
 - ~100–600+ Miles
 - More Common on 2M / 70CM

YOU - 50 MHz

Dead one minute... Worldwide the next!

Multiple propagation modes – often within minutes

HamRadio 24-7
W2RE



The RaDAR Sport Tracker 11.1

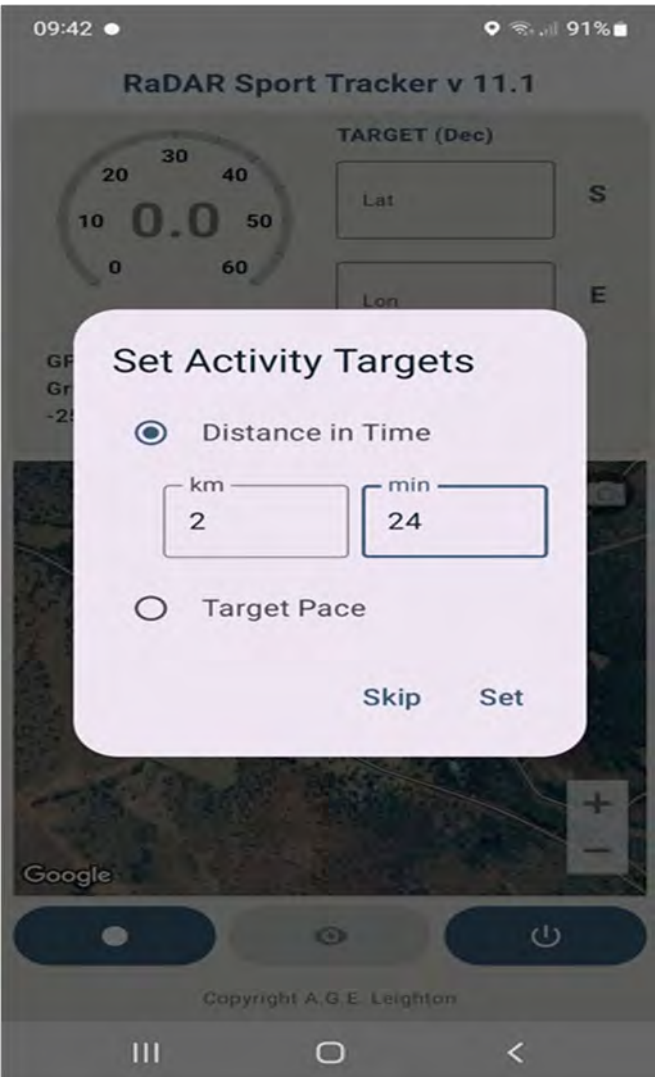
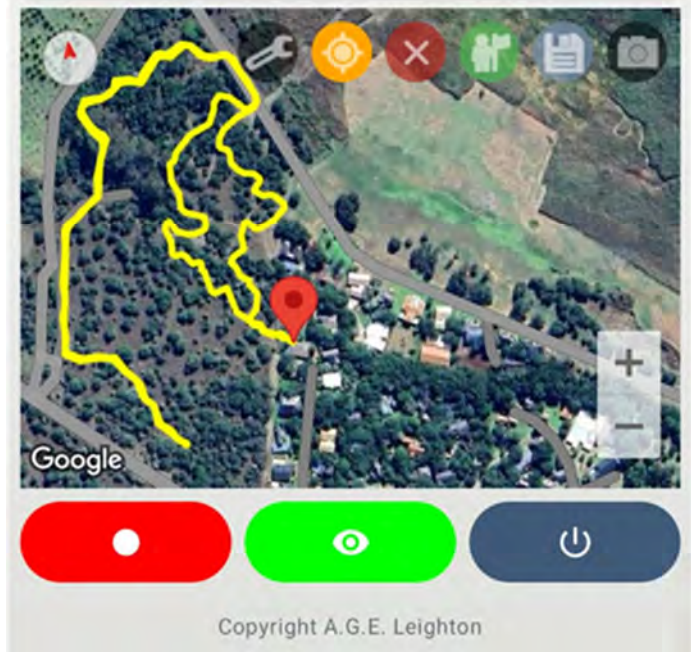
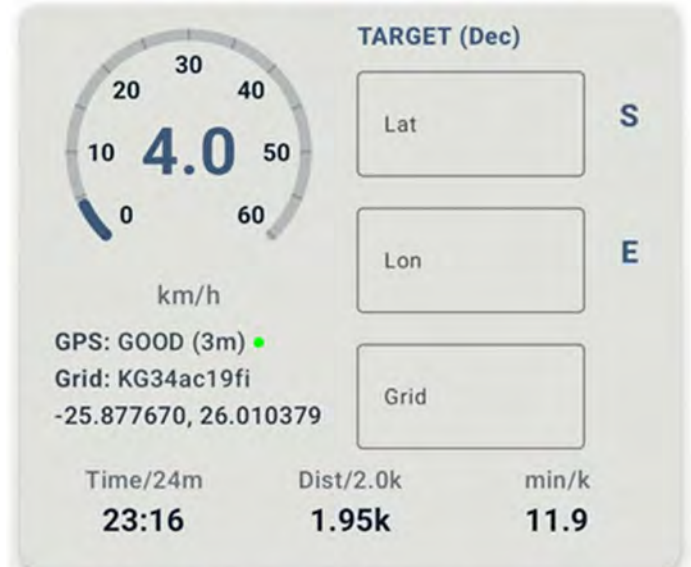
Eddie Leighton, ZS6BNE

Activities

Using the tracker as a walking / hiking / jogging activity trainer, the first you need to do is to enter an achievable target for the activity. Here in the example, I set a two kilometres distance which I wanted to complete within twenty four minutes. This is a brisk walk along a nature trail.

proven to be a valuable tool in helping you to achieve your goals.

RaDAR Sport Tracker v 11.1



Turn the volume up on your Android device. Once the target is set, tap the record button (on the left) and the show track button (in the centre) then begin your journey. You will hear the voice, "Recording started." After a minute you may hear the same voice, "Behind your target pace" or "Within target pace" depending on the speed you are moving. Every minute thereafter you will get an update on your pace status.

Once you reach the first kilometre, you will hear the voice announcement and every kilometre thereafter. This keeps you focused and a has been

Just above the map you will see your time, distance travelled and calculated pace in minutes per kilometre. Above the time and distance values are the times selected for the activity. Your speed is indicated in the analogue display of the speedometer together with a numeric display of speed in kilometres per hour. The maximum range is sixty kilometres to cater for faster activities like cycling.

(Continued on page 25)



(The RaDAR Sport Tracker 11.1 from page 24)

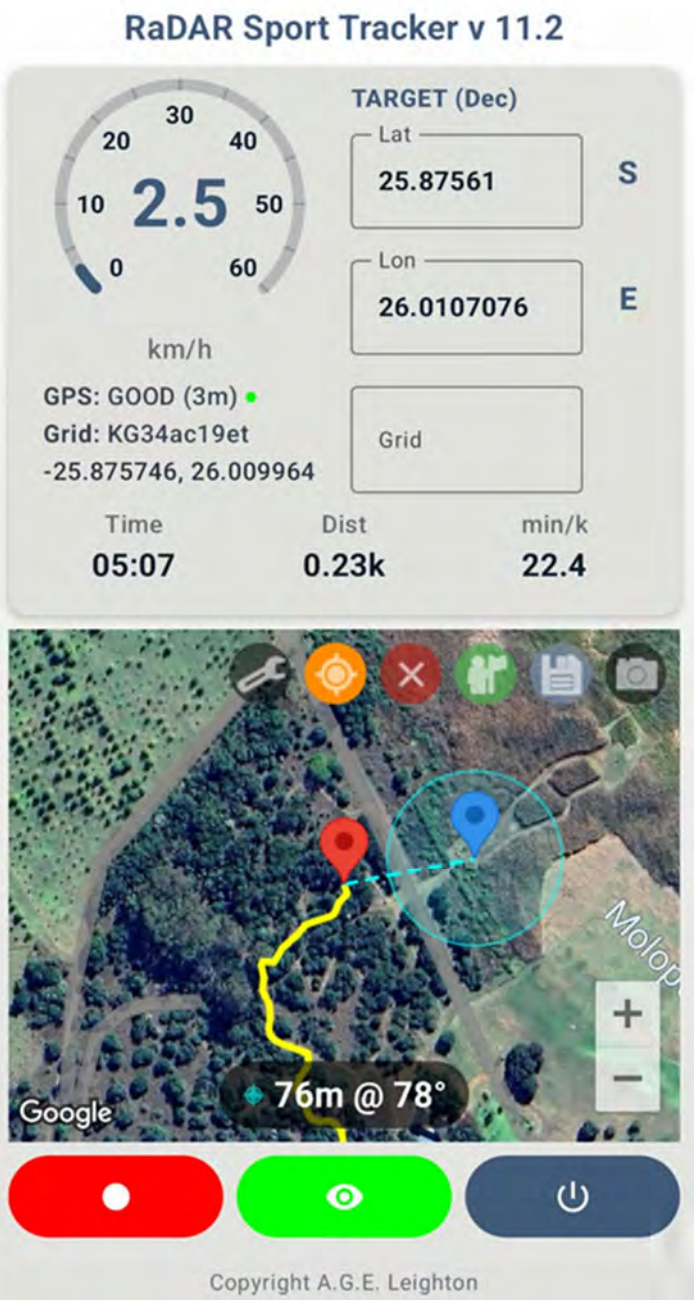
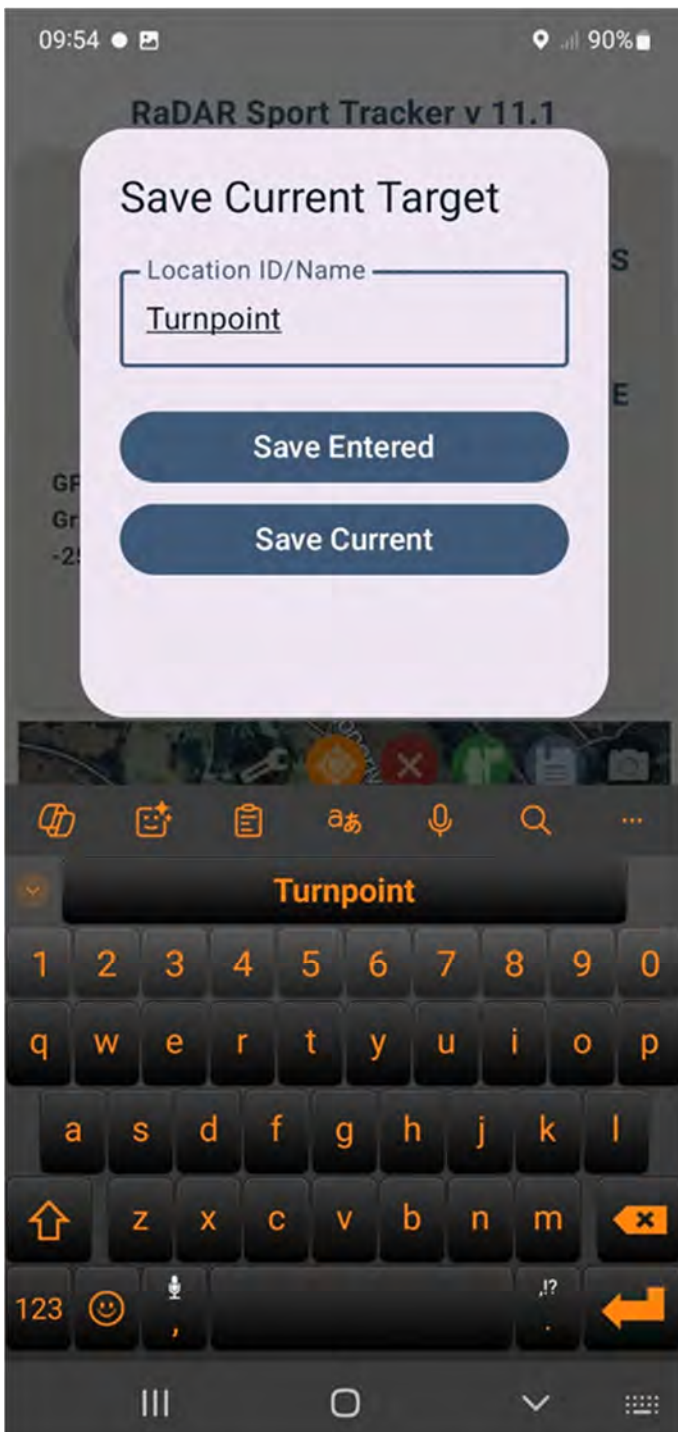
Once you reach your destination you may want to terminate the app but before doing that use the camera icon to take a snapshot of the results. Terminate the app by tapping the button on the right and confirm the request. At this stage a KML file is written in the Downloads\GPSActivityTracks folder of the phone which can be used to show the activity track in Google Earth or any other KML file reader.

This app has many applications. Other facilities available are targets but that will be explained in a separate document.

Tracking

Using the tracker as a walking / hiking / jogging tracker, you first need to enter a target. You can either enter decimal coordinates into the Lat and Lon fields or a maidenhead grid location in the Grid field and save it. The alternative is to store your current location / GPS coordinates where you may find the need to return to this point.

Once you have one or more targets stored, you can select any one and the tracking system will be activated. Tap the record and show track buttons and start moving in the direction of the target. The distance and direction to the target will be displayed at the bottom of the map. The target area is highlighted.



(Continued on page 26)



RaDAR Sport Tracker v 11.2

TARGET (Dec)
 Lat: 25.87561 S
 Lon: 26.0107076 E
 Grid: [Empty]

GPS: GOOD (3m) ●
 Grid: KG34ac19gu
 -25.875671, 26.010571

Time	Dist	min/k
06:31	0.31k	21.3

15m @ 63°

Copyright A.G.E. Leighton

Once you come within fifty meters of the target, the target is centralised on the map and zoomed in. Yellow steering arrows will appear either on the left or the right assisting steering towards the target. The orientation of the phone of course must be the right side up.

Whatever your activity, may you achieve the goals you set for yourself.

3Y0K – the expedition and the return

Paul Johnson, ZS1S

Words cannot easily describe what the expedition was like for the team – they simply ran out of adjectives.

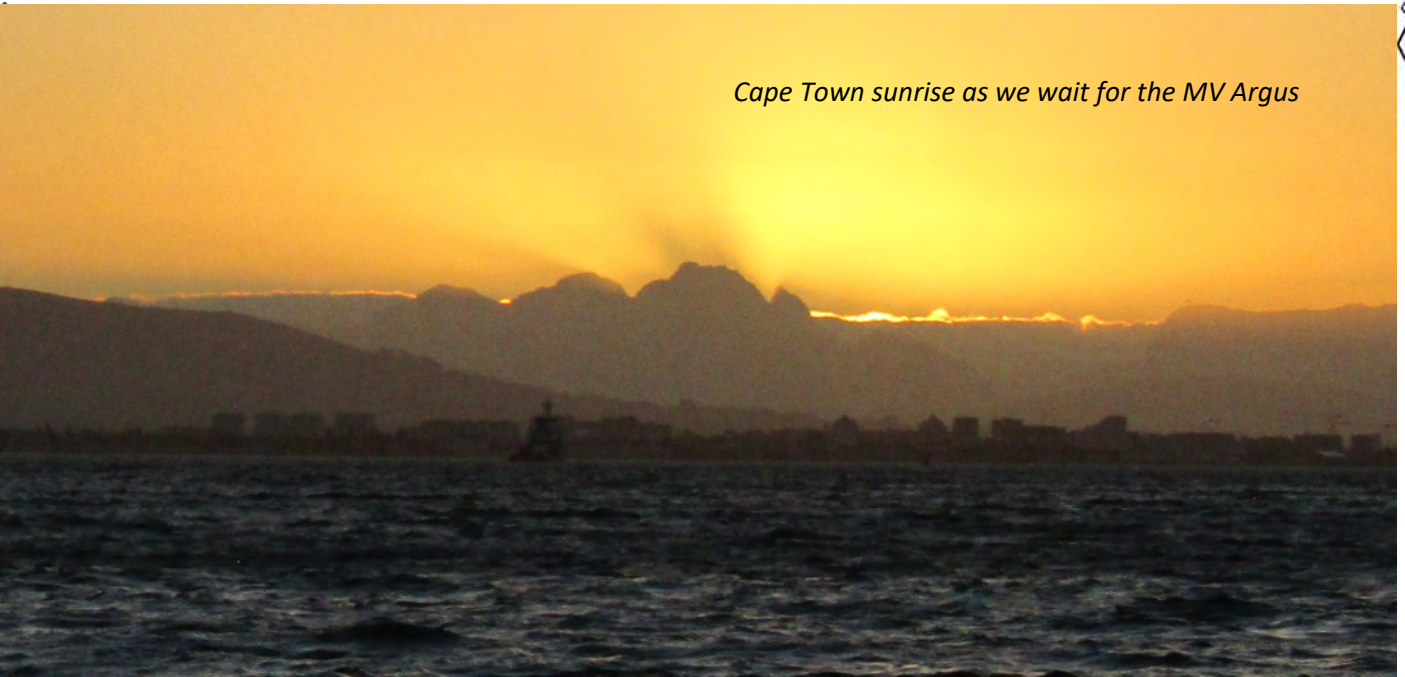
Monstrous pile-ups, gritted teeth against the violent wind, rain, snow and cold, superb flying by the pilots, breathtaking scenery, dogged determination to keep going against all odds and great fun and satisfaction at being able to get QSOs and ATNOs into logs all around the world, not to mention severe irritation with deliberate interference and pirate activity.

My involvement from the outside looking in was that going to Bouvet is definitely way up in the list of the most challenging destinations to plan for. Discounting the DX entities that are becoming very difficult to visit due to the environmental and





Cape Town sunrise as we wait for the MV Argus



(3Y0K – the expedition and return from page 26)

political complexities involved, islands such as Bouvet and many others located in hostile geographical locations are seriously ambitious and demanding.

The transport and logistics are very expensive

and complicated. The team has to be a cohesive and dedicated group, with members who are passionate about DX and know what they are in for, emotionally, physically and financially. Flying into a comfortable tropical destination and

(Continued on page 30)

Bouvet sunrise. Dennis, KT8X





Bouvet Camp from above - photo by helicopter pilot Stefan Smuts



Top. First flight to Bouvet. Photo by helicopter pilot Stefan Smuts
Bottom. Heli landing on Bouvet. Photo by Neil Reed





North America is that way. Photo by Dennis, KT8X

(3Y0K – the expedition and return from page 27)

operating a radio in a pair of shorts and a T-shirt is very different from being in polar clothing, surviving in cold tents and eating ready-made rations warmed up on a paraffin heater.

The decision was made to scale down earlier than originally planned, pack up and leave absolutely nothing behind on the island due to worsening weather and decreasing opportunities for safe air transport of people and cargo.

The pictures published here, with credits and supplied to me by Dennis KT8X, are a small glimpse into the activity on the island. The group picture in front of the yacht club is courtesy of Gudmi, TF3SG. The southern ocean and yacht pictures are courtesy of Donato, IK2EGL.

The embroidered Bouvetoya Airlift patch was a group idea, instigated by Stefan Smuts, helicopter pilot and Dennis, KT8X, (designed with a little help from AI)

and a limited amount were produced in Cape Town.

All other pictures were taken by me on board the yacht *Amberes*, owned by Robert, ZS1FF.

The ETA in Cape Town was noted on the AIS



MV Argus powering into Cape Town. Photo by Paul, ZS1S



MV Argus arrival. Photo by Paul, ZS1S



(3Y0K – the expedition and return from page 30)

system for Saturday 21 March, with boarding of the harbour pilot requested for 07:00. Robert and I decided to get on the water long before sunrise to be ready for a photo opportunity with Table Mountain as a stunning backdrop. At that time, there was nothing visible on the AIS and no response on the VHF marine channels; *MV Argus*, where were you?

It soon became obvious that the specified time of 07:00 was meant to be 07:00 UTC. The two-hour difference resulted in a spectacular sunrise and much better light for meeting the *Argus* in Table Bay, as shown by the pictures here.

After docking, the team spent the rest of the day alongside dealing with the final packing and sealing of the (in)famous container, ready to be offloaded and shipped in bond to the USA.

There is a wealth of information about the expedition online. The QSL manager for the

expedition is Charles, M0OXO, as a start go to his website and look for statistics. Contacts with Africa, as an example constituted 1,15% of the total number of QSOs, being 226 on CW, 327 on SSB and 622 on FT8.

A welcoming party was held at the Royal Cape Yacht Club for the team, the helicopter crew, the Cape Town DX community and the local shipping agents who were so helpful in all aspects of the vessel handling, customs and clearing, immigration and booking of accommodation. Several members of the team, unfortunately, had to leave for home due to the difficulties and expenses involved in altering travel arrangements. Most but not all of the national flags were on show in the group picture taken in front of the yacht club lounge.

We are indebted to the SARL and an anonymous local radio amateur for generous donations towards the costs of the welcoming

(Continued on page 32)

MV Argus approaching the harbour entrance. Photo by Paul, ZS1S





Donato and Regin waving. Photo by Paul, ZS1S



(3Y0K – the expedition and return from page 31)
party.

It was a privilege to be involved, in a small way, with the expedition.

I would like to think that we, in Cape Town,

were able to extend true hospitality and friendship to all the foreign visitors. My grateful thanks go to all who helped in whatever way to make this a memorable experience.



The welcoming party at the Royal Cape Yacht Club. Photo by Gudmi, TF3SG



Celebrating
30 Years



Mills On The Air 2026

Saturday 9th to Sunday 10th May

CALLING ALL RADIO AMATEURS!!

The 30th anniversary of Mills on the Air in conjunction with National Mills Weekend (run by S.P.A.B.)

This year we are inviting Mills and Radio Amateurs from around the World to take part in this unique event. Bringing Amateur Radio to locations that are typically seen only by Mill enthusiasts and Walkers!

Mills on the Air began back in 1996, when our founder happened to spot a call out on the RSGB Newsfeed for a few Amateurs to set up at a select few Mills around the country to operate on the National Mills Day.

This turned into a decades long event that now had more than 300 operators and clubs taking part from the UK, The Netherlands, Finland, Australia, South Africa and many more locations!

It is free to take part, but we do encourage you to give a donation to your local Mill to help them with their fundraising efforts. Many are run by volunteers and every penny helps!

We are open to all Amateur Radio Bands and Modes and this year, there are DMR groups set up specifically for us!

(more details can be found on our facebook page)

If you would like to take part, please visit our website to sign up!

www.nharg.org.uk/mota

We have regular updates on our Facebook page, including interesting histories of the Mills taking part!



www.facebook.com/MillsOnTheAir



The 2026 International Lighthouse & Lightship Weekend (ILLW)

The ILLW is normally held on the third full weekend in August each year. For 2026, the event runs from 00:01 UTC on Saturday 15 August to 24:00 UTC on Sunday 16 August.

The following lighthouses have been registered to date - Pierre, ZS6PS/3 from Hondeklip Bay – ILLW number to be issued; the Bo-Karoo ARC, ZR3VDK/1 from Doringbaai - ZA0020; the Cape Town ARC, ZS1CT from Green Point - ZA0006; Peter, ZS1PZ from Slangkop - ZA0015; the Cape Radio Group, ZS1CRG from Cape Point - ZA0014; the Overberg ARC, ZS1OAR from Danger Point, ZA0005; the Boland ARC, ZS1BAK from Cape Agulhas, ZA0011; the Eden ARC, ZS1ERZ from Ystervark Point - ZA0009; the Southern Cape ARC, ZS1SKR from Cape St Blaize - ZA0026 and the Cape Coast ARC, ZS1CCR from Cape Seal - ZA0033





The GM Pole Antenna

Chris Turner, ZS6GM

For most of my working life I have lived in places not conducive to the installation of antennas for the HF amateur bands. One of my favourite activities, professionally and amateur is antenna experimentation, so I treated every antenna installation as a challenge to get the most out of my antenna systems, no matter the circumstances or environment.

When I was living in the UK in the early 1980s, my back garden was a postage stamp with neighbours on three sides. I tried zig zag wire antennas, loaded wire antennas, end fed wire antennas, you name them, I tried almost every trick in the book. I even tried a 14AVQ trapped vertical ground mounted antenna with the recommended 2 radials per band. Reception was great but I could not get anyone to hear me using my 100-Watt transmitter. It was time to do some reading.

Firstly, the 14AVQ only used the full height as a radiator on 40 m. On all other frequencies, the upper parts were effectively disconnected by the various traps. What a waste of antenna length!

Secondly, because the ground is very lossy and the other half of the antenna, the image, is in the ground, half the power was going to keep earth worms warm in winter. And, what's more, the antenna tuning and efficiency changed with the seasons and whether it was raining or not.

I set myself two challenges.

1. Design a multi-band ground mounted antenna that would work on the 40 to 10 metre bands without needing traps or an expensive automatic tuner and;

2. Reduce ground losses to a minimum.

Challenge one

Despite the common 'belief', a self-resonant antenna is not needed for maximum antenna efficiency, it simply makes feeding the antenna easy, as in the case of the simple half wave dipole. What is important, is to feed the antenna such that all the available current flows in the antenna and therefore is radiated. While so called take-off angle is an important consideration, it becomes less significant where the antenna operates in a cluttered environment of buildings, trees and other obstacles.

A vertical, or monopole, when ground mounted, will have its major radiation lobe at some

elevation determined by the electrical length of the radiator, its environment and nearby clutter. Simulation suggests an elevation between thirty and sixty degrees.

Back to challenge one. What height monopole when operated over a good ground will present an impedance that is easy to match and at the same time has a radiation pattern suitable for operating at medium to long distances?

It turns out that a monopole, 7,4 metres high is $\frac{3}{8} \lambda$ on 14,2 MHz, providing excellent low angle radiation and works as an extended $\frac{3}{4} \lambda$ on 10 metres. Matching on 40, 17, 15 and 12 metres is easy using a simple L matching network.

I later shortened the antenna to 7,1 metres to add the WARC frequencies. This length works as a $\frac{1}{4} \lambda$ on 30 metres and provides a better match on 10 m. There was no noticeable difference in 20 m performance at the slightly shorter length.

Original measurements were made with a Palomar Engineers Noise bridge which allowed me to design a relay switched matching network. Later measurements were made with an N2PK network analyser.

f MHz	7,8 m	7,2 m	7,2 m EZNEC
3,6	23-j549	10-j375	3.3-j453
7,1	18-j100	19-j120	14.4-j143
10,1	81+j25	66+j0	38+j9
14,1	111+j210	330+j242	143+j213
18,1	26-j130	54+j185	706+j264
21,2	14-j85	25+j119	446-j466
24,5	10-j45	17-j65	106-j279
28,5	74+j13	102+j0	44-j78

Table 1 below shows the measured impedances and EZNEC simulation for comparison.

To match the impedance of the antenna to the feedline, a simple L network is adequate. On 40 m, a capacitor input network is required and on 20 m an inductor input network is used. On 30 m the

(Continued on page 36)



(The GM Pole Antenna from page 35)

antenna works as a $\frac{1}{4} \lambda$ and so no matching is required and on 17 m, only an inductance is required to extend the electrical length to provide a match. A matching network could have been used but proved in practice to be unnecessary.

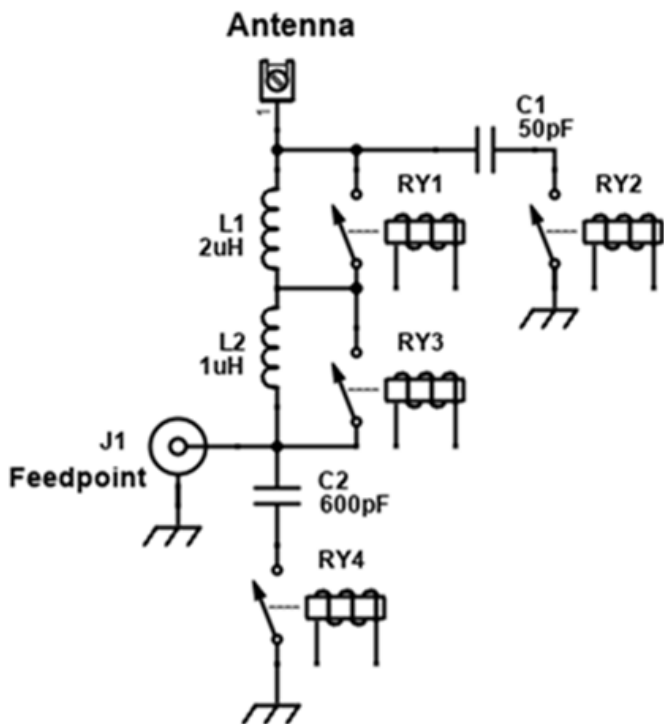
Figure 1 is the final circuit diagram for my relay switched matching unit, which is mounted in a water proof enclosure at the base of the antenna. A combination of relays is used to choose the correct network values for each amateur band. Standard single pole changeover automotive relays are cheap and readily available. With the values calculated, the SWR is under 2:1 on all the amateur bands.

I tried adding additional matching in the box for 80 m, but the very high voltages present caused flashover and corona discharge. The solution was to install an air spaced loading coil between the base of the antenna and the antenna terminal on the matching box and short circuit the coil when not on 80 m.

Figure 2 shows the mounting configuration using hydraulic clamps and the matching unit. CAT-5 Ethernet cable is used to control the relays from the shack.



Fig. 2. Antenna base showing clamps, mounting plate and weatherproof box containing the matching circuits and relays.



Relay selection Fig. 1 – Antenna matching unit
40m - RY4 on
30m - RY1 and RY3 on
20m - RY3 and RY2 on
17m - RY1 on

The antenna was constructed using three lengths of telescoping aluminium tubing. The lower (outer) tube is 25,4 mm diameter.

Two hydraulic clamps are used for mounting to a plate with U bolts attaching the plate onto a 5,08 cm/2-inch steel pipe driven into the ground.

Challenge 2 reducing ground losses

As I have previously mentioned in many of my antenna articles, the efficiency of any end fed antenna, no matter whether it is self-resonant or not, or whether it has loading or matching circuits, depends on having a low loss ground system into which the ground current can be driven. Imagine a

(Continued on page 37)



(The GM Pole Antenna from page 36)

light bulb and battery. If you connect one pole of the battery to the bulb, it does nothing. Connect the second pole to the other side of the bulb and it lights. A go and return are required to drive current into an antenna. That return in the case of an end fed is the ground [plane].

Experiments over the years have shown two to three radials hardly reduce ground losses. Eight radials start to show a significant improvement while 16 radials are even better. Once the radial count reaches 32, incremental improvement is negligible.

Tuned radials are not necessary. In fact, the radials need be no longer than the physical height of the antenna. If there is insufficient space, then radials of any length are effective. Two thirds of antenna current flows in the first third of the radiator (and ground system) so for a radiator 7 metres high, radials as short as 2 metres can be very effective. They may be buried a cm or less in the ground and need not be insulated. In fact, I use

1 mm bare copper wire. They do not need to be straight but can zig zag in the cracks of paving, or around obstacles in the garden.

The aim is to install as much wire in or on the ground, as close to the base of the antenna as possible. More shorter radials definitely work better than fewer long ones.

Wrap Up

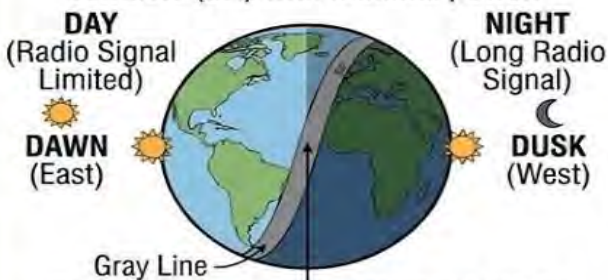
Living in a community or house with limited space need not prevent HF operation. A ground mounted multi-band vertical antenna can be very effect on air and reasonably cheap to build using locally available components. This design provides multi-band operation on all the usual HF bands with performance comparable to that of stealth wire antennas.

The benefit of this design is that the whole length of the antenna radiates, unlike trapped antennas which disconnect parts of the antenna on higher frequencies.

GRAY LINE PROPAGATION: THE DX MAGIC HOUR

UNDERSTANDING THE GRAY LINE

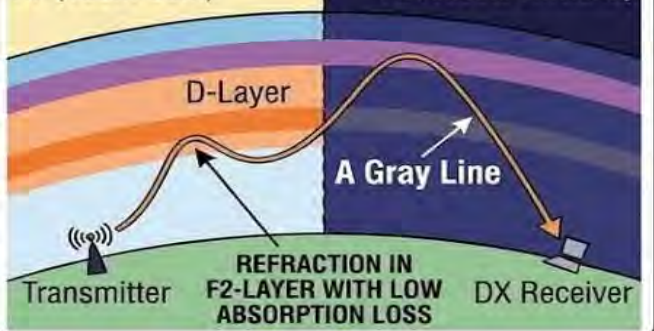
The transition zone between day and night on Earth. The ideal point for long-distance contacts (DX) with minimal power.



REDUCED ABSORPTION IN D-LAYER

IONOSPHERIC PHYSICS

DAY: D-Layer absorbs HF (160m-80m) **NIGHT:** D-Layer disappears; F2 reflects efficiently

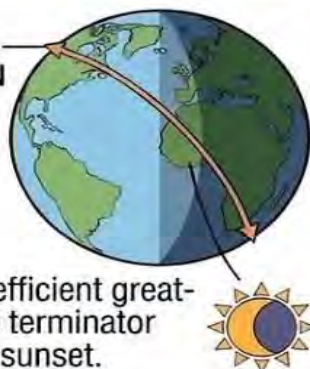


DURATION & WINDOW DIRECTION



WINDOW:
30-45 MIN

SHORT WINDOW:
30-45 MIN



The best season is near the equinoxes. Radio signals follow efficient great-circle paths along the terminator between sunrise and sunset.

GRAY LINE FREQUENCY TABLE

BAND (RANGE)	GRAY LINE EFFECT	BEST TIME
160m (Top Band)	'Impossible' signals appear	30 min before/after local sunset
80m/75m	Strong world-wide signals	Full terminator crossing
40m	The 'Bread and Butter' of DX	Especially at sunrise
20m/15m (Polars)	Extended polar path propagation	

SUPER SPECIALIST (POST-DOCTORAL) | IONOSPHERIC PHYSICS





Female Frequency - Ego-Free Technique: Learning Amateur Radio Without Intimidation

Yanira Maldonado, WP4QOE

First published in the April 2026 issue of SWR Magazine www.swrmagazine.org

One of the most fascinating aspects of amateur radio is its technical dimension. Antennas, propagation, digital modes, equipment building and fine-tuning are all part of an exciting world that never stops teaching us something new.

However, for many people, especially women entering the hobby, diving into the technical side of amateur radio can feel intimidating.

Not because the technical aspects are inaccessible, but sometimes the way knowledge is shared can create unnecessary barriers.

Along the way, it is common to encounter conversations filled with complex terminology, highly technical discussions, or explanations that seem more focused on showing off expertise than sharing it. When that happens, some may choose to stay silent rather than ask a question that might seem too basic.



But the reality is very different: no one knows it all in amateur radio.

Every operator, no matter how many years they've been on the air, is still learning. Technology changes, modes evolve, equipment transforms and there's always something new to explore.

Technical knowledge should not be an exclusive territory or a competition of expertise. It should be, as it has always been at its core, a space for collective experimentation.

Asking is not weakness.

Asking is curiosity.

And curiosity is precisely the engine of amateur radio.

Many times, all that is needed is an environment where learning is welcomed a place where

(Continued on page 39)



(The East Rand Hamfest from page 38)

someone takes a few minutes to explain how an antenna works, what a SWR adjustment means, or how to start experimenting with a new digital mode.

Fortunately, within our community, there are many amateurs who understand this perfectly. They are the ones who share their experience with humility, teach with patience and celebrate when another operator grasps something new. These are the true mentors of the hobby.

Amateur radio thrives when knowledge flows freely, when questions are met with respect and when new operators, men and women alike, feel they can learn without fear of judgment. For those just starting out, or for anyone who still feels hesitant approaching technical topics, the message is simple: do not be intimidated.

The YL Beam

Heather Holland, ZS5YH

International Women's Day YL POTA Party

Alexandra Auvinen Mahurin, AC9XK

Today was my third annual YL Pota Party activation in celebration of International Women's Day! This event continues to be one of my favourites of the year.

International Women's Day is about recognizing the contributions women make in every space and amateur radio is no exception. While amateur radio has traditionally been male-dominated, women are active operators, contesters, builders, emergency communicators and leaders. Events like the YL POTA Party highlight that presence and make it visible.

Wonderful weather in Indiana (USA) today, sunny and in the 60s, which beats the last two years which have been cold and rainy. I once again activated Mounds State Park in Anderson, Indiana US-2261 and it was BUSY (both on the air and at the park)!

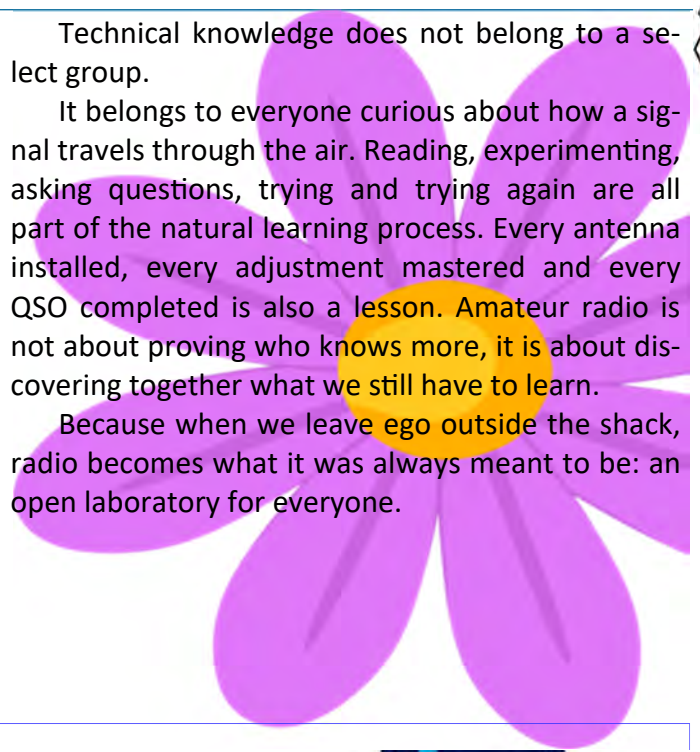
Logged around 140 contacts in two hours. Three countries, 34 states, 21 CW and 119 SSB. 100 watts on SSB, moved down to 30 watts on CW.

I ran 20 metres SSB for most of the activation and then moved to CW. This switch definitely required a mental reset. After working voice for a while my first CW contact came in and I could not decode, could not send, could not... CW.

Technical knowledge does not belong to a select group.

It belongs to everyone curious about how a signal travels through the air. Reading, experimenting, asking questions, trying and trying again are all part of the natural learning process. Every antenna installed, every adjustment mastered and every QSO completed is also a lesson. Amateur radio is not about proving who knows more, it is about discovering together what we still have to learn.

Because when we leave ego outside the shack, radio becomes what it was always meant to be: an open laboratory for everyone.



I almost called it a day but decided to step away for a short break and come back. After a few QSOs I got back in my groove, at least until my iPad died. There was also a bee that decided to land on the hand I was sending with... just to keep it interesting.

Grateful for every contact and especially for the women who continue to make their mark in this hobby. This week I will be working the YL World Wide Event. Some of it from home and some from a park. I will be on SSB, CW and FT8. This is the first YL WWA event so be sure to work all the YL's that will be on the air this week! 73, 33, 88 de AC9XK

Yukiko Tsuji Maki, 7K4TKB

On 8 March, four good POTA friends of the Japanese YL club, JLRS, activated from different places - Miho from a snowy field after skiing, Yuko and Yoko from near the amateur radio event venues and Yuki from the heart of Tokyo near the Imperial Palace.

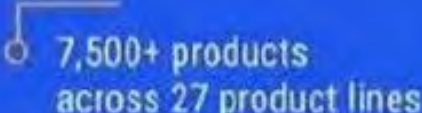
In Tokyo, POTA by handheld transceivers is very popular and we always get many responses because of the high amateur population density in this highly populated city. We wore soft pink, like

(Continued on page 41)

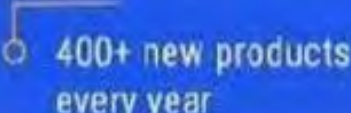


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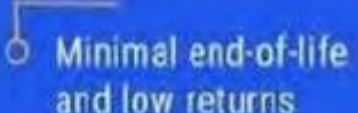
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The South African Maritime Mobile Weather Net

The Maritime Net is on the air daily at 06:35 UTC [08:35 CAT] and 11:35 UTC [13:35 CAT] on 7,120 MHz LSB and 14,316 MHz USB.

The 06:35 UTC and 11:30 UTC transmissions are for High Seas METAREA 7 which covers from Ascension Island down to Madagascar East and Marion Forties on 14,316 USB.

The coastal weather and general sails are on 7,120 MHz LSB after the main weather broadcast.

The team is Peter, ZS1CH; Marjoke, ZS5V; Woody, ZS3WL and Johan, ZS6WZ.



The IARU Intruder Watch Service (formerly the IARU Monitoring System or IARUMS) is a worldwide service authorised by the IARU Administrative Council. It is served by dedicated volunteers.

A monthly IWS Newsletter is published and can be downloaded from <https://www.iaru-r1.org/spectrum/monitoring-system/iarums-r1-newsletters/>



Yoko Matsuoka JS2IMQ

the colour of Japanese cherry blossoms in early spring.

Even though we are far apart, our signals travelled through the wide spring air, calling CQ somewhere in Japan and gave us the feeling that we were connected under the same sky. We each enjoyed the same activities in different places, which brought us a sense of togetherness and a bond as fellow YL POTA enthusiasts, as if it were a party up in the air through radio waves and we were on cloud nine!

[#YLPOTAParty] www.facebook.com/hashtag/ylpotaparty

2026 YL-WWA 2026 Award Results 9 to 15 March 2026

Activators Mixed

1. Petra Wurster, DL5PIA Germany
2. Mariza Tsata, SV8OVH Greece
3. Agnieszka Pasternak-Haczewska, SQ8BWA Poland

Activators SSB

1. Sandy Raeker, DL1QQ / N0QQ USA
2. Barbara Sluga, S55BA Slovenia
3. Raisa Skrynnikova, R1BIG Russia

Activators CW

1. Tina Ockert, DL5YL Germany
2. Suzy Leidal, HA4ZS Hungary
3. Helga Ferrante Picelli, IN3FHE Italy

Activators Digi

1. Sara Hautamäki, OH5YL Finland
2. JC Goi Muangamphun, E20NKB Thailand
3. Sandra Arango, HK3YL Colombia

Official: 299 Activators from 51 Countries

Most represented: USA 60; Germany 49; Poland 13; Argentina 12; Indonesia 12; Italy 12.

Pure YL Power

The first WWA YL was a success! What a week! On Sunday, the first WWA YL came to an end, the numbers are simply impressive - 300 509 QSOs were performed in total! 234 female activists from 51 countries were at the start and showed what is in the amateur radio community. Especially our YLs from Germany have delivered well - with 37 945 QSOs, they secured the title of "National Winner!"

The highlights of German radio amateurs:

Category All Band Mix: first place for Petra, DL5PIA (4 981 QSOs)

Category CW: first place for Tina, DL5YL (3 112



N0QQ, Sandy
by www.qrz.com/db/N0QQ



QSOs)

SSB Category: I managed to get myself to a proud sixth with 4 239 QSOs.

It was not a classic contest, but the live broadcast on amateuraward.cloud triggered a real addiction factor for pile-ups in many.

A huge thank you to the 48 910 Hunters worldwide for the warm connections!

A big thank you also goes to Max, IW1FRU; Carlo, IK1HJS, the whole WWA team and my co-ordinator Veronika, DL4VER. This screams for a repeat in 2027!

Did you also participate? Drop me your highlights.

Heike Drechsler, DL3HD, Deutscher Amateur-Radio -Club e.V. Bundesverband für Amateurfunk

Monique Nuijten-Bakker PD0YL

Just watched some YouTube videos and I discovered that a lot of YLs had their first pile-up on SSB, all thanks to YL-WWA. In the past I had some like the same but never had what Raisia, R1BIG and Paula, OK2YL do. They are great girls doing pile-ups. I did sometimes have a pile-up with CW. Spotting was very important, so the hunters knew where we were.

I secretly hope now that we are also allowed to join as activators during the normal WWA. Because I really had a lot of fun and it just leaves you wanting more.

ORARI YL Community Post - World Wide Award (WWA) YL 2026 Activation

From the pile-ups to the long-distance contacts, it was a week filled with great signals and even better connections. Proud to have been a part of this global celebration of YL in amateur radio, with nearly 95% of my QSOs CW successfully reaching from Oceania all the way to Europe. A big thank you to all the hunters! Tia, YB1TIA, from Indonesia.

Results of the SARL YL QSO Party

Saturday 7 March 2026 - 15 logs for the first leg (6 YL + 9 OMs)

- 1st Esmarie Lotriet, ZS3EL – 147 points
- 2nd Sonet de Wet, ZS3SW - 124 points
- 3rd Gwen Moolman, ZS6GWN - 102 points
- 4th Dave du Toit, ZS6DDT - 49 points (OM)
- 5th Martie Venter, ZS6MV - 45 points

6th Lizette Scheepers, ZS6ZET and (OM) Keith Barker, ZS6Hi - 42 points

8th Wallie Lourens, ZS6WNL - 33 points (OM)

9th Andre Du Plessis, ZR6AGA - 29 points (OM)

10th Esmè Walsh, ZS1YE - 27 points

11th Keith Lowes, ZS5WFD - 25 points (OM)

12th Walter Moll, ZS6BCI - 24 points (OM)

13th Mark Walker, ZS6MDX - 22 points (OM)

14th Roy Walsh, ZS1YR - 14 points (OM)

15th Martin James, V51MJ - 6 points (OM)

YLWRC (World Radio Community)

Severine Dobbels, ON5RS created a YL community to brainstorm with fellow YLs about “women in the AMATEUR radio world.” Are you an YL and would you like to join too? <https://chat.whatsapp.com/JFwoQL8qnbvEGmy2sjtP8P> Belgian Radio Amateur Stations.

Out-and-About

Guinea

Elvira, IV3FSG will be active as 3X3A from Roume/ Rooma Island (AF-051), POTA GN-0006, Guinea between 11 and 25 April. She will operate SSB, CW and digital on 160, 80, 60, 40, 30, 20, 17, 15, 12, 10 and 6 m with two low power stations and vertical antennas. Elvira expects a couple of daily power outages that will force her off the air.

Belize

Paula, OK2YL and her OM Vlad, OK2WX were on holiday in Belize and were active as V31YL and V31WX (IOTA NA-073) from 9 to 22 March. Paula also participated in the week-long YLWWA 2026 activity between 9 and 15 March.

Belize is a Caribbean country between Mexico and Guatemala. More than a third of the country's territory is occupied by national parks and nature reserves. There are also a large number of Mayan monuments.

TU5MZ, Ivory Coast

Mich, F4WEO, a member of YL de France, reported, “My operation from Ivory Coast TU5MZ in 2026 has ended. TU5MZ from the village of Motobé, made 7 749 QSOs from 160 to 6 meters using FT8/FT4. I used an Icom 7300 barefoot antenna, wire antennas: DH3PZ L-shaped HF5 antenna (+ 30/40 m extensions), KELEMEN 80/160

(Continued on page 43)



(The YL.Beam from page 42)

dipole and a homemade 60 m dipole.

The HF5 antenna (2011), after 15 years of excellent service worldwide, stopped working after 3 days, despite careful attention to contacts. The Kelemen antenna, configured in an inverted V (9 m), showed a reasonable SWR on 20, 17, 15, 12 and 10 metres, providing 7 bands that the matching network easily compensated for. The 60 m dipole, mounted as a sloper, operated on 60 and 6 m and then on 30 m with 25 watts and a high SWR (working with the JAs every night...!).

Many thanks to the residents and dignitaries of Motobé for their wonderful welcome and kindness. Thanks to Mathurin for his warm hospitality. There was a 15-hour power outage at the end of our stay. Prolonged water cuts were frequent. As they say, 'This is Africa!' The temperature and humidity were high (32 - 34 °C, 95%)."

PJ2/K8LG - Curacao Island

Grace Papay, K8LG was active as PJ2/K8LG from Curacao Island, IOTA SA-099 between 3 and 10 March.

Peru

Young Ladies of Peru were active from "Faro Torre Reloj" PER-037 between 20 and 22 February 2026. Also known as the "Clock Tower Lighthouse"

in Callao, Peru, the radio operators using their own call signs and were active during the American Lighthouse Weekend.

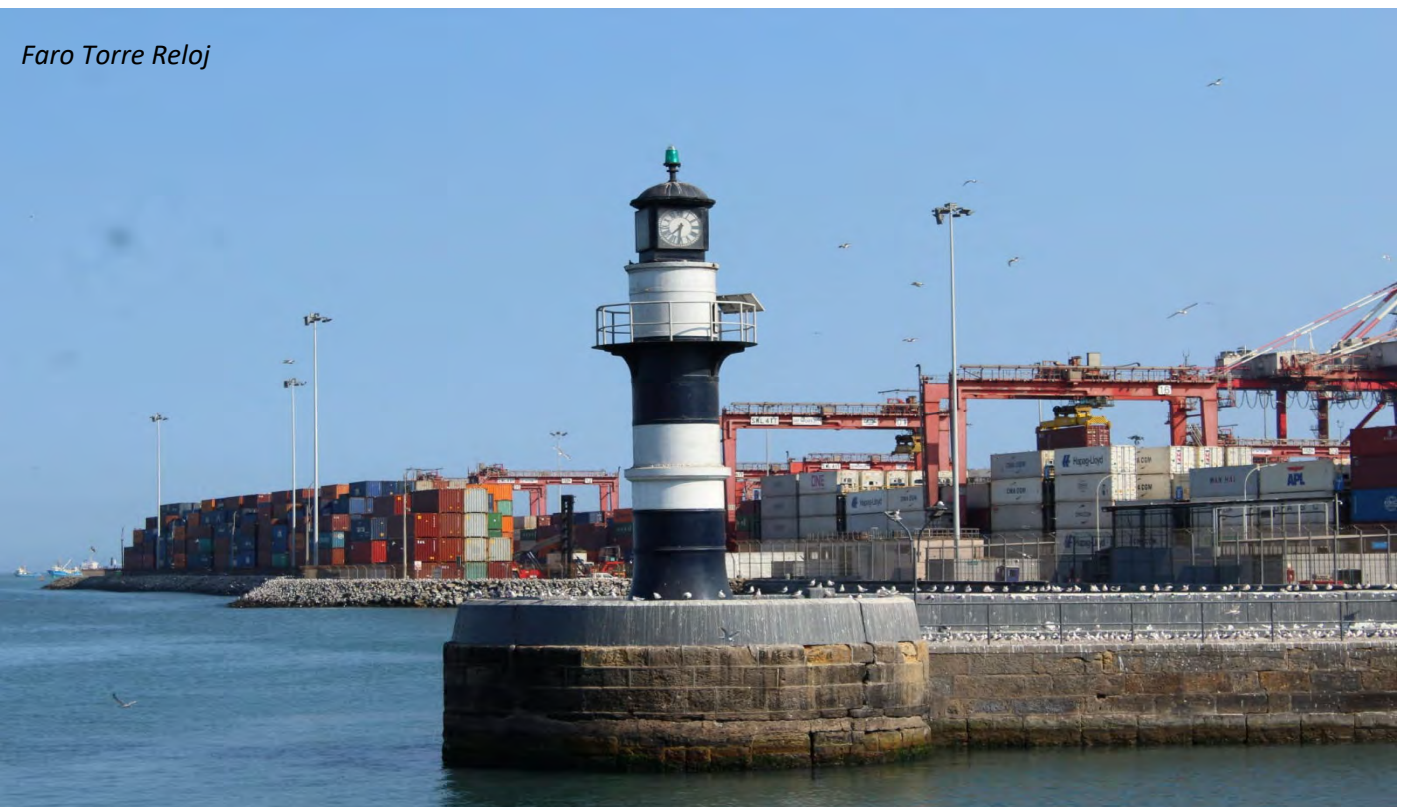
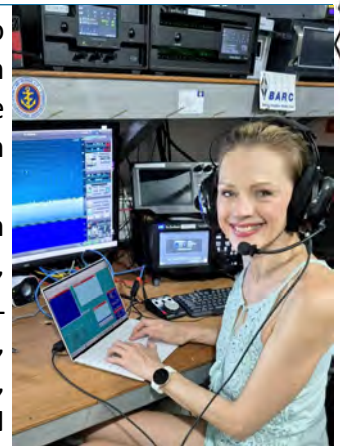
The team was Juan Carlos, OA4EEE; Martín, OA4EFA; Raúl, OA4EFI; YL Diana, OA4EIW, Julio, OA4DXW; YL Sonia, OA4DEM; Oscar, OA4AMN and Andrea, OA4EKI. The group achieved a good number of contacts operating on 10, 20 and 40-metres. (Boletín Semanal OA - Radio Club Peruano Edición No 07 del 24 de febrero de 2026).

The Clock Lighthouse became a visual and urban landmark for the residents of Callao, Peru's main maritime gateway. Its dual function as a lighthouse and monumental clock makes it unique among South American lighthouses. Beyond its utilitarian value, the Clock Lighthouse is a cultural asset that transcends the local to become part of the maritime history of Peru and the Pacific.

Women's Day Celebrated in Peru

On Saturday 21 March 2026. our Young Ladies OA of Peru, operated OA4O, the RCP station (Radio

(Continued on page 44)



Faro Torre Reloj



(The YL.Beam from page 43)

Club Peru). A gathering of OA colleagues sharing their radio experiences. One of their objectives in operating the RCP station was to make as many DX contacts as possible, raising awareness of the Young Ladies OA by broadcasting their voices so that they become better known worldwide.

Contact

yl.beam News Editor: Eda (Heather)

zs6ye.yl@gmail.com

The newsletters can be found at <https://wrarc-anode.blogspot.com/>; the Italian Radio Amateurs Union: QTC URI www.unionradio.it/qtc-la-rivista-della-unione-radioamatori-italiani/; the West of Scotland Amateur Radio Society <https://wosars.club/category/yl-news/>; YLs-Amateur Radio Ladies-Portugal www.facebook.com/CT2ISX and Amateur YL www.facebook.com/amateur.yls.

Amateur Radio – Not Just For the Nostalgic

Bryan Bergeron, NU1N

When I received my new catalogue from MFJ Enterprises, I could not help but feel a twinge of nostalgia. Scanning through the pages of the latest ham gear revealed very little has changed since my youth. Sure, some of the instruments sport LCD displays instead of analogue meters or LED displays, but from a gross technological perspective, the catalogue could have been from the '70s. There was the usual mix of antennas, antenna rotors, linear amplifiers, antenna tuners, watt meters, microphones and even a handful of iambic keyers for CW operation using Morse Code.

It is no secret that amateur radio has been in decline for a while, hastened by the popularity of the Internet. It used to be an accomplishment to chat with someone in Africa or Japan. Plus, slow-scan TV was good for perhaps a frame every couple seconds. Today, all that is required for world-wide video and audio communications is a mobile phone — not a room packed with powerful gear. I can remember calibrating my wall clock and oscillator circuits with signals from WWV at 5,0 MHz and 10,0 MHz. Today, of course, clocks with built-in receivers update the displayed time automatically.

In short, most electronics enthusiasts do not consider amateur radio at the cusp of innovation in technology. And perhaps it is not. However, if you are really serious about learning and experiencing electronics, you owe it to yourself to check out what amateur radio has to offer. I still use the diagnostic techniques I learned building and troubleshooting communications gear today — on both digital and analogue circuits.

I still remember my first moonbounce communications using a microwave transceiver and an antenna array that automatically tracked

the moon. Of course, it took months to prepare for what was about a minute of communications time. There was learning about high gain antenna arrays and then using coat hangers and aluminium tubing to construct an array. There was working with waveguide and heliax and figuring out the trajectory of the moon on a particular night. Plus, there were a couple dozen other problems that had to be solved. As a result, I learned a lot with each project. At least for me, it is not about the final conversation, it is the process of building a system with specific capabilities and then operating it to the best of my ability.

You will not find that sort of challenge or excitement working on a bench with, say, a microcontroller and a few LEDs. It is one thing to build a power supply to use one day on your projects and another to build one specifically to power a transceiver that must stand up to the rigors of emergency use. Amateur radio has a long history of public service. I spent many hurricane seasons in Louisiana providing communications for hundreds of families in temporary shelters. That is when knowing how to set up an antenna with duct tape and coat hangers paid off — not only for me, but for everyone in the shelters.

<https://www.nutsvolts.com/magazine/article/amateur-radio-not-just-for-the-nostalgic>



International Amateur Radio Union, Region 1

27th General Conference - Vienna, Austria, 19 to 23 September 2026

The 27th IARU Region 1 General Conference, to be held at the Austria Trend Parkhotel Schönbrunn (<https://www.austria-trend.at/en/hotels/parkhotel-schoenbrunn>).

The opening Plenary will take place on Saturday 19 September 2026 and the Final Plenary on Wednesday 22 September 2026. The 100th anniversary celebration of the OV with a festive theatrical performance will take place at 19:00 on 21 September 2026.

The business of the Conference will be conducted in English.

The Conference will be an 'in-person' meeting with online streaming of the C3 and Plenary meetings. Remote participants will not be able to take the floor during the discussions and will have to ask their in-person proxies for questions or votes. Day by day detailed information will be made available through a dedicated website. No remote voting procedure will be used.

The Working Group and Committee chairmen may organize preparatory online discussions as soon as the final list of contributions is available.

Conference Papers

All Member Societies are invited to submit papers for consideration by the Conference. Papers must be submitted by Monday 15 June 2026 by e-mail to the Conference Secretary.

Member Societies, the Executive Committee, the IARU Region 1 Specialised Bodies, the Administrative Council, the International Secretariat and other IARU Regions may submit papers. Please ensure that papers reach the Secretary before the

deadline, late papers may not be accepted.

The full set of papers will be available for download from the IARU Region 1 Conference Web from Monday 6 July 2026. Member Societies are responsible for distributing papers to their delegates.

Following the Opening Plenary, the meetings of the various Working Groups takes place - Amateur Radio Direction Finding (ARDF), Amateur Radio Space Experiment (ARSPEX), High-Speed Telegraphy (HST), Emergency Communications, the Political Relations Committee (PRC), the Spectrum and Regulatory Liaison Committee (SRLC), Support to the Amateur Service (STARS) and the Programme for Disabled Radio Amateurs (PDRA).

Committee 2 (C2) deals with the finances of Region 1. The Committee is elected during the Opening Plenary. Committee 3 (C3) looks after the General Administration and Organisation matters, while Committee 4 (C4) deals with HF matters. Committee 5 (C5) deals with VHF/UHF and Microwave matters, Committee 7 (C7) deals with EMC matters and Committee 8 (C8) is the Youth Working Group. Committee 6 (C6) is the Election and Ballots committee and is elected during the Opening Plenary.

Member Societies can submit papers for C2 Finances, C3 Administration, C4 HF, C5 VHF/UHF and Microwaves, C7 EMC, C8 Youth and the Workgroups. The template for the papers are available from the SARL Secretary at secretary@sarl.org.za.





Optimized Moxy Antennas for the 2, 6 and 10-Metre Bands

The original 6-metre design has been scaled for 2 and 10 metres.
Dave Ahlgren, K1BUK

QST, March 2026

In the May 2019 issue of QST, my article, "The Moxy Antenna," described four-element Moxon-Yagi (or Moxy) antennas for the 6-metre band. (April 2026 Radio ZS. Ed.) These antennas combined the low SWR of the Moxon with the high gain and front-to-back (F/B) ratio of the Yagi. I am still using a four-element Moxy on a painter's pole 4,5 m above ground and have made contacts with 48 states and 41 countries with it.

After my 2019 article was published, many amateurs e-mailed me to ask if the antenna could be scaled down to 2 metres and if it could be built in a three-element configuration. Such questions inspired a fresh look at the antenna, leading me to the new designs presented in this article: three- to six-element antennas for the 2- and 6-metre bands and three- to five-element antennas for the 10-metre band. These new designs exhibit low SWR, higher gain and excellent F/B ratios.

This article outlines the design process, presents tables that summarize the dimensions of optimized antennas for the three bands, discusses



Figure 1. Dave Ahlgren, K1BUK's 6- and 2-metre Moxy antennas on a 4,8 m painter's pole

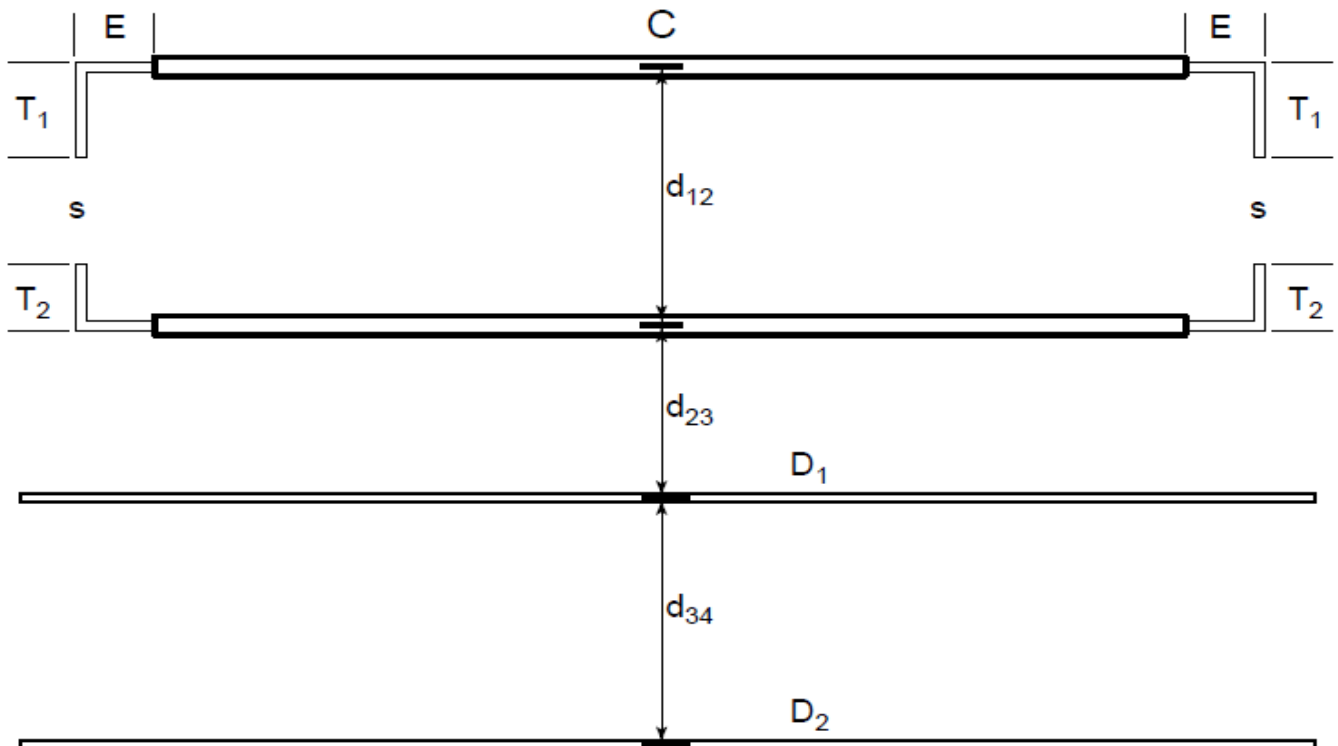
construction approaches and evaluates on-air results.

A New Design

The results presented here relied on

(Continued on page 48)

QS2603-Ahlgren-T1



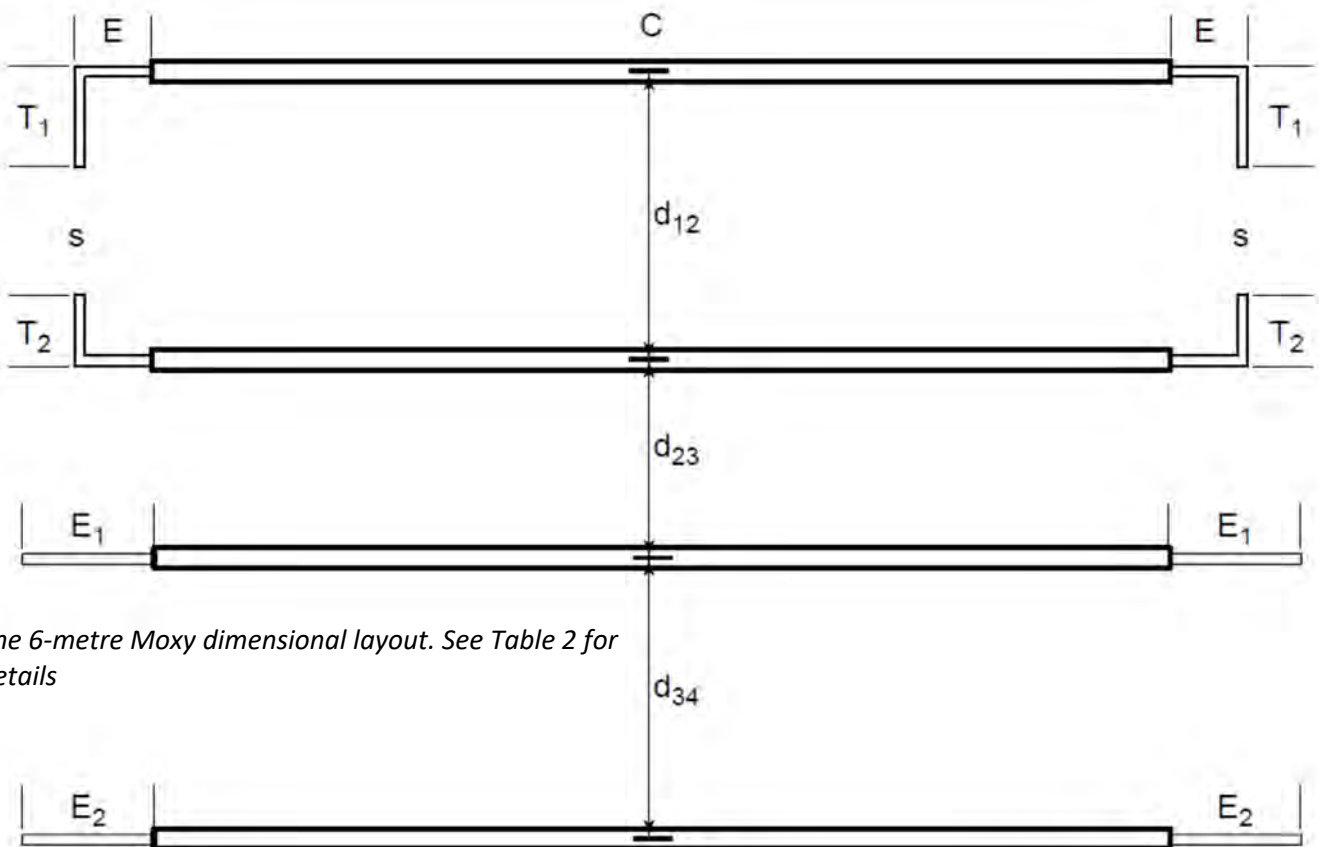
The 2-metre Moxy dimensional layout. See Table 1 for details. Take note: IARU Region 2 - 2 metres = 144 to 148 MHz, in Region 1 - 2 metres = 144 to 146 MHz. Ed.



Table 1. Optimized Dimensions (in Millimetres) for Three- to Six-Element 2-Metre Moxy Designs

$f = 144,5$ MHz, $H = 6,096$ m. Diameters: $C = 5,08$ cm, others 9.525 mm. Physical boom is 75 millimetres longer than distance D from reflector to front director.

Design	3 Element	4 Element	5 Element	6 Element
Gain (dBi)	12,7	14,5	15,7	16,7
SWR	1,0	1,0	1,0	1,0
F/B (dB)	30,0	30,0	47,0	40,0
Rad eff (%)	69,6	73,2	75,4	76,6
C	457,2	278,0	278,0	457,0
E	203,2	280,0	280,0	203,0
T1	112,4	114,0	114,0	110,0
S	98,7	61,2	73,4	73,6
T ₂	76,2	85,1	86,4	99,9
D ₁	824,9	893,0	898,0	925,9
D ₂		844,0	892,0	880,1
D ₃			809,0	875,0
D ₄				842,8
d12	287,3	260,3	273,8	283,5
d23	340,5	280,0	279,4	255,3
d34		466,0	466,0	466,0
d45			579,0	451,0
d56				490,0
D	628	1,006	1,598	1,946
Physical boom	704	1,082	1,674	2,022
Physical boom (ft)	2,31	3,55	5,49	6,63



The 6-metre Moxy dimensional layout. See Table 2 for details

Table 2. Optimized Dimensions (in Inches) for Three- to Six-Element 6-Metre Moxy Designs

f = 50,313 MHz, H = 20 feet. Diameters: C = 2-inch, others $\frac{3}{8}$ inch. Physical boom is 3 inches longer than distance D from reflector to front director.

Design	3 Element	4 Element	4 Element	5 Element	5 Element	6 Element
Gain (dBi)	12	13,3	14	14,4	15,1	15,4
SWR	1,02	1	1,01	1,01	1	1,02
F/B (dB)	25	30	31	40	37	60
Rad eff (%)	68,9	72	72,9	73,4	74,8	75,3
C	72	72	72	72	72	72
E	11,000	11,350	11,350	11,375	11,375	11,375
T1	13,119	11,825	12,189	13,630	12,081	12,000
S	8,900	7,241	7,676	7,647	7,439	4,923
T ₂	9,879	9,915	12,356	11,194	10,327	10,447
E ₁	13,141	16,761	19,330	18,000	17,794	18,368
E ₂		14,075	16,429	16,000	16,000	16,339
E ₃				13,861	13,011	14,000
E ₄						12,095
d12	31,898	28,981	32,222	32,471	29,848	27,370
d23	37,102	19,016	24,000	30,293	30,548	29,639
d34		45,002	48,778	38,368	61,972	44,879
d45				39,868	75,498	41,278
d56						64,703
D	69	93	105	141	198	208
Phys. boom	72	96	108	144	201	211
Phys. boom (ft)	6	8	9	12	16,7	17,6

(The Moxy Antenna from page 46)

optimization algorithms built into the *4NEC2* software (www.qsl.net/4nec2). These algorithms accept an initial antenna design and vary its dimensions to improve performance, as measured by simulated forward gain, F/B ratio and SWR. The algorithms require the user to assign a numerical weight to each measure and the user specifies which antenna dimensions are adjusted.

In this project, I obtained the initial designs. For the 2-and 10-metre bands by scaling the 6-metre antenna. Then, I used *4NEC2* to compute optimal dimensions of the Moxon section, the directors and the element spacings. I specified a convenient boom length for some designs. For others, an optimal boom length was calculated by *4NEC2*. Tubing diameters were consistent with construction standards presented in chapter 25 of the 25th edition of *The ARRL Antenna Book*.

In this project, I used two of *4NEC2*'s optimization algorithms, named Evolve and Optimize. Each antenna design required two weighted optimization steps. Step one used

4NEC2's Evolve algorithm to compute the best director lengths and spacings. This step also emphasized maximizing forward gain and F/B ratio with less weight assigned to SWR. Step two used the Evolve algorithm to optimize the Moxon dimensions and first director position. In this step, SWR was heavily weighted, while the gain and F/B ratio were less so.

For some designs, a third step line-tuned the design-frequency SWR using the Optimize method. Tables 1, 2 and 3 summarize the results of the optimization runs and include predictions of gain, F/B ratio and SWR performance at the design frequency.

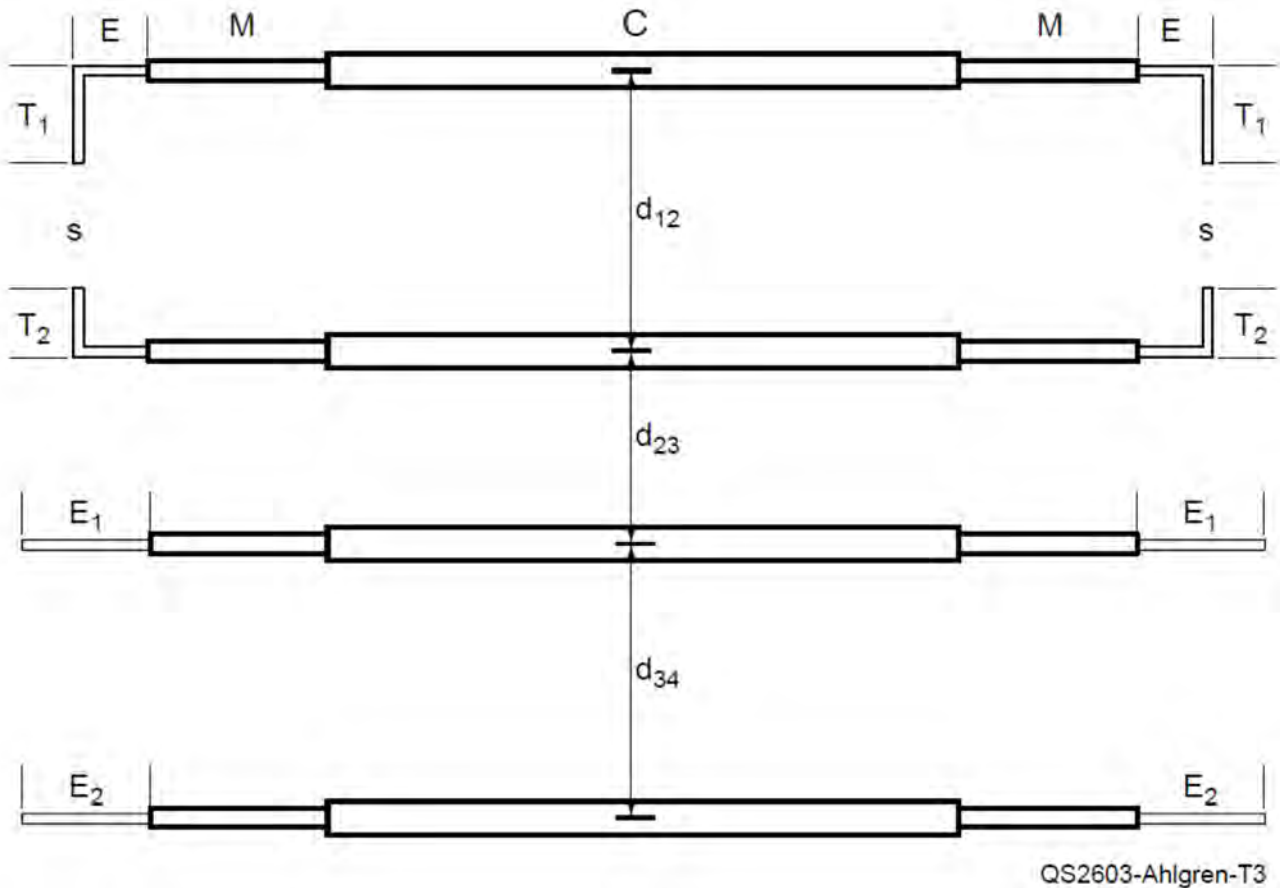
Making Moxy Antennas

My May 2019 article presented a detailed construction plan for a 6-metre Moxy that used a fibreglass boom and available hardware. Feedback from amateurs who made a Moxy indicated that they had adopted their own construction methods. Bill Blazina, W3XS from Oregon said, "I used cedar

(Continued on page 49)



The 10-metre Moxy dimensional layout. See Table 3 for details



(The Moxy Antenna from page 48)

for the boom and element mounts, works great with a coax balun. Seems as good as the five-element commercial Yagi that it replaced.” And Dave Lancey, NØUB from Missouri said, “I used a metal boom and plexiglass to insulate the boom-to-

element mounting. The SWR came right in at the start. I moved up from a 6-metre Moxon and the Moxy is heads and shoulders over it. I am up to 47 states and 150 grid squares.”

This feedback suggests two construction approaches: to use a boom of insulation material, or to insulate the antenna elements from a metal

(Continued on page 52)

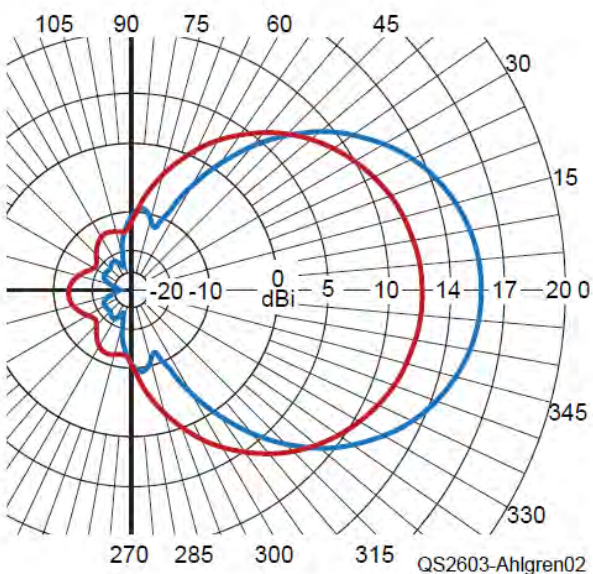


Figure 2. Horizontal radiation patterns in dB for three-element 6-metre Moxy (red) and five-element 2-metre Moxy (blue), both 6,098 m above average ground. Main take-off angles: 6 metres, 14 degrees; 2 metres, 5 degrees.

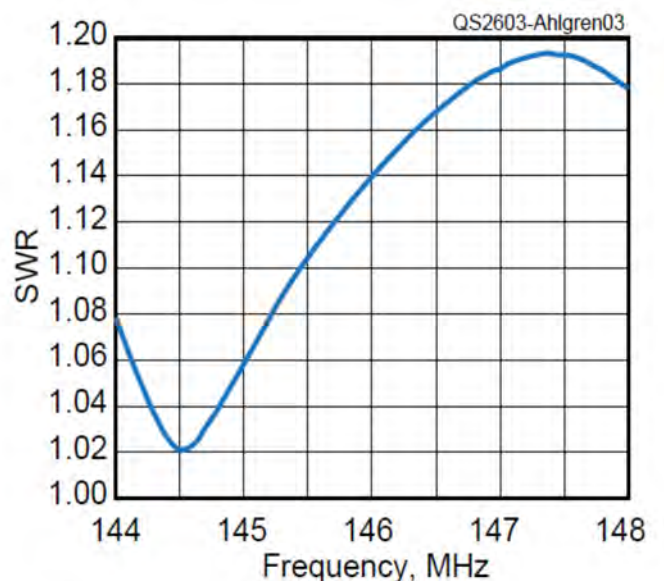


Figure 3. Measured SWR vs. frequency of a five-element 2-metre Moxy.

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Table 3. Optimized Dimensions (in Inches) for Three- to Five-Element 10-Metre Antennas

f = 28,074 MHz, H = 40 feet. Diameters: C = 5/8 inch, M = 1/2 inch, others 3/8 inch. Physical boom is 3-inches longer than distance D from reflector to front director.

Design	3 Element	3 Element	4 Element	4 Element	5 Element	5 Element
Gain (dBi)	12	12,2	12,8	13,8	14,3	14,7
SWR	1,01	1,01	1,01	1,02	1,01	1,02
F/B (dB)	23	34	32	32	40	33
Rad eff (%)	69,2	69,6	71,5	73,9	74,7	75,4
C	72	72	72	72	72	72
M	32	32	32	32	32	32
E	23,890	22,570	19,858	17,863	16,900	16,900
T1	18,000	21,080	20,474	20,826	23,596	22,760
S	12,980	28,000	15,204	13,064	13,717	14,040
T ₂	11,730	15,580	16,136	17,228	20,059	17,383
E ₁	24,690	27,150	24,008	29,291	28,153	26,102
E ₂			22,243	26,377	27,957	26,056
E ₃					22,256	21,115
d12	42,710	64,660	51,814	51,118	57,372	54,183
d23	50,290	52,340	26,827	31,131	37,606	42,650
d34			62,358	82,751	53,168	104,400
d45					88,855	125,767
D	93	117	141	165	237	327
Phys. boom	96	120	144	168	240	330
Phys. boom (ft)	8,0	10,0	12,0	14,0	20,0	27,5

(The Moxy Antenna from page 49)

boom, both work! To prove this point, I made a five-element 2-metre Moxy with a square PVC boom and a three-element 6-metre Moxy with an aluminium boom (see Figure 1). Predicted radiation patterns for these antennas are presented in Figure 2.

The five-element 2-metre antenna uses a 2,54 cm square PVC boom. Elements are inserted into the boom through holes drilled carefully with a drill press. The two halves of the driven element are separated by 5 millimetres and linked by a fibreglass rod secured using high-strength epoxy. The 6-metre antenna uses a 2,54 cm square aluminium boom. Element insulators were cut

from high-density polyethylene and mounted to the boom by square U bolts. Both antennas use a choke balun placed close to the feed point. The balun consists of a short length of RG-8X coaxial cable and five type-43 ferrite cable cores (Fair-Rite type 2643540002).

Details of making the Moxon section are presented in my May 2019 article and The ARRL Antenna Book includes relevant guidelines for builders. Two important points to note are to allow an overlap of at least 4 inches between telescoped tubing sections and to avoid galling by applying copper-based anti-seize grease at tubing intersections. See QST in Depth (www.arrl.org/qst-in-depth) for further construction details and NEC files for all designs.

Performance

The 2- and 6-metre designs were mounted on a 4,87 m painter’s pole. Figure 3 presents the SWR curve for the five-element 2-metre antenna measured using a NanoVNA-F device (<https://depelec.com/nanovna-f>). After a slight (less than 1

(Continued on page 53)



Figure 4. A KPA500 SWR readout of a three-element 6-metre Moxy at 50.313 MHz



(The Moxy Antenna from page 52)

centimetre) adjustment to the driven element, made by equally sliding the “trombone” ends of the Moxon, an SWR of 1,02 was measured at the design frequency of 144,5 MHz.

Figure 4 shows the SWR indication at 50,313 MHz for the three-element 6-metre antenna — the on-air performance was excellent. I made many FT8 contacts from grid square FN31 during sporadic-E openings in the summer of 2025 and I had several contacts with South American stations during trans equatorial openings. Operating portable using FT8 from grid square FN53 with 100 W and an antenna 6,098 m above ground, I logged DX stations from Europe, South America and the Caribbean.

I look forward to receiving feedback from those who make a Moxy antenna!

All photos provided by the author.

Dave Ahlgren’s, K1BUK, adventures in ham radio began in 1957, with his Novice call sign KN1BUK. He operated as W8IXX in Michigan in the early 1970s and returned to the hobby in 2015, after retiring from teaching courses in digital and analogue electronics, computer-aided design (CAD) and robotics at Trinity College. He now holds an Amateur Extra-class license and operates on 160 to 6 metres via CW, SSB and FT8/FT4. He has earned DXCC and nine-band WAS. Dave’s current projects include CADs of antennas, tuners and baluns using 4NEC2 and EMCoS Studio CAD. He earned a BS from Trinity College, an MSEE from Tulane University and a PhD in EE from the University of Michigan. Dave can be reached at djahlgren@cox.net.

CERTIFIED 3-ELEMENT YAGI-UDA ANTENNA: 40M BAND (7.05 MHz)

ELEMENT LENGTHS (M)

Reflector: ~22.3 m (Full-size)
 Driven Element: ~21.2 m (Full-size)
 Director 1: 19.30 m (~Shortened)
 Tolerances: ±0.5% (al (-0.475 λ))

ELEMENT SPACING (M)

Reflector to Driven: 8.50 m (0.20 λ)
 Driven to Director: 6.80 m (0.16 λ)

MAIN DIMENSIONS (M):

15.3 m (0.36 λ)

1:100 Scale Bar
Full-scale elements

YAGI SPECIFICATIONS 7.05 MHz

- Gain: 6.8 – 7.2 dBi typical
- F/B Ratio: 19 - 22 dB
- Bandwidth (SWR <2): 100 – 150 kHz
- Impedance: Matched to 50Ω via adjustable Gamma

Driven Element Insulation: Delrin Block Support

MECHANICAL & INSTALLATION CONSIDERATIONS:

1. Boom Length: 15.3 m (optimized)
2. Tapered Element Diameter: 70 mm base ~ 15 mm tip
3. Weight: 75 kg (avg. with elements + boom)
4. Rotor Required: Heavy-Duty (Yaesu G-2800 or equivalent)
5. Minimum Tower Height: ~ 18 m, guyed

VALIDATED DATA REFERENCES:

1. ARRL Antenna Book for Radio Communications
2. Yagi Antenna Design (Dr. James L. Lawson, W2PV)
3. Professional Antenna Modeling Software (NEC-4/NEC-2)

Gamma Match (Complete Geometry)

Coax → Gamma Tube & Rod → Driven Element

ELECTRICAL & ENVIRONMENTAL PARAMETERS:

Electrical Height: 18.0 m (H) → ~0.42 λ
 Target Ground Type: Typical
 Average Soil (e.g., 5 mS/m Conductivity, $s_v=13$)



The m'Bashe lighthouse

The Deputy Assistant Lighthouse Keeper (also cook and window cleaner!)

This month we visit the Eastern Cape and more specifically the Wild Coast.

The m'Bashe lighthouse lies on the Wild Coast, part way between East London and Port St Johns and just down the road from a little holiday resort that has been there for decades, known as The Haven.

On 24 February 1554, the Portuguese ship São Bento ran aground at the mouth of the Mbashe River. The ordeal of 322 of its survivors, who walked from there to Lourenço Marques, presently Maputo, has been recorded.

In 1890, the Lighthouse Commission recommended the erection of lighthouses at Mendu Point and Cape Hermes and that an unlit beacon be erected at Bashee until replaced by a lighthouse.

The beacon was erected in 1892 but the Bashee lighthouse was only commissioned on 3 December 1926. This was after the master of the RMS Armadale Castle, Captain H Strong, had revived the issue in 1923. The lighthouse was built, not at Mendu Point, as originally planned, but at a more accessible location close to The Haven hotel.

Mr H.C. Cooper, Lighthouse Engineer for the Government of the Cape Colony, constructed the lighthouse at a cost of 10 750.00 pounds. The original light source was an acetylene gas mantle burner, which was replaced in March 1962 by an electric lamp, increasing the candlepower from 225 000 to 3 300 000 candelas.

The lighthouse is now fully automatic, with



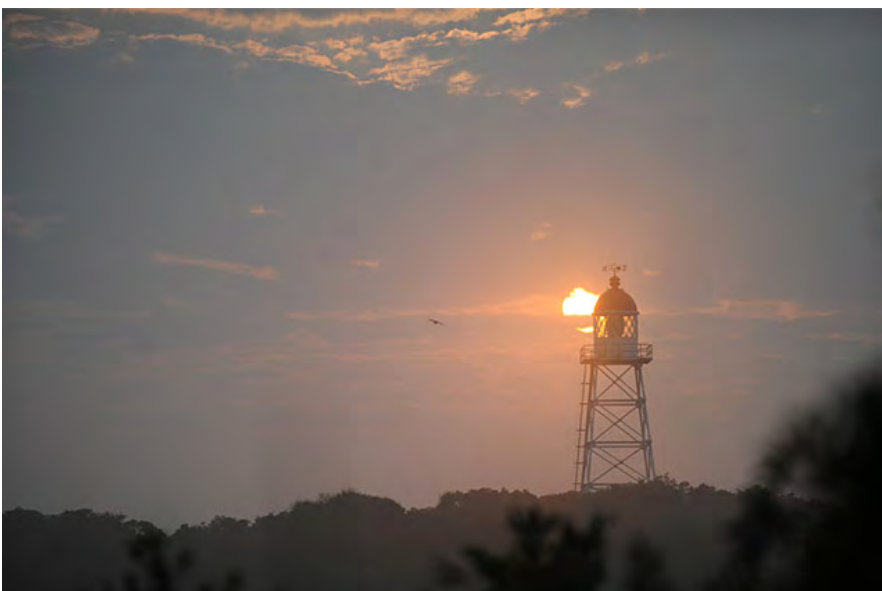
diesel stand-by generators. A resident caretaker reports any malfunctioning to the maintenance depot at East London.

Today's lighthouse is a lattice steel structure roughly 250 metres away from the original lightkeeper's house. It converted to electric power in 1962, but the original tower is still in use, its little red dome a beacon of colour against the blue of the sky.

It was an isolated post for a lightkeeper particularly as the nearest town was Umtata, even if a bus operated between Bityi station and the lighthouse only twice a week to bring provisions. Post came to the families stationed here from Elliotdale, a little village about 40 kilometres away.

The m'Bashe Lighthouse is located just east of the Bhanyana River mouth on a sandy hill. There are

(Continued on page 55)





(Lighthouse from page 54)

two way to reach it from the Haven. You can walk via a bad road which can be very muddy and then walk back along the beach, which will require you to get your feet wet when returning over the mouth of the Bhanyana River - or you can walk it both ways via the beach, where the lighthouse is visible at all times.

The Haven has a long and chequered history. It was originally established as a private seaside holiday resort back in 1922 by Edward Reid, a former seaman, using a PTO (Permission To Occupy) lease on state-owned land. The resort changed ownership twice in the period up until 1976 and then at this point was taken over by the Transkei Development Corporation.

This part of the coast was particularly popular with fishermen as there was some good kob (kabeljou - *Argyrosomus inodorus*) to be caught, particularly off the rocks in the vicinity of the lighthouse.

However around The Haven is now a Marine Protected Area and no fishing is allowed. The m'Bashe River, so popular with fishermen, separates two little nature reserves – the Dwesa and Cwebe (ZSFF-0110).

The Mbashe River is one of the major rivers in

the Eastern Cape Province. It flows in a south-eastern direction and has a catchment area of 6 030 km². The river drains into the Indian Ocean through an estuary located near the lighthouse at Bashee, south of Mhlanganisweni.

After passing under national road N2, the Mbashe River encounters southwest of Elliotdale and north-east of Dutywa the more rugged terrain of the Wild Coast and suddenly enters into a 64 km long series of violent twists and turns known as the Collywobbles before continuing more sedately towards the Indian Ocean.

The Mbashe river's main tributaries are the Xuka River, Mgwali River, Dutywa River and the Mnyolo River. Presently this river is part of the Mzimvubu to Keiskamma Water Management Area

Some of the fishes caught in its waters are the Smallmouth yellowfish (*Labeobarbus aeneus*), Goldie barb (*Barbus pallidus*), Chubbyhead barb (*Barbus anoplus*), Freshwater mullet (*Myxus capensis*), Giant mottled eel (*Anguilla marmorata*) and African longfin eel (*Anguilla mossambica*). The Smallmouth yellowfish (*Labeobarbus aeneus*) is an invasive species, now widely present in the river system.

(Continued on page 56)





(Lighthouse from page 55)

Technical Stuff

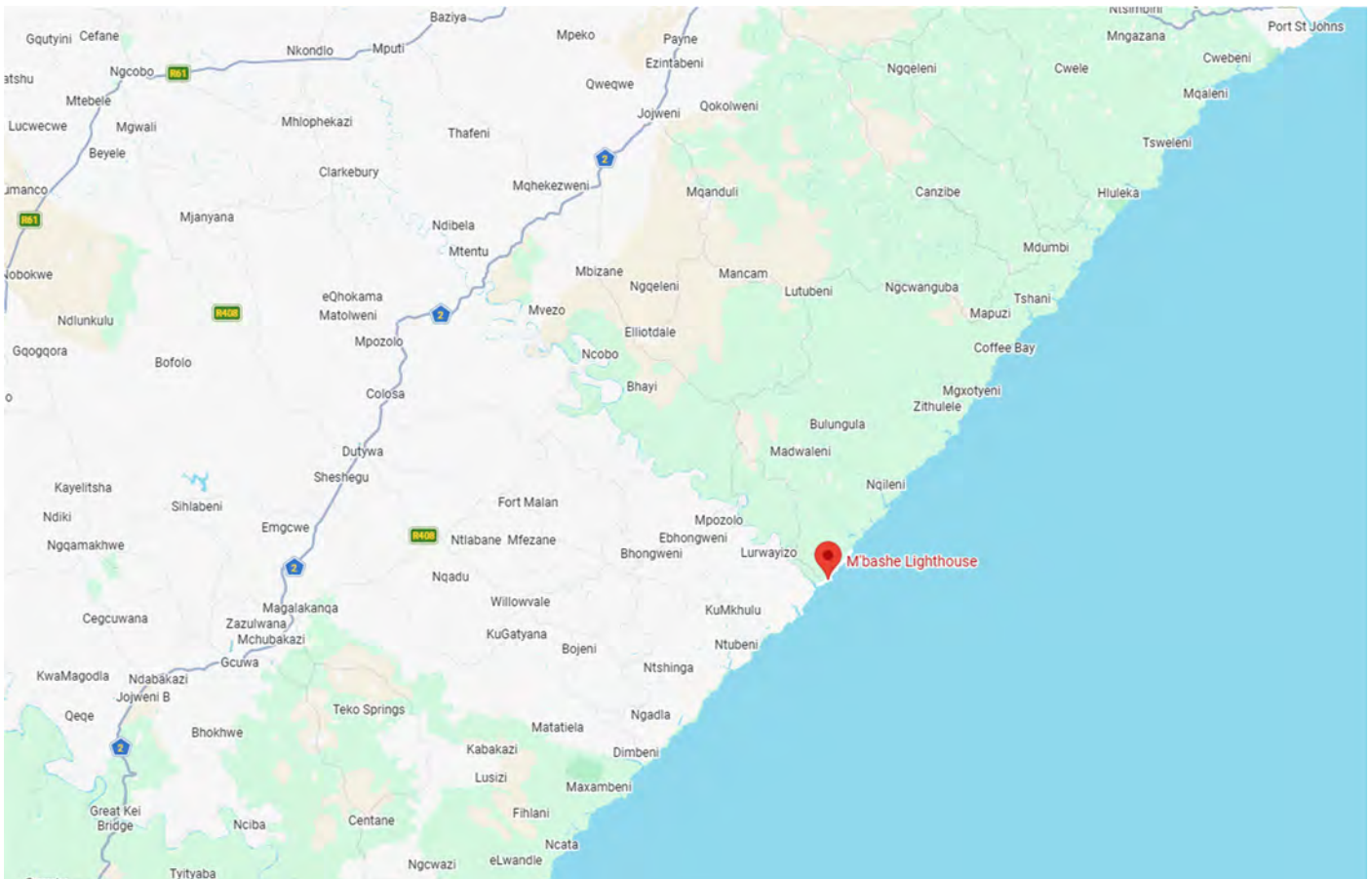
Commissioned: 3 December 1926
 Construction: a 14 m high lattice steel tower. The lighthouse is white and the lantern dome is red
 Focal Plane: 47 m
 The Light: It emits three white flashes every 38 seconds. The three flashes are separated by 5, 16 and 16 seconds in an unusual pattern.
 Candle Power: 3 300 000 candelas
 Coordinates: -32,241 S 28,082 E
 Grid Sq.: KF47AS
 Admiralty No: D6438
 ARLHS No: SAF-053
 ILLW No: not issued yet.

Sources

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Vintage amateur radio

From Wikipedia, the free encyclopaedia

I can remember the radio set in our home in Potchefstroom, it had valves and took its time switching on! It was turned to LM Radio until just before 19:00, then my Dad would turn the dial to Springbok Radio for the news bulletin and afterwards "No Place to Hide." At 19:30 it was back to LM Radio. Then we moved to Bloemfontein and got a new fangled radio set with FM. But I would still turn the dial around the short-wave bands and listened to all the stations broadcasting there.

In 1992, when I passed my 12 words per minute morse code test at the SA Post Office, I bought a Swan 300B from Basil, ZS6BDS (SK) and started making QSOs. Later I bought a Yaesu FT-77 from Andre, ZS2ACP. With these two radios I worked my Worked All ZS, All-Africa Award and DXCC.

In 2025, I bought a Yaesu FT101Z from the estate of Philip, ZS4PV. It is now in the shack next to the Yaesu FT-897 and FT-8800. A mix of old and new.

Yes, it is nice to look at the new radio equipment available and buying what your budget allows. But do not get rid of the old radios. Keep them in a special place in your shack and switch them on now and again and make a QSO. Real radios glow in the dark! Dennis, ZS4BS

Vintage amateur radio is a subset of amateur radio hobby where enthusiasts collect, restore, preserve, build and operate amateur radio equipment from bygone years, such as those using vacuum tube technology. Popular modes of operation include speaking over amplitude modulation (AM) and communicating using Morse code through continuous wave (CW) radio-telegraphy. Some enthusiasts have interest in owning, restoring and operating vintage military and commercial radio equipment such as those from 1940s to 1960s. Some undertake to construct their own gear, known in amateur slang as home-



An amateur radio operator "Radio shack" with vintage gear

brewing, using vintage parts and designs. Several amateur radio clubs and organizations sponsor contests, events and swap meets that cater to this specialized aspect of the hobby.

Appeal

Vintage radio enthusiasts contend that the precise digital frequency displays and state-of-the-art, microprocessor-based features of modern amateur equipment lacks the aesthetic appeal and "soul" of amateur electronic gear from the vacuum tube era.^{1,2} Additionally, many find satisfaction in taking commercially-made amateur equipment from the 1930s–1970s, often characterized as boat anchors by US amateurs because of their large size and weight and carefully restoring it.^{3,4,2}

The proliferation of integrated circuits in modern amateur radio equipment has made amateurs nostalgic for vacuum tube-based designs. Radios that contain solid state parts do not require frequent tinkering, whereas vacuum tube radio equipment is less predictable, lending routine radio contacts more excitement and giving vintage amateur radio devotees a more primitive experience.³ Enthusiasts claim that boat anchors sound



Hallicrafters SX-28 tuning dial

brewing, using vintage parts and designs. Several amateur radio clubs and organizations sponsor contests, events and swap meets that cater to this specialized aspect of the hobby.

Appeal

Vintage radio enthusiasts contend that the pre-

(Continued on page 58)

(Vintage amateur radio from page 57)

better than modern equipment, saying that the tube audio from vintage gear is "warmer" and more aesthetically pleasing.⁵

Some hobbyists see vintage radio operation as a valuable asset to help preserve the history and heritage of radio for future generations.³ They sometimes assist in the restoration and operation of vintage radio equipment for historical exhibits, museums and historic ships or aircraft.⁶ Examples of this are groups of amateurs who restore, maintain and operate the radio installations of the ocean liner 'Queen Mary,' the engineering heritage site Musick Memorial Radio Station and the National Register of Historic Places listed Massie Wireless Station.^{7,8,9} Amateur restoration of historic military radios includes the B-17 Flying Fortress 'City of Savannah' at the National Museum of the Mighty Eighth Air Force, the B-29 Superfortress 'Enola Gay' at the National Air and Space Museum and the submarine 'USS Requin' at the Carnegie Science Centre.^{10,11,12} Amateur radio



Vintage equipment in the Queen Mary radio room

operators on various retired maritime vessels, such as the destroyer 'USS Kidd' and the battleship 'USS Texas,' regularly use vintage transmitters to communicate with other ship museums for events like Museum Ships Weekend and National Pearl Harbor Remembrance Day.^{13,14,6}

AM activity

Amplitude modulation (AM) was once the main voice mode in amateur radio before being superseded by Single-sideband modulation (SSB). But AM has recently become a nostalgic specialty interest on the shortwave amateur bands.⁵ Several



"AM'er" Joe Walsh, WB6ACU on the air

AMers operate vintage vacuum tube transmitters in conjunction with separate receivers. Some operators have even obtained old AM broadcast transmitters from radio stations that have upgraded their equipment. Others build their equipment from scratch (called homebrewing) using both modern and vintage-era components.¹⁵ Rock star Joe Walsh is an advocate of amateur radio and an avid vintage gear collector, maintaining nine complete vintage stations in his home, including a Collins broadcast transmitter.^{16,17}

In the United States, amateur radio AM activity can be found on mediumwave, MF and shortwave, HF frequencies which include 1,880 - 1,890, 3,885, 7,290, 14,286, 21,390 and 29,000 - 29,200 and feature swap nets that cater to interest in vintage AM equipment.¹⁵

AM operation has drawn interest from people outside the hobby, such as shortwave radio listeners using inexpensive receivers available to the public. While focused on simple technologies from the past, AMers may also mix state-of-the-art technology with their vintage interests, such as experimenting with synchronous detection to enable reception of AM signals free of static and fading.¹

Conversations ("QSOs in amateur slang) are typically configured as "roundtables" consisting of several participants. Interested newcomers are usually encouraged to switch their modern transceivers to AM mode, introduce themselves and join the conversation.¹

Classic gear

Amateur radio equipment of past eras like the 1940s, 50s and 60s that are separate vacuum tube

(Vervolg op bladsy 60)



MISSION STATEMENT

Our aim is to facilitate, generate and maintain an interest in the location, acquisition, repair and use of yesterdays radio's and associated equipment.

To encourage all like minded amateurs to do the same thus ensuring the maintenance and preservation of our amateur heritage.

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Above. Collins S-Line, featuring separate power supply, receiver, transmitter and speaker console, c. 1960s
Right. EF Johnson Viking Ranger transmitter, c. 1958



transmitters and receivers (unlike modern transceivers) are an object of nostalgia and many see rehabilitation and on-air use by enthusiasts.^{18,19}

Vintage operating activity is not limited to the AM mode. Many devotees use their "classic" amateur gear from vintage-era American manufacturers like Eico, EF Johnson, National, Heathkit, Hammarlund, Drake, Collins, WRL, Swan, Signal/One, Lafayette and Hallicrafters, to make radiotelegraphy (CW), SSB, FM and RTTY two-way contacts.^{20,21}

Some enthusiasts define the age parameters of vintage or classic gear as "old enough to exhibit the glow of vacuum tubes," but the designation may include some early solid-state gear.^{22,20,21}

Some even sub-specialize in military radio collecting and undertake to restore and operate surplus communications equipment, much of it dating back to World War II, from AN/ARC-5 command sets and US Signal Corps SCR-300 and SCR-536 walkie talkies to exotic gear like the British Paraset, a small espionage transceiver supplied to Resistance forces in France, Belgium and the Netherlands.^{23,24,21,25}

There is considerable interest in vintage military and commercial radio equipment among EU amateur radio operators, especially gear from British manufacturers such as Marconi, Racal, Eddystone, Pye and a variety of Russian, German, Canadian, British RAF and British Army equipment, such as the well-known Wireless Set No. 19.^{26,27,28}

"Glowbugs" are a related aspect of vintage radio and harken back to the early days of amateur radio, when most amateurs hand-crafted their own equipment. Smaller in size than "boat anchors", "glowbug" is a term used by US amateurs to describe a simple home-made tube-type radio set. The majority of glowbug transmitters are designed to be used in the CW radiotelegraphy mode.²¹

Glowbug transmitters having simple, tube-based designs were part of many beginner amateur stations. According to author Richard H. Arland, interest in glowbugs has increased among QRP enthusiasts and others with a penchant for constructing their own equipment and many amateurs are assembling simple HF CW transmitters. Amateur radio Glowbug enthusiasts can often be heard communicating on the shortwave bands via CW using Morse code.²¹

Clubs, events and publications

Many vintage radio clubs sponsor special events and contests, such as the "AM QSO Party" sponsored by the *Antique Wireless Association*, the "Heavy Metal Rally" sponsored by *Electric Radio Magazine* and the "Classic Radio Exchange." Such operating events are not traditional amateur radio contests inasmuch as they are a night of friendly QSOs using home-built, restored commercial amateur, broadcast or military equipment.²⁰ The Antique Radio Club of Illinois operates a vintage radio station as a public demonstration at the Antique Radio Fest allowing licensed amateurs who visit to operate the transmitter.^{29,30}



Eddystone EC10 shortwave receiver c. 1967

The Amateur Radio Lighthouse Society and *The AM Radio Network's*³¹ "Expedition to Thomas Point Shoal Lighthouse" in Chesapeake Bay, MD commemorated the history of lighthouses with a vintage spe-

NET TIMES & FREQUENCIES (SAST):

**Saturday 06:00 (04:00 UTC) -
AM Net - 3615**

**Saturday 07:00 (05:00 UTC) -
Western Cape SSB Net - 3630**

**Saturday 08:30 (06:30 UTC) -
National SSB Net - 7140;
Sandton Repeater 145.700
Echolink - ZS6STN-R; ZS0A W A-L
Relay on 3615 for those having
difficulty with local skip conditions.**

**Saturday 14:00 (12:00 UTC) -
CW Net - 7020; (3550 after 15min if band
conditions not good on 40)**

**Wednesday 19:00 (17:00) -
AM Net - 3615, band conditions permitting**





Above. Glowing cathodes in two transmitting vacuum tubes

Right. Vacuum tube transmitter

(Vintage amateur radio from page 60)

cial event station using the call sign K3L.^{32,33}

Britain's *Vintage and Military Amateur Radio Society*, affiliated with the Radio Society of Great Britain, coordinates regular on-air "nets" where enthusiasts gather as well as massive technical files for the benefit of members.²⁶ *The Surplus Radio Society*, a Dutch society of collectors of old ex-military radio equipment and other nostalgic receivers and transmitters holds weekly radio activity nets every Sunday on 3,575 MHz CW / 3,705 MHz AM and sponsors several flea markets and exchange fairs each year.³⁴

The Wireless Set No. 19 Group, with members virtually worldwide, caters to those who collect, restore and/or operate vintage military communications equipment, with emphasis on the World War II Wireless Set No. 19 radio. Many members are Amateur Radio operators who use the equipment for on-air contacts with others.³⁵

The ARRL published "Vintage Radio", a collection of articles from QST magazine describing vintage equipment, restoration and operation.³³

The Antique Wireless Association of Southern Africa is devoted to the "maintenance and preservation of our amateur heritage" for enthusiasts of older types of short wave radios and amateur equipment and maintains a museum exhibit in Johannesburg.³⁶

Restoration

Repair and restoration of vintage amateur radio equipment may involve replacing vacuum tubes, reforming electrolytic capacitors if needed, replacing any faulty resistors, replacing two-wire power



cords with three-wire cords except on transformer less AC/DC radios and receiver alignment as necessary.³⁷

Since vacuum tube gear contains potentially lethal voltages, several safety measures, such as discharging power-supply capacitors and keeping one hand away from the chassis when working on powered-up gear, are commonly employed. Some older equipment has a direct connection to the metal chassis on one side of the incoming AC power line, which results in the entire unit becoming electrified if the power plug is inserted backwards. Many older radios, such as vintage receivers, are not safety-fused.^{4,38} In addition, those who collect, restore or otherwise use vintage radio equipment may unknowingly encounter harmful radioactive substances, PCBs and asbestos.³⁹

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(Continued on page 63)



(Vintage amateur radio from page 62)

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External links

[Antique Wireless Association](#)

[Glowbug resources](#)

[Electric Radio Magazine](#)

[Vintage And Military Amateur Radio Society \(UK\)](#)

Shacks On The Air anyone?

John VA3KOT

There has been an explosion of “On The Air” programmes lately. I think SOTA (Summits On The Air) may have kick started the trend. To my mind SOTA remains the purest and best of them all. Although there are many drive-up summits, many others require strenuous effort to reach the “activation zone” on foot. Unfortunately, here in southern Ontario, we have very few high elevation points. Some peaks over 500 meters can be found, but without the required “prominence” to qualify for the SOTA programme. I visited one of the few SOTA peaks in my area once. It was hard to see why it was classified as a peak. The activation zone was a section of flat road. SOTA forbids activating from inside a vehicle, so all an activator has to do is park at the side of the road, get out and play radio at the roadside. Piff!

Woof Woof

Some friends and I enjoy a leisurely CW rag chew once a week. We have one thing in common – mourning the loss of once-loved canine friends. At the end of every session, we sign off with “woof”. So, when I think of the World-Wide Flora and Fauna programme (WWFF) my mind interprets that as “Woof-Woof”.

WWFF is very popular in Europe and to a lesser extent in North America. If you hear a station

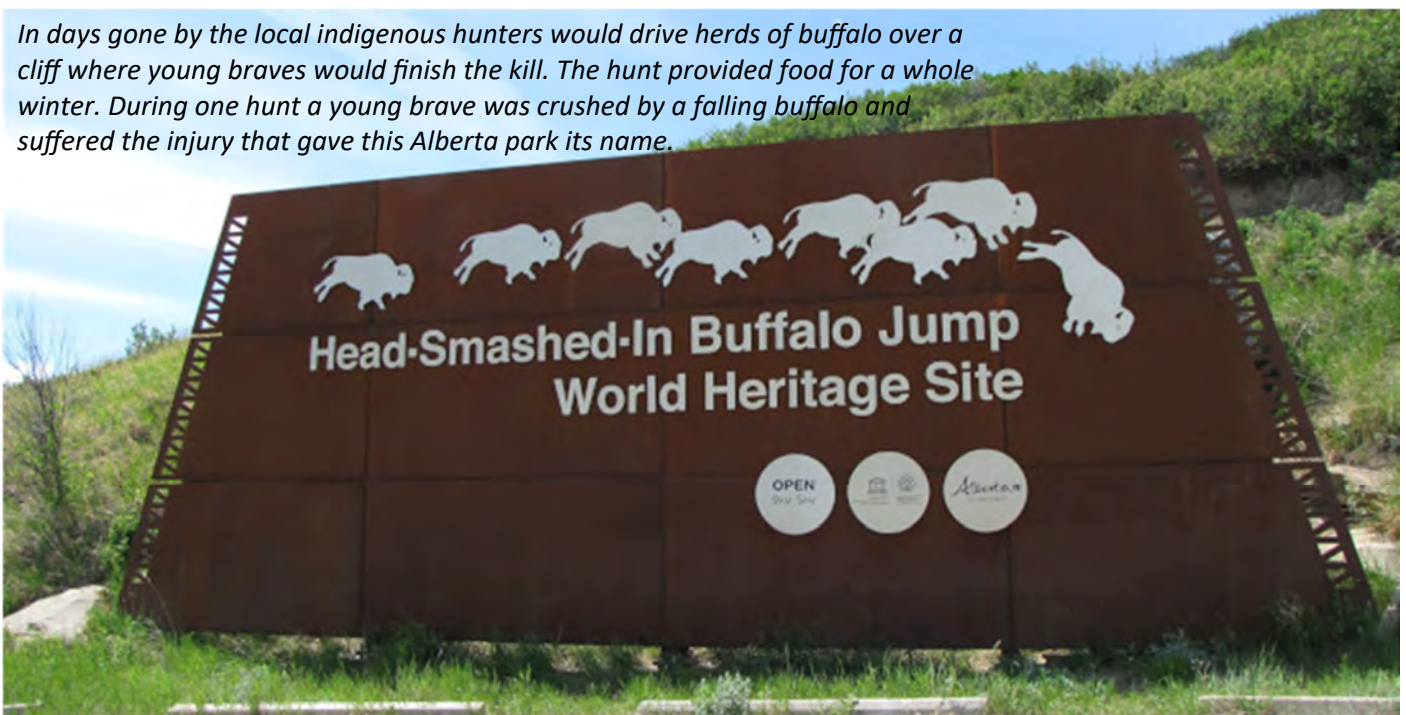
signing off with “73 44” you will know it is a WWFF QSO in which 44 contacts are required to activate a park. Some of the “Woof-Woof” programme rules are quite strict. If you are operating from inside multiple parks, you can only claim one for your activation, unlike POTA where one set of contacts can qualify for multiple activations in the right location. SSB participants in SOTA programmes greatly outnumber CW operators so, although getting 44 contacts by phone may be relatively easy, getting the same QSO count by CW is sometimes more challenging. Fortunately, QSO counts for operating sessions are cumulative so you can return to the same park as many times as is necessary to validate an activation.

POTA

From humble beginnings the Parks On The Air programme has exploded to become a formidable force in amateur radio. Every day there are multiple parks being activated around the world. The required QSO count to qualify an activation is 10. Ten is much more attainable than 44, but even so, there are days when even that number is a challenge. For those of us who like to handicap our operations by using QRP, a day of poor propagation conditions can bury our signals in the noise. I have participated in POTA for the last few years and

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In days gone by the local indigenous hunters would drive herds of buffalo over a cliff where young braves would finish the kill. The hunt provided food for a whole winter. During one hunt a young brave was crushed by a falling buffalo and suffered the injury that gave this Alberta park its name.





(Shacks On The Air anyone from page 64)

have had very few outings in which I experienced a “busted activation,” i.e. made fewer than 10 contacts. Some operators avoid busted activations by making HT to HT VHF simplex contacts with other hams in their group. If you think that’s a good idea there is a way to [make every POTA session an effortless success regardless of propagation conditions.](#)

POTA was predicated on the idea that fewer rules make for better participation. That is a good premise and has worked well making POTA the “elephant *outside* the room”. On the downside, even the few rules that are in place are not enforced. When I suggested a Park-to-Park contact should mean a contact between two *different* parks, POTA management politely suggested I should forget about it and just enjoy my own operations.

I read one account of an “activation” completed within 30 m of a park boundary. That is valid for trails, but not for actual parks. I know that particular park and it does not qualify for the 30 m

rule. Generally, an operator and all their equipment must be completely within a park’s boundary. But perhaps, if that rule does not work for you, “forget about it” and enjoy yourself.

The Drive-Thru activation

Unlike SOTA, POTA does not forbid operating from inside a vehicle. This has led to something variously called “Parking Lots On The Air (PLOTA)” or “Drive-Thru” activations. Mea Culpa; I have been guilty of this several times, but I try to avoid drive-thru activations except in winter. In winter, brave Canadians do not even button up our Mackinaws until it gets to 100 below and we stir our coffee with our thumbs. It is only out of respect for our radio equipment that we would even consider operating from inside the comfort of a vehicle when the howling wind is blowing the snow horizontally and the mercury in the thermometer is frozen solid.

In summer many of us prefer to enjoy a hike or visit some of the spectacular scenery in our parks

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Kakabeka Falls, northern Ontario, the “Niagara of the North.” If you gotta moment during your PLOTA activation, step outta the car and take a look.

(Shacks On The Air anyone from page 65)

before or after a radio session. But for some diehard POTA activators, the name of the game is contacts – lots of 'em – then drive on to the next park where once again its eyes down, antennas up; no time to get out of the car. We each enjoy our hobby in our own way.

All the other OTAs

There are so many OTA programmes these days it's getting out of hand. How about TOTA? Did you think it means Towers On The Air? You are correct. But it also means Toilets On The Air. How about that; you can play radio while attending to your bodily functions. I know of one ham who takes his Handy-Talkie into the shower, so he doesn't miss any calls from his buddies; SHOTA anyone? TOTA also means Tiles On The Air. A Tile is a Maidenhead sub-square about 5 km by 7 km.

I am surprised nobody has thought of What 3 Words On The Air (W3WOTA?, WWWOTA?). W3W is a ridiculous (my opinion) method of dividing the world up into small squares each designated by

three unique words. A lot of words are needed to identify all the world's locations, so some very rare and unusual words are employed. The English language is pronounced very differently around the world and even within the United States. I met a very interesting fella who proudly came from "the South" once. He explained that the words "pin" and "pen" are pronounced exactly the same where he came from. Imagine trying to battle poor propagation conditions while interpreting a strange dialect relaying a rare and unusual word. When I [posted on this topic](#) some time ago I received a comment that W3W is universally accepted by emergency responders and we should just get used to it. Yay, let's all get used to confusion and damn the torpedoes.

Don't laugh please

Try not to titter when I introduce the next OTA. It is called HEMA and stands for "Humps Excluding Marilyn's." I believe it is a European programme, but I have not come across it on this side of the

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The spectacular Athabasca Glacier along Icefields Parkway, Alberta. Maybe worth stepping out of the car to take a look. It is possible to hike right up to the base of the glacier or take a specially-equipped bus ride out on the ice.



(Shacks On The Air anyone from page 66)

Atlantic. My first reaction was to wonder why Marilyn's humps were excluded. I am sure HEMA has attracted a lot of jokes, but it is actually a serious programme. A "hump" is a summit with at least a 100-metre prominence, while a "marilyn" is a summit with at least a 150-metre prominence. So, a hump excluding marilyns is a summit with a prominence between 100 and 150 metres. Robert Ripley might have made a TV episode about this one.

I'm OOTA here

I have become involved with one of the new OTAs and have filed my first couple of logs. It is called "[Out On The Air \(OOTA\)](#)". As "the seasons go round and round and the painted ponies go up and down" (Joni Mitchell) the carousel of time begins to take its toll and I have less energy than I used to have. Just a few winters ago I would strap on snowshoes and haul a sled full of radio equipment across the deep and crisp and even white landscape to do an outdoor winter activation. No more. Maybe less inclination to join the OTA rat race too. Now I am content to set up in the

sunshine and enjoy just being outdoors with my radio and maybe a newly built antenna. If I make a few contacts, I am satisfied. The great thing about OOTA is that there is really only one rule – just get out of the shack and make at least one contact. That's just fine with me. If you do a POTA or "Woof Woof" activation, or you activate a hump that was not Marilyn's that counts too. Softly, softly, catchee monkey; relax, breathe; soak up the summer sun; enjoy life, it does not last forever.

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Other transceivers

Daniel Romila, VE7LGG



Many radio operators are looking to buy cheaper usable transceivers or simply want to feel the adventure of using something new and exotic. One such transceiver is the HSM1 monoband 50 Watts:

It is a 1 kilogram, 5,5 x 15 x 16 cm (+ 3 cm for heatsink) piece of equipment. At the beginning of May 2026, it can be bought for around 150 USD (205 CAD) from ebay and from hambuilder.com. I tried to find an independent review on YouTube, but a fast search did not get any result. Maybe at the later moment in time when this article will be published you will be luckier.

A bigger brother is HBR4HFX -100W SSB/CW HF 4-Bander Transceiver (80, 40, 30 and 20 m) for some 255 USD (349 CAD).

This transceiver went through several versions and it is available for several years now. Due to its cheap price as new, a second hand such transceiver (actually just several years old, in new, modern technology)

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(Other Transceivers from page 67)

is a serious competition to the big-name transceivers sold 4 - 5 times more expensive as second hand and being 20 - 30 years old. *But set your expectations lower than for Icom, Yaesu, Kenwood and do your research for commonly known problems and see if they were solved or not in the while.*

More known are the transceivers from HF Signals (India). The zBitx v2 (left) has 5 Watts with a price of



269 USD and the initial version is cheaper, also 5 Watts, just 169 USD (right):

Those transceivers know to do all kind of things (like CW, FT8, logging), in addition to the normal radio communication function. People play with their firmware and you can find plenty of information online. They are built around Raspberry Pi boards, so they can be connected to an external display, can function with a mouse and keyboard and so on.



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(Shacks On The Air anyone from page 68)

While more expensive (399 USD = 546 CAD) the sBitx v3, the bigger brother, has 25 Watts.

If you become over excited about the above SDR transceiver choices, please immediately have in mind that you will not obtain the same 1 MHz bandwidth waterfall as for ICOM 7300 and YAESU FT710, but just some 25 KHz.

The transceiver commercially known as Wolf, or RS998, or Zastone 7500 has a bandwidth of 384 kHz (still not on par with the big names). The cost comes very close to the big-name transceivers, around some 1 300 USD (1 778 CAD) for the 100 Watts version which is also capable of Tx and Rx in the 144 MHz band and only Rx in the 432 MHz band.

I started this article as research for myself to find out if there is any chance to buy a transceiver outside of the known path, not from the main manufacturers and still obtain some quality and money saving. I was mostly interested in the SDR transceivers, with waterfall as large as possible and with external display capability. Nowadays it is pointless – in my humble opinion – to buy a transceiver which does not have an external display option. Those radio amateurs who have an SDR with waterfall and just a small 5-7 inches display and are happy, they practically continue to work as with a non-SDR transceiver, because this is how they got used to, for many years. I cannot imagine myself hunting for stations without having the 34 inches curved monitor as full display. This eliminates from the start many models like YAESU FTX1, YAESU FT991A, ICOM 7300.

In the budget range there are today (May 2026) only two models I would consider: YAESU FT710, ICOM 7300 MK2.

Once somebody tried to have a big display for his/her transceiver, an initial 500 kHz (or 1 MHz) band scope to see everything/almost everything in the HF band initially before setting to the working 100 kHz band scope, there is no coming back. It is addictive. This eliminates the XIEGU G90 from being taken into consideration by me, because it has a maximum 48 kHz band scope.

I also got used to stay continuously with the hand on the NOTCH filter and DSP. This might be a habit related with using a YAESU FT710 and not an ICOM 7300 and on the fact I have a visual continuous feedback on a very large display.



Telemetry via Re-Purposed WSPR for Pico Balloons

Stewart Clark ZR1WT

WSPR, developed by Joe Taylor K1JT, is a great way to monitor Pico balloon as they float around the world in jet-streams typically at an altitude ~13 km, as there are 10's of 1 000's of amateurs with automatic WSPR receivers listening 24/7.

Each time a valid WSPR message is successfully decoded, it is uploaded to the WSPR website at <https://www.wsprnet.org/>

Most of the time a pico balloonist cannot receive the signal due to bad propagation conditions from the balloon to the pico balloon owner's QTH, however, others may receive it and report it!

Below we have a typical graphic from a WSPR decoding website e.g. wspr.rocks. Red dots being the balloon and white dots the spotters.

This, however, only displays location and the signal strength as received by the spotter.

Pico-Balloonists want more. For example, altitude, temperature and more. WSPR does not support this type of data.

A standard WSPR transmission contains only these three fields:

- ◆ 6-character call sign (28 bits)
- ◆ 4-character Maidenhead grid locator (15 bits)
- ◆ Power level (7 bits)

There have been many approaches to sending more data (or telemetry) from a pico-balloon.



Early Pico Balloon Tracking and Telemetry

Andy Nguyen, VK3YT pioneered long-range pico balloon tracking using JT9 which is part of the WSJT-X suite developed by Joe Taylor K1JT and allows global reception with only milliwatts of TX (sensitivity -27 dB SNR deep in the noise). However andy used custom telemetry encoding which required a modified version of WSJT-X to be distributed to the participating amateurs around the world wanting to decode the telemetry. Not ideal.

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(WSPR for Pico Balloons from page 70)

Hans Summers, GOUPL proposed an innovative twist: encode all telemetry directly into WSPR-like packets, allowing the global network of existing WSPR monitoring stations to unknowingly receive and upload the data to the WSPRnet database without needing special receivers or software.

This maximises reception potential for telemetry as there are already many HAMS with standard WSTJ -X receiving and decoding WSPR. And of course, at an even better sensitivity of -28dB SNR (deep in the noise).

Review of WSPR Message Content and Transmission

A standard WSPR transmission contains three fields:

- ◆ 6-character call sign (28 bits)
- ◆ 4-character Maidenhead grid locator (15 bits)
- ◆ Power level (7 bits)

These 3 fields combined form a 50-bit message which is first passed through a convolutional encoder with rate $\frac{1}{2}$ and constraint length 32, where each input bit is converted into two output bits using generator polynomials applied to a 32-bit shift register, meaning every output depends on the current bit and the previous 31 bits; this long memory spreads the information across the stream and provides strong redundancy, allowing powerful error correction at the receiver using algorithms such as Viterbi decoding.

The encoded bit stream is then interleaved, rearranging the order of bits so that burst errors from fading or interference are dispersed rather than clustered, improving decoding reliability. A known synchronisation vector is then combined with the data to provide a reference for precise time and frequency alignment at the receiver.

The final result is mapped into 162 symbols, which are transmitted using 4-FSK modulation (4-tone Frequency Shift Keying) at a symbol rate of 1,4648 baud. Total transmission time is 110,6 seconds with about a 6 Hz bandwidth. This optimises extremely weak signals, enabling reliable decoding well below the noise floor.

WSPR followed by Telemetry encoded WSPR

Hans Summers approach: The Pico-Balloon payload would still send a standard WSPR packet containing the call sign, Grid4 location and a power level followed by the proposed re-purposed WSPR packet containing the encoded telemetry data.

That is, in every 10-minute cycle, the first 2 minutes would be a standard WSPR packet, followed directly afterwards with a 2-minute telemetry packet, a total of 4 minutes.

How the telemetry is encoded into a WSPR lookalike packet is the subject of this article.

Standard Telemetry Encoded (U4B)

Hans settled on the follow standard telemetry which would be transmitted immediately after the standard WSPR packet.

- ◆ **Locator56** (the last 2 chars of a 6-char grid) would provide greater location resolution
- ◆ **Altitude** 0 m to 21 340 m
- ◆ **Temperature** -50 C to 39 C
- ◆ **Voltage** 3 to 4,95 V (of the power source to the payload)
- ◆ **Speed** 0 to 82 knots
- ◆ **GPSValid** = 0 or 1
- ◆ **HdrTelemetryType** = 0 or 1 (std telemetry)

The **GPSValid** field is used to indicate the telemetry is based on data from GPS with a valid lock. If full lock has not been acquired, one can still send the data and the receiving station knows how valid the data is.

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(WSPR for Pico Balloons from page 71)

The **HdrTelemetryType** is used to distinguish standard from other telemetry packets. Hans released that once the approach has been established others would may want to send other data eg pressure. If HdrTelemetryType is set to 1, then it is the standard telemetry (U4B as above) and well defined. Setting to 0, allows balloonists to send non-standard telemetry and decoding has to be specified. More on this aspect later.

The approach allows several telemetry packets to be sent in one 10 minute transmission cycle.

How to Encode the Telemetry into WSPR

Real-world measurements (temperature, voltage, pressure, etc.) are continuous or high-resolution, so must be mapped to bounded integer ranges (i.e. **normalised** and **quantised**) to send as binary telemetry data.

Selecting suitable step sizes leads to the following bit usages (using Log2 of quantisation):

- ◆ **Locator56** (last 2 chars can be A-X i.e. 24*24 combinations) 576 values (**9,2 bits**)
- ◆ **Altitude** 0 m to 21 340 m, steps of 20 m, 1 068 values (**10,1 bits**)
- ◆ **Temperature** -50 C to 39 C, steps of 1 C, 90 values (**6,4 bits**)
- ◆ **Voltage** 3 to 4,95 V, steps of 50 mV, 40 values (**5,3 bits**)
- ◆ **Speed** 0 to 82 knots, steps of 2 knots, 42 values (**5,4 bits**)

e.g. Voltage (after normalisation and quantisation) would be stored as 0-39

Encode using Mixed Radix Packing

One approach would pack the fields next to each other. But this can be very wasteful of the limited bits available in a WSPR packet (eg Locator56, a 9,2-bit field, would require 10 bits) and further would not resemble a valid WSPR packet!

There is a better way resulting in no wasted bit space and the resulting packet would pass as a WSPR packet. The technique is **mixed radix packing**. The radix refers to the quantisations of the various telemetry components. All the telemetry fields are combined into a single large number by encoding using mixed radix packing.

Then use **mixed radix unpacking** of this large number into the 3 **WSPR fields** each having their own and different quantisation. This will result in valid WSPR look alike fields.

Tutorial on Mixed-Radix Packing Technique

The technique of mixed radix packing combines fields of different ranges into a single large integer. An example of 3 fields with different quantisations will demonstrate the technique.

v1_size = 50 (radix 50 i.e. 50 different values after Quantisation of the values)

v2_size = 20

v3_size = 80

From the above quantisation, we require $50 \times 20 \times 80 = 80\,000$ distinct values to encode the 3 variables into a BigNum.

$\text{Log}_2 80\,000 = 16,28$ bits

Individually would require:

$\text{Log}_2 50 = 5,64$ bits

$\text{Log}_2 20 = 4,32$ bits

$\text{Log}_2 80 = 6,32$ bits

Total 18 (when rounding up to the nearest whole number of bits, which would waste nearly 2 bits)

Encoding into a Single BigNumber

Encoding in reverse order, that is, start with v3

BigNum = 0

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(WSPR for Pico Balloons from page 72)

$\text{BigNum} = \text{BigNum} * \text{v3_size} + \text{v3}$

$\text{BigNum} = \text{BigNum} * \text{v2_size} + \text{v2}$

$\text{BigNum} = \text{BigNum} * \text{v1_size} + \text{v1}$

e.g. $\text{v1}=42, \text{v2}=17, \text{v3}=65$

$\text{BigNum} = ((0*80 + 65)*20 + 17)*50 + 42 \Rightarrow 65,892$

This guarantees a reversible mapping.

Decoding from the BigNumber

Restoring $\text{v1}, \text{v2}$ & v3 is the reverse of the encoding and starts with v1 .

Note:

% is modulus (i.e. the integer remainder after division)

// is integer division (i.e. result is an integer, dropping any resulting decimals)

Using $\text{BigNum} = 65,892$ (from the example).

$\text{v1} = \text{BigNum} \% 50 \Rightarrow 42$ modulus of BigNum by the quantisation of v1 (i.e. 50) restores v1

$\text{BigNum} = \text{BigNum} // 50$ remove the previous variable from BigNum by integer divide by the previous variable's quantisation (i.e. 50)

$\text{v2} = \text{BigNum} \% 20 \Rightarrow 17$ modulus of BigNum by the quantisation of v2 (i.e. 20) restores v2

$\text{BigNum} = \text{BigNum} // 20$ remove the previous variable from BigNum by integer divide by the previous variable's quantisation (i.e. 20)

$\text{v3} = \text{BigNum} \% 80 \Rightarrow 65$ modulus of BigNum by the quantisation of v3 (i.e. 80) restores v3

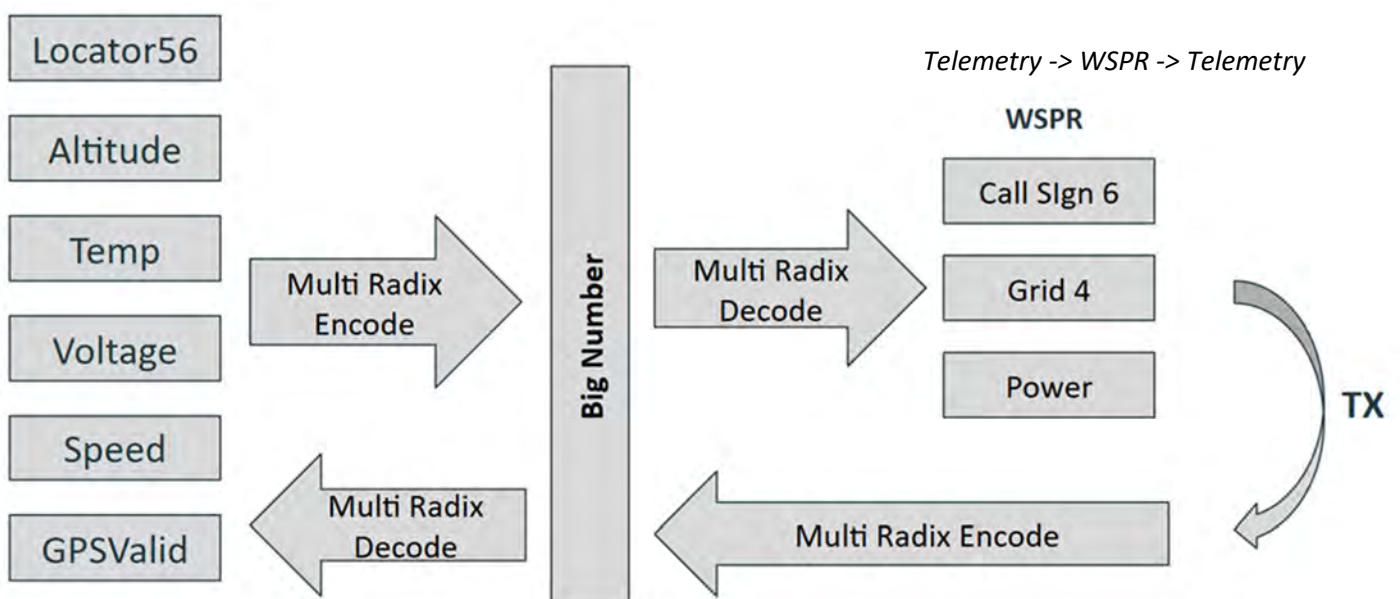
How to use Mixed-Radix Packing for Telemetry -> WSPR

The procedure is to encode the telemetry values **Locator56**, **Altitude**, **Temperature**, **Voltage** and **Speed** using mixed radix packing with the quantisation of the fields into a **Big Number**.

In order to send this as a WSPR packet, this **Big Number** must be decoded into the 3 valid WSPR fields: **Call sign**, **Grid** and **Power Level** using the quantisation of these WSPR fields. The resulting WSPR detail will be valid and acceptable by WSPR receivers and decoders.

On the receiving end, to recover the telemetry, the 3 WSPR fields are decoded using mixed radix packing with the specific quantisation of the WSPR fields into a **Big Number** and then decode using the quantisation of the telemetry fields back into the original telemetry items.

(Continued on page 74)





(WSPR for Pico Balloons from page 73)

In summary, the telemetry values are encoded to 3 WSPR fields going via an intermediate **Big Number** and on the receiver encode the 3 WSPR fields into a **BigNumber** and then decode to the original into the telemetry fields. The graphic on the previous page should make it clearer as to what is happening:

WSPR and Telemetry Linking

To link this telemetry WSPR packet with the base WSPR packet and to cater for and identify multiple trackers all transmitting in the same band, the concept of a channel number (0-599) was devised by Hans.

The channel number is encoded into 3 aspects of the telemetry packet

- ◆ Call sign: 1st and 3rd chars
- ◆ The even numbered minute slot within the 10-minute cycle that TX starts,
- ◆ The lane (frequency within 200hz WSPR bandwidth) to TX in.

Call sign C1 and C3 Detail

The call sign possible 1st and 3rd chars are specified as:

- ◆ First char: 0,1, or Q (not a valid call sign so wont clash with any real call sign)
- ◆ 3rd char: 0-9

(30 possibilities)

Lane or Frequency

Part of the channel number determines the lane in which that tracker should TX in. 4 lanes have been specified which correspond to 1 of 4 frequencies in the WSPR band to TX in.

The WSPR band width is 200 Hz and this is divided into 4 lanes.

For example, in the 10 m band, the 4 lanes are standardised and centred on

- ◆ 28 126,020 Hz
- ◆ 28 126,060 Hz
- ◆ 28 126,140 Hz
- ◆ 28 126,180 Hz

Slot Number within the 10-minute Cycle

Finally, the even numbered minute slot within the 10-minute cycle in which to start TXing i.e. 0,2,4,6,8 (there are 5 slots in a 10 min cycle)

Taking the 3 encodings of the channel, 30 (call sign), 4 (lanes) and 5 (slot), we have 600 combinations in total which provides 600 **channels**. The channels are numbered is 0-599.

Reserving a Channel using the Channel Map

Channel map configuration is provided by Traquito <https://traquito.github.io/channelmap> – see below. There are 600 channels (0 - 599) for each WSPR band available. To reserve a channel, login using one's call sign and select an unused channel number.

For example, a tracker that has been assigned channel 463, in the 10 m band.

Call sign 1st and 3rd chars of the telemetry packet will be "Q" & "3" respectively.

Start transmitting with a standard WSPR packet in the 0th minute of each 10 minute segment, followed by the telemetry packet.

The TX central frequency will be 28 126,020Hz (lane 1).

Note: More than 1 telemetry packet can be sent, each one follows the previous, with a maximum of 4 per 10-minute cycle.

Typical WSPR decodes

(Continued on page 75)



00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	Q0	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	min	lane	frequency
0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540	560	580	4	1	28,126,020
1	21	41	61	81	101	121	141	161	181	201	221	241	261	281	301	321	341	361	381	401	421	441	461	481	501	521	541	561	581	6	1	28,126,020
2	22	42	62	82	102	122	142	162	182	202	222	242	262	282	302	322	342	362	382	402	422	442	462	482	502	522	542	562	582	8	1	28,126,020
3	23	43	63	83	103	123	143	163	183	203	223	243	263	283	303	323	343	363	383	403	423	443	463	483	503	523	543	563	583	0	1	28,126,020
4	24	44	64	84	104	124	144	164	184	204	224	244	264	284	304	324	344	364	384	404	424	444	464	484	504	524	544	564	584	2	1	28,126,020
5	25	45	65	85	105	125	145	165	185	205	225	245	265	285	305	325	345	365	385	405	425	445	465	485	505	525	545	565	585	4	2	28,126,060
6	26	46	66	86	106	126	146	166	186	206	226	246	266	286	306	326	346	366	386	406	426	446	466	486	506	526	546	566	586	6	2	28,126,060
7	27	47	67	87	107	127	147	167	187	207	227	247	267	287	307	327	347	367	387	407	427	447	467	487	507	527	547	567	587	8	2	28,126,060
8	28	48	68	88	108	128	148	168	188	208	228	248	268	288	308	328	348	368	388	408	428	448	468	488	508	528	548	568	588	0	2	28,126,060
9	29	49	69	89	109	129	149	169	189	209	229	249	269	289	309	329	349	369	389	409	429	449	469	489	509	529	549	569	589	2	2	28,126,060
10	30	50	70	90	110	130	150	170	190	210	230	250	270	290	310	330	350	370	390	410	430	450	470	490	510	530	550	570	590	4	3	28,126,140
11	31	51	71	91	111	131	151	171	191	211	231	251	271	291	311	331	351	371	391	411	431	451	471	491	511	531	551	571	591	6	3	28,126,140
12	32	52	72	92	112	132	152	172	192	212	232	252	272	292	312	332	352	372	392	412	432	452	472	492	512	532	552	572	592	8	3	28,126,140
13	33	53	73	93	113	133	153	173	193	213	233	253	273	293	313	333	353	373	393	413	433	453	473	493	513	533	553	573	593	0	3	28,126,140
14	34	54	74	94	114	134	154	174	194	214	234	254	274	294	314	334	354	374	394	414	434	454	474	494	514	534	554	574	594	2	3	28,126,140
15	35	55	75	95	115	135	155	175	195	215	235	255	275	295	315	335	355	375	395	415	435	455	475	495	515	535	555	575	595	4	4	28,126,180
16	36	56	76	96	116	136	156	176	196	216	236	256	276	296	316	336	356	376	396	416	436	456	476	496	516	536	556	576	596	6	4	28,126,180
17	37	57	77	97	117	137	157	177	197	217	237	257	277	297	317	337	357	377	397	417	437	457	477	497	517	537	557	577	597	8	4	28,126,180
18	38	58	78	98	118	138	158	178	198	218	238	258	278	298	318	338	358	378	398	418	438	458	478	498	518	538	558	578	598	0	4	28,126,180
19	39	59	79	99	119	139	159	179	199	219	239	259	279	299	319	339	359	379	399	419	439	459	479	499	519	539	559	579	599	2	4	28,126,180

(WSPR for Pico Balloons from page 74)

An example typical WSPR packet stream using ZR6WT on channel 263 would start with the standard WSPR entry (ZR6WT) followed by 3 telemetry WSPR packets.

First WSPR packet is as expected with ZR6WT, grid 4 and TX power level
Telemetry packets follow immediately after the WSPR packet.

The channel is 463, so the 1st and 3rd chars of the telemetry WSPR packet's callsign are "Q" and "3." This and the timing (starts on 0th minute) are used to link these telemetry packers to the initial WSPR packet.

y-m-d	local	txCall	txGrid	rxCall	rxGrid	MHz
2026-04-13	18:12	Q83TNN	NP08	ZR1WT	KF16ga	28.126206
2026-04-13	18:10	ZR6WT	KF16ga	ZR1WT	KF16ga	28.126206
2026-04-13	18:02	Q83TNN	OA70	ZR1WT	KF16ga	28.126205
2026-04-13	18:00	ZR6WT	KF16ga	ZR1WT	KF16ga	28.126206
2026-04-13	17:52	Q83TNN	OA62	ZR1WT	KF16ga	28.126207
2026-04-13	17:50	ZR6WT	KF16ga	ZR1WT	KF16ga	28.126207
2026-04-13	17:42	Q83TNN	OA70	ZR1WT	KF16ga	28.126208
2026-04-13	17:40	ZR6WT	KF16ga	ZR1WT	KF16ga	28.126209

Interpreting these telemetry packets

There are few websites that can interpret these telemetry packets: For example: traquito.github.io, wsprtv.com, lu7aa.org and qrp-labs.com use this channel information to combine the packets and present the balloon's position and telemetry in a human-readable form. More on this later.

Encoding into WSPR – more Detail

In practice, the technique partitions the telemetry fields into 2 groups, that is 2 big numbers. The first will decode into the **6-char call sign** (632 736 values) and the second will decode into the **4 char grid and power level** (615 600 values)

The telemetry values chosen for 1st big number are **Locator56** and **Altitude**.

Quantisation: 576*1068 = 615 168 (see earlier quantisation analysis)

The telemetry values chosen for second big number are **Temperature, Voltage, Speed, GPSValid** and **HdrTelemetryType**.

Quantisation: 90*40*42*2*2 = 604 800 (see earlier quantisation analysis)

The quantisation of the 6 char call sign is just slightly bigger than the 2 telemetry fields, so will work without loss. Similarly for the 4 char grid and power level of the WSPR packet.

(Continued on page 76)

*(WSPR for Pico Balloons from page 75)***Telemetry Fields mapped to the Call sign field**

As stated earlier, the following telemetry parameters are encoded into the Callsign6 field.

Parameter	Range	Step Size	Quantisation	Normalisation
Altitude	0 - 21340m	20 m	1068	0 - 1067
Locator56 ...			576	
Locator5	A-X	1	24	0 - 23
Locator6	A-X	1	24	0 - 23

Step1 – Encode to BigNumber

The telemetry values are packed into a single BigNumber using multi-radix packing, in reverse order (as explained earlier) starting with Locator5, then Locator6 and ending with Altitude:

$$\text{BigNum} = (\text{Locator5_ord} * 24 + \text{Locator6_ord}) * 1068 + \text{Altitude}$$

Step2 – Decode BigNumber into the Various Characters of the CallSign

The WSPR callsign is 6 chars long, with a format of C1C2C3C4C5C6

Where **C1** (0, 1, Q) & **C3** are fixed for the channel, leaving only 3 alphas (**C4**, **C5**, **C6**) and 1 alpha/numeric (**C2**) available for encoding.The quantisations for **C4**, **C5**, **C6** are 26 each and for **C2** is 36 (alphanumeric)

Reverse radix decoding using the quantisation of various callsign characters

$$c6 = \text{chr}(\text{BigNum} \% 26 + 65)$$

$$\text{BigNum} //= 26$$

$$c5 = \text{chr}(\text{BigNum} \% 26 + 65)$$

$$\text{BigNum} //= 26$$

$$c4 = \text{chr}(\text{BigNum} \% 26 + 65)$$

$$\text{BigNum} //= 26$$

$$\text{msw} = \text{BigNum} \% 36$$

$$c2 = \text{chr}(\text{msw} + \text{ord}('0')) \text{ if } \text{msw} < 10 \text{ else } \text{chr}(\text{msw} - 10 + \text{ord}('A'))$$

(normalisation depending on 0-9 or A-Z)

Finally callsign = c1 + c2 + c3 + c4 + c5 + c6

Telemetry Fields mapped to the Grid4 & Pwr fieldsThe following telemetry parameters are encoded in the **Grid4** and **Power** fields.

Parameter	Range	Step Size	Quantisation	Normalisation
HdrTelemetryType	constant = 1	1	2	0 or 1
GPSValid	0 or 1	1	2	0 or 1
Speed	0–82 knots	2 knots	42	0-41
Battery voltage	3000–4950mV	50mV	40	-3000 -> 0 to 39
Temperature	-50°C to +39°C	1°C	90	+50 -> 0 to 89

(Continued on page 77)



(WSPR for Pico Balloons from page 76)

Step1 – Encode to BigNumber

The telemetry values are packed into a single **BigNum** using multi-radix encoding, starting with **Temperature**: $\text{BigNum} = (((\text{Temp_int} * 40 + \text{Bat_int}) * 42 + \text{Speed_int}) * 2 + \text{GPSValid}) * 2 + \text{HdrTelemetryType}$

Step2 – Decode BigNumber into the characters of Grid4 and the Power Level

The WSPR **Grid** (4 chars) has the format: **aann** where **a** = A–R (18 values), **n** = 0–9 (10 values). **Power Level** contains 19 allowed values: [0,3,7,10,13,17,20,23,27,30,33,37,40,43,47,50,53,57,60]. Hence Grid & Power Level space is $18*18*10*10*19$ which can accommodate 615 600 values. Reverse radix decoding using the quantisation of various grid4 characters and the power level:

$\text{power_index} = \text{BigNum} \% 19$

$\text{BigNum} // = 19$

$D = \text{BigNum} \% 10$

$\text{BigNum} // = 10$

$C = \text{BigNum} \% 10$

$\text{BigNum} // = 10$

$B = \text{BigNum} \% 18$

$\text{BigNum} // = 18$

$A = \text{BigNum} \% 18$

The final WSPR fields are then Constructed

grid =

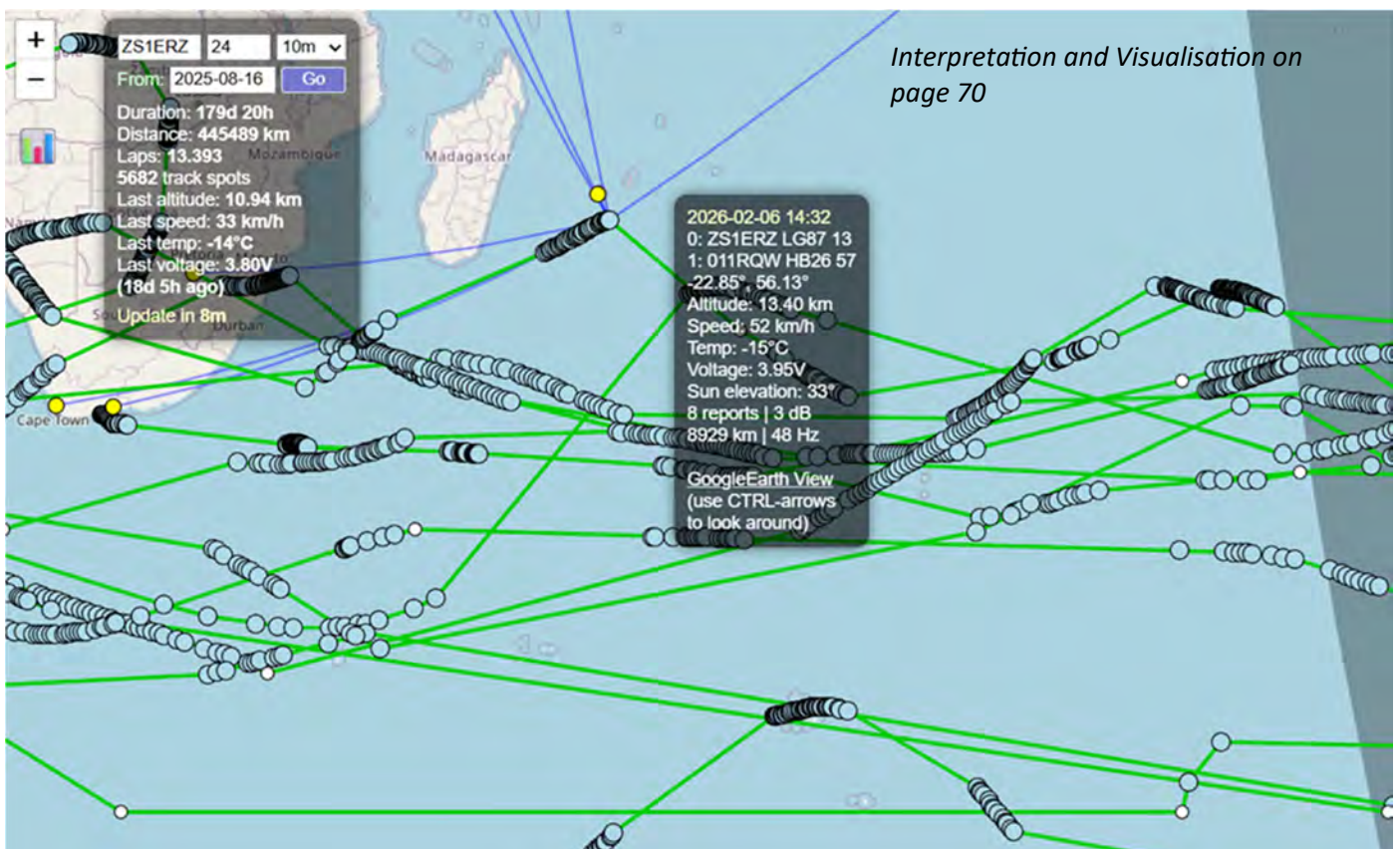
$\text{chr}(A + 65) +$

$\text{chr}(B + 65) +$

$\text{chr}(C + 48) +$

$\text{chr}(D + 48)$

(Continued on page 78)





(WSPR for Pico Balloons from page 77)

The WSPR power field contains 19 allowed values: POWERS = [0, 3, 7, 10, 13, 17, 20, 23, 27, 30, 33, 37, 40, 43, 47, 50, 53, 57, 60]. Use power_index to select the particular power level. power = POWERS [power_index] E.g. if power_index = 4, use power level =13

Interpretation and Visualisation

Tracking sites such as traquito.github.io, wsprtv.com, lu7aa.org and qrp-labs.com use this channel information to combine the two packets and present the balloon’s position and telemetry in a human-readable form. Using ZS1ERZ-12 as an example:

https://wsprtv.com/?cs=ZS1ERZ&ch=24&band=10m&start_date=2025-08-16&end_date=2026-02-13

Telemetry Detail and who Spotted it

Clicking the colourful bar chart icon (top left of the map) will switch to a display showing all the telemetry values. Further if the icon under the WSPR column is clicked, list of all the stations that received the particular WSPR packet and U4B telemetry packet.

#	Local Time	Grid	Track	Lat (°)	Lon (°)	Altitude (km)	VSpeed (m/min)	Speed (km/h)	CSpeed (km/h)	Voltage (V)	Temp (°C)	Sun (°)	# RX	Freq (Hz)	Max RX (km)	Max SNR (dB)	WSPR	
6884	2026-02-12 07:52	RH15rc	1	-14.90	163.46	10.94	-54	33		3.80	-14	25	10	58	6291	5		
6883	2026-02-12 07:42	RH15rb	1	-14.94	163.46	11.48	-30	37		4.05	-16	27	7	61	15177	-7		
6882	2026-02-12 07:32	RH15qb	1	-14.94	163.38	11.78	-28	44		4.10	-22	29	9	43	15183	-5		
6881	2026-02-12 07:22	RH15pb	1	-14.94	163.29	12.06	-10	52		4.15	-20	32	13	59	15190	-8		
6880	2026-02-12 07:12	RH15oa	1	-14.98	163.21	12.16	-20	52		4.05	-18	34	13	46	15193	-2		
6879	2026-02-12 07:02	RH15na	1	-14.98	163.13	12.36	-8	56	54	3.95	-18	37	13	46	15199	-10		
Time	TXCall	TXGrid	Pwr	RXCall	RXGrid	SNR	Dist	Freq										
07:02	ZS1ERZ	RH15	13	PT2FHC	GH64cg	-23	15199	28126038										
07:02	ZS1ERZ	RH15	13	VK1DF	QF44ot	-11	2642	28126038										
07:02	ZS1ERZ	RH15	13	VK1SV	QF44ox	-31	2626	28126039										
07:02	ZS1ERZ	RH15	13	VK1TZ	QF44nm	-21	2672	28126037										
07:02	ZS1ERZ	RH15	13	VK3KHZ	QF22pf	-26	3082	28126037										
07:02	ZS1ERZ	RH15	13	VK4EMM	QG621r	-24	1724	28126036										
07:02	ZS1ERZ	RH15	13	VK5ARG	PF95ht	-10	3254	28126036										
07:02	ZS1ERZ	RH15	13	VK5HW	PF94hk	-11	3344	28126038										
07:02	ZS1ERZ	RH15	13	VK700	QE37pd	-20	3448	28126043										
07:02	ZS1ERZ	RH15	13	ZL3AB	RE66im	-21	3297	28126058										
07:04	0I1ZVU	GI66	3	AI6VN/KH6	BL10rx	-24	5947	28126149										
07:04	0I1ZVU	GI66	3	NH6V	BK29cw	-20	5937	28126053										
07:04	0I1ZVU	GI66	3	VK1DF	QF44ot	-11	2642	28126033										
07:04	0I1ZVU	GI66	3	VK1TZ	QF44nm	-18	2672	28126033										
07:04	0I1ZVU	GI66	3	VK3AMW	QF221r	-19	3073	28126072										
07:04	0I1ZVU	GI66	3	VK3KHZ	QF22pf	-25	3082	28126033										
07:04	0I1ZVU	GI66	3	VK5ARG	PF95ht	-10	3254	28126032										
07:04	0I1ZVU	GI66	3	VK5HW	PF94hk	-11	3344	28126032										
07:04	0I1ZVU	GI66	3	VK700	QE37pd	-24	3448	28126039										
07:04	0I1ZVU	GI66	3	ZL3AB	RE66im	-19	3297	28126053										
6878	2026-02-12 06:52	RH15ma	1	-14.98	163.04	12.44	-22	63		4.10	-23	39	12	41	15206	1		
6877	2026-02-12 06:42	RH15la	1	-14.98	162.96	12.66	-18	63		4.05	-20	42	15	51	15212	0		

Extended Telemetry

The standard telemetry scheme designed by Hans Summers is a fixed set of parameters encoded into a WSPR message. While very useful and effective for most pico-balloons, it has limitations:

- ◆ The telemetry layout is hard-coded
- ◆ Adding new sensors requires redesigning the encoding
- ◆ The WEB based decoders would then have to understand the specific protocol variant

To solve this, Extended Telemetry (ET) was developed. It is a more flexible system for pico balloon telemetry. Instead of defining a fixed telemetry layout in the protocol, ET separates the system into two layers:

- ◆ Generic integer payload (ie the **Big Number**)
- ◆ External schema describing how to interpret it

(Continued on page 79)



(WSPR for Pico Balloons from page 78)

The transmitted WSPR packet carries a single packed integer (encoded into Callsign, Grid and Power Level) as for standard telemetry.

The WEB decoder uses the associated schema to unpack that integer into actual telemetry measurements.

Currently there are 2 approaches. The **ET0 (extended telemetry type 0)** and **CT (custom telemetry)**. Both define a header preceding the data. With **ET0** the header is more elaborate and takes up 9.3 bits of the limited 38.5 bits available. **CT** on the other hand defines only 1 extra header field **HdrSlot** besides the **HdrTelemetryType** (which is common to both approaches) and only takes up 3.3 bits of the 38.5 bits available.

ET0 is seen as a subtype of **CT** and hence is compatible with **CT**.

NB. **ET0** only aware systems wont decode **CT** correctly, but wont break the **ET0** decoding.

Extended Telemetry (ET0) Header

The Extended Telemetry (ET0) contains a header defined as follows

HdrTelemetryType (1 bit): 1=U4B, 0=ET

HdrRESERVED (2 bits) = 0 (always 0)

HdrType (4 bits) = 0 (usually 0)

HdrSlot = 0,1,2,3,4

Which takes up 9,3 bits of the limited 38,5 bits available

HdrSlot specifies in which 2 minute TX slot of the 10 minute window the telemetry will be sent.

- ◆ Slot 0: Usual WSPR packet
- ◆ Slot 1: Usual Std Telemetry known as U4B (by inventor Hans GOUPL)
- ◆ Slot 2,3,4: available for non-std telemetry (ie **HdrTelemetryType=0**)

Note: It is not necessary to send the U4B packet, one can send ET telemetry in all 4 slots

HdrTelemetryType:

- ◆ 0 => Non Std Telemetry (can be in slots 1,2,3,4)
- ◆ 1 => Std Telemetry (optional) always sent in slot 1

Traquito.com and the ET0 Schema

The traquito.github.io website allows simple json schemas to describe ET0 telemetry and hence can decode it:

```
[{ "name": "Ambient", "unit": "Celsius", "lowValue": -80, "highValue": 40, "stepSize": 1 },
{ "name": "Humidity", "unit": "Percent", "lowValue": 0, "highValue": 95, "stepSize": 5 },
{ "name": "Pressure", "unit": "MilliBars", "lowValue": 0, "highValue": 1100, "stepSize": 10 },
{ "name": "Altitude", "unit": "Meters", "lowValue": 0, "highValue": 50000, "stepSize": 50 }]
```

This approach allows custom telemetry layouts without changing the underlying WSPR transmission format. Here is a sample of the above telemetry definition and decoding on the website traquito.github.io. (graphic above. Ed.)

Voltage	TempF	AltFt	AltChgFpm	MPH	GpsMPH	DistMi	SolAngle	RxStationCount	WinFreqDrift	slot2.ud EncMsg	slot2.ud AmbientCelsius	slot2.ud HumidityPercent	slot2.ud PressureMilliBars	slot2.ud AltitudeMeters
3.90	-4	70,013	0	28	1	5	49	9	-2					
3.90	1	70,013	0	25	1	5	47	11	-3	074TPV_M071_23	-12	10	20	24,400
3.80	-17	70,013	1,677	25	1	12	45	10	0	064YDM_0162_60	-21	10	40	21,800
3.95	-31	36,483	1,129	69	1	6	41	8	-1	034NTW_0252_27	-36	10	140	11,100
4.05	16	25,197	1,588	14	0	0	39	9	2	024LSY_2127_10	-14	15	290	7,700
4.10	52	9,318	194	14	0	0	36	8	-2	004XTF_AB44_0	9	15	510	2,850
4.10	81	5,446	0	2	0	0	32	1	1	004HYQ_EQ89_17	33	40	840	1,650
4.10	84	5,446	0	0	0	0	30	1	0	004HYQ_CM13_30	33	35	840	1,650



(WSPR for Pico Balloons from page 79)

wsprtv.com and ET0 decoding

wsprtv.com decoding does not use a json schema and the decoding is specified in the URL. Here is an example: https://wsprtv.com/?cs=ZS1ERZ&ch=43&band=10m&start_date=2025-12-07&end_date=2025-12-19&et_dec=et0:0,s:2_121:-80:1,20:0:5,111:0:10,1001:0:50&et_labels=Ambient,Humidity,Pressure,Altitude&et_units=C,Pcent,MBars,M

#	Local Time	Grid	Track	Lat (°)	Lon (°)	Altitude (km)	VSpeed (m/min)	Speed (km/h)	CSpeed (km/h)	Voltage (V)	Temp (°C)	Sun (°)	# RX	Freq (Hz)	Max RX (km)	Max SNR (dB)	Rew ETZ	Ambient (C)	Humidity (Pcent)	Pressure (MBars)	Altitude (M)	WSPR
647	2025-12-18 07:20	AG03	0	-26.5	-179.0							17	1	32	3544	-29						
646	2025-12-18 07:10	AG03sj	1	-26.60	-178.46	9.76	1	93	87	3.80	-19	19	2	62	8756	-19	16096817922	-7	15	290	9350	
645	2025-12-18 07:00	AG03	0	-26.5	-179.0							21	1	70	8720	-27						
644	2025-12-18 06:40	AG03nm	1	-26.48	-178.88	9.74	-2	93	103	3.80	-7	26	3	70	8724	-20	16096817922	-7	15	290	9350	
643	2025-12-18 06:30	AG03in	1	-26.44	-179.04	9.76	-2	93		3.95	-15	28	1	72	8712	-18	16010859522	-7	15	290	9300	
642	2025-12-18 06:20	AG03jo	1	-26.40	-179.21	9.78	-2	93		3.85	-14	30	5	46	8700	-19	16010857922	-12	15	290	9300	
641	2025-12-18 06:10	AG03hp	1	-26.35	-179.38	9.80	0	89	88	3.85	-12	33	3	37	8688	-16	16096817262	-9	15	290	9350	
640	2025-12-18 06:00	AG03gq	1	-26.31	-179.46	9.80	2	93		3.95	-16	35	6	29	8680	-12	16096818562	-5	15	290	9350	
639	2025-12-18 05:50	AG03er	1	-26.27	-179.63	9.78	-2	89		3.85	-15	37	7	33	8668	-7	16096816962	-10	15	290	9350	
638	2025-12-18 05:40	AG03cs	1	-26.23	-179.79	9.80	0	89	85	3.85	-14	39	6	36	8656	-8	16182776322	-7	15	290	9400	
637	2025-12-18 05:30	AG03as	1	-26.23	-179.96	9.80	0	89		3.85	-16	42	9	27	8648	-11	16096853762	-16	20	290	9350	
636	2025-12-18 05:20	RG93xt	1	-26.19	179.96	9.80	0	89		3.75	-13	44	7	24	4049	-9	16096817922	-7	15	290	9350	
635	2025-12-18 05:10	RG93vu	1	-26.15	179.79	9.80	0	89	85	3.75	-10	46	10	25	12476	-11	16096816322	-12	15	290	9350	
634	2025-12-18 05:00	RG93tv	1	-26.10	179.63	9.80	0	89		3.75	-15	49	10	25	12491	-8	16096816642	-11	15	290	9350	
633	2025-12-18 04:50	RG93sv	1	-26.10	179.54	9.80	0	85		3.90	-20	51	9	25	4015	-12	16096852162	-21	20	290	9350	
632	2025-12-18 04:40	RG93qw	1	-26.06	179.38	9.80	0	89	85	3.75	-16	54	11	25	4002	-12	16096853442	-17	20	290	9350	
631	2025-12-18 04:30	RG93ox	1	-26.02	179.21	9.80	0	85		3.75	-10	56	11	31	5779	-11	16096854082	-15	20	290	9350	
630	2025-12-18 04:20	RG93nx	1	-26.02	179.13	9.80	0	85		3.70	-13	58	13	41	8008	-12	16096854082	-15	20	290	9350	

The url specification looks daunting, however, **wsprtv.com** provides a wizard to auto generate the URL. See https://wsprtv.com/tools/ct_wizard.html. Here is a screen shot of the telemetry wizard as specified earlier in the json format:

CT Message Definition

ET0 0 (User Defined) Slot 2

Custom Filters

[Add](#)

Value Extractors

Div: Mod: First value: Step: Label: Long label: Units: [Delete](#)

Div: Mod: First value: Step: Label: Long label: Units: [Delete](#)

Div: Mod: First value: Step: Label: Long label: Units: [Delete](#)

Div: Mod: First value: Step: Label: Long label: Units: [Delete](#)

[Add Opaque](#) [Add Native](#)

[Delete Message](#) [1.18 bits remaining (2 values)]

[Add Another CT Message](#)

Start date: End date:

[Generate URL](#) [Start Over](#)

Documentation is provided here: https://wsprtv.com/docs/user_guide.html



(WSPR for Pico Balloons from page 80)

Generic ET or Custom Telemetry (CT) proposed by Andy

Andy proposed a simpler telemetry packet to use only

HdrTelemetryType = 0 (ET) (1 bit) - always 0

HdrSlot = 0,1,2,3,4 # 5 values (2,3 bits)

The name Generic ET has been dropped and it is known simply as Custom Telemetry or **CT**. **CT** can store 38,5 – 3,3 => 35,2 bits for telemetry data.

NB although formally these 2 hdr items are logically the 1st 2 fields of the **CT** packet with the telemetry data following, before TXing the packet, HdrSlot is swapped with the data bits in the corresponding **ET0** position so that other non-**CT** aware systems will decode the **HdrTelemetryType** and **HdrSlot** correctly.

Below is an example of the wizard in action where slot 2 is using **ET0** for BME280 telemetry and slot 3 **CT** historical data.

CT Message Definition

ET0 0 (User Defined) Slot 2

Custom Filters
Add

Value Extractors

Div:	implied	Mod:	121	First value:	-80	Step:	1	Label:	Ambient	Long label:	= Label	Units:	C	Resolution:	0	Delete	!!
Div:	implied	Mod:	20	First value:	0	Step:	5	Label:	Humidity	Long label:	= Label	Units:	Pcent	Resolution:	0	Delete	!!
Div:	implied	Mod:	111	First value:	0	Step:	10	Label:	Pressure	Long label:	= Label	Units:	MBars	Resolution:	0	Delete	!!
Div:	implied	Mod:	1001	First value:	0	Step:	50	Label:	Altitude	Long label:	= Label	Units:	M	Resolution:	0	Delete	!!

Add Opaque Add Native

Delete Message [1.18 bits remaining (2 values)]

CT Message Definition

Custom Telemetry Slot 3

Custom Filters
Add

Value Extractors

Div:	implied	Mod:	20	First value:	-20	Step:	1	Label:	Day	Long label:	= Label	Units:	Days	Resolution:	0	Delete	!!
Div:	implied	Mod:	24	First value:	0	Step:	1	Label:	Hour	Long label:	= Label	Units:	Hr	Resolution:	0	Delete	!!
Div:	implied	Mod:	6	First value:	0	Step:	10	Label:	Minute	Long label:	= Label	Units:	Mins	Resolution:	0	Delete	!!
Div:	implied	Mod:	18	First value:	65	Step:	1	Label:	Grid1	Long label:	= Label	Units:	Chr	Resolution:	0	Delete	!!
Div:	implied	Mod:	18	First value:	65	Step:	1	Label:	Grid2	Long label:	= Label	Units:	Chr	Resolution:	0	Delete	!!
Div:	implied	Mod:	10	First value:	48	Step:	1	Label:	Grid3	Long label:	= Label	Units:	Num	Resolution:	0	Delete	!!
Div:	implied	Mod:	10	First value:	48	Step:	1	Label:	Grid4	Long label:	= Label	Units:	Num	Resolution:	0	Delete	!!
Div:	implied	Mod:	26	First value:	0	Step:	1000	Label:	Altitude	Long label:	= Label	Units:	M	Resolution:	0	Delete	!!
Div:	implied	Mod:	14	First value:	0	Step:	10	Label:	Speed	Long label:	= Label	Units:	Knots	Resolution:	0	Delete	!!

Add Opaque Add Native



(WSPR for Pico Balloons from page 81)

Generic ET Example

Pico balloon light, ZR6WT-12 (channel 463 in the 10m band) with 2 ET packets, 1 being a Generic ET packet: BME280 data in Slot2 (ET0) and Flight History in Slot3 (GenericET)

https://wsprtv.com?cs=ZR6WT&ch=463&band=10m&start_date=2026-02-06&end_date=2026-03-30&et_dec=et0:0,s:2_121:-80:1,20:0:5,111:0:10,1001:0:50~et,s:3_20:-20:1,24:0:1,6:0:10,18:65:1,18:65:1,10:48:1,10:48:1,26:0:1000,14:0:10&et_labels=Ambient,Humidity,Pressure,Altitude,Day,Hour,Minute,Grid1,Grid2,Grid3,Grid4,Altitude,Speed&et_units=C,Pcent,MBars,M,Days,Hr,Mins,Chr,Chr,Num,Num,M,Knots

#	Local Time	Grid	Track	Lat (°)	Lon (°)	Altitude (km)	VSpeed (m/min)	Speed (km/h)	CSpeed (km/h)	Voltage (V)	Temp (°C)	Sun (°)	# RX	Freq (Hz)	Max RX (km)	Max SNR (dB)	Raw ET2	Raw ET3	Ambient (C)	Humidity (Pcent)	Pressure (MBars)	Altitude (M)	Day (Days)	Hour (Hr)	Minute (Mins)	Grid1 (Chr)	Grid2 (Chr)	Grid3 (Num)	Grid4 (Num)	Altitude (M)	Speed (Knots)	WSPR	
46	2026-03-07 18:10	KF16	0	-33.5	23.0								9	1 197	68	-6																	
45	2026-03-07 18:00	KF16	0	-33.5	23.0								11	1 195	68	-4		280055148						-11	15	50	75	70	49	54	0	0	
44	2026-03-07 17:50	KF16ga	1	-33.98	22.54	0.24	0	0	0	4.60	13	14	1	196	0	-3	78671682	280045553	18	55	1010	0	-10	15	10	75	70	49	54	0	0		
Time TXCall TXGrid Par RXCall RXGrid SNR Dist Freq 17:50 ZR6WT KF16ga 13 ZR6WT KF16ga -4 @ 28126197 17:52 Q811NO #H88 23 ZR6WT KF16ga -4 @ 28126197 17:54 Q816ZY #K42 60 ZR6WT KF16ga -3 @ 28126196 17:56 Q8183T #O68 53 ZR6WT KF16ga -3 @ 28126195																																	
43	2026-03-07 17:40	KF16ga	1	-33.98	22.54	0.24	0	0	0	4.60	13	16	1	196	0	-3	78671682	280050853	18	55	1010	0	-10	20	30	75	70	49	54	0	0		
42	2026-03-07 17:30	KF16ga	1	-33.98	22.54	0.24	0	0	0	4.60	14	18	1	195	0	-3	77897282	280044758	18	55	1000	0	-9	7	10	75	70	49	54	0	0		

wsprtv.com goes even further. One can alternatively send more than 1 type of telemetry in a particular slot. A filter can be specified to select the decoding to use.

In the example below, both have a HdrType which is either 0 or 1 to indicate the type of telemetry.

CT Message Definition
Custom Telemetry [Slot 2]

Custom Filters
Type: Regular Div: implied Mod: 2 Value: 0 [Delete]
[Add]

Value Extractors

Div: 5	Mod: 2	First value: 0	Step: 1	Label: HdrType	Long label: [= Label]	Units: none	Resolution: 0	[Delete]
Div: implied	Mod: 121	First value: -80	Step: 1	Label: Ambient	Long label: [= Label]	Units: C	Resolution: 0	[Delete]
Div: implied	Mod: 20	First value: 0	Step: 5	Label: Humidity	Long label: [= Label]	Units: PCent	Resolution: 0	[Delete]
Div: implied	Mod: 111	First value: 0	Step: 10	Label: Pressure	Long label: [= Label]	Units: MBars	Resolution: 0	[Delete]
Div: implied	Mod: 1001	First value: 0	Step: 50	Label: Altitude	Long label: [= Label]	Units: M	Resolution: 0	[Delete]

[Add Opaque] [Add Native]

[Delete Message] [6.18 bits remaining (72 values)]

CT Message Definition
Custom Telemetry [Slot 2]

Custom Filters
Type: Regular Div: implied Mod: 2 Value: 1 [Delete]
[Add]

Value Extractors

Div: 5	Mod: 2	First value: 0	Step: 1	Label: HdrType	Long label: [= Label]	Units: none	Resolution: 0	[Delete]
Div: implied	Mod: 25920	Type: [121] Lon						[Delete]
Div: implied	Mod: 32400	Type: [124] Grid4 Lat Res						[Delete]
Div: 10	Mod: 25920	First value: 0	Step: 1	Label: 10Min	Long label: [= Label]	Units: none	Resolution: 0	[Delete]
Div: implied	Mod: 32400	First value: 0	Step: 1	Label: Grid4	Long label: [= Label]	Units: none	Resolution: 0	[Delete]

[Add Opaque] [Add Native]

[Delete Message] [4.54 bits remaining (23 values)]

[Add Another CT Message]



(WSPR for Pico Balloons from page 82)

One slot type entry (**HdrType=0**) is BME280 telemetry. The alternate slot (**HdrType=1**) is historical data

Finally Why only 38,5 bits of the 50bits?

In total the telemetry requires $615\ 168 * 604\ 800 \Rightarrow 372\ 053\ 606\ 400$ possible values requires $\sim 38,4$ bits. The WSPR packet has a total space of 50 bits available for data. However, because C1 & C3 are used for linking, these 936 values (9,8 bits) are lost. Further, of the 7 bits allocated to the power level, only 4,2 (corresponds to 19 values) are available (the rest are used for WSPR type internals), Finally we have 38,5 bits usable.

That's it!

If you would like more information or clarification on anything in this article, fell free to contact me. Stewart Clark ZR1WT - Stewart.Gadget@gmail.com

HF Update

Dennis Green, ZS4BS

All Africa Award

Central African Republic, TL. Joao, CR7BNW is operating as TL8BNW until June. Activity is on 40, 20, 15 and 10 metres using SSB and digital with a dipole.

The Gambia, C5. Arnaud, F4AGG and Kuc, F5RAV will be active as C5B, C5C and C5D between 25 April and 8 May. C5B from Bijolo AF-06 with satellite activity, C5C using CW and SSB and C5D from the mainland using RTTY, PSK and other digital modes. QSL via F5RAV direct, LoTW.

Namibia, V5. Eric, V5/N7XOB is travelling for a month (mid-May to mid-June) and will be active from various locations and grids. QSL via LoTW.

Tanzania, 5H. Kasimir, DL2SBY will again be operating as 5H1KB between 3 and 12 June with a focus on 6 metres during his trip. QSL via home call and LoTW.

Tanzania, 5H. Chas, NK8O will once again be operating as 5H3DX between 8 June and 2 July. Operation from 30 to 10 metres using CW, SSB and digital. QSL via NK8O, LoTW or OQRS.

Namibia, V5. Hanspeter, HB9BFM will be active as V5/HB9BFM between 26 August and 20 September. He will be active from different locations between 16:00 and 19:00 UTC using Olivia 8/250 at 14 072.000 kHz.

D.R. of Congo, 9Q. The Mediterranean DX Club will be active as 9T0MD between 30 September and 11 October. The 9T prefix has never been used



before. Operation from 160 to 6 metres using CW, SSB and digital and the QO-100 satellite and EME. More to follow.

Mozambique, C8. The Czech DX Team will be active as C8K during September and October 2026. Operation from 160 to 6 metre and QO-100, RS-44, IO-117 using CW, SSB and digital. Club Log live stream if possible. QSL via OK6DJ OQRS.

Morocco, CN. Pascal, F8NQV will be active as CN2NQV from Sidi Rahal Chatai, Morocco between 25 April and 11 July. Look for him on or around 7 155, 14 345, 18 140, 21 165 and 28 575 kHz.

Kenya, 5Z4. Paul, MM0ZBH is currently active as 5Z4/MM0ZBH from Kenya until 15 June. He operates CW, SSB and digital and is active holiday style while volunteering at a local school. QSL via LoTW and M0OXO's OQRS.

Kenya, 5Z4. Massimo, IZ0EGB, is once again active as 5Z4AB from Nairobi, Kenya, after a two-year absence. Length of stay is unknown. Activity yesterday was primarily on 20 metres SSB. QSL via IZ0EGA.

Uganda 5X. John, KF5NSR, is currently living in Kampala, Uganda and is now active as 5X/KF5NSR unless he receives a Ugandan call sign. Activity has been on 20/10m using digital. He states that his station is an Icom 7300MK2 with a Buckmaster 7-

(Continued on page 84)



(HF Update from page 83)

band OCF 135 foot/41 metre dipole and an M1 Mac Mini running WSJT-X.

Burkina Faso, XT. Harald, DF2WO (D44TWO and 9X2AW) will once again be active as XT2AW from Ouagadougou, Burkina Faso, between 6 and 19 May. Activity will be on various HF bands and QO-100 Satellite. Skeds are welcome. QSL via M0OXO's OQRS or direct.

Angola, D2. My name is Isabel Machado and I operate under the call sign D2IM from Angola. My journey in amateur radio started in Portugal, where I am also licensed as CR7BZL. Over the years, my connection with the hobby grew naturally through close contact with the amateur radio community and participation in several initiatives, including the organization of DXpeditions. Although I had not yet operated as an active station during those events, the experience allowed me to better understand the spirit of amateur radio, its technical challenges and, above all, its strong sense of global community.

Motivated by this environment and the people I met along the way; my interest gradually turned into a true passion. In 2026, I obtained my license in Angola, becoming D2IM and officially started my activity on the air.

Today, I am proud to be the only YL (female operator) currently active in Angola and I hope to contribute to promoting amateur radio in the region, while continuing to learn, evolve and make contacts around the world.

I enjoy operating different modes and making DX contacts, always with the goal of improving my skills and expanding my reach across bands and continents.

Thank you for visiting my page (QRZ.com) and I look forward to working you on the air!

73, Isabel Machado, D2IM



HF Station: ICOM IC-718; Yaesu FT-857; Yaesu FTDx10; XR3 Antenna (Inovantennas) – 10 / 15 / 20 m; JUMA PA1000+ Amplifier (Rowaves)

Satellite Station: 90 cm Dish; Yaesu FTX-1; QO-100 Ground station FD (DxPatrol); SDR Console (RX)

QSL/Confirmations: QSL Policy: Direct only (see QRZ.com); QRZ Logbook. Your confirmations via QRZ.com are greatly appreciated. Watch the slideshow on QRZ.com

9T0MD. The official website for the 9T0MD DXpedition to the Democratic Republic of Congo (30 September - 11 October) is now up and running <https://www.mdxc.support/9t0md/>. It is intended to be a dynamic hub for the DX community rather than a simple info page. The site offers an immersive look at their DXpedition, providing real-time updates and storytelling that spans the entire timeline - from initial preparations to the final wrap-up.

African Islands

Rodrigues Island, 3B9. Suvarna, VU3OPT is operating as 3B9N until 20 May. Operation from 20 to 10 metres from grid MH10QH. www.9n7ga.com

Seychelles, S7. Kasimir, DL2SBY will again be active as S79/DL2SBY between 11 and 21 September. Operation from 80 to 6 metres using CW, SSB and digital. QSL via home call or LoTW.

Sao Tome, S9. Francisco, CT7AKS will be active as S9R between 17 and 31 October. More to follow.

Ascension Island, ZD8KX. Ferdinand "Muttley or Fer," M0HXC, posted the following today. "I will be operating from the Ascension Island from 25 to 29 May. I am using an Icom IC-705 with a 20 metre EFHW antenna. Power only 5 W or 10 W when I am running from an external power source! Yes, I could run 100 W, but I do not have a RF amplifier. Looking for an Xiegu GPA100 but do not have the

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(HF Update from page 84)

budget for this. Donations are always welcome, thanks. Modes: CW (most used mode), SSB or digital on 40-30-20-17-15-12 and 10m. For CW and SSB I use split frequency, CW will be 5 kHz up and SSB 10 kHz up (example Tx:14.005 / Rx:14.010 for CW and Tx:14.220 / Rx:14.230 for SSB). The split frequency could differ depending on band activity. Due to high traffic only call sign and RST exchange, please avoid chit-chat! Please when running CW speed only up to 25 wpm. Confirming contacts only on QRZ.COM and LoTW, no eQSL confirmations.

And then DX

Liechtenstein, HB0. Kasimir, DL2SBY will once again be active as HB0/DL2SBY from 25 to 31 May. Operation on HF with a focus on 6 metres. *'This activity is intended to test and fine-tune all my devices, laptops and antennas for my activities from Zanzibar and the Seychelles.'* QSL via LoTW / home call (direct).

Franz Josef Land, R1/F. After two years of planning the RUDXT are proud to announce a DXpedition to the northern-most DXCC in the world – Franz Josef Land. A team of 6 operators will be active from Heiss island (FJL) during 15 days in late August-early September 2026. <https://www.rudxt.org/ri1fj>

French Polynesia, FO. Didier, F6BCW is active from Tikehau Atoll, Tuamotu as FO/F6BCW. He will stay there from early May to mid-July. He will be active on 80 to 6 m using CW, SSB, amplifier, VDA and vertical antennas. QSL via LoTW

Minami Torishima, JD1. Take, JG8NQJ is once again active as JG8NQJ/JD1 until mid-May during his spare time. Mostly using CW and digital. QSL via JA8CJY, LoTW.

Cook Island, E5. Tom, K7TLM and Leslie, KD7YZE will once again be operating as E51TLM between 4 and 9 May. Working conditions: IC-705 running 5 Watts to a horizontal 10 Metre end-fed half-wave wire antenna at 16 feet high just above sea level. SSB at 28,385 MHz, QRSS CW at 28,060 MHz. Look for them approximately 19:00 to 01:00 UTC. While there they will visit Jim, E51JD.

Chatham Island, ZL7. Look for ZL3IO as ZL7IO from 25 May to 4 June. An entry in the CQ WW WPX CW contest is included.

Cook Island, E5. Steve, ZL2KE and Steve, ZL4CZ will once again be active as E51CZZ and E51KEE

between 22 July and 14 August for E51KEE (CW, SSB) and between 26 July and 6 August for E51CZZ (SSB). They will be active from Rarotonga. QSL via IK2DUW.

Niue, E6. Gavin, ZL3GAV will be active as E6SP during July. Operation on HF using CW, SSB, SSTV, digital and satellite. More to follow.

Solomon Island, H44. A team with 9A2NA, 9A3MR, 9A3CJY, 9A4WY, 9A7Y and DK8ZZ will be active from Guadalcanal as H49A between 9 and 21 October. Operation on HF and perhaps 6 metres. More to follow.

Palau, T8. Yas, JA6UBY will be operating as T88RR from 10 to 18 June. Activity from 160 to 6 metres using SSB and digital. QSL via LoTW or home call.

Palau, T8. Nobu, JA0JHQ will once again be active as T88PB between 19 and 22 June. An entry in the All-Asian DX CW contest is included. QSL via home call, LoTW.

Palau, T8. A team with Masu, JA3AVO; Mune, JI3DNN; Kuni, JA1CJA; Jusei, JA3IVU and Shozo, JA3HJI plan (tentatively) activity from the VIP Guest Hotel, Koror, Palau between 21 and 29 October. They will be active on various bands and modes as: T88MB (JA3AVO), T88CZ (JI3DNN), T88DK (JA1CJA), T88ED (JA3IVU) and as T88DN (JA3HJI).

Andaman Island, VU4. The World DXpedition team will be operating during November 2027 from three POTA locations. A team with 11 operators – Dave, WJ2O; Nick Maslon, K1NZ; William "Savo" Savacool, K2SAV; Jeff Briggs, K1ZM; Miriam Briggs, N1QV; Steve Keithahn, W0ZB; Kyle Snavely, K3PT; Emily Snavely, KD0IVB; Krassy Petkov, K1LZ; Sarath Rayaprollu, VU2RS and Van Herridge, N4VGE will be active with 5 stations 24/7. Team support members are XYL Judi Savacool and XYL Vicki Herridge. [Andaman - World DXpeditions](#)

Tokelau, ZK3. In January 2026 we announced that members of the Perseverance DX Group (PDXG) and the Western Washington DX Club (WWDXC) intended to activate Tokelau ZK3. Planning for this project continues. On 3 April 2026 we had a meeting in Auckland, New Zealand with our Tokelauan sponsor, additional project details were discussed. We will be on the atoll the last 2 weeks of November 2026. The exact dates will be announced after the Tokelau Transport Office finalizes their November boat schedule. The

(Continued on page 86)



HF Propagation: Why Band Choice Changes Everything Day vs. Night

DAYTIME ☀️

F2 Layer
F1 Layer
E Layer
D LAYER (LOW) ❌

D Layer ABSORBS Signals!

- Shorter range on 160m, 80m
- Higher bands (20m, 10m); **LONG skip**
- Daytime: **DX on 20m-10m**
Better High Band Propagation

NO D-LAYER = BIG DISTANCE

NIGHTTIME 🌙

Strong F LAYER

- **D Layer DISAPPEARS!**
- Signals travel **MUCH** farther
- **DX Comes Alive!** (160m, 80m, 40m)
- **Multiple Hops Around the World**

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operating location has been selected and living accommodations for the team were discussed. Also discussed were the details of a humanitarian project we are planning for the local school. <https://www.dx-world.net/zk3-tokelau-dxpedition/>

Guyana, 8R. Aldir, PY1SAD is again operating as 8R1TM from Georgetown until 10 May with activity on all bands and 6 metre using CW, SSB, digital and satellites. QSL via LoTW or home call direct.

French Guiana, FY. Ronan, F4LJA will be active as FY/F4LJA from 20 April to 5 June. Operation on HF using mainly digital. www.grz.com/db/F4LJA

Guadeloupe, FG. Ronan, F4LJA will be active as

FG/F4LJA from 6 to 12 June. Operation on HF using mainly digital. www.grz.com/db/F4LJA

Bahamas, C6. Eric, K9GY will be operating as C6AYM between 5 and 10 August. Operation from 80 to 6 metre using CW. An entry in the WAE CW contest is included. QSL via LoTW.

Juan Fernandez, CE0Z. Felipe, XQ7IR will be operating as 3G0Z for about 3 weeks in May. Operation from 160 to 6 metres using CW, SSB and digital with a focus on the low bands. QSL via MOURX OQRS. www.robinsoncrusoe2026.net/

Martinique, FM. Darrell, AB2E will be operating as TO3E between 26 May and 2 June. An entry in

(Continued on page 87)



(HF Update from page 86)

the CQ WPX CW contest is included. Before and after the contest he will focus on WARC and low bands using mostly CW with some digital and RTTY. QSL via LoTW or direct via home call.

St Pierre and Miquelon, FP. Eric, KV1J will once again (18th tour) be active as FP/KV1J. Activity between 27 June and 13 July with an entry in the IARU HF Contest. [FP/KV1J July 2026](#)

Curacao, PJ2. Frank, PH2M will again be active as PJ2/PH2M between 12 and 29 June. Active holiday-style on 60 – 6 m, mainly digital, some SSB. QSL via bureau, direct, LoTW.

Bonaire, PJ4. Chris, WA7RAR will be active as PJ4CB during his spare time between 27 May and 8 June. Look for Chris from 20 to 10 metre using SSB and CW. Perhaps 10 metre FM simplex depending on conditions. QSL via home call direct only.

St Kitts, V4. Markus, WW6W will be back as V4/WW6W between 24 May and 1 June. An entry in the CQ WW WPX CW contest is included. QSL via home call, LoTW.

St Kitts, V4. Roger, EI8KN will be operating as V49B from Basseterre between 13 and 21 May. Active holiday-style on HF. QSL via LoTW, OQRS or direct via home call.

Turks and Caicos, VP5. Nobby, G0JVG will be operating as VP5G between 17 and 30 June. Operation on HF and 6 metres using CW, SSB and digital. An entry in the IOTA contest is included. QSL via MOOXO.

Peter I Island, 3Y0L. The team plans to activate Peter I Island in February 2027 with 19 operators. They have signed a financial agreement with a private group to share the substantial costs associated with the DXpedition. The Norwegian Polar Institute granted the official landing permit in April 2024. Logistics are currently underway; the 3Y0K (Bouvet 2026) container, which houses the expedition equipment, is being shipped to Texas for repacking before its final journey to the island. The team plans to spend approximately 20 days in the vicinity of Peter I, with about 14 days dedicated to radio operations on the island itself. Bookmark <https://3y0l.com/> for updates.

The Peter I Island DXpedition is looking for more operators.

We have just completed our successful expedition to Bouvet and are using that experience to continue with Peter I Island, a Norwegian

dependency in the Bellinghousen Sea. Our shipping container for the expedition is enroute from Cape Town to Texas with all the necessary equipment. At the same time, we are finalizing the details of this expedition.

The Peter I Island Expedition team is looking for more people who can collaborate as operators during the expedition, as we need to complete the team within a reasonable timeframe. Given that this entity currently ranks seventh on the most wanted DXCC list of most sought-after destinations, this expedition promises to be as challenging and complex as Bouvet, 3Y0K..

If you have experience in cold climates, work well in multi-operator teams, understand complex logistics and are willing to contribute the necessary effort for the success of this expedition, we would like to speak with you. Please contact us at admin@3y0l.com

South Georgia Island, VP8. Amateur Radio DXpeditions (ARDX) is proud to announce plans for a groundbreaking DXpedition to South Georgia Island, set to take place in March 2027. Operating under the allocated call sign VP0SG, this ambitious activation will target one of the rarest and most logistically challenging DXCC entities, well ranked on top of the Club Log's Most Wanted List, with particularly high demand in some areas of the world. www.ardxpeditions.com/dxpeditons/vp0sg

Russia, UA. A very large number of Russian stations using the special prefix RP81 (where the letter P stands for 'pobeda', i.e. 'victory') will be active between 1 to 9 May to mark the 81st anniversary of the end of World War II. See <https://award.srr.ru/memorial/pobeda-2026/info.html> for more information (in Russian).

Japan, JA. 8J70JARE is a special call sign celebrating the 70th anniversary of the Japanese Antarctic Research Expedition, which on 29 January 1957 established Syowa Station on East Ongul Island. The special call sign will be in use from various locations across Japan between 22 May 2026 and 29 January 2027. QSOs will be confirmed automatically via the bureau; direct cards should be sent to JG2MLI.

The Museum Column

The Suitcase in the Attic: My Grandmother and the secret radios of the Italian resistance

John Leonardelli, VE3IPS

First published in the April 2026 issue of SWR Magazine www.swrmagazine.org

A few years ago, I came across a book review¹ in the New York Times where the protagonists were the Staffette (The Messengers), the female partisans in northern Italy who waged a fierce guerrilla war against the German occupiers during World War II. These women had a strategic advantage and were the lifeblood of the movement: they were “invisible.” Exploiting the sexist assumptions of the time, they moved through checkpoints with contraband hidden in baby carriages or shopping bags, items that German soldiers rarely bothered to inspect. Because they were seldom searched, they carried not only radios but also the “code crystals” (like the FT-243s you use today). Losing a crystal meant a radio was useless, so these women often hid them inside jewellery or sewn into the hems of their skirts. My grandmother smuggled contraband in cheese and bread, which was a classic tactic of the Brigade Garibaldi. She would even offer a special dried sausage made from offal to suspicious soldiers, who appreciated the small

gift while she was busy making a covert delivery.

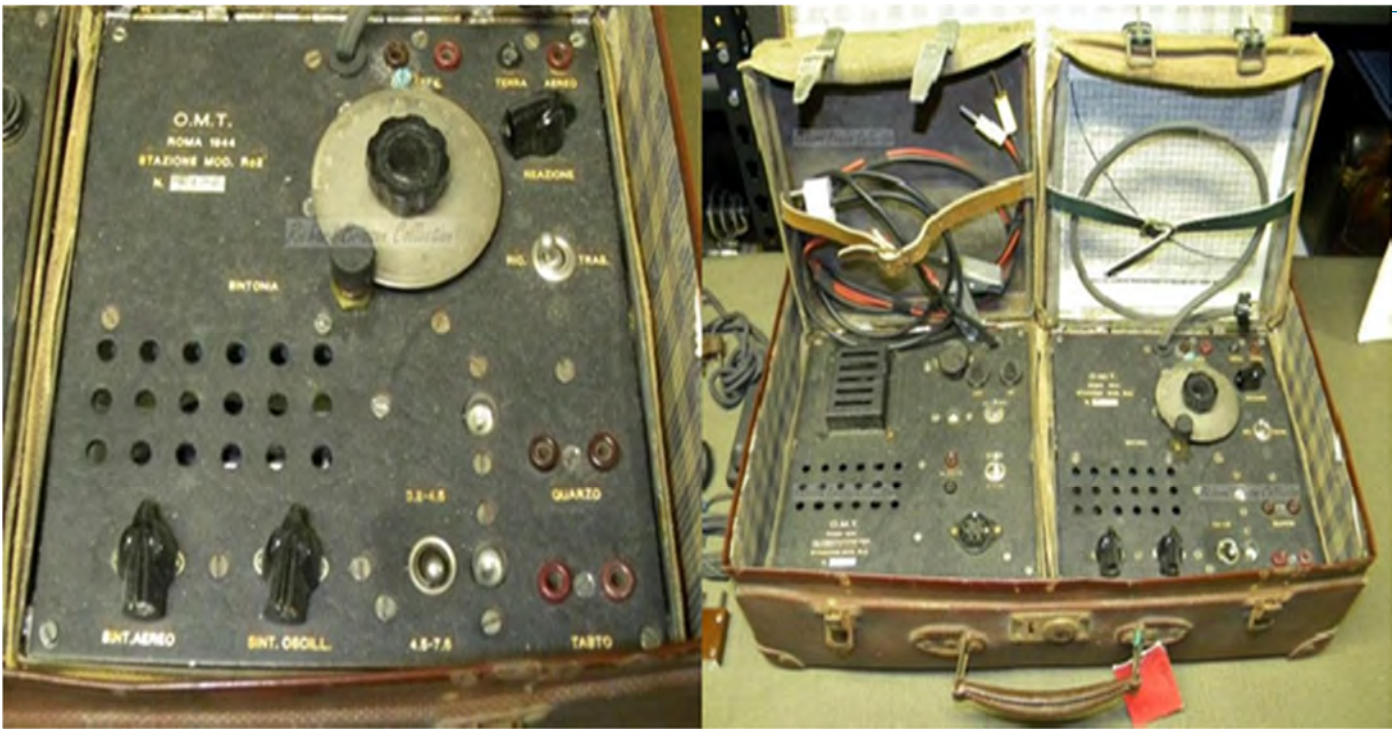
The Brigade Garibaldi were one of the largest and most influential partisan organizations in Italy during World War II. By 1945, the Garibaldi brigades had tens of thousands of fighters, making them the largest organized partisan force in Italy. They played an important role in the armed resistance against the German occupation forces and the Italian fascist regime after Italy’s surrender in 1943.

This historical account triggered a vivid childhood memory. I remembered exploring my grandmother’s attic in northern Italy as a boy and discovering a steamer trunk filled with electronic wires and dials. Hidden in a nearby burlap sack were a firearm, a knife and several tools. When I told my father, he immediately put everything away. At that age, I understood it had something to do with electronics, but also something I had never seen before or fully understood. It certainly did not resemble the Grundig radio that every European

(Continued on page 89)



Transporting an RC2 Radio to a New Location



An RC2 at the Camp X Museum in Oshawa, Ontario

(The Museum Column from page 88)

had on their kitchen counter.

During a recent visit to Italy, the truth finally came to light: my grandmother had been part of the partisan movement. And yes, she spent the war moving supplies hidden inside loaves of bread and wheels of cheese. Although I cannot be certain, I suspect that the suitcase I found was an Italian RC2 clandestine radio. My visual memory confirmed that the shape and appearance of the transceiver were very similar, as it was a two-piece unit. While I am sure she was not a trained radio operator, the presence of that suitcase suggests she was involved in something far more significant.

During the occupation, the storing equipment for the resistance. No one knows what happened to the steamer trunk in the attic.

Funkabwehr (German radio intelligence) used a ruthless tactic to locate clandestine stations: they would cut power to specific sections of towns. If a signal continued transmitting, they knew the operator was using batteries; if it stopped, they had narrowed the location down to just a few blocks. They would then deploy direction-finding (DF) vans to triangulate the exact house.

The Funkabwehr used specialised Direction Finding (D-F) equipment. They would first

(Continued on page 90)





(The Museum Column from page 89)

triangulate any signal from three different directions, obtain a fix and then send a van to take closer DF readings. They did not rely only on vans; they also used “human-portable” receivers concealed under coats. A technician would walk down a street with a loop antenna strapped to his chest, literally sensing the strength of the signal.

The Gürtelpeiler was a body-worn portable radio direction finder (RDF). Because of this, partisan operators often limited their transmissions to less than five minutes, anything longer gave the “G-men” (as the British called the German detectors) enough time to narrow the search to a specific area. The Germans had more than 20 local receivers tuned to known frequencies, waiting for activity to begin.

While the British “Paraset” is often celebrated as the ultimate spy radio of World War II, the Italian RC2 was a masterpiece of Resistance engineering that may have set the standard. Developed around 1941 by Magneti Marelli in Milan for the Italian Military Signals Service (OMT), the RC2 and its sister unit, the RF2, became staples of clandestine operations.

Although it bears a striking resemblance to the

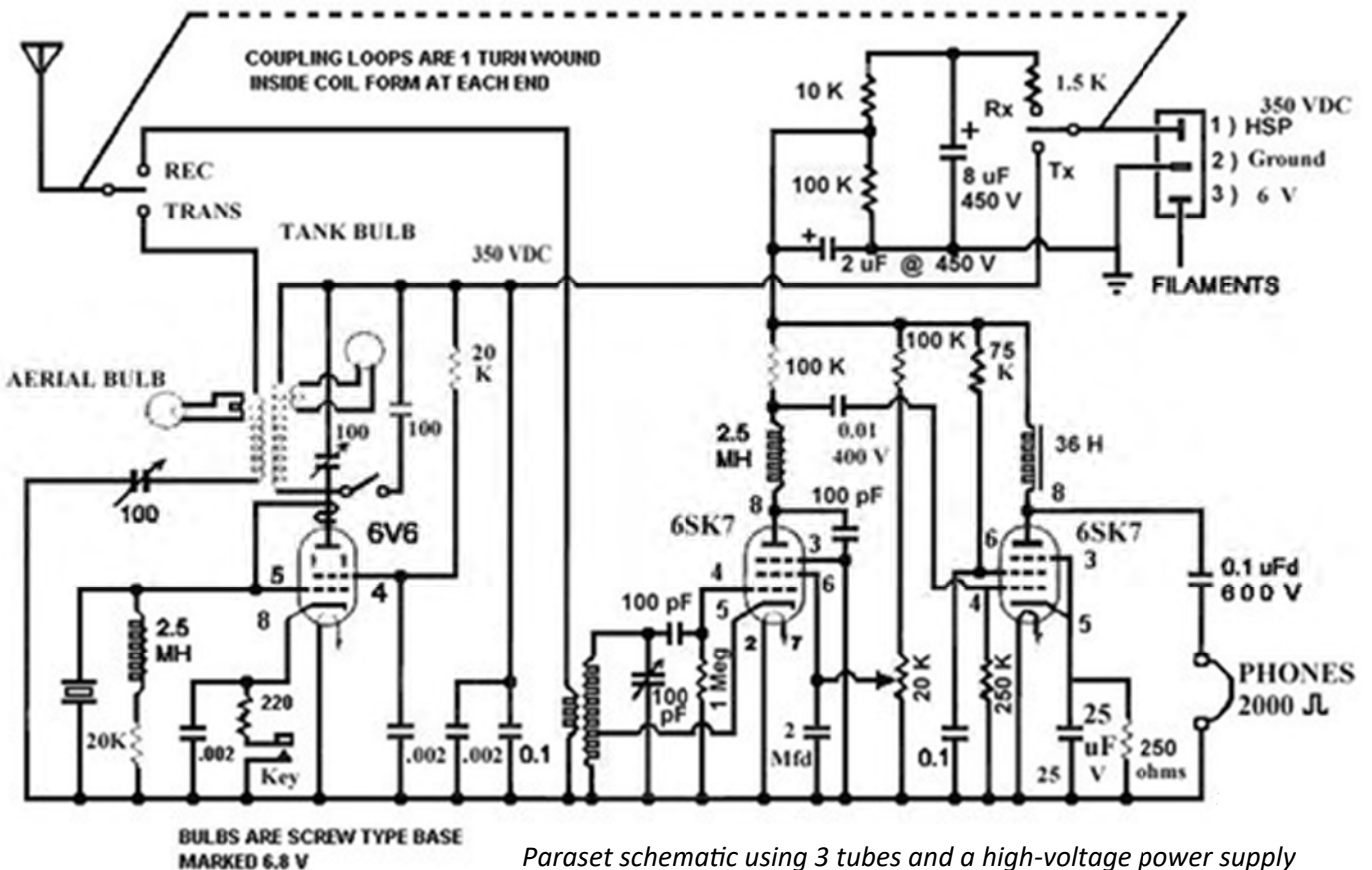
British Mk VII in both functionality and circuit design, the RC2 was introduced much earlier than its British counterpart, leading historians to suggest that the Paraset may have been based on the Italian design.

Unlike the factory-built British units, many RC2 transceivers were assembled clandestinely in “secret laboratories” within occupied cities such as Milan, disguised as standard civilian luggage. These units were specifically designed for the realities of the Italian front; they featured a robust power supply capable of handling the notoriously unstable wartime electrical grid.

Technically, the RC2 was a simple but effective transceiver, using two 6RV tubes in the receiver and a 6V6 in the transmitter to provide a solid 10 watts of output across the 3,2 – 7,7 MHz range. The transceiver is housed in a metal enclosure that fits inside a canvas carrying case. The complete unit measures 225 × 215 × 95 mm and weighs 2,4 kg. The external power supply unit (PSU) is housed in a similar canvas case and can supply 350 VDC.

Although the circuit is very similar to the later British Mk VII, it is built with different (Italian) tubes that are mounted internally. It also requires

(Continued on page 91)



Paraset schematic using 3 tubes and a high-voltage power supply



(The Museum Column from page 90)

the use of an external Morse key. The British version also uses the 6V6 but employs 6SK7 tubes, as shown below.

From History to Hardware: The Bayou Jumper

That legacy served as the introduction to my most recent QRP project. When the Four States QRP Group (4SQRG) released the “Bayou Jumper” kit, I knew I had to have one. It is a brilliant throwback to the Knight Ocean Hopper and a nod to legendary World War II spy radios like the Paraset.

Unfortunately, the kit quickly sold out. I managed to find an unassembled kit at the Dayton Hamvention in Xenia and finally had time to build it during the COVID lockdowns. To capture that authentic “clandestine” feel, I built the unit inside a wooden box.

This 40-metre solid-state radio features a regenerative receiver and a 5-watt crystal-controlled transmitter. Notable features include a classic crystal socket that uses vintage-style FT-243 crystals of which I have dozens to experiment with including frequencies such as 7 030 kHz (QRP calling frequency) and the 7 122 kHz Novice band crystal. Like the original Paraset, the Bayou Jumper

includes a built-in Morse key and I further enhanced the build with the “Soup’er Up’er” board, which provides sidetone, fine tuning and a CW filter.

The Jumper is much easier to hide in a loaf of bread than an RC2, but it is far more enjoyable to find a spot under a pine tree in the woods, throw up a wire and send a few “intelligence reports” back to headquarters. Even better, it might be the perfect radio for activating a local bunker in the Bunkers on the Air programme.

On the air

Operating the Bayou Jumper is a lesson in patience and perspective. It is a regenerative receiver design with a separate transmitter. It works surprisingly well and being rockbound (fixed frequency) means you call CQ and then tune the receiver for the responses. Using a simple dipole (eliminating the need for a tuner and maximizing efficiency), I have logged contacts in New York, Connecticut, New Hampshire and North Carolina.

My plan is to decorate the wooden “suitcase” with vintage-style travel stickers representing the states and countries I contact. I am also on the lookout for high-impedance headphones appropriate for the period to complete the aesthetic.

Building this rig was more than just a soldering exercise; it was a way to reconnect with my grandmother’s hidden history. Through QRP, I have been able to recreate a piece of the technology used by resistance fighters who risked everything for the cause of freedom.

¹ <https://www.harpercollins.com/products/a-house-in-the-mountains-caroline-moorehead?variant=40827306803234>

<https://ab1dq.com/2022/09/18/building-the-4sqrp-ozark-patrol-shortwave-regenerative-receiver/>
https://www.4sgrp.com/kits/bayou%20jumper/bjManuals/RevA/RevA_Documents.php

<https://www.cryptomuseum.com/spy/rc2/>
<https://www.radiomilitari.com/rc2.html>



I worked the world on 40 m CW from its secret location.



External display for transceivers

Daniel Romila, VE7LCC

Disclaimer: I do not sell anything, I am not affiliated with any seller and I do not advertise anything; I only gave you examples of prices and where to buy from, in order for you to have an idea about the prices.

Many radio amateurs purchased transceivers which are capable of having attached an external display. It is a big temptation to have an SDR band scope spread all over a 22 inches monitor or even on a bigger one. We bought (or we got as a gift, in my case) a modern transceiver especially for seeing the SDR waterfall as clear and big as we can, didn't we? So ...

Problem

In order to see a big SDR waterfall, one needs another monitor. This monitor many times will take more space than the transceiver itself.

Solution

Use an already existing monitor, connected to your computer, not to your transceiver. Many of us have the transceiver on a desk, where we already have a laptop/desktop computer, because we do use the transceiver for FT8 and other digital modes, which require a computer and at least one monitor, anyhow. In my case, my corner desk.

Practical solution implementation

Instead of connecting an external monitor to your transceiver, connect the transceiver's video output to a video capture card (an USB dongle) and that USB adapter into a USB port of the computer.

I bought a small USB dongle from temu.ca. In the moment I write this article, 25 April 2026, it costs 11.45 CAD (=8.37 USD =138.5 Rand) plus taxes and the shipping is free with Canada Post in Canada <https://www temu.com/ca/1080p-hd--with-usb-2-0-cam-link-adapter-for-gaming-streaming--teaching-g-601099745379649.html?>

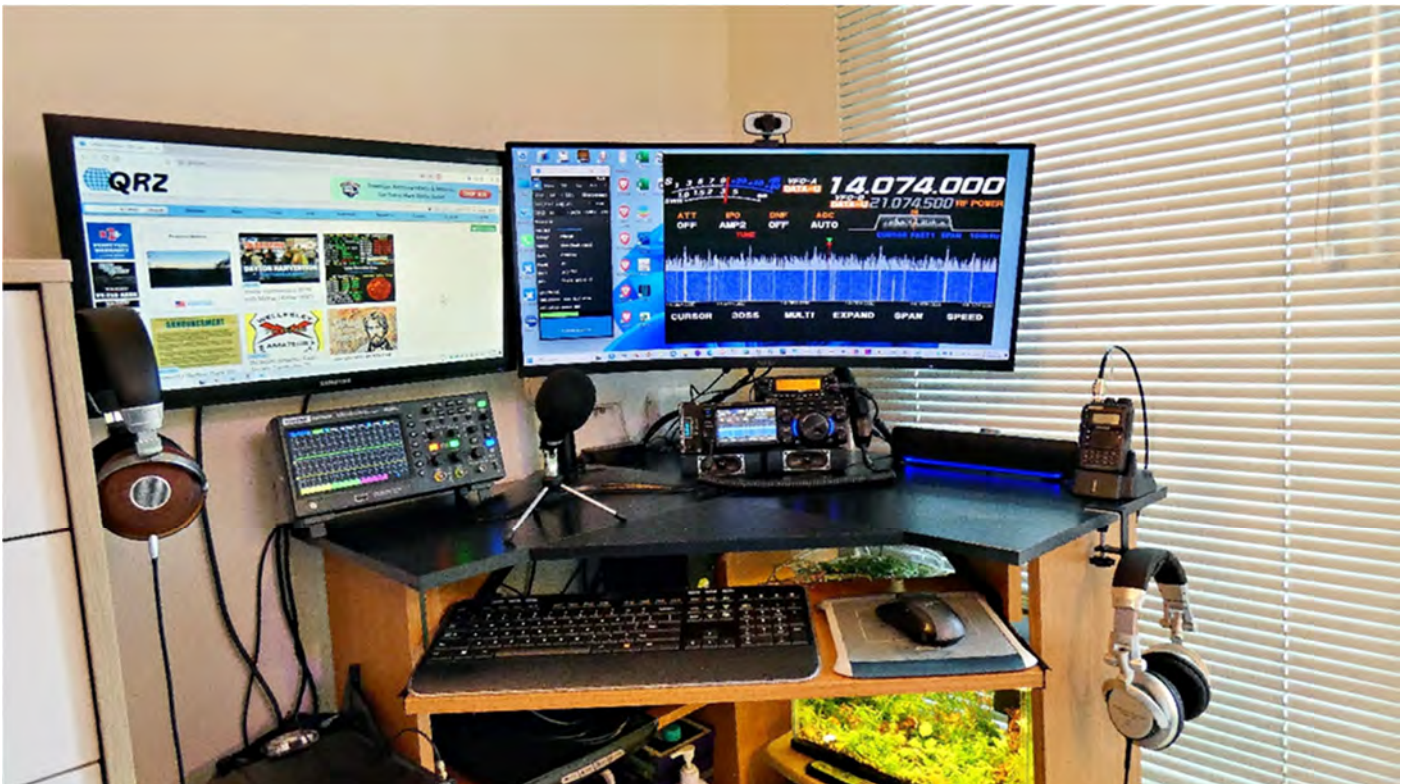
It takes some 6 – 10 days to get it. This particular model I am telling you about is declared as knowing only 1080p and requiring only an USB 2 for the full video bandwidth. If audio would come via its HDMI connector, that audio would also be transferred – digitally, of course – into the computer. On what I got it is written 4K and indeed it works 4K at reduced frame rate, 30 Hz.

We do not need 4K (yet) because the resolution of our transceivers usually did not get there.

To recapitulate what we need from the hardware point of view:

A transceiver with digital video output,

(Continued on page 93)





something like HDMI, DVI-D, Display Port and/or the mini versions of the above mentioned.

An HDMI cable

Eventually, an adapter between the HDMI wanted by the USB dongle/whatever video capture card and the video out of the transceiver. In my case, for Yaesu FT-710, I needed a DVI-D to HDMI adapter.

On 25 April 2026, such adapter is 2.02 CAD (=1.5 USD =24.5 Rand) plus taxes, with free shipping. <https://www temu.com/ca/dvi-link-male-24-1-pin-to-hdtv-female-19-pin-adapter-hdtv-to-dvi-golden-connector-for-hdtv-pc-lcd-for--360-for-ps3-g-601099590557896.html?>

In order to connect such older transceiver to your computer, one needs a different kind of video capture card, like the:



Such an analogue adapter, from which one should use the yellow connector only, is just 6.28 CAD (=4.6 USD =76 Rand) plus taxes, free shipping (on 25 April 2026), same temu.ca source

But let us come back to the modern transceivers, like YAESU FT-710 (left) and the ICOM 7300 MK2 (right).

Once we connected all hardware, the transceiver is linked with our computer and ready to have the display shown on the computer's monitor. My YAESU FT-710 knows only two display

Some observations

Older transceivers, like ICOM 7000, do have a video out, but an analogue signal out, from an RCA kind of plug.

(Continued on page 94)



(Lighthouses from page 93)

resolutions for the external display: 800 X 480 and 800 X 600 pixels. The default resolution is the lower one, so I went into settings and increased it. The only additional thing we need is the software allowing us to video capture the display of our transceiver.

I use the free programme Split Cam, which can be downloaded from: <https://splitcam.com/>. Just to give you an idea, here is the window (for settings) of this free programme.



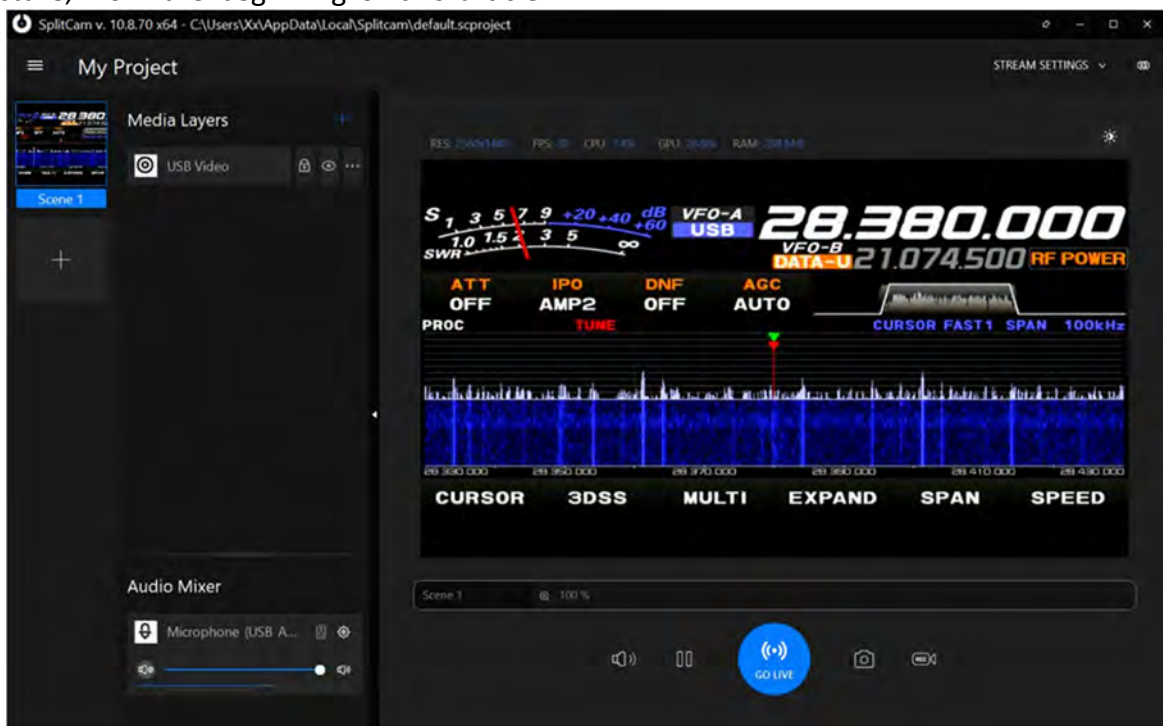
We do not need to see all this complicated window. It is enough to see what it is called "projector." It is the replica of your transceiver's display, only. Please see again the first big corner desk picture, from the beginning of this article. I

tried other video capture/webcam programmes and they all work.

Being a software window inside our Windows computer (and not a physical another monitor!) we can drag, drop, increase, decrease the window as needed, only when needed. This solution does not require more space on our crowded desk.

I use the "external monitor" all the time when working on SSB, because for many DXs first I see the station, as a modulated line on the screen, I do not hear anything that I can understand and for sure I would have passed over it if my transceiver would not have been SDR. I stop on the modulated line and many times I succeed to get a workable SSB signal using the adjustments DSP and NOTCH filter from my transceiver. Seeing the waterfall spread over a 34 inches curved monitor is a different operator experience than using the small transceiver's display.

And yes, many colleagues, looking at my corner desk picture, told me I cannot be a true radio amateur, because I am not a hoarder.





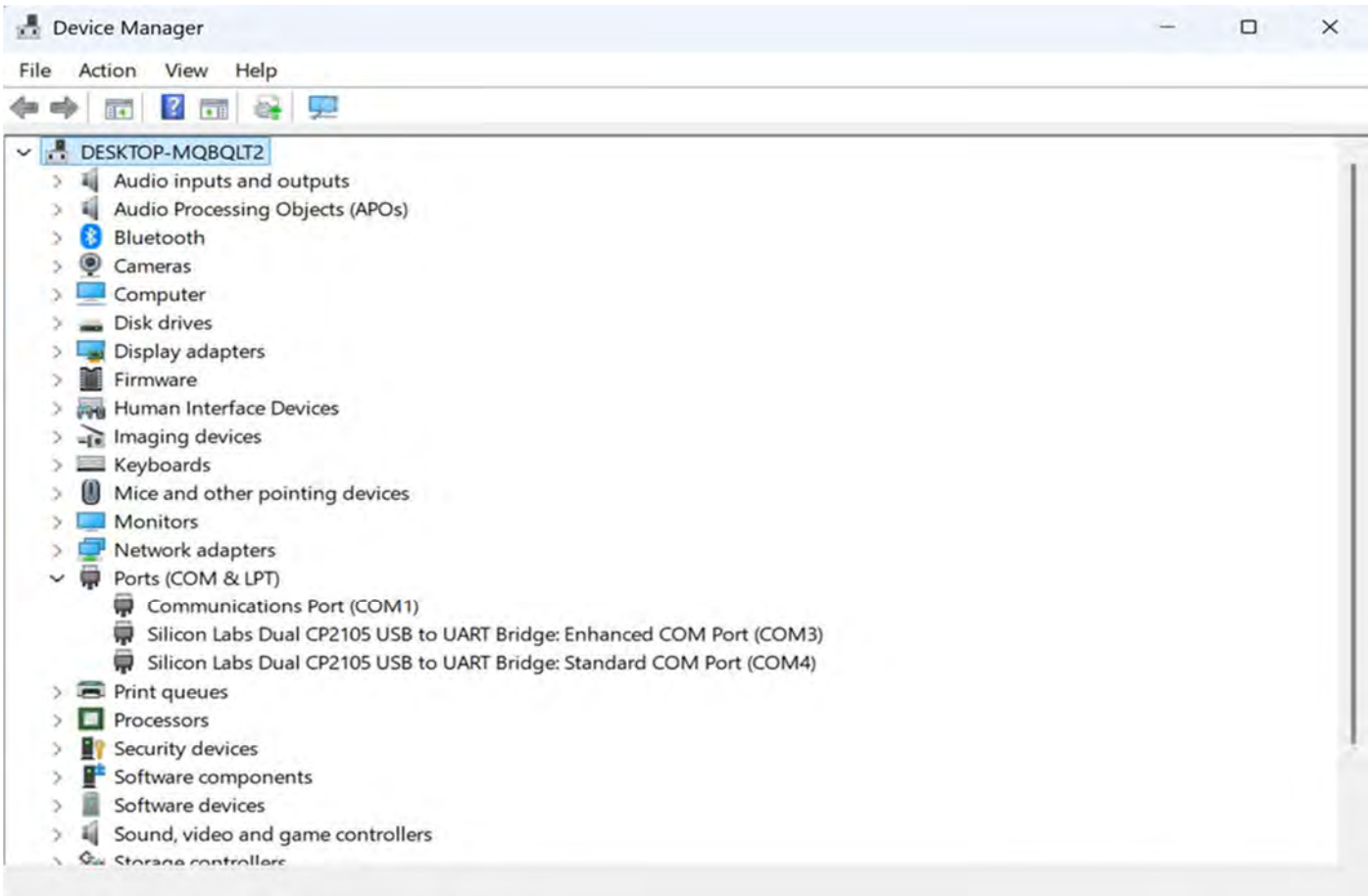
FT8 settings for the YAESU FT710 transceiver

Daniel Romila, VE7LCC

This article describes how to connect the YAESU FT710 transceiver, which has an easy connectable to the computer USB sound card, with the Windows 11 computer, running a JTDX enhanced dedicated FT8 programme.

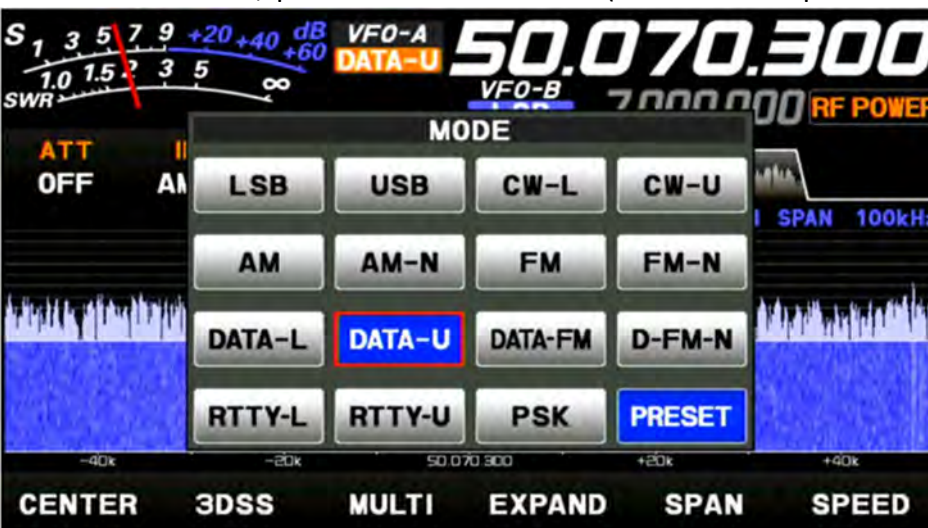
Use as driver for YAESU FT710 the Yaesu's driver, not what Microsoft Windows wants to install.

Connect the USB cable between the transceiver and the computer. Verify in CONTROL PANEL>DEVICE MANAGER that there are 2 COM ports, an enhanced one and a standard one. Note which one is which, what number. I have COM3 as the enhanced one and COM4 as the standard one. Follow the proper COM



in the next settings, depending on your personal COM numbers.

On the transceiver, press the MODE button (it is on the top of the transceiver – it is not on the front panel). Set as following.



Long press on PRESET, for having:

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PRESET

PRESET1	PRESET NAME	FT-8
PRESET2	CAT-1 RATE	38400bps
PRESET3	CAT-1 TIME OUT TIMER	10msec
PRESET4	CAT-1 CAT-3 STOP BIT	1bit
PRESET5	AGC FAST DELAY	160msec
BACK		

PRESET

PRESET1	AGC FAST DELAY	160msec
PRESET2	AGC MID DELAY	500msec
PRESET3	AGC SLOW DELAY	1500msec
PRESET4	LCUT FREQ	100Hz
PRESET5	LCUT SLOPE	18dB/oct
BACK		

PRESET

PRESET1	LCUT SLOPE	18dB/oct
PRESET2	HCUT FREQ	3000Hz
PRESET3	HCUT SLOPE	18dB/oct
PRESET4	USB OUT LEVEL	11
PRESET5	REAR OUT LEVEL	50
BACK		

PRESET

PRESET1	REAR OUT LEVEL	50
PRESET2	TX BPF SEL	50-3050Hz
PRESET3	MOD SOURCE	AUTO
PRESET4	USB MOD GAIN	50
PRESET5	REAR MOD GAIN	50
BACK		



(IARU Region 1 Report from page 96)

Now we go on the computer and in the JTDX programme (jtdx-2.2-159-win64_improved_with_JTDX_GUI

UTC	SR	DT	Freq	Message
202645	Tx		1475	- CQ VE7LGG CMB9
202645	Tx		1475	- CQ VE7LGG CMB9
202645	Tx		1475	- CQ VE7LGG CMB9

in my case):

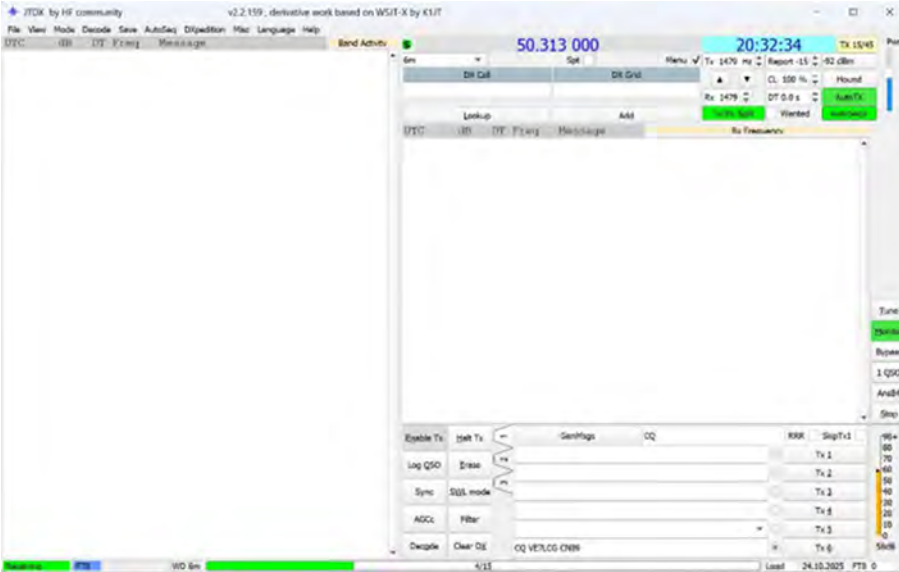
(Continued on page 98)



(IARU Region 1 Report from page 97)

See again in the CONTROL PANEL which is the enhanced port and which is the standard port; the next screen might have reversed COM3 and COM4 (numbers for my case) and the FT8 programme will not work:

Verify that your Windows operating system did not steal the COM ports of YAESU and declared



them as DEFAULT microphone and audio out.

For a good reception and decoding, the best is to have the Rx indicator in the FT8 programme shown between 50 dB and 60 dB, in the lower right corner:

This Rx level of the FT8 software actually comes from the transceiver and it is dictated by the USB out



level of the transceiver. You do need to go into it and adjust it for around 55 dB shown in the software, when adjusting on the transceiver. Press the MODE button, from the top case of the transceiver (it is not on the front panel):

You need to scroll down until you find USB OUT level (see above). Click on it with the finger, on the touch screen. Now you can increase/decrease the level by rotating the FUNC button, which is right in the



The 2025/26 Annual Report

Dennis Green, ZS4BS, SARL Secretary

The President's Report

Nico van Rensburg, ZS6QL, President – South African Radio League.

Good morning, ladies and gentlemen. A warm welcome to everyone in attendance here today as well as online, thank you for joining us at the 101-year AGM here in Port Elizabeth, or Gqeberha as it is formally known.

The past year has been one of significance and we are extremely grateful for everyone who is part of SARL's history—beginning with our founders in 1925 and continuing with the dedication and commitment of current members and community partners.

The SARL has continued to grow and thrive, thanks to the robust foundation built on our members' commitment and passion, and I am pleased to report that for now, the SARL maintained stability both from a membership and a financial perspective. However, the SARL is a member's society and to grow and retain members is of utmost importance. Yet, for the first time, individual numbers entering the world of amateur radio is becoming very disappointing, locally and internationally. There is a definite trend associated with a drop in RAE candidate numbers and dwindling RAE class opportunities, as very few clubs present lectures, practical workshops, and online classes compared to a few years ago.

As mentioned last year, we are without a doubt in a difficult situation when it comes to volunteerism and leadership within the SARL and clubs. It is a well-known fact that our clubs are the backbone of the SARL and amateur radio, fulfilling an important role within society.

A noticeable trend is clubs dying off, either because the members who could have led them into the future were never coached, or because those able never raised their hands to step up to the plate. This leaves us with a challenging scenario which needs to be addressed if we would like to grow amateur radio in South Africa into the future.

Participation and growth amongst our younger generation is similarly disappointing and urgently requires a renewed focus. This year will be the first time since 2015 that South Africa and the SARL will

not have any representation at the annual IARU R1 YOTA Summer Camp that continues to provide an outstanding experience for young radio amateurs from across the region.

Although we are experiencing many challenges, it is not panic worthy, though we need to set our focus on what we can control: our capacity to connect, build and focus on the successes to date. Everything has a context and many opportunities present themselves every day.

Over the past year, I have experienced a remarkable level of support and assistance from members and council to the SARL. Without these members' dedicated support, the League will not be able to function and provide the service that is due to our members.

I have no doubt in my mind that the SARL will continue to grow and thrive into the future. As Franklin D Roosevelt once said, "The only limit to our realisation of tomorrow is our doubts of today."

On the international front, the SARL as a member society of the IARU Region 1 will attend the General Conference 2026 in Vienna, later in this year.

The SARL is also participating in the ongoing IARU restructuring process of merging the three regions of the IARU into a single entity. It is ongoing work to ensure that the interests and operational continuity of Region 1, including its committees and working groups, are properly represented and safeguarded in any future organisational structure.

SARL Centenary Publication

I would like to step back for a moment and mention the significant effort started in 2021 by Anette ZR6D, who volunteered to capture and document the rich history of the SARL since 1925.

These artefacts, documentation and related information collected during the execution of this project will serve as a valuable reference for current and future generations, detailing the achievements and challenges faced by the league over the past century.

The outcome of this project at present is a Commemorative Handbook as pledged and I am

(Continued on page 100)



(The SARL Annual Report from page 99)

pleased to announce that it was published a few days ago.

The research and processing of all historical information into a book is an enormous task and, in all fairness, does not end, as the League's history will need to be recorded and kept alive as we journey into the future.

Congratulations on this historic achievement and a sincere thank you to Anette ZR6D and Brian ZS6YZ who took on this enormous task to ensure that the history of the League will be preserved for future generations.

SARL Volunteers and Appointees

The well-known American college football player and coach Paul "Bear" Bryant once said, "Set goals – high goals for you and your organisation. When your organisation has a goal to shoot for, you create teamwork, people working for a common good."

These words are just as applicable to the League's group of dedicated volunteers and appointees as the SARL depend entirely on these individuals to perform various tasks and to fill several portfolios.

The list is long indeed, from the news bulletins every Sunday, a monthly bumper edition of Radio ZS and weekly HF Happenings publications from the editor, Awards Management, the Repeater Coordination working groups, the V/UHF working group, QSL Bureau Management, Contest Management, Lecturers, Invigilators and RAE Management.

Then there are the volunteers for the Amateur Radio Today-program and Regulatory Affairs, SARL/ICASA liaison committee, the work done by our Legal Advisor, the SARL HAMNET organisation, serving our communities and providing a public service.

It is therefore important to provide an overview of activities and work being performed by these individuals and working groups:

SARL Standards and Technology Work Group

The work group does excellent work and the individuals working behind the scenes are James Archibald ZP6NS, Brian Jacobs ZS6YZ, Guy Eales ZS6GUY, Karel Bezuidenhout Jnr ZR6K, Peter Leonard ZS5PL and Hans van de Groenendaal

ZS6AKV (convener). They have been working on the new MOU with ICASA, looked after the TC3 EMC affairs, are monitoring the International Telecommunication Union's (ITU) World Radiocommunication Conference (WRC) discussions with WRC-27 around the corner, and have their finger on the pulse with the Draft National Frequency Plan 2025. Read more about their work in the 2026 SARL Annual Report.

Contest Working Group

Contesting is an integral part of our hobby and popular from a national and international sporting perspective. Under the experienced leadership of Johann Bezuidenhout (ZS6JBZ), together with team members Gerhard Coetzee ZS3TG, Phillip van Tonder ZS6PVT, Karel Bezuidenhout ZS6WN, Karel Bezuidenhout Jnr ZR6K, Phillip ZS6FY and Danie ZS6DPS, contest participation has grown exponentially over the past two years because of sincere commitment from this group of gentlemen.

From updating the SARL Blue Book, advertising all contests, the generation of tools and lately also the direct upload of logs to the SARL website, these gentlemen are serious about contesting.

Results of these contests are diligently published in SARL News, the Website and in HF Happenings, providing participants with timely feedback on their performance and encouraging a healthy competitive environment.

The SARL Centenary Marathon QSO Party

To celebrate the centenary of the League, the SARL Centenary Marathon QSO Party was introduced and ran as a year-long activity during 2025.

Worldwide participating radio amateurs worked South African amateur radio stations. Those who submitted their logs containing confirmed QSOs made during 2025 with South African amateur radio stations received Gold, Silver, Bronze and Participation certificates, depending on the number of stations and special event call signs contacted.

Centenary Call Sign – ZS100SARL

During the centenary year the SARL, assisted by members and associated clubs, was on the air with a special event call sign ZS100SARL.

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QSOs were made on all amateur frequencies on SSB, CW and Digital modes. 4332 QSOs were logged during the year with 3051 unique call signs worked across 115 DX zones.

The special event callsign achieved the requirements for a Worked All ZS (WAZS) certificate on the SA-QSL system and the 100 DXCC entities have received a DX Century Club award from the ARRL.

Theunis ZS2EC was responsible for 3 561 of these QSOs, while Karel ZS6WN made most of the CW QSOs.

Workshop and Presentations

SARL Annual Technical Symposium

This event was held online on Saturday, 11 April with presenters from the USA and individuals from South Africa, a programme that covered a broad list of topics and organised by Hans van de Groenendaal ZS6AKV. The presentations are available from the AMSAT SA website for those who could not attend.

AMSAT South Africa Space Symposium

Another event that deserves to be mentioned involving many of our members is the AMSAT South Africa Space Symposium held in August 2025. Every year, this event attracts local and international interest. The aim of the AMSAT SA Space Symposium is to take amateur radio into space and encourage more amateur satellite operation, development, and research.

Sandton Club – Power Hour Tech Talk

A monthly event that deserves to be mentioned is the online Sandton Club (ZS6STN) Power Hour Tech Talk. With open access available every month, this talk is packed with adventure and technical amateur radio topics to encourage fellow amateurs and fuels enthusiasm.

Annual BACAR Launch

The BACAR launch and recovery event in Secunda is an annual highlight that many amateurs look forward to. Another launch is earmarked for October this year. The team of the Secunda Radio Club is a group of seasoned experts offering us their commitment under leadership of Christo ZR6LJK.

A newcomer in the balloon arena is the Pico balloon launches that were introduced last year. This is another aspect of amateur capability being tracked all over the world with much enthusiasm. Gert ZS6CG is the man to thank for starting this most successful initiative. Join the WhatsApp ZS Pico Balloon group for in-depth details and to participate in tracking these balloons.

SARL HAMNET

SARL HAMNET, the SARL division for disaster communication, under the leadership of Brian ZS6YZ, the national HAMNET Director and Keith Lowes ZS5WFD, the Deputy National Director, as well as the regional directors, provides an excellent service that allows for awareness and public relations pertaining to amateur radio.

SARL HAMNET works closely with the South African Search and Rescue (SASAR), a division of the Department of Transport, Local Government Disaster Management and disaster management in local municipalities, the Western Cape with Wilderness Search and Rescue, the Aeronautical Rescue Coordination (ARCC) and the Maritime Rescue Coordination Centre.

The work being done on national level is an important task of providing emergency communications during search and rescue incidents and we are most grateful for the individuals willing to provide this service to society.

A detailed report from the SARL HAMNET National Director is available in the 2026 SARL Annual Report.

Should any SARL members be interested in joining SARL HAMNET, please do not hesitate to contact the regional or national directors.

Affiliated Clubs

As mentioned, the SARL and amateur radio community depend on our clubs to fulfil an important role to sustain and grow the radio amateur service.

Throughout amateur radio's history, clubs have recruited and trained new radio amateurs and have provided a community setting in which radio amateurs have been able to continue their education and training.

I would like to appeal to our clubs to continue investing the necessary resources to ensure that

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we continue to present classes promoting amateur radio. It is vital to a club's survival and growth to continually recruit newcomers, both young and old, to ensure the sustainability of the club and the SARL

Always remember, the objective is to allow RAE candidates of all ages to become active, knowledgeable, and responsible members of the amateur radio community in the country, now and into the future.

QSL Bureau

Amidst the challenges posed by the postal service situation in South Africa, the South African Radio League (SARL) continues to ensure that QSL cards are forwarded and distributed.

However, it is becoming more difficult to maintain and sustain the service and, although electronic QSLing has become the norm, many amateurs worldwide still prefer and enjoy a physical card to confirm QSLs.

The man behind the work of the QSL Bureau is Gert du Plessis ZR6GRT, our QSL Manager. Do not hesitate to contact Gert to offer personal assistance or club participation to assist in distributing QSL cards.

Annual RAE Examinations

The annual RAE examinations during May and October are administrated by the SARL on behalf of ICASA, in line with the Memorandum of Understanding between ICASA and the SARL.

In preparation for the examination many newcomers rely on guidance and lectures, including practical training provided by clubs. On a national level, a huge coordination and administrative effort is required to accommodate the two examination sessions.

Donovan van Loggerenberg ZS2DL, the SARL appointed RAE manager, was responsible for the successful 2025 October RAE and have completed the necessary preparation work for the exam to take place during May 2026.

Donovan, you have done a sterling job, and I would like to extend a warm thank you. Congratulations to you and your team to ensure that this important work continues to support the growth of amateur radio as well as SARL membership in the country.

Group Activity

Our beloved past time involves interaction and QSOs with fellow amateurs, and I would like to mention the tremendous work being done to activate and motivate fellow amateurs into various activities. Activities such as the very popular Summits on the Air (SOTA) needs recognition. It would be unfair to mention call signs as there are quite a list. Then long-distance V/UHF and Satellite activity are well organised with WhatsApp groups. A personal thank you to everyone involved, all your efforts make a huge difference and results in many hours of enjoyment on the air. Keep up the good work.

I have touched on various topics in this report. The detailed information on these topics is available in the 2026 SARL Annual Report. Please read more about these topics, achievements, and work done by the League, working groups and appointees, as compiled by our Secretary, Dennis Green ZS4BS.

Council and I are extremely grateful for the excellent work being done by these volunteers and working groups with families and full-time occupations, committing their personal time and expertise at no cost, to run the SARL successfully.

In closing, to have a vision and believe in the power of education ensures that amateur radio will not only survive but thrive in the 21st century and beyond.

It is through education, training, and hands-on experiences that we assist to shape the next generation of radio amateurs and innovators for the future.

To our AGM hosting club, PEARS, thank you so much for the huge amount of effort and hard work to ensure a successful AGM and Awards Dinner here in Gqeberha.

Last but not the least, I convey my sincere gratitude to my fellow councillors for your support and dedicated work in running the SARL – it is sincerely appreciated.

As I conclude, I sincerely thank our members for the confidence and trust bestowed upon us. Council remains committed to sustain and continuously improve the SARL's operations to live up to members' expectations.

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Thank you all for your kind attention this morning.

Regulatory Affairs

Hans van de Groenendaal, ZS6AKV

TC3 EMC

At the 2024 meeting the SARL requested that the increasing noise level on the HF spectrum be added to the agenda as an emerging need. At the TC3 meeting on 8 April 2025, Hans van de Groenendaal delivered a presentation entitled *“What anyone using radio frequencies needs to know about the increasing level of RF noise.”* The presentation was well received. The chairman requested attendees to submit feedback on the way forward which the SARL will collate and present in a report at the November meeting. The TC3 Admin failed to distribute the presentation. After two successive TC73 meetings, the Chairman instructed the Secretariat to place the presentation on the TC73 portal. The relevant section of ICASA has been share what ICASA is doing to prevent the problem from escalating and TC73 members are urged to comment by 31 August 2026.

SARL Standards and Technology Work Group (STWG)

The workgroup, James Archibald, ZS6NS; Brian Jacobs, ZS6YZ; Guy Eales, ZS6GUY; Karel Bezuidenhout Jnr, ZR6K; Peter Leonard, ZS5PL and Hans van de Groenendaal, ZS6AKV (convener) have been working on the new MOU with ICASA.

One segment of the SARL’s STWG is the monitoring of the International Telecommunication Union’s (ITU) World Radiocommunication Conference (WRC) discussions which may be relevant to radio amateurs in South Africa. James Archibald leads this. He reports as follows, *“The STWG continues to participate in South Africa’s WRC-27 National Preparatory Work Group, which is coordinated by the Department of Communication and Digital Technologies, both virtually and physically.”*

Although the agenda items for WRC-27 pose no direct threat to the radio amateur’s frequency bands, concerns are that some agenda items may impose constraints in some bands by enforcing stricter spurious and emission limits so as not to interfere with adjacent bands used by the radio

astronomers, aeronautical services, satellite users and International Mobile Telecommunications (IMT).

The IARU, through its regional organizations, is closely monitoring inputs from countries to ensure that radio amateur’s interests are heard and protected before the WRC-27 conference that will be held in Shanghai, China.”

Draft National Frequency Plan 2025

The plan was revised from the original plan submitted in March 2025. The SARL commented and pointed out the various issues affecting amateur radio. The following is the SARL submission to the second draft.

10 December 2025

Dear Davis and Richard

Thank you for the second draft of the Draft National Radio Frequency Plan 2025. The SARL appreciates the amount of work you have put into the second draft and congratulates you on a project well executed.

The SARL would like to participate in the public hearing on 15 and 16 January 2026 and herewith provide information about the points we would like to raise on behalf of the Radio Amateurs in South Africa

Pre-amble

To facilitate the reading and discussion of our submission, we have included extracts of the ITU Radio Regulations (2024)

1.56 amateur service: A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.

1.57 amateur-satellite service: A radiocommunication service using space stations on earth satellites for the same purposes as those of the amateur service.

ARTICLE 25 AMATEUR services

Section I – Amateur service

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25.1 § 1 Radiocommunication between amateur stations of different countries shall be permitted unless the administration of one of the countries concerned has notified that it objects to such radiocommunications. (WRC-03)

25.2 § 2 1) Transmissions between amateur stations of different countries shall be limited to communications incidental to the purposes of the amateur service, as defined in No. 1.56 and to remarks of a personal character. (WRC-03)

25.2A 1A) Transmissions between amateur stations of different countries shall not be encoded for the purpose of obscuring their meaning, except for control signals exchanged between earth command stations and space stations in the amateur-satellite service. (WRC-03)

25.3 2) Amateur stations may be used for transmitting international communications on behalf of third parties only in case of emergencies or disaster relief. An administration may determine the applicability of this provision to amateur stations under its jurisdiction. (WRC-03)

25.4 (SUP - WRC-03)

25.5 § 3 1) Administrations shall determine whether or not a person seeking a licence to operate an amateur station shall demonstrate the ability to send and receive texts in Morse code signals. (WRC-03)

25.6 2) Administrations shall verify the operational and technical qualifications of any person wishing to operate an amateur station. Guidance for standards of competence may be found in the most recent version of Recommendation ITU-R M.1544. (WRC-03)

25.7 § 4 The maximum power of amateur stations shall be fixed by the administrations concerned. (WRC-03)

25.8 § 5 1) All pertinent Articles and provisions of the Constitution, the Convention and of these Regulations shall apply to amateur stations. (WRC-03)

25.9 2) During the course of their transmissions, amateur stations shall transmit their call sign at short intervals.

25.9A § 5A Administrations are encouraged to take the necessary steps to allow amateur stations to prepare for and meet communication needs in support of disaster relief. (WRC-03)

25.9B § 5B An administration may determine

whether or not to permit a person who has been granted a licence to operate an amateur station by another administration to operate an amateur station while that person is temporarily in its territory, subject to such conditions or restrictions it may impose. (WRC-03)

Section II – Amateur-satellite service

25.10 § 6 The provisions of Section I of this Article shall apply equally, as appropriate, to the amateur-satellite service.

25.11 § 7 Administrations authorizing space stations in the amateur-satellite service shall ensure that sufficient earth command stations are established before launch to ensure that any harmful interference caused by emissions from a station in the amateur-satellite service can be terminated immediately (see No. 22.1). (WRC-03)

Technology developments have also impacted on Amateur Radio.

As technology has developed so has the amateur service with a current greater emphasis on technical investigations as set out in 1.56 of the definition. This also requires a fresh look as some of the power limits still in the Radio Frequency plan. In term of 25.7 of the regulation this paper will make recommendations for consideration by ICASA before the final plan is gazetted.

135,7 – 137,8 kHz Footnote 5.67A limits the power to 1-watt EIRP.

472 - 479 kHz Footnote 5.80 not applicable in South Africa. Footnote 5.80A covers the power restriction in countries at least 800 km away from a list of countries. As South Africa meets that criteria 5 Watt EIRP is permitted.

As the transmit power of stations operating on the 135,7 and 472 kHz bands will not impact on other countries, the SARL proposes that 20 dBW is allowed, which is the power limit on amateur bands where the allocation is secondary. The aim is to encourage more experimentation on these two bands, as envisage in the definition of Amateur Radio in 1.56.

1810 - 1850 kHz Footnotes 5.98, 5.99, 5.100

1850 – 2000 kHz Footnotes 5.92, 5.103

Various power limits are indicated for different areas in footnotes 5.2, 5.96 and 5.100. The SARL

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proposes that the power limit on 1810 – 2000 kHz is set at 20 dBW as in annexure I of the 1995 Radio Regulations Gov Gazette 38641

430 – 440 MHz

There are many footnotes pertaining to this band which have little impact on Amateur Radio except the ISM allocation 433,5 – 434,79 MHz. According to annexure B3 of the 1995 Radio Frequency Regulations the power limit is 10 mW. Equipment freely available in South Africa operates on 5 watt and is not programmed to operate within the frequency spectrum for ISM. Many owners of the equipment operate outside the ISM band. We understand that this is an enforcement issue and not a spectrum issue. However, it is a protection issue for which ICASA as the regulator is responsible, hence we are bringing it to your attention.

24,0 – 24,05 GHz Notes and comments should refer to Annexure I

24,05 – 24,25 GHz Notes and comments should refer to Annexure I

We look forward to the opportunity to further discuss our contribution to the final plan,

Hans van de Groenendaal and Brian Jacobs attended the public hearing following the SARL submission.

RAE Report 2024/2025

Donovan van Loggerenberg, ZS2DL, SARL RAE Manager

Being new to this position, I was always aware that it was going to be quite a job. Herewith my report on the October 2025 exam.

The SARL RAE Staff if you wish to call us that was reduced to only 4 people for the October exam which I do believe streamlined the operation and as a result made it effective. Rassie, ZS1YT; Noel, ZR6DX; Kelley and myself, Donovan, ZS2DL.

We had 95 registrations for the October exam of which 81 sat the exam of which 69 passed. This is a pass rate of 85%.

A few things came to light from my first exam as manager. Firstly, Amateur Radio was never intended as a hobby for the masses. However, it continues to be eroded by people doing the exam in the hopes of being licenced for the wrong

reasons. These reasons include owning equipment they could not otherwise own, for “Civil defence” and because it might aid their real passions be that mountain climbing, parasailing or sea rescue to name but a few. Many of these people find the course irritating and leave before its conclusion and many write, get licenced and then leave the “Hobby” almost immediately because they never meant to get involved in the first place.

I do believe this is a phenomenon that needs to be address by the SARL and Clubs as it has been a cancer for many years. It is sadly the old problem of numbers vs quality.

Secondly there is a lack of co-ordination between what is required by the SARL and ICASA and what the Clubs and their tutors are actually doing. Many Clubs do not even want to be involved with the RAE process. Many of these Clubs are now under direct control of those who fall into the first category that I mentioned above.

In this vein it is also very evident that Class B candidates have all but dried up and it seems that none of the clubs are actively pursuing Learners under the age of 20 to get involved in the hobby. 2025 saw only one new Class B licence issued.

Then, I do see the RAE evolving slightly to keep up with modern trends and will look at including a VHF and Repeater usage element to the HF assessment procedure as I do believe that is where many start and it is important to expose the candidates to this as early as possible.

Finally running this RAE without a dedicated database and system for generating automated letters and certificates is impossible. Noel, ZR6DX has perfected a system that works. It is important that Noel remain involved in the RAE and in control of this system as he knows how it works as he designed it. I cannot emphasise this more than I have.

The Website also needs to assist in this regard and due to the poor quality of the site since it was hacked, we have now for the May 2026 exam introduced a form system which will hopefully reduce the amount of manual labour, registration involved for October 2025.

In conclusion, once we are assured of stability in the form of a functioning website, database accessible to RAE staffers and a revised Practical Assessments, we can start to look at increasing the

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RAE question pool, reducing the amount of exam centres and evaluating and improving the tuition the various clubs are providing.

The RAE remains a vital function of the SARL as it is the life blood of the organization and ensures the continuation not only of the League but the hobby as a whole. It is important that it receives the recognition and attention it deserves.

SARL Hamnet

Brian Jacobs, ZS6YZ

SARL HAMNET, the Emergency Communications Division of the South Africa Radio League has been very active over the year 2025 to 2026.

There are currently active SARL HAMNET groups in Gauteng, Western Cape, KwaZulu-Natal, Eastern Cape, Free State and the Northern Cape. The busiest groups are in Gauteng and the Western Cape. Both these groups are active not only with South African Search and Rescue (SASAR), which is a division of the Department of Transport, but also with both Provincial and Local Government Disaster Management and in the case of Western Cape with Wilderness Search and Rescue as well.

Due to the National Disaster Management Centre being in Gauteng there are also discussions taking place at a National Level with the NDMC being led by SARL HAMNET Gauteng. SARL HAMNET is acting in a consulting/advisory role as it simply does not have the resources that may be required when systems start to fail and it is vitally important that plan for Emergency Communications Systems to be successful, the systems need to be planned from the top down and that all spheres of government can intercommunicate when needed. SARL HAMNET can only be the last resort when all else fails.

In Gauteng, SARL HAMNET has also been requested to be the communication specialists for the South African Urban Search and Rescue Team USAR SA-01. This is a specialist search and rescue team currently comprising of specialists from the local fire and rescue and emergency medical services in Gauteng and are trained to international standards based on the UN INSARAG guidelines. During 2025 three members from Gauteng attended regular USAR training sessions and formed a strong relationship with the team. They

also received training on the operation of an On-Site Operations Coordination Centre which is responsible for the coordination of all teams in a search and rescue.

Between 1 – 5 December 2025, Brian, ZS6YZ deployed as a Communications Specialist with the USAR SA-01 Team to the Eastern Cape to participate in the INSARAG Earthquake Response Exercise (ERE-2025) in Nelson Mandela Metropolitan Municipality.

This ERE was a large-scale tabletop simulation exercise which will be attended by International USAR Teams, Emergency Medical Teams (EMTs), UNDAC members, NGOs, UN Agencies / Humanitarian Country Teams as well as National and Regional Agencies and other international response organizations. Members from SARL HAMNET Eastern Cape were requested to participate in the event by Nelson Mandela Metropolitan Municipality Disaster Management. This exercise was an invaluable experience that exposed SARL HAMNET members to what happens in an Operations Coordination Centre where its operators will be required to operate when providing emergency communications.

In January 2026 two SARL HAMNET operators deployed with the USAR SA-01 team to Mozambique to assist with the floods. There were at that time no cellular communications in the affected areas in Mozambique. Due to administrative issues the team did not cross the border into Mozambique and were re-assigned to assist in Limpopo. The SARL HAMNET members demobilised as there was no need to provide communications in Limpopo as all commercial services were still operational.

Gauteng, Western Cape, KZN, Eastern Cape and the Free State SARL HAMNET members have also been actively involved in providing radio communications for sporting events in their areas. These events have always been a good training for fundamental emergency communications, although it involves primarily VHF and UHF FM communications and makes extensive use of APRS mainly for tracking of resources during the events. It also trains the SARL HAMNET members how to work in a command-and-control environment.

SARL HAMNET country wide has also assisted the Aeronautical Rescue Coordination Centre

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(ARCC), with locating emergency beacons that have been activated. These beacons being PLB, ELTs and even EPIRBs are used aboard aircraft and vessels at sea in the event of an emergency to be able to locate the persons, aircraft, vessels or life rafts and when the beacon is activated it is of utmost importance that the beacon be located as soon as possible. SARL HAMNET members have excelled in this task.

This year there has only been a few aviation incidents that SARL HAMNET has been requested to assist with. The most notable one was the Barberton incident where teams from Mpumalanga and Gauteng deployed to assist with locating an aircraft that had crashed in the Lebombo Mountains between Barberton and Eswatini. SARL HAMNET's role was to provide communications as there was no cellular services in the Lebombo Mountains. Again, this was an invaluable experience and all the senior SARL HAMNET members who deployed learned a lot of what worked, what challenges were experience and how one can be better prepared in the future.

SARL HAMNET leadership attends both the ARCC and Maritime Rescue Coordination Centre (MRCC) meetings on a regular basis, but going forward will require more active participation from SARL HAMNET members in the port cities of Richard's Bay, Durban, East London, Port Elizabeth, Cape Town and Saldanha Bay as the MRCC establishes Sub-Rescue Centres in these ports that are run by the local Harbour Masters. The exact requirements and terms of engagement still need to be established.

IARU Monitoring Service

James Archibald, ZS6NS, Coordinator

The SARL remains a member of the IARU Region 1 Monitoring and Intruder Watch, known as IARUMS.

Over the past year the monitoring service has continued to document non-amateur intrusions which are typically:

Over-the-horizon radars.

Military digital modes.

Broadcast stations operating inside amateur allocations; and

Various unlicensed or misallocated signals.

Although these intrusions hinder radio amateurs from making full and proper use of their HF bands, the geo-location of South Africa makes us partially immune to the interference experienced in the Northern Hemisphere.

During the period of this report, the League received no formal reports of intruders in the HF bands (*but they do exist*).

For amateurs interested in obtaining further detailed information on where and what type of signals are received in our HF bands, a monthly newsletter is available from <https://www.iaru-r1.org/spectrum/monitoring-system/iarums-r1-newsletters/>. The monthly IARUMS News-letters are published by Gaspar Miró, EA6AMM.

Recordings of military transmissions can be found on the Signal Identification Guide Wiki at www.sigidwiki.com/wiki/Category:Military. Monitor the short-wave bands on-line with a web based SDR receiver at www.websdr.org/ IARU Monitoring System (IARUMS) www.iarums-r1.org/

James has indicated that he is stepping down as the IARUMS Coordinator for the SARL. Ed.

The QSL Bureau

Gert du Plessis, ZR6GRT

A substantial amount of QSL cards were received during the year.

The QSL cards for Division 1 to 5 were distributed and forwarded via PUDO. Currently here are quite a few cards for division 6 that need to be sent to the clubs and to the SARL members who do not belong to a club. This will be done within the next month as I am moving house and should pay more attention to the cards by the end of May.

The current situation with the Post Office with a likely risk of the state-owned entity entering liquidation failing to achieve financial sustainability make it difficult to send mail overseas and within South Africa with the assurance that the mail will reach its destination.

Council is working on an agreement with the German Amateur Radio Society, the DARC QSL Bureau on providing a QSL service for international QSL cards. A difficult process at present as the

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standard service that the DARC QSL Bureau is not suitable for the SARL requirement thus work in progress.

Publications

Dennis Green, ZS4BS

Radio ZS

Twelve issues of Radio ZS were published in the period under review. Thank you to the regular contributors and thank to the Clubs who provide me with a copy of their newsletters. Radio ZS can be found at <https://mysarl.org.za/radio-zs-archives/> and the IT Team is working on the archive of previous issues. Gert, ZS6GC provides the monthly updated Radio ZS Index. Thank you Gert.

HF Happenings

The HF Happenings newsletter is published almost every week (there are times when I miss out because of other activities!) The Newsletter is sent out via e-mail and can be found at <https://mysarl.org.za/hf-happenings/>. You can subscribe at HFHappenings+subscribe@groups.io.

On the Air Activity

Amateur Radio Today

Amateur Radio Today is produced weekly by Hans van de Groenendaal, ZS6AKV with input from Dave Reece, ZS1DFR (SARL Hamnet), Dave Long, ZS5FR (Satellites), Brian Jacobs, ZS6YZ (Focus on VHF) and Dennis Green, ZS4BS (HF News). The hour-long programme is transmitted on Sunday at 10:00 CAT on various VHF/UHF repeaters with a relay by Louis Veldkamp, ZR4DJL on 7 115 kHz. What is the possibility of having a relay on 60 metres (5 MHz)?

There is a repeat transmission on Monday evenings at 19:30 CAT on 3 620 kHz by courtesy of Andy Cairns, ZS6ADY. Amateur Radio Today is also available for download on www.sarl.org.za.

SARL News Team

The SARL News Team ensures an Afrikaans and English bulletin every Sunday morning. The length of the bulletin is dependent on news items received in the News Inbox.

Each week an invitation is extended to Clubs and

members to submit news items, but very few take the opportunity to do so. Clubs do not want to advertise their activities or achievements. "We invite clubs and individuals to submit news items of interest to radio amateurs and shortwave listeners, in both English and Afrikaans where possible, by uploading the news item at mysarl.org.za/news-inbox/ or by sending items to news@sarl.org.za no later than Friday morning preceding the bulletin date."

The text bulletins are uploaded to <https://mysarl.org.za/hq-sunday-bulletin-and-archives/> while the audio bulletins are available at <https://sarlnews.podbean.com/>. The bulletins are sent out on a Saturday afternoon via the SARL Communications mailing list (781 members). You can subscribe at sarlcommunications+subscribe@groups.io.

I extend a word of thanks to the SARL News Team – Hannes, ZS6JDE; Dave, ZS1DFR; Kevern, ZR2BK; Herman, ZS6CTA; Deon, ZR1X; Andy, ZS6ADY; Paul, ZS1S; Viv, ZS6VD; Rory, ZS2BL; Irene, ZS6IEA and Christo, ZS3CDW. Johan, ZS6JHB became a silent key during the year, unfortunately nobody volunteered to take his place.

Advertisers on the Web and Radio ZS

Dennis Green, ZS4BS, Editor of Radio ZS

The Council and Members would like to thank the following businesses who advertise on the League web site and in Radio ZS - Sam's Radios; RF Design; ICOM Hamshack Pretoria; ZS2BL's S.A. Hamshack; Hot Tools, Bombastik and Ronnies Shop. Please support our advertisers!

SARL Awards

Dennis Green, ZS4BS, SARL Secretary

Tjerk Lammers, ZS1J handles the issuing of the Certificates for the All Africa Award, the Worked All ZS Award and the Top Band Certificate and this information can be found in the SARL Awards Directory http://www.zs6p.com/SARL_Awards_Directory.pdf.

The Trophies and Awards for 2025 will be handed to the various recipients at the 2026 Awards Dinner at the Willows in Port Elizabeth on 2 May. The names of the worthy recipients will be

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announced at the Dinner and published in the June 2026 issue of Radio ZS.

Contest Working Group

Johann Bezuidenhout, ZS6JBZ

Contesting is an integral part of our hobby and popular from a national and international sporting perspective. Under the leadership of Johann Bezuidenhout, ZS6JBZ with team members Gerhard Coetzee, ZS3TG; Phillip van Tonder, ZS6PVT, Karel Bezuidenhout, ZS6WN; Philip Fischer, ZS6FY; Danie Schnetler, ZS6DPS and Karel Bezuidenhout, ZR6K (the Younger) ensures that this important aspect of our hobby functions extremely well.

I would like to thank this team sincerely for your continued support and dedication in executing this important work, ensuring that the contesting management required continue to cater for the contest preferences of a broad spectrum of amateur radio operators.

The Contest Working Group of the SARL has been actively involved in enhancing and promoting the competitive spirit within the amateur radio community through various contests throughout 2025 and into 2026.

The group has successfully executed and managed a comprehensive schedule of contests, contributing significantly to the vibrant contesting environment in South Africa. The results of these contests were published on the SARL Contest Information WhatsApp Group, in SARL News and HF Happenings, providing participants with timely feedback on their performance and encouraging a healthy competitive environment.

Participation in contests during 2025 improved over 2024. The VHF/UHF contests has remained a challenge.

For 2026, a two leg 20 m Club Contest has been introduced with the intent that those in ZS1 will be able to more successfully participate with better propagation to the Northern reaches of the country.

It is most pleasant to work with this group of individuals and I would like to thank you all sincerely for your continued support and dedication in providing and executing this important work.

Looking ahead to 2026, the Contest Working Group is focused on not only maintaining the momentum gained in recent years but also expanding participation in and the reach and impact of contests within the amateur radio community.

ZS100SARL and the 2025 SARL Centenary Marathon QSO Party

In 2025, the South African Radio League (SARL) celebrated its 100th anniversary - 20 May 2025 to 19 May 2026.

1925 saw the birth of the South African Radio Relay League. At the outset membership was strictly restricted to experimenters in possession of a licence and capable of conducting two-way telegraphic communication. In 1926 there was a membership of 90, all experimenters actively engaged in transmission work. QTC was the first printed magazine issued by the League in May 1928. In 1947 the word Relay was dropped and the SARRL became the South African Radio League (SARL).

In 2025 the SARL has over 1 500 members, presents two radio amateur's exams (RAE) per year, runs a QSL bureau, publishes a weekly HF Happenings newsletter and a monthly Radio ZS magazine. The SARL transmits a weekly news bulletin and the on-air magazine programme called Amateur Radio Today. The SARL runs several local and international contests to promote the radio amateur hobby. The SARL represents South African radio amateurs at the South African Regulator as well as in IARU Region 1.

The SARL Centenary Marathon QSO Party

In conjunction with the 100th anniversary of the SARL, the SARL Centenary Marathon QSO Party ran as a year-long operating event starting at 00:00 UTC on 1 January 2025 and ran through to 23:59 UTC on 31 December 2025.

Participating amateur radio operators worldwide worked South African amateur radio stations. Operators who submitted their logs containing QSOs made during 2025 with South African amateur radio stations received Gold, Silver, Bronze and Participation certificates depending on the number of stations and special event call signs contacted.

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Operators who wish to submit their 2025 operating log (in ADIF or excel format) to sarlcentenary@sarl.org.za have until 30 June 2026 to apply for an award certificate.

Centenary Call Sign ZS100SARL

During 2025 the SARL, with the aid of its members and associated clubs, was on the air with a special event call sign ZS100SARL. Two-way QSOs were made using CW, phone and digital on 160, 80, 60, 40, 30, 20, 17, 15, 12, 10, 6, 2 metres and 70 centimetres. All QSOs were uploaded to the ARRL Log of the World, QRZ.com, Club Log and the SARL SA-QSL systems.

Operating Activity

4 332 QSOs were logged during the year, 353 CW, 425 SSB, 11 FM, 9 FT4 and 3 534 FT8 QSOs. Theunis, ZS2EC was responsible for 3 561 of those QSOs. 3 051 unique call signs were worked across 115 DX zones. Bands worked 160 m to 70 cm. 324 South African stations and 2 727 DX QSOs were worked.

Confirmations

2 693 QSL on LotW
3 035 confirmed QRZ.com

Awards received

The QSL requirements for WAZS on SA-QSL were met and a certificate received

The ZS100SARL call sign achieved QSLs with 100 DXCC entities and has received a DX Century Club award from the ARRL.

QSL activity

QSLworld.com was used to send out an e-QSL card to all call signs contacted (1 card per station). The ZS100SARL QRZ.com page is active, including its ClubLog OQRS QSL card request link. ZS100SARL QSL cards can be requested via ClubLog OQRS or by e-mailing QSO details and a request to sarlcentenary@gmail.com

VHF/UHF and Microwave Manager

SARL Repeater Coordination Working Group

Phillip Van Tonder, ZS6PVT

The Past Year

As expected, the past year was relatively quiet regarding new repeater applications. The SARL Repeater Work Group processed three applications and provided ongoing assistance with license renewals and ICASA support.

License Updates and Re-licensing – Gauteng (Pretoria)

The SARL Repeater Work Group was tasked with assisting the Pretoria Amateur Radio Club (PARC) with various club and repeater licenses. These applications were successfully completed and transferred to the SARL ICASA license system. This transition offers significant benefits to organizations like clubs; by having licenses held by the SARL rather than individuals, license administration becomes far more flexible and sustainable.

A special thank you goes to Noel, ZR6DX for his ICASA liaison work and management of the ICASA Portal. I would also like to acknowledge Rassie, ZS1YT for his time, effort, and expertise with the ICASA system, which was instrumental in achieving this ideal outcome.

The list of updated repeaters includes:
ZU9NSD: Wonderboom (438,825 MHz) – PARC
ZU9OSE: Radcliff (145,725 MHz) – PARC
ZU9NSF: Midrand (439,025 MHz) – PARC

New Application

New application was done with assistance given to Mpisi Club close to Vryheid and the Polokwane Repeater interest group. All three the new licenses are in the 70 cm band and frequency is listed below:

ZU9MPS: Mpisi Mountain Vryheid (438,750 MHz)
ZU9PLR: Radar Hill Polokwane (439,100 MHz)
ZU9PLY: Ysterberg Polokwane (439,150 MHz)

Record Keeping

The repeater list was updated by cross-referencing known active repeaters with the records on the previous SARL website. To bolster the accuracy of the database, several calls were made to clubs and repeater custodians to update their records; these requests were also broadcast via the SARL Sunday News Bulletins.

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Response to these requests was limited, and very few new or previously unknown records were updated. Simultaneously, the Repeater-Book application was updated using the data received. Following Noel's, ZR6DX resignation in June 2025, record keeping has been maintained via a spreadsheet, which can be viewed on the MySARL webpage. A copy of the repeater records, including custodian contact details, was sent to SARL HAMNET for use in emergency situations.

Unlicensed and Incorrectly Operated Repeaters

It remains a well-known fact that several unlicensed and unlisted repeaters are still in use. In these cases, no attempt has been made to update information or present a valid license to the Repeater Work Group. Instances of "applied self" licenses were observed last year and brought to the attention of ICASA in hopes of eliminating this practice. A formal letter was sent to ICASA requesting co-operation in addressing this phenomenon.

Digital Repeater Network

The Repeater Work Group continues to monitor the digital repeater network closely. Digital communication and talk-groups have grown in popularity, with a national DMR net now active on Tuesday nights as well as other nets during the week and lots of activity on the popular talk groups. D-STAR has also seen a resurgence in popularity, bolstered by the technical talk presented on the Sandton Power Hour Tech Talk platform by Dick, ZS6BUN.

The implementation of transcoders bridging the DMR and D-STAR realms is a breakthrough, showing great potential for newcomers and the younger, tech-savvy generation. We extend a special thanks to the digital administrators working behind the scenes - Johann, ZS6JPL and Jan, ZS1Z for their many years of dedicated service.

I wish everyone increased repeater activity and continued enjoyment of the amateur radio hobby!

SARL VHF/UHF/SHF: DXCC, VUCC and Distance Records Table.

Paul Smit, ZS6NK

Twelve updates were made over this period,

eleven in 2025 and one in January 2026. Members, as in previous years, have been asked for inputs although a handful do send claims without prompting. The records can be found at <https://mysarl.org.za/vhf-uhf/>.

Report on Beacons from the VHF Working Group

Brian Jacobs, ZS6YZ

The Karoo Beacon Project has been put on hold due to a shortage of time and resources.

The site is still available in Strydenburg. The security on the site still needs to be upgraded and the solar power system needs to be specified and quotes obtained. All the beacon hardware has been purchased and is now waiting to be integrated into a fully operational beacon and to be thoroughly tested before being installed on the site in Strydenburg. All antennas and splitter cables have also been purchased.

The hope is to get more younger enthusiastic amateurs involved in the project to take it to fruition. The project still holds great value to the amateur community even though the general interest in VHF and above still has not recovered since the key of Carl, ZS6CBQ fell silent.

IARU Region 1 President's Report 2024

Sylvain Azarian, F4GKR

The report of the IARU Region 1 President was published on pages 105 to 142 of the April 2026 Radio ZS.



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