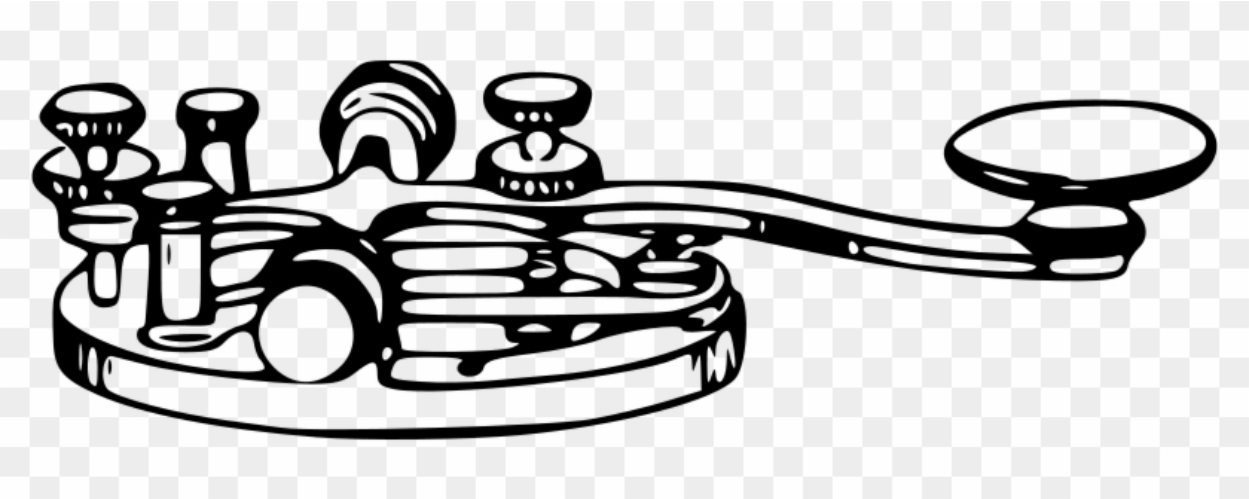
QSA-5

Marin Amateur Radio Society Monthly Newsletter

Established 1933 **May 2025**



When all else fails, you can count on Amateur Radio

From Our President:

No letter this month

From the Editor:

We're a month away from summer. Time has certainly flown because it seems like we were just finishing the first month of the new year. The weather is getting warmer and rainy days are a thing of the past. I don't know about everyone else, but I prefer warmer weather and longer periods of daylight! Our club has been moving along with activities and community events. The VE wing of the Marin Amateur Radio Society held the second testing session of the year.

We're introducing the first of our antenna building articles next month, followed by new designs each month. I was going to publish the article for this month's issue but ran into a time crunch due to some problems with the creation of diagrams. However, I will have them resolved this week and put them into the pages of the QSA-5 next month. These will be easy to build and inexpensive. They've also been thoroughly tested. Who tested them? Walt K4OGO and me. In fact, the ARRL just published a book of his antenna designs, Salty Walt's Portable Antenna Sketchbook (available at the ARRL: https://home.arrl.org/action/Store/Product-Details/productId/2026924035). At $22.95 it's a bargain considering the wealth of antenna designs within its pages. The antennas I'll be presenting will be portable but can be set up permanently.

As always, I'd like to thank Curtiss Kim, Michael Fischer, Rob Rowlands, Rich AG6QR, Michael Klein and the usual suspects for their contributions. You have made this publication so much better. As always, anyone can contribute to the QSA-5, either by submitting an article or offering a suggestion for something you'd like to see within pages of the QSA-5.

QSA-5Editor@w6sg.net

New Members:

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

04/10/2025


marin
Service
Training
Community
EST 1933
AMATEUR RADIO SOCIETY

Call to Order 19:30 Hours (7:30 PM) 1930 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 MSC without amendment

Approve minutes of 13 March board meeting minutes -MSC to approve minutes as published in QSA-5

Secretary's Report/Communications – Directors & Officers Insurance policy renewal received.

Treasurer's Report Published in QSA-5 Marin Taxes Paid, Comm Van License tag renewed. Public Service requested APRS I-Gate $530.00, MSC to reimburse Doug. We still have some outstanding reimbursement that haven't been submitted, please submit.

Members Milt Hyams KM6ASI, Larry Bradley KK6QPE, Rob Rowlands NZ6J, Scott KN6ZDM. Skip Fedanzo KJ6ARL, Kathy Spicher KM6URP, Charlie Benet AI6TT, Mark Klein KM6AOW

Committee and other Reports:

1. **Membership** Curtis WA6UDS– 116 current members, this represents 70% of membership at this time last year.

2. **Facilities** Skip KJ6ARL– We have 2 derelict vehicles, a white Honda behind the Comm Van (Khal?) and a motorcycle outside big sliding door, not registered since 2019, also believed to belong to Khal. This needs to stop. Khal will be notified. Skip commended the OCEF antenna installation crew for a very nice installation. Steve KB6HOH– Second bathroom door deadbolt needs repair. Larry KK6QPE - There is a "card" on a bathroom doorknob that should be removed. Rob NZ6J will repair lock and take care of the "card" item.

3. **VOAD/RCV** SkipKJ6ARL – Exercise Beacon 2025, an emergency communications drill, will be held on May 1st. RCV/VOAD will be participating by deploying to shelter sites and CBO's as appropriate and as time permits. A RACES/RCV leadership meeting wil be held at 0900 Saturday am. Login info is available from Skip if you want to attend. We have 1 new RCV member and 2new RCV members that are currently being processed by the county.

4. **Technical** Milt KM6ASI – Was not able to get up to Mt. Tam due to weather conditions. The county radio department is behind schedule on tower work, and we will need to be

up there when they are. Rob Rolands was hiking on Middle Peak, and the 443.250 repeater was working well from up there. His observation is that it is not working well from the south. We still need to test further. Gerald W6NOV has given Curtis WA6UDS the order for the roof antenna mounts. 2 are now on order. We will also be upgrading the 2 dual-band antennas to tri-band antennas to support 1.2 gig band. We will also be looking at adding 220 MHz. Some coax cable replacement will be necessary, particularly for 1.2 GHz. Dan Sobel is preparing a cable management plan for securing new coax cables.

5. **Public Service** Scott KN6ZDM– 2025 Public Service season is going very well. Ridge to Bridge April 26th and Miwok 100 May 3rd. We have additional people signed up, may use them to do radio testing. Public service will continue to use APRS and continue using the tracking board. Public service will be adding a survey link for participants to send feedback. Curtis WA6UDS – Rich Slusher KI6UIM suggested we have business cards for operators to handout to people who inquire about the public service events that we do. Curtis will be printing some samples, and we could follow up with professionally printed cards with QR Code to access club information. Curtis & Scott – we can use these cards at Field Day also.

6. **VE Testing** Jim KM6WWY- VE Test Saturday 4-12-25. We had 3 applicants but 2 of them cancelled.

7. **Comm Truck** Jim KM6WWY– I will have to step down due to insufficient time and physical limitations. Charlie Benet AI6TT volunteered to assume the Comm Truck Committee Chairman position. Jim will submit his driver info to the insurance to get him on the approved driver list.

8. **NBAM** Kathy KM6URP– North Sonoma County CERT in conjunction with Sonoma County will hold a Disaster Simulation @ Sonoma County Fair Grounds (5-31-25) AREDN will need 3 sites for the drill. They will have VOIP phones and 2 or 3 cameras, WINLINK over AREDEN to pass resource message traffic. There will be teams from Marin, Sonoma, Napa, and Mendocino counties. Skip KJ6ARL– questioned about CERT members being used out of their sworn county. Kathy will check that. She contacted Powell at Napa CERT to set up a meeting to discuss equipment provided previously to them by Dave Sneed. N. Bay Communications co-operative is working on gaining access to county towers and sites for emergency volunteer organizations. Sonoma County RF interference survey found no RF interference to Sherriff sites. Mark KM6AOW – AREDN for Winlink training will be held May 4th at MARS Clubhouse at 10 am. PBX and Mesh-Mail server is up and running and has international connection. New software will be issued soon that will require re-flashing of quite a bit of the NBAM equipment.

9. **Field Day** Steve KB6HOH- FD committee met Wednesday 4/9. Will be 6/28/25 and will be at same location as last year, Stafford Lake Park Group Area 1. Preliminary responsibilities were assigned. We do need to get a public safety officer. Will plan on hanging some antennas on Friday afternoon before to ease setup workload on Saturday if it is approved by the park staff. N1MM logging software training will be scheduled. Curtis Kim is working on public relations handout material and getting it out to local media and other interested parties. It will be also used for public information at the Field Day event. Budget still needs to be worked up, the annual budget has allocated $1,000. Ken AB6JR – Suggested that a CERT presence be added to our Field Day event if possible.

10. **Picnic**- Steve KB6HOH -The September 13th date has been locked in with Stafford Lake Park. Will be at same location as last year, Group Area 1.

Old Business:

1. Donations Committee Charter – Curtis WA6UDS No new activity to report.
2. New Google environment – Bruce N6VLB Working to setup online storage of club records to TechSoup Google service. The initial trial will be done using NBAM data.
3. Keeping public meetings fun- Curtis WA6UDS from this 9-minute video: https://www.youtube.com/watch?v=6_aCmXNQchc Curtis - Presents 2 areas, Trim what is discussed in meetings to make them less detailed, particularly fewer committee reports in the general meeting. Stick to interesting topics and less club business and enlist speaker presentations. "Fun with Ham Radio" can be short presentations by members. Ken AB6JR - QSA-5 can be the primary information source, up to date and preclude having to present it at the general meeting. Committee reports can be in it. Curtis is putting something together for the board to act on. The board generally agreed that it would be possible to get board and committee reports to Hugh Patterson for inclusion in QSA-5 before the monthly general membership meetings.

New Business:

1. Directors & Officers insurance policy is $859.00 MS & Carried by show of hands to renew D&O policy.
2. Moving QuickBooks to TechSoup (Attachment 1) Bruce N6VLB- We are now paying $780/Year for QuickBooks, and it would be reduced to $80/Year via TechSoup. TechSoup is a service for non-profits. Moving would save $700/year. TechSoup also provides several Google products and services free of cost. Following discussion, MSC to transfer our QuickBooks subscription from Intuit to TechSoup.
3. 6 Meter Repeater Curtis WA6UDS – The club has an opportunity to get a 6 Meter repeater. A survey was conducted among the club members. Due to insufficient time to discuss the survey, this item will be postponed to the May Board Meeting. Rob NZ6J will inform the potential repeater donor of our timing.

Good of the Order Nothing Noted

Executive Session Not Required

Adjourn 21:25 MSC to adjourn.

Next Regular Meeting 2 May 2025

Attachment 1.

QuickBooks Online Plus, 1-Year Subscription, 5 Users

Donor Partner: Intuit
Category: Accounting, Cloud Computing
Platform: Multiple platforms
Format: Online
Product ID: G-49616
Availability: Available

Admin Fee:
$80.00

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DESCRIPTION | SUBSCRIPTION DETAILS | RULES, ELIGIBILITY AND RESTRICTIONS

Description

QuickBooks Online Plus is online accounting software that helps organizations manage essential financial tasks like creating invoices, producing reports, and tracking expenses, contributions, and payments.

This donation provides a one-year subscription for up to five users for QuickBooks Online Plus. You must renew your QuickBooks Online account with TechSoup every 12 months and pay $80 to reconfirm your eligibility for this program and continue your use of the subscription. The $80 admin fee allows TechSoup to continue to make this program available. See the **Subscription Details** tab for more information.

Marin Amateur Radio Club

Balance Sheet Comparison

As of April 28, 2025

	TOTAL	
	AS OF APR 28, 2025	AS OF APR 28, 2024 (PY)
ASSETS		
Current Assets		
Bank Accounts		
B of A Facilities Account - 8795	2,078.40	5,370.90

B of A General account - 4328	74,728.61	56,726.18
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	**$76,807.01**	**$62,097.08**
Other Current Assets		
Uncategorized Asset	0.00	385.00
Total Other Current Assets	**$0.00**	**$385.00**
Total Current Assets	**$76,807.01**	**$62,482.08**
Fixed Assets		
club house- 27 Shell Rd. MV	58,983.00	58,983.00
Total Fixed Assets	**$58,983.00**	**$58,983.00**
TOTAL ASSETS	**$135,790.01**	**$121,465.08**
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	-4,187.45	-16,683.83
Total Equity	**$135,790.01**	**$121,465.08**
TOTAL LIABILITIES AND EQUITY	**$135,790.01**	**$121,465.08**

Marin Amateur Radio Club

Profit and Loss

January 1 - April 28, 2025

	TOTAL	
	JAN 1 - APR 28, 2025	JAN 1 - APR 28, 2024 (PY)

Income		
Christmas Party Income		640.00
Donations	1,209.00	1,350.00
Dues	150.00	240.00
Public Service Refund		168.15
Rent	10,800.00	13,000.00
Unapplied Cash Payment Income		385.00
Total Income	**$12,159.00**	**$15,783.15**
GROSS PROFIT	**$12,159.00**	**$15,783.15**
Expenses		
Accounting	340.00	240.00
Awards	400.00	
Car & Truck	354.94	321.00
Car & Truck Gas		60.00
Total Car & Truck	**354.94**	**381.00**
Christmas Party		2,970.23
Contractors		16,000.00
Equipment < $2,500	431.48	
Field day		35.00
Food	661.44	68.20
Garbage	210.96	198.00
Housekeeping		248.65
Insurance	567.00	564.50
Comm Van Insurance	1,006.49	1,249.50
Total Insurance	**1,573.49**	**1,814.00**
Meals		76.86
Office Supplies & Software	52.00	
Other Business Expenses	575.32	
Public Service Expense	1,994.10	2,393.25
Reimbursable Expenses		20.00
Repair & Maintenance	922.50	14.71
Repeater		1,878.89
Station Upgrades & Maintenance	1,894.69	
Taxes & Licenses	4,164.36	4,049.67
Utilities	1,492.07	1,479.50
Water	214.85	385.29
Web Services Expenses	0.00	

Total Expenses	**$15,282.20**	**$32,253.25**
NET OPERATING INCOME	**$ -3,123.20**	**$ -16,470.10**
Other Expenses		
MESH Grant Disbursement	1,064.25	213.73
Total Other Expenses	**$1,064.25**	**$213.73**
NET OTHER INCOME	$ -1,064.25	$ -213.73
NET INCOME	$ -4,187.45	$ -16,683.83

MARS Club News

May Meeting Presentation

From Curtis Ardourel WA6UDS

Greetings

I am pleased to announce that we will have a presentation at Fridays membership meeting. Richard Cochran AG6QR will be demonstrating a DUI Seismometer that he has built and connected to the MESH. He will set the device up in the club house so you can see it and perhaps make the earth move under our feet. I personally would want to be on hand for this. I am expecting higher than usual attendance on Friday so if you could let me know if you plan to attend by emailing rsvp@w6sg.net I can ensure that there is enough pizza for all.

73 DE WA6UDS
Curtis Ardourel
President and Membership Chair
Marin Amateur Radio Society
WA6UDS@W6SG.NET

AREDN and Winlink

From Mark Klein km6aow

Greetings

For those of you that attended the session on Winlink and asked me questions about AREDN, this is a reminder that on May the 4th at the MARS Clubhouse at 10 am, I will be doing a hands on training session for those interested. My intent is for a quick review of AREDN and then spend the rest of the time flashing your own devices. You can find the list of supported devices here if you don't have one

already: https://www.arednmesh.org/content/supported-devices-0. I will have a couple of my own devices available to work on if needed.

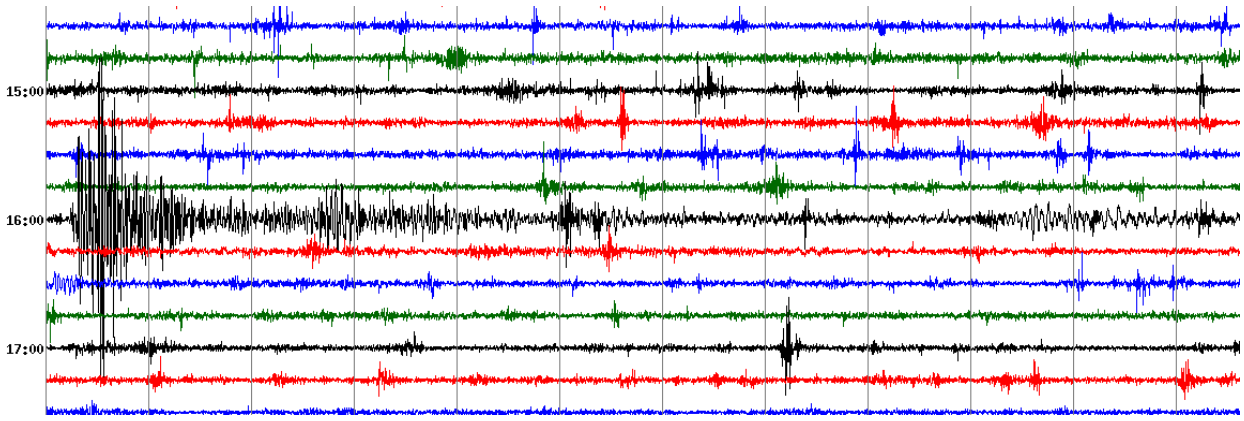
73 de km6aow

Mark Klein

Arden Mesh AG6QR's Seismometer

From Rich AG6QR

Below is helicorder charts from a live seismometer located in the Terra Linda neighborhood of San Rafael, California, approximately fourteen miles north of the Golden Gate Bridge. Each chart covers twelve hours, starting from the time in the link name. All times are presented in UTC. The latest chart will be updated approximately every two to three minutes. This seismometer does not depend on utility power nor on Internet communications. An explanation of the image follows:



Some background information on AG6QR's seismometer
Disclaimer

I am not a professional seismologist, just an amateur person interested in many fields of science. The USGS hires many qualified scientists who educate the public on matters of seismology; you should make use of their expertise instead of trusting mine.

My instrument, while it is quite good for an amateur scientist, is not a professional seismometer. Furthermore, it is located in a noisy location -- a professional would prefer an isolated location much further away from human activities. My seismometer is anchored to the concrete slab floor of a residential garage, in a well-populated subdivision. It picks up passing trucks, neighbors' laundry equipment, people jogging by on the sidewalk across the street, our own garage door opening and closing, blasts from a rock quarry located about five miles away, and other random and sometimes interesting things. It does capture earthquakes, but most things it captures (especially most small things it captures) are not earthquakes. Of course, the kinds of seismic events that might cause nearby damage are much, much larger than these everyday noises it is constantly picking up.

This may not work

I refuse to use the word "uninterruptible" to describe any power supply, network infrastructure, or piece of computer hardware. Nevertheless, my seismometer, and its connection to my AREDN mesh node, as well as the AREDN mesh itself, can operate independently of commercial utility power, and independently of all commercially supplied Internet communications. The same goes for my NTP server with its locally attached GPS, which is connected to the AREDN node at my home. I intend to keep all of this running regardless of electrical supply or Internet service. But we're contemplating a disaster. AREDN becomes most useful after an event that is so serious that it brings down most conventional power, communications, and Internet services over a wide area. It's not hard to imagine that such an event might also be capable of bringing down my ability to participate in the AREDN mesh. There are no guarantees.

It takes a village

One individual seismometer, no matter how good it is, can't determine a precise location for an earthquake nor determine its magnitude. Seismologists use multiple readings from a coordinated networks of multiple instruments to perform this type of work. My own instrument particiates in such a network, and reports its data to the Raspberry Shake network via the Internet. But the AREDN mesh network is primarily for use when the Internet is unavailable.
My hope is that even a single seismometer may help someone determine whether a particular shaking they felt was caused by a small event nearby, or a large event much further away. If you are not located very close to me, and we both felt the same thing, it was probably felt widely.

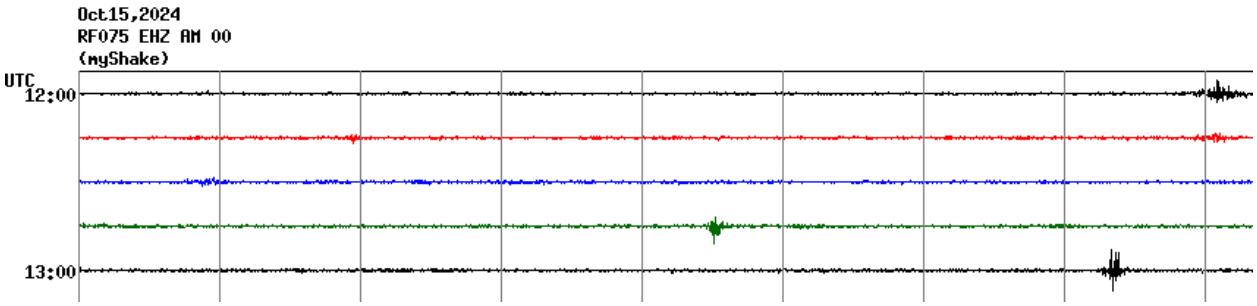
Understanding how the chart markings correlate with clock time

Each chart is a series of horizontal lines, arranged like the lines of text on a printed page. To read the whole chart in chronological order, start at the top, read each line left-to-right, and when you finish one line, continue to the line below.

The width of the chart represents fifteen minutes. There are vertical lines marking each minute, with minute numbers at the bottom. Since each line covers fifteen minutes, that means there are four horizontal lines across the chart for each hour. The chart cycles through black, red, blue, and green lines, and repeats that cycle of colors every hour. The color helps you separate the different traces if they happen to overlap. Hourly times are indicated on the left and right sides of the chart.

Lines will have squiggles in the vertical direction when the seismometer senses movement. Small squiggles may just look like the line has thickened a bit. Larger squiggles may extend up and down to overlap some lines above and below. Really large squiggles will "peg the needle", such that they are limited and won't overlap more than five lines above and below.

Here is a cropped section of the upper-left corner of a typical chart:



In the upper left corner, you see the date, Oct 15, 2024, along with some information identifying my seismometer (RF075) and the channel of data which is being reported (EHZ AM 00).

Along the left side of the chart is a series of hourly time marks showing the UTC hour. The right side of the chart (not shown in this picture) has similar markings every hour. Since the chart is fifteen minutes wide, the topmost marking on the right side is 12:15 UTC, on that same black trace that started at 12:00 UTC. There are vertical lines at one-minute intervals. The whole chart is fifteen minutes wide, but this image is cropped to just the first approximately eight and a quarter minutes. Count the spaces between the vertical bars, noting that each space represents one minute. If you scroll down to the bottom of a chart (one of the real charts you can download, not this cropped section of a chart), you'll see the vertical bars have a scale of minute numbers across the bottom.

There are two of these charts produced per day. This one covers the interval between 12:00 UTC and 00:00 UTC, while the other one covers the interval from 00:00 UTC to 12:00 UTC.

All seismological data is generally reported in UTC, which should be familiar to ham radio operators. But as a helpful hint, both the UTC time and the local California time of the last update are presented together on the page containing the index of charts.

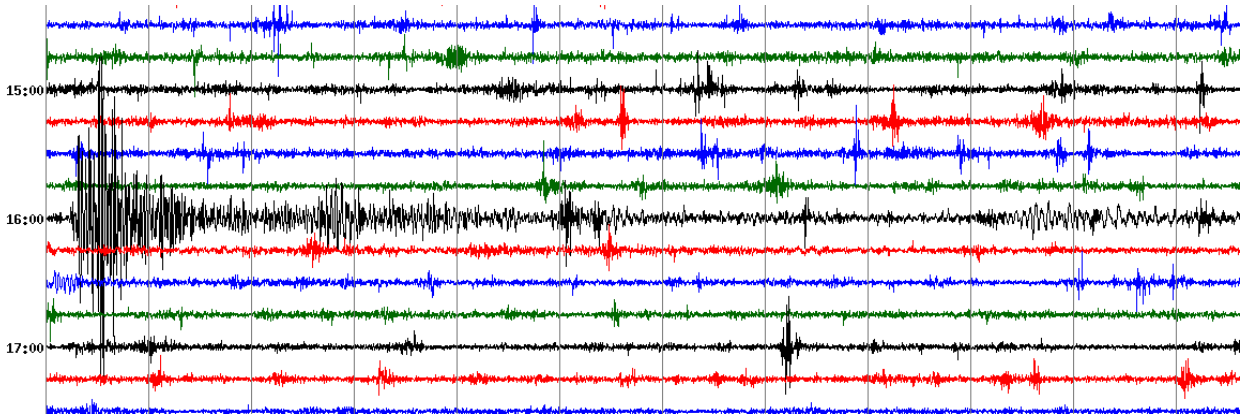
This excerpt of the chart is pretty quiet, but there are a few noticeable squiggles. The first is on the black trace, near the upper right of the picture. By counting the vertical intervals, starting with 12:00, you can see that the disturbance began just slightly before 12:07, and reached its maximum intensity slightly after 12:07. Just

below it, on the red trace, there's a much smaller disturbance that peaked almost precisely 15 minutes later, or 12:22. The blue trace is very quiet, with only a few small disturbances. The green trace has a disturbance at about 12:49:30, about halfway between the line representing 12:49 and the one representing 12:50. (Recall that the green line begins at 12:45.) Finally, the black line beginning at 13:00 has a disturbance at about 13:07:20.

All of these disturbances are small. Notice also that they begin gradually, and they are almost symmetric -- they end in more-or-less the same way as they begin. This is typical of the signature made by passing vehicles. The disturbance ramps up as the vehicle approaches, and trails off as the vehicle moves farther away.

What does a real earthquake look like?

Seismic disturbances usually show a sudden onset followed by an exponential decay. Here's a recording made by this seismometer installed in this location, showing a genuine earthquake.



Notice the big black disturbance at just after 16:00 starts relatively quickly, then it slowly tails off. If you use your imagination a bit, the shape is somewhat reminiscent of the bell of a trumpet that's pointed to the left.

This is a recording of a magnitude 7.8 earthquake that happened in Fiji, on the other side of the Pacific Ocean! It was a very large, very distant quake. By the time it got to this side of the ocean, it was not strong enough to be noticed by humans

unless they were looking at sensitive instruments. But it was much stronger than the other minor disturbances caused by typical human activities in my neighborhood.

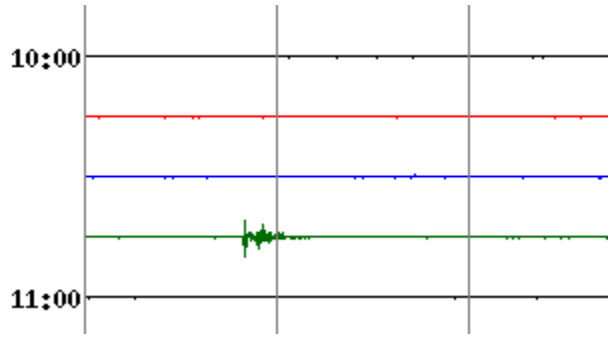
Any earthquake that is strong enough to be noticed widely in the area around San Rafael, where this seismometer is located, will probably "peg the needle" on this seismometer, so that the trace of the motion will be "clipped" and the full extent won't be shown. That's especially true of a quake that is strong enough to cause significant damage in our area.

A quake that is nearby will show a much more sudden onset than this example. It will go from nothing to full strength almost instantly, at least as shown on these charts.

A quake that is somewhat distant, say ten to a hundred miles away, will often show two "trumpet bells". This is due to the separate arrival of "P-waves" vs. "S-waves". As a very rough rule of thumb, if you count the number of seconds between the P-wave arrival and the S-wave arrival, and multiply by 5, you'll get the approximate distance in miles to the earthquake epicenter. This is only a crude estimate, and with only one reading, it doesn't tell you anything about the direction to the earthquake.

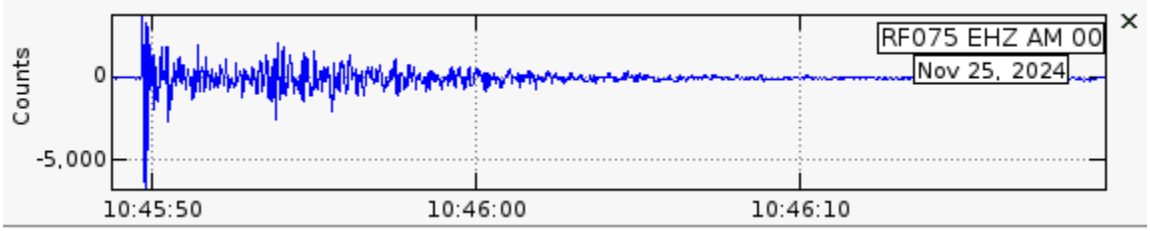
Why did the big Fiji earthquake shown above not show separate P-waves and S-waves? It was far enough away that the waves traveled through the liquid mantle below the Earth's crust, and S-waves don't travel through liquids.

A smaller quake



Shown above is a portion of a chart showing a much smaller, much closer earthquake. According to the USGS, this was a magnitude 2.4 quake located 1 km WSW of Kensington, CA, near the East Bay city of El Cerrito, approximately 26 km (16 miles) east-southeast of my location. It was at a depth of 4.2 km at 10:45:44 UTC on 2024-11-25.

This small quake was not reported in any news media that I saw. The USGS received 175 reports of people feeling it in this well-populated area, but it was not strongly felt even near the epicenter. It's just barely at the level to be noticable on this style of chart from my seismometer. It does show the characteristic shape of a sudden onset followed by exponential decay.



I can use software to directly extract the recording from my seismometer and display it at higher resolution than the helicorder charts I have published so far. Above is an extraction showing a higher resolution trace of the smaller quake in El Cerrito. It's easier to see the sudden onset and subsequent decay. You can also see a secondary shaking that started roughly three seconds after the initial shock. This marks the arrival of the S-waves, about three seconds later than the P-waves. The rule of thumb says that you can multiply that three second difference by 5 miles per second, which gives a 15 mile distance to the event, in reasonable agreement with the 16 mile distance to the USGS-reported location.

From Curtiss Kim:

What: 2025 ARRL Amateur Radio Field Day
When: June 28 - 29, 2025 11am-11am
Where: Picnic Area 1, Stafford Lake Park, 3549 Novato Blvd, Novato, CA
Who: The Marin Amateur Radio Society (MARS) https://w6sg.net/site/

Contact: Steve Toquinto, KB6HOH@comcast.net

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 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.

###

Mondo Fondo

NB2MCM Rallye

4/27/2025

You will want to print these out and bring them with you. I recommend at least reading them once before you arrive. There will be an introduction to the rallye and the chance to ask questions. Here's the link:

https://w6sg.net/MondoFondoRallyeInstructionsFinal.pdf

LAWMAKERS RECONSIDER MEASURE TO PROTECT ANTENNAS IN HOAS

While this isn't club news, it affects all amateur radio operators living under the rules of HOAs (Homeowner Associations). From Rob Rowlands

SKEETER/ANCHOR: The US Congress has also returned to considering a measure giving hams the right to install antennas that, until now, have been banned or restricted by homeowner associations. We have more on that from Paul Braun WD9GCO.

PAUL: A proposed law has been reintroduced in Washington, D.C. to restrict the power that homeowner associations, or HOAs, have to prevent ham radio operators from installing antennas outside their residences.

This is the latest version of the Amateur Radio Emergency Preparedness Act, which has been considered by US lawmakers over the past several years without taking any action.

The measure prohibits HOAs from writing rules that ban amateur radio antennas, which are recognized as part of an essential disaster communications system for public safety. The act also provides hams with a means of resolving disputes that arise in connection with their antennas.

The sponsors are US Senators Roger Wicker, a Mississippi Republican, and Richard Blumenthal a Connecticut Democrat. Opponents of the measure in previous years have raised concerns that large antennas spoil the aesthetics of a community. Many of the measure's supporters have countered that ham radio antennas should be given the same consideration as satellite dishes and TV antennas, which many HOAs permit.

This is Paul Braun WD9GCO.

You can download the entire transcript from
here: https://www.arnewsline.org/s/nsln2468.txt
Or the audio from here: https://www.arnewsline.org/s/Report2468.mp3

ARRL also made a bulletin about this measure (they were broadcasting it on HF a few weeks ago)

ZCZC AG02
QST de W1AW
ARRL Bulletin 2 ARLB002
From ARRL Headquarters
Newington CT February 7, 2025
To all radio amateurs

SB QST ARL ARLB002
ARLB002 Amateur Radio Emergency Preparedness Act Re-Introduced

Legislation Will Increase Communication Options During Natural Disasters

WASHINGTON - U.S. Senators Roger Wicker, R-Miss., and Richard Blumenthal, D-Conn., and Representatives August Pfluger, R-Tex., and Joe Courtney, D-Conn. announced their joint re-introduction of legislation in the Senate and House to restore the right to Amateur Radio operators to install the antennas necessary to serve their communities.

Homeowner association rules often prevent Amateur Radio operators from installing antennas at their homes even though Amateur Radio has proven to be essential in emergencies and natural disasters such as hurricanes when other means of communication fail.

"Mississippians should have access to every possible means of warning for natural disasters, including amateur radio operators. In an emergency, those warnings can mean the difference between life and death," Senator Wicker said. "The Amateur Radio Emergency Preparedness Act would remove unnecessary roadblocks that could help keep communities safe during emergencies like tornadoes, hurricanes, and fires."

"When disaster strikes, amateur radio operators provide vital, often

life-saving information, which shouldn't be hindered by prohibitive rules or confusing approval processes. The Amateur Radio Emergency Preparedness Act eliminates obstacles for ham radio enthusiasts, allowing them to continue their communications and serve their communities in the face of emergencies," said Senator Blumenthal.

"Natural disasters and other emergency situations that hinder our regular lines of communication are unfortunately unavoidable, which is why we must bolster our emergency preparedness by removing the barriers amateur radio operators often run into when installing antennas. Amateur radio plays a vital role in public safety by delivering critical information to people at all times. My district is home to dozens of amateur radio operators ready to volunteer in the event of an emergency, and I am proud to lead this legislation," said Congressman August Pfluger.

"As we know from recent natural disasters, amateur radio operators in Connecticut can be a critical component of disaster response and emergency management. It is in our communities' best interest that we give them the capabilities to operate at the highest level, and with the re-introduction of this bill, we've taken a strong step in that direction," said Congressman Courtney.

Background:

The Amateur Radio Emergency Preparedness Act of 2025 (H.R. 1094 and S. 459) would require homeowner associations to accommodate the needs of FCC-licensed Amateur Radio operators by prohibiting the enforcement of private land use restrictions that ban, prevent, or require the approval of the installation or use of Amateur Radio station antennas. Homeowner associations have often prevented installation and use of such antennas through private land use restrictions. This has hindered voluntary training for emergency situations and blocked access to necessary communications when disaster strikes.

Among other provisions, this legislation would:

* Prohibit homeowner association rules that would prevent or ban Amateur Radio antennas

* Specify an approval process for installing Amateur Radio antennas

* Provide a Federal private right of action to Amateur Radio operators in disputed cases

On behalf of America's Amateur Radio licensees, Rick Roderick, the President of The American Radio Relay League, re-confirmed the ARRL's full support for the passage of the Amateur Radio Emergency Preparedness Act of 2025 and extended his thanks and appreciation to Senators Wicker and Blumenthal and Congressmen Pfluger and Courtney for their unflagging leadership of the bi-partisan effort to support and protect the rights of all Amateur Radio Operators.

The text of the House version can be found in PDF format at, https://www.arrl.org/files/file/Advocacy/HR1094%20House%20Private%20Land%20Use%20Bill.pdf

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.

Heee's Back by Curtiss Kim, KM6GUY

Dennis Murphy, KK6EZY, of Tiburon got his Technican license a dozen years ago but life caught up with him and the ham hobby fell by the wayside. Recently his social media friends began encouraging him to join them in their POTA (Parks On The Air) excursions. Murphy showed up at the MARS VE session in mid-April to upgrade to General so he could take advantage of the HF bands. Murphy's story is not new. Many hams are coming back to the airwaves to pick up where they left off.

Thankfully MARS offers at least four testing dates during the year to encourage those interested in getting their ticket or to offer the opportunity to upgrade to the next license. More and more Volunteer Examiners (VE's) have been turning out at the testing exams to offer their help. In the recent session, VE's Gearld McCarthy, W6NOV, Ken Brownfield, AB6JR, Mel Nunez, AB6QM, Michael Ham, WA6LCN, Curtiss Kim, KM6GUY, Hugh Patterson, KN6KNB, David Pearson, K6DBP, and John Hefler, K7SYH turned out to assist. Registration was handled by JoAnne Saltzgarber, KN6FXH. It's been written that VE's are essential for the continued vitality of ham radio. The operators play a crucial role in ensuring the quality of amateur radio licensing by administering exams, verifying skills, and certifying future operators, and contributing to the overall health and advancement of the hobby. To become a Volunteer Examiner you have to study procedures on amateur radio licensing and take an open book test. Lead Volunteer Examiner, Jim Saltzgaber, KM6WWY, says the next MARS exam session is Saturday, July 12, 2025 at 1PM at the Mill Valley MARS clubhouse.

(1st picture Dennis Murphy, KK6EZY takes General license test. 2nd picture VE's Ken Brownfield , AB6JR and Gerald McCarthy, W6NOV grading exam. 3rd picture Lead Examiner, James Saltzgaber, KM6WWY, congratulating Dennis Murphy on his upgrade. 4th picture, VE Hugh Patterson, KN6KNB and Dennis Murphy, KK6EZY talk about what radio Murphy should get for POTA use.)




2025
North Bay 2-Meter Critical Mass
Calendar

2025

May 18th (third Sunday) James
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

Rather than do a separate report on the April North Bay Critical Mass meeting, I've included the email sent out from Curtis Ardourel WA6UDS, our club President. It covers everything that occurred that day (photographs appear at the end of the writeup):

From: Curtis Ardourel WA6UDS

Greetings

North Bay 2 Meter Critical Mass (NB2MCM) usually meets on the third Sunday of the month. However because of Easter Sunday this month's meeting will take place on Sunday 27 April, at the Juror's parking lot at the Marin Civic center. While the typical meeting involves radio practice and technical discussion this month we are doing something new. Rich Slusher KI6UIM and I written a short Car Rallye based on Brian Cooley's best practices video on the MARS website Watch Video

NORTH BAY 2-METER CRITICAL MASS PRESENTS
"MONDO FONDO"
A MARS PUBLIC SERVICE EVENT TRAINING EXERCISE
IN THE FORMAT OF A COURSEMARKER/GIMMICK CAR RALLYE
SUNDAY, APRIL 27, 2025 From 10:00am – 12:00pm
AT THE MARIN CIVIC CENTER JUROR'S PARKING LOT
(Civic Center Drive at Matthew Hymel Drive)

The theme of this event is based on the MARS Public Service Best Practices video on the MARS website (https://w6sg.net/mvid.html) and will serve to reinforce those practices while driving on a simulated public service event route. The objective is to learn and have fun at the same time.

This type of car rallye is not based on speed or time and no special vehicle is needed to participate. This event will take around an hour to complete and is run on nearby residential roads. Attached is a description of this type of rallye and what (few) items you will need to run it. There will also be a brief “rallye school” and a chance to ask questions on the morning of the rallye. After the rallye is over, we will meet at the Black Bear Diner in Terra Linda to hand out awards and have fun.

Please sign up for this event in advance at RSVP@W6SG.NET and we will send you a set of instructions to review before the rallye.

73 DE WA6UDS
Curtis Ardourel
President and Membership Chair
Marin Amateur Radio Society
WA6UDS@W6SG.NET

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-Marin 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, Commonweal, Bolinas, last picture Tomales Fire Station.)

HF Radio 101

Yes, this is the same article that was published last month. I apologize for the repat but I had some technical difficulties with the diagrams for the series of antenna building articles we're going to do monthly. Thankfully, the problems have just been resolved, and we'll start the articles in the June issue of the QSA-5. I suppose it doesn't hurt to keep the terminology article up for another month. Thank you for your patience!

Before we start building antennas, we need to take a brief look at antenna theory. While I know you more advanced operators know this material, I want any newer operators to have a basic understanding of what makes these antennas work.

Introduction to Antennas

An antenna is a critical component of any ham radio station. It is responsible for converting electrical signals into electromagnetic waves and vice versa. The efficiency of an antenna significantly impacts the performance of your radio system. I cannot stress enough the importance of antennas and their use in HF radio. How good an experience you have will heavily depend on the antenna you use. While you could simply get recommendations from other amateur radio operators regarding what antenna you should own, there bare so many variables involved in successful antenna deployment, that you could easily end up with an antenna that doesn't work well in your using environment. Therefore, you need to really know something about antenna in order to get the most out of them.

We're going to look at antenna theory and antennas in this chapter. This is meant as an introduction to the topic. Antenna theory is such a critical topic in amateur radio that hundreds of books have been written about the subject. If this book, I'm just providing enough information to get you started. I highly recommend you acquire a copy of the ARRL Antenna Book. This is the amateur radio antenna bible and will give you much more detailed information about antennas.
Antennas serve as the crucial interface between electronic devices and electromagnetic waves. They are essential components in any radio communication system, converting electrical signals into radio waves for transmission and vice versa for reception. The design, characteristics, and installation of antennas significantly impact the efficiency and effectiveness of a radio system.

The physical dimensions of an antenna are closely related to the frequency of operation. This relationship is known as resonance, and it's essential for achieving optimal performance. Antennas are typically designed to be resonant at a specific frequency or range of frequencies. By matching the antenna's dimensions to the desired frequency, operators can maximize signal transmission and reception. Antennas can be classified into various categories based on their radiation patterns. Omnidirectional antennas radiate equally in all directions, while

directional antennas focus the signal in a specific lobe. The choice of antenna depends on the desired coverage area and operating conditions. For example, a directional antenna can be used to target a specific location, while an omnidirectional antenna is suitable for general communication.

Antenna gain is another important factor to consider. Gain refers to an antenna's ability to concentrate radio waves in a specific direction. A higher gain antenna can improve signal-to-noise ratio and extend communication range. However, higher gain often comes at the expense of bandwidth, which is the range of frequencies an antenna can efficiently handle.

Proper installation and tuning are crucial for optimizing the performance of an antenna. The antenna should be placed in a location with minimal obstructions and adequate height. Additionally, impedance matching between the antenna and the transmitter or receiver is essential for efficient power transfer. By understanding antenna principles and selecting the appropriate type for their needs, ham radio operators can maximize their communication capabilities and achieve successful results.

Antenna Theory for HF Radio

As previously stated, an antenna is a critical component in any radio communication system, acting as the interface between electrical signals and electromagnetic waves. In the realm of HF (High Frequency) radio, antenna design and performance are paramount for effective communication. The fundamental principle behind an antenna is its ability to efficiently radiate and receive electromagnetic energy. The physical dimensions of an antenna, particularly its length, are closely related to the frequency of operation. This relationship is crucial for achieving optimal performance.

The efficiency of an antenna is determined by factors such as its gain, bandwidth, impedance, and radiation pattern. Gain refers to an antenna's ability to concentrate radio waves in a specific direction, while bandwidth determines the range of frequencies it can handle effectively. Impedance matching between the antenna and the transmitter or receiver is essential to prevent power loss. The radiation pattern describes how an antenna distributes radio waves in space.

Understanding antenna theory is essential for ham radio operators. By selecting the appropriate antenna for a given situation and optimizing its installation, operators can significantly improve the quality and range of their communications. Factors such as antenna height, ground conditions, and nearby objects can also influence antenna performance.

In conclusion, antennas are the cornerstone of radio communication. Their design and characteristics directly impact the efficiency and effectiveness of a radio system. By applying fundamental antenna principles, ham radio operators can optimize their equipment for various operating conditions and achieve successful communication.

Here are some basic concepts to learn as we work our way through antenna theory. They will serve you well in your antenna building endeavors and make reading the ARRL Antenna Book a bit easier. I've included a simple analogy with each term to make grasping that term easier.

Basic Antenna Theory Terms

- **Resonance:** An antenna is most efficient when it is resonant at the operating frequency. This means its physical dimensions are matched to the wavelength of the signal. Imagine tuning a guitar. When you pluck a string, it vibrates at a specific frequency. If you pluck another string at the same frequency, the first string will start to vibrate too, even if you're not touching it. This is called resonance. In radio, resonance happens when an antenna is the right size for a specific frequency, making it vibrate most efficiently and send or receive signals better.

- **Impedance:** The impedance of an antenna is the opposition it presents to the flow of alternating current. It's essential to match the antenna impedance to the transceiver's output impedance for efficient power transfer. Imagine trying to push a swing. If you push at the right time (matching the swing's rhythm), it's easy to keep it going. But if you push at the wrong time, it's harder. This is like impedance in radio. If your equipment matches the antenna's impedance (rhythm), the signal flows smoothly. If it doesn't match, the signal gets "stuck" or "bounces back," which can weaken it.

- **Polarization:** Refers to the orientation of the electric field of a radio wave. Antennas can be vertically or horizontally polarized. Imagine a rope. If you shake it up and down, the waves travel vertically. If you shake it side to side, the waves travel horizontally. In radio, the direction of the waves is called polarization. Some antennas work better with vertical waves, while others work better with horizontal waves. It's like choosing the right tool for the job.

- **Gain:** A measure of an antenna's ability to concentrate radio waves in a specific direction. Imagine a megaphone. When you shout into a megaphone, your voice sounds louder because the megaphone focuses the sound in one direction. In radio, gain is like a megaphone for your signal. A high-gain antenna focuses the radio waves in one direction, making the signal stronger and easier to hear from far away.

- **Bandwidth:** The range of frequencies over which an antenna operates efficiently. Imagine a highway. A narrow highway can only handle a few cars at a time, while a wider highway can handle many more. In radio, bandwidth is like the width of the highway. A wide bandwidth means you can send more information (like data or voice) at once, while a narrow bandwidth limits the amount of information you can transmit.

Basic Antenna Theory: A Deeper Dive

The amateur radio operators who successfully make contacts around the globe with modest equipment understand antenna theory and tend to build their own antennas. These amateurs often take advantage of locations other than their homes for operating. They own multiple antennas and know which antenna to use for specific operating conditions. I have a dozen or so antennas, with the majority of them being homemade. You could simply follow along with YouTube videos and websites, build antennas and avoid the bulk of antenna theory. However, you'd never get your antennas to work as well as they did in the video or on the website.

Antennas are the crucial interface between electronic devices and electromagnetic waves in radio communication. For HF (High Frequency) radio operators, understanding antenna theory is paramount for achieving optimal performance and maximizing communication range.

Antenna design and characteristics significantly impact the efficiency of radio transmission and reception. The physical dimensions of an antenna, particularly its length, are closely related to the frequency of operation. This relationship is known as resonance, and it's essential for achieving maximum power transfer. By understanding resonance, operators can select or design antennas that are well-suited for their desired frequencies.

The radiation pattern of an antenna describes how it distributes radio waves in space. Some antennas are omnidirectional, radiating equally in all directions, while others are directional, focusing the signal in a specific lobe. The choice of antenna depends on the desired coverage area and operating conditions. For example, a directional antenna can be used to target a specific region, while an omnidirectional antenna is suitable for general communication.

Antenna gain is another important factor to consider. Gain refers to an antenna's ability to concentrate radio waves in a specific direction. A higher gain antenna can improve signal-to-noise ratio and extend communication range. However, higher gain often comes at the expense of bandwidth, which is the range of frequencies an antenna can efficiently handle.

Proper installation and tuning are crucial for optimizing the performance of an antenna. The antenna should be placed in a location with minimal obstructions and adequate height. Impedance matching between the antenna and the transmitter or receiver is also essential for efficient power transfer. By understanding antenna theory and applying these principles, ham radio operators can significantly enhance their communication capabilities and achieve successful results.

We’re going to look at some concepts in greater detail to expand your knowledge base. All of the following play a critical role in successfully working the HF bands. I’ve been able to work with modestly priced equipment and get results that leave

the operators with high-end transceivers wondering how I did it. Spend the time now to learn basic antenna theory and you'll save both time and heartache for years to come! We'll start by looking at a crucial concept in all radio communication, resonance.

Resonance in HF Radio

Resonance is a fundamental concept in physics and plays a crucial role in radio communication. It occurs when a system is excited at its natural frequency, resulting in an amplified response. In the context of HF radio, resonance is essential for efficient antenna operation. When an antenna is resonant at a specific frequency, it exhibits maximum efficiency in radiating or receiving electromagnetic waves. This means that more of the transmitted power is converted into radio waves, and more of the received signal is captured by the antenna. By understanding and utilizing resonance, ham radio operators can optimize their antenna systems for better performance and communication.
To achieve resonance, the physical dimensions of an antenna must be carefully calculated to match the desired frequency. This involves determining the appropriate length of the antenna elements based on the wavelength of the radio wave. Factors such as the type of antenna, its environment, and the desired operating frequency influence the resonant length. By carefully matching the antenna's dimensions to the operating frequency, hams can maximize signal strength and efficiency.

Impedance in HF Radio

Impedance, a measure of the opposition to the flow of alternating current, is a critical concept in HF radio. It represents the complex interaction between resistance, capacitance, and inductance within a circuit. In the context of antennas, impedance matching between the antenna and the transmitter or receiver is essential for efficient power transfer. A mismatch results in power loss, reduced signal strength, and potential damage to equipment.
Ham radio operators strive to achieve a low Standing Wave Ratio (SWR), which indicates a good impedance match. Techniques like using antenna tuners, baluns, and understanding the characteristics of different antenna types help in optimizing impedance matching. By carefully considering impedance, operators can maximize the performance of their radio systems and enjoy improved

communication.

Polarization in HF Radio

Polarization refers to the orientation of the electric field component of a radio wave. In the simplest terms, it describes the direction in which the wave is oscillating. There are two primary types of polarization: vertical and horizontal. Vertical polarization occurs when the electric field is perpendicular to the Earth's surface, while horizontal polarization occurs when the electric field is parallel to the Earth's surface.

The polarization of an antenna must match the polarization of the incoming wave for optimal reception. For HF radio, vertical polarization is commonly used due to its efficiency in ground wave propagation. However, skywave propagation can affect polarization, as the ionosphere can rotate the plane of polarization. Understanding polarization is crucial for antenna design and selection, as well as for troubleshooting reception issues.

Antenna Gain

Antenna gain is a measure of an antenna's ability to direct radio waves in a specific direction. It's expressed in decibels (dB) and compares the antenna's performance to a reference antenna, typically a half-wave dipole. A higher gain antenna concentrates more power in a particular direction, resulting in improved signal-to-noise ratio and longer communication range. In HF radio, gain is crucial for long-distance communication, as it allows operators to overcome atmospheric noise and interference.

Antennas with higher gain, such as yagi-uda or beam antennas, are commonly used for DXing (long-distance communication). However, it's important to balance gain with other factors like bandwidth and ease of installation. Understanding antenna gain helps operators choose the right antenna for their specific needs and operating conditions.

Bandwidth in HF Radio

Bandwidth refers to the range of frequencies within which a signal can be

transmitted without significant distortion. In the context of HF radio, it's the measure of how wide a signal is spread across the frequency spectrum. A wider bandwidth allows for higher data rates, but it also requires more spectrum space. For HF operators, understanding bandwidth is crucial. Different modes of operation require varying amounts of bandwidth. For instance, narrow-band modes like CW (Continuous Wave) occupy minimal bandwidth, while wideband modes like SSB (Single Sideband) require a larger spectrum. Additionally, antenna design impacts bandwidth. Some antennas have inherently wider bandwidths, making them suitable for multiple frequency bands, while others are more specialized for narrower frequency ranges.

The Anatomy of an HF Antenna

An HF (High Frequency) antenna is a complex system composed of several interconnected components. Understanding these parts is essential for proper installation, tuning, and maintenance.

The most fundamental component of an antenna is the radiating element. This is the part of the antenna that directly interacts with electromagnetic waves. It can be a simple wire, a tubular element, or a more complex structure. The length of the radiating element is crucial for determining the antenna's resonant frequency. Supporting structures are used to hold the radiating element in place. These can be masts, towers, or other structures that provide stability and elevation. The choice of supporting structure depends on the antenna's size, weight, and the intended installation location.

Feedlines connect the transmitter or receiver to the antenna. They carry the radio frequency (RF) signals between these components. Common types of feedlines include coaxial cable and twin-lead. The length and type of feedline can affect the antenna's performance and introduce losses.

Baluns are often used to match the impedance of the antenna to the transmission line. This helps to minimize standing waves and improve power transfer. Baluns can be passive devices, such as transformers, or active devices that incorporate circuitry to provide impedance matching.

Grounding is another important aspect of antenna systems. A good ground

provides a reference point for the antenna's electrical currents, reducing noise and improving efficiency. Ground systems can vary from simple ground rods to more complex radial systems.

List of Antenna Components

- Radiating element
- Supporting structure
- Feedline
- Balun
- Ground system

Antenna Components in Greater Detail

The Radiating Element: The Heart of an HF Antenna

The radiating element is the primary component of an HF (High Frequency) antenna responsible for interacting with electromagnetic waves. It converts electrical signals from the transmitter into radio waves for transmission and vice versa for reception. The design and characteristics of the radiating element significantly influence the antenna's performance, including its gain, radiation pattern, and efficiency.

The most common types of radiating elements used in HF antennas include wires, rods, and loops. Wire elements can be straight, folded, or shaped into various configurations. Rod elements are often used in vertical antennas and can be made of metal or fiberglass. Loop antennas consist of a closed loop of wire, which can be circular, rectangular, or other shapes.

The length of the radiating element is crucial for determining the antenna's resonant frequency. A half-wave dipole, for example, has a length of approximately half a wavelength of the desired frequency. This ensures optimal impedance matching and efficient radiation. However, other lengths can also be used, such as quarter-wave verticals or full-wave loops.

The shape of the radiating element can also affect the antenna's radiation pattern. For example, a dipole antenna has a relatively omnidirectional pattern, radiating equally in all horizontal directions. A Yagi-Uda beam antenna, on the other hand,

has a directional pattern, focusing the signal in a specific lobe. By understanding the relationship between the radiating element's design and the antenna's performance, ham radio operators can select the most suitable type for their specific needs.

Supporting Structures: The Backbone of HF Antennas

Supporting structures play a vital role in HF (High Frequency) antenna systems, providing a stable foundation for the radiating elements and ensuring proper alignment and elevation. The choice of supporting structure depends on various factors, including the antenna's size, weight, and the intended installation location.

One of the most common supporting structures for HF antennas is the mast. Masts can be made of wood, metal, or fiberglass and are available in various heights and configurations. They are often used to support vertical antennas, allowing for adequate elevation and reducing ground losses.

Towers are another option for supporting HF antennas, especially for large or heavy antennas. Towers can be constructed of steel or other materials and can provide significant height, enabling long-distance communication. However, towers require careful planning and installation, as well as appropriate permits and regulations.

In some cases, existing structures, such as buildings or trees, can be used to support HF antennas. However, these structures may have limitations in terms of height and stability. It's essential to ensure that the antenna is securely attached to the supporting structure and can withstand weather conditions.
The choice of supporting structure depends on the specific requirements of the antenna system. By carefully considering factors such as antenna size, weight, installation location, and budget, ham radio operators can select the most suitable supporting structure for their needs.

Feedlines: The Lifeline of HF Antennas

Feedlines are essential components of HF (High Frequency) radio systems, connecting the transmitter or receiver to the antenna. They carry the radio

frequency (RF) signals between these components, ensuring efficient power transfer and minimizing signal losses. The choice of feedline depends on factors such as the antenna's impedance, the operating frequency, and the distance between the transmitter and antenna.

One of the most common types of feedlines used in HF radio is coaxial cable. Coaxial cable consists of a central conductor surrounded by an insulating layer and a shield. This construction provides good shielding against external interference and minimizes signal losses. Coaxial cable is available in various sizes and impedances, allowing for flexibility in antenna installations.

Twin-lead, also known as ladder line, is another type of feedline used in HF radio. It consists of two parallel conductors separated by insulators. Twin-lead is often preferred for longer runs due to its lower loss characteristics. However, it can be more susceptible to interference and requires careful matching to the antenna's impedance.

The length of the feedline can also affect its performance. Excessive feedline length can introduce losses and create standing waves, which can degrade the signal. It's important to select a feedline of appropriate length and to use antenna tuners to minimize impedance mismatches.

By understanding the characteristics and choosing the appropriate feedline for their specific application, ham radio operators can optimize the efficiency and performance of their antenna systems.

Baluns and Ununs: Essential Components for HF Radio

Baluns and ununs are specialized devices used in HF (High Frequency) radio systems to match the impedance of the antenna to the transmission line. Impedance matching is crucial for efficient power transfer and minimizing standing waves, which can degrade signal quality and cause equipment damage. A balun (balanced-to-unbalanced transformer) is used when the antenna is unbalanced, such as a dipole or a vertical antenna. It transforms the balanced impedance of the antenna to the unbalanced impedance of the coaxial feedline. This matching prevents common-mode currents from flowing on the shield of the coaxial cable, reducing interference and improving signal quality.

An unun (unbalanced-to-unbalanced transformer) is used when both the antenna and the feedline are unbalanced. It provides impedance matching between these two components, ensuring efficient power transfer. Ununs are often used with vertical antennas that have a ground radial system.

The choice between a balun and an unun depends on the specific antenna configuration and the desired impedance match. In some cases, a balun may be necessary to prevent common-mode currents, while an unun may be sufficient for impedance matching.

Proper impedance matching is essential for optimizing the performance of an HF antenna system. By using baluns and ununs, ham radio operators can improve signal-to-noise ratio, reduce standing waves, and enhance overall communication efficiency.

Baluns and ununs are available in various designs and impedance ratios. The appropriate choice depends on the specific requirements of the antenna and the transmission line. It's important to select a balun or unun that is rated for the desired frequency and power level.

By understanding the role of baluns and ununs and selecting the appropriate device for their antenna system, ham radio operators can optimize their communication and achieve successful results.

Baluns and Ununs: When to Use Them

- **Balanced antennas:** Dipoles, inverted-V antennas, and slopers are examples of balanced antennas that require baluns.
- **Unbalanced antennas:** Vertical antennas with a ground radial system are examples of unbalanced antennas that often require ununs.
- **Coaxial feedlines:** Both baluns and ununs are commonly used with coaxial feedlines.
- **Impedance mismatches:** If you're experiencing high SWR or other signs of impedance mismatch, a balun or unun may be necessary.
- **Reducing common-mode currents:** Baluns are particularly useful for preventing common-mode currents from flowing on the shield of a coaxial

cable.

Ground Systems and Radials in HF Radio

A well-designed ground system is essential for optimizing the performance of a vertical HF antenna. The ground acts as a counterpoise, providing a return path for the antenna's current. A good ground system helps to reduce ground losses, improve radiation efficiency, and minimize interference.
One of the most common types of ground systems used in HF radio is the radial ground system. This consists of multiple wires radiating outwards from the base of the antenna. The number and length of these wires significantly impact the antenna's performance. More radials and longer lengths generally result in better grounding.

The type of ground material also plays a role in the effectiveness of a ground system. Conductive materials like copper or aluminum are preferred, as they offer lower resistance. However, even non-conductive materials, such as dry soil, can provide some level of grounding.

The length of the radials should be as long as practical, ideally a quarter-wavelength or more of the operating frequency. However, practical limitations often dictate the length of the radials. In some cases, a combination of buried and above-ground radials can be used to optimize performance.

By carefully designing and implementing a ground system, ham radio operators can significantly improve the efficiency and performance of their vertical antennas. A well-grounded antenna can reduce ground losses, improve radiation efficiency, and minimize interference, leading to better communication and overall system performance.

Types of HF Antennas

High Frequency (HF) radio, operating in the 3 to 30 MHz range, is a versatile communication medium that enables long-distance contacts across continents and oceans. It's a popular choice for amateur radio operators, emergency services, and international broadcasters.

The choice of antenna is crucial for effective HF communication. Different types of antennas are designed for specific applications and operating conditions. For example, dipole antennas are a simple and versatile option suitable for a wide range of frequencies. Vertical antennas are often used for ground wave propagation and are well-suited for limited space installations. Beam antennas, such as Yagis, offer directional gain, focusing the signal in a specific direction for improved communication range.

The selection of antenna depends on various factors, including the desired range, frequency band, and operating environment. For long-distance contacts, directional antennas like beams are often preferred. However, for local or regional communication, omnidirectional antennas like dipoles or verticals may be sufficient.

Understanding the characteristics of different antenna types and their suitability for specific applications is essential for successful HF radio operation. By selecting the appropriate antenna, ham radio operators can optimize their communication capabilities and achieve long-distance contacts.

We start our antenna building next month with the classic dipole, that tried and true staple of HF amateur radio operators around the world!

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 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. 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-11

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/