THE S.A.R.C.

COMMUNICATOR

July - August 2025

Surrey Amateur Radio

50

1975 - 2025

The Bi-monthly Journal of Surrey Amateur Radio Communications

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...from the Editor's Shack

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Issues appear bi-monthly, on odd-numbered months, for area Amateur Radio operators and beyond, to enhance the exchange of information and to promote amateur radio activity.

Contributions of articles and photos are welcome.

During non-publication months we encourage you to visit the Digital Communicator at ve7sar.blogspot.ca, which includes recent news, past issues of The Communicator, our history, photos, videos and other information.

To subscribe, unsubscribe or change your address for e-mail delivery of this electronic journal, notify communicator @ ve7sar.net

If you find The Communicator worthwhile, regular readers who are not SARC members are invited to contribute a donation towards our Field Day fund via PayPal or via eTransfer to payments@ve7sar.net

SARC maintains a website at www.ve7sar.net Please check it out, it has been redesigned to offer more information!

By the time you read this, another Field Day will be in the history books.This year we again used our OTC - our training centre, as the site for our operations which are described in this issue.

It was disappointing for us, likely because band conditions were very poor. At least it is an equalizer because 'Old Sol' doesn't give preferential treatment to anyone. You will find a very interesting story about the current solar turmoil on page 12.

Scientists are uncovering evidence of a lesser-known cosmic rhythm called the Centennial Gleissberg Cycle, a roughly 80- to 100-year modulation that influences the sun's activity. After a period of relative calm, new research suggests this cycle is awakening, promising increasingly intense solar cycles through the 2050s… and here we though the solar max only brought great propagation.

Our big event is coming soon, as celebrated by our cover and several stories and reminiscences from our past 50 years. Tuesday, October 7th officially marks 50 years since that first SARC meeting, coincidentally that meeting in 1975 also took place on a Tuesday. We are asking all our 160+ members to make a special effort to check into our regular weekly SARC Net at 8pm (Pacific time) that evening. We also have IRLP and Echolink and we welcome your check-ins to help us commemorate the event. We are fortunate to have 3 living members from that first year still with us, Fred VE7IO, Ralph VE7OM and Ken VE7BC.

Enjoy this issue, and please keep the feedback coming.

73,

~ John VE7TI, Editor
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IN THIS ISSUE

Do you have a photo or bit of Ham news to share? An Interesting story or link? Something you are looking for?
eMail it to communicator at ve7sar.net for inclusion in this publication.

This Month's Cover…

We're celebrating! It is the 50th anniversary of the founding of the Surrey Amateur Radio Club (now Surrey Amateur Radio Commuinications Society). Youi will find several references to our history in the pages of this edition.

"I have not failed. I've just found 10,000 ways that won't work."
- Thomas A. Edison

The Rest of the Story...

The Unsung Pioneers

Some lesser-known early Amateur Radio experimenters and the dawn of wireless communication

The invention of radio, a cornerstone of modern communication, is often attributed to Guglielmo Marconi, whose name is synonymous with the first successful long-distance wireless transmissions. However, the path to radio was paved by a host of lesser-known inventors and amateur experimenters whose curiosity, ingenuity, and relentless tinkering laid the groundwork for this transformative technology. These early pioneers, working in the shadows of more celebrated figures, conducted critical experiments in the late 19th and early 20th centuries, exploring electromagnetic waves and wireless telegraphy. Their contributions, often overlooked, were instrumental in shaping the development of radio as we know it today.

The Theoretical Foundations and Early Discoveries

The story of radio begins with the theoretical work of scientists like James Clerk Maxwell, who in the 1860s predicted the existence of electromagnetic waves traveling at the speed of light. Maxwell's equations provided the intellectual foundation for radio, but it was Heinrich Rudolf Hertz who, in the 1880s, experimentally confirmed the existence of these waves, later called "Hertzian waves." Hertz's work involved generating and detecting electromagnetic waves using spark-gap transmitters and receivers, proving Maxwell's theories. While Hertz dismissed the practical applications of his discovery, his experiments inspired a generation of inventors and amateurs to explore the potential of these invisible waves.

David E. Hughes

Among the earliest to stumble upon radio-like phenomena was David Edward Hughes, a British inventor working in London in 1879. Hughes noticed that a faulty contact in a Bell telephone he was using in his experiments produced sparks that could be detected as an "extra current" by a nearby device. He developed a detector based on his microphone design, similar to later coherers, and found he could pick up these "aerial waves" up to 500 yards away. In 1880, Hughes demonstrated his findings to the Royal Society, but the phenomenon was dismissed as electromagnetic induction, and he abandoned further research.

Hughes's work, though not fully recognized at the time, was a critical early step in detecting radio waves.

The Role of Amateur Experimenters

The late 19th century saw a surge of interest in wireless communication, driven not only by professional scientists but also by amateur experimenters who were fascinated by the possibilities of Hertzian waves. These hobbyists, often working with limited resources, played a significant role in advancing radio technology. One such figure was Mahlon Loomis, an American dentist who, in 1866, claimed to have demonstrated wireless telegraphy by using kites to transmit signals between two points. While Loomis's experiments lacked the rigor of later work and are debated by historians, his efforts reflect the era's growing curiosity about wireless communication.

Another key figure was Alexander Stepanovich Popov, a Russian physicist who, in 1894–95, developed a radio receiver based on Oliver Lodge's coherer design. Popov's device was initially intended as a lightning detector to track storms for the Russian forest service, capable of sensing lightning strikes up to 30 kilometers away. On May 7, 1895, Popov presented his receiver to the Russian Physical and Chemical Society, an event celebrated in Russia as "Radio Day." By March 1896, he successfully transmitted a Morse code message ("Heinrich Hertz") between two buildings 250 meters apart. Although Popov did not pursue patents or commercial applications, his work demonstrated the practical potential of radio waves for communication, predating some of Marconi's achievements.

In India, Jagadish Chandra Bose conducted pioneering experiments with electromagnetic waves in the 1890s. Bose developed a mercury coherer, a sensitive device for detecting radio waves, and demonstrated the generation and reception of radio signals in public lectures. His work predated Marconi's, and some argue that Bose's coherer was used by Marconi in his early systems. However, Bose, driven by scientific curiosity rather than commercial ambition, did not patent his inventions or focus on communication applications, leaving his contributions underappreciated outside academic circles.

Bose and his 60 GHz microwave apparatus at the Bose Institute, Kolkata, India. His receiver (left) used a galena crystal detector inside a horn antenna and galvanometer to detect microwaves. Bose invented the crystal radio detector, waveguide, horn antenna, and other apparatus used at microwave frequencies.

The Amateur Spirit and Technological Advancements

The early days of radio were marked by a "rugged experimentation" period, where the lines between professional and amateur were blurred. Hobbyists and inventors alike raced to build better equipment, often sharing their findings through publications like American Electrician. Marconi's 1899 transmission of the America's Cup yacht races sparked widespread interest, and detailed construction plans published in magazines enabled amateurs to replicate his experiments. These early designs were simple, using readily available parts, which democratized access to radio experimentation.

One significant advancement came from the work of Reginald Fessenden, a Canadian inventor who pushed radio beyond Morse code. In 1900, Fessenden achieved the first wireless transmission of audio over a distance of about one mile, and on Christmas Eve 1906, he made history with the first public wireless broadcast, transmitting music and speech to ships at sea. Fessenden's invention of the radio-frequency alternator, which produced continuous waves, was a leap forward from the spark-gap transmitters used by Marconi and others. His work laid the foundation for modern AM radio, though he struggled to secure patents and recognition, overshadowed by Marconi's commercial success.

David Edward Hughes' experiments.

Amateur radio operators, or "hams," also played a crucial role in advancing the technology. In the early 1900s, amateurs formed wireless clubs across the United States and Europe, experimenting with new techniques and sharing knowledge. The invention of the crystal detector, a simple and inexpensive tuner, made it easier for hobbyists to build receivers, fueling the growth of amateur radio. By 1914, Hiram Percy Maxim, an American inventor, founded the American Radio Relay League (ARRL), creating a network of amateur stations to relay messages over long distances. This organizational innovation improved the reliability of radio communication and fostered a sense of community among experimenters.

Challenges and Controversies

The contributions of these early experimenters were not without challenges. Many, like Hughes and Popov, faced skepticism from the scientific establishment, which often dismissed their findings as mere curiosities. Others, like Nikola Tesla, encountered legal and financial obstacles. Tesla's work on high-frequency electricity in the 1890s included experiments with radio waves, and he filed a patent for key radio components in 1897. However, a fire destroyed his lab in 1895, delaying his progress, and Marconi's patents were initially favored by the U.S. Patent Office. In 1943, the U.S. Supreme Court upheld Tesla's patent, posthumously recognizing him as a key figure in radio's invention, but public perception still largely credits Marconi.

The debate over who "invented" radio underscores the collaborative nature of its development. Marconi's success stemmed not only from his technical innovations but also from his entrepreneurial drive and ability to secure funding and publicity. Unlike many of his contemporaries, Marconi saw the commercial potential of radio and worked tirelessly to develop practical systems, such as his transatlantic transmission of the letter "S" in 1901. However, his achievements built on the discoveries of Hertz, Lodge, Bose, Popov, and others, highlighting the collective effort behind radio's evolution.

The Legacy of the Amateurs

The contributions of early amateur radio experimenters extended beyond technical innovations. Their passion for exploration and willingness to share knowledge created a culture of collaboration that accelerated radio's development. By the 1920s, as commercial radio stations like 8MK (later WWJ) in Detroit and 9XM (later WHA) in Wisconsin began regular broadcasts, the groundwork laid by amateurs enabled the rapid expansion of radio as a mass medium. These stations, initially experimental, relied on technologies and techniques honed by hobbyists.

The legacy of these unsung pioneers is evident in the global impact of radio. From enabling ship-to-shore communication to broadcasting entertainment and news, radio transformed society, thanks to the curiosity and persistence of early experimenters. Figures like Hughes, Popov, Bose, and Fessenden, though less celebrated than Marconi, were vital to the discovery and refinement of radio technology. Their stories remind us that innovation often emerges from the margins, driven by those who dare to explore the unknown.

In future Communicators we will explore their contributions in depth.

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THE S.A.R.C. COMMUNICATOR

Some Early Surrey Amateur Radio Club History

The Surrey Amateur Radio Club (SARC), now known as Surrey Amateur Radio Communications, was born in the spring of 1975 in the Electronics Lab of North Surrey Senior Secondary School in Surrey, British Columbia. A conversation among electronics students who had recently earned their Amateur Radio Licenses, guided by their instructor Doug Moore (VE7CBM), ignited the idea for a local club. Student Cory Balbraith (VE7CGR) championed the concept, broadcasting it enthusiastically across the airwaves and garnering widespread support. By the fall, plans for a formal club had gained unstoppable momentum, setting the stage for SARC's emergence as a cornerstone of the amateur radio community.

Founding and First Steps: 1975–1976

The club's inaugural meeting took place on the first Tuesday, October 7, 1975 in the school's electronics room, with permission from the administration to hold weekly Tuesday night meetings. Many attendees of this historic gathering, some of whom remain active today, laid the foundation for SARC's enduring legacy. Doug Moore, as the keyholder, was elected President, tasked with opening the school, chairing meetings, and ensuring coffee and cookies fueled the group's enthusiasm. Cary Miller (VE7CFC) became Vice President, and Cory Balbraith took on the role of Secretary-Treasurer. The club was licensed as VE7SAR under Cary's sponsorship, leveraging his advanced amateur radio certificate.

Theory lessons began in December 1975, led by Doug Moore, Bob Searle (VE7CHB), Cary Miller, and Fred Orsetti (VE7CJG). Mike Holly (VE7AVM) played a critical role, producing instructional tapes and teaching Morse code (CW) to aspiring hams. Additional instructors, including Garreth Gammon (VE7CGG) and Lee Middleton (VE7BHS), contributed over the years, ensuring robust educational support. Although the club had access to the school's Kenwood 510 transceiver, technical issues prevented its use, prompting members to rely on personal equipment and resourcefulness.

SARC's first Field Day in June 1976, held at Fred Orsetti's property (QTH) and supervised by Mike Holly, was a formative experience. Participants included Mike Holly, Cary Miller, Carl Bertholm (VE7CLC), Mike Heritage (VE7CLE), Ed Dunham (VE7CIO), Laurence Holloway (VE7ADC), Jerry Szakal (VE7COI), Ralph Webb (VE7BVG), Vic Medway (VE7CON), Pat Cavanagh (VE7CAV), Bob Searle, Doug Moore, Peter Desrosier (VE7CGZ), and his wife Lise. Though the group's score was modest, the event fostered camaraderie and practical experience. When Cory Balbraith graduated in January 1976 and moved to Nanaimo to work at radio station CHU, Fred Orsetti stepped into the Secretary-Treasurer role.

Growing Momentum: 1976–1977

The 1976–77 season, under President Fred Orsetti, Vice President Bob Searle, and Secretary-Treasurer Carl Bertholm, saw significant advancements. SARC acquired a

portable tower and a TA 33 Jr. beam antenna, enhancing their Field Day operations. The event moved to Monkey Mountain, east of Abbotsford, recommended by Al Neufeld (VE7CDC) for its stunning views, though its treacherous access road tested participants' resolve. Bob Searle and Peter Desrosier ensured the team was well-fed, maintaining morale during the challenging setup.

Social events flourished, with the club hosting its first annual Christmas Party at the Islanders restaurant on King George Highway near White Rock. A tour of Canadian Pacific Airlines facilities, organized by Tony Craig (VE7XQ), offered members a glimpse into professional communications systems, enriching their technical knowledge. The club's official call sign, VE7SAR, solidified its identity, and its activities began to attract attention beyond Surrey.

Innovation and Recognition: 1977–1978

Led by President Mike Holley, Vice President Carl Bertholm, and Secretary-Treasurer Mike Heritage, the 1977–78 season was marked by innovation. SARC initiated a Ten Meter Net on 28.675 MHz every Sunday at 0400 Zulu, initially led by Fred Orsetti and later managed by Carl Bertholm and Mike Heritage. Mike Holly supplemented the net with Morse code practice, reinforcing the club's educational mission. Field Day on Monkey Mountain was a triumph, with SARC initially announced in QST as the top Canadian club in the 3A category. A late submission by a rival club dropped them to second place, but the achievement was remarkable for a young organization.

The club's first auction at North Surrey Senior Secondary School was a lively success, blending equipment trading with camaraderie. The second annual Christmas Party at the Surrey Inn faced interference from a Saturday night disco, but members' enthusiasm ensured a memorable evening. These events underscored SARC's ability to balance technical pursuits with social engagement.

A Peak of Activity: 1978–1979

The 1978–79 season, under President Carl Bertholm, Vice President Mike Heritage, Secretary Joan Gendron (VE7CTB), and Treasurer Jim Johnson (VE7CSJ), was a high-water mark. An influx of new students prompted Max Green (VE7DZ) to take over theory instruction, ensuring the club could accommodate growing interest. The season began with a picnic at Port Kells Park on August 27, fostering connections among members and their families.

SARC's first Flea Market on October 15, 1978, at Hjorth Road Hall drew buyers and sellers from across the Lower Mainland, establishing the club as a regional hub for ham radio commerce. The annual Christmas Party at St. Helen's Church hall, catered by Woodwards, was a festive highlight. A "bunny hunt" (radio direction-finding event) organized by Fred Orsetti, using a borrowed transmitter from the British Columbia Frequency Modulation Association (BCFMA), with Cary Miller repeatedly winning, much to the frustration of others.

Field Day preparations included a trial run at Surrey Place mall, where Joan and Len Gendron's motorhome housed a station, and Cary Miller transmitted pictures via slow-scan television (SSTV) from his Delta QTH. The club purchased a generator and a 204BA monobander antenna, which proved instrumental during Field Day on Monkey Mountain. Carl Bertholm and Mike Heritage managed the mess tent, ensuring participants were well-fed. SARC secured first place in Canada and eleventh overall in the 3A category, a testament to their growing prowess.

A standout project was the Surrey Centennial Certificate, celebrating Surrey's 100th birthday in 1979. Cecil Boggis (VE7YM) made numerous contacts, while Doug Moore handled paperwork, supported by a grant from the Surrey Centennial Committee and printing assistance from Fred Orsetti and Carl Bertholm. Certificates were sent to hams in England, France, South America, Australia, and nearly every U.S. state, showcasing SARC's global reach.

Community Engagement and Resilience: 1979–1980

Under President Bill Driscoll (VE7ARL), Vice President Al Neufeld, Secretary Mike Foster (VE7ACZ), and Treasurer Lee Hopwood (VE7BDZ), the 1979–80 season emphasized community service. SARC participated in the Pacific National Exhibition's amateur radio booth, showcasing their portable tower and beam. They set up a station (VE7SAR) at Bear Creek Park for Heritage Day, utilizing the Gendrons' motorhome, and provided communications for Delta Family Days. Two Flea Markets at Hjorth Hall—in October and March—cemented their popularity among hams.

Field Day moved to Joe Chesney's property in Langley due to poor road conditions on Monkey Mountain. When the club's generator failed, Ralph (VE7PWA) supplied ni-cad batteries, and Fred Orsetti's generator kept them charged. A new 4-element 15-meter monobander, procured by Mike Heritage, enhanced operations. Despite logistical challenges, the event highlighted SARC's adaptability and teamwork.

Overcoming Challenges: 1980–1981

Fred Orsetti returned as President in 1980–81, joined by Vice President Cary Miller, Secretary Chris Johnson (VE7FFJ), and Treasurer Lee Hopwood. A CUPE strike forced meetings to shift from the electronics room to classrooms at North Surrey Secondary and, at times, the Guildford Main Library. Max Green continued preparing students for exams, while Fred Orsetti's efforts established contact with the Emergency Measures Organization (EMO), precursor to the Surrey Emergency Program Amateur Radio (SEPAR), enhancing SARC's role in emergency communications.

The Christmas Party at Scandia House in Whalley, arranged by Olaf Saetre (VE7CIS), was a success, though the venue later closed. No bunny hunts were held, but two Flea Markets maintained the club's commercial vibrancy. Field Day returned to Monkey Mountain, with Carl Bertholm and Mike Heritage managing the mess tent. A Cloverdale Scout troop assisted with setup and teardown, providing portable toilets ("Mrs. Murphy's parlour"). While the point total was modest, the event's enjoyment underscored SARC's spirit.

The Communicator

The Communicator, the club bulletin, conceived by Bob Searle, nurtured by Doug Moore, and adopted by Carl Bertholm, became a vital communication tool.It was later taken over by Fred Orsetti, who produced 100 monthly editions. In July 2010 Fred asked John Schouten if he would like to assume the role as editor and publisher, a task John has held to the present day. In passing the Communicator role, Fred wrote: "As this is the last Communicator for the year and my last one as Editor, I would like to add a few final comments. SARC is stronger now than it has been for a number of years and the interest in amateur radio is also growing. This all bodes well for SARC and for amateur radio in Surrey.

Congratulations to the past SARC directors who have volunteered many hours of their time, and in some cases covered their own expenses, for a job well done. I am proud to have been a part of the SARC experience and I look forward to participating with everyone in the future.

Amateur radio in Surrey is now known as a strong contributor to the advancement of our hobby as we continue to be on the leading edge on amateur radio communications."

Legacy and Lasting Impact

From its origins in a school lab, SARC grew into one of North America's most active amateur radio clubs. Its educational programs, Field Days, Flea Markets, and community initiatives like the Surrey Centennial Certificate and SEPAR demonstrated its commitment to technical excellence, fellowship, and public service. Overcoming challenges like equipment failures, difficult terrain, and labor strikes, SARC's members showcased resilience and ingenuity. By 1981, the club had not only built a thriving local community but also left a global mark, with achievements like top Field Day rankings and international certificate distribution. This vibrant early history laid the foundation for SARC's enduring legacy as a leader in amateur radio and emergency communications.

Telus Donates Tower/Trailer to SARC!

December 2009

"This is like winning the lottery!" commented one of the elated SARC members present when viewing the tower/trailer combination donated by Telus to the Surrey Amateur Radio Club.

Telus Fleet Standards & Maintenance Manager, Wayne Butler, and Fleet Technician, Dan Auld, in demonstrating the tower to the happy group, said that the reason SARC had been singled out for this gift was that they were aware of the contributions that Surrey ARC and SEPAR Society had made to emergency communications in Surrey, and they wanted to be sure that it would be put to good use in service to the community.

After the stabilizer arms are spread, and with the push of a button the hydraulic system and power winch will raise the tower to a vertical position then extendit to a height of 107 ft. The generator can deliver 8 kw at 120 and 240 volts which should be more than ample to power a full complement of radios, amplifiers, and ancillary gear (and maybe even the coffee pot!).

Thanks to Surrey Fire Services, we also now have a very secure location to store this unit along with SARC's other towers and trailers. Some fun hours will be spent by the proud owners getting familiar with this equipment, learning how to use it safely and putting it to use in contests, emergency simulations and, if needed, in real events.

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Christmas 2010

[Left] In Spring 2010, an IRLP/Echolink node was installed on the 2m repeater, supplementing IRLP on 440 Mhz at the UHF repeater site. SARC is in the final stages of securing a new, improved repeater location on the roof of a North Surrey high-rise.

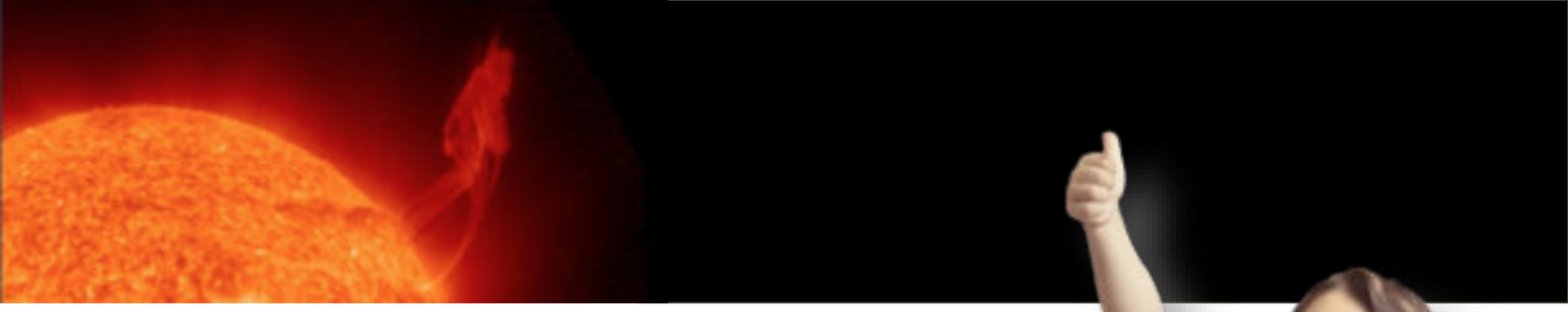
This is expected to significantly improve VHF and UHF communication within Surrey and beyond. In addition, SARC's lottery application was successful and the club will be begin replacing obsolete equipment with new gear early in 2011. SEPARS was equally successful with their Lottery application and the two projects will complement each others' objectives.

Long-time SARC webmaster Hiu Yee VE7YXG at Field Day 2010 equestrian-mobile

We are

SARC

Surrey Amateur Radio Communications



News You Can't Lose

The Centennial Gleissberg Cycle:

A New Era of Solar Intensity

by SPACEWEATHER.COM

If you've been captivated by the dazzling auroras of Solar Cycle 25, brace yourself: the next few decades could bring even more spectacular displays. Scientists are uncovering evidence of a lesser-known cosmic rhythm called the Centennial Gleissberg Cycle, a roughly 80- to 100-year modulation that influences the sun's activity. After a period of relative calm, new research suggests this cycle is awakening, promising increasingly intense solar cycles through the 2050s.

Most people are familiar with the 11-year sunspot cycle, where the sun's magnetic activity waxes and wanes, producing sunspots, solar flares, and auroras. The Gleissberg Cycle, however, operates on a much grander scale, subtly amplifying or suppressing solar activity over a century. For the past 15 years, the sun has lingered near a low point in this cycle, resulting in subdued solar behavior. But according to a recent study published in Space Weather, that's about to change.

"We've been studying protons in the South Atlantic Anomaly," says Kalvyn Adams, an astrophysics student at the University of Colorado and lead author of the study. The South Atlantic Anomaly is a weak spot in Earth's magnetic field, located over the South Atlantic Ocean, where solar particles like protons can approach closer to our planet.

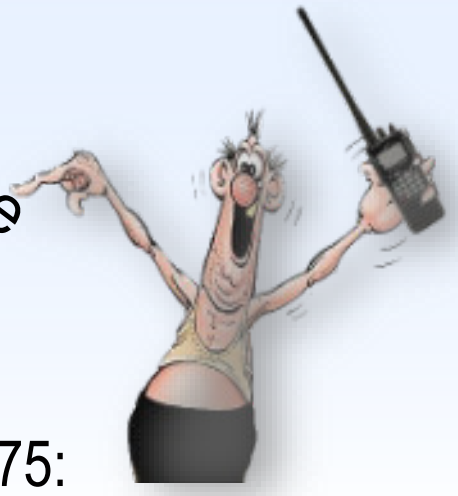
These protons, Adams explains, act like a "canary in a coal mine" for the Gleissberg Cycle. Data from NOAA's Polar Operational Environmental Satellites show a clear decrease in these protons, signaling that the Gleissberg Cycle is poised to surge.

This finding aligns with other clues pointing to the end of the "Gleissberg Minimum." Current sunspot counts are higher than expected, the sun's ultraviolet output is climbing, and Solar Cycle 25 has already surpassed activity forecasts. Together, these indicators confirm that the sun is entering a more active phase of the centennial cycle.

What does this mean for the future? Solar Cycles 26 through 28, peaking around 2036, 2047, and 2058, respectively, are expected to grow progressively stronger. The Gleissberg Cycle's peak, projected around 2055, could align with Solar Cycle 28, potentially making it one of the most intense in recent history. This upswing could bring more frequent and vivid auroras, but it also poses challenges for our increasingly space-reliant society.

"With thousands of satellites and spacecraft in orbit, we need to prepare for a changing space environment," Adams warns. Higher solar activity could mean increased particle fluxes and radiation, which can disrupt satellite operations and communications.

Page13—News You Can Lose



The Lighter Side of Amateur Radio

The Great Ham Radio Hullabaloo of 1975: A 50-Year Flashback

Greetings, fellow hams, and welcome to a time-traveling tale of 1975, when our amateur radio club was born in a blaze of static, soldering irons, and sideburns so wide they interfered with UHF signals! As we celebrate 50 years of beeps, blips, and banter, let's rewind to the groovy days of disco, bell-bottoms, and the golden age of ham radio hi-jinks.

Picture it: 1975, a year when gas cost 57 cents a gallon, Jaws terrified moviegoers, and the only "handheld" was a brick-sized dream in some engineer's polyester pocket… with a pen-protector of course. Our founding hams gathered in a basement thick with cigarette smoke and optimism, armed with vacuum tube rigs, hand-cranked Morse keys, and a passion for connecting across the ether.

The club's first meeting was a key milestone, at a time when tuning a Heathkit transmitter without setting the shag carpet on fire was an accomplishment in itself.

Back then, a "portable" radio weighed as much as a Volkswagen Beetle, and antennas sprouted from rooftops like dandelions after a spring rain. Transistors were just starting to replace vacuum tubes, but most rigs still hummed and glowed like a sci-fi movie prop.Our pioneers battled TVI (television interference) complaints from neighbors obsessed with Happy Days, shouting, "Your rig's ruining Fonzie's 'Ayyyy!'" Legend has it that one brave ham, hoping to erect a home-brewed dipole, sweet-talked a neighbor with a plate of macrame-decorated brownies… and it worked.

Morse code was king in ‘75, and our founders tapped out dits and dahs with the fervor of disco dancers doing the Hustle. Equipment was mostly DIY or bust—kits from Heathkit, the Drake TR-4 and Collins KWM-2 ruled the shack, but if your solder joint failed, you’d be QRT (off the air) for hours, cursing under your breath while the cat chewed your coax.

Of course, not all was smooth sailing. Band conditions were fickle—sunspots played havoc with HF, and one poor ham swore his signal bounced back from a UFO. The DoC’s rules loomed, and the budget for coax and connectors often competed with the need for more lava lamps. Yet, through blown fuses and tangled feedlines, our club was born, a ragtag crew united by the magic of radio waves and a shared dream of “working the world.”

The Language: The lingo was as colorful as the era’s leisure suits. “Ragchewing” meant long chats about everything from propagation to pet rocks, while “DXing” was the thrill of snagging a signal from halfway across the globe—usually followed by a victory dance that rivaled anything at Studio 54. QSL cards, those postcard proofs of contact, piled up like eight-track tapes, each one a trophy of a night spent twirling knobs in the glow of tube-lit dials.

Before texting and emojis, there was Morse code—a language that could make even the most patient person feel like they were in an intense game of “guess that dot and dash.” Sending a “CQ” call was the ham equivalent of shouting “Anybody out there?” into the void, hoping someone would shout back.

And when you finally made contact, the Q-signals flew faster than a disco beat: QSL for “Got your message,” QRZ for “Who’s calling me?” and QTH for “Where are you?” It was a secret code that only the coolest kids on the block understood.

The Social Scene: More than just static and squeaks. Contrary to popular belief, 1975 ham radio wasn’t just about talking to your radio. It was a social lifeline. Operators swapped stories, weather reports, and occasionally, recipes for meatloaf (because why not?). Field days were the ultimate parties—imagine a bunch of radio geeks camping out, trying to get a signal while avoiding mosquito attacks and the occasional squirrel sabotage.

The Challenges: When Solar Flares Were the Original Internet Outages. Back then, if your signal dropped, it wasn’t because of a bad Wi-Fi connection. It was probably a solar flare, a thunderstorm, or your neighbor’s newfangled electric lawnmower wreaking havoc. Troubleshooting meant hours of fiddling with knobs, checking connections, and praying to the radio gods.

Despite the quirks, amateur radio in 1975 was pure magic. It connected people across cities, countries, and continents long before the internet made it cool. It was a hobby, a science, a community—and sometimes, a comedy of errors.

So here’s to 50 years of hamming it up, making waves, and keeping the spirit of 1975 alive—one “CQ” at a time. Dust off those old rigs, fire up the antennas, and remember: the best conversations happen when you least expect them... even if they come with a bit of static.

We salute those 1975 hams—our founders, who turned static into connection, one CQ call at a time. So, raise your coffee mug (or your mic), and let’s toast to the days of big hair, bigger antennas, and the birth of our club. Here’s to 50 more years of “73” (best regards) and beyond—may your signals stay strong and your QSOs be plenty!

~

Amateur Radio History

In the Province of British Columbia

The history of amateur radio in British Columbia (BC) reflects a blend of technological innovation, community engagement, and adaptation to the province's unique geography, which includes remote coastal areas, mountainous terrain, and urban centers like Vancouver. While specific records of early amateur radio in BC are sparse, the broader Canadian and regional context provides a framework for understanding its development.

Beginnings (Pre-1920s)

Amateur radio in Canada began to take shape in the early 20th century, with enthusiasts experimenting with wireless telegraphy. In BC, coastal communities and maritime activities likely drove early interest, as radio was critical for ship-to-shore communication. By the 1910s, hobbyists in Vancouver and Victoria were building spark-gap transmitters and crystal receivers, inspired by global advancements in wireless technology. The federal government, through the Department of Naval Service, started regulating radio in 1913, issuing experimental licenses with "X" prefixes (e.g., XWA). In BC, early operators faced challenges due to the province's rugged terrain, which limited signal propagation, but also fostered innovation in antenna design and long-distance communication.

During World War I (1914–1918), amateur radio activities were suspended across Canada, including BC, as the government restricted private radio use for security reasons. Equipment was often confiscated, and operators were encouraged to support military communications. Post-war, the ban lifted, and amateur radio surged in popularity.

1920s–1930s: Formalization and Growth

The 1920s marked a significant period for amateur radio in BC. In 1922 radio broadcasting began to appear. Initially there was not a separate category for stations making broadcasts intended for the general public, so the earliest broadcasts were sent by stations operating under standard amateur and experimental licences. In early 1922 two new licence categories were added: "Private Commercial Broadcasting station" and "Amateur Broadcasting station". In late April 1922 an initial group of twenty-three commercial broadcasting station licenses was announced, which received four-letter call signs starting with "CF", "CH", "CJ" or "CK", plus one additional "C" as the third or fourth letter. Stations in the Amateur Broadcasting station category received alphanumeric call signs starting with the number "10".

In 1929 at the International Radiotelegraph Convention (Washington, 1927) Canada was assigned the call letters blocks CFA–CKZ and VAA–VGZ.[38] These came into force January 1, 1929, and amateur radio stations were now included in the ITU lettering scheme. Initially all amateur radio stations were given the prefix "VE" which replaced informal use of "NC", a prefix in use by the United States Navy.

The Great Depression in the 1930s slowed growth but also highlighted amateur radio's value. With limited commercial communication infrastructure in rural BC, "ham" operators filled gaps, relaying messages for isolated communities. Clubs in Victoria and Vancouver organized training sessions to help new operators obtain licenses, and homemade equipment remained common due

to economic constraints. BC Amateurs and those in western Canada were issued "VE5" callsigns until 1939.

1940s–1950s: War and Post-War Boom

World War II (1939–1945) again halted amateur radio activities, as operators were prohibited from transmitting. Many BC "hams" contributed to the war effort, serving as radio operators in the military or supporting the War Emergency Radio Service (WERS), which trained civilians for emergency communications. After the war, surplus military equipment such as receivers, transmitters, and electronic components such as vacuum tubes flooded the market, making amateur radio cheaper more accessible and fueling a post-war technology boom.

At the International Telecommunication Convention (Atlantic City, 1947) member nations refined the international call sign blocks. Canada was assigned CFA–CKZ, CYA–CZZ, VAA–VGZ, VXA–VYZ, XJA–XOZ and 3BA–3FZ. These came into force January 1, 1949. The 3BA–3FZ block eventually was reallocated between Mauritius, Equatorial Guinea, Kingdom of Swaziland, Fiji, and Panama.

The Canadian government, under the newly formed Department of Marine and Fisheries, issued licenses with the "VE" prefix, and BC operators were assigned the "VE7" call sign district, which remains in use today. Vancouver emerged as a hub, with urban operators forming early radio clubs to share knowledge and equipment. The British Columbia Amateur Radio Association (BCARA), one of the province's earliest organizations, was established to coordinate activities and advocate for operators.

BC's geography shaped its amateur radio culture. Operators in remote areas, such as logging camps, mining towns, and coastal villages, used radio to connect with the outside world, often providing critical communication during emergencies like floods or forest fires. Shortwave radio, which became prevalent in the 1920s, allowed BC operators to achieve long-distance (DX) contacts, including with the U.S., Australia, and Europe, fostering a sense of global community.

In BC, clubs organized in cities like Vancouver, Victoria, New Westminster, and smaller centers like Kelowna and Prince George. The Vancouver Amateur Radio Club (VARC), formed in the 1940s, became a key player, organizing events like Field Day and supporting emergency communications. The 1950s saw notable technological shifts, with single-sideband (SSB) replacing AM modulation and VHF/UHF bands gaining popularity, enabling clearer and more reliable communication. BC operators experimented with repeaters to extend VHF signals across mountainous regions, a practice that became critical for emergency services.

1960s–1970s: Community and Emergency Roles

By the 1960s, amateur radio in BC was well-established, with a strong community focus. Clubs like the Surrey Amateur Radio Club (SARC), founded in 1975, emphasized education, offering licensing courses and technical workshops. The province's amateur radio emergency services began formalizing, with groups like the Amateur Radio Emergency Service (ARES) collaborating with local governments. During natural disasters, such as the 1964 Hope Slide, a major mountain slide in Ocean Falls in the winter of 1965 or coastal storms, BC operators provided vital communication links when telephone lines failed.

The 1970s saw increased engagement with public events. BC amateurs participated in the Pacific National Exhibition (PNE) and community festivals, showcasing radio technology. The introduction of FM repeaters and packet radio (early digital communication) kept BC at the forefront of innovation. Clubs also organized "fox hunts" (radio direction-finding contests) and DXpeditions to remote BC islands, leveraging the province's diverse geography.

1980s–1990s: Technological Advances and Challenges

Driven by a group of BC Telephone Company employees who were also Amateurs, the BC Telephone Pioneers Amateur Radio Club (TPARC) formed. The 1980s brought digital modes like AMTOR and packet radio, which BC operators adopted for messaging and data transfer. The

"Vancouver Protocol" developed by the Vancouver Amateur Digital Communications Group (VADCG) was far superior to other packet protocols being developed in the early 1980s and incorporated many of the features of modern TCP/IP.

The emerging rise of personal computers enabled software-based radio control, and clubs offered training to keep members updated. Emergency communications remained a priority, with BC amateurs supporting responses to events like the 1991 Fraser River floods. Sadly, in 2025, the Telephone Pioneers Amateur Radio Club voted to wind up operations. Ongoing challenges with site retention, line-of-sight obstructions, and a declining system due to technological change made it difficult to maintain a viable packet network.

As an organization that shares similar values, TPARC approached the BCFMCA with an offer to gift it some of its assets as part of the disbursement process, in accordance with the BC Societies Act. The BCFMCA took over the operation and maintenance of the VE7TEL VHF and UHF voice repeaters, located on the Burnaby/Vancouver border, to allow for their continued use by local amateurs.

However, the 1990s posed other challenges. The growth of commercial communication technologies, like cell phones and the internet, reduced amateur radio's practical necessity, leading to a decline in new licensees. BC clubs countered this by emphasizing the hobby's educational value and its role in emergency preparedness. Organizations like the Radio Amateurs of Canada (RAC) strengthened advocacy, and BC operators contributed to national efforts to protect amateur radio spectrum allocations.

2000s–Present: Modern Era and Resilience

In the 21st century, BC amateur radio has comfortably adapted to technical evolution and changing times. Notable BC amateurs developed the first wide area 56K TCP/IP-based packet network and invented the now ubiquitous IRLP service.

PERCS

The province's amateur radio community continues to support emergency communications, notably during wildfires (e.g., the 2003, 2017 and 2021 BC wildfire seasons) and power outages. Remote and Indigenous communities, where commercial infrastructure is limited, benefit from amateur radio's reliability. Events like the annual BC QSO Party and Field Day maintain enthusiasm, while youth programs aim to attract new operators.

In the Lower Mainland, a coordinated simplex Frequency Plan was developed with agreement from various amateur radio groups. It was tested in two 2002 exercises dubbed "TOPHAT" which proved that the municipalities in the district could operate simplex frequencies in an emergency without interfering with each other.

Key Characteristics of BC Amateur Radio

- Geography's Influence: BC's mountains, islands, and remote areas have driven innovation in repeaters, portable operations, and emergency communications.
- Community Focus: Clubs have been central, fostering education, mentorship, and public service.
- Emergency Role: Amateur radio's reliability in disasters has cemented its value in BC, where natural hazards are common.
- Adaptation: From spark-gap to digital modes, BC operators have embraced technological shifts while preserving the hobby's spirit.

This foregoing summary draws on general knowledge of Canadian amateur radio history and web searches confirming the role of BC clubs in emergency services and community events. Specific records for BC's early amateur radio are limited, as much of the activity was informal and documented locally, or not recorded at all.

~ John VE7TI

If other BC Clubs have historical information to contribute, I'm willing to compile and edit that information as a historical reference, and publish the results in a future article. You may send information to communicator@ve7sar.net

Radio Ramblings

The Grab Bag

by KEVIN McQUIGGIN VE7ZD / KN7Q

Kevin VE7ZD/KN7Q is active in EME, meteor scatter and much more. He lives on Vancouver Island.

Summer has begun and I'm sure we are all looking forward to the "lazy, hazy, crazy days of summer" [1]. Nice warm weather, sun, long days and maybe a couple of weeks of vacation. It's the time for some relaxing ham operation from the lawn chair, at the beach, under the stars, on a POTA excursion, or even in the shack.

This issue I'll cover some interesting shorter topics, as we all need a break from intense articles that require a lot of concentration of the part of the reader. Summer's the time to relax and not need to "think" too much.

It'll be a "grab bag" of timely activities and interesting topics. So, here we go!

Receiving FT8 Using a "Boat Anchor" Receiver

Laura VE7LPM and I collect vintage radios dating from the 1920s through 1940s. We have about seventy of them, in varying states of repair. All are in reasonable condition, and I work on them when I have a bit of spare time. Last month I dug out a couple of Hammarlund receivers (models HQ-140XA and HQ-160) and got them going again.

The HQ-140XA dates from 1956, and the HQ-160 from 1964. They are "boat anchor" receivers: large, heavy receivers that weigh about 15 kg each [2]. The receivers are vacuum tube based and cover the low broadcast band (540 KHz) to 31 MHz in either AM or CW modes.

The design, construction and quality of both receivers is excellent. They were used in commercial, government and military applications and coveted by amateurs of the day as high-end, highly sensitive receivers with high selectivity. Both radios are pictured in Figure 1, and Figure 2 shows an advertisement for the HQ-140XA in the December 1956 issue of QST. $249 was a lot of money in those days!

Figure 1 – HQ-140XA and HQ-160

Figure 2 – Advertisement, December 1956 QST (https://archive.org)

I worked on the HQ-140XA first. I acquired it about 20 years ago for $25 at a surplus sale at the University of British Columbia.

The radio was in great shape. I tested the eleven vacuum tubes. While three of them showed "marginal" or "weak" on my tube tester, the radio played, and I was able to hear broadcast stations from here on the Island and in the Lower mainland.

An important aside: these old radios use big power transformers, old-tech large-value electrolytic capacitors and high voltage for the plates of the vacuum tubes. If you acquire one of these radios, NEVER just "plug it in" and turn it on to see if it works! If the electrolytic capacitors are dried out and shorted (a common issue), then you will burn out the radio's main power transformer. Replacements for these transformers are "unobtanium" (i.e. likely impossible to find) and repairs or new "wound to your specifications" transformers are very expensive. Unless you want to spend a couple of hundred dollars on a new power transformer, don't just "plug it in!" Contact SARC's Elmers and get referred to someone who can help you safely test your new vintage acquisition [3].

The HQ-140XA needed three tubes replaced, so I contacted "Pacific TV" in Victoria - an excellent vacuum tube sales operation – and was able to purchase replacements [4]. Once they were installed in the radio it played even better than before. Addition of an outside antenna (100-foot longwire from my garage to a handy tree on the property) and a good ground improved things even more, and I was able to listen to WWV, international shortwave broadcasts, and all the HF amateur bands. I listened in to several 20m SSB QSOs and noted CW activity as well as the usual cacophony of FT8 digital signals on 14.074 MHz.

The radio receives CW and AM only, so you may wonder how I was able to receive the USB voice QSOs on the amateur bands. The radio (and the HQ-160 which I will discuss briefly below) has a "CW Tone" control. It is intended to be used to adjust the audio tone of CW signals to the operator's personal preference. However, it can also be used to adjust the offset (tuning) of the

AM demodulation envelope to favour the upper or lower sideband of the signal.

Through experimentation and deft adjustment of the tone control it is possible to receive intelligible USB or LSB voice signals, and even FT8 (which generally uses USB or DATA modes on modern transceivers). This allowed me to "read the mail" on 20m USB QSOs and hear traffic on the busy 2.5 KHz-wide FT8 channel on 14.074 MHz.

I thought that it would be fun to try to decode FT8 signals (one of amateur radio's most modern and most popular modes) using this boat anchor receiver. Would this be possible?

How could I use the audio output terminals from the HQ-140XA to route the receiver's audio into my computer sound card, and from there to WSJT-X (the de facto standard program for FT8)? I would have to build an interface, because these old radios can have several volts on their audio output jacks; this could seriously damage a computer.

There's an easier solution: change the audio input settings of WSJT-X to use the computer's microphone instead of the internal sound card. WSJT-X is quite capable of decoding FT8 signals in noise, including the ambient noise coming through the microphone.

If I tuned to 14.074 MHz, used the HQ-140XA's "CW Tune" control to focus on the upper sideband, and then turned the radio's volume up, then maybe WSJT-X would be able to decode the FT8 audio, if I put my laptop (my WSJT-X machine) beside the boat anchor radio's speaker.

This seemed to be an easy solution to the question. If it worked, it would be fun to see FT8 decodes from a 60-year-old receiver that was designed for use in a totally different world of radio.

I gave it a try. No decodes at first. Maybe I needed to adjust the radio's "CW Tune" setting a bit. Trial and error. Then, after a minute or two: SUCCESS! I started decoding FT8. See Figures 3 and 4.

Figure 3 – Decoding FT8 Through the Receiver's Speaker

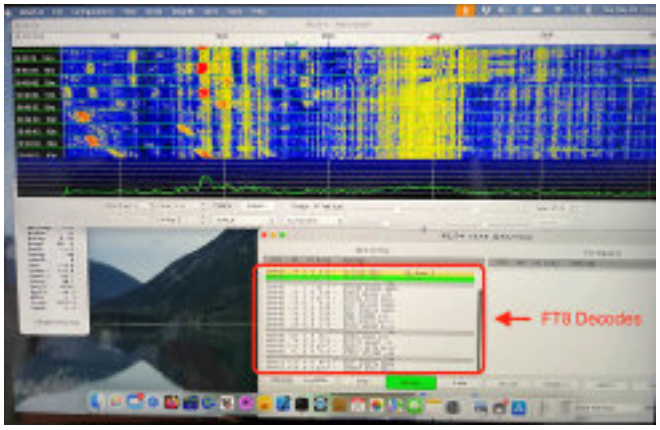


Figure 4 – FT8 Decodes Using an HQ-140XA Receiver

This was a very cool result, at least in a "techie" sort of context. If it had a personality, I felt that this old 1950s radio, long sitting idle and likely feeling bored and obsolescent, would be overjoyed to approach relevance again and contribute to amateur radio by receiving leading-edge digital signals in 2025.

Of course, radios do not have personalities, but it was a nice thought. I had made an obsolete old radio useful again, albeit in a contrived, artificial context. Such is the fun of tinkering.

I have redeployed the HQ-140XA as the garage radio here at home in Courtenay, and have been listening to it regularly.

Next on the workbench was the newer Hammarlund HQ-160. This radio has more tubes than the HQ-140XA and better sensitivity. It dates from 1964. Strangely, it too does not include SSB reception. I won't spend more time on this radio here, but suffice it to say that it with a little TLC (no tube replacements were required), it works even better than the older HQ-140XA.

Deployment of a Good Lightning Arrestor

In early May I finally got around to installing a lightning arrestor and static charge dissipation device on my HF fan dipole. Lightning protection is important for every amateur station, but (ignoring Murphy's Law) it is less critical here on the west coast due to our low frequency of thunderstorms compared to, say, southern Ontario or the southeast USA. My dipole has been up for about two years so it was time to address the issue so that my rigs would have a bit more protection if a rogue thunderstorm pops up.

I had purchased two Morgan Systems M-303 HF Arrestors last fall, but the cold, rainy weather kept me inside the shack for the winter. These arrestors have excellent reviews and have been popular in both the amateur and commercial radio markets for many years. See Figure 5 (please ignore the curious parrot). See the specs at https://www.surgestop.com/coaxial-arrestors/m-303-.html.

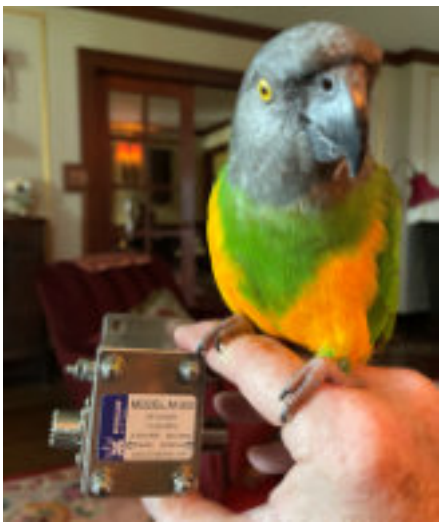


Figure 5 – HF Surge Protector (and Curious Griswold)

The M-303 covers 1.5 to 54 MHz and can handle 3 kilowatts power. I bought this model instead of the 1 kilowatt-rated M-301 just in case I purchase a legal-limit power amplifier someday [5].

For those new to HF or amateur radio, a lightning arrestor (also called a surge protector) needs to be inserted in the feedline between the HF antenna and your radio, as shown in Figure 6. The surge protector has three connections:

1. An antenna input, typically a female SO-239 connector at HF frequencies. Your antenna's feedline goes to this connector;
2. A rig output, also usually an SO-239. This goes to the antenna connector of your rig; and
3. A ground connection. This must be connected to an earth ground outside of your home or building, although an in-building ground might have to step in if you live in an apartment or condo.

If lightning hits your antenna, then the surge protector will attempt to divert the extremely high voltage and current from the lightning strike to ground. This will protect your (expensive) HF radio from damage. It's a near certainty that no receiver or transceiver has ever been designed to withstand up to 300 million volts and 30,000 amps of current [6] applied to its antenna connector! Far better to divert a lightning strike to ground.

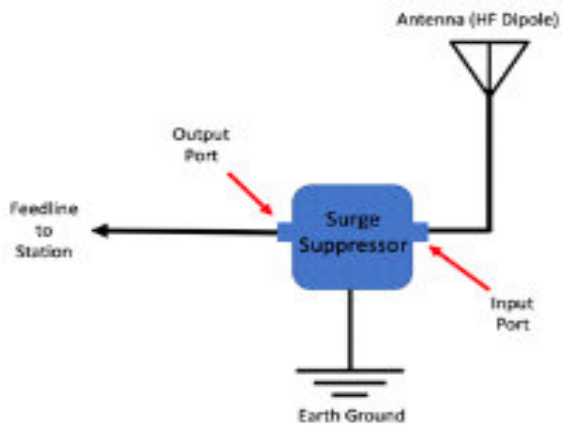


Figure 6 – Using a Surge Protector/Lightning Arrestor

The specs looked good for the arrestor, but just to make sure I ran tests for return loss (an alternate representation of SWR) and passthrough power loss on the arrestor after it arrived. SWR (return loss) was great, and the arrestor showed minimal signal loss through the device.

For installation, I needed a suitable weatherproof box near the feedline's entry point to the shack. Fortuitously, there was a decommissioned Telus telephone service entry box on the north side of the house where my dipole was erected. See Figure 7.

Figure 7 – Telus Box Suitable for Repurposing

With the societal move to IP networking and VOIP (Voice Over IP) telephony, we had cancelled Telus service to the house in 2022, choosing another broadband provider for our connectivity. The Telus box looked like the best place to install the new M-303 surge suppressor.

Inspection of the box generated a space concern: the M-303 unit was a bit big and would fit into the box only with some effort. I removed all the old telephone connections and hardware. I fed the Telus cable back into the basement, retaining it for any future use should it ever need to be reactivated. This freed up a lot of space. The M-303 fit, but there would be insufficient space once the two PL-259 coaxial connectors were populated.

I solved the problem by mounting the M-303 at an odd angle inside the box. There was enough space in a rubber grommet at the bottom of the box for the ground connection and two feedlines. See the final configuration of the box in Figure 8.

Figure 8 – Final Configuration of the Arrestor Box [16]

I've been using the dipole antenna on all HF bands now for a month, and I can report that SWR is fine on all bands and there has never been an issue with RF power damaging the arrestor.

The "Howzit" of "Waterfall" Displays

Most of us are familiar with "waterfall" displays [11]. A waterfall display improves situational awareness by providing the operator with a visual overview of all RX signal activity on a particular band, over a user-settable bandwidth. Like a spectrum analyzer, the top part of the waterfall display consists of a display of signals currently present in the selected bandwidth. Below this spectral display, a vertically scrolling section of the waterfall displays the past 5, 10, 15 seconds or more of spectral activity. This gives the operator an indication of the number and types of signals present in the passband. The top part of the display depicts the "live" spectral diagram, while the lower part records how this spectrum has changed over time.

Figure 9 shows an example of a waterfall display on the Elecraft K4 transceiver. This rig has two VFOs and can display waterfalls for both VFOs, possibly on different frequencies or even different bands, at once.

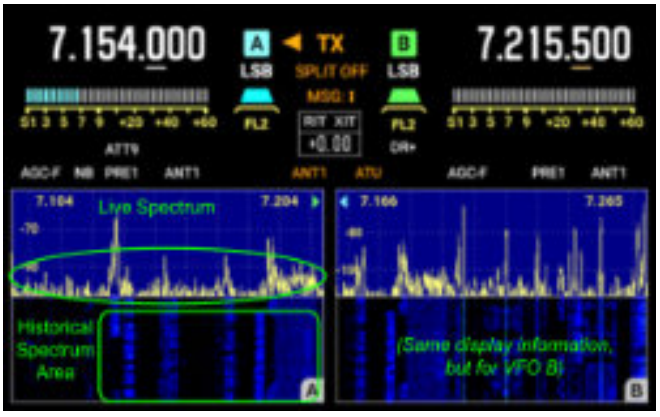


Figure 9 – Elecraft K4's Waterfall Display

There are several advantages to this type of display. Since the waterfall's bandwidth can span an entire HF amateur band, or even several megahertz, the operator can "see" signals within the entire band at a glance. This greatly improves the operator's situational awareness of what is happening on the band, and where specifically to tune within the band. Contest activity, pileups, CW, data modes and SSB activity can be easily discerned just by looking at the waterfall.

This visual presentation of the RF spectrum is significantly superior to the earlier era where an operator had to manually tune up and down (and up and down…) the band, listening for signals to ascertain propagation conditions and operational activity.

Waterfall displays greatly enhance the operator's situational awareness and make amateur operations much more efficient. Let's look at two aspects of the technology.

A) Technology:

So how does a waterfall display work? This is a very big question, but we can cover the fundamental aspects of it in a few paragraphs.

The waterfall is a product of the evolution of radio from the analog to the digital era. Digital signal processing (DSP) is the enabling technology. Waterfall displays were not possible in the age of analog receivers because it was not possible to process analog signals in a manner that would be able to produce either the upper spectral display, or the lower historical spectral information in real time [12].

Fast CPUs and DSP chips, especially analog to digital (A/D) converters, have made it possible for modern radios to capture RF spectrum at very high sample rates and convert the captured bandwidth to a digital stream of numbers which can then be processed by software to filter and demodulate signals in real time.

DSP signal analysis is a mathematical process that applies filtering and demodulation to a sample stream to produce audio or data output that can then be processed by our ears (in the case of audio modes) or by other decoding software such as WSJT-X, FreeDV, or FLDigi.

I have written quite a bit about DSP and the superiority of digital versus analog signal processing in this column in the past. This processing code can be quite complicated, but DSP can improve the sensitivity and selectivity of receivers and the quality of transmitted signals by several orders of magnitude. All modern radios use DSP techniques.

DSP also enables the waterfall display. A mathematical function called the Discrete Fourier Transform (DFT) can be applied to the received data stream to produce the real time spectral display that is used at the top of the waterfall. The math behind the DFT is complex, but radio design engineers can now rely on open-source software libraries to do the "heavy lifting" of computing the DFT of an input data stream [13].

The lower (historical) portion of the waterfall display is simply a scrolling history of the *magnitude* (relative signal strength) of the real time spectrum display at the top of the waterfall. How does this section of the waterfall work?

Imagine taking a snapshot of the real time display and then rotating that trace by 90 degrees so that you are looking at it edge-on. This edge-on view (a line that is a single pixel in height) is then written at the top of the historical window after moving all the other lines down one pixel. Then the software moves on to generate a real time spectrum from the next set of input samples.

There are a lot more details that we won't cover here, but in a nutshell that's how the waterfall display works. The visual appearance of the waterfall, and in fact the very capability of producing it, depends on the stream of numbers coming out of the radio's A/D converter and the DFT libraries. Without DSP, creation of these waterfall displays would be impossible.

B) The Waterfall was a "Classified" Military Technology:

Waterfall displays were originally developed in the military services (particularly those of NATO) in the 1980s to improve situational awareness and provide tactical advantage to armies and navies engaged in cold war military operations [14]. The functionality (and the very existence) of these displays was classified, and military members were forbidden from discussing them with those outside their services [15].

DSP was in its infancy, and only governments could afford the advanced computing hardware that was necessary to support waterfall displays. DFT techniques were brand new, and one could say that these classified military projects drove the development of better and faster CPUs, A/D computing hardware, and advanced DSP software libraries.

Research and development (R&D) in this area was eventually spun off into mainstream computing and computer hardware designs, and we are reaping the benefits of this early DSP research in our ham shacks today.

Passive Radar Update: "The Chicken or the Egg?"

Now for a short update on my passive radar system. You may recall that I discussed this system in detail last issue. The system is SDR based, and I am writing my own code.

Passive radar works by using an "illuminator of opportunity" such as an FM broadcast station to generate signals (music, news, et cetera) that will bounce off aircraft in flight. The time delay between arrival of the direct signal at the passive radar receiver and the time of the arrival of the signal's echo can be used to mathematically subtract the direct signal, leaving only the echo. Digital signal processing code can then analyze the echo to locate the aircraft and measure its velocity.

The system is working, but it does not seem very sensitive. My task since the last issue has been to investigate why.

Through some online digging I discovered that there was a polarization mismatch between the transmitted FM signal and my receiving antenna. The FM broadcast station I am using as the illuminator is using horizontal polarization, while my receiver was using a vertically polarized Yagi [7].

As you probably recall from your amateur radio courses, a polarization mismatch of 90 degrees between the transmitter and receiver greatly affects the strength of a received signal. Signal loss is theoretically infinite, but in the real world the observed loss is usually around 30 dB. This means that the received signal strength is only 1/1000th of what it could be if the receive antenna's polarization matched that of the transmit antenna [8].

There's a handy online calculator that will help you estimate loss due to mismatched polarization available at https://www.calculatoratoz.com/en/polarization-mismatch-loss-calculator/Calc-33612.

I deleted all the signal data I had captured previously, reoriented my RX Yagi for horizontal polarization, and recaptured about an hour's worth of new data for analysis. The new data is of much higher quality, and my work on the analytical software is continuing. See Figure 10 for my revised RX setup.

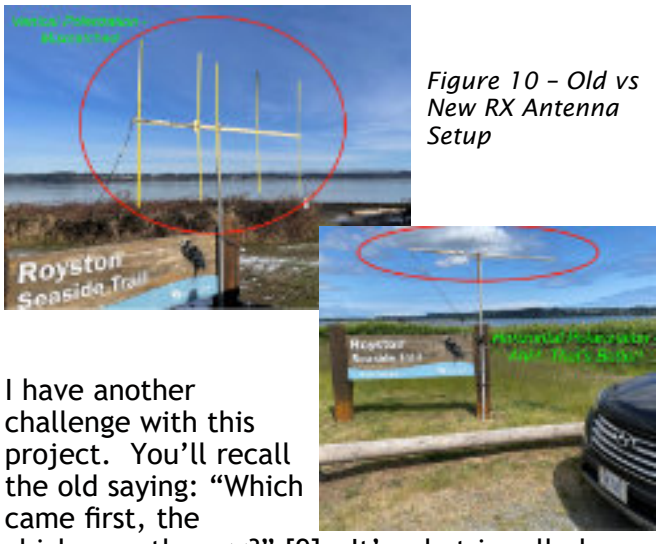


Figure 10 – Old vs New RX Antenna Setup

I have another challenge with this project. You'll recall the old saying: "Which came first, the chicken or the egg?" [9]. It's what is called a "causality dilemma": you need a chicken to lay

an egg, but the chicken needs to hatch from an egg to be able to grow up and lay one. Which one came first?

In the case of my radar project, the situation could be described as follows:

- *I am not seeing strong echoes even when I know that many large aircraft have been in the area, and their echoes should be in the data set.*
- *Is this lack of target detection due to poor data capture, or do I have a good data set and am not seeing the targets because of errors in my analytical DSP code?*

Either I do not have a good data set (which would indicate an error in the SDR data capture process); or I have valid data but there's a deficiency in my analytical DSP code. I am working to resolve this dilemma.

I don't have access to a known-good radar data set [10], so the best I can do is to capture multiple data sets using my bladeRF SDR, using distinct gain settings and azimuth settings for each capture. Look for a report on the results in a future column.

Conclusion

That's it for this issue. Have a great summer!

Feedback on Radio Ramblings is always welcome and may be directed to the Editor, or directly to me at mcquiggi@sfu.ca. Thanks for reading!

73,

~ Kevin VE7ZD / KN7Q

References

[1] From a 1963 single by Nat King Cole, a popular singer from the 1930s – 1960s. See https://en.wikipedia.org/wiki/Nat_King_Cole and listen to the song at https://www.youtube.com/watch?v=MRmEZMAfD3Y.

[2] A modern term. A "boat anchor" is a vintage radio based on obsolete technology. Jokingly, its best use is that it is large enough and heavy enough to be used as an anchor for a large watercraft. Seriously, "boat anchors" may be bulky, old, and inefficient, but they represent classic technology of their day, and many served faithfully in ham shacks and commercial operations, or even in military service. These "snapshots from the past" are easily restored, there is a collecting community, and it is fun to have one in the shack.

[3] Don't ruin your old radio by just plugging it into an AC outlet. SARC's "Elmers" (mentors) may be reached via elmers@ve7sar.net. We have people with lots of experience in "boat anchors" who have the proper test equipment and be able to help.

[4] Pacific TV has been in business for decades and has 10,000+ vacuum tubes in stock. Their website includes a searchable inventory and contact information for questions and quotes. See https://pacifictv.ca or call the owner John at (250) 386-4283. Tell him I referred you!

[5] I can currently run a maximum of 500 watts on HF and 6 metres, and cannot see the need for more power, especially in this era of highly sensitive digital modes. Nonetheless, for a few dollars more for the M-303, it is good not to exclude this potentiality.

[6] From the USA's National Weather Service, see https://www.weather.gov/safety/lightning-power.

[7] I discovered the polarization error when I looked up the broadcast FM station I'm using on the excellent "FCC Data" web site (see https://fccdata.org/?lang=en&canfm=CKLR-FM). It's a private website that simplifies search of FCC and ISED radio licensing databases.

[8] To convert a value in decibels (dB) to a more familiar context, divide the gain or loss in dB by ten, and compute 10 to this power. A 30 dB loss means $10^{(30/10)}$, or 10^3, which is 10 x 10 x 10, or 1000. A 30 dB loss means that 1/1000th of the original power is received. On the other hand, a 30 dB gain (say, through an amplifier) means that the input signal comes out of the amplifier 1000 times greater in power.

[9] Where did the first chicken come from, then? The Greek philosopher Plutarch analyzed this dilemma in his essay "The Symposiacs", written in the 1st century CE. See https://en.wikipedia.org/wiki/Chicken_or_the_egg. It is amazing that people have been pondering this sort of

problem for thousands of years!

[10] I have reached out via email to others who have built their own passive radar systems asking for a copy of a raw data set that contains valid targets, but have not heard back from them yet.

[11] Waterfall displays are well documented on Wikipedia at https://en.wikipedia.org/wiki/Waterfall_plot.

[12] In the analog era, one could use a spectrum analyzer to generate a "swept frequency" plot at a specific frequency and bandwidth, but this was a slow process, and such an approach was not of practical use for real time radio operations. Spectrum analyzers were rare and their cost in today's dollars would have been > $10,000. Not a viable approach for an amateur radio operator!

[13] The popular "fftw" open-source software package from MIT is widely used by researchers and hobbyists to access Fourier transform functionality, including DFTs, for development projects. DFT functions are also available as an add-on for popular applications such as Microsoft Excel. See https://www.fftw.org/ and https://www.youtube.com/watch?v=zn-nKRMExaQ.

[14] See https://www.pbs.org/wgbh/nova/subsecrets/sprisonlortsds.html.

[15] Reference misplaced, I am googling to re-discover it!

[16] My ground connection (the green wire) from the arrestor to a buried ground plate could be improved by use of a heavier gauge of wire. This is a project for the summer.

The callsign VB7MAN has expired, and Manna@80 has concluded

Together we achieved over 8,000 contacts, over 60,000 QRZ lookups, the production of a fantastic film, we were in national, local and radio news, and got loads of Children on the air. We all had some fantastic conversations with some wonderful people around the globe.

We would like to remember the Sacrifice of those in Bomber Command and the Bomber Squadrons of the USAAF, the deadliest branch of service in WW2 with another International series of SES events the same as we did for operation Manna.

But also commemorate those all around the world who do things so that their memory is not forgotten. Be that a huge thing like the Bomber Command Museum of Canada or a small thing like a Memorial at a crash site. Also noting the work still going on today to recover and bury aircrew.

THANK YOU FOR THE HUGE EFFORT YOU ALL MADE FOR OPERATION MANNA@80 AN INCREDIBLE RESULT! The feed back has been incredible here, what a team effort!!!

We made a big splash in the amateur radio world and hopefully educated or reminded some people of the mistakes of the past thanks to ALL OF YOUR HARD WORK!.

73

Andy M0IYE
Rose 2E0RXO
Daron 2E0GFY
(the International Bomber Command Centre Radio Team)

Amateur Radio Contesting…

But is your log accurate?

Based on a YouTube video from Q5 WORLDWIDE HAM RADIO

Amateur radio contesting, also known as "radiosport," is a popular activity among amateur radio operators. It involves making as many contacts as possible within a specified period, often ranging from a few hours to several days. Contesting is a competitive and exhilarating aspect of amateur radio, combining technical skills, strategy, and quick thinking.

The Essence of Amateur Radio Contesting

Amateur radio contests are organized events where participants aim to contact other amateur radio stations, exchange specific information, and log these contacts accurately. The primary goal is to accumulate points based on the number of contacts made and the quality of the exchanges. Contesting can be done using various modes, including CW (Morse code), SSB (voice), and digital modes like RTTY and FT8.

Contesting is not just about making contacts; it's about the thrill of competition and the challenge of optimizing your station's performance. Operators often spend months preparing for major contests, fine-tuning their equipment, and developing strategies to maximize their scores. The excitement of hearing a rare DX station or breaking through a pile-up is what drives many contesters to participate year after year.

Types of Contests

There are numerous types of amateur radio contests, each with its unique rules and objectives. Some of the most popular contests include:

1. DX Contests: Focus on making contacts with stations in different countries. These contests are often highly competitive, with operators striving to work as many countries as possible within the contest period. Examples include the CQ World Wide DX Contest and the ARRL International DX Contest.
2. QSO Parties: State or regional contests where participants aim to contact as many stations within a specific area. These contests are often more relaxed and provide an opportunity for operators to work stations in specific states or regions. Examples include the California QSO Party and the Texas QSO Party.
3. Field Day: An annual event where operators set up portable stations and make contacts in a simulated emergency environment. Field Day is not just a contest; it's also an emergency preparedness exercise and a social event. Operators set up stations in parks, campgrounds, and other outdoor locations, often using battery or generator power.
4. VHF/UHF Contests: Emphasize contacts on higher frequency bands, often involving line-of-sight communication. These contests

are popular among operators who enjoy working the higher bands and experimenting with antennas and propagation. Examples include the ARRL June VHF Contest and the CQ VHF Contest.

Preparation and Strategy

Successful contesting requires careful preparation and strategy. Operators must ensure their equipment is in top condition, including transceivers, antennas, and logging software. Additionally, understanding propagation conditions and planning operating times can significantly impact performance. Operators often develop strategies to maximize their score, such as targeting high-value multipliers or focusing on specific bands during peak propagation times.

Preparation for a contest begins long before the actual event. Operators spend time researching propagation forecasts, studying past contest results, and planning their operating schedules. They may also test their equipment and antennas to ensure everything is working correctly. Some operators even practice their operating skills by participating in smaller contests or running simulated pile-ups.

Contesters tend to be very focused on being very brief. When there are 45 guys calling, how do you get through? Tip #1 is don't call on frequency. The guys who are a little bit off tend to make it through. There was one guy that always made it through the pile-up on the first call no matter what. It's all about timing on phone. You really can't go off frequency that much, but get the timing right and you're golden. And then as soon as the pile-up goes away, throw your call in. The advice would be to send your call once… Listen… And if they don't come back to you, send your call again. It's OK.

Good audio is fantastic. It just seems to cut through. Use a good mic and, if you use .WAV files, as in N1MM+, use Audacity to set your pitch a bit higher. It will be clearer and it will stand out.

Here is a summary of the key points:

1. **Brevity**: Contesters focus on being brief in their communication.
2. **Timing**: Timing is crucial in making successful calls, especially when dealing with pile-ups. Timing your call right after the pile-up goes away is key.
3. **Call Strategy**: Send your call once, listen, and if there is no response, send your call again.
4. **Audio Quality**: Good audio quality is essential as it helps in clear communication and cutting through the noise.
5. **Enunciation**: The ability to enunciate well is important for effective communication.

Log Checking and Accuracy

Accurate logging is crucial in amateur radio contesting. Logs must include details of each contact, such as the call sign, time, frequency, and exchange information. After the contest, logs are submitted to the contest organizers for verification. Log checking involves cross-referencing submitted logs to ensure the accuracy of the contacts. Discrepancies, such as incorrect call signs or missing exchanges, can result in penalties or disqualification.

Log Checking Process

The log checking process is meticulous and involves several steps:

1. **Log Submission:** Participants submit their logs electronically, often using standardized formats like Cabrillo. The Cabrillo format is widely used in amateur radio contests and allows for easy processing and verification of logs.
2. **Cross-Referencing:** Contest organizers use software to cross-reference logs, checking for matching contacts between different logs. This process helps identify errors and discrepancies, ensuring that all contacts are valid and accurately logged.
3. **Error Detection:** The software identifies errors, such as incorrect call signs, duplicate contacts, or missing exchanges. Operators may receive notifications of these

errors and have the opportunity to correct them before the final results are published.

4. **Scoring:** After verifying the logs, scores are calculated based on the number of valid contacts and multipliers. Multipliers are often based on the number of different countries, states, or regions worked during the contest.
5. **Results:** Final results are published, and winners are announced. Contest organizers may also provide detailed reports and analysis of the contest, highlighting the performance of top operators and stations.

Importance of Log Checking

Log checking ensures the integrity and fairness of amateur radio contests. It helps maintain a level playing field by verifying that all participants adhere to the contest rules and accurately log their contacts. The process also encourages operators to develop good logging practices and attention to detail.

Log checking is not just about finding errors; it's also about promoting good operating practices. Operators who consistently submit accurate logs are often recognized for their attention to detail and commitment to fair play. This recognition can be a source of pride and motivation for many contesters.

Challenges in Log Checking

Log checking is a complex and time-consuming process. Contest organizers must deal with thousands of logs, each containing hundreds or even thousands of contacts. The software used for log checking must be able to handle this volume of data and accurately identify errors and discrepancies.

One of the biggest challenges in log checking is dealing with "busted" call signs. These are call signs that have been logged incorrectly, either due to operator error or poor propagation conditions. Identifying and correcting these errors requires careful analysis and cross-referencing of logs.

Another challenge is dealing with duplicate contacts. Operators may accidentally log the same contact multiple times, either due to confusion or intentional attempts to inflate their scores. Contest organizers must identify and remove these duplicates to ensure fair and accurate scoring.

Technological Advances in Log Checking

Advances in technology have made log checking more efficient and accurate. Modern log checking software can process logs quickly and identify errors with a high degree of accuracy. These tools also provide detailed reports and analysis, helping operators understand their performance and identify areas for improvement.

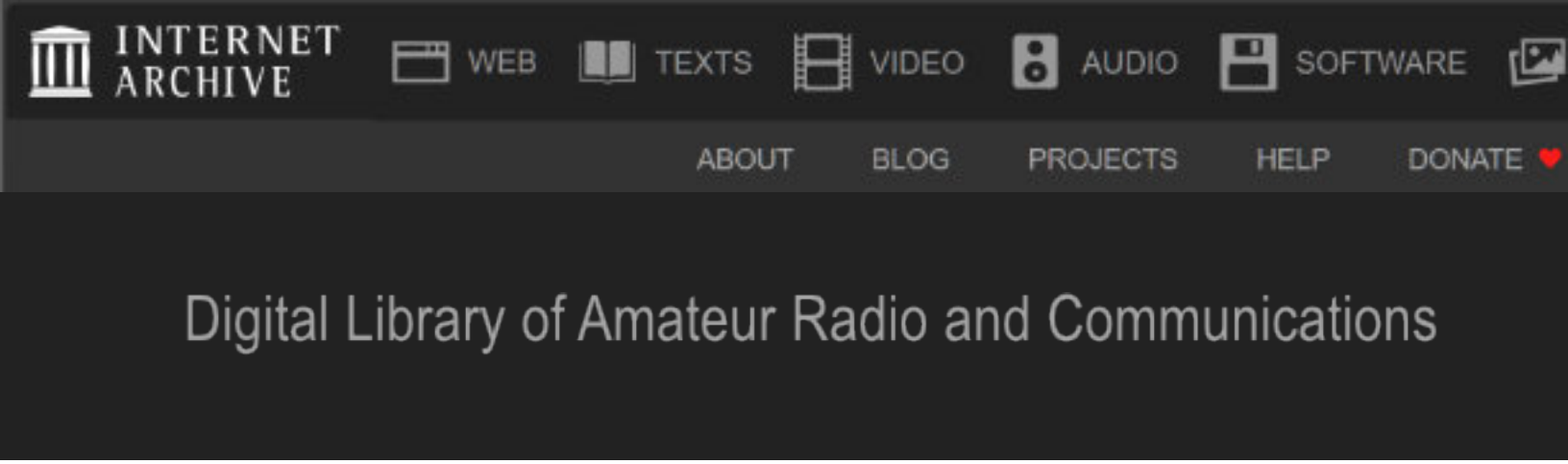
One of the most significant technological advances in log checking is the use of machine learning and artificial intelligence. These technologies can analyze logs and identify patterns and trends, helping contest organizers improve the accuracy and efficiency of the log checking process.

Amateur radio contesting is a thrilling and competitive aspect of the hobby, offering operators the chance to test their skills and make contacts worldwide. Accurate log checking is essential to ensure the integrity of the contests and reward operators for their efforts. Whether you're a seasoned contester or a newcomer, the excitement and challenge of amateur radio contesting are sure to keep you engaged and motivated.

Contesting is more than just a competition; it's a community of operators who share a passion for amateur radio and the thrill of making contacts. The camaraderie and friendships formed through contesting are often as valuable as the scores and awards. So, if you're looking for a new challenge and a way to connect with fellow operators, give amateur radio contesting a try. You might just find yourself hooked on the excitement and fun of radiosport.

~ Based on the video from Kevin Thomas, W1DED Founder, Q5 Worldwide Ham Radio

https://youtu.be/1g4yxIvBzz8



An introduction

by Kay Savetz K6KJN

There's a free online amateur radio library. It's been growing for nearly three years, and has grown to be an unparalleled resource for hams everywhere. It's been called the most ambitious library in the history of the hobby. It's called the Digital Library of Amateur Radio and Communications. (https://archive.org/details/dlarc)

DLARC offers 21 terabytes of information, including amateur radio magazines and newsletters from around the world and going back more than 100 years, searchable callbooks, manuals for radio equipment ranging from the common to the obscure, radio shows and podcasts about ham radio, historical slideshows, and DX-pedition reports. In 2024 alone, we scanned 1.1 million pages of radio-related material and digitized hundreds of audio cassette tapes and videotapes. All of the material is full-text searchable. Audio and video is transcribed. It's entirely free for hobbyists, researchers, and everyone else.

I'm the curator of the DLARC library. It's a project of Internet Archive (archive.org), the not-for-profit online library. You might know Internet Archive as the folks behind "The Wayback Machine" — the tool that lets you view web sites as they were before they were changed or went offline. (https://web.archive.org/) The DLARC project is funded by Amateur Radio Digital Communications, a foundation that supports ham radio projects. (https://www.ardc.net/)

The most popular material in the library includes a complete collection of 73 Amateur Radio Today magazine (https://archive.org/details/73-magazine) — more than 518 issues which were donated by Wayne Green before he passed. Other magazines available include VHF Communications, Coop's Satellite Digest, Florida Skip, and pre-1962 QST. There's some really old material, also, including Radio & Television News from 1919 on, and The Telegraphic Journal and Electrical Review, published in the 19th century.

Another top use of the library is access to more than 150 amateur radio callbooks, going as far back as 1909. (https://archive.org/details/callbook) You could click the "Search text contents" button, type your grandmother's call sign and see every callbook that lists her.

DLARC's newsletter collection is another very popular part of the library (https://archive.org/details/dlarc-newsletters) with about 50,000 newsletters from amateur radio clubs around the world. Newsletters include W5YI Report, from 1978 until 2003. It was known as "America's Oldest Ham Radio Newsletter". And niche-interest newsletters, like from the The American Ionospheric Propagation Association, which was

a club for TV and FM DXers —enthusiasts who tried to receive television and radio signals from as far away as possible. The group was founded in 1953 and lasted until 1963.

If you'd like to add your club's newsletter to the library, we can do it. Even if they're already on your club's web site, this provides a long-term backup of your content and increases visibility to new readers. If your club has old newsletters on paper that haven't been digitized yet, DLARC may be able to do that at no cost to the club.

Some of my favorite material at DLARC is the stuff that we've found and digitized that has never been available online before: valuable information that sometimes hadn't been seen or heard by more than a handful of people. For instance, the library is home to English translations of Russian amateur radio publications done by Dexter Anderson (W1STN) — from 1978 to 2000, he summarized and translated the Soviet Amateur Magazine "Radio" and articles about radio in the "Patriot" newspaper (https://archive.org/details/russian-amateur-radio)

A new and unique addition is a complete script archive of Neil Carleton VE3NCE's "Radio Stamps" radio show (https://archive.org/details/radiostamps) The program ran for five years (1990 through 1995) on the DX Partyline show of radio station HCJB in Ecuador. The program was about collecting postage stamps depicting radio-related topics.

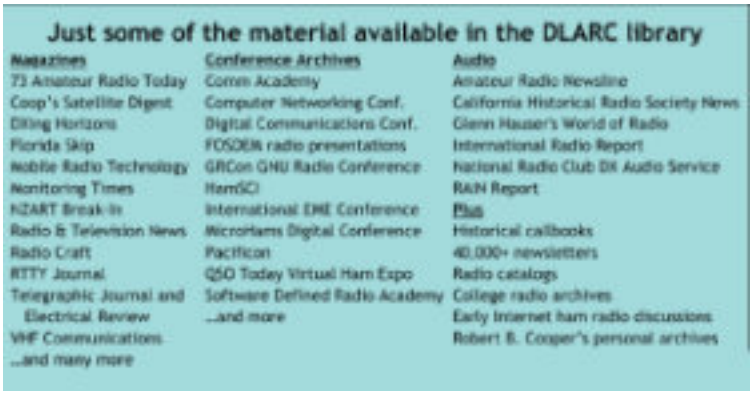
Another offering: nearly every episode of Ham Radio & More, a radio show about amateur radio hosted by Len Winkler KH7LW. It aired from 1991 to 1997, and was the first radio show devoted to ham radio on the commercial radio band. Winkler interviewed Bob Heil, Bill Pasternak, Fred Maia, Wayne Green, and other names well known to the amateur radio community. Call-in discussion topics ranged from technical topics to community issues. (https://archive.org/details/hamradioandmore) DLARC has 319 episodes, more than 464 hours of programming. All are machine-transcribed, so are keyword searchable.

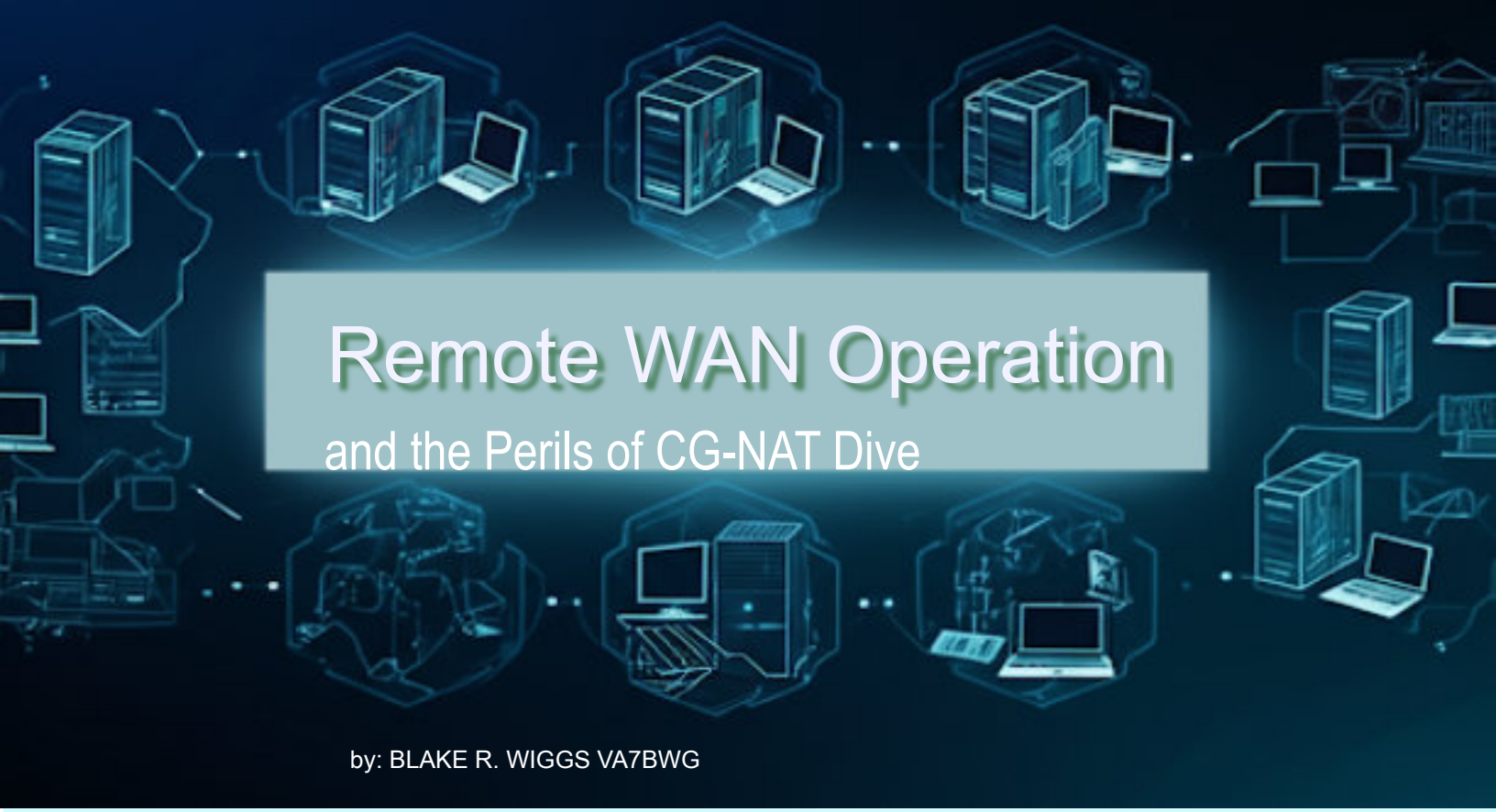
DLARC has scanned hundreds of catalogs for ham radio and related equipment and more than 7,000 manuals. There's also our E-mail Lists archive (https://archive.org/details/dlarc-email) which includes ham radio-related discussion lists, dating back to the late 1980s and early 1990s. A project I'm currently working on is locating the archiving documents related to the history of packet radio, including the hard-to-find but important Packet Radio Temporary Notes documents. (https://archive.org/details/packet-radio)

The DLARC library is always on the lookout for more material. I maintain a "want list", a list of resources that we're looking for to fill out collections. Feel free to visit https://archive.org/details/dlarc-wantlist to see if you have something that the library needs.

If you have questions about the library or material to contribute, contact me at kay@archive.org. Otherwise, I invite you to explore DLARC — I bet you'll find a fascinating rabbit hole to dive into. Visit DLARC at https://archive.org/details/dlarc.

~ Kay K6KJN





Remote WAN Operation

and the Perils of CG-NAT Dive

by: BLAKE R. WIGGS VA7BWG

Suppose you have a remote-capable Icom transceiver (IC-7851, IC-7610, IC-7300, IC-9700, IC-7100, IC-905, IC-705, etc.) and you've plugged the word "remote" into SARC's new online index for The Communicator, as explained at pages 7-11 of the May-June issue. That will give you a list of articles on remote operation, as shown in Figure 1 below.

After reviewing those articles together with your Icom transceiver's manual(s) and Icom's RS-BA1 IP Remote Control Software operation manual, supplemented by watching a few of the many YouTube videos on remote operation of Icom rigs, you decide to give it a try[1]. With a bit of patience, in fairly short order you'll be remotely operating your transceiver over your local area network (LAN). In some cases that may be all you need, for example if operating from your shack is inconvenient for any reason you can operate from another more convenient room at your QTH. But some operators may want to take things further and operate from outside their LAN, perhaps from a remote site hundreds or thousands of kilometres away from the QTH—so-called wide area network (WAN) operation.

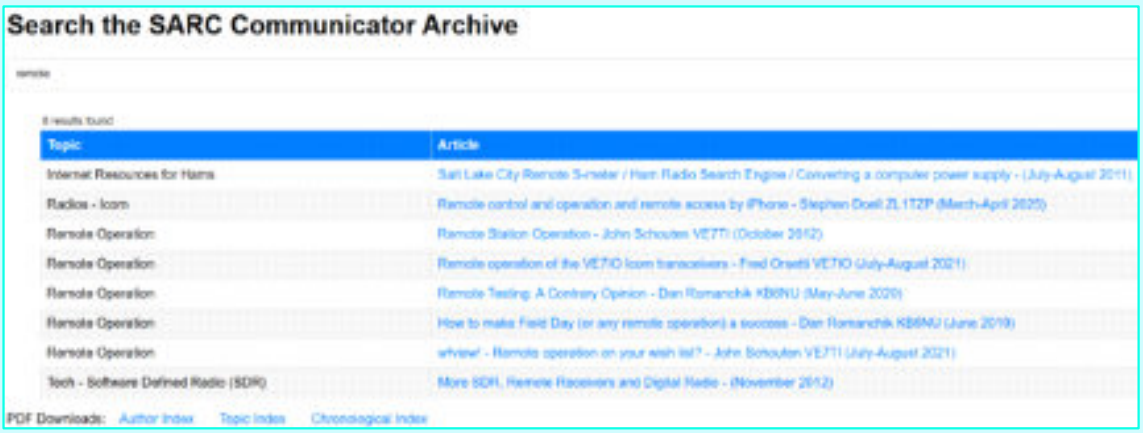


Figure 1- the online index showing results of a search for the keyword 'remote'

Remote WAN operation entails further study of your manuals, YouTube videos, etc. with special attention to remote WAN operation. Typically for example you'll be doing things like port forwarding, setting up a Dynamic DNS (DDNS) service, etc. That's all covered in the manuals and videos—it's not my intention to provide a "How To" type tutorial here. However, suppose you've done everything carefully and remote WAN operation still doesn't work—LAN operation works fine, but not remote WAN operation. Now what?

One thing you should check is your QTH's public IP address. That is easily done via a service such as WhatIsMyIPAddress.com. Depending upon your ISP and your geographic location, your QTH's public IP address (in IPv4 format) will be something like 206.16.251.49. This is the address a remote computer needs in order to access devices connected to the LAN at your QTH, such as your Icom transceiver. So far so good, but WhatIsMyIPAddress.com only provides your QTH's public IP address as seen from *outside* your LAN. You should also check your QTH's public IP address as seen from *inside* your LAN and verify that the two IP addresses match. The router at your QTH will display your WAN IP address—that's your QTH's public IP address as seen from inside your LAN. If the inside and outside IP addresses match then your remote WAN operation problem is beyond the scope of this article and you'll have to continue troubleshooting elsewhere.

However, if your QTH's inside and outside public IP addresses differ from one another, it's possible that your ISP has switched your Internet service to Carrier-Grade Network Address Translation (CG-NAT).

There's a shortage of IPv4 IP addresses. CG-NAT allows an ISP to share a single IPv4 IP address among multiple customers. With CG-NAT, your QTH's outside public IP address points to your ISP's router, not to the router at your QTH. Your ISP's router determines whether traffic should be passed to your QTH's router or to some other customer's router (i.e. a customer who shares the same public IP address). Port forwarding is problematic with CG-NAT since it would have to be set up on the ISP's router; CG-NAT doesn't allow for the one-to-one mapping required for effective port forwarding. Remote WAN operation of your transceiver won't work if you're relying on port forwarding on your QTH's router and if your QTH's Internet service uses CG-NAT. A Dynamic DNS (DDNS) service won't work with CG-NAT either because it will point to your ISP's router, not to your QTH's router.

So now what? In theory you could set up a VPN between your remote site and your QTH. Another option is to try to convince your ISP to give you a static IP address, although that will likely come at a price. These options are beyond the scope of this article, which is only intended to highlight the potential CG-NAT snag to remote WAN operation of a transceiver.

In closing I'll mention some other telltale signs that your ISP may have switched you to CG-NAT:

- Other devices on your LAN for which you have set up port forwarding are no longer accessible from outside your LAN, even though you haven't changed anything. Examples may include security cameras, baby monitors, thermostats, network attached storage (NAS) drives, remote (e.g. RDP) access computers, etc.
- Your public IP address as seen from inside your LAN (i.e. the WAN IP address displayed by your router) has the form 100.xxx.xxx.xxx, e.g. 100.81.142.250 (The block of IP addresses allocated for CG-NAT usage is 100.64.0.0 to 100.127.255.255).
- Execution, on a computer at your QTH, of the Windows command-line utility *tracert your public IP address* (e.g. *tracert 206.16.251.49*) returns the results in two or more hops, rather than a single hop.
- While using a computer outside your LAN, you cannot successfully ping your QTH's public IP address as seen from either *outside* or *inside* your LAN. For example, execution of the Windows command-line utility *ping 206.16.251.49* returns "Request timed out" and *ping 100.81.142.250* returns "Destination net unreachable."

~ Blake VA7BWG

Footnotes

In Canada, you'll also need the Advanced qualification; see Radiocommunication Information Circular 3 "Information on the Amateur Radio Service", section 4 "Qualifications", sub-section 5 "Privileges and restrictions", sub-sub-section 2 "Advanced Qualification" (i.e. RIC-3 4.5.2)

Six Meters

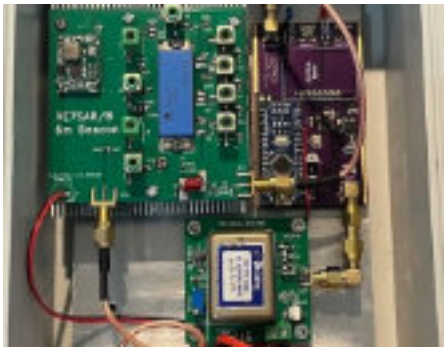
The SARC 50.070 MHz beacon

An amateur radio beacon is an automated transmitter that sends out continuous or periodic signals to assist operators in studying radio propagation and improving communication. These beacons are strategically placed around the world and operate on fixed frequencies, allowing amateur radio enthusiasts to monitor real-time band conditions. By observing a beacon's signal strength and location, operators can determine whether certain frequency bands are open for long-distance communication. This is particularly useful for identifying ionospheric conditions (such as F-layer or sporadic-E propagation), tropospheric ducting, or other atmospheric effects that enable signals to travel farther than usual.

In addition to propagation monitoring, beacons serve as valuable tools for station testing and antenna evaluation. Operators can use beacon signals to check the performance of their receivers and antennas by comparing received signal reports with expected results. Some beacons transmit at very low power, making them ideal for testing weak-signal reception capabilities. Furthermore, beacons help maintain regulatory compliance by operating on standardized frequencies, ensuring proper band usage and minimizing interference. For example, the International Beacon Project coordinates a global network of beacons on designated HF frequencies, providing consistent reference points for operators worldwide.

Beyond practical communication benefits, amateur radio beacons contribute to scientific research by collecting long-term data on ionospheric behavior and solar activity. Networks like the Northern California DX Foundation's (NCDXF) beacon system and digital modes like WSPR (Weak Signal Propagation Reporter) allow for detailed propagation analysis. Whether used for real-time band assessment, equipment testing, or atmospheric research, beacons play a crucial role in the amateur radio community by enhancing understanding and efficiency in wireless communication.

The Surrey Amateur Radio Communications Society (SARC) continues to expand its boundaries above 30 MHz with the successful deployment of a 6m beacon, VE7SAR/B, operating on 50.070 MHz. This initiative, part of a broader effort to promote activity on underutilized bands, builds on the success of the club's earlier 10 GHz and 24 GHz beacon projects.



The driving force behind the 6m beacon has been Dino Gueorguiev, VE7NX, whose leadership, technical expertise, and determination were instrumental in bringing this project to life. Working with

Scott Charles, VA7SC and John VA7XB, Dino oversaw the beacon's design, construction, and deployment, ensuring it became a reliable tool for monitoring propagation and encouraging 6m activity among local and regional amateur radio operators.

Technical Details and Design

The 6m beacon project began with the goal of creating a signal that most club members could easily monitor, given that 6m is often called the "magic band" due to its fascinating propagation characteristics. Unlike most amateur radio beacons , where components are generally available off the shelf, the SARC 6m beacon required more creative problem-solving.

At the heart of the beacon is an Arduino Nano microcontroller paired with an Si5351 clock chip. The printed circuit board (PCB) was designed by Bert, VE2ZAZ, and sourced from Oregon State. The system relies on a 10 MHz oven-controlled crystal oscillator (OCXO), following a design by Hugh, VA3TO, to provide a stable reference frequency.

Dino, VE7NX, personally wrote the software code for the Arduino, integrating all components to generate the precise 50.070 MHz CW signal. For the initial amplifier stage, Dino repurposed a 3W amplifier brick sourced from his own collection and built a custom low-pass filter to clean up the signal before transmission. The antenna, an omnidirectional Moxon-type horizontal design, was procured online by John, VA7XB, ensuring wide area coverage without the need for significant elevation.

Challenges and Overcoming Setbacks

The initial installation of the beacon at SARC's Operations & Training Centre (OTC) in South Surrey went smoothly and operated successfully during testing. However, the team soon faced an unexpected challenge. When a nearby HF contest began, a 1 kW amplifier operating on 40m—just above the 6m antenna—generated significant harmonics that overwhelmed the modest 3W amplifier, leading to irreversible damage.

Stepping in to address this critical issue, Les, VA7OM, designed and built a robust replacement amplifier. Importantly, this new amplifier incorporated a bandpass filter with strong rejection on the 40m band, safeguarding the beacon from future interference. With the improved amplifier installed, the beacon has since operated continuously and reliably.

Community Impact

The VE7SAR/B beacon serves as a valuable resource for both the SARC membership and the wider amateur radio community. Operators from across the Lower Mainland of British Columbia, Vancouver Island, and even as far south as Seattle, Washington, have reported hearing the beacon. Its continuous CW signal provides an important indicator of propagation conditions on 6m, a band known for openings that can span vast distances when conditions align.

Dino's leadership and hands-on involvement have been central to the beacon's success. His ability to source components, integrate hardware and software, and mobilize fellow club members exemplifies the spirit of amateur radio experimentation and collaboration.

Listen In

For those interested, the VE7SAR/B beacon can be monitored on 50.070 MHz in CW mode. We invite all operators to tune in, report receptions, and join us in exploring the magic of the 6m band. If you hear our 6m beacon, please let us know at beacons@ve7sar.net.

The 6m beacon list

~

Spooltenna

Product review

by JOHN LEONARDELLI VE3IPS

John Leonardelli VE3IPS has been a ham since 1975. His SWL, CB and high school ham radio interest led him to pursue an electrical engineering career and degrees in Communications and Telecommunications technology.

John's primary interests include: Building ham-related gadgets and antennas, QRP, contesting, portable and mobile HF operation with a focus on POTA and SOTA.

The Spooltenna HF EFHW antenna designed by Robert KO4HUI stands out as a highly portable and cleverly designed solution for HF operators who prioritize quick deployment, compact storage, and multi-band capability. Built with portable and QRP operation in mind, the Spooltenna brings together functionality and form in a way that supports both casual operating and serious field use. It covers 40m, 20m, 15m and 10m in a single antenna solution allowing band hopping without an antenna tuner which is a joy when out in the field.

I made a beeline for the Spooltenna booth at Dayton Hamvention on Friday morning as I had serious FOMO about it being sold out. Popular items sell quickly with over 35,000 shoppers roaming the venue with cash in their pockets.

At $149 USD, it offers immense value and practicality making every deployment a successful one. Robert has made the antenna design open-source but if you factor in the time and materials gathering I found it easier to buy than build allowing me more time to make contacts.

First Impressions

The antenna arrives neatly wound on a durable spool made form PCB material, which also doubles as the deployment and storage mechanism. It's a smart design that eliminates tangled wire headaches and makes setup intuitive, especially for solo operators. The silicone #20 gauge wire is stranded, insulated, and lightweight yet rugged enough to handle outdoor conditions or tight urban backyards.

The manual is provided as well as an SWR sweep of a quality control test that is done before shipment.

Build Quality

The Spooltenna's craftsmanship is impressive. The housing components are solid, and the toroid and transformer windings are clean and well-constructed. The integrated 49:1 Balun matches a 50-ohm feedline to the high impedance at the antenna feed point efficiently, enabling it to operate without a tuner on its resonant bands.

The BNC connector is solidly affixed and doesn't wobble under stress. The integrated winder or spool allows easy deployment and takedown, which is a major plus for SOTA/POTA and backpack operators.

Its round form factor makes it easy to pack being 5 by 1 inches in size.

On-Air Performance

Performance-wise, the Spooltenna EFHW holds its own. When installed as a sloper or inverted V with the feed point near the ground and the far end elevated, it provides solid NVIS performance on 40m and good DX capability on 20m and up. The antenna radiates efficiently with low SWR on the bands it's designed for. It makes field operations simple as it does not need a tuner and it's very fast to deploy.

I use a 10 foot length of RG-316 from the antenna to a common mode choke and then a 25 foot length of RG-316 to my Icom 705. BNC connectors make interconnections simple with no concern about missing any adapters. At low power levels the choke is not mandatory but as you go over 20 watts you may realize that RF feedback may cause some problems.

There is a provision for attaching an external 7-10 foot radial.

QRP operators using 5 to 10 watts will find that it performs admirably even under challenging band conditions.

If the antenna spool is placed inside a waterproof container, I suggest that it is usable as a permanent installation. It is not by itself water proof but it survived OK during a brief rain shower. However, the antenna design is for portable operators. I found that covering the spool with a zip lock plastic bag was ideal keeping it dry during rainy weather.

Deployment & Use

Setup time is under five minutes with the fiberglass mast already in place. The winder helps keep the wire untangled, and the entire kit fits in a cargo pocket or side pouch of a backpack. It pairs perfectly with radios like the Icom IC-705, Elecraft KX2/KX3, and Yaesu FT-818 and FT-891.

The end-fed design means only one support is truly needed—ideal for minimal setups. This makes it particularly well-suited to park activations camping trips, or emergency use. Tie the far end to a tree branch or pole, and you're on the air fast.

I prefer to use an inverted V set up with a 16 foot fiberglass mast as I can deploy it anywhere. I also use a 32 ft fiberglass mast which gets the antenna up higher especially when a tree is not available.

I had great success using it from a hotel room in Dayton, sloping it downwards towards the pool area from the window.

Everything fits in a military pouch and I added some RF adapters, coax, the CMC, Paracord and a couple of tent stakes. I keep the SOTAbeams Carbon 6 mast separate which also includes a tubular ground spike used for beach umbrellas.

I tend to do a lot of "gun and run" activations that are less than 20 contacts in between errand runs, which is normal for me. Having the ability to deploy this antenna without tangling allows me more time to operate than fiddling around and its coverage of the main bands is ideal.

I can hang the Spooltenna with some Paracord and a carabiner clip off my side view mirror on my car and toss the end up in a tree (water bottles are ideal for toss ups) and go operate without a fuss from inside my car.

For longer deployments I will choose between an inverted V and a sloper scenario based on what the park offers as far as antenna placement.

We were tempted to try operation with a 500 watt mobile amplifier but did not want to test for smoke so I suggest you enjoy it barefoot and use it as it was designed.

👍 Pros

- Ultra-portable and compact
- Fast, tangle-free deployment
- Excellent for QRP and field operations
- No tuner required on resonant bands
- Solid SWR and great on-air reports

👎 Cons

- Bandwidth is limited to 4 bands due to design
- Wire gauge may not support higher power levels
- Requires decent height (at least 20 feet) and space to deploy optimally

Final Thoughts

The Spooltenna HF EFHW antenna is a highly recommended antenna for portable HF ops, emergency kits, and minimalist station setups. Whether you're activating parks, camping, or just working from a backyard, this antenna is designed to make HF operations simple, effective, and stress free.

www.spooltenna.com

Field-tested and approved by VE3IPS

https://youtu.be/NxHf_Qx_lQc

~ John VE3IPS
Pronoun: QRP+

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- https://www.buymeacoffee.com/ve3ips

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- REZ Antenna: Scout, RECON 40, RANGER 80 https://www.youtube.com/watch?v=lCgMHqSi2Do

(ISED) Releases New Documents for Amateur Exams

by DAVE GOODWIN VE3KG, RAC Regulatory Affairs Officer

For immediate release | June 2, 2025

On May 30, 2025, Innovation Science and Economic Development Canada (ISED) published three important documents related to the Amateur Radio examinations:

ISED updated "RIC-1 – Guide for Examiners Accredited to Conduct Examinations for Amateur Radio Operator Certificates" which sets standards for Amateur Radio certificate examinations and provides direction to Accredited Examiners (AEs) on the conduct of exams.

This update to RIC-1 makes three important changes:

1. ISED has given specific direction on the conduct of "virtual examinations," that is, examinations conducted over the internet.
2. ISED has dropped geographic restrictions for AEs. AEs in any province or territory may now examine candidates in any province or territory.
3. ISED has clarified that both the candidate and the AE must be in Canada at the time of the exam.

These changes were initiatives by ISED and were the subject of a Canada-wide consultation with AEs.

On that same date, ISED published two new documents specifically for the Basic exam:

1. A sheet of formulas and block diagrams. These are fully labelled. ISED is offering these for training purposes only.
2. A very similar sheet of formulas and block diagrams with all labels and context removed. These may be used as approved reference material during all Basic examinations starting on July 15, 2025.

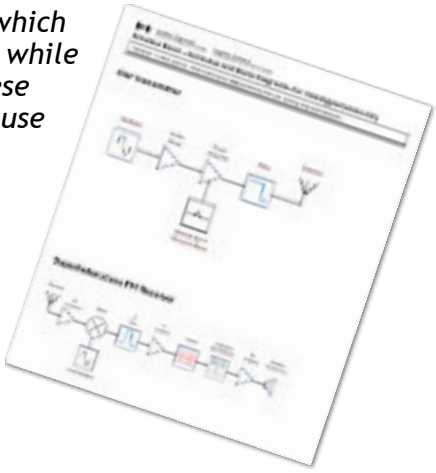
These new documents were RAC initiatives. They were created by the members of the RAC Examination Standards Committee (RAC-ESC-CNE).

~ Dave Goodwin, VE3KG
Regulatory Affairs Officer
Radio Amateurs of Canada

Examination requirements are described in RIC-3.

New reference document for ISED Amateur Radio examinations

This link provides a zip file, containing two PDF files. One file is a set of labeled formulas and block diagrams, which may be used by amateur candidates as a study aid prior to writing the Basic exam, and the other is an identical, but unlabeled, set of formulas and block diagrams, which may be used as an aid while writing the exam. These files are available for use as of July 15, 2025



You've got the Power!

Monitoring your voltage

by DOUG JEFFERY VA7JDJ

Over the past 6 months I have been building up my portable radio gear getting ready for what I hope will be a great POTA season. Like many hams I bought a Lithium Iron Phosphate (LiFePO4) battery to power my portable adventures. The light weight made it easy to justify buying LiFePO4 over the older (and much heavier) sealed lead acid battery.

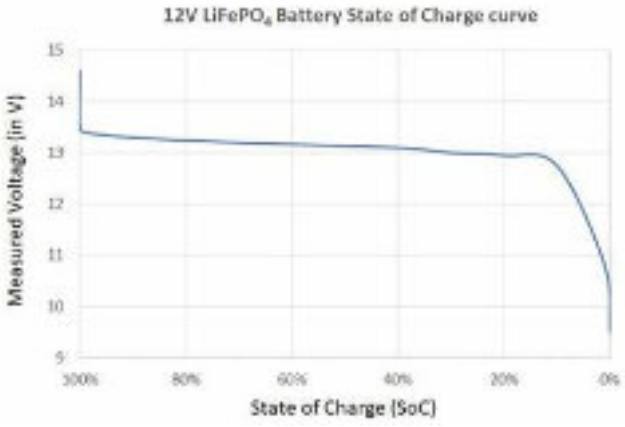
One other part of my POTA rig is a power distribution box that I built. I 3-D printed an enclosure with openings for an Anderson Power Pole inlet connection, circuit breaker, 12V accessory plug, 2x Anderson Power Pole outlet and a fancy USB charge connector that features an LED ring showing the battery voltage. I also printed the housings for the Power Poles. I really enjoyed not needing to drill and file the holes that I needed for the components.

I was pleased with the results, but soon realized that looking at the battery voltage was not a great way of judging the state of charge of the LiFePO4 battery. You see the problem is that these batteries have an extremely flat discharge curve, so the voltages at 80% charge are very similar to the voltages at 20% charge. To further complicate the situation we place some pretty high demands on the battery. While receiving my rig draws about 1.5A, but during transmit this can climb up to 20A. These swings in current also cause the battery voltage to vary.

So if the battery voltage isn't a good way to know the battery's state of charge what can you do? I remembered a power meter that I used to use when flying radio controlled airplanes. I dug through my flight box and found what I needed.

This little meter is available on Amazon for around $25 and on some Chinese web sites for as little as half of that! I put a set of Power Poles on this so I could use it to feed my power distribution box and keep track of the battery. It seemed like a great solution with the meter reporting:

- Volts
- Amps
- peak Amps
- Power



- peak Power
- Ah consumed
- Wh consumed

Everything seemed to be pretty good until, one day sitting at the SARC Saturday breakfast, John VE7TI asked the innocent question: “Have you taken it apart to see how its built?” The discussion went on to speculating if this could be adding significant voltage drop from the shunt resistor or general construction. I had to admit that (surprisingly) I had never looked under the covers.

Later that same weekend I had a screwdriver in hand and pulled the unit apart looking to see “How it was built”. There is a standard 16 character by 2 line LCD with a small PCB attached by the header pins. The leads were made of good quality 14 gauge wire with silicone insulation. The shunt resistor is a surface mounted 1mOhm 5% current sense specific component. Looking at similar parts on Digikey’s website I am guessing that it’s rated to 8W, at 20A the resistor would be dissipating 0.4W, so there is lots of margin in the part.

My first impressions were very favourable. I decided that I would replace the 14 gauge wire with 12 gauge for a little lower loss and put it back together. I considered replacing the 5% tolerance shunt resistor with a more precise 1% version, but in the end didn’t feel it would be a significant enough improvement to warrant the effort. I looked at the LCD data sheet and considered adding a control for the LCD off/on/brightness. This would amount to a small power savings over a longer activation. The LCD backlight normally runs all of the time. I have put this on the list for possible future improvements.

Having used it on a few activations now I can report that it works well enough to have a good sense of the state of charge in the battery. The main fault that I can see is that the meter does not remember how many amp hours you’ve used if it is disconnected. Ion days where I anticipate using the battery in several locations have solved this by remembering to write down the consumption before unplugging the battery. This may be an opportunity for a better design for portable operations in the future. For now I am happy with this solution.

73,

~Doug VA7JDJ

A free CW key?

Demonstrating my paddles made from three jumbo paperclips, a block of wood, a 3.5mm stereo patch cable and four screws. Since I had all these items around the house, total cost of construction was $0.00 https://youtu.be/oqJL08Wq2Fw

And another type altogether: https://youtu.be/Oj43VmKNcJw

Reinventing Spark Gap Radio

By GUY IMMEGA VA7GI with the assistance of TOBY HAYES, VE7CNF

Guy Immega VA7GI is a retired aerospace engineer and entrepreneur, living in Vancouver, Canada. His company, Kinetic Sciences Inc. built experimental robots for the space station, robots to clean up nuclear waste and miniature fingerprint sensors for cell phones. Since retirement, Immega has focused on writing science fiction. His novel, Super-Earth Mother, was published in 2023 by EDGE Science Fiction & Fantasy.

www.guyimmega.com

A Brief History of Spark Gap Radio

Imagine living in 1901, with most houses lit by oil or gas lamps, long range land transport limited to horses and steam trains, and messages sent via telegraph wires or transatlantic cable. Marconi had already shown that radio signals reached ships at sea beyond the horizon. On December 12th of that year, Marconi, age 27, climbed the Cabot Tower on Signal Hill, a windswept promontory overlooking the Atlantic Ocean in St. Johns, Newfoundland. He launched a kite tethered by a 500-foot antenna wire, hoping to demonstrate transatlantic radio communications.

Marconi, an avid inventor and experimentalist, worked in a manner familiar to most hams. Heinrich Hertz discovered radio waves generated by electrical sparks in 1888, but concluded: "I do not think that the wireless waves I have discovered will have any practical application." In fairness, Hertz could only detect electromagnetic waves over a very short distance by using a receiving loop antenna with a small second spark gap to indicate the signal. In contrast, Marconi wanted to demonstrate long distance radio communications.

For his 1901 transatlantic test, Marconi used a 10 kW spark gap transmitter in Poldhu, Cornwall, England. It produced a noisy, wideband signal in the VLF and LF range, spanning from a few tens of kilohertz to around 500 kHz. The transmitter needed a massive antenna (supported on 20 masts), due to the long wavelengths used in early radio transmissions.

In Newfoundland, Marconi's primitive coherer detector received the repeated the Morse Code letter S—dit-dit-dit—the first radio contact spanning the Atlantic Ocean. The demonstration was controversial, but Marconi later started regular transatlantic radio-telegraph service in 1907.

In his Nobel Prize speech in 1909, Marconi admitted that he didn't understand how radio worked. He didn't know why radio signals caused metal particles in the coherer detector to conduct (even today, nobody is certain). Marconi knew that radio waves traveled in straight lines, but he also believed they somehow followed the curvature of the Earth. At that point in history, the ionosphere was unknown. Nobody understood that radio signals are reflected and refracted by an invisible layer in space, allowing them to bounce around the planet. For many people, invisible radio waves seemed like magic.

Over time, spark gap radios improved. On April 14, 1912, at 11:50 PM, the Titanic struck and iceberg. Starting at 12:05 AM, the ship sent radio distress signals until ten minutes before it sank beneath the calm surface at 02:20 AM. The Titanic used a 5 kW rotary spark gap coupled to a horizontal 450 foot “Twin-T” antenna above the deck. Marconi’s rotary spark gap transmitter produced a “musical” 840 Hz modulated carrier on two RF frequencies (500 & 930 kHz).

The Titanic’s receiver used a magnetic detector, a continuous loop of soft iron wire moved by clockwork and magnetized by the received radio signals—invented by Ernest Rutherford. The backup receiver used a coherer detector. The radios on the Titanic worked well and saved 710 lives.

Marconi’s radios used high power in the longwave part of the spectrum below 500 kHz. The Radio Act of 1912 in the United States mandated the licensing of amateur radio operators. The act restricted hams to wavelengths shorter than 200 meters (above 1.5 MHz). This was before the discovery of the ionosphere in 1924. Ironically, as hams began to experiment in these "worthless" bands, they discovered their true potential and laid the foundation for modern HF radio communications.

Hams used spark gap transmitters well into the 1920s, until the Alexanderson alternator (a high speed rotating AC generator) and vacuum tube oscillators made continuous wave (CW) transmissions practical. Spark gap transmitters generate extreme interference, essentially broadband static. They have been prohibited by international law since 1934.

Why Build a Spark Gap Radio?

Classic radios evoke intense nostalgia. Hams who imprinted on crystal controlled tube transmitters will never forget their first QSO. Boat anchor radios still find loving homes. I treasure my 1958 Collins KWM-1.

But there was a prior generation of amateur radio operators that used spark gap equipment. These early hams were true radio pioneers, at the beginning of radio. Their transmitters used Model T induction coils to produce sparks. The biggest challenge was making a sensitive RF detector.

Some ancient spark gap radio equipment is in museums. An original working Braun spark gap transmitter and coherer receiver, built with exquisite craftsmanship, are in the Museo Scienza in Florence, Italy. There has also been a partial reconstruction of the Titanic’s rotary spark gap transmitter.

My goal was to reinvent spark gap radio in order to understand and celebrate the first amateur radio pioneers. To do this I constructed an operational gap transmitter and coherer receiver—perhaps the first end-to-end spark gap demonstration in more than 100 years (certainly the first on 10 meters). The completed spark gap rig demonstrates electromechanical radio communications without electronics—no detector diodes, transistors, tubes or amplifiers.

Spark Gap Transmitter

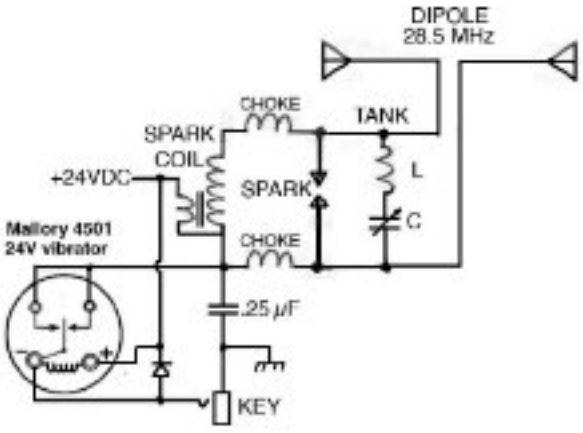


Figure 1. Schematic of Spark Gap Transmitter

Induction Coil and Vibrator

Like the early ham spark gap transmitters, the induction coil is a Ford spark coil from the 1960s. It runs on 24VDC (instead of the rated 12V) to make a hotter spark. Instead of breaker points, a vibrator (Mallory 4501 24V SPDT, available on eBay) provides switching at 400 Hz. The vibrator predated switching transistor power supplies and was used to provide square wave

input to high voltage transformers for mobile tube radios in the 1950s. The 4-pin Mallory vibrator fits a 2A3 triode tube socket. Of course, a .25 µF capacitor is used with the vibrator on the primary of the spark coil, as with breaker points used with an automotive spark coil.

Spark Gap

The spark gap required experimental development. Automotive spark plug technology is designed to work with high voltage and low current. In contrast, Marconi's 1901 10kW transatlantic spark gap transmitter used low voltage at high currents. Marconi's spark gap electrodes were made of tungsten to withstand heating.

Figure 2. Photo of Dual Spark Plug

For a low power spark gap, an automotive spark coil produces very high voltage (~50 kV). In the experimental transmitter, the spark gap is between the center electrodes of two opposed spark plugs (with the side electrodes removed). Note: the spark plugs must have no built-in RFI suppressor resistors.

The width of the spark gap is adjusted for maximum RF signal to the coherer receiver (about 0.060 inches, 1.524 mm). A too-wide gap reduces spark current and energy; a too-narrow gap becomes like a short circuit. Also important is the spark rate; more sparks per second provides greater average transmitter power. Choke coils (~60 µH; 27 turns close-wound, 1.5" diameter) isolate the RF generated by the spark gap from the vibrator and power supply.

Tank Circuit

To reduce antenna size, the demonstration spark gap transmitter was designed to operate on 10 meters. A simple LC tank circuit is tuned to 28.5 MHz. The inductor is 3.5 turns of heavy wire at 1.25" diameter and 1.5" length (~.23 µH). The tank circuit variable capacitor (~135 pF) must withstand sparks at about 50 kV. Ordinary variable capacitors will arc or burn up. Fortunately, I had an ancient vacuum variable capacitor which works well. The tank circuit is resonant only when the spark fires (the spark gap must be short circuited when using a grid-dip meter to tune the resonant frequency). Since the tank circuit partially determines the spectrum used by the transmitted signal, high-Q is desirable.

Antenna

For the 10 meter antenna, I used two continuously loaded CB whip antennas, configured as a horizontal dipole, tuned to 28.5 MHz with copper sliders. Balanced dipole antennas require no ground plane, or grounding wire. The antenna's resonant frequency partially determines the spectrum of the transmitted signal.

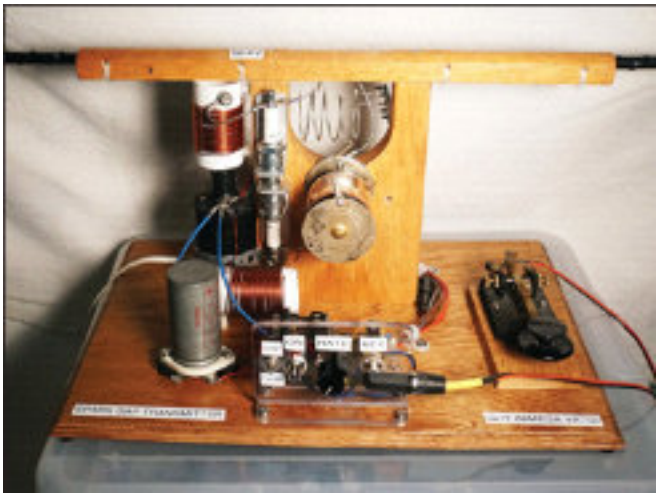


Figure 3. Photo of Spark Gap Transmitter

The choice of 10 meters allows small, portable antennas to be used. The total width of the loaded dipole is four feet, convenient for demonstrations. The antenna is connected

directly across the spark gap of the tank circuit (link coupling worked, but was not as effective). The antenna impedance is 50 ohms, but transmitter impedance varies with spark current. The antenna operates at the full voltage of the spark coil during transmit (don't touch!).

Coherer Receiver

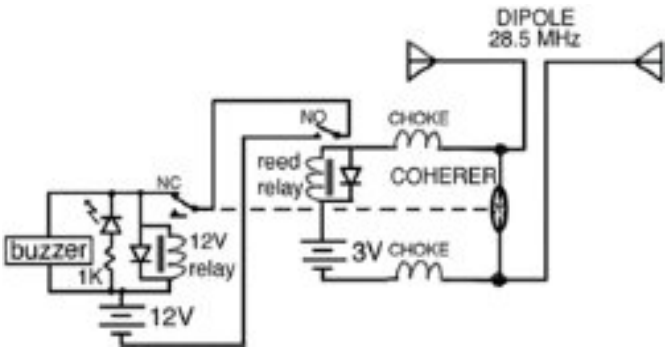


Figure 4. Schematic of Coherer Receiver

Dual Power Supply

The coherer receiver uses two power supplies. A 3V battery used in the coherer circuit to activate a sensitive reed relay, isolated from the rest of the receiver circuits. The 3V reed relay (MEDER SIL03-1A72-71D) has a built-in flyback diode (to suppress voltage transients) and is capable of tracking rapidly repeating spark signals. A second 12V power supply operates the 12V relay, buzzer, and LED light in response to a received signal.

Antenna

The receiver dipole antenna is identical to the transmitter antenna (tuned to 28.5 MHz). Signals received on the antenna are applied directly to the coherer detector, causing it to conduct. When exposed to RF, the resistance of the coherer drops from several thousand ohms to between 50 and 200 ohms, depending on the strength of the RF field. This provides an approximate match to the 50 ohm impedance of the dipole antenna.

Coherer Detector

The biggest challenge was developing the coherer receiver circuit. The coherer was an early radio signal detector invented in 1892 by French physicist Edouard Branly. In 1899, physicist Jagadish Chandra Bose did experiments to improve coherer operation. In 1895 Marconi demonstrated the coherer and used it in the late 19th and early 20th centuries.

The coherer typically consists of a glass tube filled with filings of brass, nickel, or other metals. The loose pile of filings normally has high resistance. In the presence of an RF signal, the powder clumps together and coheres (become conductive), activating a sounder. After detection, the coherer must be tapped or shaken between each dit and dah of Morse code to de-cohere, or open the circuit. Some coherer receivers employed a small electromechanical hammer to tap the glass and knock the brass powder loose. The hammer method was very slow.

I used a coherer manufactured by Navone Engineering. Coherer detectors are sometimes available on eBay. For those skilled in machining and glass blowing, it is possible to make your own. The dimensions are not critical.

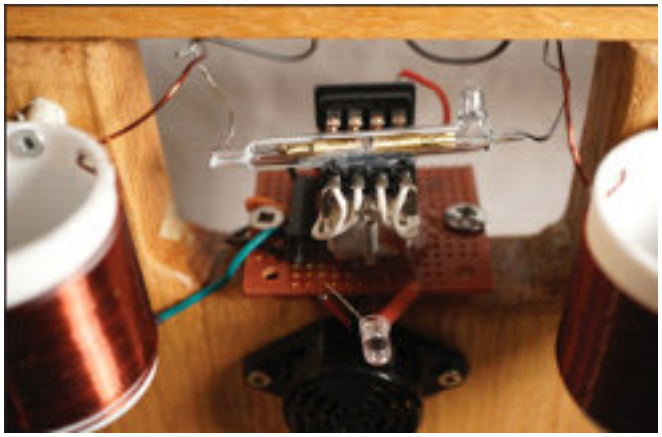


Figure 5. Photo of Coherer Detector

Nobody is certain how a coherer works. One theory is that electromagnetic waves induce tiny currents in the metal filings. These currents can cause small arcs or sparks between adjacent

particles that "micro-weld" them together at the points of contact, creating micro-bridges that establish a conductive path for electricity.

A coherer is a finicky and variably sensitive detector. When an RF field is applied to a coherer, it sometimes it fails to respond, while at other times it “locks up” and won’t decohere easily. The small heap of brass powder in the coherer offers many possible parallel paths for conduction and the response time is almost instantaneous.

Improved Coherer Signal Tracking

There are several coherer demonstration videos on YouTube. They show a spark igniter that causes the coherer resistance to drop. A tap on the glass tube shakes the powder and “de-coheres” the connection. The necessity of tapping presents a major challenge to coherer receiver design. The original coherer detector used electromechanical tapping after each dit or dah of Morse Code, to make it ready to receive the next signal.

After many experiments, I found that the traditional coherer circuit could be improved—eliminating tapping of the glass tube with a tiny hammer. Since coherer conduction in an RF field is nearly instantaneous, it will occur even while the tube is continuously shaken. The churning motion of the brass powder does not stop coherer conduction in the presence of RF. The challenge is to find a way to track rapid on-off switching of the coherer detector, without using a transistor (which would use technology not available in 1901). With the current design, the vibrating coherer detector conducts and decoheres as it receives signals, allowing it to continuously receive Morse Code.

Figure 6. Photo of Coherer Receiver

The receiver uses a sensitive reed relay in the coherer circuit, which provides a fast response to an RF signal. The relay supplies power to buzzer and LED light, indicating a dit or dah of Morse code. In practice, the note is rough but readable.

Coherer Receiver Operation

While simple, the operation of the coherer receiver is not obvious. The dipole antenna is directly connected to the coherer detector, which is isolated by choke coils (~60 µH). A 3V reed relay is activated when the coherer detector rapidly conducts current in an RF field. The 3V relay then activates a second 12V relay, which vibrates. The glass coherer tube is mounted (hot glued) onto the armature of the 12V relay. This mechanical connection allows the 12V relay to shake the brass powder in the coherer, breaking (decohering) the connection. The mounting angle of the coherer on the armature is not critical (the coherer tube is horizontal with the “V” of the brass powder pointed downward.

The coherer normally detects hundreds of sparks per second from a Morse code signal. This causes the 12V relay to vibrate continuously for the duration of each dit or dah churning brass powder. The vibrating 12V relay does not interfere with ongoing reception of spark signals, since the coherer is able to establish a near-instantaneous conduction path.

In practice, an RF signal causes the resistance of the coherer to drop (switch on), activating the 3V relay. In random but rare instances, the conductive path through the coherer becomes “stuck,” and does not decohere, even when vibrated. However, the power to the 12V relay is interrupted by normally closed contacts in series with the relay, which will cause the 12V relay close fully and then open (and forcibly shake the brass powder). This works to “unstick” the coherer, making it ready for the next RF signal.

Below is the sequence for the coherer receiver to detect a signal.

1. Antenna receives signal (a dit or dah of Morse code)
2. The coherer detector conducts current

3. A 3V battery activates (closes) the reed relay in series with the coherer detector
4. Reed relay sends power to 12V relay, piezo buzzer, and LED
5. The 12V relay is wired to turn itself off, causing it to vibrate the coherer (glued to the armature of the 12V relay)
6. The piezo buzzer (wired in parallel with the 12V relay) produces raspy Morse code sounds (and flashing LED light)
7. 12V relay armature (with coherer mounted on it) starts vibrate, the shaken coherer decoheres, breaking the connection to the reed relay.
8. The reed relay opens (due to the shaken coherer) - 12V relay opens and stops vibrating- - the piezo buzzer goes quiet & LED blinks off
9. The sequence is repeated whenever there is a signal at the antenna. A piezo buzzer and LED light are connected in parallel with the 12V relay in the receiver. They pulse continuously when a Morse code signal is received. This provides a rough but copiable audible and visual Morse Code.

Performance Results & Demos

The spark gap transmitter is designed for low power and limited range. The average power of the transmitter can be estimated as follows:

Avg power = (energy per spark) X (spark rate)

Energy per spark = (peak RF output power) X (RF pulse duration)

A spark gap produces 4kW peak damped sinusoids lasting only a few cycles. That is equivalent to a 1 kW rectangular pulse for 100 nS, for a pulse energy of 0.0001 joule. At a 400 Hz spark rate, the average power of the spark gap is about 40mW, similar to a WiFi router. The 28.5 MHz spark gap signal can be detected by the coherer receiver up to a range of 25 feet.

The demonstration unit produces static similar to an electric fence or high-pressure sodium vapor lamps. Short transmissions of a few seconds at low power produces minimal interference and does not violate the spirit of the prohibition of spark gap transmissions.

Concluding Remarks

Resurrecting spark gap radio was a little like doing experimental flint-knapping to learn about stone arrowhead technology. There are several YouTube videos of simple spark gap transmissions. Although various components of spark gap radios exist in museums and collections, few working end-to-end systems—both transmitter and receiver—exist. The 10 meter spark gap transmitter demonstrates all the components of tuned spark gap radio, including the induction coil, oscillator, spark electrodes and antenna.

By far the biggest challenge was the coherer receiver. Although there are several YouTube videos showing the operation a coherer detector, a practical receiver required much more experimentation. I set two goals for the spark gap receiver: no modern active components and automatic decohering of the coherer detector. After many experiments, I was able to achieve this using only electromechanical components. The key insight was that the shaken coherer detector can operate in continuous mode, receiving each dit and dah of Morse code as it is sent.

The reinvention of spark gap radio is a bit like radio archaeology. The photos show a spark gap transmitter and coherer receiver working together, perhaps the first complete spark gap radio transmitter and receiver system since the 1920s.Taken together, the spark gap transmitter and coherer receiver demonstrate the utility of the earliest radio inventions. The romance of the first radio technology—communications with invisible waves—still fills me with wonder.

Videos of the operating Spark Gap Transmitter and the Coherer Receiver are available for the publisher's website.

~ Guy VA7GI

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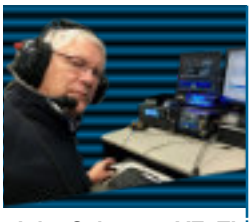
A Special Interest Group for the iCOM 7300, 7610, 9700 and other compatible models

Efficient SD Card Management for iCOM Transceivers

A Technical Guide

by JOHN SCHOUTEN VE7TI



John Schouten VE7TI

Has both an iCOM 7300 and 9700 and is fascinated by the 'hidden' features of these transceivers.

In this article, we will explore the SD card functions and file management features of the iCOM IC-7300, a popular transceiver among amateur radio operators. Similarities exist also for the iCOM IC-7610, the IC-9700, IC-705 and other models, so these functions should also work with these transceivers. This guide aims to provide a comprehensive overview of how to effectively utilize these features to enhance your radio experience.

SD Card Functions

The Icom IC7300 offers several SD card functions that are essential for managing your radio settings and recordings. These functions include saving and loading settings, formatting the SD card, updating firmware, and capturing screenshots.

You can save the following data onto the card:

- Data settings of the transceiver (Settings and memory channel contents saved in the transceiver). Useful if you are transferring settings from one IC-7300 to another, or if you preserve operating settings for different users or

modes, such as SSB, FT-8, etc. You vcan back-up this data by inserting the SD card into your PC and copying the files there.

- Communication content (The transmitted and received audio).
- Communication log (The communication and receive history log).
- Voice audio for the Voice TX function (Voice audio to use with the Voice TX function).
- RTTY decode log (The transmitted or received RTTY decode history log).
- Captured screens

Formatting the SD Card

Formatting the SD card is a crucial step to ensure it is ready for use. The format option in the SD card menu allows you to erase all data on the card and prepare it for new recordings and settings. It is recommended to format the SD card periodically to maintain optimal performance.

The best SD card for audio recording is typically a Class 10 card, with brands like SanDisk, Samsung and Toshiba being reliable and most highly recommended. For most audio recorders, a capacity of 32GB is a good starting point.

Firmware Update

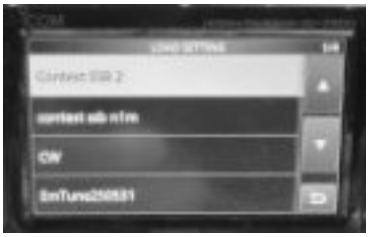
Updating the firmware of your Icom IC7300 is essential to keep the radio functioning smoothly and to access new features. The firmware update option in the SD card menu provides clear instructions and warnings to ensure a successful update. It is advisable to always use the latest firmware version for the best performance.

Steps to Update Firmware

1. Download the latest firmware from iCOM's official website.
2. Copy the firmware file to the SD card (must be formatted in FAT32).
3. Insert the SD card into the transceiver.
4. Navigate to the firmware update menu and follow the on-screen instructions.

This method is more reliable than USB-based updates because it eliminates potential driver issues and ensures a stable installation process.

Saving and Loading Settings



The SD card menu allows you to save your radio settings, which include memory settings and various options configured through the set menus. To save settings, navigate to the SD card menu and select "Save Setting." The default file name includes the year, month, date, and a serial number. You can also customize the file name for specific purposes, such as contest settings. Loading settings is equally straightforward; you can choose to load all settings or select specific ones, such as the CAT control address and oscillator reference adjustment.

Audio

This feature is invaluable for:

1. Making a QSO record or to confirm your QSO with a rare entity's station or on a DX'pedition.
2. Contest logging (recording entire operating sessions for later analysis).
3. Repeatedly sending the same message - such as calling CQ. The recorded contents are saved onto the SD card.
4. Training and education (studying Morse code, improving operating techniques).

Recording Options

- RX Recording: Captures incoming audio (useful for logging or signal analysis).
- TX Recording: Records transmitted audio (helpful for self-evaluation).
- Auto Recording: Can be set to record only when signals exceed a certain threshold.

Voice Keying

The built-in Voice Keyer permits you to record a file and play it back on transmit. The transmit level, defaulting to 50%, ensures clean audio

without over-driving, while the auto-monitor feature overrides the monitor setting to play voice memories through the speaker, preventing feedback during live mic use.

The IC-7300 supports eight memory slots for pre-recorded messages, each up to 90 seconds. Recording a CQ call, using the built-in mic and adjusting gain to keep levels around 80% on the VU meter, as recommended by the manual. The radio mutes RX audio during recording to prevent background noise, and recordings play back through the speaker, not the line out. Operators can name memories (e.g., "CQ") and use them for contests or special events, such as Field Day, where pre-recorded responses like “3A BC” or “73 and good luck” streamline communications. The radio automatically keys and unkeys during playback, and a repeat function, with a 1-15 second delay (default 5 seconds), loops messages for continuous CQ calls, easily interrupted by touching the button or keying the mic.

Setting up a “CQ, CQ <Your Call>”

The most useful function I use is pre-recorded settings for transmit audio files. It is a function I normally use in a contest with N1MM+, but I don’t always operate in a contest. If I am just spending an hour looking for DX, I generally use the built-in IC-7300 audio recording feature. To use it:

Recording a voice keyer file:

Menu > Voice > *Select REC/Set* > Rec

Select one of the 8 available slots. I use slot 1 for calling CQ, slot 2 for just my callsign and the remainder for specialized recordings depending on what I am doing. For example, in the recent MANNA@80 special event I briefly described the nature of the event, so as not to have to repeat myself constantly. You have up to 90 seconds per record slot, although you would not likely transmit for that length unless you’re a ‘long-winded operator’.

After you press on a slot, you will see a Name field, REC Level and 3 buttons, record, play and stop. By pressing the red dot on record, you are in record mode and you use your transmit mic to record your audio. Press the square Stop button when you are dome and the triangular button to hear what you have recorded. You will also see a ‘MIC GAIN’ button if you need to adjust your recording volume. If you’re happy with it press the return button lower right, if not, just record it again.

Using the recordings:

Press Menu > Voice. You will see your message buttons on the bottom of your screen. You can set your transmit *[TX LEVEL]* there and the default is 50%. You can turn it up or down and you can use the AC function to adjust to make sure you're not over-driving your radio. If you have it adjusted to anything else, press and hold the default button and it takes it back to 50%. I've found again that usually 50% seems to be pretty good as long as you've recorded the message using the VU meter and you have that adjusted properly.

If you press *[REC/SET] and then [SET],* you can set your audio monitor on or off. There is an auto monitor function that's normally set to on. You probably want to leave it on. The auto monitor function does just that, it lets you hear what is being transmitted when you press the buttons. If you’re not using a head set your audio may cause feed-back and you may want to leave the monitor off. With a headset there should be no issues. Do you want to hear the message as it is transmitted? - I do.

You can also set the repeat time to re-transmit your message. For a general CQ, I prefer 5-7 seconds.

There is a video illustrating the process at: https://youtu.be/kz2L47qEDo0

Recordings are saved as WAV files, which can be played back or edited on a computer or another device from the SD card. I like to

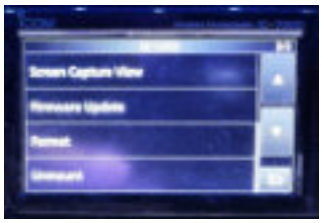
use the free and excellent Audacity program to do this. You can remove any silent gaps or artifacts and I use the *Normalize* and *Volume* functions to fine tune the audio.

PTT and Audio Record

The push-to-talk (PTT) auto-record feature, off by default, activates recording when the mic is keyed, continuing until 10 minutes of inactivity or a closed squelch. A pre-record buffer (5, 10, or 15 seconds, defaulting to 10) captures RX audio before the mic is pressed, ensuring no critical communication is missed. This setup is ideal for dynamic net operations, organizing files for easy review.

To record audio from your transceiver that you wish to review or preserve, the recorder's file management features are robust. With the default file split option enabled, the radio creates separate files for each transmit/receive cycle or when the squelch closes under the "squelch auto" condition, tagging each with frequency, date, and time metadata.

Disabling file split results in a single continuous file, which may include switching sounds between TX and RX. The squelch auto setting ensures recording only when audio is present, conserving SD card space, while the "always" option records even during silence if the radio is squelched. These features are invaluable for logging extended operations, such as emergency communications during events, allowing net control operators to record days of activity efficiently.



When the PTT Automatic Recording function is set to ON in the Voice set mode, the recording automatically starts when you push [PTT]. *(IC-7300 manual p. 6-8).*

Screen Capture and Image Storage

The screen capture feature allows you to take screenshots of the radio's display. This can be useful for recording band activity or documenting settings. To enable screen capture, press: Menu > Set > Function > *scroll down to* Screen Capture [POWER] SW. Tap to turn this ON. Back out of the menu. To capture a screen, briefly tap the POWER ON/OFF button. The process is demonstrated on video at https://www.youtube.com/watch?v=ZEJRqvjpVM8.

To view a capture, select Menu > Set > SD Card > *scroll to* Screen Capture View. Press on the screen to display the file, long press to delete it. These are standard graphics files so that you can also read them from the SD card inserted in your computer.

File Management

The Icom IC7300 provides robust file management capabilities for voice recordings. You can play, delete, and view information about recorded files directly from the radio. Additionally, folders can be managed similarly, allowing you to organize your recordings efficiently.

Additional SD Card Functions

While the IC-7300, IC-7610, and IC-9700 share most SD card functions, the IC-7610 and IC-9700 include some additional capabilities:

- Remote operation logging (storing command logs for software control).
- Expanded memory for contest modes (storing large numbers of contacts).
- Enhanced recording options (longer durations, higher sample rates).

Efficient SD card management is crucial for maximizing the capabilities of your Icom IC7300 transceiver. By understanding and utilizing the various functions and features, you can ensure your radio settings are backed up, firmware is up-to-date, and recordings are well-organized. This guide serves as a valuable resource for amateur radio operators looking to enhance their radio experience.

Tom W2IVDD is an experienced amateur radio operator and the creator of the IC-7300 from A-Z series. His expertise in radio operations and technical knowledge provides valuable insights for fellow enthusiasts.

https://www.youtube.com/watch?v=Xkm5JOwWfnE

~ John VE7TI

Refer to your iCOM user manual page 8-1 to 8-9 and pages 6-2 to 6-9 and Section 7 for the features described here.

A complete overview of the IC-7300 features can be viewed at https://youtu.be/yhCd6Z-tSTE

Antenna Adventures

A compact 2m/70cm J-pole that wasn't

from a project by JOSE DE JESUS MOURA COSTA PS8ET

As many regular readers are aware, I enjoy building antennas, the more unique the better, and they have been profiled on these pages. But sometimes something that looks great and that should work, doesn't live up to its billing. This is the story of one, and I'd love to hear feedback on why it did not.

I came across an inexpensive and easily built antenna by PS8ET, a dual-band J-Pole for 2m and 70cm. There are several versions of this antenna on the web, all of which are said to work. I found it easy to build with readily available materials. This antenna was said to work as a J-pole at 70 cm and ¼-wave monopole for 2m.

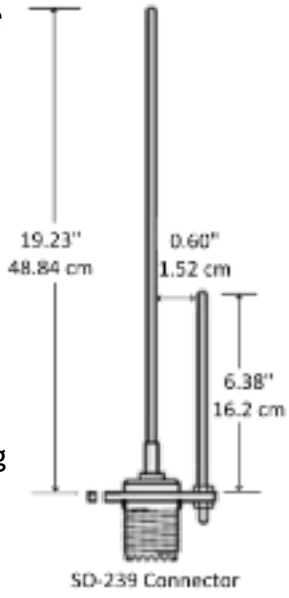
J-Pole features

The J-Pole antenna is composed of a half-wavelength radiator fed by the centre conductor and a quarter wavelength element connected to the braid of the coaxial cable. Basically, the antenna is a dipole fed at one end. It has an omnidirectional pattern with a low radiation angle. The quarter-wavelength element acts as an impedance transformer to the transmission line. Being a half-wave antenna, it provides a small gain over a quarter-wave ground antenna

The stub is soldered to the lug of a ring terminal that will allow adjustment as it is rotated eccentrically to adjust the separation to the central element; and it will also allow slight adjustment to the length of the same, to optimize SWR.

An acrylic separator, attached to the rods by silicone, allows the necessary separation of the elements to be maintained.

This view allows you to observe in more detail the separator and the location of the assembly on a a PVC cover for pipe 50mm in diameter.



The finished antenna is 51cm long.

Materials used in construction:

- 51cm length of 1.5" (or wider) PVC irrigation pipe
- 2 PVC caps
- Brass or copper welding rod 2.5mm diameter, by 66cm long
- SO-239 connector, screws with nuts & washers
- Acrylic to make the spacer

145.198 FM 1:2.5 [81.77% efficiency]

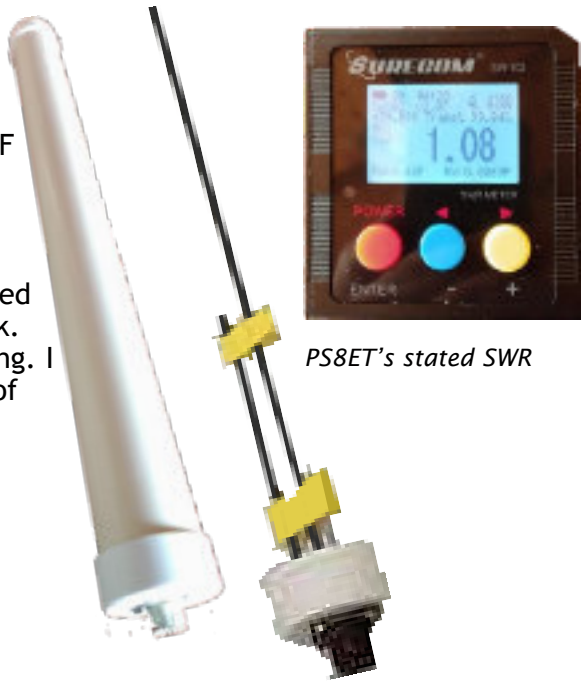
439.099 FM 1:1.1 [99.84% efficiency]

According to the author, an optimal SWR was obtained in UHF and was adjusted to improve performance in VHF.

Well, I did not mount it into a pipe because I did not get anywhere near the 2m SWR result without it, achieving just under 1:3 as my best effort On the other hand, 70cm measured less that 1:1.1, so if you need a UHF antenna this would work. It is such a simple antenna that it shouldn't be that frustrating. I did check every connection, tried various types and lengths of coax, and multiple analyzers, but still no 2m improvements.

Suggestions?

~ John VE7TI



PS8ET's stated SWR

DIY Professional Front Panels: A Step-by-Step Guide

This video introduces a new do-it-yourself (DIY) method for creating professional-looking front panels with crisp details and colors, resistant to water and even coffee. This method cleverly avoids the need for specialized tools like CNC or UV printers.

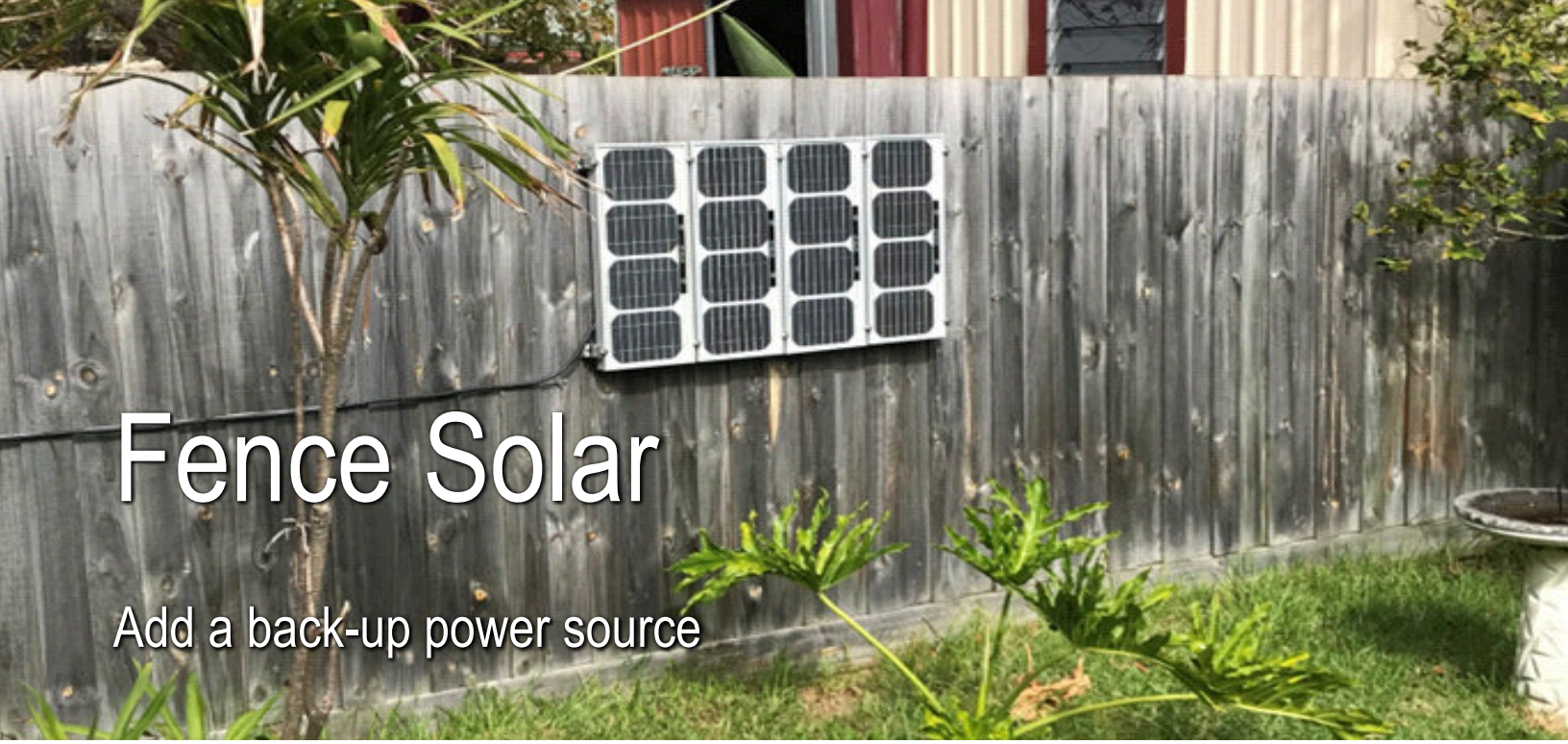
Key Steps

- Begin by creating your design using vector software like Inkscape. Ensure all measurements are in millimeters and account for the panel size, drill holes, and labeling
- Printing: Print your design at 100% scale using a regular inkjet or laser printer. For larger panels, consider using a local copy shop.
- Treat the printed paper with a transparent satin finish acrylic spray varnish to make it semi-transparent. Then, spray the backside with opaque white acrylic spray paint to prevent the aluminum from showing through.
- Panel Substrate Preparation: Use aluminum flat bars as the panel substrate, cut to the desired dimensions.
- Clean the aluminum thoroughly with acetone or nitro thinner to degrease it.
- Adhere the cut-out design to the prepared aluminum substrate using a two-part glue or resin. When applying, press from the center outwards to avoid trapping air bubbles. For optimal results, thinner paper (55 g per square meter) is recommended.

- Apply a second coat of spray varnish to the panel. Once the varnish is dry, carefully drill the necessary holes. Ensure the drill bit is clean, and remove any paper burrs around the holes using a file or knife.
- Apply a final coat of spray varnish, paying special attention to sealing the edges, especially around the drilled holes . The video demonstrates the panel's impressive durability against rubbing and water immersion. For enhanced solvent resistance, a coat of liquid transparent epoxy can be applied.

This DIY method allows you to create professional-looking front panels that rival factory-made products, all without the need for expensive or specialized equipment.

~



Fence Solar

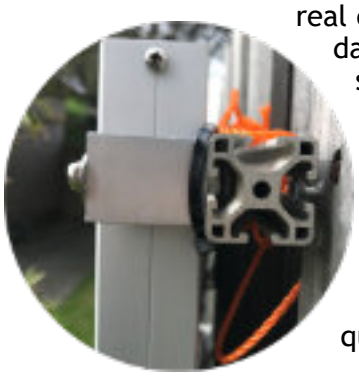
Add a back-up power source

by PAUL STUBBS VK3TGX

On YouTube I stumbled across a video of a man with surplus solar panels, he'd just done an upgrade and was left with his old panels, so he decided to hang a few on his backyard fence.

Then I realised I had a few panels that have been sitting around for years – brand new in box awaiting installation. I had most of the bits, just a lack of time and tile roof mounts to make it a reality. I already have a 3KW system on my roof, I planned to park these ones off the end of those. These are 12V panels, that I was going to use to augment my 12V DC system.

Now hanging panels on your fence is not quite ideal, however it is otherwise wasted real estate, and on the plus side is a darn sight easier to work on, no slip and fall hazards here. Boy do those OHS (Occupation heath Standards) type get touchy when they see someone climb up a ladder, as evidenced by Molly Meldrum's rather public calamity when he fell whilst installing some Christmas lights quite a few years ago. So for many reasons a fence mount is way more convenient – especially if your install is kind of experimental like mine.



These BP panels (Do BP even doo solar anymore) are rated at 20W, so I should get 80W from them, right? Well not exactly, that's with them facing straight into the sun on a cloud free day with the panels not overly heated, any deviation from this and you'll pay the price. Even professionally installed panels on your roof will rarely achieve full output, their mounting angle will never be right, and in the middle of summer when we have the most sun, the panels will be getting quite hot (maybe I should pop a temp sensor on mine – now there is a project) which will reduce their output. In some quick and crude measurements it's currently more like 20W from the whole install – let's just wait for summer surely they'll do better.

To mount them I scrounged two lengths of T rail aluminium extrusion *[photo left]*, into which I slid some stainless-steel coach bolts, these bolts extend just past the face of the panels where a washer and Nylock nut holds them in place. On the ends I had

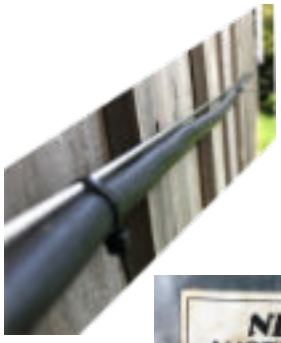
a bit of a problem as a bolt and washer does not like being only supported on one side, so I cut some dummy pieces from some aluminium bar to fill the void. The cable tie is to try end encourage that aluminium piece not to go flying. Yes I could have done better, but it worked on the day. I'm sure if I went to a shop that sells this T-bar, or solar panels I could get some ready-made clips, however I didn't want to walk away and come back another day – I used what I had.

This is another advantage of a readily accessible fence mount, I can just walk up to it anytime and tweak things, I would never have done this if it was going up on the roof.

Initially I screwed some eyelets onto the fence and hung the assembly from them using the nylon rope you can see here, I bit tricky and needing the wife to hold the other end whilst I fiddled with my lack of knot tying prowess. Actually the whole assembly was not that heavy and I mostly just shirt fronted it against the fence, however that tactic started to fall apart when I tried to move to one end to tie the rope – so hence me yelling 'Honey – help'. Later on I ran some counter sunk screws into the fence and slid the T-rail onto them, way more secure.

However this a WAY more safer than my escapades on my brothers colourbond roof with full size panels, it must have been getting a tad late in the arvo as his roof stated getting exceedingly slippery. At one point I had a panel in one hand and my other arm wrapped around the mounting rail. I had to let go of the rail and re-position my hand so I could lower the panel into place, trouble was the rail was really the only thing stopping me from sliding off the edge of the roof – so I went for a lightning quick re-position – it must have been quick enough as I'm here telling the story. (She'll be right mate).

Now for the cabling, I wanted to connect it to my garden shed where my backup batteries are installed. Now it would have been way easier if I had the backside of the fence, I could just run it along the rail – but I didn't, so I either had to run it along the face of the fence, or get out the shovel and run a trench along the fence line, there was no way it could just sit on the ground as it would not last very long when it was time to cut the grass, if my line trimmer didn't get it the mower surely would.



I ran two screws into the fence and ran a length of wire rope between them, then lashed the cable to them, this way all the tension is on the wire rope, not the electrical cable. In my odds and sods I had a roll of genuine NEC 'Solar cable', perfect, that should really enhance the performance, surely….

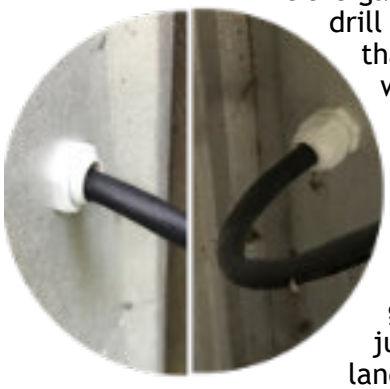
Apart from a good amount of copper it had an exceedingly good outer jacket, obviously designed for outdoor exposure, perfect. Pity it came as two 7 meter lengths, rather than one 14M length.

The other option was garden light cable, when this stuff first came out it was quite good, however looking at a newer length in my garden shed I quickly realised that they had really optimised this stuff for maximum profit as it had been severely downgraded from what my memory of it was. I'd also run this stuff up my radio tower, however this new stuff – now kind of useless. So head off to a solar supplier would be my advice these days.

Normally solar panels are wired in series, bringing the string voltage up to a few hundred volts, usually at a fairly healthy current of 10+ amps, so quite dangerous if you're not careful, especially in a fence install as everything is now quite accessible, especially if you have kids, so use the deigned for it supplies. On my system, series would have given me near 75VDC, enough to give you a surprise, however I've wired all mine in parallel, giving an open circuit voltage of a way safer 18V, but more like 13.5V under load.

With series connected panels you have to be very careful, as DC arcs are easily generated should you break a link whist the system is under load, you need switches rated for this type of work. On my rooftop system the shutdown instructions are to first isolate (turn off, disconnect) the 240V AC connection to the inverter, this reduces the solar DC current to near zero, before flipping the DC isolators. Breaking a 10A AC feed is way easier and safer than a 480V DC line.

When I worked for Telstra we had these kind of large UPS's, they had 200V of lead acid battery in them that was then stepped up to 400V. One day one of the techs slipped with his multimeter probe starting a DC arc, it kept burning as it worked its way along a circuit board destroying everything in its path. So watch out, high power high voltage DC can be really nasty.



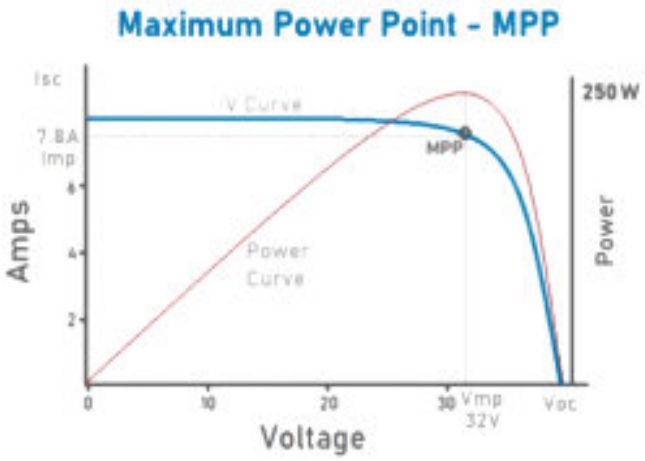
At the garden shed end I used a step drill and fitted a cable gland, not that I needed to keep stray water out of the shed, that cause was lost years ago, no, this is to protect the cable from the sharp edges of the sheet metal it's made of. I prefer to put the larger nut/gland end of the gland inside, as outside it's just asking for something to land on it and snap it off.

In the garden shed I have this old Telstra electrical box, I think it was originally a 50V power supply, however I put it in there ages ago, for possible future projects, well now it's housing an NEC solar regulator. I almost don't need one, probably a diode would be enough as the static DC load mostly exceeds the solar supply, however I have a Lithium Phosphate battery in there and they get upset if taken over 14.8V, so the board will cut off at 14.2V, and also provides that diode isolation mentioned earlier. I have another board made by Solarex that was originally a low voltage cut off and alarm board that I rejigged for high voltage cutoff, almost perfect however no diode, so the old NEC won that race. (Neither are a perfect fit for my usage)

I had a look in Jaycar, they had a few low power regulators, but they were setup for lead acid batteries, as in the cut off too high – so no good for me. They do have a much more elaborate one, processor controlled where you can specify everything, however Its quite a bit more expensive and seems optimised for 20A strings, way above my league.

I did have a 'Maximum powerpoint tracker' regulator from a deceased estate that I was asked to build, I would have loved to give that a spin, but it's nowhere to be found, I must have given it back (they took forever to get back to me, I almost don't remember that bit).

With solar panels there is an optimal load that will get you the most out of a panel, kind of like the coaxial cable you use on your radio, although in that case you know the optimal load, most often its 50 ohms. However with solar panels it shifts about depending on the amount of sun light received. In good sunlight one of my panels gave me a touch over 18V with no load, and near an amp into a short circuit.



Now solar panels are somewhat resistive, so if I draw any current that 18V will drop, so there is no way I could get 18V x 1A, or 18W. It's like that graph here, but obviously that one is for a much bigger panel. Voc for me is 18V and Isc is 1amp. Obviously there is a point in there where one gets the most, as per that red curve. An MPP tracker is usually an elaborate processor controlled switchmode supply that constantly tweaks its parameters and converts that optimal voltage to what you need – usually to charge a battery. Or there is this thing….

Maybe I should just order one of these from AliExpress. Certainly cheap enough.

~ Paul VK3TGX

13 Colonies Special Event July 1 – 7

One of the most popular summer operating events kicks off its 17th year. The event has grown from Special Event Stations making approximately 12,000 contacts to last year making 292,496 contacts around the world. The Event runs from July 1st, 9:00 AM -July 7 Midnight Eastern (July 1 – 1300 UTC > July 8 – 0400 UTC).

Event founder Ken Villone KU2US, is passing the torch on to Tony Jones N4ATJ. For the past 16 years Villone has lead the Event by working with state and bonus station coordinators. Then after the event he would print out individual certificates for thousands of people who made contact with the special event stations.

The Special Event consist of one station operating in each of the 13 Colonies (K2A – K2M) and three bonus stations (WM3PEN – Philadelphia, GB13COL – England, TM13COL – France) each representing their city, state, or countries role in America's Colonial period.

Villone describes how the event got started: "I had just finished participating in the ARRL Sweepstakes in 2008, and remarked how fun it was. I could not figure out why there were not more of these type special events on the air? So I decided to try my luck and create one for one year only to see what happens and to have some fun. I knew we had to offer a special QSL card and/or certificate plus have on hand a printer and supplies. The hard part was deciding what the event would commemorate and when to do this. I needed a theme that ALL could relate to! Also the event would have to be the type with multiple event stations involved, like the ARRL Sweeps.

Then it hit me! 13 Colonies states, during the 4th of July week and offer a certificate with the theme for the year. I made sure the theme was different each year with a different certificate design, to make it interesting and to also make them collectible. The theme would highlight some event or thing connected to the American Revolution. I had a hard time getting 13 different Ops, one from each Colony state but it worked out. It was a success! We did over 12,000 contacts the first year. We did over 32,000 contacts in 2010, and had 26 state operators total. There was a 13 Colonies special event in 1962 but only lasted one year, according to my research (I was 13 years old)."

Ham Radio operators and SWLs can participate in the event. Complete information about the call for each colony station and the bonus stations can be found on the event website 13colonies.us and they can follow us on Facebook – 13 Colonies Special Event Community. Stations need only make one contact with one of the participating stations or they can go for a Clean Sweep and work all 13 Colony stations and the 3 bonus stations. Each station offers a special QSL card for the event as well as a different certificate each year. Operators can keep an eye out for the special event stations can keep an eye out for them by watching many of the dx spotting networks such as DXSummit.fi.

The Heroic Hack That Saved Voyager 1

The first interstellar software update

based on a video by SCOTT MANLEY

Aging spacecraft starts up a radio transmitter it hasn't used since 1981 from 15 billion miles away

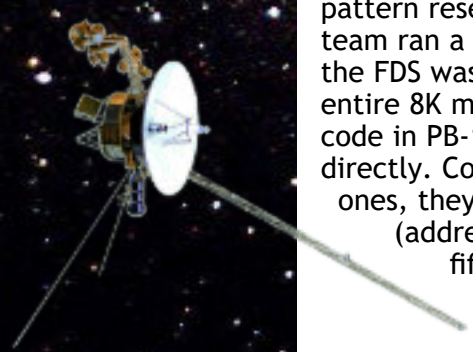
Now that's QRP DX!

In the vast emptiness of interstellar space, 22.5 light-hours from Earth, NASA's Voyager 1 spacecraft faced a crisis in November 2023 that threatened to silence humanity's farthest-reaching explorer. Launched in 1977, Voyager 1 has been a cornerstone of space exploration, delivering groundbreaking discoveries from Jupiter's volcanic moon Io to Neptune's cryovolcanic Triton. By 2023, it was the most distant human-made object, faithfully transmitting a trickle of data at 160 bits per second from beyond the heliopause, where the solar wind meets the interstellar medium. But when its signal turned to incomprehensible noise, a small team of engineers at NASA's Jet Propulsion Laboratory (JPL) embarked on an extraordinary mission to save it—a feat that culminated in the first interstellar software update.

Voyager 1's journey began in an era of bell-bottoms and mainframe computers, carrying 1970s technology to the stars. Its three computer systems—the Computer Command System (CCS), Attitude and Articulation Control System (AACS), and Flight Data Subsystem (FDS)—were built with redundancy, including duplicate processors and memories. By 2023, dwindling power from its radioisotope thermoelectric generators forced the spacecraft to run on single-string systems, with only a magnetometer, plasma wave subsystem, and low-energy charged particle instrument still active. The Flight Data System (FDS), responsible for formatting and transmitting data, was the linchpin of communication. Unlike its counterparts, it used cutting-edge (for the 1970s) dynamic RAM—8,192 words of 16-bit memory across 512 chips—hardwired to the power source to avoid catastrophic data loss.

When Voyager 1's telemetry stream turned to gibberish in November 2023, JPL's veteran engineers faced a daunting challenge. The signal was present, modulated correctly, with periodic changes indicating the AACS was keeping the antenna pointed at Earth. But the data

The Voyager 1 spacecraft communicates with Earth using the X-band radio transmission mode, at a frequency of around 8.4 GHz for downlink and 2.3 GHz for uplink. The communication system employs binary phase-shift keying (BPSK) modulation to encode data, transmitted through the spacecraft's 3.7-meter high-gain antenna. The Deep Space Network (DSN) antennas on Earth, managed by NASA, receive these signals. Due to the extreme distance (over 24 billion kilometers as of 2025), the signal is extremely weak, requiring highly sensitive receivers and error-correction coding, such as Reed-Solomon and convolutional coding, to ensure reliable data transmission at low bit rates, currently around 160 bits per second.



lacked synchronization markers, rendering it unreadable. With the spacecraft 45 light-hours round-trip away, each command took two days to yield a response, and opportunities to uplink commands were limited to once a week. The team's initial attempts—resetting components in hopes of a simple fix—yielded no results. The problem pointed to the FDS, the only Voyager-specific computer, about which little documentation remained. Tribal knowledge had faded, and tools from the 1970s were obsolete, leaving engineers to sift through digitized reports and memos.

The team hypothesized a memory corruption in the FDS, which used volatile semiconductor memory prone to failure. A prior incident in 1981 had already disabled one memory bank, leaving Voyager 1 with no redundancy. To diagnose the issue, engineers developed a fault tree, sending cautious commands to avoid further damage. After three months of painstaking weekly tests, they tried cycling through the FDS's 30 operational modes—each designed for tasks like general science (GS), imaging (IM), or playback (PB)—using a risky, never-before-used "poke" command to directly write values into memory. This bypassed the normal mode-switching routine, which was likely stuck due to corrupted memory.

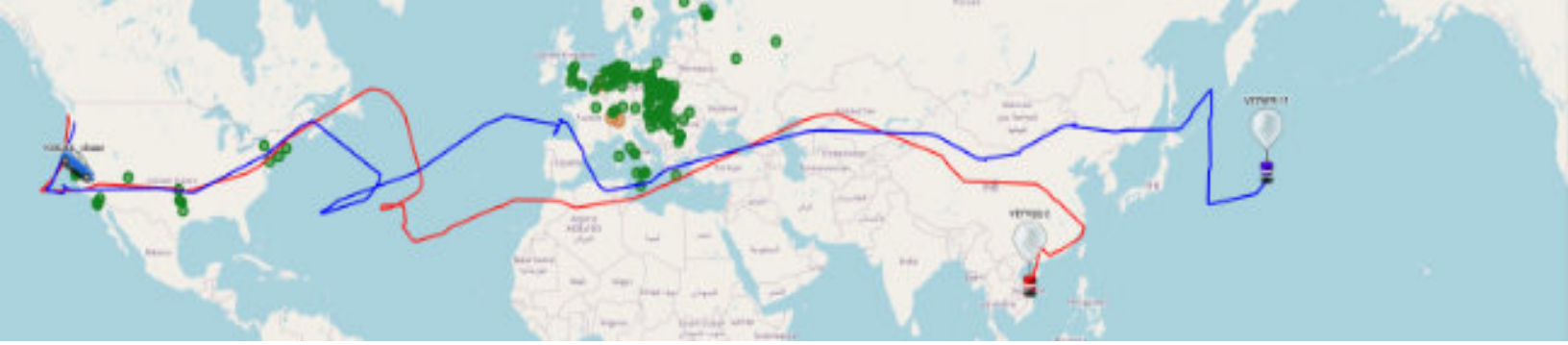
On a Sunday, after a weekend of waiting, a breakthrough emerged. In PB-15 mode (playback), the signal changed, and an RF expert analyzing raw data noticed a pattern resembling a memory dump. The team ran a longer test, confirming that the FDS was sequentially dumping its entire 8K memory—likely due to broken code in PB-15 mode reading memory directly. Comparing this dump to earlier ones, they pinpointed a 256-word block (addresses 1400 to 14FF) where the fifth bit was stuck high, corrupting half the locations. This defective memory chip or its connections disrupted every telemetry mode, causing the communication failure.

Fixing the issue required rewriting the FDS code to avoid the corrupted memory—a Herculean task without modern tools, emulators, or even working hardware replicas. The team found a "min Simrock" routine in an old, OCR-scanned memo—a basic telemetry program they manually disassembled and verified. Using the poke command, they uploaded this "Hello World" equivalent, word by word, and on April 18, 2024, Voyager 1 responded, restoring basic communication after five months of silence.

The final challenge was relocating the corrupted code to uncorrupted memory. With no free contiguous 256-word block in the upper memory bank, the team sacrificed the EH-12 (engineering high-rate) mode, which was less critical as low-rate EL-40 sufficed for troubleshooting. They meticulously split and relocated code, updating jump instructions to maintain timing within the FDS's 2.5-millisecond interrupt cycles. Each change was hand-checked, as a single error could doom the spacecraft. On April 20, 2024, the EL-40 mode was restored, followed by science and playback modes by July, fully reviving Voyager 1's functionality.

This interstellar hack, executed 15 billion miles away, was a testament to human ingenuity. Voyager 1, now nearly 50 years old, continues its journey, powered by a fading energy source but sustained by a dedicated team. With no planned interstellar probes to replace it, Voyager 1's data remains unique, a whisper from the cosmos kept alive through engineering heroics. As it drifts further, approaching a 2030 power limit, the spacecraft carries humanity's curiosity into the stars, a pale blue dot's enduring legacy.

~ Scott's video is at https://youtu.be/p0K7u3B_8rY



Update on the VE7NFR Pico Balloon

information from ADRIAN STIMPSON VE7NZ

June 5, 2025 - Good morning from mission control (well, my upstairs home office). We survived the first 24 hours which is a big milestone as about a third of our flights have not done so.

We got our first data packet at 9:40 Pacific time as the Sun rose just high enough off the north coast of California to drive the solar panels. We are floating at a steady altitude around 13,100 metres which is a very stable place to be and nicely above risk of clouds/rain which should not be seen above 13,100 metres.

Because we need fairly strong and high-angle sunshine to transmit, we only expect to see reports roughly four hours after sunrise until four hours before sunset at the balloon's then-current location.Reports should update every ten minutes.

We had some problems with data reporting between the various tracking sites. We think we have fixed this and the best site is: https://bit.ly/3FQ5MlH, but if it is not updating, you can go to: https://traquito.github.io/search/spots/dashboard/?band=20m&channel=536&callsign=VE7NFR&dtGte=2025-05-22. If you want to see a map of where the 27mW signal has been received in the last hour, this is a good link: https://bit.ly/4kDzZUj. If you want to also watch the race between our balloon and the Comox team's VE7YQQ-2, launched just 55 minutes earlier, you can see both balloons at this link: https://bit.ly/3ZSSMTc.

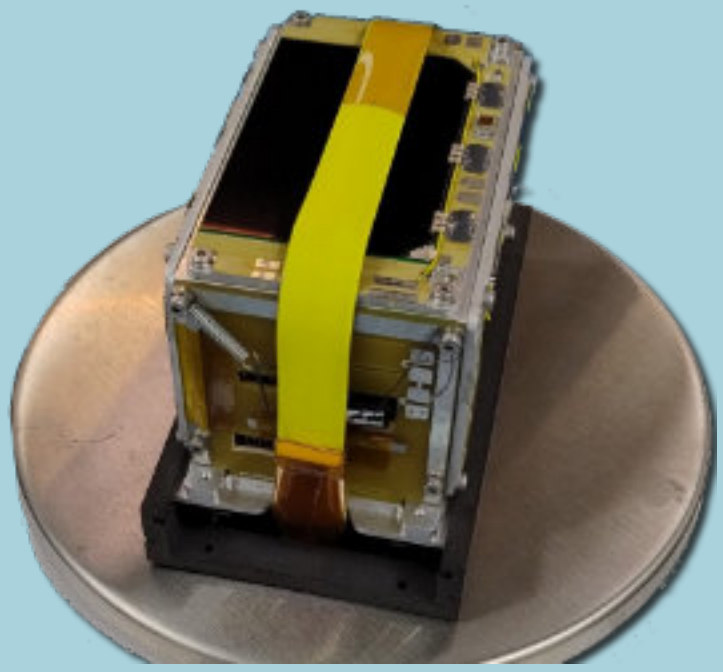
The photo is Scott VA7SL at the launch site and a photo of the tracker on the ground. Note how thin the magnet wire 20m dipole is in the grass on the left hand side - almost impossible to see at launch time and much care is taken to avoid anyone stepping on it!

The screen grab along the top of the page is at 38.85417, 165.79167, off the East coast of Japan, and a third of the way home across the Pacific Ocean, the latest location of VE7NFR-11 and VE7YQQ-2 before The Communicator publication date. Stay tuned… perhaps she will make it home!

~

AMSAT Designates SO-125

New FM Repeater Satellite



June 4, 2025

At the request of AMSAT-EA, AMSAT has officially designated HADES-ICM as SO-125 (Spain-OSCAR 125). The satellite has been cataloged with NORAD ID 63492.

HADES-ICM, a 1.5U PocketQube satellite equipped with an SDR-based FM and digital repeater for amateur radio use, was successfully launched aboard a SpaceX Falcon 9 rocket during the Transporter-13 mission from Vandenberg Space Force Base, California.

Following its deployment from the ION-SCV-017 Orbital Transfer Vehicle (OTV) on March 31, the satellite has been undergoing commissioning and testing. The FM repeater has now been activated, operating on weekends before transitioning to full-time (24/7) operation—mirroring the operational model of AMSAT-EA's earlier HADES-R mission.

HADES-ICM features an improved SDR-based repeater capable of transmitting up to 0.25W when battery conditions permit, making it accessible to stations using handheld antennas like the Arrow antenna. The coordinated frequencies are:

- Uplink: 145.875 MHz
- Downlink: 436.666 MHz

The repeater operates with an open squelch and does not require a sub-tone, simplifying access for amateur radio operators.

University of Manchester Experiment

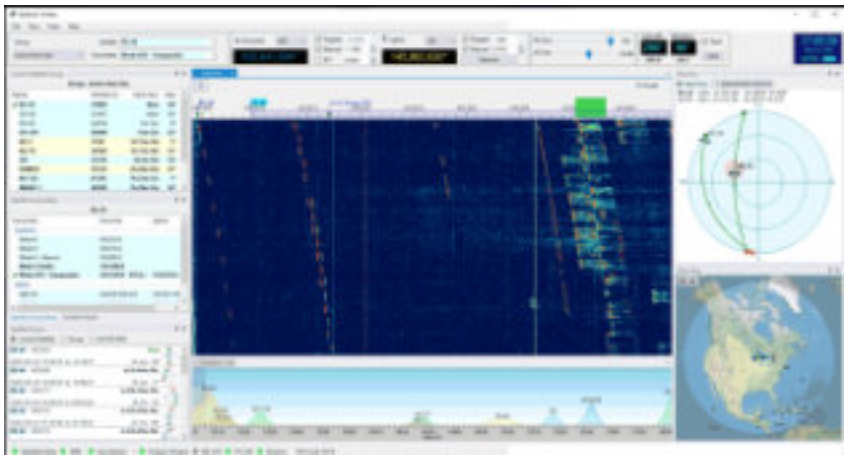
In addition to its primary repeater function, HADES-ICM carries an experimental payload from the University of Manchester's Smart IRGraphene Engineering Innovation Centre (GEIC). This experiment tests a very low-power active radiator under space conditions, with telemetry data made publicly available.

AMSAT congratulates AMSAT-EA on this successful mission and extends gratitude for their ongoing contributions to the amateur satellite community.

~

SkyRoof: New Amateur Satellite Tracking Software

Alex VE3NEA releases a new Windows program

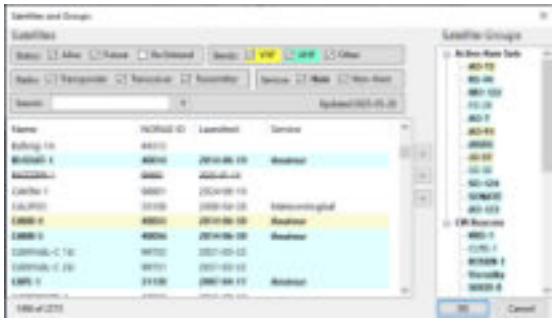


SkyRoof is an open source, 64-bit Windows application for Hams and satellite enthusiasts. The components in the window may be resized, reorganized, maximized or minimized.

While still in beta, the software can provide detailed information about all ham satellites, tracking them in real time, and provide pass prediction. It also shows a skymap and SDR waterfall display.

It combines satellite tracking and SDR functions in one program, which opens some interesting possibilities. For example, all satellite traces on the waterfall are labeled with satellite names, the boundaries of the transponder segments follow the Doppler shift, and all frequency tuning is done visually, with a mouse.

The Satellites and Groups window has many commands to filter and search satellites, to rename them, and to view detailed information about the satellites and their transmitters.



The receiver software supports demodulation of SSB/CW/FM, and it automatically compensates for Doppler. It can also interface with antenna rotators that support hamlib.

SkyRoof was designed by the author for his iCOM IC-9700, which is fully CAT interface supported. Other transceivers are being added as the program is developed, but uses the freeware rigctld.exe, a HamLib-based CAT control daemon, to control compatible transceivers. The arguments on the command line must be tailored for your specific radio and COM port settings.

SkyRoof can make voice announcements of the the satellite AOS events. Up to two announcements per event may be enabled.

To install SkyRoof, download the installer from the Download page, run it, and follow the on-screen instructions. The author has created a manual, available at https://ve3nea.github.io/SkyRoof/users_guide/skyroof_users_guide.pdf and there is a video at: https://www.youtube.com/watch?v=_Z6qOl1OfbQ

I've installed the software and interfaced it to my IC-9700. It looks fabulous and is easy to use. I'm looking forward to installing it for my Kenwood D-710GA and to further developments.

CQ: International Dog & Cat Days Special Event

by CARYN EVE MURRAY KD2GUT

When a group of radio operators begin calling "CQ International Dog Day" in August, they're not just looking for QSOs.

They are in search of people who have room in their hearts to help the abandoned, abused and homeless dogs around the world in whatever way they can. These dozen or so special event operators know the power of rescue because they've been deeply involved in it themselves: Hanz YL3JD and his wife opened their home – first in Holland, later in Latvia – and have given needy dogs a second chance at a new family. In Australia, and later in Germany, Ed DD5LP and his wife discovered – several times – that their household was incomplete without canine company. Many of the other operators' rescued dogs were adopted after hard lives on the street; others were at the pound, hours away from being euthanized.

International Dog Day (and in the US, National Dog Day) is August 26 every year. The tradition was created by US pet advocate Colleen Paige as a day to recognize the needs of society's unwanted and cast-off dogs and affirm the commitment to adopt, donate or raise awareness of their special needs.

Hanz amplified the original message by adding an amateur radio component in 2022, taking the special-event callsign YL1DOG and operating as a single station. The following year he was joined by Chris, G5VZ, and David, G4YVM, in the UK. By 2024, a team of eight US rescue-dog advocates, operating as K2D, had come on board. This year is the biggest yet, as hams in Germany and other countries run with the pack. All operators will be looking to hear from dog-lovers and supporters in either CW or SSB on HF, on VHF/UHF simplex, or via DMR and Echolink.

The international team has added incentive certificates, including special endorsements such as "Full Kennel," the equivalent of a clean sweep. Their website, dogdayradio.org, is updated regularly with the operators' special-event callsigns, their operating schedules, a chance to meet the dogs who inspired them and hear their stories.

In case you are wondering where the cats are – well, they're running ahead of the dogs! International Cat Day will be operating as a separate event, two weeks before the Dog Day operators get on the air – and they will be carrying a similar message for cat-rescue awareness. See catdayradio.org for details.

For live updates of both events, to search for the different callsigns, to see the operators' schedules or to apply for and download award certificates visit these links when they become available:

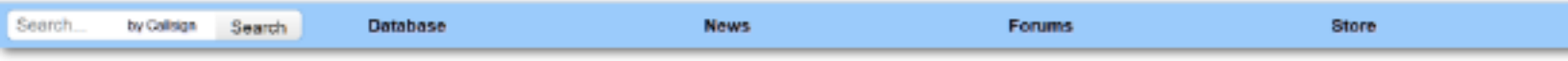
https://hamlog.online/icd

https://hamlog.online/idd

Meanwhile, be aware that all special-event operators will be working like dogs – and why not? – because they want to hear and share as many rescue stories as they can.

~ Caryn Eve Murray KD2GUT
United States Team Leader for K2D

A Comprehensive Guide to



Crafting an Engaging Biography Tab

The website QRZ.com stands as the premier platform for amateur radio operators to showcase their stations, share their stories, and connect with a global community of hams. A well-crafted QRZ page serves as a digital calling card, offering a glimpse into your setup and personality that enhances engagement during QSOs (radio contacts). Drawing from the insightful guide by Oscar M7OJA at https://m7oja.com/improving-qrz-page, this article explores how to elevate your QRZ.com page through strategic formatting, compelling content, and the integration of external tools via embeds. Whether you're a veteran operator or a newly licensed enthusiast, this guide provides a roadmap to create a professional, engaging, and functional QRZ page that resonates with visitors.

Setting Up Your QRZ Account

Before optimizing your page, ensure you have a QRZ.com account and have claimed your callsign. For those new to the platform, M7OJA references a helpful resource titled "After Receiving Your Callsign," which outlines the initial setup process. Once your account is active, you gain access to several tabs that form the backbone of your profile. The Detail tab displays critical station information, such as your Maidenhead Gridsquare, address, and coordinates. The Biography tab offers a customizable HTML canvas for sharing your story and embedding dynamic content. Additional tabs, like the Web tab for visitor messages and the Logbook tab for QSO records, provide further opportunities to engage with the community. This guide focuses on enhancing the Detail and Biography tabs to maximize your page's impact.

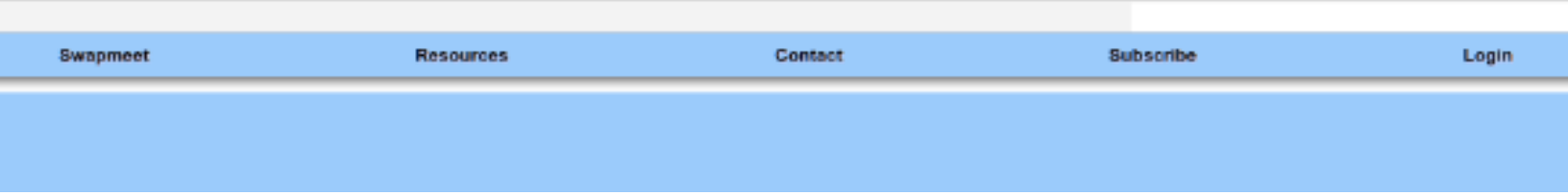
Optimizing the Detail Tab

The Detail tab is the first stop for operators looking up your callsign, making it essential to provide accurate and relevant information. A key component is your Maidenhead Gridsquare, a standardized system that pinpoints your geographic location with four or six characters (e.g., IO94HT for M7OJA). Including this detail helps operators determine your position for directional communication or award tracking, such as Worked All Grids. To add your Gridsquare, navigate to the Edit tab, select Edit [your callsign], and access the Map, Grid Square, and Coordinate Settings. Enter your Gridsquare, which you can calculate using an online tool linked in M7OJA's guide if you're unsure of your code. For added precision, include your latitude and longitude coordinates. Saving these changes ensures your location is readily available to visitors.

Beyond the Gridsquare, consider adding your city and country to provide context without compromising privacy. While a full address isn't necessary, this information aids operators participating in contests or seeking QSL card exchanges. Updating these details is straightforward through the Edit tab's address settings, allowing you to strike a balance between transparency and security. A complete Detail tab sets a professional tone and makes your page a reliable resource for the amateur radio community.

The Biography tab is where your QRZ page comes to life, offering a blank HTML canvas to share your amateur radio journey. This section allows you to weave a narrative about your station, interests, and achievements, making it

Formatting, Content, and Embedding



a powerful tool to connect with other operators. Oscar Acton M7OJA emphasizes that a well-structured biography not only informs but also engages visitors, particularly during QSOs when operators check your page for context. Oscar has written a detail;ed explanation on his website, but here is an overview.

To edit your profile tab, hover over your callsign in the QRZ taskbar, select Edit [your callsign], and choose add or edit your biography text, fonts, etc. The WYSIWYG editor simplifies text and image additions, while switching to HTML view via the source button unlocks advanced customization, such as embedding external tools.

Your biography should introduce your station and share what drew you to amateur radio. Perhaps you were inspired by a mentor, a memorable DX contact, or the thrill of building your first antenna. Highlighting your favorite operating modes (e.g., SSB, CW, FT8), bands (e.g., 20m, 40m), and activities (e.g., DXing, POTA, contests) helps others understand your interests and fosters connections during relevant events. Equally important is describing your station setup, including your transceiver, antenna, and power output. For example, M7OJA's page for GB3RS includes a photo of the shack, which adds a visual dimension that captivates visitors. A high-quality image of your setup, optimized for web loading (under 1MB), can make your page more relatable and engaging.

Formatting plays a critical role in ensuring your biography is easy to read and visually appealing. Use headings and subheadings to organize content into clear sections, such as "About Me," "My Station," and "Achievements." While bullet points can summarize key details, prioritize descriptive paragraphs to maintain a narrative flow. A Reddit discussion on QRZ pages cautions against overly long biographies, suggesting that concise, high-quality content is more effective than exhaustive lists. Regularly updating your biography to reflect changes in your station or activities keeps your page fresh and relevant.

Embedding External Tools for Enhanced Functionality

The ability to embed external content in the Biography tab transforms your QRZ page into a dynamic resource. By integrating tools like live DX cluster spots, log searches, or award statistics, you provide real-time value to visitors. M7OJA's guide details how to add embeds by switching to HTML mode in the Biography editor, copying the embed code from the external service, and pasting it into your page. Some services, like Club Log or POTA, require account setup, so ensure you've enabled the necessary features before embedding. Modifying the code to include your callsign and adjusting parameters like height or width ensures a seamless fit within your page's layout.

One standout embed is Club Log's "Last 10 QSOs" feature, which displays a table of your most recent contacts. To implement this, enable the feature in your Club Log settings, copy the provided iframe code (e.g., *<iframe src="https://clublog.org/last10_iframe.php?call=[your_callsign]&limit=50" ...>*), and paste it into your Biography. This embed allows operators to verify QSOs or track your activity, enhancing your page's utility. Similarly, embedding POTA statistics showcases your activation or hunting achievements, encouraging others to hunt your signals during park operations. A live DX cluster feed, sourced

from services like DXSummit, displays real-time spots for your callsign, boosting visibility during contests or DXpeditions. Log search tools, available through Club Log or QRZ's Logbook API, enable visitors to query your QSOs directly, streamlining confirmation processes.

When adding embeds, test them in preview mode to ensure they render correctly. Overloading your page with too many embeds can slow load times or overwhelm visitors, so select 2–3 high-impact tools that align with your goals. Always verify that your embeds comply with QRZ's content guidelines, which prohibit inappropriate or malicious content. By strategically integrating embeds, you create a page that's both informative and interactive, setting it apart from static profiles.

Advanced Strategies for a Standout QRZ Page

To elevate your QRZ page further, draw inspiration from community feedback and best practices. Highlighting awards like DXCC, Worked All States, or POTA milestones adds credibility and showcases your accomplishments. A visually appealing table or badge can make these achievements pop. Including additional images—such as your antenna setup, QSL cards, or field operations—adds depth to your page. A Reddit user praised pages with unique visuals, like climbing photos for tower setups, noting that "people love stuff from up high." While impressive equipment is a draw, a modest station presented with clarity and enthusiasm can be equally compelling.

Engage your audience by enabling the Web tab, where visitors can leave messages. Responding to these fosters connections and builds your reputation within the community. Regularly updating your page ensures it reflects your current setup and activities, maintaining relevance. Above all, adhere to QRZ's "G-rated" content policy, avoiding prohibited material like profanity or spam while ensuring embeds and links enhance the user experience without clutter.

Learning from the Community

A Reddit thread on notable QRZ pages underscores the value of thoughtful presentation. One user highlighted KC4NX's page for its meticulous documentation of equipment and setup, proving that attention to detail can make even a simple station stand out. The community emphasized that a well-organized, visually appealing page, regardless of budget, resonates more than a cluttered or overly technical one. By balancing narrative, visuals, and functionality, you create a page that invites exploration and connection.

A thoughtfully designed QRZ.com page is a powerful tool for sharing your amateur radio journey and connecting with the global ham community. By optimizing your Detail tab with essential information like your Maidenhead Gridsquare, crafting a compelling Biography with a mix of narrative, images, and embeds, and adhering to best practices for formatting and content, you can create a page that stands out. M7OJA's guide at https://m7oja.com/improving-qrz-page offers a solid foundation, and many suggestions, while community insights remind us that and personality are key. Experiment with embeds, keep your content fresh, and engage with visitors to make your QRZ page a true reflection of your passion for ham radio. Happy operating!

~ QRZ

An Improved Tank Circuit

EFHW coupler

by JOHN CORBY VA3KOT

About a month ago Ham Radio Outside the Box posted about “a third way” to match the high impedance at the feedpoint of an End-Fed Half-Wave antenna. A link to the original article is at the bottom of this post. A “30-minute special” was built to prove the concept actually works. It did work fine business (as we say on-air), but that initial implementation had a serious limitation – it was limited to a single band due to the use of a fixed capacitance (a trimmed short length of coax). How could we adapt the basic design to cover multiple bands? Read on to hear about a new improved EFHW coupler that does indeed cover multiple bands.

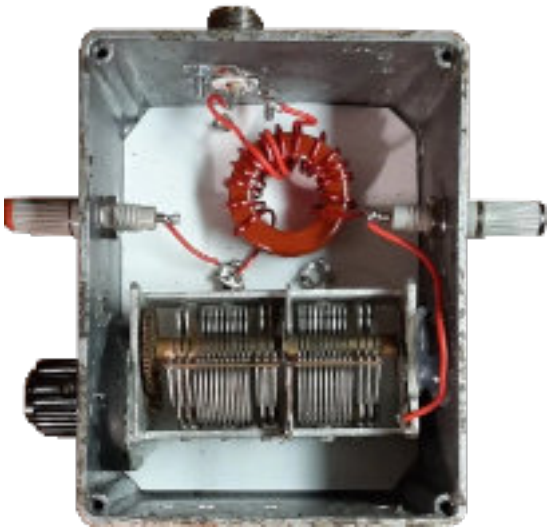
A QRO(p) coupler

Searching through the vaults containing a vast reserve of assorted electronic components at Ham Radio Outside the Box laboratories (my basement) I unearthed an air-spaced variable capacitor. These now rare items were common in the days of TRF (Tuned Radio Frequency) receivers. For a long time now Superheterodyne circuits have seen the gradual demise of air-spaced variable capacitors.

What’s behind the big knob?

When you look a radio in the face you will usually see that one of the knobs is larger than the rest. That would be what we used to call the “Tuning” knob; nowadays it is more likely to be labeled “VFO”. That would be our first clue as to whether the component behind the front panel is an air-spaced variable

John Corby VA3KOT resides in Owen Sound, Ontario but is more often found operating CW out in the "Big Blue Sky Shack". He especially enjoys activating parks for the POTA program and blogging about his experiences at HamRadioOutsidetheBox.wordpress.com



capacitor or one of those new-fangled devices called a “Rotary Encoder”. If you turn the knob until you hit an end stop it is a variable capacitor; if it turns freely it is a rotary encoder. For somebody like myself who first gained an interest in radio when capacitors were called “condensers” that is important and useful when deciding whether to purchase an old radio at a yard sale with a view to scavenging its parts.

The component I found in the underground vaults is an even rarer device – it has a slow-motion gear drive. That is a valuable feature when tuning a high-Q tank circuit. I re-used the T200-2 powdered iron core and coil windings from the original single-band coupler. Consumer grade AM radio sets often used a thin cord stretched around an elaborate system of pulleys to achieve the same fine adjustment in tuning, but a mechanical gear system is more robust and reliable

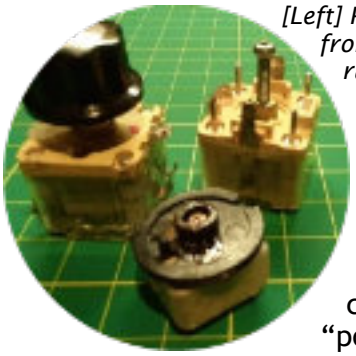
The capacitance range of the “tuning condenser” was measured using my “Almost All Digital Electronics L/C Meter IIB” and those values, along with the fixed value of the toroidal inductor, were plugged into a LibreOffice spreadsheet to find the range of resonant frequencies available with this coupler. My target was 20m, 30m and 40m – the bands I use most frequently. Good luck struck again, my junque box variable capacitor was able to cover those three bands so I got to work building the new coupler.

Construction

There are only two main components – an inductor and a variable capacitor so putting the coupler together didn’t take very long. For expedience I re-used an old Hammond aluminum enclosure from a long forgotten project. I would have preferred a plastic enclosure but I didn’t have a suitable plastic box available. Now that the device has been proven to work I plan to purchase a domestic electrical box from the hardware store. Hammond aluminum project boxes are sturdy and well made, but they have what I perceive to be a design flaw – sloping walls – which makes them unsuitable for projects like this one. Another consideration is that the kind of variable capacitor employed in this project should be electrically isolated from its enclosure because the body of the capacitor is connected to its static plates. We want to prevent stray capacitance or unwanted conductive paths.

This project was built for my “QROp” rig which is a Yaesu FT-891 capable of 100 watts but which I rarely use above 20 watts. I have even used it as a QRP rig by dialing the HF Power setting down to 5 watts. The disadvantage of operating the FT-891 as a QRP rig is the high current consumption. There is very little practical difference in signal strength between 5 watts and 20 watts, but 20 watts might just edge my signal above the noise during poor band conditions. So I am now working on a QRP version.

Working QRP usually involves lightweight station equipment although that isn’t always the case – refer to my post: “My radio is tiny. So why is my POTA backpack so heavy?“. No matter how small your transceiver is, all the ancillary equipment (like a chair, drinking water etc) adds weight to your pack. Lightweight radio gear doesn’t really allow use of heavy variable capacitors. A QRP version of this coupler will replace the heavy, bulky, air-spaced variable capacitor with polyvaricons which are very small and very lightweight.



[Left] Polyvaricons scavenged from secondhand AM/FM radios.

Incidentally, why are these miniature variable capacitors called "polyvaricons"? Is the name a contraction of "polymer variable condenser"? Condenser? Surely that should be "polyvaricaps". Now this old codger feels at home!

Tip: Polyvaricons are available from various QRP parts suppliers but there is another source that is very convenient and cheaper. I went to a local charity shop recently and bought a couple of budget AM/FM radios for pocket change. The checkout clerk told me I had 7 days to check that the radios actually work and I could return them if they didn't.

I replied that I guarantee they won't work in about an hour from now as I am going to tear them apart to use their components!

Polyvaricons usually have several sets of plates some of which are high capacitance and some are low capacitance. To make fine adjustments of the capacitance in a QRP version of this project I plan to exploit this feature. Combined with replacing a bulky SO-239 with BNC connectors, all in a small lightweight plastic project box should reduce the size and weight and make a QRP version suitable for backpacking.

Why not use an L-match?

I believe an L-match, discussed in previous posts, is a more efficient coupler for End-Fed Half-Wave antennas. Unlike the tuned tank circuit design, an L-match does not involve the use of a transformer which introduces potential losses. So why have I gone ahead with a tuned tank circuit coupler instead?

I have corresponded with readers who use L-matches as couplers for EFHW antennas. One thing stands out about L-match couplers – each band requires a separate coupler with a fixed capacitance and fixed inductance. This is not conducive to rapid band changes in the field. An alternative is an L-match tuner employing a variable capacitor and variable inductor. I have built one of these but I am of the opinion that this introduces potential losses due to the switched inductance. Even a variable capacitance introduces the potential for losses because of the way contact is made with the moving vanes.

There is a way to configure variable capacitors to overcome this problem. Builders of small magnetic loops often employ it because even a tiny ohmic resistance can impact loop efficiency. In regard to inductance changes, perhaps plug-in inductors could be used just like in the old days when capacitors were condensers.

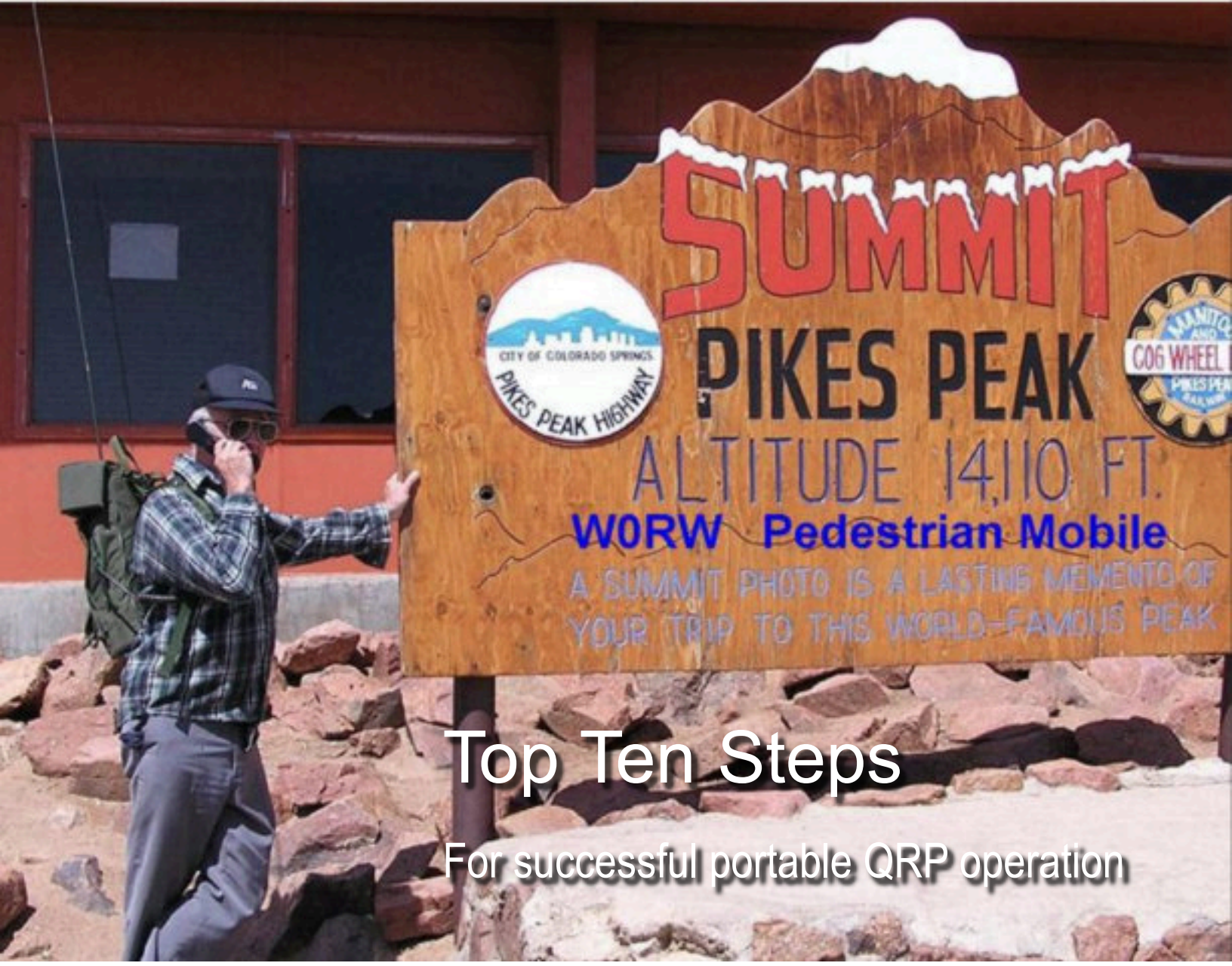
This whole series of posts here on Ham Radio Outside the Box documents the pursuit of a highly efficient replacement for the broadband impedance transformer commonly used with EFHW antennas. What is your opinion? I invite your comments on this topic.

Re-read the original post:

Matching an EFHW antenna – a third way

There is no doubt about the popularity of the End-Fed Half-Wave antenna. It is used by a very large number of hams, especially during portable operations like POTA, SOTA, WWFF etc. Why is it so popular? The principal reason seems to be ease of deployment. The EFHW requires only a single support and can even… *Continue reading*

~ John VA7KOT



Top Ten Steps

For successful portable QRP operation

by PAUL SIGNORELLI W0RW

1. Propagation and Band Activity.

When you operate QRP portable you want to work as many people as possible so the band conditions must be good. This means that you have to keep track of the propagation conditions before planning an operation. I check the DX Cluster or RBN's for activity.Before I pick a date to operate, I monitor the bands at the same time that I plan to operate.

The Absorption Index is also a key factor, I never operate when the "A" Index is above 10, Which is probably most of the time these days. Radio stations 'Trenton Military' (15034 kHz) or 'CHU' (14670 kHz) for 20-meter propagation checks are good for real time propagation.

Coastal stations might use WWV/WWVH.20 meters is best for daytime country wide propagation.40 and 80 meters are good for nighttime operation.

I always try to avoid contests and other busy periods. Checking the QST Contest Calendar helps to ensure the band is going to be clear.

Check your desired frequency in advance, you don't want to pick a frequency that is used for nets, traffic handling or RTTY.

2. Weather Conditions.

The weather forecasting is really good these days, so this is easy.Try http://www.wunderground.com/. I look for warm temperatures and no wind. Check your local web cam. Even Pikes Peak has a weather station and a Panoramic HD web cam.

See http://www.springsgov.com/units/pikespeak/index.asp

3. Honey Do Items.

Always check the XYL's honey doo list and make sure you are clear for the day and have a happy home coming.

4. Location and Road Conditions.

National Parks or State Parks are great places to operate from: http://www.nps.gov/findapark/index.htm, If you are an Old Timer you can get a lifetime Pass.

Always check the road and site conditions before going out in the field. You don't want to drive hundreds of miles to find out that the Capulin Volcano road is closed by snow. Canyon roads can have snow or land slides. Even Pikes Peak can be closed or have a delayed opening and prevent you from getting to your desired operating location on time.

Pick an open space operating site, canyons are not good for QRP operating. You might need trees for hanging an antenna or if you are going to operate Pedestrian Mobile with a whip you will want to find trails that don't have a lot of over hanging, antenna eating branches.

5. Equipment Readiness.

You need to check out your equipment right before you head out to your operating site.This prevents leaving behind some critical item. Needless to say, you should have your antenna all pre-tuned before you leave.

My radio is always mounted to a backpack and is always ready to go. The Li-Ion battery is always charged but I always take a spare. I just need to put the backpack into the car, with the antenna and counterpoise.

The accessories are also checked: microphone, earphones, key, SWR meter, pen, log, watch, hat, gloves, coat, etc.

Make an equipment checklist.

It is good to have a spare accessory batteries (9V), a spare radio and duct tape for contingencies.

6. Vittles.

I take water, lunch and my VHF HT in a fanny pack.

7. Operating Announcements.

I try to post my operations on the reflectors a day before the operation. When you post too far in advance, people forget and when you post right before the operation, some people don't get the notice until after you are finished.

I always try to be on my exact posted frequency (or alternate) at the exact time so people don't get stood up. QRPspots, HFnow, QRP-L, qrpARCI, SOTA Spots are good places to list your operation, as appropriate.

Posting your operating times gives you more Q's. It is no fun running your battery down calling CQ with no responses.

Post your schedule in GMT (Universal Time/Zulu time) as well as your local time.

Also post details about your operating location, links to pictures, trail maps, QSL information, will be helpful, etc.

8. Prep Your Vehicle.

Put gas in your tank!

9. Initial set up.

When I arrive at my operating site, I set up my rig, attach the antenna, and check power and my operating frequency.

When operating Pedestrian Mobile, I tune my whip and dragwire, put on my backpack and I am ready for the trail.

10.Safety.

Always be prepared for adverse conditions.You might need rain gear, snake proof boots, etc.

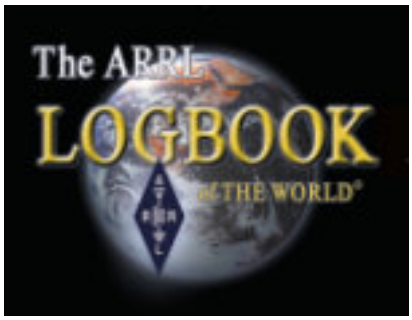
Always give someone your travel plans. Take your cell phone or an HT that will hit a repeater.

For more detailed Pedestrian Mobile information get WA3WSJ's Amateur Radio Pedestrian Mobile Radio Handbook.

See http://www.lulu.com/product/paperback/amateur-radio-pedestrian-mobile_handbook/16364181, or Amateur Radio And The Great Outdoors, by Edward Breneiser

~ Paul W0RW

ARRL Announces Logbook of The World® Systems Upgrade



ARRL's Logbook of The World® (LoTW®) is the 2nd most popular benefit among members. It is also an extremely popular service internationally for non-members, as it is the primary means for providing confirmations for ARRL Awards, such as DXCC and Worked All States.

As a part of the ongoing modernization of the ARRL systems infrastructure, LoTW will be receiving major upgrades to the operating system it is running on, the relational database system it uses to store and access logbook and awards data, and server hosting, where it will be fully migrated to the cloud. These changes will, among other improvements, ensure LoTW performance needs can be better met based on user demand.

~ ARRL

The RSGB Looks at Morse Code

Morse code, a method of encoding text characters into sequences of dots and dashes, was the subject of a recent "RSGB Tonight@8" discussion featuring Eric Arkinstall M0KZB and Michael Toppel GM5AUG. The session delved into the history of Morse code, crediting its invention to Samuel Morse and Alfred Vail, and explored its continued relevance, particularly among amateur radio enthusiasts for activities like contesting and worldwide communication.

A significant portion of the discussion was dedicated to the practicalities of learning Morse code, emphasizing the importance of desire, self-discipline, and consistent practice. Various learning methods were highlighted, including joining clubs and utilizing teaching apps and online courses, with specific mentions of programs like CW Academy and the Morse Mania app.

The presenters also touched upon different types of Morse keys, recommending straight keys for beginners, and offered valuable practical advice for learners, such as the benefit of frequent, short practice sessions, listening to GB2CW broadcasts, and preparing for initial contacts.

Despite the advent of newer digital communication modes, the attraction of Morse code remains present, with the RSGB planning to promote it further, acknowledging its enduring popularity and effectiveness, even in engaging younger generations in amateur radio.

https://youtu.be/8Ns-vly1v2c

~

Small Pistols of Ham Radio Contesting: Stuart VE3RGO

Stuart Hayes, VE3RGO, is living proof that you don't need a "big gun" station to thrive in the world of amateur radio contesting. As a "small pistol" operator with modest equipment, Stuart shares how resourcefulness, persistence, and club camaraderie can lead to big wins and rewarding experiences.

Despite having a simple setup, Stuart's commitment to learning and competing has earned him remarkable contesting achievements. A central theme of this conversation is Stuart's deep connection to the Kitchener-Waterloo Amateur Radio Club—a century-strong community that embraces all aspects of ham radio and fosters a supportive environment for operators at every level.

Whether it's running a virtual licensing course or encouraging members to dive into state QSO parties, the club's leadership excels at turning newcomers into lifelong enthusiasts. Stuart's journey, from QRP beginnings to national contest wins, illustrates how participation and a willingness to try can make contesting a fun and attainable goal.

His story also highlights how activities like Parks on the Air (POTA) provide valuable practice for handling pileups and improving operating skills. The YouTube video is below.

~ QRZ

"Too Many Antenna? What You Talking About Willis?"

Jim Williams Jr. N4JAW
My ham radio journey began while spending the Christmas holiday of 1956 at my grandparents. Since going car-free several years ago, 99% of my POTA activations are done by bicycle. I call myself “Ham on a Bike” and as a bike tourist it is nothing for me to load up my bike for a trip which includes ham radio to add to the adventure.

https://www.qrz.com/db/N4JAW

Earlier this spring I did a Blog about taking advantage of the warmer temperatures in the U.S. to do antenna maintenance and construction. One of my plans was to deploy a Kite Antenna. However, weather conditions have presented wind speeds above the Kite's ratings with lots of severe weather days or days with low wind speeds. As a result, I have had to altered those plans. But fear not; that only leads me to build another antenna. I have a saying about antenna. They are like underwear. You can NEVER have TOO MANY.

As I look back over my Ham Radio years I wish I had built more of my antenna as a Novice. There is nothing wrong with purchasing commercial made antenna but building your own gives one a better understanding of how that antenna works and quite frankly how antenna work in general. I have purchased a handful of commercial manufactured ham radio antenna over the years but prefer to build my own when possible.

With today's U.S. Ham Radio License structure, as a Technician Class Operator; making a 10 meter Dipole or even a Vertical is not only simple and inexpensive but one of the most easiest antenna one can make. It will give you an opportunity to put to practice that knowledge you gained in obtaining your license.

KM4CFT EFHW / EFR QRP Antenna

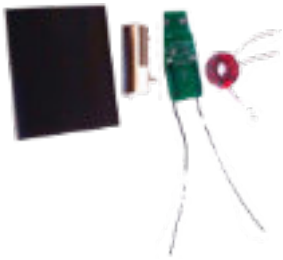
One of the bad habits I've developed over my ham radio yeas is buying kits and placing them in a bin and forgetting about them for months on end. That is the case with this antenna kit I purchased months ago. The KM3CFT EFHW / Random Wire Antenna Kit.

I have taken advantage of these rainy and windy weather days to build Jonathan's (KM4CFT) Kit. I choose to build the Random Wire configuration. As we begin the downside of Solar Cycle 25, HF Band conditions have been changing abruptly and inconsistently hourly, daily and weekly. I normally don't like carrying along a tuner with my Ham on a Bike operations but with band conditions the way they are; I prefer not having

to constantly getting up from my operating position to lower my Linked Dipole or Linked EFHW to change frequencies. This random wire option makes it so much easier.

I had plenty of wire and other parts to build this kit. This was going to be an easy build to go along with my YouKits HB-1B, Yaesu FT-817 or Yaesu FT-891 since the kit is rated for 20 Watts (Max)

After checking that all of the parts of the kit were present it was time to get started on this build this kit.



This build was going require very little soldering. The biggest obstacle for me was winding the toroid. I have been unable to figure out WHY I'm so intimated of winding a toroid and yet I successfully get it done each time.

The only thing left was to solder BNC to board, add brass connections to ends of wire cut a 29' 6" (26 AWG) wire for the radiator, a 17' (26 AWG) wire for the counterpoise and attach heat shrink to board and BNC. From start to finish this build took less than an hour.

Now as Solar Cycle 25 starts to be rather unpredictable I've accept the reality it is better for me to have more antenna options to use with my Multi-Band rigs i.e. (FT-817, FT-891 and HB-1B.

Pictured below right is my most recent setup utilizing my KM4CFT 9:1 Unun Random Wire with my YouKits HB-1B, ATU-10 Autotuner, American Morse Equipment Ultra Porta Paddle, and my 10 meter SotaBeams Travel Mast.

Below Jonathan KM4CFT gives you a glimpse of his tutorial of how to construct this antenna for the Random Wire Configuration. Have fun building this antenna.

[KM4CFT QRP End Fed Random Wire Kit Assembly Tutorial]

~ Jim N4JAW

This article ["Too Many Antenna? What You Talking About Willis?"] was taken from Jim's blog with permission. You can read his many other blog posts at [https://hamonabike.blogspot.com]

by MIKE WEIR VE9KK

Mike Weir VE9KK was first licensed in 1989 and upgraded to advanced in 2000.

He primarily operates contests both CW and RTTY.

His blog is at: VE9KK the world of CW

My "thing" in amateur radio is contesting and more specifically CW contesting. With most contesting programs the F keys on your keyboard are used for sending specific macros. Macros are stored messages and can be edited to do many things. Such as sending your call sign, sending an exchange and so on. As well as the F keys certain contesting programs also have keyboard combinations that do certain things and finally single keyboard keys that also perform a contesting function. During the heat of a contest, I have now and then hit between the keys on my keyboard and sometimes it so happens to be a key combo for my N1MM+ contesting program. All of a sudden I have no volume, switched VFO's and so on, it does not put me in my happy place.

Above is a picture of my Lenovo full-sized preferred pro 2 keyboard. This is a mechanical key system I have tried many keyboards and this type for me is the best. It's not too sensitive as to when my fingers are resting onA the keys I am not accidentally typing letters in the N1MM+ call window. I have tried the small keyboards but I find I am not able to fly along at a nice speed. I like this keyboard so much that I purchased a second one just in case this one fails. My luck it would be discontinued when I wanted to purchase another one.

Let's have a closer look at the macro setup, shall we? The keys at the top left to right are:

- STOP which does just that, if I want the rig to stop sending a macro I hit that key. Reasons for this might be when I am searching and pouncing I start to send my call and because my radio is set to full break in I may hear 4 or more other powerful stations calling as well. I just hit stop as at 100 watts I am wasting my time. Also if my exchange is asked to be sent again I may hit the "X" twice and since I am in full break in or QSK as it is called I may hear the station send "TU" after the first repeat and then hit stop.
- CQ is self-explanatory, it's my calling CQ contest macro.
- X is short for contest exchange.
- TU again simple as a good Canadian I am always saying TU.
- VE9 is my call sign and used to send when I am doing search and pounce.

- HIS this will send the station call sign I have entered in the call box of N1MM+. What I use it for is while running if I copy a partial call only this will send the partial call sign.
- MYNR with most all contests you send 599 or 5NN for CW and then there is the unique part of the exchange such as a serial number, province, age, member number and so on. This key will send the unique part of the exchange if the other station asks for a repeat.
- RUN This key is used when I am searching and pouncing and then I want to start running (calling CQ contest) I hit this key and N1MM+ goes from search and pounce mode to running mode.
- TEST this macro will just send "TEST VE9KK" generally, I do this to identify just after a pileup. There may be some op's waiting to contact me but have no idea what my call is.
- ?? very straightforward forward this just sends out a question mark.
- LOG this is an interesting one. I have found in the past using ESM (Enter sends message) when I have been operating search and pounce it can get confused. For example, I find a station calling "CQ CONTEST" I then hit the ENTER key and the first ESM message is sent (my call). If the station answers another call I then have to send my my call again. I now go to the VE9 macro key and only part of my call is recognized, again I go to the VE9 key. Next is my exchange I have hit the ENTER key for the next ESM message (my exchange). At times my call has been sent or the station gets logged which would be the 3rd ESM function. To avoid confusion I use the X key to send the exchange. Next, I use the LOG macro key to log the contact.
- R this macro simply sends the letter "R" when a confirmation is needed.
- W this macro is a wipe function, when you hit this key it removes information. It can remove a call or exchange very fast so you can start over.

You may have noticed some of the macro keys are yellow and others white. This was intentional, the yellow keys are used for running and the white generally for search and pounce. Also, there are two green dots above and below the "MYNR" key. At times either during search and pounce or running I will need to repeat the main part of the exchange such as a number. This is done most times in the heat of the moment and the green dots call my attention to the key right away without having to look or think about it.

The pause/break key (top right key) has a blue dot on it. This key is used when operating SO2V and this blue dot key when pressed will swap to the functioning VFO. Pressing this key will switch to the opposite VFO both transmit and receive switch. The blue dot is for fast identification.

The numbers keys with the green and red dots are my CW speed increase and decrease keys. Green to increase speed and red to decrease speed.

Finally the yellow dots are a key combination, when you first press the ALT + W keys you mute the sub-receiver. I have to be honest here I seldom use this key combo, using the Icom 7610 it is very simple to mute either receiver. There is a volume knob for each receiver and if you push the knob you silence that receiver. I use this as it is very fast and simple But I still have to learn to remember to unmute. I have in the past wondered why a certain receiver is so quiet and it is my error as it is still muted. I will be removing the yellow dots and the label "mutsub".

That is my contest keyboard setup, leave a comment if you have anything to all or what your keyboard functions are.

~ Mike VE9KK

Zero Retries

Repeaters Are For Voice, Digipeaters Are For Data - NOT!

by STEVE STROH N8GNJ

Steve Stroh N8GNJ is the Editor of the Zero Retries newsletter (https://www.zeroretries.org) which promotes technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology.

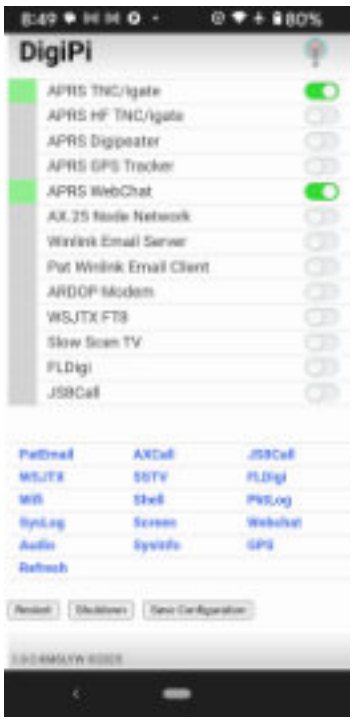
When not writing Zero Retries, Steve experiments with Amateur Radio data radio systems in N8GNJ Labs (his shop) in Bellingham, WA, and planning for the first Zero Retries Digital Conference in Everett, WA in September, 2025.

As more new Hams come into Amateur Radio, their tendency to get started is to buy an inexpensive portable radio. After all, these portable radios are very aggressively marketed on Amazon, and many Amateur Radio YouTube channels breathlessly celebrate every new radio variant and firmware update. But then… these new Hams are often disappointed with the experience because they just don't understand radio technology very well with the known poor performance of typical "rubber duck" antennas, and low power transmission.

Trying to work most repeaters with a portable radio indoors is a disappointing experience because most Amateur Radio repeaters were designed to be accessed by (higher power) mobile and base stations with external antennas. I posit that to attract more new Hams, Amateur Radio needs to offer more repeaters, configured to provide better coverage for low power portable users.

And, to counter the increasing popularity of Meshtastic on unlicensed bands (who needs a Ham radio license?) we need more data repeaters. While many new Hams come into Amateur Radio and are willing to experiment with voice, long term they're more comfortable texting (data modes) than talking. And the same problem applies - new Ham's data stations are typically low power because they start with inexpensive equipment such as portable radios, and often are operating from apartments, condos, communities that don't allow external antennas, etc. Thus repeaters (and digipeaters) configured for low power data use are just as needed as repeaters for low power voice use.

To illustrate the "inexpensive experimentation with data" theme, two systems allow inexpensive experimentation. Both are open source projects with a wide following and many variants. The **All In One Cable (AIOC)** is a modem and programming adapter that connects to many portable radios. The open source project is at https://github.com/skuep/AIOC



and the best assembled and tested AIOC I've found is https://na6d.com/. The second is the **DigiPi Project** - https://craiger.org/digipi/ which is an inexpensive combination of a Raspberry Pi Zero 2W and a simple modem. One simple modem for DigiPi is the **N7EBB Radio Interface Board** - https://n7ebb.org/.

Ideally, such new repeaters could do both voice and data, dynamically and interchangeably.

Seattle 9600 bps Repeater Network

In my column last issue - **An Introduction to the IP400 Network Project**, I discussed a new project for next generation, high speed data networking being developed specifically for the Amateur Radio "400 MHz" band (430-450 MHz in Canada, 420-450 MHz in most of the US). Part of the roadmap of the IP400 Network Project will be the **Supernode** - an adapter for repeaters that will add compatibility with IP400. Hopefully by end of Summer 2025, IP400 hardware, and perhaps Supernode hardware, will be widely available and many of us will be able to experiment with IP400. But IP400 isn't the only way we can be doing advanced data communications on Amateur Radio repeaters.

Repeaters Are For Voice, Digipeaters Are For Data - NOT!

In discussing data over repeaters, I need to get the paradigm of "repeaters are for relaying voice, digipeaters are for relaying data" out of the way. I can offer a quick illustration why that's an invalid differentiation between voice and data usage on repeaters versus digipeaters. In Amateur Radio, we've had the capability for single frequency repeaters for voice for decades now. An example of a single frequency repeater (or simplex repeater) adapter is the **Argent Data Systems ADS-SR1** - https://www.argentdata.com/catalog/product_info.php?products_id=98. But hardly anyone uses single frequency (or simplex) repeaters except under emergency conditions because receive / record / transmit is a poor experience compared to dual frequency full duplex repeaters. Imagine talking, then waiting (long) seconds for the other person to finish talking and then it's your turn again. You'd prefer to hear the other person talk in real time. And if you talk before hearing the "over" from the other person, you risk "doubling" with the other person and having to start the conversation all over. Not to mention how hard it is for someone to break into a conversation.

The paradigm of "communications are more pleasant and more efficient using a dual frequency full duplex repeater" is equally applicable to data communications. That is, using a dual frequency full duplex repeater for data works amazingly well compared to relaying data using a receive / record / transmit digipeater.

I'm an advocate of dedicated data (or dedicated to shared data and voice) repeaters because I was a user of a network of five dedicated-to-data repeaters in the Seattle area in the 1990s. I described that network in a paper - **The Puget Sound Amateur Radio TCP/IP Network (Circa 1995)** - https://www.superpacket.org/2021/03/the-puget-sound-amateur-radio-tcpip-network-circa-1995.html. Those repeaters were dedicated to data usage (the K9NG / TAPR 9600 bps Frequency Shift Keying (FSK) modem using bit regeneration -

https://www.zeroretries.org/i/143337873/advantages-of-a-bit-regenerating-repeater-for-local-area-networks at each repeater. Those repeaters did not support voice usage at all - only 9600 bps data.

These repeaters worked amazingly well despite 9600 bps data being problematic at the time (and still is problematic) because 9600 modems are "fussy and less forgiving" than 1200 bps AFSK modems because each user station, instead of trying to be compatible with every other user's varying radios, deviation, multipath, etc., each user adjusted their modem and (ideally) aimed a beam antenna at the nearest data repeater. Mostly the repeaters worked so well because they eliminated the **Hidden Node Problem** - https://en.wikipedia.org/wiki/Hidden_node_problem.

The user radios we used in the Seattle 9600 bps repeater network were a mix of modified voice radios and some designed-for-data radios. Most of the latter category were data radios such as small, low power data radios from Tekk. Others were modified crystal controlled radios modified for best performance with 9600 bps modems. But that was then, and all of those repeaters are now long gone for reasons that aren't germane to this discussion. The bottom line is that we did the experiment of using dedicated dual frequency full duplex repeaters for data, and wow, they worked really, really well to pass data efficiently and fast over a wide area, and supported modest user stations.

Using Data Over Repeater in This Era

Most hams think of data over repeater as using "soundcard" modes over normal FM repeaters, such as legacy Packet Radio - AX.25 1200 bps Audio Frequency Shift Keying (AFSK). Also, some of the modes in the **fldigi suite** - https://www.w1hkj.org/ such as FSQ and MT-63 work fine over repeaters (though they're slow because they're intended for the narrower channels of HF). But doing data over a voice repeater has drawbacks, primarily the user expectations (and frustrations) at "hearing data tones over my favorite voice repeater".

In the end, that approach works, but it usually ends up being a pretty crude and frustrating way to do data over Amateur Radio repeaters.

In this era, the best performance for doing data over voice repeaters is by using **VARA FM** - https://rosmodem.wordpress.com/. VARA FM is a variant of VARA HF designed for the wider, quieter channels of VHF and UHF when using FM. When using radios with "flat audio"[1] connections and high performance audio adapters[2], data speeds of up to 25 kbps - 20x faster than typical 1200 bps. Even using typical VHF / UHF radios and typical audio adapters, VARA FM can achieve data speeds of 12k bps - 10x faster than typical 1200 bps.

Describing how VARA FM achieves such speeds is outside the scope of this article, but one of its significant advantages is that it "senses and adapts" its performance if it's being used on a repeater. For example, the turnaround time on a repeater is slower than a simplex connection, and thus VARA FM automatically adjusts its RX / TX delay to accommodate the repeater's RX / TX delay. Another adaptation of VARA FM is that notes that its subcarriers that are at the same frequency as the CTCSS tones transmitted on repeaters aren't being successfully transmitted so it stops trying to use those particular subcarriers for the duration of the data transfer.

Icom D-Star Digital Data (DD) Mode

Another system for fast data communications via repeaters in this era is Icom's DD mode on 1240-1300 MHz, with data speeds of 128 kbps. DD mode was actually the original D-Star mode, predating D-Star Digital Voice (with some data) mode on 144-148 MHz and 440-450 MHz. Although the original user radio for DD mode (the Icom ID-1) has been discontinued, Icom's IC-9700 and IC-905 radios are able to do DD mode, and Icom continues to make repeaters that can do DD mode on 1240-1300 MHz - the ID-RP1200VD. If "cost is no object", using a Icom IC-9700 as a user radio, and the Icom ID-RP1200VD is the fastest data mode over repeater available "off the shelf" for Amateur Radio.

MMDVM and the New MMDVM-TNC Data Mode

In my description of the use of MMDVM below, I'm referring to connecting to MMDVM repeaters over the air, with an MMDVM modem fitted into the repeater, and using an MMDVM modem on a radio to transmit to and receive from the repeater.

Perhaps the most promising method to do data over repeaters is to adapt an FM repeater for use with a Multi Mode Digital Voice Modem (MMDVM). An example of how to build (or adapt) a repeater for use with MMDVM is described by Ben Fogt N5AMD - **How to make a MMDVM Digital Repeater** - https://n5amd.com/digital-radio-how-tos/make-mmdvm-digital-repeater/. MMDVM "hotspots" are now widely known and used, but Jonathan Naylor G4KLX originally developed MMDVM for repeaters, so Hams weren't "held hostage" to having to buy commercial digital voice repeaters such as from Motorola, Icom, and Yaesu.

The "Add MMDVM" approach to data repeaters is one of the most promising ways to do data over repeaters because an MMDVM repeater can provide a variety of digital modes, including all the digital voice modes supported by MMDVM - generally DMR, D-Star, System Fusion, P25, NXDN, M17 and some data modes, including POCSAG (the data format for transmitting alphanumeric paging) and AX.25 (typical 1200 bps AFSK using AX.25).

This is being done. The Mount Diablo Amateur Radio Club's **W6CX-DV MultiMode Digital Voice Repeater** in California - https://www.mdarc.org/repeater-systems/digital-voice uses MMDVM to be equally accessible to D-Star, DMR, [System Fusion], and M17. Because it's based on an MMDVM modem, data modes supported by MMDVM could be added at any point in the future.

POCSAG is particularly interesting because it's a very robust protocol (no chance to ask for retries) and it's now easy to implement with inexpensive Software Defined receivers as receiving stations. See https://hampager.de/#/ for more information. Imaging being able to transmit local bulletins to a wide variety of users with nothing more for the receiving stations than a Raspberry Pi Zero and an inexpensive SD receiver.

In 2024, G4KLX announced that he had developed a new data mode for for use with MMDVM devices called **MMDVM-TNC** - https://github.com/g4klx/MMDVM-TNC. I did a deep dive into MMDVM-TNC in Zero Retries 0175 - **MMDVM-TNC is (Kind of) Real** - https://www.zeroretries.org/i/150495953/mmdvm-tnc-is-kind-of-real. Attributes of MMDVM-TNC include:

- MMDVM-TNC runs on existing MMDVM hardware such as the **ZUMRadio MMDVM-Pi** - https://zumradio.com/products.html#mmdvm-pi.
- MMDVM-TNC uses the same on-air waveform as Digital Mobile Radio (DMR) - (C)4FSK.
- Data speeds up to 9600bps works within a 12.5 kHz channel.

Zero Retries Digital Conference

September 13, 2025

Everett, Washington

If you're interested in topics such as IP400 Network Project (discussed in my last column), data repeaters (discussed above) or many of the widely varied "Advanced Amateur Radio" topics I discuss in my newsletter Zero Retries, then you'll probably enjoy attending the inaugural Zero Retries Digital Conference (ZRDC) which will be held on Saturday September 13, 2025 in Everett, Washington.

For more details, see https://www.zeroretries.org/p/conference.

Zero Retries Digital Conference 2025 Flyer

- Interleaved Forward Error Correction (FEC) - Improved Layer 2 Protocol (IL2P) is integrated to make the data transmission more robust.
- Using MMDVM-TNC requires only attachment using a KISS interface from other Amateur Radio software.

MMDVM-TNC can operate at various data speeds:

1200 bps using AFSK and AX.25

9600 bps using C4FSK and IL2P

14400 bps using C4FSK and IL2P

19200 bps using C4FSK and IL2P

24000 bps using C4FSK and IL2P

28800 bps using C4FSK and IL2P

33600 bps using C4FSK and IL2P

38400 bps using C4FSK and IL2P

What's even more interesting about MMDVM-TNC is that G4KLX has worked with Nino Carrillo KK4HEJ, the developer of the **NinoTNC** - https://tarpn.net/t/nino-tnc/nino-tnc.html (kit) and https://www.rpc-electronics.com/smtninotnc.php (assembled and tested) to ensure that these modes are available in a NinoTNC. Thus users can use a more conventional "TNC" device instead of an MMDVM modem to access MMDVM-TNC in a MMDVM-equipped repeater.

Note that the data modes 9600 bps and faster will require a radio with a flat audio connection[1].

And, caution, the MMDVM-TNC data modes have been tested on a bench, but (as far as I'm aware) haven't been widely tested with actual radios in real world conditions. That's one of the many experiments I hope to do in Summer 2025 in my shop - N8GNJ / Zero Retries Labs.

I'd be remiss if I didn't include that some Digital Voice systems, that can be used over repeaters, support data, to varying degrees. For example, M17 digital voice has a well-specified ability to interchangeably use M17 digital voice and data using a standard AX.25 "KISS" software interface. D-Star transmits a small data stream with every voice transmission and some D-Star radios support a "DV Fast Data" mode which flips a bit and allows almost all of the 4800 bits of a D-Star transmission to be used for data instead of Digital Voice. DMR and P25 also can be used to transmit data, but I've only seen proprietary systems from Motorola and Hytera that can do so. From my observations, none of these "DV and some data" systems have seen widespread usage in Amateur Radio.

Data Over Repeaters In the Near Future

It's related to this topic, but a bit out of scope for this article to mention Amateur Radio Emergency Data Network (AREDN) microwave networks. If you have an AREDN network in your area, and you can connect to it, most of this discussion is moot because you already have fast data connectivity over Amateur Radio.

One interesting idea I recently encountered and have only begun to explore is the concept that a Digital Mobile Radio (DMR) repeater can consist of a single channel radio which uses one time slot to receive, and the other time slot to transmit. This allows a full duplex repeater to be used on a single channel. Thus no complex, contested dual frequency coordination is needed, and the hardware is simplified to not require a large, expensive duplexer to combine the simultaneous use of a transmitter and receive on different frequencies into a single antenna. Let thousands of new single channel repeaters bloom? Especially in high density areas such as college campuses, near large apartment complexes, etc. This seems a "fertile area for experimentation and development".

There has been a persistent request for VARA FM to be made available to run on Linux and be made available as open source. The developer or VARA FM has declined such requests, but there was nothing preventing open source developers

to tackle such a project, and it looks like such a project is now available… if a bit unpolished compared to VARA FM. **The Mercury modem software** - https://github.com/Rhizomatica/ mercury was developed by Rhizomatica. It was discussed at Hamvention 2025 and I was able to ask the developers if it was usable for VHF / UHF FM, and they said it was, though that was not their primary use case. All of the parameters of Mercury can be configured for wider and quieter channels. The emergence of Mercury is a welcome development.

And in the coming (few) years, it seems likely that we will have Software Defined Radios that can easily implement these and many other modes. Not only will the user be able to select the advanced data mode that they want to use to communicate with another station, but the radio will probably use some form of embedded Machine Learning (ML) to automatically identify these data modes, possibly from a standardized beacon transmission that says "I'm capable of the communicating with these modes" and then transmits a hash of a lookup table entry describing every mode the station is currently capable of.

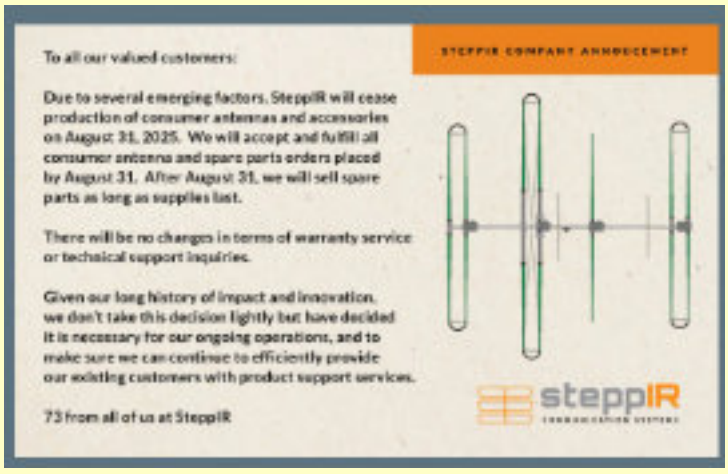
I can't wait!

~ Steve N8GNJ

Note: I do not receive any compensation for the products linked in this article.

References

1. Flat audio is bypassing the voice pre-emphasis and de-emphasis stages in a typical two-way radio. This permits data to work much better. Flat audio connections in a radio are also called "data jack" (6-pin MiniDIN connector) and "9600" connection (and corresponding parameter settings in such radios). See https://en.wikipedia.org/wiki/9600_port.
2. High fidelity audio adapters pass a wider range of audio frequencies than typical audio adapters. An example of a high fidelity audio adapter is the DRA (Digital Radio Adapter) series of products from Masters Communications - https://www.masterscommunications.com/products/radio-adapter/dra/dra-index.html.



If you were contemplating buying a SteppIR antenna, now would be a good time to place an order. The detail on the web about this is a bit ambiguous so it will be interesting to see what really happens. They are not going out of business!

" SteppIR continues to aggressively move the technology forward on mechanically optimized Yagi and Vertical antennas for our past, current and future ham radio customers. We know we have had our warts, but at the same time we have gotten rid of a LOT of them over the years and we will continue to advance the product, until we reach a point where every part of the system is "smart", and you won't have to worry about those dumb (But getting smarter every day) controllers any longer."

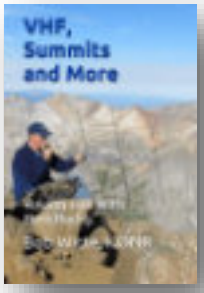
John Mertel WA7IR
President/CEO

SteppIREngineeringandRepair@groups.io | SteppIR update - John Mertel

What's In Your Rubber Duck?

by BOB WITTE KØNR

Bob Witte K0NR maintains a great blog site, and a book at https://www.k0nr.com/wordpress/



A few steps back to an earlier column that caught my eye. -Ed.

Anyone with a VHF or UHF handheld transceiver (HT) probably uses the standard "rubber duck" antenna for casual use. I often refer to the rubber duck as The World's Most Convenient Crappy Antenna. To be fair, all antennas are a compromise…the rubber duck optimizes small size and convenience at the expense of performance. The Wikipedia entry describes the rubber duck antenna as "an electrically short monopole antenna…[that] consists of a springy wire in the shape of a narrow helix, sealed in a rubber or plastic jacket to protect the antenna."

Being curious about what really is hiding inside the typical rubber duck antenna, I decided to take a few of them apart. I did not try to assess the performance of the antennas but just examine their construction.

Baofeng UV-5R Stock Antenna

I started by dissecting a Baofeng UV-5R antenna, which took some aggressive action with a diagonal wire cutters to split the rubberized jacket near the bottom. After that, the jacket slid off to reveal the classic spiral antenna element inside. You can see some white adhesive near the top of the spiral element (upper right in the photo).

The Baofeng antenna had a female SMA connector.

Note: You can access high resolution versions of the photos in this article by clicking on them, allowing you to see lots of detail.

Yaesu FT-1DR Stock Antenna

The Yaesu antenna was easy to disassemble. In fact, I chose this antenna because I noticed that the outside jacket had come loose and was starting to slide off the antenna. A steady pull on the cover exposed the antenna elements without any further antenna abuse. (I plan to reinstall the cover with a few dabs of glue and expect that it will continue to work fine.)

The construction of this antenna is quite different from the Baofeng. The main element is a very tightly-wound spring… so tight that I expect that it acts like a solid wire electrically. In other words, it doesn't have the spiral configuration that makes the antenna act longer electrically. At the bottom of the antenna, there is a coil inserted in series with the radiating element (connects radiating element with the center pin of the SMA connector).

The photo to the right shows a closeup view of the male SMA connector and the coil.

Laird VHF Antenna

Next, I wondered if antennas for commercial radios used different design or construction techniques. Laird makes high-quality antennas for the mobile radio and other commercial markets, so I purchased one of their VHF rubber duck antennas to dissect. This model is intended for use with Motorola radios requiring a threaded antenna stud.

This antenna was a challenge to cut open. I used a sharp knife and diagonal pliers to cut the rubberized jacket and peeled it back using a needle-nose pliers. The rubberized coating was embedded into the spiral antenna element, so it did not come apart easily. It took over an hour fighting with the antenna and I gave up before getting the entire spiral element exposed.

Peeling back the outer coating of the Laird antenna

The Laird antenna is clearly the sturdiest of the three antennas. The spiral element is much thicker than the Baofeng and the rubberized coating is tougher and molded tightly into the spiral element.

The Baofeng and Laird antennas use the same design concept…just take a spiral antenna element and apply a protective cover. However, the Laird construction was far superior, but not a surprise given that Baofeng is a low-cost provider in the ham radio (consumer) market.

My disappointment is with the Yaesu antenna. The antenna came apart after one year of not very heavy use. I expect I can put it back together with some adhesive, improving on the design in the process.

Anyway, I found this interesting and wanted to share it with you. What's in your rubber duck?

~ 73, Bob KØNR

Foundations of Amateur Radio

What's really happening at the IARU?

by ONNO BENSCHOP VK6FLAB

Onno Benschop VK6FLAB

To listen to the podcast, visit the website: http://podcasts.vk6flab.com/. You can also use your podcast tool of choice and search for my callsign, VK6FLAB.

Full instructions on how to listen are here: https://podcasts.vk6flab.com/about/help

The other day a report in "Amateur Radio Daily" caught my eye. Under the heading "IARU Considers Consolidation", I read that the International Amateur Radio Union, celebrating 100 years of representing our hobby, is considering significant change. Links in the report reveal a PDF document titled "IARU Consultation on Proposed Restructuring March 2025".

The document, dated 21 March, outlines the structure of the IARU, four organisations, one for each ITU Region, and one global organisation, the International Secretariat. It provides some insights on how the funding arrangements between these organisations exist and goes on to talk about how the IARU operates, including incorporation, or not, currencies, committees, priorities and other background and historic information.

All excellent. Stuff that should be public knowledge, but having spent the better part of a year reading IARU documents, this one brought several new eye opening things to the table.

The document attributes no authors but is at least spell-checked in US English, and appears to be part of a discussion started long before I became an amateur. In 2005, the IARU started the "IARU 2025 Committee" to look into the future of the organisation. It concluded its work in 2012. In 2020 a new committee was started, the "Future Committee", consisting of representation from each of the regions.

The introductory wording is curious and includes these words: "We can no longer afford not to move the process forward" - at least implying that this document is a foregone conclusion.

Searching for the document on the IARU sites will give you no results. Searching for "Future Committee", gives you two results, neither actually having the words "Future Committee". The only reference which makes any sense in either of those two results, and only after the fact, is a paragraph, published on 12 October 2020, that refers to the Administrative Council, or AC, and states: "The AC received and discussed an in-depth report from its Working Group on the Future of IARU and agreed to steps for evolving toward a more flexible organization and strengthened relationships with all stakeholders in the global amateur radio community and telecommunications ecosystem."

For a process that started 20 years ago, this is the first I've heard of it. Curious wouldn't you say, in an organisation that claims to represent both you and I? It's almost like the IARU wants to keep this whole thing a secret. There's more.

The thrust of the document is to explore the notion of simplifying the operation of the IARU by consolidating the four organisations into one incorporated body based in Switzerland, where the IARU Region 1 organisation is currently incorporated. It goes on to discuss how this is great for the hobby, how it will save on resources and how it will allow the mostly volunteer run organisation to operate more democratically.

It outlines the process for adoption, including a 60 day consultation period for the 167 Member Societies, as-in peak bodies in your country. I'll save you the suspense, the consultation period ended before I saw the document. There's a 30 day "Detailed Draft Proposal phase" and a "Final Proposal and Voting stage", neither of which are on any specific time-line that I could find.

You might say, well, Onno, you're not a member society, it's none of your business. That's true. Here's the thing. Let me quote from Section 5, on page 11: "In many cases the IARU Member-Society does not represent the majority of the national amateur community."

So .. not to belabour the point, the IARU, who is proud to represent Amateur Radio on the International Stage, writes in its own documentation that the organisation doesn't represent the majority of amateurs while claiming its intention to make the organisation more flexible and democratic. Gotta say, feeling all warm and fuzzy.

In Section 6, the document goes into great detail about finance. I'm kidding, it has one sub-sub section about money, section 6.1.3, less than 10% of the document, no less explosive for its brevity. It states that each region contributes to the overall IARU budget, but that this contribution remains insufficient to cover the many critical representation efforts required.

It goes on to say that "Historically, the ARRL has played a key role in bridging this financial gap".

All podcast transcripts are collated and edited in an annual volume which you can find by searching for my callsign on your local Amazon store, or visit my author page: http://amazon.com/author/owh. Volume 7 is out now.

Feel free to get in touch directly via email: cq@vk6flab.com, follow on twitter: @vk6flab or check the website for more: http://vk6flab.com/

If you'd like to join a weekly net for new and returning amateurs, check out the details at http://ftroop.vk6flab.com/, the net runs every week on Saturday, from 00:00 to 01:00 UTC on Echolink, IRLP, AllStar Link, IRN and 2m/70cm FM via various repeaters.

If you'd like to participate in discussion about the podcast or about amateur radio, you can visit the Facebook group: https://www.facebook.com/groups/foundations.itmaze

This podcast episode was produced by Onno (VK6FLAB). You can find more at http://vk6flab.com/

For its contribution, the ARRL currently nominates the President and Vice President which the member societies get to vote on. I wonder what happens if they don't vote for the nominated candidate and what happens when the ARRL is no longer first among equals, will it continue to fund the IARU?

While pointing out that all direct representation of the IARU at the ITU are made by volunteers, as well as "nearly all" other activities, I wonder which activities are paid and how much?

There's also discussion about a "not ideal" "compromise", namely that we'll have to be virtual attendees to save money. Really? In 2025, after a century of representing amateur radio, we're still attending meetings in person? Has nobody at the IARU heard of this new technology, you know, the one it claims to promote, radio? Or the more modern version, teleconference? You'd think that a bunch of volunteer radio amateurs would jump at the chance to debate things over radio.

Moving on

The finance section includes an interesting statement. "Many regions have accumulated cash reserves" and "where these reserves are substantial and have resulted from a specific region's activities, they may need to be held in trust and designated exclusively for initiatives related to that former region".

Let's unpack this.

There's three regions. "Many regions" means more than one, but not all, so, two. In other words, one region has no money. Which one?

Moreover, "substantial" reserves from "a specific region", means one of the other two, so, one. So, it made money, it's substantial, it's intended to be designated exclusively for that one region. Which one?

The Wireless Institute of Australia, which claims to have existed longer than the IARU and the ARRL before it, was a federation. In 2004 the regulator indicated that it should consolidate its efforts because apparently the various state WIA organisations "could never agree on a single outcome".

This organisation was incorporated in VK3 where it continues to exist as a first among equals. Curiously the Victorian, Tasmanian and South Australia with Northern Territory Divisions of the Wireless Institute of Australia are each still incorporated and active. Today if you're in VK6, like I am, your experience of the WIA is completely different from that if you're in VK3 and to a lesser extent VK2.

Remind you of anything?

The document mentions that "only fully paid up member-societies in good standing have the right to vote" and "The current fee structure will need to be harmonized across all three regions, which may lead to increased dues for some Member-Societies".

That tells us that some member societies will have to pay more money and if they don't they won't be able to vote. I wonder if these are members of the region with all the money, or from the region without money? I'll remind you that member societies have already been acknowledged by the IARU as being underfunded, offering reduced services with some member societies being disbanded.

The point being that we're finding out behind the scenes, after the fact, of a process that has been in play for 20 years, that aims to create a single harmonised body whilst exacerbating existing inequities, and doing so in secret.

Is that the kind of body that you want to represent you on the world stage?

Is this something that your member society knows about, is it actively participating, does it share that information with you or hide it? Are you informed, or did you learn more today from me than you have in the past 20 years?

Before I leave you to your thoughts, credit to Cale K4HCK for publishing the story and thanks to their source for sharing the document.

~ 'm Onno VK6FLAB

Back to Basics

From The Canadian Basic Question Bank

The Common Mode Choke

John Schouten VE7TI has been teaching amateur radio courses for over 25 years, and is the Course Coordinator for Surrey Amateur Radio Communications

The new Canadian Basic question bank, coming into effect July 15, 2025 has a number of new questions on interference. Lets look at one of them in this issue of The Communicator. The question covers both interference and a mention of an OCF antenna, not in the old question bank.

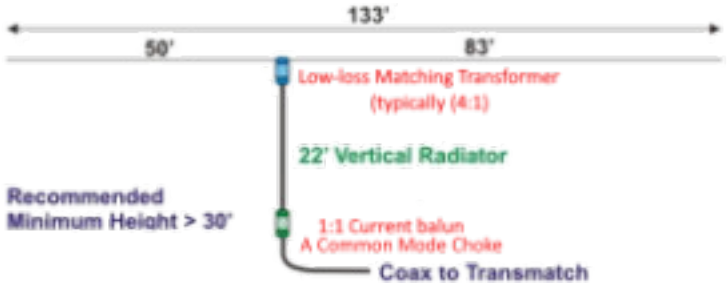
B-003-019-008

You are using an HF off-centre-fed (OCF) unbalanced antenna. When you transmit on SSB, distorted audio and noise are heard from an outboard amplified speaker. What device could you install in the transmission line to mitigate this problem?

1. An antenna tuner
2. A common-mode choke
3. A low-pass filter
4. A surge suppressor

Lets look first at the OCF Antenna

An HF OCF (High Frequency Off-Center Fed) antenna, often called an off-center fed dipole, is a versatile multi-band wire antenna widely used in amateur radio for its ability to operate across multiple frequency bands without always needing a tuner. The antenna consists of a dipole with two unequal-length legs, typically split at an off-center point, such as one-third and two-thirds of the total length, creating a shorter and a longer leg.



Specifications

Freq. Coverage	80 - 10 meters
Gain	As much as 10dBd*
Radiator Length	133' Horizontal 22' Vertical
Feed Line	50-ohm coax
Power Rating	1500 W CW/SSB
Support Height	>35' Useable at 25'
Radials	Not needed

* Based on user reports, field evaluations, and product reviews. Gain is due primarily to the low angle radiation pattern which doesn't exist in common dipoles.

Features

80, 40, 30, 20, 17, 15, 12, 10 meters
All Bands, ONE ANTENNA
Low Angle DX Radiation Pattern
Excellent Receiving Antenna
Excellent Performance at Low Heights

At this off-center feedpoint, a balun, usually 4:1 or 6:1, connects the coaxial feedline to the antenna, transforming the antenna's higher impedance of 200-300 ohms to match the 50-ohm feedline for efficient power transfer.

By placing the feedpoint off-center, the antenna achieves resonance on multiple harmonically related bands, such as 80m, 40m, 20m, 15m, and 10m, due to the varying current distributions created by the unequal leg lengths, resulting in low standing wave ratio (SWR) on these bands.

Unlike a center-fed dipole where current peaks at the center, the OCF's off-center feed shifts current nodes, enabling multi-band operation while the balun maintains balanced current flow despite the asymmetrical design. The radiation pattern varies by band, resembling a broadside dipole pattern on the fundamental frequency like 80m, but forming complex multi-lobe patterns on higher bands, supporting both near-vertical incidence skywave for local communication and low-angle radiation for long-distance DX contacts.

This design offers simplicity with a single feedline and no need for traps, along with flexibility for installation as a flat-top, inverted-V, or sloper. However, the off-center feed can introduce some RF current on the feedline, necessitating a robust balun or choke, and SWR may be higher on non-resonant frequencies, sometimes requiring a tuner. Additionally, the radiation pattern on higher bands may include nulls, affecting signal strength in certain directions.

For example, an 80m OCF antenna might be approximately 133 feet long, with a 50-foot short leg and an 83-foot long leg, fed at the junction with a 4:1 balun, effectively operating on 80m, 40m, 20m, 15m, and 10m. Overall, the HF OCF antenna's off-center feed and balun enable its multi-band capability, making it a popular, efficient choice for amateur radio operators seeking a straightforward solution for HF communications.

While this is an excellent HF antenna - if you have the space to hang it, an OCF antenna does have some issues.

OCF interference issues

When operating an off-centre-fed (OCF) or another unbalanced HF antenna, many radio amateurs encounter a frustrating issue: distorted audio and noise emanating from an outboard amplified speaker during SSB transmissions. Especially when operating on the 40m band, my family room stereo speakers would come alive with a distorted version of what I was transmitting.

Common mode current refers to RF current that flows equally on the outer shield of the coaxial cable and, in some cases, on other conductors (such as ground wires or audio cables) rather than being confined to the intended differential (inside) path between the center conductor and the shield. This occurs when the antenna system is not perfectly balanced, which is typical for OCF and other unbalanced antennas. This RF energy is not supposed to be present on these conductors, but due to the imbalance in the antenna system, it finds its way in.

Since OCF antennas are inherently unbalanced, they can lead to common-mode currents on the feedline, which then couple into the speaker's wiring, acting as an unintended radiator or receiver of RF energy.

So, how do Common Mode Chokes Work?

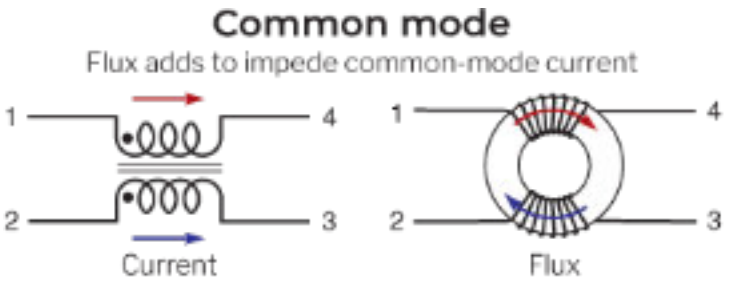
In normal or differential mode (single choke), current travels on one line in one direction from the source to the load, and in the opposite direction on the return line that completes the circuit. In common mode, the noise current travels on both lines in the same direction

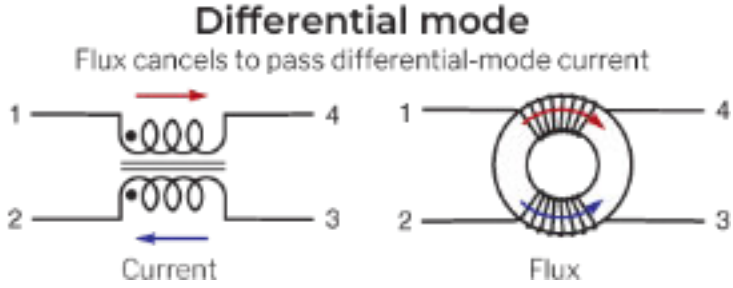
In common mode, the current in a group of lines travels in the same direction so the combined magnetic flux adds to create an opposing field to block the noise, as illustrated by the red and green arrows in the toroid core shown In the diagram *[left]*, In differential mode, the current travels in opposite directions and the flux subtracts or cancels out so that the field does not oppose the normal mode signal.

https://youtu.be/QkKPS6WayB0

As mentioned, OCF antennas are inherently unbalanced, especially when not properly matched or fed with an appropriate balun. This imbalance causes RF energy to flow not just along the intended path inside the coax, but also along the outside of the coax shield (common mode currents). When these currents reach your station, they can induce RF into audio circuits, control cables, network cables, and even power lines, causing distortion, noise, and erratic behavior in speakers and other equipment.

This process converts the RF signal into an audible frequency, which is then amplified and heard as distortion, noise, or a "buzz" in the audio output. This phenomenon is sometimes called "RF in the audio" or "RF feedback."





Step in Process	Effect on Audio/Equipment
Common mode current on coax	RF flows on shield, not just inside
RF enters shack via wiring	Couples into audio and control circuits
RF rectified in audio circuits	Distortion, noise, or buzz in output
Amplified by audio equipment	Heard as distorted or noisy audio

Solutions to Mitigate the Problem

1. Install a Common Mode Choke (Sheath Current Choke)

A common mode choke (also called a feedline choke or sheath current choke) is a device that blocks RF currents from traveling along the outside of your coax. Placing one at the antenna feedpoint and another where the coax enters your station is highly effective. This forces RF currents to stay on the inside of the coax and prevents them from coupling into your station equipment.

2. Use a Proper Balun at the Antenna Feedpoint

A current balun (not just an impedance transformer) is essential for OCF antennas. The balun helps maintain balance and reduces common mode currents. Typical OCF dipoles use a 6:1 balun to match the higher feedpoint impedance (about 300 ohms) to 50-ohm coax.

3. Grounding the Feedline and Equipment

Ground the shield of your coaxial cable where it enters your station. This provides a path for stray RF to dissipate safely to ground, reducing the chance of it entering your audio circuits.

4. Shield and Filter Audio and Control Cables

Use shielded audio cables and consider adding ferrite chokes to speaker, microphone, and control cables. This solved my family room audio issues., Ferrite beads or snap-on chokes help block RF from coupling into these circuits.

So, getting back to our new question bank…

B-003-019-008

You are using an HF off-centre-fed (OCF) unbalanced antenna. When you transmit on SSB, distorted audio and noise are heard from an outboard amplified speaker. What device could you install in the transmission line to mitigate this problem?

The correct answer is:

2. A common-mode choke

~ John VE7TI

Special Introductory RAC Membership Opportunity for New Amateurs

Message from the RAC President

Congratulations again on achieving your Certificate of Proficiency in Amateur Radio and welcome to Radio Amateurs of Canada! In recognition of your achievement, I'd like to offer you a free one-year membership which includes:

A subscription to the digital (eTCA) version of The Canadian Amateur magazine, with access to previous online issue. Opportunities to connect with local Amateurs through the RAC Affiliated Club Program which includes liability insurance for your personal Amateur Radio activities Access to annual RAC Contests, Special Events and Operating Awards Opportunities and discounts from various partner organizations Full member rights including participating in the decision making at RAC Annual General Meetings and in the election of RAC representatives. There are many great reasons to join RAC and I hope you will take advantage of this special offer by completing the introductory membership form provided below.

If you need any additional information please don't hesitate to contact me by email at president@rac.ca or by contacting the RAC Office at racgm@rac.ca.

– 73 (Best Wishes) and welcome!

No-ham Recipes

BBQ Chicken Marinade

by Muriel Foisy VE7LQH (SK)

Try this marinade at your summer barbecue.

- 1/3 cup (90 ml) soy sauce
- 2 tablespoons (30 ml) honey or brown sugar
- 1 tablespoon (15 ml) white wine or wine vinegar
- 1 clove garlic, minced or garlic powder
- 1/4 teaspoon (1.25 ml) ground ginger
- 2 tablespoons (30 ml) salad oil

Combine all marinade ingredients; mix well. Put chopped chicken in a plastic bag in a bowl; pour marinade over chicken and secure the top of the bag. Let marinate several hours or overnight. Drain marinade from chicken. Barbecue until done, using marinade as a baste. When chicken is cooked, put left over marinade into microwave bowl with lid and bring to boil. Use as dipping sauce with chicken or serve over cooked rice.

Author's note: Chicken has a naturally occurring skin bacteria called Campylobacter ieiuni. Campylobacter can make us very ill if we ingest it.

The marinade that has had chicken in it may contain Campylobacter. It would be safest to save some marinade in a clean jar, and then use the rest to marinate the chicken. Use the marinade from the jar to baste the chicken while barbecuing, since you may want to baste the chicken one more time just before serving. In that case, the heat will not have enough time to kill the bacteria.Wash the cutting board in hot, soapy water after cutting the chicken. Then wash your hands and utensils in hot, soapy water to remove and kill any germs. Be sure the chicken is well cooked. Always put cooked chicken on a clean plate; the plate you used for the raw chicken may contain Campylobacter.

July 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
	13 Colonies Special Event July 1 – 7	**Canada Day** Canada Day Contest 1930 SEPAR Net 2000 SARC Net			1879 Bell Telephone Company founded	Coffee: 0700 Denny's King George Blvd. & 68 Avenue OTC Open 0930
6	7	8	9	10	11	12
		1930 SEPAR Net 2000 SARC Net	SARC Social Meeting (OTC) 1900-2100	1856: Nicola Tesla born 1962: Telstar 1 launched		Coffee: 0700 OTC Open 0930
13	14	15	16	17	18	19
		1930 SEPAR Net 2000 SARC Net				Coffee: 0700 OTC Open 0930 Contest: NA QSO Party RTTY Richmond ARC Swap Meet
20	21	22	23	24	25	26
1897: The Wireless Telegraph and Signal Company is founded in England 1937: Marconi dies Contest: NA QSO Party RTTY		1930 SEPAR Net 2000 SARC Net	SARC Directors Meeting 1900-2100			Coffee: 0700 OTC Open 0930
27	28	29	30	31		
		1930 SEPAR Net 2000 SARC Net		Event details: SARC—SEPAR 'Live' calendar link All contest information: WA7BNM Contest Calendar: Home		

August 2025

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
Event details: SARC—SEPAR 'Live' calendar link All contest information: WA7BNM Contest Calendar: Home						Coffee: 0700 Denny's King George Blvd. & 68 Avenue OTC Open 0930 **Contest: NA QSO Party CW**
3	4	5	6	7	8	9
Contest: NA QSO Party CW	BC DAY	**1930 SEPAR Net** **2000 SARC Net**		1981: FCC establishes General Radiotelephone Operator License, ceases issuing First and Second Class Operator licenses.	International Cat Day Special Event	Coffee: 0700 OTC Open 0930 **Contest: WAE DX Contest CW**
10	11	12	13	14	15	16
Contest: WAE DX Contest CW	1942: Actress Hedy Lamarr (Hedy Kiesler Markey) and composer George Anthiel receive U.S. patent for spread-spectrum-frequency-hopping system	1877: Edison invents phonograph 1902: Fessenden granted patent for hot-wire barretter **1930 SEPAR Net** **2000 SARC Net**	1912: Radio Act of 1912, titled An Act to Regulate Radio Communication, is approved **SARC Social Meeting (OTC)** **1900-2100**			Coffee: 0700 OTC Open 0930 **Contest: NA QSO Party SSB**
17	18	19	20	21	22	23
Contest: NA QSO Party SSB		**1930 SEPAR Net** **2000 SARC Net**				Coffee: 0700 OTC Open 0930
24	25	26	27	28	29	30
		International Dog Day Special Event	1910: James McCurdy sends first aircraft-to-ground wireless message SARC Directors Meeting 1900-2100			Coffee: 0700 OTC Open 0930

Radio-Active

Profiles of SARC members

Fred Orsetti: Our longest serving member

More than half a century on the airwaves and with SARC

coordinated by BLAKE R. WIGGS VA7BWG

Fred VE7IO

Fred was first licensed in 1975 as VE7CJG, after finally finding time to take a 12- to 15-week amateur radio course at Burnaby High School. He had long been encouraged by ham friends, and the course—then far more rigorous than today—required CW proficiency at 12 words per minute plus the ability to draw radio circuit schematic diagrams from memory. The next year, in 1976, Fred earned his Advanced qualification and began expanding his electronics knowledge with night classes at BCIT. That combination of hands-on experience and formal education laid a strong foundation for a life deeply embedded in amateur radio.

Founding SARC and Field Days to Remember

Fred is one of the founding members of the Surrey Amateur Radio Club (now Surrey Amateur Radio Communications Society - SARC), a group he helped start alongside Doug Moore VE7CBM of the Surrey school system back in 1975.

The club's inaugural Field Day in 1976 was held at Fred's QTH. These were not casual affairs either. Fred recalls returning home to find a dense array of wires strung through the trees, evidence of the team's efforts to get their antennas in the air. The 10-meter rig worked so well that every time it was keyed, Fred's doorbell rang. Field Day events in that era featured massive radios and power-hungry amplifiers. To keep everything running, the team borrowed a 5-kW generator from Civil Defense, but even that wasn't enough to power everything.

After the success of the club's first field day there was interest in operating from a better location. A great location, at least from a "higher is better" perspective, was the infamous 'Monkey Mountain' east of Abbotsford. Site access was another matter. With four-wheel drive vehicles mandatory for ferrying gear and people to the summit, the setup was logistically challenging. Once at the top, operators had no way down until the event ended. "You were a captive operator," Fred jokes. He recalls that SARC's Field Day team operated successfully from Monkey Mountain for several years, taking first place in Canada in 1977 and 1978. Of course that was the pre-computer era, so all logs were handwritten, and operating a station required two people: one to work the radio, and one to log—both of whom had to be proficient in CW. Finalizing the logs for submission could take weeks.

Equipment Evolution and the Iconic IC-H2

Fred's equipment history mirrors the technological evolution of the hobby. His first VHF radio was an Icom IC-H2 handheld. In those days, the idea of reprogramming a radio on the fly was revolutionary. The IC-H2 used a diode matrix for frequency programming—no crystals, but no keypad either. "Programming" meant calculating and making the required diode cuts, a process Fred now recalls with a laugh. He eventually handed the IC-H2 over to Dave Powell-Williams VE7MQ, who developed a processor for it.

From RTTY to PSK31 and Digital Discovery

Fred has always had an eye on innovation. He recalls working with John Brodie VA7XB in the late 1990s to explore PSK31, a then new digital mode featuring phase shift keying and error correction. PSK31 represented a leap forward from the gibberish-prone world of RTTY. Though Fred prefers CW and RTTY today—largely due to age-related hearing challenges—he embraces digital evolution as part of the hobby's natural growth. Indeed, while we were chatting in Fred's shack, he mentioned that his Icom IC-7610 radios were set up for both LAN and WAN remote control operation. I noticed Fred's IC-9700 VHF / UHF transceiver and remarked that I remote control my own IC-9700 over my LAN. Fred leapt up, disconnected the antenna feeds from his IC-9700, pulled it forward, found the Ethernet port and exclaimed Eureka! I have no doubt that Fred's IC-9700 will soon be set up for both LAN and WAN remote control operation.

Fred served on the RAC Amateur Radio Hall of Fame Board of Trustees for 12 years as the representative from British Columbia

Hamvention and a Deal with the Devil (or Reno)

1995 marked Fred's first attendance at the famous Hamvention in Dayton, Ohio—a pilgrimage every serious ham hopes to make. He enjoyed it so much that he returned for 15 consecutive years. There, he met operators from all over the world, including several from

Japan who recalled working him in contests. But those Dayton trips came with a condition: a deal with his wife, Marion. “If I got to go to Dayton,” Fred explains, “then we had to go to Reno when I got back.” Marion loved the casinos, so this trade-off became a yearly ritual—Hamvention for Fred, Reno for Marion.

Emergency Communications and SEPAR

Fred’s commitment to public service radio is another cornerstone of his ham radio story. As a SEPAR member (and SEPAR coordinator for many years), he was directly involved during several major emergencies. In 2005, after Hurricane Katrina devastated New Orleans, the BC Public Service Net was contacted to help relay messages from battery-powered hams in the disaster zone. Fred was part of the team that made sure those messages—often brief situational reports—got passed along the network to friends and family elsewhere.

Two years earlier, Fred had also been deeply involved during the 2003 Okanagan Mountain Park (Kelowna) wildfire. With thousands displaced, hundreds of homes destroyed and critical infrastructure threatened, Fred received a call from the Red Cross asking for help. There was concern that if a particular BC Tel facility was lost to the fire, all local outbound communication would be severed. Fred initially worked with John Schouten VE7TI who was the British Columbia Emergency Program Southwest Region Amateur Radio Representative at the time. They had in mind a linked repeater arrangement, but that was dismissed as impractical when the Red Cross indicated that traffic on the order of 5,000 messages per day was anticipated. Fred then contacted Ian Procyk VE7HHS who proposed a Winlink email-over-radio solution.

In the end, the BC Tel facility survived and the Winlink network wasn’t needed—but Ian’s work laid an important foundation for BCWARN (BC Wireless Amateur Radio Network). Fred later nominated Ian for the RAC Amateur of the Year Award, which Ian received in 2004.

A Teacher and Elmer to Many

Fred has always been deeply committed to mentoring new hams. His shack features two Icom IC-7610s configured for contesting and remote operation, with a custom switching system that lets multiple people listen in.

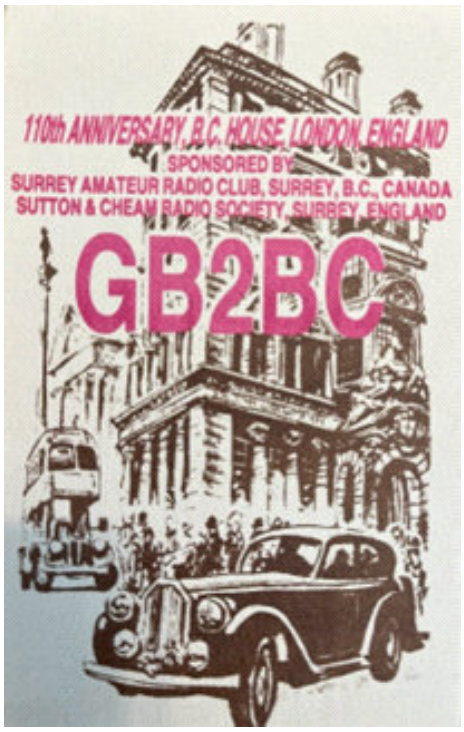
This setup is perfect for teaching. He and Jim Smith VE7FO (SK) developed detailed contesting training materials that continue to benefit newcomers today.

Fred emphasizes the importance of letting new operators make mistakes: “That’s how you learn,” he says. “If you don’t mess up, you won’t know how to handle a similar situation in the future.”

Looking Back and Looking Forward

Fred describes today’s amateur radio scene as a “smorgasbord.” In his view, it’s better than ever. “We’d still be stuck with CW, SSB, and RTTY if things hadn’t changed. Now there are repeaters, satellites, digital modes, EME. You can pick and choose your path—it’s amazing.”

Still, Fred recognizes that something has been lost along the way. “New hams today are scared to transmit because they’re afraid to mess up.



When we started, we had to mess up. That's how we figured it out."

Memorabilia and Milestones

Fred's shack isn't just a technical hub—it's a repository of amateur radio history. His QSL card collection includes some rare and meaningful ones, each a reminder of distant voices, challenging contests, and long friendships.

Fred fondly recalls that in 1982 a group of SARC hams went to London, England and set up special event station GB2BC at BC House, in cooperation with the Sutton & Cheam Radio Society. SARC hams were billeted with their UK counterparts. This entailed daily railway travel back-and-forth between London and various outlying places. One SARC member had to change trains to reach his destination. Fearing he might get lost; Fred and the others lectured him repeatedly on the necessary travel procedures. He still managed to get off at the wrong stop and walked all the way to the next railway station, dragging a wheeled suitcase. The wheels did not survive.

After 50 years, Fred is still logging QSOs, improving his shack and making radio waves count.

~ Blake VA7BWG

In 1982 a group of SARC hams went to London, England and set up special event station GB2BC at BC House, in cooperation with the Sutton & Cheam Radio Society. Fred is on the left and Ralph Webb VE7OM is 4th from the left.

Radio-Active

Another SARC Founder

Ralph Webb VE7OM

More than half a century on the airwaves

coordinated by BLAKE R. WIGGS VA7BWG

Ralph VE7OM

Ralph Webb VE7OM is one of SARC's original members. These days he's a member of the White Rock Amateur Radio Club, but he maintained his SARC membership in the club's early years, participating for example in the infamous "Monkey Mountain" Field Day events (see this issue's profile of Fred Orsetti VE7IO for more details of those events).

Ralph has been an active and passionate amateur radio, as evidenced by his many POTA, SOTA, Technical, DX-pedition and other hobby-related posts on the White Rock club's website. From a chance encounter with a shortwave setup at a summer cottage to operating from historically significant sites across Europe, Ralph's story is one of curiosity spanning almost sixty years in the hobby.

Early Life and Inspiration

It was during a family stay at a rented cottage in Norway Bay, Québec, that Ralph first encountered amateur radio as a youngster. The neighbor's setup—believed to be a Hallicrafters—sparked a fascination that never left him.

When the family moved to British Columbia, fate brought Ralph into contact with another ham through his parents' square dance club. That operator, Max Green VE7DZ (another early SARC member), helped ignite Ralph's deeper involvement in the hobby. Ralph soon enrolled in a Morse Code class at Vancouver City College, studied independently with support from the Burnaby Amateur Radio Club, and earned his Basic qualification in April 1967, receiving call sign VE7BVG. He obtained his current call sign VE7OM in May 1983.

Ralph operating at Poldhu field in Cornwall, England

Operating at GB2BC in London (in 1982

Professional and Technical Background

After high school, Ralph pursued electronics through trade school and built a career in avionics (the electronic systems used on aircraft). He worked with Okanagan Helicopters and several airlines, including Pacific Western Airlines, Canadian Airlines, and Air Canada; followed by a 10-year stint working for BCIT—where he still does some part-time work. His avionics work complemented and reinforced his technical interests in radio communication, and vice versa. As evidence of that, Ralph's summary (here) of his 2005 round-the-world trip is a must read.

Outside of work, Ralph earned his private pilot's license. He also enjoys photography, particularly when exploring scenic areas.

Radio Adventures and Achievement

Ralph's decades in amateur radio are filled with remarkable memories. He recalls operating at GB2BC in London (in 1982, with Fred Orsetti VE7IO and other SARC members) alongside the Sutton and Cheam Amateur Radio Society.

He also remembers a separate trip to the UK in October 2013 during which he operated at Poldhu Field—the site of Guglielmo Marconi's famous transatlantic radio signal tests. Ralph's narrative on the White Rock Club's website (here) explains:

"There is no 'place' called Poldhu, but there is a bay and a series of bluffs that go by that name. I bought a day pass bus ticket and started on my journey. Poldhu is the place where Marconi set up his transmitting antennas and transmitter that succeeded in sending the Morse 'S' that was heard in St. John's Nfld in December of 1901. The field where he established his antenna farm faced the sea directly to the west, the direction to North America that he wanted to be heard. I arrived on a windy (it's always windy by the sea in Cornwall) cloudy day, threatening rain. I got off the bus at Poldhu Cove and walked up the road towards a building that used to be a hotel, but now a care home. There is little marking the site as to what significance it holds, except a few small signs indicating the path to the Marconi site and center. I walked into the field, after opening the latched gate and went to the marker on the Cornwall Coast Path which indicates that place as where Marconi conducted his radio experiments. I could walk over to the foundations of the transmitting hut and see the massive cement guy wire footings in a great circle around what would have been the antenna support masts.

I set up my dipole near the cliff edge on 20 meters and radio near the path in the field and used one of the antenna mast guy wire footings as a seat and tuned across the band. I was able to work a number of stations including my first

trans-Atlantic QSO with a station in South Carolina. Again, the band seemed quite busy, and the contacts were fairly short—typical 20-meter handshake style but with a bit of 'back and forth' as well. One of the French stations that I worked commented on the Poldhu QTH that I had given and asked about the Marconi significance. I was quite happy to be able to tell him that I was in the field that he had used for his antenna farm! As it was quite windy, my fingers had to be warmed up from time to time, but to visit the site where long distance radio really began, gave me a warm feeling that I'm sure I will feel throughout my Amateur life."

Figure 2Ralph operating TM100VIMY

A poignant moment for Ralph involved his participation, in early April 2017, in setting up 100th anniversary station TM100VIMY at Vimy Ridge, honoring the 100th anniversary of the battle where his grandfather had served in 1917. As Ralph explains in his summary on the White Rock Club's website (here):

"On April 9th, the 100th Anniversary of the start of the battle, a large crowd gathered at the VIMY memorial for a special celebration. Attending were the Prime Minister and Governor General of Canada, HRH Prince Charles, Prince Andrew and Prince Harry, and the President of France. They and about 35,000 of my closest friends joined together to remember the sacrifice of the men who fought for that ground a century ago. This was a truly moving experience and one that I'm happy to have attended. I remembered my grandfather who was at Vimy so long ago, but survived, so many did not, and are remembered on the walls of the cenotaph as they have no known grave.

I think that, as a group, we showed quite well, and the special event station passed the message to the world that we don't forget---we remember and celebrate the thing that was accomplished there. I am proud to have been part of a group of Amateurs who made it happen."

Operating Style and Gear

Ralph is a CW aficionado, especially for late-night sessions. He quips that "It doesn't bother sleeping family."

Ralph's shack has evolved significantly, from a home-brewed oscillator to a Johnson Ranger, then to a Drake TR4 transceiver, and now to an ICOM IC7300. "Less money per watt," he notes with the kind of pragmatic enthusiasm only a seasoned ham could appreciate.

One of his favorite pieces of equipment is the SteppIR antenna, which he praises for its innovative design and the convenience of not requiring a tuner.

Reflections on the Hobby

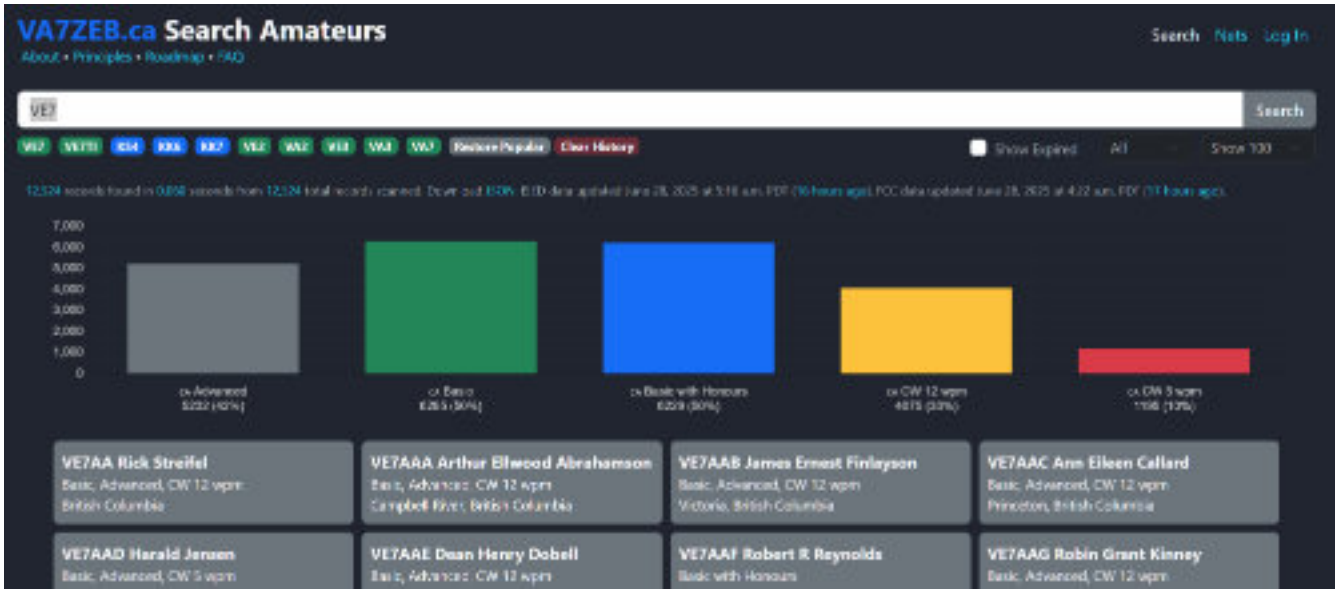
Ralph enjoys the annual British Empire Radio Union (BERU) contest and continues to find joy in traditional modes like CW. He laments that many newer hams miss out on learning Morse Code. Digital modes don't hold his interest. In the true spirit of amateur radio, Ralph observes that the hobby has allowed him to be friends with others, irrespective of who they are or where they come from.

A Lasting Influence

For Ralph, amateur radio has been more than a hobby—it was a gateway into a fulfilling technical career and a lifelong pursuit of knowledge, connection, and adventure. Looking back, he credits amateur radio for guiding him into electronics and aviation.

~ Blake VA7BWG

Here is a great new callsign search site



SARC member Reg Natarajan VA7ZEB wrote a call sign search because he didn't like the ISED search, and he wanted to search US/CA amateurs from the same website. Reg also wanted to know the breakdown of results by certification, so if you search for VA7 or VE7, it will tell you how many of those have advanced and CW. It also has a net logger, and may gain other features as time passes. Your feedback is welcome.

https://va7zeb.ca/search/amateur

I think that you will be amazed at the variety of information that is available.

~

From The Communicator in 1991

DUES are DUE

Please try to see the Treas. and give him $20.00 it will be greatly appreciated by he and his family!!

Blake VA7BWG noted that, adjusted for inflation, the SARC membership fee of $20 in 1991 should be $47.20 today. What a bargain that it is as low as $26,and look at the great free magazine that you receive as a bonus!

PLEASE RENEW!

SCANNING: Mr. Scanner exits the scanner biz

Norm Schrein, known as “Mr. Scanner,” has retired from the scanner business after decades in the field. He started publishing frequency directories in 1977 and evolved his publications into National Communications Magazine, which he edited until 2014. Schrein was influential in the scanner community, with strategic partnerships and various business interests, including selling scanners and accessories.

~ National Communications Magazine

SARC-SEPAR Field Day 2025

3F at our training centre

by DOUG JEFFREY VA7JDJ

The tradition continues! As always the RAC/ARRL Field Day is set for the fourth full weekend in June. For those not in the know Field Day is one of the largest North American amateur radio events of the year. Typically over 30,000 hams operate in this event. Individuals and clubs participate by setting up portable stations or operating from an Emergency Operations Center (EOC). This is a chance to show the public what we do with to support Emergency Preparedness, Public Service and to demonstrate our technical skill in communications.

SARC start our planning for Field Day long in advance of the event. Usually this involves a small group meeting to decide everything from what equipment we will be putting on the air to to planning for a dinner on the Saturday night. Field Day operates similar to the way most radio contests do with points being granted for making radio contacts, but it goes further offering points for a variety of operational activities. After hours of staring at the rules for 2025 the team decided that we would operate from the Operations and Training Center (OTC) using 3 low power (100W) stations. A station was set up focusing on Phone, CW and FT8 (digital) modes. We decided to use the Bigfoot mobile

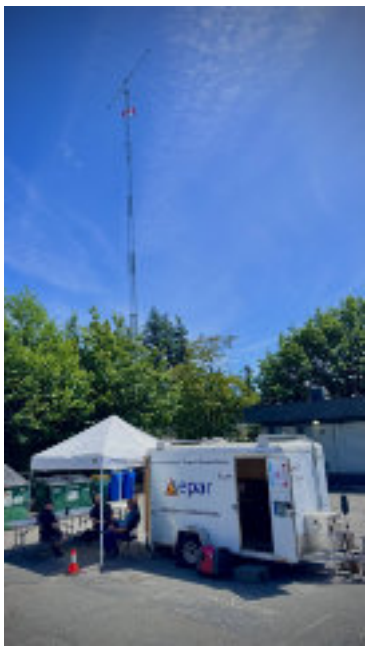
tower and beam for 10m, 15m and 20m. The beam would be pointed South East to give the best overall coverage to the rest of North America from BC. Our long wire antenna for 40m and 80m would be linked to the portable tower allowing it to be much higher than usual, improving our overall operating performance on those bands.

With a plan in place the setup crew met on Friday to deploy the portable tower, run cables, test gear and generally ensure that all equipment was operating optimally. The overall plan of who would operate which radios at what time was set and communicated to operators and station managers. We felt ready for the Field Day to begin.

On Saturday morning people started arriving at the OTC after our usual breakfast ritual at Denny's. Scott delivered the site safety briefing about 20 minutes before start time and then we were off. Band conditions were not perfect, so we worked our way through contacts making the best of the propagation. Our FT8 station started off slowly with very few contacts being made. Eventually the source of the problem was narrowed down to a bad coax delivering signals from the triplexer into the classroom Fortunately when the coax was installed 2 runs were put in. We were able to move over to the other run and were away in the digital calls.

A few other special radio contacts were made during the event. Our satellite station manager managed to make a number of VHF contacts using repeaters on different satellites. At one point he finished a contact and came in excited to report that he was not just using the repeater on the ISS, but in fact had talked with an astronaut on board! If that wasn't enough he managed to talk with a different astronaut on a subsequent ISS pass. The other very unique contacts that were made were SHF calls on 10GHz and 24 GHz. The wizardry of these microwave transverters allowed the signals from a stock VHF radio to be upconverted into these almost unimaginably high frequencies.

As the day progressed band conditions were up and down. By dinner time a good number of members had gathered to join in for the Field Day dinner. A big spread of food was setup



and the dinner hour passed by quickly with lots of good cheer about Field Day and people sharing their favorite radio stories.

Our scheduled operators kept the radios going through to the wee hours of the morning. After the schedule operators were through a small group of SARC members stayed up to keep the antennas warm. Conditions and time of day made for some pretty low rates of contact, but it all adds up in the end! The morning relief crew came loaded with coffee and breakfast sandwiches. A very welcome sight to be sure!

Overall we had a great time working the gear to make as many contacts over the radio as we could and spending time together with radio friends.

I want to extend my heartfelt thanks to all who participated in Field Day in any capacity. There are simply too many people who generously gave up their time and ability to make Field Day 2025 a great success. Thanks to you all!

~ Doug VA7JDJ

The Contest Contender

The RAC Canada Day Contest

Celebrating Canada's 158th birthday

by DOUG JEFFREY VA7JDJ

Contesting is an important aspect of our club's activities. It's interesting to reflect on why we do contesting and what we learn from the experience. We usually rally a team from the club to participate in the Canada Day Contest. This contest aligns with Canada's birthday and gives Canadian amateurs the opportunity to share the celebration with operators in Canada and abroad. Points are biased to making contacts with Canadian VE and VA stations more valuable and contacts with provincial RAC stations worth even more points.

Part of the reason that we actively participate in contesting is to demonstrate that our equipment and processes are running smoothly. In an emergency we need to be confident that the gear is running smoothly and that operators are experienced and comfortable in it's use. For 2025 we had the equipment and procedures all in place, but another wild card was dealt to us. Unfortunately a number of our regular operators ran into health and family commitments that cut down the size of our team. John VE7XB re-arranged the schedule multiple times reacting to the changing availability of operators.

The plans for operating had originally started with a plan to run 2 stations and to use the additional height of the Bigfoot portable antenna to increase our reach. As our numbers diminished over the days leading up to the contest it was determined that we would probably do better operating a single station at high power. Several experienced POTA

Doug Jeffrey VA7JDJ reporting on SARC's contesting efforts.

operators also joined the team taking their POTA experiences and crossing that over into into contest mode. Special thanks to Mike VE7YEG who helped guide them through their early contesting experiences.

Most of the action was on 20m during the day with some operators moving down to 40m and 80m at night. Conditions on 20m ranged from quiet to steady giving opportunities for Search & Pounce as well as running.

We did have some excitement at the OTC. The facility that we use is shared with the South Fraser Search and Rescue group. Unfortunately they forgot that we were operating in the radio room, so when they left the building they turned on the alarm and locked up as usual. When our final operator was leaving around midnight there was some excitement around the alarm system!

Thanks to all who organized and participated:

- Mike VE7YEG
- Sheldon VE7SRF
- John VE7TI
- Jan VA7VJ
- Les VA7OM
- Steve VE7SXM
- •Karl & Barb VA7QCK & VA7FDP
- Rob VE7CZV
- Scott VA7KAT
- John VA7XB

~ Doug VA7JDJ

I have switched PDF readers!

I recently switched from traditional PDF readers to the reader included in the free Duck browser. I have found that, not only is the Duck browser more secure, by not sharing your information and feeding you ads based on your browsing history, but it also removed those annoying ad breaks from YouTube. One of the best features though is the PDF reader. It shows quick links to Communicator stories on the left and I can also switch on a true 2-page view. As you may have noticed, some stories run across 2 or more pages. Some of the graphic are split if you only view one page at a time.

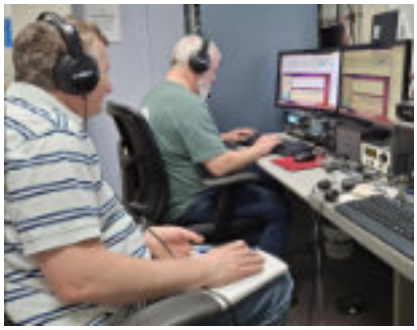
When you load a PDF, there is a switch at the top of the screen to turn on 2 page viewing and a second switch to show the cover page separately. Once that is done, you can view The Communicator as it was meant to be.

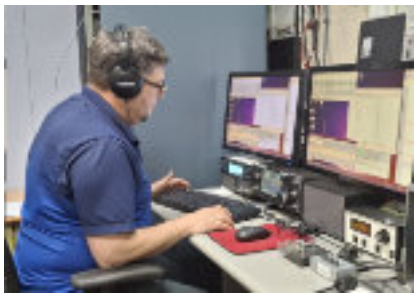
~ John VE7TI

CQ WPX (CW) Contest

Using VB7MAN

by JOHN BRODIE VA7XB





Our CW contest roster has grown, with the welcome addition of new members Brian VE7WO and Sheldon VE7SRF, who operated at our station for the first time. Otherwise, the regular CW crew was on hand including Les VA7OM, Jan VA7VJ, Slawa VE7LWW, Dino VE7NX and John VA7XB.

Propagation conditions were best described as “less than ideal” – daytime conditions were poor much of the time, yet there were occasional short openings to Europe, including during the evening hours. It is always a bonus when 10m is open, but it did not happen this time.

Use of the callsign VB7MAN had advantages and disadvantages: It created some interest when running, but caused confusion on search and pounce, with many operators either copying the callsign incorrectly, or asking for callsign repeats.

We did not experience any equipment malfunctions, other than one amp alarm/power down on 80m when Slawa was operating Friday evening. It appears that our previous swr problems either have been fixed by the maintenance on the beam or were somehow related to moisture from previous high rainfall events.

I heard from Brian and Les that Europe was wide open on Saturday evening but, unfortunately, we did not have sufficient operators for that time.

The QSO map cannot be displayed because the Adventure Radio site is not currently running.

~ John Brodie VA7XB

CQMPXCW 5/17/25 - Band by Band Stat:

Band	3.5	7	14	21	28	Tot
3.5	3	0	0	0	0	3
7	0	99	0	0	0	99
14	0	0	887	0	0	887
21	0	0	0	369	0	369
28	0	0	0	0	2	2
Total	3	99	887	369	2	1280

Rank		Score	QSO	Prefixes	
1	VA2WA	16,962,390	3,818	1,305	Contest Group du Quebec
2	KP2B	12,886,488	3,599	1,199	Florida Contest Group
3	NU2W	12,496,614	3,240	1,223	Frankford Radio Club
4	NO3Y	11,863,008	3,171	1,224	Potomac Valley Radio Club
5	WZ7F	9,818,162	3,015	1,144	Western Washington DX Club
6	N6NT	5,224,622	1,964	962	Potomac Valley Radio Club
7	KU7T	3,746,953	1,743	851	Bavarian Contest Club
8	KT7E	3,268,439	1,613	819	Willamette Valley DX Club
9	NM4AA	2,578,680	1,509	684	Florida Contest Group
10	VB7MAN	2,082,340	1,280	644	
11	NW6P	415,856	559	376	Northern California Contest Club
12	WF6C	29,945	128	113	NCCC

Here are the stats

The New Look of Our Website

Our website at https://ve7sar.net is the official online presence of the Surrey Amateur Radio Communications Society (SARC), based in Surrey, British Columbia, Canada. Thanks to Reg VA7ZEB and his team it has been completely overhauled to increase content and improve the user experience.

The website serves as a hub for SARC and its affiliate, the Surrey Emergency Program Amateur Radio (SEPAR), focusing on fostering amateur radio skills, community engagement, and emergency preparedness. It aims to inform members, prospective radio enthusiasts, and the public about SARC's activities, resources, and contributions to Surrey's communication infrastructure. The site emphasizes education, technical proficiency, and community service, particularly in emergency communications.

Some of the Key Sections and Content

The Home Page

Introduces SARC's mission to promote amateur radio through education, mentoring, and emergency support. It highlights SARC's role in maintaining communication infrastructure (repeaters, mobile units) critical for Surrey's emergency preparedness. The page mentions partnerships with local schools, like Kwantlen Park High School, where students can earn academic credit for amateur radio certification.

About Us

Details SARC's history, starting with its licensing as VE7SAR under Cary Miller (VE7CFC). It covers past events like Field Days, Christmas parties, and community activities (e.g., Heritage Day at Bear Creek Park). It describes SARC's community-driven approach, offering a welcoming environment for newcomers with mentorship from experienced "Elmers."

SEPAR (Surrey Emergency Program Amateur Radio)

This page is dedicated to SEPAR, SARC's emergency communications division, led by Gord Kirk VA7GK. SEPAR supports Surrey's emergency preparedness with trained volunteers and requires a criminal record check for membership. It outlines SEPAR's infrastructure, including a radio room at Surrey Fire Hall 1 and access to high-elevation repeater sites, supported by the Surrey Fire Service.

Repeaters

Provides technical details on SARC's repeater network, including:

- VE7RSC (VHF): 147.360 MHz+ (tone: 110.9 Hz North, 103.5 Hz South), IRLP node 1736, Echolink node 496228.
- 220 Band: 223.960 MHz- (tone: 110.9 Hz), IRLP node 1738.
- UHF: 443.775 MHz+ (tone: 110.9 Hz), Yaesu/Fusion and Analog, WIRES-X capable.
- Includes IRLP operating guidelines, DTMF codes (e.g., A3 for audio test, B for date, C for time).

Training and Education

SARC offers three to four 7-week online courses annually, with 100–200 students, covering Basic, Advanced, and Morse Code (CW) certifications. Graduates receive a one-year free SARC membership. There are a variety of workshops to develop related skills.

The Communicator

SARC's free bi-monthly digital newsletter, read by thousands in over 165 countries, covering technical articles, events, and SARC/SEPAR updates. Past issues are available.

Friends Lost...

Art Siemens VE7SIE (sk)

We are sad to report the passing of former SARC member Arthur Siemens VE7SIE. Art passed away unexpectedly on May 8th at Royal Columbian Hospital.

Art was well known and liked in the local ham community. He was a past member of Surrey Amateur Radio Communications with his partner Nicole VE7PET. Art was also a long-time volunteer with the Salvation Army where he often looked after one of their mobile kitchens, and an Emergency Social Services (ESS) volunteer where he assisted at emergency shelters. After moving to Port Coquitlam last year, Art joined the Maple Ridge Amateur Radio Club.

Our deepest condolences to Nicole and to Art's family.

~

David Sinclair VA7DRS (sk)

David was a member of SARC until he retired and moved to Armstrong, BC a few years ago. A member of the North Okanagan Radio Amateur Club (NORAC), he passed away June 24 from a heart attack.

Our deepest condolences to David's family.

~

May 2025

SARC General Meeting minutes

May 14, 2025

Recording Secretary MIKE PORISKY VA7YEG

Attendance: 21 members/guests attended.

Start Time: 19:00 hrs. May 14, 2025

Location: Fire Training Center – 14923 64 Ave

Welcome & Presentation of Agenda

Steve McLean called the meeting to order and gave a brief welcome message and introduction of tonight's guest speakers – Guy Immega (VA7GI) and Martin Matila (VA7MM).

Presentation

Guy demonstrated his Spark Gap transmission device that was originally built by Marconi in the early 40's and then used in WW1. This was recognized as the first (wide-band) radio transmitter; sending signals short distances. With further development, Marconi was able to improve the distance as far as 100 miles. In the early days they did not understand atmospheric propagation or why it was possible to receive signals further than line of site. The practicality of radio transmission was soon realized and the distance increased until transatlantic communication was possible.

Guy, reviewed the construction of both the transmitter and receiver – explaining the design evolution of each component

Mark continued the review of early transmitters and more specifically signal generators. He reviewed the above spark-gap transmitter and followed with the evolution of the Anderson attenuator, crystal oscillators, LC circuits, and more stable timing circuits; all used for sending CW (continuous wave). Eventually radio wave communication led to the introduction of the

vacuum tube which is still used today. Mark reviewed the schematic diagrams of early radios and demonstrated a regenerative receiver (on 80m) with POS feedback.

Business Meeting

Announcements:

- The AGM will take place during the June meeting. Reminder to those that want voting privileges during the meeting, that paid up membership is required. Also, if you will not be able to attend the meeting, please fill out a proxy form.
- Horace Bong (VA7XHB) is willing to assist members set up their radios to send Winlink email messages Saturday mornings at the OTC.
- Adam Drake is still accepting donated handheld radios that he can distribute to students taking his summer school program
- Reminder that everyone is invited to SARC's Saturday breakfast at Denny's (6850 King George Blvd) – 7 to 9 am, followed by a visit to the OTC.

Committee Reports:

Financial Report – Presented by Scott H.

- The Profit & Lost financial report and the latest Balance sheet were reviewed with members

SEPAR/OTC – Gord K.

- Gord thanked all those that assisted represent SEPAR at the City of Surrey's Emergency Preparedness event. Our presence provided an opportunity to introduce Surrey Amateur Radio to various elected officials, who past on their appreciation to SARC volunteers. Members of South Fraser Search & Rescue expressed interest in obtaining their amateur radio certification after learning about SARC and SEPAR.
- Talks continue with SFSAR regarding the allocation of space at the OTC.

Membership – John B.

- Seven to Eight new members have signed up in the last month, including several through the new web site, bringing the total to 155. John reminded everyone that membership renewals were now due. Voting at the AGM will require active status by through paid-up membership.

Contests – John B.

- John reviewed the contests that have recently completed and those coming next month.
- The WW DX CW contest will take place on May 23-24. The callsign VB7MAN is available to use.
- Field day is scheduled for June 28-29. The call for contest operators will go out in a couple of weeks. Anyone interested should contact John B.
- Canada Day contest will take place a few days after Field Day. The Big-foot antenna will remain in place after Field Day and 2 radios will be used for both contests.
- John S. indicated that the VB7MAN callsign was still available until the end of May to anyone that wanted to activate the special event. John also highlighted the great effort put in by some individuals including Jeanne VA7QD with over 250 QSOs. The combined contacts totaled over 2000 with some contacts using an original WWII radio. Thanks to Jaspal VA7JB for printing QSL cards that will be sent out soon.

Repeaters – All repeaters are operating normally. No Information was discussed.

HAM Classes - John S.

- There is one teaching week left in the current course, followed by review and practice tests before exams at the end of the month.
- Future classes are on hold until content is created to support the new questing bank. There are over 200 new questions and approximately 400 wording changes.

Old Business:

Current Projects – John B.:

- All beacons are working. The 10 GHz beacon, operating with just 150 mW, was heard at Mt. Olympia. Dino collected an audio file of the signal and will post it on SARC's website (ve7sar.net).
- A 47 GHz beacon is currently in development.
- The Maple Ridge swap meet that took place on May 4th brough in $710 in sales.
- Dino took the opportunity to set up and demonstrate his 10 GHz microwave transmitter. John B. created a poster that highlighted the 10 GHz beacon project, which generated a lot of interest from swap meet participants.

Field Day Planning - Andrew VA7LGN

- Andrew gave an overview of Field Day, which will take place during the last weekend in June.
- The call for operators will go out in early June.
- The event will be set up at the OTC again this year if a second site is not confirmed.
- Additional points (2x) are available if contacts are made using FT-8. It was suggested that the GOTA station be set up as the FT-8 station.
- Three radios will be available for contesting, plus the satellite station for extra points.
- John S. will send out invitations to Surrey elected officials. A proclamation has also been sent to the city and we are still waiting for permission to set up the big-foot tower.
- The HF antenna should be installed at Firehall 1 within the next couple of weeks.

Beam Replacement and Other: Steve M.

- Steve contacted several vendors for more information and pricing. On a separate topic Steve reminded members that Kjeld's tower is still available at no cost if anyone is willing to take it down.
- SARC's Foxhunting event was well attended despite a spattering of rain drops. The idea of having a Fall event was brought up and will be considered. Special thanks extended to Andrew (VA7LGN) for 3D-prining the trophies and to Anton, Scott, Ralph and Nell for preparing the food and drinks.
- Orders are being taken for SARC name tags. Anyone interested should contact Doug Jeffries (VA7JDJ)

New Business:

- Reminder that next month's meeting will include the Annual General Meeting (AGM) which will require a 25% presence to reach quorum. Members who will not be present at next month's meeting are encouraged to fill out a Proxy and give it to someone who will be attending. A link to the proxy form will be included in an upcoming bulletin.
- John B. asked for a show of hands of members interested in taking a first aid and/or CPR course if it was offered. More than half of those present expressed interest. Gord said that he will look into options.
- It was pointed out that receipts are not sent out when memberships are paid through e-transfers. Reg VA7ZEB said that he can add code on the website to send out a receipt when a new membership is paid. John B. would like to see PayPal phased out, in favour of e-transfer to 'payments@ve7sar.net'.

Adjournment:

Steve moved to adjourn the meeting, seconded by John S. VE7TI. Carried. The May meeting adjourned at 20:58 hours.

June 2025

SARC Annual General Meeting Minutes

June 11, 2025

Recording Secretary MIKE PORISKY VA7YEG

Date: Wednesday, June 11, 2025

Start Time: 19:02 hours

Location: Fire Training Centre – 14923 64 Avenue

Attendance and Quorum

Total members: 162

Members in good standing (paid): 110

Quorum required: 28

Members present (in person or by proxy): 39. Quorum was confirmed.

Call to Order and Agenda Review

- Steve McLean called the meeting to order at 19:02 hours, welcoming attendees. He explained that the evening would begin with the AGM, followed by the regular monthly meeting dedicated to Field Day planning.
- John B. confirmed that quorum was met and that all members present had received ballots for the election.
- The agenda was presented with no additions or objections.

Silent Key

- A moment of silence was held to honour SARC members who passed this year:
  - *Joe Klok (VA7JK)*
  - *Art Siemens (VE7SIE)*
  - *Walter Hendrickson (VE7BGJ)*
- Tributes were shared:
  - *John S. offered kind words in memory of Art.*
  - *Shawn D. spoke on Joe's contributions.*
  - *Steve M. acknowledged Walter's long-time involvement with SARC.*

Approval of 2024 Minutes

- Steve reminded members that the 2024 AGM minutes had been published in advance via bulletin.
- No questions or comments were received.

Financial Report – Presented by Scott H.

Scott H. presented the financial report, which was displayed to members.

Scott moved to accept the financial report as presented.

Seconded by: Andrew. Carried unanimously.

Announcements

Presented by Steve M.

- Field Day and the Canada Day Contest will be discussed during the regular meeting following the AGM.
- Summer Socials: Informal gatherings will be held during the July and August meeting dates. Members are encouraged to bring snacks; soft drinks will be provided.
- Volunteer Request: Radio operators are invited to assist at the City of Richmond's Salmon Festival and Canada Day Parade on Tuesday, July 1, from 09:00 to 12:30 hours. Interested members should contact Urey (ve7ure@cwthree.com).
- Weekly Breakfast: Ongoing invitation to join the Saturday breakfast at Denny's (6830 King George Blvd.) at 07:30 hours. The OTC will be open afterward for socializing and projects.
- 50th Anniversary: September 2025 marks SARC's 50th anniversary. John S. has written a commemorative article for The Communicator, which includes profiles of two founding members.
- The Hyack Parade will not require radio operator support this year, opting to use commercial radios.

Committee Reports

Past Accomplishments – Steve M.

- Three beacons (6m, 10m, and 24m) were built and installed by Dino and Scott.
- An AREDN antenna was installed at the Concord building (awaiting final configuration).
- Firehall 1 underwent upgrades; several computers were installed, and the Flex radio was relocated from the OTC for remote operation.
- The OTC radio room was reconfigured by Steve M. and John B., enabling battery backup during outages via a new 2kW inverter.
- The SARC website was redesigned by Reg N. (VA7ZEB), featuring updated photos, links to The Communicator, and a new archive index developed by Blake W. (VA7BWG).
- Community service events included BC Shake-Up, Run-Surrey-Run, Foxhunting, and the Surrey Emergency Preparedness event. A slideshow of members in action was presented.
- An amateur radio course at Kwantlen Park Secondary was led by John S. (VE7TI) with support from members and guests. Most students passed their certification.

SEPAR/OTC – Gord K. VA7GK

- Discussions continue with SFSAR regarding space allocation at the OTC.
- A VHF radio was installed in the classroom for certified operators, used regularly since. Project led by Reg N., built by John B.
- Acknowledgement of support from Surrey Fire Services, including storage access at multiple firehalls and use of Firehall 1 and the Training Centre.
- Members were encouraged to consider joining SEPAR; applications available from Gord. Existing SEPAR cards must be renewed every five years.

Membership – John B. VA7XB

- Current membership: 162
- Members in good standing: 110
- Growth attributed to recent ham classes and website improvements.
- Special thanks to John S., Stan W. VA7NF, and Reg N.

Contests – John B.

- 21 members participated in SSB, CW, and RTTY contests.
- Special mention: Slava (VE7LWW) placed 1st in Canada (BC) in the WW RTTY DX contest.
- Field Day: June 28–29; first draft schedule distributed.
- Canada Day Contest: Draft schedule in place, subject to updates.
- Reminder: SARC radios are available for all members to participate in contests.

Manna@80 – John S.

- Over 8,000 contacts were made worldwide; SARC accounted for 3,300 QSOs, including all 50 U.S. states (pending one confirmation).

Projects – John B.

- Notable achievements by Dino (VE7NX), including a record-breaking 24 GHz long-distance contact.
- Plans to attempt a 273 km contact under optimal conditions.
- Three new projects are planned for the upcoming year.
- Dino acknowledged the team's support and expressed enthusiasm for the upcoming 47 GHz beacon.
- Reg N. proposed a new project: a frequency tracker/radio finder for locating QRM sources.

Website & Nets – Reg N. (VA7ZEB)

- All nets operating well.
- New 440 net introduced: first Sunday of each month at 19:30 hours, led by Daryl (VA7CQD) — designed as a UHF test net.
- Website redesign now complete: visit ve7sar.net. Focus remains on keeping content current.

The Communicator – John S.

- Six issues annually, with growing outside contributions.
- SARC members are encouraged to submit content.
- Donations have been received in appreciation of the publication.

Ham Classes – John S.

- Summer school class cancelled due to low enrollment and funding.
- Ongoing communication with Adam to deliver electronics content to students.
- Three classes completed this year; certification stats unavailable as many students are remote.
- New exam question bank and handouts are being integrated into future course materials.
- A fall class is unlikely due to preparation time.
- Appreciation extended to Reg N. and Blake W. for the Communicator indexing project.

Repeater – Horace B.

- All repeaters are operating nominally.

Election of Directors

Conducted by Andrew E. VA7LGN

- Steve M. turned the floor over to Andrew E. to oversee the election process.
- The four incumbent directors agreed to stand for re-election and were pre-listed on the ballot.
- Three calls for nominations from the floor were made; none were received.
- As a result, the incumbents were re-elected by acclamation.

New Business

- John S. proposed that the following founding members be granted honorary lifetime membership in recognition of SARC's 50th anniversary and their attendance at the inaugural 1975 meeting:
  - *Fred Orsetti VE7IO*
  - *Ralph Webb VE7OM*
  - *Ken Clark VE7BC [Joined shortly afterwards]*
- The motion was unanimously carried.

Adjournment

Motion to adjourn: Steve M.
Seconded by: Gord K. (VA7GK)
Carried unanimously.

The AGM adjourned at 19:46 hours.

After the AGM concluded, the regular monthly meeting of SURREY AMATEUR RADIO COMMUNICATIONS (SARC) was convened.

June 2025 Monthly Meeting Minutes

Date: Wednesday, June 11, 2025

Start Time: 20:00 hours

Location: Fire Training Centre – 14923 64 Avenue

Call to Order and Agenda Review

Steve McLean VE7SXM called the meeting to order at 20:00 hours. This portion or the monthly meeting will consist of discussions about Field Day and the Canada Day contest.

The floor was turned over to Andrew E. (VA7LGN), coordinator for the Field Day event.

2025 Field Day Overview

Andrew reviewed the purpose of Field Day and gave a brief history of SARC's involvement over the years.

This year's Field Day will take place on June 28th and 29th .

Planning

- A Site plan was displayed, showing the placement of the SEPAR trailer and the big-foot antenna. The layout of equipment and the operations will be identical to last year.
- SARC will be operating as a 3F site, meaning 3 stations at a fixed base. CW, SSB and FT-8 are all allowed on the following 5 HF bands: 10m 15m 20m (using the beam antenna) 40m and 80m using the wire antenna. VHF and UHF frequencies are also permitted for satellite contacts.
- Invitations have already been sent out to municipal representatives and elected officials.
- The operator schedule was displayed with many openings still available. Any other members interested in contesting can add their names to the list that will be available following the meeting.

Saturday Supper

- This year, to simplify the organization of the meal served Saturday evening, it was suggested to order take-out. A show of hands was requested for those in favour of Chinese which was unanimous. Reg N. asked if a pot luck meal was more acceptable but it was pointed out that many would be too busy at the OTC to prepare a meal. Soft drinks and coffee will also be provided. Anton agreed to organize the delivery of the take-out order.

Setup

- The bigfoot trainer will be brought to the OTC on Thursday evening and it will be set up starting at approximately noon on Friday, June 27. Volunteers are needed to assist with the setup. Those interested should add their names to the forms available at the end of the meeting.
- Stan W. asked if operating a 3F site still restricts us from setting up within 24 hours of the start time. Andrew believes setup can be done anytime, but we will not be starting before 11:00 hours.
- Traditionally, pizza is brought in for those assisting with the setup on Friday afternoon.

Bonus point activities

- Adrian M. (VA7YEP) has agreed to demonstrate making a contact via satellite. The time for this demonstration will depend on the schedule of satellites passing overhead.
- Adrian M. will also operate the satellite radio station when appropriate satellites are within range.
- Dino & Scott will demonstrate microwave communications using 10 and 24 GHz frequencies.
- Dino has also agreed to hold a training session on how to receive signals from the 24 GHz beacon.
- Still looking for an activity that can be done by any youths in attendance (8-12 yrs).
- Points are available for making contact with Field Day organizers using VHF, UHF and WinLink. Horace B. (VA7XHB) has agreed to

send a WinLink email message to the organizers.

- Testing and operating for 1 hour using battery power only will result is additional points. The OTC radios will be tested to see if they continue running when the radio room is switched to battery power. This process will need to be coordinated with those operating the radios at the time. Doug J. (VA7JDJ) will attempt to make contacts with his QRP radio which operates on battery.

Questions and Feedback

- John B. will send out a bulletin on June 18th – if you have anything to add, send it to him before the 16th.
- John B. asked if SARC will operate a GOTA station? Can the SEPAR trailer be set up with radios for GOTA operators. Currently there are no GOTA participants signed up but the SEPAR trailer will be activated. The FT-8 station can also be used for GOTA if operators are available.
- Stan W. indicated that the trailer will require additional antennas but that should not be a problem.
- Doug J. pointed out that if conditions are good, we can use GOTA and if not good, we use FT-8.
- Reg N. had a request from Angus (VA7VY) for someone to monitor and participate in their emergency program at 9:00 hours Saturday. It will take approximately 5 minutes.
- Anton asked if anyone will be bringing a solar panel. Andrew believes that someone will bring that equipment.
- Doug stated that a Safety Officer is not required when operating from a fixed base. However, there are extra points for completing a safety-related checklist. Scott T. (VE7KAT) agreed to perform the duties of the Safety Officer.
- Rob G. (VE7CZV) would like to install the NVDA software on the second computer in the radio room. This will be done on Saturday. Rob will also create his CQ wav files on Saturday.
- John B. suggested running low power during the Canada Day contest. He will be collecting names of those wanting to participate.
- Anton confirmed that supper on Saturday is scheduled for 6 pm – estimating 25-30 members & guests.

Adjournment

Motion to adjourn: Steve M.

Seconded by: Doug J. (VA7JDJ)

Carried unanimously.

The meeting adjourned at 20:45 hours.

The SEPAR Report

Field Day 2025

by GORD KIRK VA7GK

Gord Kirk VA7GK is a SARC Director and the City of Surrey SEPAR Coordinator

Field Day 2025 is rapidly approaching and planning for this event is well underway. It is the largest ham radio event of the year. This annual event combines the technical skills with outreach and preparedness. Part of amateur radio is also public service using our skills to support our local city with public event communications, preparedness for communications outages and education. SEPAR is city's Emergency Program arm for amateur radio. Our local amateurs provide support to this program. Surrey Amateur Radio Communications (SARC) is the non-profit society that provides the local amateur radio activities which in turn create the enthusiastic and trained volunteers which volunteer with the city.

Field day is both a contest and an emergency exercise. It challenges us to set up our equipment to get the best results which ensures we set up and test all of our equipment annually. It gives a chance for newly licensed amateurs to get on the air on a busy weekend where they will get to experience using the radio to make contacts throughout North America. It allows us to invite the city agencies to see our trained volunteers operating the equipment.

It is a tremendously fun time. The camaraderie of the local radio community coming together, visiting, sharing a meal or two and talking/ using our radio gear is an annual highlight for amateur radio. It is also a fantastic reminder of the value of a trained amateur radio operator to the local community. Being confident in the use of our radios, and abilities. Knowing how far and to whom we can communicate with various modes in an emergency is extremely valuable. Whether it be digital modes, voice or CW having amateurs with radios and knowledge of how to use them is a skill that is extremely valuable in situations where normal communications are not possible.

Field day is the annual reminder to test out our gear. Is my radio programmed correctly, do I have a means to power it without traditional "grid power". How is my antenna working? Do I have new gear that I am looking forward to testing? It is also exciting to contact a friend in another city that I may have met at a local hamfest or simply talked to on the radio several times. Questions about what alternative modes and equipment I might use if the "bands" aren't doing well due to solar activity.

SEPAR members will be volunteering as part of the team for this year's field day in Surrey. The 100' portable tower Bigfoot will be set up along with the SEPAR trailer and radios to participate in the event. Our local elected officials and public service agencies have been invited. As this next Communicator is released field day will be over and the many stories will be shared about the weekend.

Our website has recently undergone a major upgrade and many pictures of the event will be available. Please make sure to visit and have a look. www.ve7sar.net

If you have been traveling or other reasons have kept you from participating in this year's field day you haven't missed everything. Each week we run practice nets via radio, have a drop in breakfast and a drop in at the Operations and Training Center (OTC) where many of our group come together and try out new things, test equipment and learn from

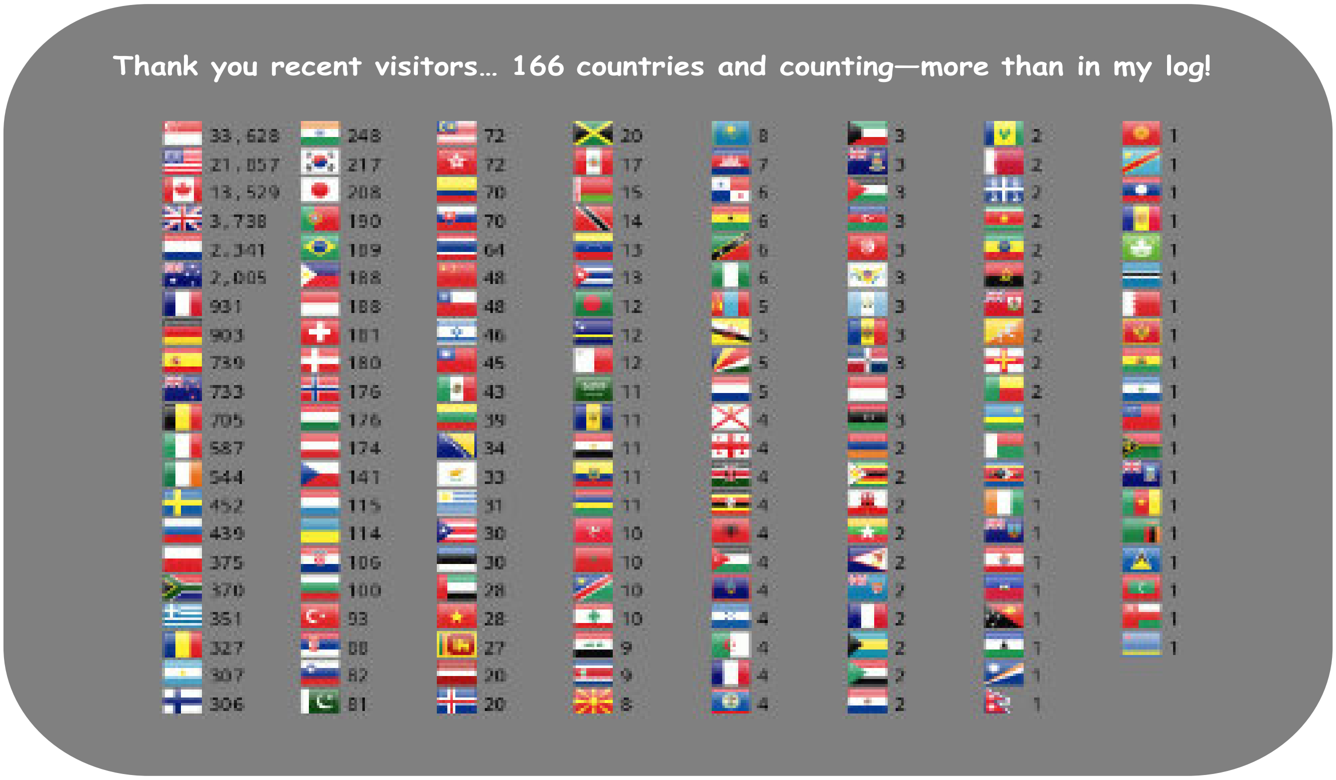
each other. Every week there is an opportunity to get help setting up your radio, Winlink, antenna, mesh node etc. There is opportunity to get coaching on operating a radio, or participating as one of our contest operators.

Our SEPAR/SARC team is a community that is welcoming and open to have you drop in and join us. I hope you will one day drop in and say hi.

As always if you have any questions please reach out.

~ Gord Kirk, VA7GK

Volunteer SEPAR Coordinator
coordinator@separ.ca



Reprint Policies

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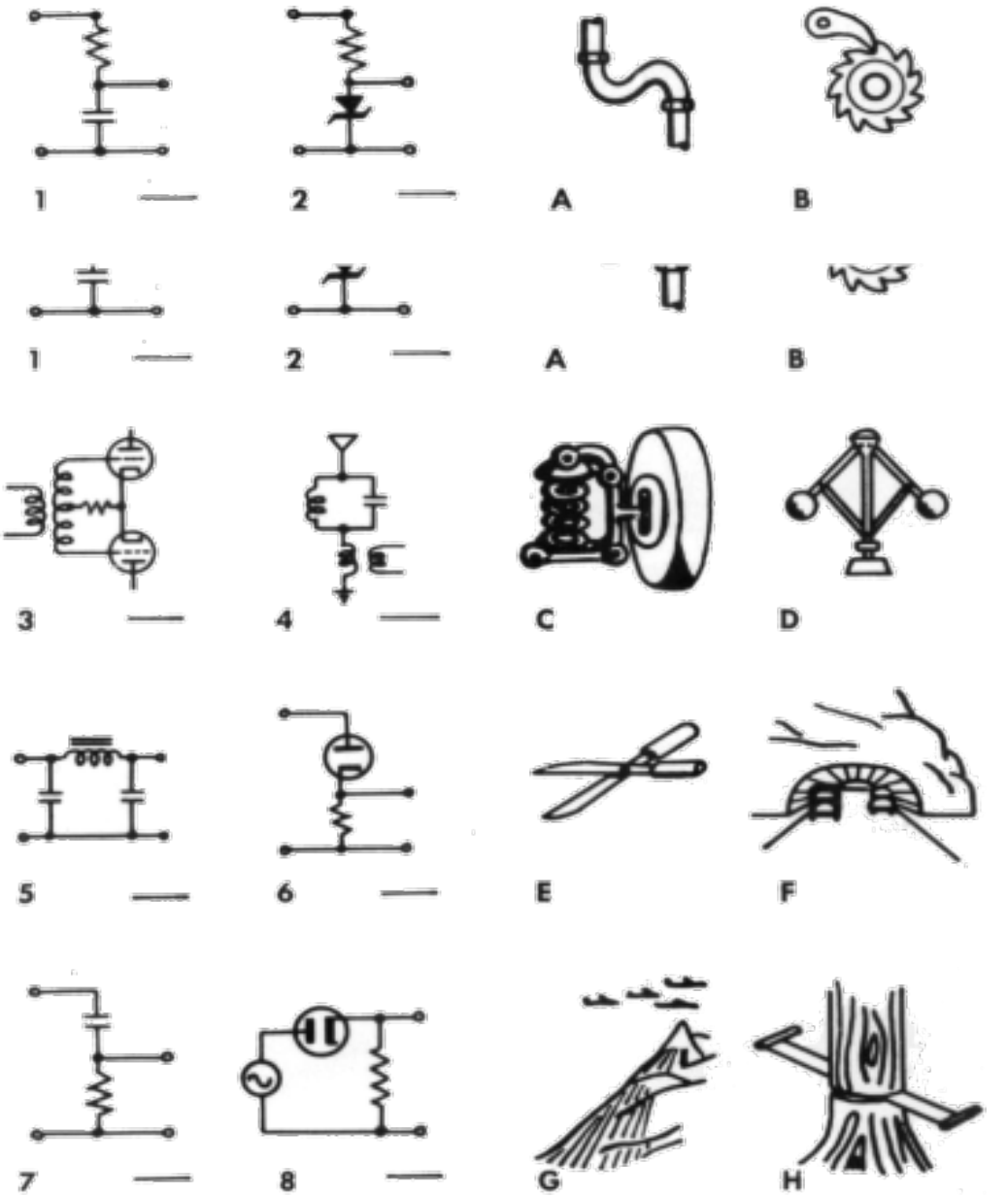
We welcome your comments and feedback

Please consider leaving a comment via email to communicator@ve7sar.net, or on our blog site https://ve7sar.blogspot.ca or, better yet, contact our authors directly, so they know someone is out there reading their work in our publication.

ELECTRONIC ANALOGY QUIZ

By ROBERT P. BALIN

Electronic circuits perform functions similar to many mechanical devices and natural phenomena, and finding an analogy between them often leads to a better understanding of both. See if you can match the numbered electronic circuits on the left with the lettered sketches on the right.



November, 1961

59

Popular Electronics - November 1961

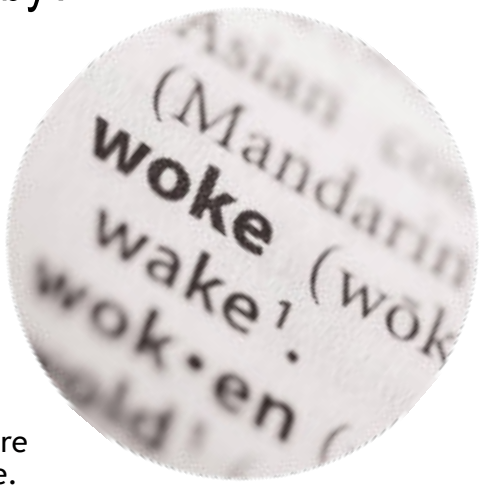
Answers on page 124

We're QRT

Opinion: OM, YL, and XYL

Are they still appropriate in the hobby?

by JOHN SCHOUTEN VE7TI



Recently, on a local repeater, an acquaintance overheard a conversation that mentioned the term 'XYL'. Curious, she asked what it meant. I explained that it referred to a married woman, not necessarily a ham, and that it was a form of historical slang that is prevalent in many hobbies and occupations.

Amateur radio has long been a hobby built on connection, technical skill, and a shared love for wireless communication. Over the decades, it has developed its own unique language—terms like YL, XYL, and OM are woven into the fabric of our community, serving as shorthand that fosters camaraderie. However, as societal norms evolve, the language we use can come under scrutiny. In 2025, the appropriateness of these traditional terms is worth examining. How do they fit into today's more diverse and inclusive amateur radio landscape, and how can operators navigate their use with respect and awareness?

In the recent past, there has been considerable anxiety in some quarters about "political correctness", particularly at universities. Now it's known as wokeness, and even though the terminology has changed, the concerns are much the same.

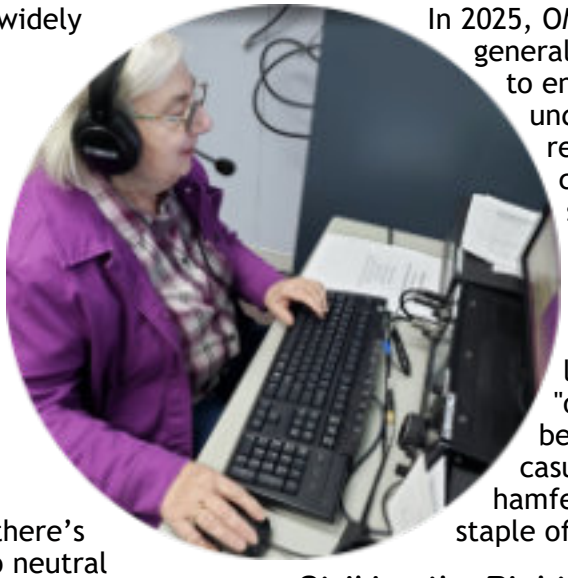
The Historical Roots of Ham Radio Lingo

The terms YL, XYL, and OM emerged in the early days of amateur radio, a time when Morse code and telegraphy dominated the airwaves. Efficiency was key, and abbreviations became standard practice. Yet, these terms also reflected the social dynamics of their era—a hobby that was predominantly male, with notable exceptions, and with women often in supportive, rather than operational roles. Today, as amateur radio welcomes more women and younger enthusiasts, the historical origin, and the way we use these terms must be understood to ensure everyone feels valued and included, and most of all, that they are not terms of disrespect or dismissal.

YL, standing for "Young Lady," has traditionally been used to refer to any female amateur radio operator, regardless of age. Originating in the early 20th century, it was a courteous way to

acknowledge women in a male-dominated space. Organizations like the Young Ladies Radio League (YLRL), and the Canadian Ladies Amateur Radio Association (CLARA) have proudly carried the term forward, using it in contests, awards, and fellowship.

In modern usage, YL remains widely accepted, particularly among seasoned operators who appreciate its historical significance. However, some newer hams—especially younger women—may find the term outdated or even slightly patronizing. While many still embrace it, others might prefer neutral alternatives like "operator" or simply being addressed by their call sign. The key is awareness: if an operator identifies as a YL, the term is perfectly appropriate, but if there's any uncertainty, defaulting to neutral language ensures respect.



XYL, meaning "Ex-Young Lady," was coined to describe the wife of a male ham operator, often implying she was not a licensed participant herself. It carried a lighthearted, almost affectionate tone, reflecting a time when many women were involved in the hobby indirectly—perhaps by tolerating long hours spent in the "shack" rather than operating the equipment themselves.

Today, appropriateness of the term XYL may be questioned by some. Many spouses are now licensed operators in their own right, proudly identifying as YLs rather than being relegated to the "ex" category. The term can come across as dismissive, reinforcing outdated gender roles that no longer reflect the reality of amateur radio. Outside the hobby, it may be best to avoid XYL altogether, opting instead for neutral terms like "spouse" or simply using the person's name or call sign if they are active in the hobby.

OM: A Term That Endures with Camaraderie. "Old Man," is perhaps the most resilient of these traditional terms. Used to address any male operator, regardless of age, it carries a sense of fellowship rather than literal meaning. Its origins lie in the early days of Morse code, where brevity was essential, and it quickly became a standard way to acknowledge fellow male hams.

In 2025, OM remains widely used and generally well-received. It's rare to encounter objections, as it's understood to be a term of respect rather than a commentary on age. That said, as with any jargon, context matters. In very formal settings or when interacting with operators who prefer modern language, alternatives like "operator" or call signs may be more appropriate. But for casual QSOs, club meetings, or hamfests, OM continues to be a staple of ham radio culture.

Striking the Right Balance in Modern Ham Radio

The challenge for today's amateur radio community is balancing tradition with inclusivity. The hobby's rich history is part of its charm, but language should never alienate newcomers or make anyone feel unwelcome. Here are some guiding principles for operators navigating this evolving landscape:

First, know your audience. In traditional settings—such as on-air nets, vintage radio gatherings, or conversations with long-time hams—terms like YL and OM are likely to be embraced. However, in more diverse or progressive circles, neutral language may be preferred.

Second, prioritize respect. If someone indicates they prefer not to be called YL or OM, the courteous response is to adjust accordingly. The spirit of amateur radio has always been about mutual respect, and that extends to how we address one another.

Finally, embrace the evolution of language. Just as technology in amateur radio has advanced, so too has the culture surrounding it. New terms may emerge, and old ones may fade, but the core values of friendship, learning, and shared passion remain unchanged.

Honoring the Past While Looking Forward

As a matter of opinion, a lot of today's 'wokefullness' rubs me the wrong way, but that is likely a product of my advancing age.To me, terms like YL, XYL, and OM are more than just abbreviations—they are artifacts of amateur radio's history, reflecting the social dynamics of their time.

Perhaps the best approach is one of mindfulness: recognizing when traditional terms are appropriate and when more neutral language better serves the community. By doing so, amateur radio can continue to thrive as a welcoming space for all—where the joy of communication transcends generational and cultural shifts.

What do you think? Are these terms still meaningful in your experience, or is it time for new conventions? Join the discussion on your local repeater, club forum, or social media—because in amateur radio, every voice matters.

~ John VE7TI

Electronic Analogy Quiz Answers

CIRCUIT	ANALOGY
1. Low-pass filter	F. Tunnel
A low-pass filter "clips off" signals above a certain frequency; a tunnel "clips off" objects above a certain height.	
2. Zener diode regulator	D. Centrifugal governor
A zener diode "resists" changes in voltage; a governor resists changes in speed.	
3. Push-pull circuit	H. Two-man saw
A signal is alternately "pushed" and "pulled" in a push-pull circuit; a two-man saw is alternately "pushed" and "pulled" by its operators.	
4. Wave trap	A. Drain trap
A wave trap removes unwanted signals; a drain trap "removes" unwanted odors.	
5. Smoothing filter	C. Coil spring suspension
A filter "absorbs" signal "peaks" before they reach the associated circuits; a spring "absorbs" vibration "peaks" before they reach the associated chassis.	
6. Diode clipper	E. Hedge clipper
A diode clipper "clips" off "peaks" in a signal; a hedge clipper "clips" of "peaks" in a hedge.	
7. High-pass filter	G. Mountains
A high-pass filter obstructs the passage of signals below a certain frequency; a mountain obstructs the passage of objects below a certain height.	
8. A.C. rectifier	B. Ratchet-and-pawl
An a.c. rectifier allows current to flow in one direction; a ratchet-and-pawl allows a shaft to turn in one direction.	

Social Reminder

The Saturday weekly social gathering is once again 'on' at the Denny's Restaurant, 6850 King George Blvd., Surrey BC from 07:30—09:30. All are invited. Afterwards, we will host workshops and will be available to invigilate Amateur Radio exams at the OTC, 5756—142 Street, Surrey from 10-noon.

Bring your ham issues, our Elmers will try to help you sort them out.

HAM LEFTOVERS...

How to track down radio transmissions

You turn the dial on your radio, and hear a powerful source of interference crackle in over the baseline noise. You're interested as to where it might be coming from. You're receiving it well, and the signal strength is strong, but is that because it's close or just particularly powerful? What could it be? How would you even go about tracking it down? Here is a good place to start: https://www.youtube.com/watch?v=3vLtIsfRu_o

HAM Operators Last Line of Communication in Nuclear War | The Iowa's News Now Vault

YouTube https://www.youtube.com/watch?v=YWrDQ0_iRW0

Auto add your FT8 QSO directly to QRZ.COM

7Z1CY says: "With this video I am trying to help increasing the QSO confirmation by automating QSO adding to QRZ after each successful FT8 QSO." See for yourself: https://youtu.be/lKeKZ6JYp2A

SWR Magazine

There is a new magazine that comes out of the Caribbean and looks quite nicely done… almost as good as The Communicator 😊 To subscribe for free: https://docs.google.com/forms/d/e/1FAIpQLSeNvfE0Q26iq-ZwzQ6ccsmhFvDJJiZ4ognUNw6FL75W-8K1ig/viewform?usp=header

Record-breaking participation in 2025 Amateur Radio exam in Bangladesh

This year's remarkable participation highlights the growing interest and engagement in amateur radio activities throughout the country. Participants hailed from various districts, reflecting a nationwide enthusiasm for exploring the opportunities and skills offered by amateur radio: https://forums.qrz.com/index.php?threads/record-beaking-participation-in-2025-amateur-radio-exam-in-bangladesh.953894/

Introduction to impedance matching

Impedance matching is one of the perpetual confusions for new electronics students, and for good reason: the idea that increasing the impedance of a circuit can lead to more power transmission is frighteningly un-intuitive at first glance. Even once you understand this, designing a circuit with impedance matching is a tricky task, and it's here that [Ralph Gable]'s introduction to impedance matching is helpful.

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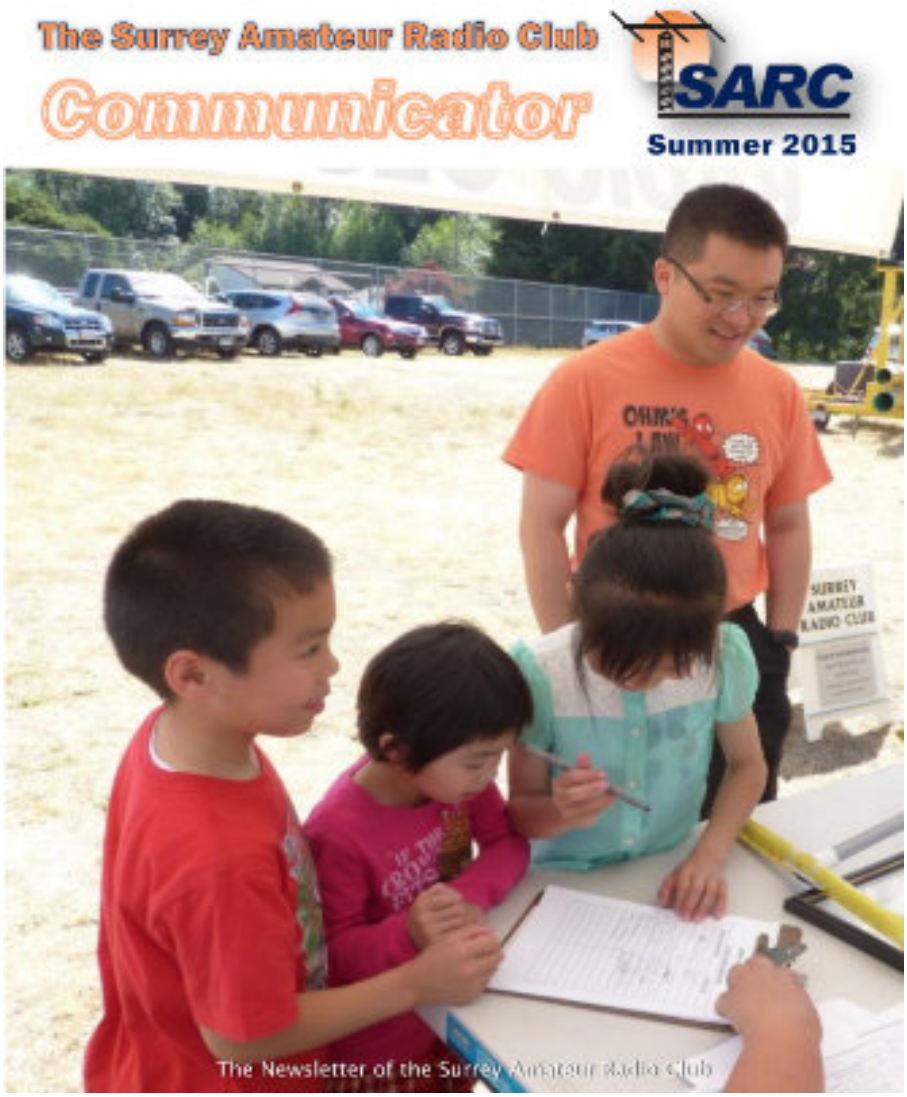
A look back…

At The Communicator—July 2015



Statistically our best Field Day ever, despite running the entire event QRP and on battery power. We set an overall top score in our class that has not been beaten to date. Read about it at:
https://tinyurl.com/July15Communicator

Past Communicators are available at:
Past Communicator Issues

or search the complete Communicator contents & index at:
SARCindex

July and August

We're on summer break, but we're back in September with a new Communicator and new meeting presenters.

In the meantime, you're invited to our Summer Social gatherings at the OTC on the second Wednesday evenings of July and August from 7pm.

Enjoy the summer, I'll be in the park with POTA.

On the Web

ve7sar.net

Between Communicators, watch your e-mail for news, announcements of Amateur Radio events, monthly meetings and training opportunities.

Click the links below to follow our presence on the web and social media:

SARC Blog
ve7sar.blogspot.ca

Bluesky (No more 'X')
#ve7sar.bsky.social

FaceBook
SurreyAmateurRadio

Our YouTube Channel
SurreyARC

SARC hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228. On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 or IRLP Node 1737.

Every Thursday evening at 8 pm is SARC's net for newly certified hams, although more experienced hams are also encouraged to attend. This net operates on the same frequencies shown above for the Tuesday nets. Participants will help you with your new-ham questions and assist you in getting comfortable using your radio. Check in with your GOTA net hosts.

Join the 220 MHz net taking place at 7:30 pm on the last Sunday of every month on VE7RSC repeater 223.960 MHz -1.6MHz tone 110.9 Hz, with net control, Shawn VE7BD. This is not a "chat" net – just check in, exchange signal reports, and get on with your evening.

Down The Log...

SARC Monthly Meetings

2nd Wed. (Sept-Jun)
1900 hrs at the Surrey Fire Service Training Centre, 14923 - 64 Avenue, Surrey, BC. Here is a what3words link and map: https://what3words.com/markers.addiction.ozone

Weekly SARC Social

Saturday between 0730 and 0930 hrs at the Denny's Restaurant, 6850 King George Blvd., Surrey BC

Workshops

Saturday between 1000 and Noon at the OTC 5756 142 Street, Surrey

SEPAR Net

Tuesday at 1930 hrs local on 147.360 MHz (+) Tone=110.9

SARC Net

Tuesday at 2000 hrs local on 147.360 MHz (+) Tone=110.9

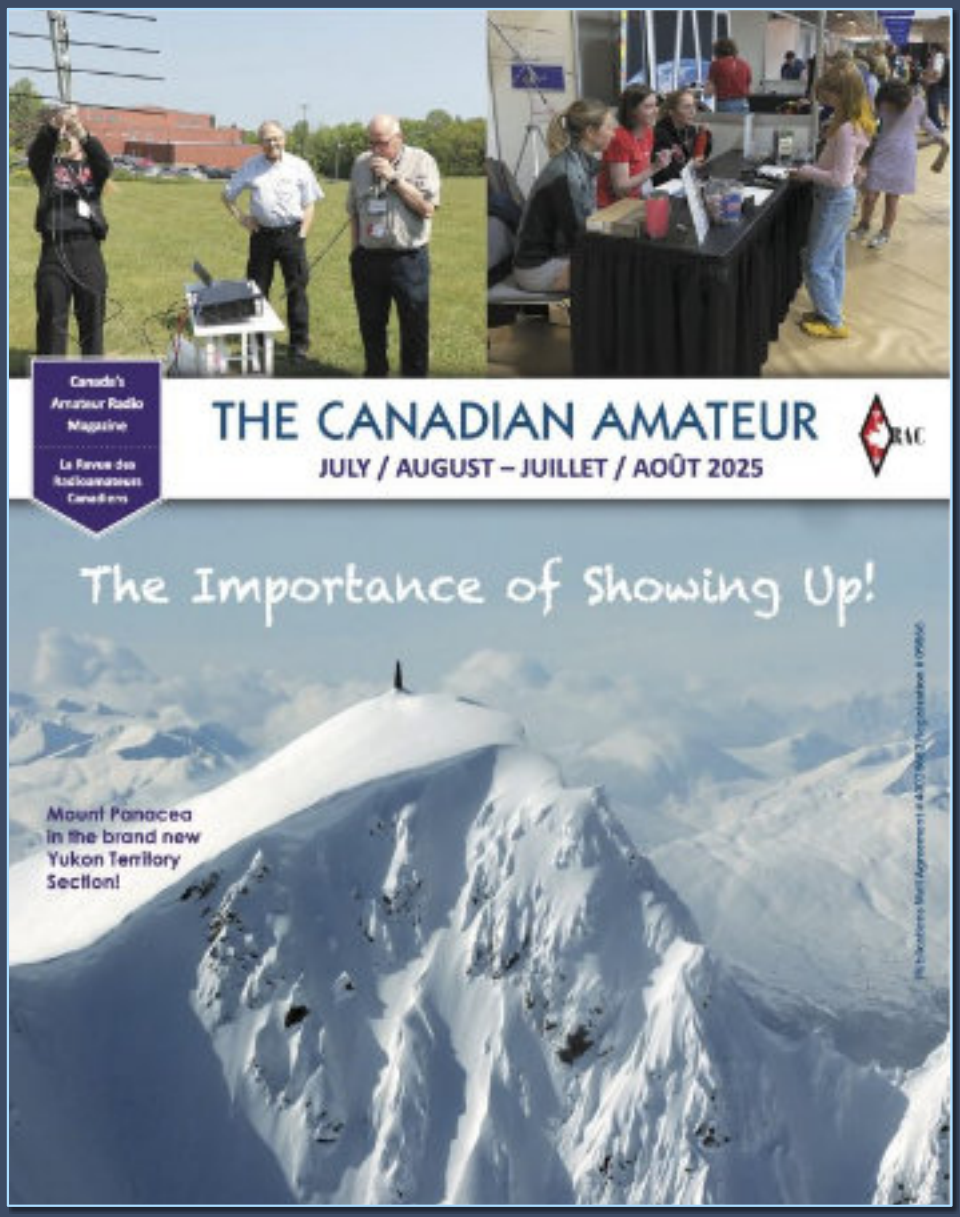
VE7RSC Repeaters

2m North: 147.360MHz+ Tone=110.9Hz
IRLP node 1736
Echolink node 496228

2m South: 147.360MHz+ Tone=103.5Hz Fusion capable; No IRLP/EchoLink

1.2m: 223.960 Mhz -1.6 Tone=110.9Hz

70cm: 443.775MHz+ Tone= 110.9Hz
IRLP node 1737
WiRES-X Room ID 00047



The Canadian Amateur (TCA),

Canada's premiere national magazine devoted to Amateur Radio, is published six times per year and is the membership journal of the Radio Amateurs of Canada (RAC). It is available in both print and digital versions (eTCA). Members of RAC, Canada's sole national Amateur Radio organization, receive TCA automatically.

A subscription to TCA also provides membership in Radio Amateurs of Canada. RAC is also the publisher of TCA. For information on how to join Radio Amateurs of Canada and subscribe to TCA please visit our Membership Sign Up page.

At 64-pages per issue and reaching approximately 4,500 readers, TCA offers news and views on the Canadian Amateur Radio scene from coast to coast to coast. It includes regular columns, features and technical articles of interest to Amateur Radio operators. In addition, a Coming Events calendar, Feedback, QSL Bureau information and coverage of regulatory issues are also provided.

If you would like additional information about The Canadian Amateur magazine please contact the Editor Alan Griffin at tcamag@yahoo.ca.