

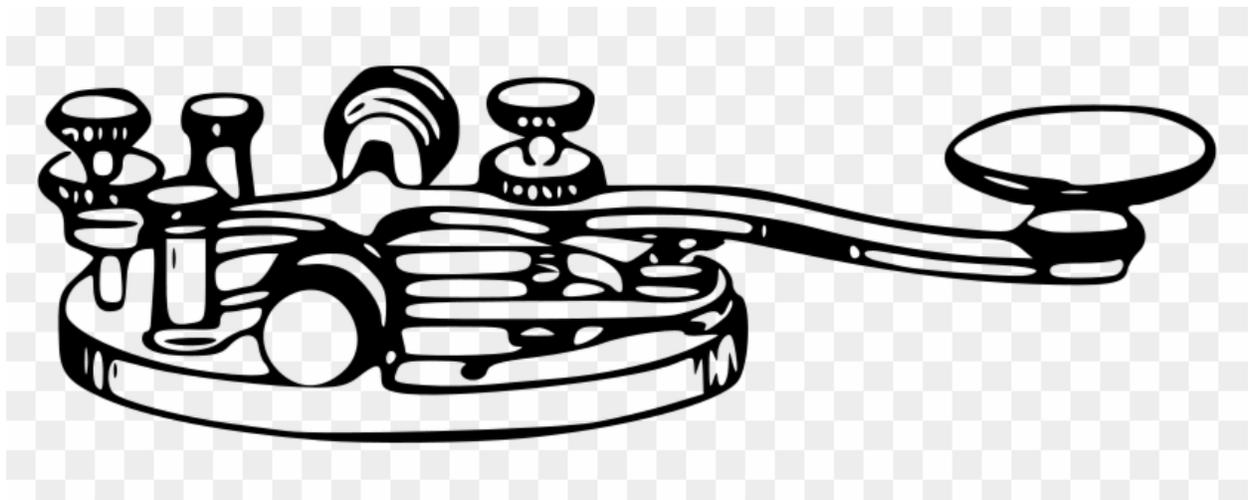


QSA-5

Marin Amateur Radio Society Monthly Newsletter

Established 1933

June 2025



When all else fails, you can count on Amateur Radio

From Our President:

The conventional wisdom is that the summer solstice is the first day of summer. This year that falls on 20 June. That has the longest period of daylight of the year and has been for at least a few centuries been called Midsummer eve. It also means that the days will start getting shorter again. I prefer to think of the cross-quarter days as when the seasons change. Of course, if you look up cross quarter days you will get a variety of days to choose from. For the start of summer, I like May Day but that is just me.... Getting to the point.

When you read this we will be in June and on our ham radio calendar the signal event has to be Field Day. MARS will be participating in Field Day this year on the 28th and 29th of June at Stafford Lake as we did last year. I urge you to come out and help us setup up, operate, strike down and or just visit. Stafford Lake is a beautiful spot and a chance to see folks face to face. For more information email fieldday@w6sg.net. We will be providing food so if you intend to come out I would like to know so email rsvp@w6sg.net

Our technical committee has recently completed some excellent work at the clubhouse. We now have HF, VHF, UHF, and microwave antennas. This also means that we can work HF from the clubhouse and our Sunday morning HF net is back up and running. Check the Nets page on our website. None of this work would have happened without the leadership and boundless energy of Gerald McCarthy W6NOV. Gearld conceived the idea and working with Milt Hyams KM6ASI and Marc Bruvry KF6VNT developed a plan and a budget. This they brought to the board and received approval and executed on time and on budget. I anticipate that there will be an article in QSA-5 with more information and pictures. Come on down to the clubhouse and check it out.

Our next club meeting will be on 6 June as usual. However, things will be a little different. Rob Rowlands NZ6J and Kathy Spicher KM6URP will be doing an AREDN or what is often called the mesh demo for the meeting. I understand that they will be setting up equipment in front of the clubhouse at 6:30 so you may want to show up early. I expect extra folks to show up so please email me at rsvp@w6sg.net so I can make sure to have enough pizza.

73 de wa6uds

From the Editor:

It's June and summer is here! June ushers in the year's biggest radio event, Field Day. The QSA-5 will be covering this event in both this month's issue and the July issue. As always, the Marin Amateur Radio Society is busy with numerous events, assisting our community and the amateur radio arts.

This month, we've included the first do-it-yourself antenna project, the classic dipole. Over the next few issues, we'll provide instructions for antennas you can build easily and cheaply. These antennas have been thoroughly tested in the field under a variety of physical conditions as well as with several different radio types. As we all know, commercially made antennas can be expensive and difficult to get set up. The antennas we'll present will be cheap, easy to install and very effective.

I know many of you who do the HF bands have been frustrated because of the high K indexes and poor signal propagation. It's the way of the bands and a great set of band conditions are generally around the corner! As of the writing (June 1st, 2025) of this letter, the K index is at 8 and band conditions are poor. I planned on a morning of European contacts. As the old adage goes "Man makes plans and God Laughs."

As always, a special thank you to Curtiss Kim and the usual suspects for making the QSA-5 the publication it is. I appreciate your help and couldn't do this without you. As always, please send me ideas and articles you've written, and we'll get them into the pages of the QSA-5. After all, this is your publication.

QSA-5Editor@w6sg.net



New Members:

Charles Darwall KO6JDL - San Rafael

Karen Nyhus KN6SGD - Petaluma

Bob Silva WA6NEA – Roseville



“Your parents hath given you a name. And the FCC hath given you another...”



Marin Amateur Radio Society Board of Directors Meeting 5/8/2025

Call to Order 19:30 Hours (7:30 PM)

Attendance:

President: Curtis Ardourel WA6UDS

Vice President: Ken Brownfield AB6JR

Secretary: James Saltzgaber KM6WWY

Treasurer: Bruce Bartel N6VLB

Director: Richard Cochran AG6QR

Director: Steve Toquinto KB6HOH

Director: Ed Essick K6ELE

Trustee W6SG: Marc Bruvry KF6VNT

Trustee K6GWE: Brian Cooley K6EZX

Adopt agenda

Approve minutes of 10 April board meeting published in QSA-5

Secretary's Report/Communications- Not present.

Treasurer's Report – Treasurer's report published in QSA-5. Taxes are due 5/15, Accountant, Mark Mumm, has done draft versions and submitted them for treasurer's and president's signature.

Members present: Skip Fedanzo KJ6ARL, Antonis Papatsaras AA6PP, Scott Pasternak KN6ZDM, Dan Sobel N6HLZ, Mark Klein KM6AOW, Rob Rolands NZ6J, Kathy Spicher KM6URP, Charlie Benet AI6TT, Lary Loomer KI6LNB

Committee and other Reports:

- 1. Membership** Curtis WA6UDS- As of today, membership total is 120, 73% of this time last year. He will update QSA-5 and will send a group email to remind members who have not renewed.
- 2. Facilities** Skip KJ6ARL – There will be antenna work on roof during the new few weekends. Cleanup along west wall: The gardener has done some cleanup along the west side and some weed whacking in the back. It was moved that Skip be authorized no more than \$600/visit to do quarterly cleanup He will put the gardener on a quarterly schedule to keep the weeds under control. It was found that the Comm Van shore power circuit Romex cable is bad and needs repair. Curtis WA6UDS – Dan N6HLZ & Mark Klein KM6AOW installed a new temporary cord. Dan N6HLZ – power should be taken from an appropriate source and installed in a code compliant manner. Curtis WA6UDS – This needs to be done before the end of summer. Skip and Curtis will get an estimate and organize the repair.
- 3. VOAD/RCV** Skip KJ6ARL – RCV participated in the Beacon 2025 Exercise, May 1st. Communications were tested from various potential Red Cross shelter sites and had good communication. It is now in the VOAD ballpark to determine if RCV will take them on as Community Based Organizations that are supported. This remains to be discussed. Tests with Red Cross radios cannot reach their headquarters from some sites, RCV UHF frequencies will be more effective.
- 4. Technical** Milt KM6ASI -Not present.
- 5. Public Service** Scott KN6ZDM- 3 events completed so far this year. Next event 6/8, Dipsea organized by Rob NZ6J. APRS worked well on this last event, with IGATES that work well. The Ridge Trail Association donated \$500 to MARS in appreciation for our support for their event.
- 6. VE Testing** Jim – Not present
- 7. Comm Truck** Charlie AI6TT – Comm Van is registered and sticker affixed. Curtis WA6UDS – Congratulations on your new position. Charlie – has been cleaning and getting it organized, and lubricating locks and door bearings. Test and lubricating of the mast needs to be scheduled. Curtis – We also need to get the portable generator test ran in preparation for Field Day.

8. NBAM Kathy KM6URP – Has meeting with Maj. Wykoff with Salvation Army in Petaluma to discuss installation of one or possibly 2 AREDN nodes there. One will be Petaluma to Sonoma Mt. and Salvation Army to DV Ranch in west Sonoma. Met with Bodega Bay and delivered equipment. They are planning and working on getting the equipment installed. They were assisted with updating the nodes when delivered. Battery and solar power are installed on their sites and they will require cables and switches to complete the installation. Disaster simulation May 31 by N. Sonoma County CERT. NBAM AREDN team will participate with cameras, VOIP phones, WINLINK over AREDN to send resource requests. Kathy is working on a COMM Plan. Work is continuing with Sonoma County Infrastructure for the 5 proposed AREDN sites. We have secured 2 of them, Geysers Peak and Pine Mountain. They are working on Sonoma Mountain and have approved of another meeting. Rob and Kathy will be doing an AREDN demo at the next MARS meeting at the clubhouse. NBAM will have an AREDN demonstration at this year's Field Day. Mark KM6AOW – Last Sunday a hands on AREDN training with another scheduled on Saturday May 24th. Mark will handle emailing invitations to properly focus the attendees to the technical level of the training. A new release of the AREDN software is out and in the field. This is the "big release" that has Babble & OLSR technology. AREDN north bay performance should be improved. In the future OLSR technology will eventually be phased out in favor of Babble technology. Legacy Tunneling technology is being phased out. This will require changes in the HAP at the club. New HAP routers will be discussed at the next NBAM meeting.

9. Field Day Steve KBHOH – Committee meeting was held Wednesday. Dan KN6PNA is working on an ICS-201 for Field Day. We will be requesting a loaner AED for field day from Marin County or Novato Fire. Training in its use will be required. We will not have CAL Anber available to do the food service. KB6JHT may be available to help. Anyone who can help with that please contact Steve. Scott KN6ZDM volunteered for a cooking shift. An official greeter will also be present.

10. Picnic Steve KN6HOH – No discussion currently. The club picnic will be on September 13th.

Old Business:

1. Donations Committee Charter- Curtis WA6UDS is still working on this one.
2. New Google environment – Online storage of club records Mark KKM6AOW – NBAM is transferring documents into it and the permissions are working well so far. They will soon be having additional people adding documents, and he will report if there are any problems.

3. Keeping public meetings fun from this 9-minute video:
https://www.youtube.com/watch?v=6_aCmXNQchc
4. Curtis WA6UDS – We are doing some of the suggestions in the video, some we are not. One other issue is detailed committee reports in the general meeting. Reduce this to Activity announcements and keep them to 1:30 or 2:00 minute reports. Curtis will try to put this into practice at the next board meeting. Prior to the meeting starting he will check with committee chairs if they have anything to report.
5. 6 Meter Repeater Curtis WA6UDS – The 6-meter repeater survey results were not conclusive for or against obtaining and installing the 6-meter repeater. Ed K6ELE inquired what the cost to install it would be. Rob NZ6J was requested to produce a budget for this repeater. He noted that Dale on Sonoma Mountain may be interested in hosting it at MARS expense, and that 6- meter repeaters are being shut down across the US. Kathy KM6URP – Questioned whether Sonoma County Radio Amateurs would be interested. She is on the SCRA board and will put it on their agenda for next week. Skip KJ6ARL – Recommended that we “do touch it!” considering our current budget deficit and that we currently have enough repeaters. Antonis AA6PP – It feels like a backwards move for the club. Rob NZ6J – We do need to let Eric at Wolfback Ridge know if we are interested in it. He will wait for the results of the SCRA board meeting to let Erik know if we or SCRA is interested.

New Business:

1. KWMR, proposal by Curtiss KM6GUY that MARS hose Ham radio focused programs. Tabled until June meeting. Cancelling July meeting since it falls on the 4th. Curtis WA6UDS proposed cancelling the July 4th monthly club general membership meeting. Following discussion, it was MSC'd by a show of hands that the July meeting be cancelled
2. Rent increase for our upstairs tenant- Curtis WA6UDS
 - a. The last rent increase was 6/1/24 of \$100 to \$2700
 - b. 2025 approved budget assumes increase to \$2800.

Discussion of rent increase included presence of 5% county cap, possibility that tenant share utility costs, she is not presently paying utilities, and if tenant does decide to move out, substantial upgrade and other work would be required before a new tenant could move in. The possibility of writing an updated lease that includes utility charges was discussed. The fact that there is currently no provision for separate metering was mentioned. Rent increase was tabled until the next board meeting.

Good of the Order – Nothing Noted

Executive Session -Not Required

Adjourn MSC to adjourn at 20:53

Next Regular Meeting 6 June 2025

Next Board Meeting 12 June 202

Marin Amateur Radio Club

Balance Sheet Comparison

As of May 31, 2025

| | AS OF MAY 31, 2025 | TOTAL AS OF MAY 31, 2024 (PY) |
|-------------------------------------|---------------------|----------------------------------|
| ASSETS | | |
| Current Assets | | |
| Bank Accounts | | |
| B of A Facilities Account - 8795 | 1,516.40 | 5,170.90 |
| B of A General account - 4328 | 72,078.87 | 61,352.98 |
| CD | 0.00 | 0.00 |
| Money Market | 0.00 | 0.00 |
| VE Session Cash | 0.00 | 0.00 |
| VE Session Cash Received | 0.00 | 0.00 |
| Total Bank Accounts | \$73,595.27 | \$66,523.88 |
| Other Current Assets | | |
| Uncategorized Asset | 0.00 | 385.00 |
| Total Other Current Assets | \$0.00 | \$385.00 |
| Total Current Assets | \$73,595.27 | \$66,908.88 |
| Fixed Assets | | |
| club house- 27 Shell Rd. MV 5 | 8,983.00 | 58,983.00 |
| Total Fixed Assets | \$58,983.00 | \$58,983.00 |
| TOTAL ASSETS | \$132,578.27 | \$125,891.88 |
| LIABILITIES AND EQUITY | | |
| Liabilities | | |
| Total Liabilities | | |
| Equity | | |
| Opening Balance Net Assets | 124,400.00 | 124,400.00 |
| Retained Earnings | 15,577.46 | 13,748.91 |
| Net Income | -7,399.19 | -12,257.03 |
| Total Equity | \$132,578.27 | \$125,891.88 |
| TOTAL LIABILITIES AND EQUITY | \$132,578.27 | \$125,891.88 |

Marin Amateur Radio Club

Profit and Loss

January - May, 2025

| | TOTAL | |
|-------------------------------|--------------------|----------------------|
| | JAN - MAY, 2025 | JAN - MAY, 2024 (PY) |
| Income | | |
| Christmas Party Income | | 640.00 |
| Donations | 1,299.00 | 12,000.51 |
| Dues | 180.00 | 270.00 |
| Public Service Refund | | 168.15 |
| Rent | 13,500.00 | 15,600.00 |
| Unapplied Cash Payment Income | | 385.00 |
| Total Income | \$14,979.00 | \$29,063.66 |
| GROSS PROFIT | \$14,979.00 | \$29,063.66 |
| Expenses | | |
| Accounting | 1,705.00 | 300.00 |
| Awards | 400.00 | |
| Car & Truck | 354.94 | 429.95 |
| Car & Truck Gas | 34.89 | 88.02 |
| Total Car & Truck | 389.83 | 517.97 |
| Christmas Party | | 2,970.23 |
| Contractors | | 21,109.00 |
| Equipment < \$2,500 | 431.48 | |
| Field day | 35.00 | 35.00 |
| Food | 661.44 | 68.20 |
| Garbage | 263.70 | 247.50 |
| Housekeeping | | 448.65 |
| Insurance | 1,427.83 | 1,131.50 |
| Comm Van Insurance | 2,085.07 | 2,026.00 |
| Total Insurance | 3,512.90 | 3,157.50 |
| Meals | 70.77 | 76.86 |

| | | |
|--------------------------------|---------------------|----------------------|
| Office Supplies & Software | 65.00 | 18.00 |
| Other Business Expenses | 575.32 | |
| Public Service Expense | 3,295.57 | 3,960.47 |
| Reimbursable Expenses | | 20.00 |
| Repair & Maintenance | 1,521.63 | 14.71 |
| Repeater 1,878.89 | | |
| Station Upgrades & Maintenance | | 1,894.69 |
| Taxes & Licenses | 4,164.36 | 4,049.67 |
| Utilities | 1,917.45 | 1,849.02 |
| Water | 341.05 | 385.29 |
| Web Services Expenses | 0.00 | |
| Total Expenses | \$21,245.19 | \$41,106.96 |
| NET OPERATING INCOME | \$ -6,266.19 | \$ -12,043.30 |

| | | |
|-----------------------------|---------------------|----------------------|
| Other Expenses | | |
| MESH Grant Disbursement | 1,133.00 | 213.73 |
| Total Other Expenses | \$1,133.00 | \$213.73 |
| NET OTHER INCOME | \$ -1,133.00 | \$ -213.73 |
| NET INCOME | \$ -7,399.19 | \$ -12,257.03 |

LIFE IS SIMPLE



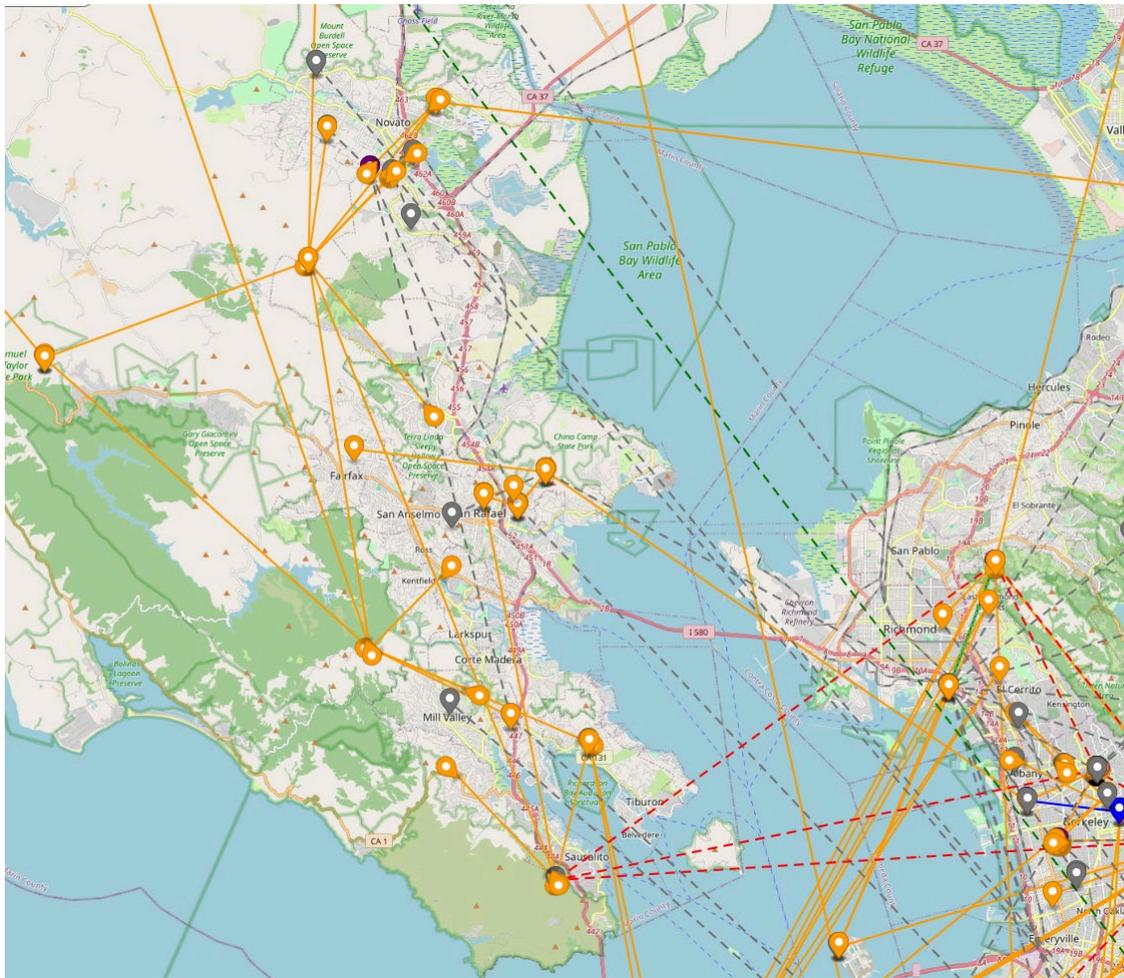
MARS Club News

AREDN Mesh demo

Friday 6 June 2025 at MARS Clubhouse



The June 6th MARS membership meeting will include an Amateur Radio Emergency Data Network (AREDN) demonstration presented by Kathy Spicher KM6URP and Rob Rowlands NZ6J. They are planning to set up some hardware so you can see the technology up close. They will start at 6:30 which is a little early but there is a lot to show. Please come down to see cool gear and learn about this technology. Since I am expecting extra folks, please email me at rsvp@w6sg.net so I can make sure there is enough pizza.



ARRL Field Day: A Grand Tradition of Amateur Radio

From Hugh KN6KNB

ARRL Field Day stands as a cornerstone event in the amateur radio calendar, a testament to the enduring spirit of communication, preparedness, and camaraderie within the ham radio community. Held annually on the fourth full weekend of June, this highly anticipated event sees thousands of amateur radio operators across North America, and often beyond, venturing outdoors to establish temporary radio stations. More than just a contest, Field Day embodies the core values of amateur radio: technical skill, public service, and the ability to communicate under adverse conditions.

The roots of ARRL Field Day stretch back to 1933, born out of a desire to demonstrate the reliability and utility of amateur radio in emergencies. The American Radio Relay League (ARRL), the national association for amateur radio in the United States, conceived the idea as a competitive exercise to test operators' abilities to set up and operate stations independent of commercial power sources. Early events were relatively small-scale, but the concept quickly gained traction as operators recognized the invaluable experience gained in deploying equipment rapidly and communicating effectively without reliance on existing infrastructure. This initial focus on emergency preparedness has remained a guiding principle throughout Field Day's evolution.

The primary purpose of ARRL Field Day is multifaceted. Foremost, it serves as a large-scale emergency preparedness exercise. Participants practice deploying antennas, setting up transceivers, and operating from remote locations, often utilizing generators, solar power, or batteries. This hands-on experience is critical for developing the skills necessary to provide vital communications in natural disasters or other emergencies when traditional communication systems may fail. The ability of amateur radio to provide reliable, independent communication links has proven invaluable in countless real-world scenarios, and Field Day is a crucial annual drill for this capability.

Beyond emergency preparedness, Field Day acts as a powerful public awareness event. Participants often invite the general public to visit their stations, offering demonstrations of amateur radio in action and explaining its role in communication and community service. This outreach is vital for recruiting new licensees and educating the public about the valuable resource that amateur radio represents. It provides a tangible demonstration of how hams can establish communication from virtually anywhere, fostering an appreciation for the hobby's unique capabilities.

Furthermore, ARRL Field Day fosters a strong sense of community and friendly competition. Groups of hams, ranging from small clubs to large, well-organized teams, work together to set up and operate their stations, often camping together for the weekend. The event encourages teamwork, problem-solving, and the sharing of knowledge. While there is a scoring system to encourage activity and recognize achievements in various categories, the competitive aspect is often secondary to the joy of operating, making contacts, and enjoying the camaraderie of fellow enthusiasts.

In summary, ARRL Field Day is a vibrant and essential tradition that encapsulates the spirit of amateur radio. From its origins as an emergency preparedness drill to its current role as a public outreach and community-building event, Field Day continues to highlight the unique capabilities of ham radio. It provides a crucial opportunity for operators to hone their skills, demonstrate their value to society, and celebrate the enduring fascination with radio communication, all while enjoying the great outdoors and the fellowship of their peers.



2025 Field Day

From Curtis WA6UDS

T minus 33 Days and Counting

Mark your calendar the Marin Amateur Radio Society will once again be participating in ARRL Field Day. We will be operating from 11:00 AM PDT on June 28 through 11:00 AM PDT on June 29 at Stafford Lake Park in Novato. This is the same location as Last Year. If you want to make some QSOs or just hang out we would love to see you there. There will be food as well as radio. Lunch on Saturday, Dinner Saturday night and breakfast on Sunday.

We will need folks to help with the set-up and strike, and we will provide additional info about the schedules for those activities soon. If you have questions, please email Steve Toquinto KB6HOH our Field Day Chair at fieldday@w6sg.net

If you are planning to attend please email me at rsvp@w6sg.net so I can get a head count for food.

73 de wa6uds

2025 ARRL Amateur Radio Field Day

From Curtiss Kim

What: 2025 ARRL Amateur Radio Field Day

When: June 28 - 29, 2025 11am-11am (24 hrs)

Where: Picnic Area 1, Stafford Lake Park, 3549 Novato Blvd, Novato, CA

Who: The Marin Amateur Radio Society (MARS)

Contact: Steve Toquinto, kb6hoh@comcast.net

Talkin frequency: 147.585 Mhz simplex

What is the one critical communication element that has never failed during a disaster? The answer is amateur radio. Ham radio operators, often part of organizations are relied upon to be up and running especially when conventional means such as landline phones, cellphones and the internet are lost. Often times amateur operators establish needed communication links, relay messages, and provide essential information to aid in disaster response and recovery. The Pacific Palisades and Altadena fires, Hurricane Milton, and Tropical Storm Helene are just a few examples where hams proved invaluable.

The Marin Amateur Radio Society will demonstrate how radio operators become a lifeline, connecting communities, and relaying vital information when the club takes part in the nationwide Field Day competition. During the event Marin amateur radio operators will contact temporary radio stations in public locations across the nation to demonstrate their skill and service.

“Ham radio functions completely independently of the internet and the landline phone systems and a station can be set up almost anywhere in minutes”, according to Steve Toquinto of MARS.

You are invited to stop by and see amateur radio communications in action. A variety of experienced operators will be on hand to show how this network will come to life during the next Bay Area disaster. Witness what these radio operators can do as they set up and talk to other makeshift stations in various parts of the US.



This event is sponsored by the National Association for Amateur radio.

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RCV Participates in Beacon 2025

The Radio Communication Volunteers (RCV) of MARS showed their readiness skills taking part in a large-scale earthquake simulation designated “Beacon 2025”. The exercise at the beginning of the month originating out of Humboldt County was designed to bring together emergency management offices, local agencies and various community partners to practice real life communications and disaster response strategies. RCV members participated in the morning session on both UHF and VHF frequencies while ACS-RACES worked HF out-of-county communications. RCV, which works in close partnership with many Marin County community agencies was asked to deploy and establish communications using local repeaters. Some of those who participated included Skip Ferdanzo, KJ6ARL as net control, Dirck Brinckerhoff, KM6VKQ, Sheila Adams-Sapper, KO6HYX and Curtiss Kim, KM6GUY. The radio operators checked in from various locations reporting simulated damage and assessment reports. In additions those in the field were asked to switch to a separate net control and report on simulated damage such as road conditions, structural collapse and crowd sightings. In an actual emergency, RCV members would respond under similar conditions once activated. An added component included reports from several simulated Red Cross field locations. In the After Action Report, RCV’s Lead Operator, Skip Ferdanzo noted...”RCV and ACS-RACES have multiple years of experience and established protocols for self-activation and organization. Our continuing exercises with and without advanced notice definitely showed their worth during this Exercise.” The goal of RCV is to establish needed radio communication between various community based organizations and a central emergency operations center during an actual disaster or incident.

If you would like to find out more about RCV the website is MarinRCV.org





2025 Public Service Season Signup List

From: Michael Fischer K6MLF

We had a great turnout of 55 amateur radio operators in the clubhouse last Saturday, most of whom are pictured here. Sorry we missed some of you North Bay 2-Meter Critical Mass and Southern Marin Fire radio team folks, but we hope to see you on one or more of the events coming up soon!



Volunteer Examiner News

Dates remaining on our 2025 schedule will be Jul 12th, and Oct 11th. Please mark your calendars. The next session is coming up in a few weeks.

The ARRL Volunteer Examiner's (VE) program has played a pivotal role in the licensing of amateur radio operators in the United States since its inception in 1984. Prior to the establishment of the VE program, amateur radio licensing exams were administered exclusively by the Federal Communications Commission (FCC). This process was often cumbersome, requiring candidates to travel to FCC offices, which were not always conveniently located. The introduction of the VE program decentralized the examination process, making it more accessible to aspiring operators. Under this program, qualified volunteers, themselves licensed amateur radio operators, were authorized to administer exams, significantly streamlining the licensing process and encouraging greater participation in the hobby.

The VE program is a cornerstone of the amateur radio community, reflecting its ethos of self-regulation and mutual support. By empowering experienced operators to oversee the licensing process, the program fosters a sense of responsibility and mentorship within the community. Volunteer Examiners are required to meet stringent qualifications, ensuring that they possess the knowledge and integrity necessary to uphold the standards of the amateur radio service. This peer-driven approach not only maintains the credibility of the licensing process but also strengthens the bonds within the amateur radio community, as new operators are welcomed and guided by those who share their passion for the hobby.

The importance of the VE program extends beyond its practical function of administering exams. It has been instrumental in promoting the growth and diversity of amateur radio. By making the licensing process more accessible, the program has lowered barriers to entry, enabling individuals from all walks of life to become licensed operators. This inclusivity has helped amateur radio remain relevant in an era of rapid technological change, attracting new generations of

operators who bring fresh perspectives and innovations to the field. The VE program has thus played a crucial role in ensuring the continued vitality of amateur radio as a dynamic and evolving pursuit.

Moreover, the VE program has had a profound impact on emergency communications and public service. Amateur radio operators are often called upon to provide critical communication support during disasters and emergencies, when traditional communication infrastructure may be compromised. By facilitating the licensing of new operators, the VE program helps to expand the pool of skilled individuals who can contribute to these efforts. The program's emphasis on rigorous testing ensures that licensed operators are well-prepared to handle the technical and operational challenges of emergency communication, thereby enhancing the overall resilience of the amateur radio service.

In summary, the ARRL Volunteer Examiner's program has been a transformative force in the world of amateur radio. By decentralizing the licensing process, fostering community engagement, and promoting inclusivity, the program has made amateur radio more accessible and vibrant. Its role in supporting emergency communications further underscores its significance, as it equips new operators with the skills needed to serve their communities in times of crisis. The VE program stands as a testament to the enduring spirit of amateur radio, embodying its values of innovation, collaboration, and public service.



2025 North Bay 2-Meter Critical Mass Calendar

2025

June 22nd (fourth Sunday; third is Fathers' Day) Milt

July 20th (third Sunday) Rob

August 17th (third Sunday) Michael

September 21st (third Sunday) James

October 26th (fourth Sunday; third is Pacificon) Milt
November 16th (third Sunday) Rob
December 14th (second Sunday; third is too close to Christmas) Michael

North Bay Critical Mass Report

We didn't receive any information regarding last month's event. However, we've included an important announcement regarding the June meeting:

June Critical Mass: Change of Date to June 29

From Milt KM6ASI

All

Because of the change of dates for the 2025 Field Day, we are changing our Critical Mass for June to June 29th, the Sunday of Field Day. We will also alter the times to coincide with the Sunday activities of Field Day. If you are interested in joining us for breakfast, please be at the Stafford Lake Park Group Site 1 by no later than 8:30 am. If you are going have breakfast with us, please RSVP as per the instructions below. The exercise for the day will be very similar to what we did last year.

As you drive in, you can check in on 147.585 simplex, the Field Day check in frequency. Our training will start at 0900 with the usual introductions. After preliminary orientation to Field Day radio procedures, you will be turned over to one of the operating HF stations to conduct a QSO on HF. Note, don't worry if you don't have a General or higher license since each station will be under the supervision of a control operator, allowing you to operate that station. This will be a good opportunity to practice your phonetic alphabet skills as it is used on HF much more than 2m or 70cm. The goal is for each attendee to have at least one

logged QSO to their credit for the day. Field Day radio operations will end at 11 am and attendees will be encouraged to assist in site tear down.

Hope to see you there..

73, milt KM6ASI

ACS/RCV Mission Statement

Mission: During national, regional, or local emergencies provide effective backup radiocommunications in support of the EOC/VOAD and Community Based Organizations (CBOs) or other non-public safety agencies within the Marin County OA when requested by competent authority.

Capabilities: Proven ability to establish and maintain radio communications between OA EOC/VOAD and CBOs during exercises including the three annual Golden Eagle and two Great Shakeout exercises. Ability to deploy and operate portable stations as needed to establish reliable communications in areas that are otherwise out of touch with the EOC/VOAD.

Resources: Develop and maintain the resources that may be needed to support the overall mission:

1. Operators – A corps of trusted radio operators with: (1) basic skills and a commitment to establishing radio communications when needed; (2) ongoing participation, training, and practice in accurately passing message traffic using a variety of basic analog and specialized digital means.
2. Mobile stations – Individual operators routinely test and maintain their own radio transceivers and related equipment including power supplies, which can be deployed to locations otherwise lacking reliable communications with the EOC/VOAD or between two or more CBOs.
3. Relationships – Establish on-going relationships of familiarity and trust

between RCV operators and with key staff of served agencies, including EOC and VOAD.

RCV is asking “Can You Hear Me? Can You Hear Me Now?”

By Curtiss Kim, KM6GUY

Members of the Radio Communication Volunteers (RCV) completed an exercise at the beginning of the month designed to test the capabilities of radio repeater use in reaching the west county. The drill was originally designed to use three UHF repeaters, The Big Rock repeater (477.1750 MHz) is on the ridge that separates Novato and Lucas Valley. Mount Barnabe (444.125 MHz) is located above Samuel P. Taylor Park and Mount Tam (443.250 MHz) is located on the west side of the summit. At the start of the check-ins it was determined that Mount Tam was out of service but the call-ins would continue on the other two repeaters. RCV volunteers were assigned various locations from Stinson Beach to Tomales. A series of role calls were conducted to see if locations in Central Marin could be reached from the coastal regions utilizing Big Rock and Mt. Barnabe. Other RCV members were assigned to various community-based organizations from Novato to Central Marin to San Geronimo Valley. The exercise proved invaluable in pinpointing weaknesses that exists at various sites. No contact was made with the Stinson Beach parking lot perhaps because of the loss of Mt. Tam repeater. Additionally the location at Muir Beach was not staffed. Sketchy communication was logged from Commonweal on Mesa Road in Bolinas. Contact was lost altogether from the Tomales Fire Station as well. Reliable to very good communications were noted from Point Reyes along Highway 1, Dillion Beach and the San Geronimo Recreation Center back to locations in Central Marin. However several locations in Novato recorded marginal communications. The information gathered will be used to help determine communication sites within the coastal communities. The goal of RCV is to provide back up communications to various community-based organizations in Marin in the aftermath of a major disaster or incident. RVC volunteers are not

expected to immediately deploy during an emergency but to eventually make sure the local organizations have efficient and reliable communications to allow them to serve their clientele. Homeward Bound, the San Francisco-Marín Food Bank and Canal Alliance are just some of the participants in the program.

If you would like to get involved in public service and utilize your communication skills the website is MARINRCV.org.

(First picture Mt. Barnabee, second picture, Big Rock, third picture, Commonwealth, Bolinas, last picture Tomales Fire Station.)



HF Radio 101

From Hugh KN6KNB

The Wire Dipole Antenna

This month, we kick off our series on do-it-yourself antennas. I'm going to start by introducing some very basic horizontal and vertical antennas that can easily be made and deployed. All the materials can be purchased on Amazon. The first antenna up is the classic wire dipole. I say "wire" because you can use pipe or any other metal based material for the arms of this antenna.

The dipole antenna stands as a foundational standard and enduring design in the realm of High Frequency (HF) amateur radio. Its simplicity, effectiveness, and relative ease of construction have cemented its status as a primary choice for radio amateurs across the globe. From new licensees taking their first steps into the world of HF communication to seasoned operators seeking reliable performance, the dipole consistently delivers a potent combination of efficiency and versatility for transmitting and receiving radio signals. Its fundamental principles, rooted in basic electromagnetic theory, make it an excellent starting point for understanding how antennas interact with radio waves.

At its core, a dipole antenna consists of two conductive elements of equal length, typically wires, fed at the center by a coaxial cable or balanced line. The total length of the antenna is usually a quarter or half-wavelength at the operating frequency, meaning each element is approximately a quarter-wavelength long. When fed with radio frequency current, these elements become resonant, creating standing waves of voltage and current along their length. This resonance is crucial for efficient radiation of electromagnetic energy into space, allowing for effective communication over long distances, a hallmark of HF operation.

The physical orientation and height of a dipole significantly influence its radiation pattern and performance. When erected horizontally, a half-wave dipole exhibits a

bidirectional pattern, radiating most of its energy perpendicular to the wire, making it ideal for point-to-point communication. Raising the antenna higher above ground generally lowers the angle of radiation, which is advantageous for long-distance (DX) contacts via skywave propagation. Conversely, a lower height can be more effective for shorter-range, local communications. The dipole can be used either horizontally or vertically.

Despite its straightforward design, the dipole offers remarkable adaptability for amateur radio operators. By adjusting its physical length, a single dipole can be tuned to resonate on a specific frequency within an HF band. Furthermore, clever variations such as multi-band dipoles (e.g., fan dipoles or trap dipoles) allow a single antenna to operate efficiently on multiple HF bands, saving space and simplifying antenna setups. This inherent flexibility makes the dipole an excellent choice for fixed stations, portable operations, and even emergency communications.

In essence, the dipole antenna is more than just a basic aerial; it is a fundamental building block of HF amateur radio. Its elegant simplicity, combined with its robust performance and adaptable nature, ensures its continued prominence in the hobby. Understanding the principles behind the dipole provides a solid foundation for any aspiring or experienced amateur radio operator, enabling them to effectively engage with the airwaves and connect with fellow enthusiasts worldwide.

How the Dipole Antenna Works

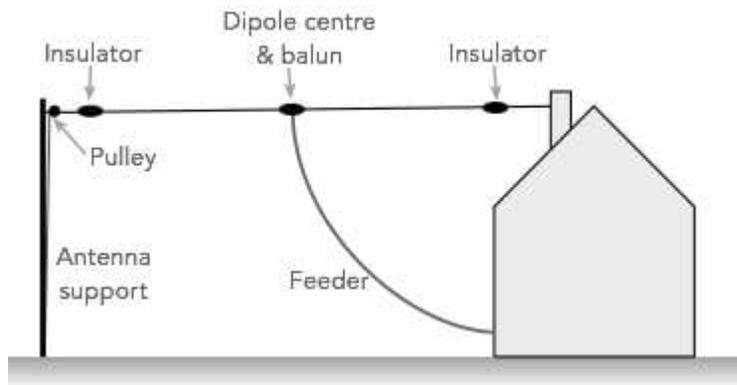
A dipole antenna functions on the fundamental principles of electromagnetism, converting electrical energy into electromagnetic waves for transmission, and vice versa for reception. At its heart, a dipole consists of two conductive elements, typically wires or rods, of equal length. These elements are separated by a small gap at their center, where a radio frequency (RF) current from a transmitter is applied. When this alternating current is introduced, it causes electrons to rapidly oscillate back and forth along the length of the antenna elements, creating dynamic electric and magnetic fields around them.

The key to a dipole's efficiency lies in its resonant length, which is typically designed to be a quarter or half-wavelength of the intended operating frequency. This quarter or half-wavelength design allows for the formation of standing waves of current and voltage along the antenna. At the center feed point, the current is at its maximum, while the voltage is at its minimum. Conversely, at the ends of the antenna, the voltage reaches its maximum, and the current approaches zero. This specific distribution of current and voltage is crucial for effectively launching electromagnetic energy into space.

As the current oscillates along the antenna elements, it generates a continually changing magnetic field. Simultaneously, the oscillating voltage creates a corresponding electric field. These two fields are intrinsically linked and mutually perpendicular. As they expand outwards from the antenna and then collapse back in with each cycle of the RF current, they detach from the antenna and propagate through space as self-sustaining electromagnetic waves. These waves travel at the speed of light, carrying the radio signal away from the transmitting antenna.

In the receiving scenario, the process is reversed. When an incoming electromagnetic wave sweeps across the dipole antenna, the oscillating electric and magnetic fields of the wave induce a small alternating current and voltage within the antenna elements. Because the antenna is designed to be resonant at the frequency of the incoming wave, it efficiently absorbs the energy. This induced electrical signal, mirroring the original transmitted signal, is then fed to a receiver, where it is amplified and decoded, thus completing the communication circuit.

Here's an illustration of how the components of the horizontal dipole go together:



Building a Dipole Antenna

Building a simple wire dipole antenna is a fundamental project for any amateur radio enthusiast. This guide will walk you through the steps to construct a half-wave dipole, which is an excellent choice for a variety of HF bands. Here's a photograph of the center connector you can purchase at Amazon:



https://www.amazon.com/Binding-Coaxial-Splitter-Connector-Adapter/dp/B07TC1L8RP/ref=sr_1_3?crid=1PFHYSY22RYXX&dib=eyJ2ljojMSJ9.Q79TniaHQPPt7ahGOAEDqdhTdFt1ot24Z4nnyW5di9ulGr - QpPEjHZFF3STn0hwphb4 T-pXrZEM1m6ls2FC37J5C17Q1PcNcKCCWzn8eVUPe6jvIraF1HhsFC7O7Wer-FrhLHZuvolYphZceYJJrYofNxaDYfTJUXEAKUDLLfe4sgG oUuGmwUzJ3u14cp1c1zvfWhl DI hrXnrudBvJTg200g1CiOF6OPzNgdzY.RW7fC-Igdvb4HOiUma4zOL4ydxNFbqEeWcLAB5S0Xi0&dib_tag=se&keywords=BNC%2Bco

[nector%2Bfor%2Bdipole%2Bham%2Bradio%2Bantenna&qid=1748798111&sprefi
x=bnc%2Bconnector%2Bfor%2Bdipole%2Bham%2Bradio%2Bantenna%2Caps%2C
208&sr=8-3&th=1](https://www.instructables.com/BNC-Connector-for-Dipole-Antenna/)

1. Materials Needed:

- **Antenna Wire:** Approximately 14–16-gauge stranded copper wire is recommended. You can use aluminum core stranded copper wire. (Which is cheaper than pure stranded copper wire). Use speaker wire which can be purchased inexpensively and, because the wire consists of a left and right fully insulated side, can be split which doubles the total amount of wire. The total length will depend on your desired operating band.
 - For 40 Meters (approx. 7 MHz): About 66 feet (20.1 meters) total. Each leg will be about 33 feet (10.05 meters).
 - For 20 Meters (approx. 14 MHz): About 33 feet (10.05 meters) total. Each leg will be about 16.5 feet (5.03 meters).
 - For 10 Meters (approx. 28 MHz): About 16.5 feet (5.03 meters) total. Each leg will be about 8.25 feet (2.51 meters).
 - *Note: These are approximate lengths. You will tune the antenna later. Additional lengths can be found at the end of this article.*
- **Coaxial Cable:** RG-58 (50 Ohm impedance) or similar coaxial cable. The length depends on how far your antenna will be from your radio. Ensure you have enough to reach your shack comfortably, plus some extra for routing.
- **Center Insulator/Feed Point:** You can buy a commercial dipole center insulator with an SO-239 connector or make your own using a small piece of PVC, plastic, or even a robust electrical junction box. I recommend purchasing a center insulator to make things easier. The key is to provide a weather-resistant point where the coax connects to the antenna wires.

- **End Insulators:** Two non-conductive insulators (e.g., ceramic dog bones, plastic, or even strong nylon rope ties) to support the ends of the antenna wire. Look for electric fence insulators, which are inexpensive.
- **Rope/Cord:** Strong, UV-resistant rope (nylon, Dacron, etc.) for supporting the antenna.
- **Coax Cable/Connectors:** A PL-259 connector for the end of your coaxial cable to connect to your radio or antenna tuner, and optionally spade or ring terminals if you're connecting wires directly to a DIY center insulator.
- **Tools:** Wire cutters, wire strippers, tape measure, soldering iron and solder (if assembling connections), crimping tool (for terminals/connectors), and an antenna analyzer or SWR meter.

2. Calculating and Cutting the Wire:

First, determine which HF band you want your dipole to operate on. The general formula for a half-wave dipole is:

- **Length (feet) = 468 / Frequency (MHz)**
- **Length (meters) = 142.65 / Frequency (MHz)**

This formula gives you the *total* length of the dipole. You will then divide this by two to get the length of each leg. For example, if you want to build a dipole for 20 meters, target the center of the band (e.g., 14.175 MHz).

- Total length = $468 / 14.175 = 33.01$ feet.
- Each leg = $33.01 / 2 = 16.5$ feet.

It's crucial to **cut the wire slightly longer than your calculated length**. You will trim it during the tuning process. Add at least 6 inches (15 cm) to each leg as a starting point.

3. Preparing the Center Feed Point:

I recommend purchasing a manufactured center insulator from Amazon because they provide a cleaner product than doing it yourself. However, I've included

instructions should you want to do it yourself. If using a commercial center insulator, it will likely have an BNC or SO-239 connector and terminal posts for the antenna wires. Strip about 1 inch (2.5 cm) of insulation from one end of each antenna wire and connect them to the respective terminals (one wire to the center conductor connection, the other to the shield connection). Ensure a secure electrical and mechanical connection.

If making a DIY center insulator:

- Carefully prepare the end of your coaxial cable. Strip back the outer jacket, then the braid shield, and finally the inner conductor's insulation.
- Connect the coaxial cable's center conductor to one antenna wire and the braid shield to the other antenna wire. Solder these connections for best performance and durability.
- Enclose these connections in a weather-resistant enclosure (your chosen PVC or junction box) to protect them from the elements. Create strain relief for both the coax and the antenna wires to prevent stress on the connections.

4. Attaching End Insulators and Rope:

At each end of your two antenna wire sections, create a loop and attach an end insulator. You can thread the wire through holes in a plastic insulator or use a knot (like a bowline) to secure the wire around a ceramic insulator. Then, attach a length of strong, UV-resistant rope to each end insulator. This rope will be used to support the antenna and provide tension when you deploy it.

5. Deploying and Tuning the Antenna:

- **Erection:** Choose a location for your dipole antenna. It should be as high as possible and clear of large metal objects (power lines, metal roofs, etc.) that can detune it. Common configurations include a "flattop" (horizontal) or an "inverted V" (center high, ends sloping down). The inverted V often requires only one high support. With wire antennas, height is might, meaning the higher up the antenna, the better the RX/TX.

- **Initial Placement:** Temporarily raise the center feed point and the ends of the antenna using your ropes. The ends should be high enough to be out of reach.
- **Tuning with an Antenna Analyzer/SWR Meter:** This is the most critical step. Connect your antenna analyzer or SWR meter to the coaxial cable coming from your dipole.
 - **Sweep the frequency range of your chosen band.** You are looking for the lowest Standing Wave Ratio (SWR), ideally 1.5:1 or lower, at your desired operating frequency within the band.
 - **If the SWR "dip" is below your desired frequency (antenna is too long):** Trim a small, equal amount (e.g., 1-2 inches or 2-5 cm) from *each end* of the antenna wires. Re-check the SWR. Repeat until the SWR minimum is at your target frequency.
 - **If the SWR "dip" is above your desired frequency (antenna is too short):** This is why you cut it long! If it's too short, you'll need to add wire back to the ends. It's much easier to trim than to add, so always start long.
- **Final Installation:** Once tuned, secure the antenna firmly in place using the ropes. Ensure the feedline runs away from the antenna elements at a right angle for at least 10-20 feet to minimize interaction with the antenna's radiation pattern.

Optional: Adding a Balun (Balanced to Unbalanced) Choke:

While not strictly required for a simple dipole, a 1:1 balun at the feed point can help prevent common mode currents on the coaxial cable. Common mode currents can cause RF interference in your shack, affect the antenna's radiation pattern, and even lead to RF burns. A simple way to create a choke balun is to coil about 6-10 turns of your coaxial cable (about 6-8 inches or 15-20 cm diameter) near the feed point and secure it with zip ties. This creates an inductance that chokes off common mode currents.

By following these instructions, you'll have a functional and effective dipole antenna, a cornerstone of any HF amateur radio station. Remember to always prioritize safety when working with antennas and heights.

Here's the list of wire lengths for dipoles for both half and quarter wavelengths:

| Band | Frequency (MHz) | Half-Wave Length (Feet) | Quarter-Wave Length (Feet) |
|------|-----------------|-------------------------|----------------------------|
| 160 | 1.8 MHz | 260 | 130 |
| 80 | 3.5 MHz | 134 | 67 |
| 60 | 5.4 MHz | 88 | 44 |
| 40 | 7 MHz | 67 | 33 |
| 30 | 10 MHz | 46 | 23 |
| 20 | 14 MHz | 33 | 17 |
| 17 | 18 MHz | 26 | 13 |
| 15 | 21 MHz | 22 | 11 |
| 12 | 25 MHz | 19 | 9.4 |
| 10 | 28 MHz | 17 | 8.5 |

Ham Radio News

Each month, QSA-5 searches the internet for stories about amateur radio in the news. As editor of our publication, I merely present these articles and do not take a position regarding their message or content.

Ham radio operators provided critical communications help: A nice article reminding us of the important role amateur radio plays when all else fails.

<https://www.tribtoday.com/news/local-news/2025/05/ham-radio-operators-provided-critical-communications-help/>

Ham Radio Operators Assemble Ahead of Hurricane Milton: A nice piece regarding disaster preparedness.

<https://www.radioworld.com/news-and-business/headlines/ham-radio-operators-assemble-ahead-of-hurricane-milton>

Ham radio and the world of amateur radio operators: A nice piece on amateur radio operators in Canada.

<https://canadiangeographic.ca/articles/ham-radio-and-the-world-of-amateur-radio-operators/>

Get Ready for "Ham Radio Open House" on World Amateur Radio Day 2025: For all you DXers, this is a great opportunity to make those hard to get contacts!

<https://www.arrl.org/news/get-ready-for-ham-radio-open-house-on-world-amateur-radio-day-2025>

Ham Radio Call Signs Discovered During Clayton UC Renovation Revive Memories of Lehigh's Amateur Radio Society: This is an interesting read regarding amateur radio's rich history.

<https://news.lehigh.edu/ham-radio-call-signs-discovered-during-clayton-uc-renovation-revive-memories-of-lehighs-amateur>

WKHS Makes International Contact with Amateur Radio: A nice look at introducing amateur radio to youth.

<https://www.radioworld.com/tech-and-gear/wkhs-makes-international-contact-with-amateur-radio>

Local Club Connecting Amateur Radio Enthusiasts: From the Weirton Daily Times.

<https://www.weirtondailytimes.com/news/local-news/2024/12/local-club-connecting-amateur-radio-enthusiasts/>

The Rich History of Ham Radio Culture: A really nice piece looking at the history of our beloved hobby (really a passion).

<https://thereader.mitpress.mit.edu/the-rich-history-of-ham-radio-culture/>

Ham Radio In the Internet Age: An interesting article that looks at how amateur radio has changed with the times.

<https://hackaday.com/2024/10/25/ham-radio-in-the-internet-age/>

Masonic Amateur Radio Club demonstrates ham radio hobby in Great Falls: A nice piece on what all amateur radio clubs should be doing to keep amateur radio alive.

<https://www.krtv.com/news/great-falls-news/masonic-amateur-radio-club-demonstrates-ham-radio-hobby-in-great-falls>

Amateur Radio is Put in A New Light Thanks to Brandon Radio Club: The Brandon Radio Club is getting people interested in amateur radio by getting them on the air at their events.

<https://www.ospreyobserver.com/2024/07/amateur-radio-is-put-in-a-new-light-thanks-to-brandon-radio-club/>

FCC Regulatory News

Here are the current regulatory changes and FCC news as it applies to Amateur

Radio. This section of the QSA-5 newsletter was introduced last year. We will add new regulations and rules monthly, removing the older regulations and rules as new regulations/rules are introduced. As of the August 2021 issue of the QSA-5 newsletter, this list of FCC regulations and changes will be reduced, only covering this year's new regulations and rules. The newest regulations and changes will appear at the top of the list. Note that we are not able to cover every change the FCC has made this year within our publication. Still, nothing new from the FCC this month:

FCC Initiates Broad Inquiry on Rules to Delete or Amend: This is of importance to everyone who has an FCC license.

<https://www.arrl.org/news/fcc-initiates-broad-inquiry-on-rules-to-delete-or-amend>

FCC Upholds Record \$34,000 Forfeiture Against Amateur Licensee: The story started a few years back but finally came to a sticky financial end for the offender.

<https://www.arrl.org/news/fcc-upholds-record-34-000-forfeiture-against-amateur-licensee>

FCC Seeks Comments on Tribal FM Allotment in Wyoming: This is an interesting read about an area of radio outside the norm.

<https://www.radioworld.com/news-and-business/business-and-law/fcc-seeks-comments-on-tribal-fm-allotment-in-wyoming>

Solar Activity Significantly Affecting Ionosphere, FCC Opens Docket for Comments on Impact: The impact of solar activity has been driven the FCC to solicit comments regarding it's impact:

<https://www.arrl.org/news/solar-activity-significantly-affecting-ionosphere-fcc-opens-docket-for-comments-on-impact>

FCC to Require Two Factor Authentication for CORES Users: It seems that the

powers that run the big show have found yet another fee to tack on to the amateur radio operators ability to operate:

<https://www.arrl.org/news/fcc-to-require-two-factor-authentication-for-cores-users>

FCC To Vote on Removing Symbol Rate Restrictions: From the ARRL regarding the digital modes.

<https://www.arrl.org/news/fcc-to-vote-on-removing-symbol-rate-restrictions>

Propagation News

Here are some links dedicated to propagation conditions, space weather, sunspot cycle information and all things related to solar conditions:

The ARRL Solar Report: This is the ARRL solar update, which is updated regularly:

<http://www.arrl.org/news/the-arrl-solar-report-15>

DX.QSI Propagation: A simple, straightforward website for propagation conditions that is regularly updated:

<https://dx.qsl.net/propagation/>

Radio Society of Great Britain: What's New and Propagation Now:

A great resource from the UK version of the ARRL regarding solar activity and propagation:

<https://rsgb.org/main/technical/propagation/whats-new-propagation-now/>

SunSpotWatch.com:

A good general interest site for amateur radio operators who follow solar activity:

<http://sunspotwatch.com/>



DIY Radio References

We have added a few additional links to our list and will continue to do so as we discover more websites related to the Do-It-Yourself movement! QSA-5 is going to keep adding to the original list of online resources, bringing you more resources as we find them. If there is anything you think would be useful to other club members, contact me and I will be happy to include it in this reference section.

Microcontrollers and Single Board Computers: With the advent of the Arduino micro-controller board, the Raspberry Pi (a single board minicomputer) and Texas Instrument's Launchpad (also a single board microcontroller), Amateur Radio enthusiasts can build both accessories, such as antenna tuners, and fully functioning transceivers. I have spent the last year at the University of California studying these devices, learning how to use them and incorporate them into electronic projects. I was able to build two HF receivers based on the Arduino and Raspberry Pi devices. The best news of all is that these devices are inexpensive! I encourage you to check these websites out!

Arduino: The Arduino microcontroller board was the first to popularize these devices. They are inexpensive and can be used for a variety of radio related projects.

I will include some links to radio related Arduino projects in the next issue of the QSA-5. Here's a link to the Arduino homepage:

<https://www.arduino.cc/>

Raspberry Pi: Did you every wish you could have a PC small enough to fit into your shirt pocket? Your dream has come true. The Raspberry Pi 4 is a fully functional Quadcore 1.6 GHz computer, about the size of a package of playing cards. It has an Ethernet jack, two USB 2 ports, two USB 3 ports and two HDMI ports. Next month, I'll post some links to radio related Raspberry Pi projects. Here's a link to their homepage.

<https://www.raspberrypi.org/>

Texas Instruments TI Launchpad: The Launchpad is Texas Instruments answer to the Arduino. The Launchpad is geared more towards advanced projects and is slightly more expensive. However, the Arduino still holds it own against this device. The Arduino also has more in the way of opensource software. Here is a link to the TI Launchpad homepage.

<https://www.ti.com/design-resources/embedded-development/hardware-kits-boards.html>

Tools for electronics: It is a lot easier to build or repair your electronics if you have the right tool. Paperclips and duct tape are not the solution to everything (unless you are McGyver – hopefully, you got the reference). Therefore, we added some links to suppliers of electronics tools.

Jameco Electronics: A supplier of decent tools at a reasonable price:

<https://www.jameco.com/Jameco/content/tools.html>

Electronic Printed Circuit Boards (PCB): If you design and build projects that require specific circuit boards, you know how difficult it is to find a board that will work for your purposes. Designing a board and then having it made can be expensive. Here is a company that has a large number of radio PCBs you can purchase and then add components to. They also can take your design and fabricate a PCB at a very reasonable cost. The company's name is **PCBway**:

<https://www.pcbway.com/project/>

Electronic Components and Parts: Many of us involved in amateur radio are constantly tinkering with electronics. It seems to be part of our genetic makeup! Here are some links to companies that sell electronic components and parts, starting with San Rafael's own Electronics Plus (Support local business).

Electronics Plus: It's great to have an electronics store close by for those times when you need a part immediately:

<https://www.electronicplus.com/>

Digikey: A good source for DIY and Maker projects as well as parts. They claim to have the world's largest selection of electronic components.

<https://www.digikey.com/>

Jameco: This company is a good source for almost everything, especially mainstay items such as resistors, capacitors, etc.

<https://www.jameco.com/>

Homemade Antennas: Many new amateur radio enthusiasts put a great deal of time and effort into researching their first radio. However, they often neglect the most important component to a successful radio experience, the antenna. Even if you have some ham radio experience, antennas can be a daunting subject. Commercially manufactured antennas can be expensive and beyond your budget during these hard financial times. Even if you have the funds available to purchase

an antenna, reading through the antenna's specs can be akin to reading some long lost ancient language. A good solution for increasing your knowledge of antennas and radio wave propagation, not to mention cutting the costs down, is to build them yourself. Here are some links to DIY (do it yourself) sites to give you a start:

Antenna building basics:

<https://www.wikihow.com/Build-Several-Easy-Antennas-for-Amateur-Radio>

Good Reference for several antenna types:

<https://www.hamradiosecrets.com/homemade-ham-radio-antennas.html>

A step-by-step guide for building a simple antenna:

<https://geardiary.com/2012/07/21/building-a-simple-ham-radio-antenna-without-soldering/>

Instructions for a VHF/UHF dual band antenna:

<https://www.instructables.com/Quarter-Wave-Dual-Band-VHFUHF-Ham-Radio-Antenna/>

Build an HF dipole antenna:

<https://www.electronics-notes.com/articles/antennas-propagation/dipole-antenna/hf-ham-band-dipole-construction-80-40-20-15-10-meters.php>

Introduction to antennas:

<https://www.onallbands.com/ham-radio-antenna-options-for-home-and-portable-operations/>

Ham Radio QRP Transceiver Kits: With the advent of SDR (Software Defined Radio), building fully functioning ham radios has become a lot easier and extremely inexpensive. While, having fewer bells and whistles, as well as being low power

units, many have fully functional touchscreens and cover many of the HF bands:

An easy to build QRP transceiver. No soldering needed to build:

<https://www.hfsignals.com/>

An easy to build, single band CW kit:

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

Offering several kits and finished transceivers:

<https://youkits.com/>

Propagation Websites: Propagation is a key factor in successful radio communications. Here are some links to websites that will help you with all your basic propagation needs:

Real time band conditions:

<https://qrznow.com/real-time-band-conditions/>

VOACAP band conditions:

<https://www.voacap.com/hf/>

ARRL Propagation Page:

<http://www.arrl.org/propagation>

Real Time HF Propagation Prediction:

<https://hamwaves.com/propagation/en/index.html>

Ham Radio Websites of general interest:

Ham Radio News: Here are some sites and articles you may find of interest regarding ham radio.

ARRL News Page, which is a good place to find national news regarding ham radio:

<http://www.arrl.org/news>

QRZ Now. Another good site for ham radio news from around the globe:

<https://qrznow.com/>

The Amateur Radio Newsline. An AP styled news feel page for amateur radio:

<https://www.arnewsline.org/>