

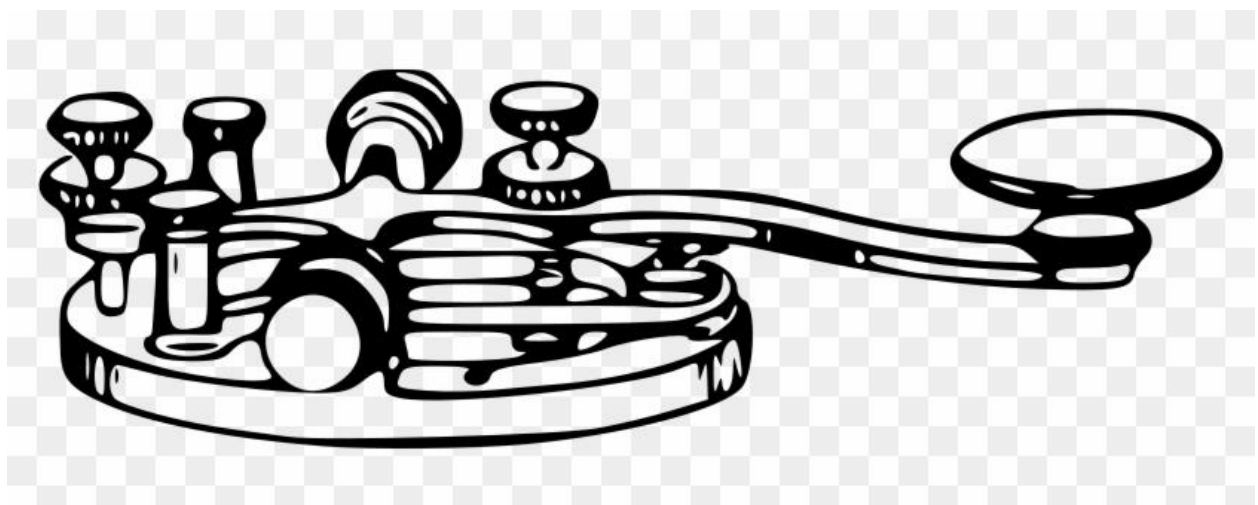


# QSA-5

## Marin Amateur Radio Society Monthly Newsletter

Established 1933

December, 2024



When all else fails, you can count on Amateur Radio

## **From Our President:**

We have reached December the first of 2024. This is where I am supposed to reflect on the last year. This December I am going instead to look forward rather than back. We will have some challenges in 2025. The county emergency communications landscape is uncertain. Our own Public Service Committee will be under new leadership with Scott Pasternak KN6ZDM at the helm. I am very pleased he has decided to take on the role. He has excellent people skills, and organizational skills. Michael Fischer K6MLF and Row Rowlands NZ6J, both former chairs will be mentoring him as well. Our North Bay Area Mesh committee now includes MARS members from Sonoma County and all signs point to our being able to expand northward even as we try to navigate the uncertain landscape in Marin County.

Inspired by a presentation to the club made by new member Mohit Bhoite KE0JVM, who is clearly an engineer and a artist, wowed us with his electronic creations, there is renewed interest in doing club construction projects. We have done these in the past where the club chooses a design, and the club purchases parts in bulk. People sign up by buying the parts and then we meet at the club house one or more times to build the project with mentors on hand to help out folks who are not regular builders. I think this is a great way after covid to get folks back to in person sessions at the club house on Sunday mornings.

Meeting at North Bay 2 Meter Critical Mass NB2MCM provides new hams mentoring and experience with their radios as well as feeding new people into our Public Service events. The Sunday morning meetings also provided another place to learn, but since Covid attendance has dropped. Club construction projects may help bring people back. In 2024 we gained 17 new members, many of them new hams. Face to face mentoring is the best way to pass on knowledge.

Enough of my blathering for now. Get back to your leftover turkey. I hope to see you all soon in this new year.

73 de wa6uds

## From the Editor:

It's hard to believe that we're almost at the start of the new year. We've survived Thanksgiving and are heading towards Christmas at lightning speed. With the holidays come countless ads to buy, buy, buy and partake in the yearly tradition, Christmas consumerism. We'll all suffer through bad Christmas sweaters, fruit cake you could hammer nails with, and Christmas songs we've all heard one too many times. Before you get the wrong idea, I really do like holidays, but just in a subtler fashion. Let's all enjoy the holidays in our own way! Getting back to amateur radio and heading into winter, the 10-meter band is jumping! I'm testing a new export radio that does 10, 11, 12, and 15 meters with a PEP that comes in at 100 watts SSB (even though it is advertised at 80 watts SSB).

It's a great time to be into amateur radio! Advances in technology has made the entry cost for new hams a lot lower and there's more bang for your buck when it comes to radios! More and more people are taking their technician's exam. MARS is building up its ranks and it's up to us to welcome the newly licensed amateur radio operators. It's up to us to bring in the next generation of amateur radio operators to keep this great hobby alive! Our beloved club is busy as always. The Marin Amateur Radio Society is holding their annual Christmas gathering. Club elections are taking place, and the first VE session is coming up in January. MARS is moving forward! Thanks to Curtiss Kim and the usual suspects for their contributions. I hope your Thanksgiving was wonderful and your holidays bright!

[QSA-5Editor@w6sg.net](mailto:QSA-5Editor@w6sg.net)



## **New Members:**

Katherine Jewett KO6GIN – Sausalito

Jonathan Brown AK6VB - Rohnert Park





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

**Marin Amateur Radio Society**

**Board of Directors Meeting**

**11/14/2024**



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

**Called to order: @ 19:32 hours.**

**Attendance:**

**President:** Curtis Ardourel WA6UDS

**Director:** Richard Cochran AG6QR

**Director:** Ed Essick K6ELE

**Director:** Steve Toquinto KB6HOH

**Secretary:** James Saltzgaber KM6WWY

**Director:** Jeffrey Young KM6Y

**Treasurer:** Bruce Bartel N6VLB

**Trustee W6SG:** Marc Bruvry KF6VNT

**Trustee K6GWE:** Brian Cooley K6EZX

**Adopt agenda:** MSC to adopt agenda as presented

**Approve Minutes:** of 10 October board meeting MSC to adopt Minutes as published in QSA-5

**Secretary's Report/Communications:** Jim – Nothing to report

**Treasurer's Report:** Published in QSA-5

a) NARCC paid through 2025

b) Google for Nonprofits is authorized and active, free due to our non-profit status. – Bruce will be meeting with Curtis and Brian Cooley to start the setup. Details will be brought to the board in the future. We will have Google Meets that can be used in lieu of Zoom for meetings. It will allow us to store documents on Google Drive in our club account.

c) Marin property taxes first installment paid.

d) Letter to IRS sent – Working with accountant re: a late filing penalty letter.  
Members Present: Milt Hyams KM6ASI, Mark Klein K6AOW, Skip Fedanzo KJ6ARL, Rob Rowlands NZ6J, Scott Pasternak KN6ZDM, Ken Brownfield AB6JR, Charlie Benet AI6TT, Larry Bradley KK6QPE, Dan Sobel N6HLZ, Larry Loomer KI6LNB

## **Committee and other Reports:**

**1. Membership:** Curtis Presently 160 members. This is 97% of this time last year.

**2. Facilities:** Skip Good news- clubhouse cleaned, yardwork being done. The large vine in oak tree near gate has been removed. Some branches still need to be removed that are touching the Comm Van parking shelter. Jim and Skip will be looking at doing something to make the sliding back door easier to navigate.

**3. VOAD/RCV:** Skip- Both are alive and well. Adriana Rabkin, who is still director of Marin VOAD, hosted a traveling conference between South Bay, East Bay and Sacramento areas. There is some interest in these areas for Ham radio support of Community Based Organizations. Marin RCV may have done some prototyping for some of the other counties. The "Great Shake Out" exercise 10/17 RCV participation AAR has been published. No notice activation has been successful under the compressed conditions of drills. This will have to be rewritten to have a closer fit to a multi-day event.

**4. Technical:** Milt- We have located the controller for the vertical SteppIR antenna from Alan Bowker's equipment. Jerry Foster will be working on the correct connection for it and getting the necessary power supply. We plan to put it up at the clubhouse in lieu of the R8 antenna. Gerald McCarthy has volunteered help install the Stepp IR on the clubhouse. We will need to organize with our tenant for the installation of the antenna. Rob Rowlands and Milt are checking issues that are reported with the simul-cast repeater system noise and multi-path interference. Possibly lowering the power from Mt. Barnabe will help. Also getting some outside noise on 146.700 when the gate is open. Rob has tested turning off the Mt. Barnabe repeater temporarily. Adding a receive pl tone for each repeater may be useful with troubleshooting which one is receiving interference. A crossband repeater has been set up on Scott's KN6ZDM boat, input= 445.500 pl 192.8 input, 146.555 out to add coverage for southern Marin simplex.

**5. Public Service:** Rob/Scott – Scott Pasternack KN6ZDM will be taking overall responsibility for organizing the MARS 2025 Public Service schedule. He will be assisted by Rob Rolands, Michael Fischer, Oliver Lu, and Don Magdanz. Next

year's schedule will be presented at the January board meeting and potentially will contain a new event.

**6. VE Testing:** Jim 2025 schedule has been submitted to ARRL, and it should be live on their site in about 7 days. Test dates are January 11, April 12, July 12, October 11. All test sessions will start at 1:00pm at the clubhouse. Thanks to all the MARS VE Examiners, including the 4 VE's, that made this year a success. Some changes to the W6SG.net examination pages are in order.

**7. Comm Truck:** Jim – We need to do the maintenance check list. We also need to recruit some volunteers to assist with the general maintenance of the comm van.

**8. NBAM:** Bruce -The last membership meeting was held October 16th. Rob Rolands has re-joined the NBAM steering committee. Most of the equipment in storage at the clubhouse has been updated and inventoried. Mark Klein organized and led an additional update party to complete the updating of equipment that had not been done. Kathy KM6URP provided an update on North Bay activities including Bodega Fire Station 10 that will become a demo station. Mark has set up a new tunnel server at the clubhouse and has emailed detailed instructions for connecting to it. The field deployment equipment is in the process of being updated and will be identified with the W6SG call sign in lieu of the individual operator's call. Mark Klein – will be meeting with Adam Mclaughlin via telephone regarding next steps regarding issues with Napa Sheriff's and Napa Office of Emergency Services locations that have gone silent again. We rely heavily on link between Sugarloaf and Mt. St. Helena for northern Sonoma connectivity it's time to start working on an alternate solution because if we can't get support from Napa and that link goes down everything is dead to the north. In discussion with the Sonoma County public infrastructure there are a couple of sites that we might get access to, Mt. Burdell being one of them. That would eliminate problems that we have coming up from Marin with Big Rock. Mark will be exploring that more. These items will be discussed at the next NBAM meeting on November 17th. Rob Rolands and Michael Fischer have installed two mesh nodes on Mt. Tam East Peak to provide an RF connection to the club. Mark Klein – Anyone who does not have RF Mesh connectivity and would like to explore mesh operations is invited to reach out to him for assistance connecting to the new tunnel server and how to utilize it.



**9. Bylaws:** Curtis – The Bylaws committee has submitted a report of suggested changes to our current 1997 version. It is 36 pages, 11,000 words. Curtis reviewed these changes to the board, change by change, for comment, discussion, modification, and approval. There were comments and suggestions, resulting in a revised version of the modified bylaws. It was moved that the revised version of the bylaws, as modified by the board, be submitted to the general membership by inclusion in the upcoming MARS election. The motion was seconded and carried.

**Old Business:**

1. Paint the Clubhouse- Fund is still at \$9280, remaining at \$4.5 on the website S Meter.
2. Revitalizing Babble Class – tabled until December meeting
3. Donations Committee Charter – tabled until December meeting
4. Christmas Celebration – Rob and Scott investigated having our Christmas celebration at the Cantina restaurant in Mill Valley. They reported that it would be \$35/person + tax/tip for a fajita bar. Drinks would not be included but could be purchased at the bar individually. The date would be 7 December @ noon. MARS would handle collecting payment for the food. After discussion, it was MSC that “MARS would have a simple Christmas lunch, Dec. 7, 12:00 – 1:00 PM at the Cantina, Fajita Bar Buffett luncheon only, without door prizes.” The December membership meeting will be held on Friday December 6th, our normal date/time.
5. Jane Rogers and Michael Fischer Fund - \$500 for the building- tabled to December meeting

**New Business:**

1. New Google environment – Online storage of club records- tabled to December meeting
2. Election- Test of election found that the full slate must be voted for. Curtis will modify before submitting to membership.
3. December Meeting – See Old Business Item 4. Christmas Celebration.

**Good of the Order:** Nothing presented.

**Executive Session:** Not required.

**Adjourn:** MSC, 20:22 hours

**Next Regular Meeting 6 December 2024**

**Next Board Meeting 12 December 202**

# Marin Amateur Radio Club

## Balance Sheet Comparison

As of November 30, 2024

		TOTAL
	AS OF NOV 30, 2024	AS OF NOV 30, 2023 (PY)
ASSETS		
Current Assets		
Bank Accounts		
B of A Facilities Account - 8795	3,000.90	5,485.61
B of A General account - 4328	73,358.05	77,509.49
CD	0.00	0.00
Money Market	0.00	0.00
VE Session Cash	0.00	-129.00
VE Session Cash Received	0.00	-45.00
<b>Total Bank Accounts</b>	<b>\$76,358.95</b>	<b>\$82,821.10</b>
Other Current Assets		
Uncategorized Asset	385.00	-95.00
<b>Total Other Current Assets</b>	<b>\$385.00</b>	<b>\$ -95.00</b>
<b>Total Current Assets</b>	<b>\$76,743.95</b>	<b>\$82,726.10</b>
Fixed Assets		
club house- 27 Shell Rd. MV	58,983.00	58,983.00
<b>Total Fixed Assets</b>	<b>\$58,983.00</b>	<b>\$58,983.00</b>
<b>TOTAL ASSETS</b>	<b>\$135,726.95</b>	<b>\$141,709.10</b>
LIABILITIES AND EQUITY		
Liabilities		
<b>Total Liabilities</b>		
Equity		
Opening Balance Net Assets	124,400.00	124,400.00
Retained Earnings	13,748.91	-20,412.57
Net Income	-2,421.96	37,721.67

<b>Total Equity</b>	<b>\$135,726.95</b>	<b>\$141,709.10</b>
<b>TOTAL LIABILITIES AND EQUITY</b>	<b>\$135,726.95</b>	<b>\$141,709.10</b>

## Marin Amateur Radio Club

### Profit and Loss

January - November, 2024

	TOTAL	
	JAN - NOV, 2024	JAN - NOV, 2023 (PY YTD)
Income		
Christmas Party Income	640.00	
Donations	23,996.00	1,699.17
Dues	8,920.51	7,074.75
Interest Income		792.77
Public Service Refund	168.15	450.00
Rent	31,800.00	26,000.00
Unapplied Cash Payment Income	385.00	
<b>Total Income</b>	<b>\$65,909.66</b>	<b>\$36,016.69</b>
<b>GROSS PROFIT</b>	<b>\$65,909.66</b>	<b>\$36,016.69</b>
Expenses		
Accounting	1,665.00	1,275.00
Awards		299.99
Car & Truck	2,224.89	2,327.80
Car & Truck Gas	152.42	258.02
<b>Total Car &amp; Truck</b>	<b>2,377.31</b>	<b>2,585.82</b>
Christmas Party	2,970.23	
Contractors	22,549.00	
Field day	854.66	1,370.26
Food	632.38	
Garbage	560.70	534.54
Housekeeping	1,123.80	

Insurance	5,640.00	5,537.00
Comm Van Insurance	2,457.01	2,790.25
<b>Total Insurance</b>	<b>8,097.01</b>	<b>8,327.25</b>
Meals	235.24	
Office Supplies & Software	794.49	
Other Business Expenses	13.00	104.93
Picnic	1,705.10	1,757.51
Public Service Expense	4,188.44	1,379.96
Reimbursable Expenses	542.00	2,496.73
Repair & Maintenance	2,851.06	415.00
Repeater	2,158.67	1,567.50
Taxes & Licenses	8,222.03	4,074.67
Uncategorized Expense	104.51	
Utilities	4,067.69	4,219.81
VE Session	174.00	
Water	1,330.79	949.03
<b>Total Expenses</b>	<b>\$67,043.11</b>	<b>\$31,532.00</b>
<b>NET OPERATING INCOME</b>	<b>\$ -1,133.45</b>	<b>\$4,484.69</b>
Other Income		
MESH Grant Income		33,500.00
<b>Total Other Income</b>	<b>\$0.00</b>	<b>\$33,500.00</b>
<b>Other Expenses</b>		
MESH Grant Disbursement	1,288.51	263.02
Total Other Expenses	\$1,288.51	\$263.02
<b>NET OTHER INCOME</b>	<b>\$ -1,288.51</b>	<b>\$33,236.98</b>
<b>NET INCOME</b>	<b>\$ -2,421.96</b>	<b>\$37,721.67</b>

# LIFE IS SIMPLE



# MARS Club News

## MARS Christmas Celebration 2024

We are going back to the future.

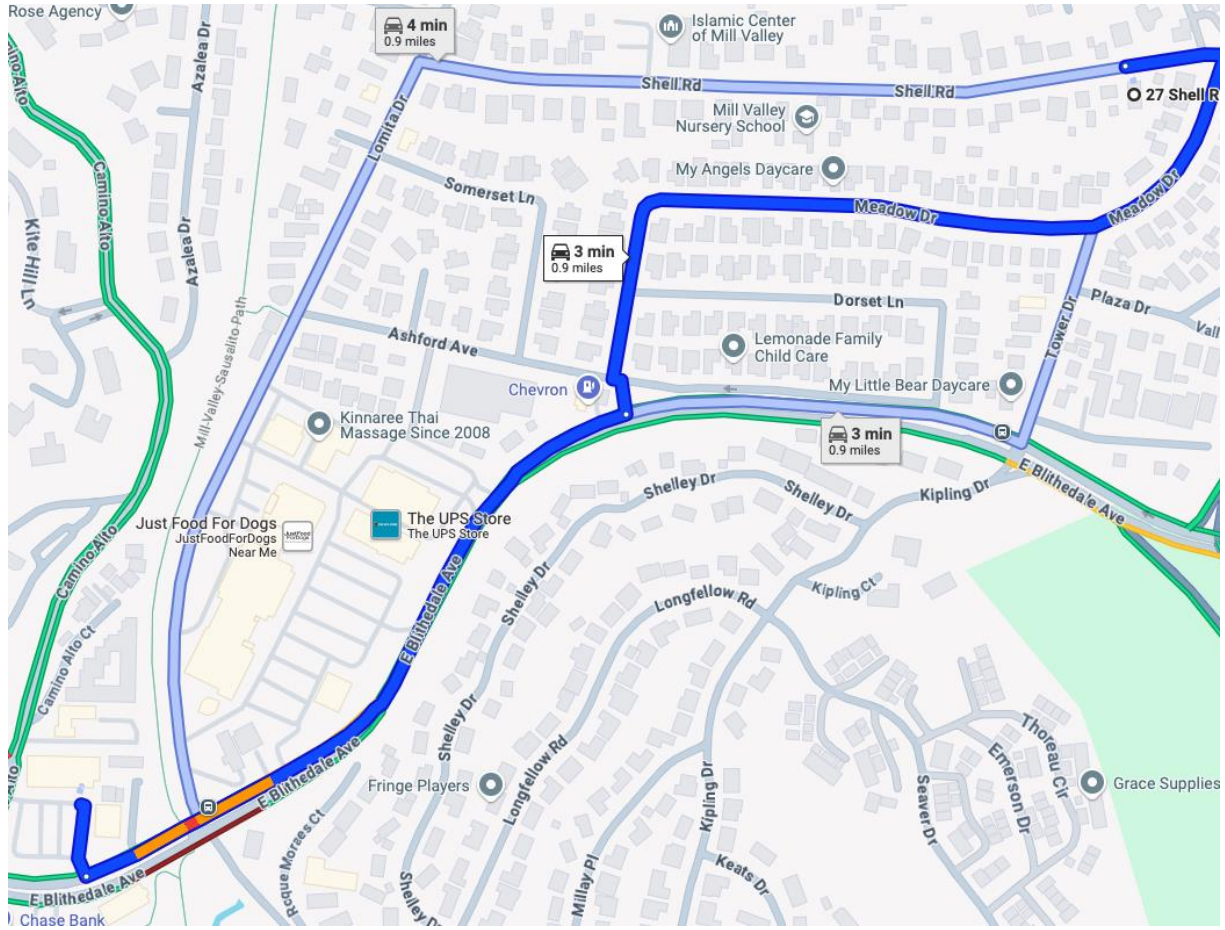
In the dark and dusty recesses of my mind I recall we had our Christmas party at the Deer Park Villa in Fairfax. Of course, during the plague, we did not have a Christmas party at all. Last year we had a luncheon at the club house. This year we are trying something a little different.

We will be doing a Cantina Fajita Buffet. This will include Grilled Fajita Chicken Breast, Grilled Fajita Skirt Steak, and Grilled Seasonal Vegetables served with Sautéed Onions and Bell peppers. Accompanied by Mexican Rice, Refried Beans, Spicy Cantina Beans, Warm Corn and Flower Tortillas, Guacamole, Salsa Fresca, Sour Cream, Shredded Cheese, and Shredded Lettuce.

The meal includes the all of the above and gratuity. You will be responsible for beverages or dessert. The Cantina has a full bar and makes an excellent Margarita.

The cost is \$45.00 per person paid in advance. We will accept cash or check payment at the door but that will cost \$50.00 per person. If you intend to pay at the door please let me know at [rsvp@w6sg.net](mailto:rsvp@w6sg.net)

To get to the Cantina at 651 E Blythedale Ave, Mill Valley



## Amateur Radio Put to the Test

**From Curtiss Kim:** Held over from last month's issue of the QSA-5: Sometimes we overlook just how good we have it. Our region is broadly classified as a Mediterranean Climate. Translated, summers are dry, sunny and warm and winters are said to be mild, wet and occasionally stormy. While we have felt the effects of climate change, nowhere else has Mother Nature shown her wrath than the southeastern part of the nation. Back-to-back storms, Helene and Malcolm have stretched resources to the maximum and put amateur radio communications to the test. The wicked weather has wiped out entire towns, killed over 200 residents, taken numerous power grids offline and left roads and street impassable. While landlines, cell service and the internet have disappeared in those areas, amateur radio remained the one constant. In many cases, licensed operators have been working side by side with first responders in the affected areas. The National Association for Amateur Radio (ARRL) is tracking amateur radio in critical situations and reports a significant impact in all phases of the rescue and recovery efforts. There are numerous stories of how operators have dealt with stranded people, the need for water and medications and alternative evacuation routes. ARRL reports individual hams have established pop up nets, maintained mountain top repeaters and supplied logistical support. In Marin County, MARS has taken the lead in providing supplemental radio communications. Members are actively involved in ACS/RACES (Auxiliary Communication Service/Radio Amateur Civil Emergency Service) under the authority of the Marin County Sheriff's Department. The goal is to provide additional communications to assist the Office of Emergency Management. (OEM) MARS members often do this on their own time using their own equipment. In addition, MARS has a second support organization called Radio Communication Volunteers. (RCV). Operators, when approved, fall under the jurisdiction of the county's Department of Public Works. RCV members will deploy to various community-based organizations after a major emergency has affected Marin County. The members will stay with that organization to provide radio communication in the days following the initial disaster. Some of the organizations taking part include the San Francisco-Marín Food Bank, Canal Alliance and Homeward Bound. In both instances, the groups hold regular check-ins, meetings and drills. According to Rob Ireson, K6RGI. Chief RACES Officer, ACS-RACES activates



when requested by OEM or other public health and safety agencies. “We do not self-activate, however we do anticipate and prepare for activation when conditions warrant.” In short, amateur operators in Marin stay prepared as illustrated by this month’s Great Shakeout exercise. The “no notice-protocol” called for assembling a roster of available amateurs who could provide needed support for a specific incident. Recent areas of concern in Marin include the prolonged power safety power shutoffs by PG and E, and the potential for flooding caused by atmospheric river events. When all else fails...there is still power in Marin, the power of amateur radio.





## Volunteer Examiner News: End of the Year Wrap Up

The year is ending and the MARS VE Team brought many new amateur radio operators into the fold during 2024. The MARS VE 2025 exam schedule will be Jan 11<sup>th</sup>, Apr 12<sup>th</sup>, Jul 12<sup>th</sup>, and Oct 11<sup>th</sup>. Our Volunteer Examiners look forward to bringing more new amateur radio operators into the fold and helping existing license holders upgrade their licenses! It is crucial that clubs take the time to develop VE programs so we can keep our hobby alive and well. Here's to another successful year.

**From Curtiss Kim:** MARS is finishing off the year with one of the biggest VE sessions in recent memory. Nine candidates turned out on October 12<sup>th</sup> to either earn their first amateur radio license or upgrade to the next level. In addition, Jim Saltzgaber, KM6WWY, Lead Volunteer Examiner, was pleased to see four new VE's turnout to familiarize themselves with the testing procedures in the exam process. Sitting shoulder to shoulder with the veteran examiners, the new VE's graded test results, oversaw application registration and signed off on the paperwork. Michael Ham, WA6LCN, Luis Membrila, WA6LM, Gerald Mcarthy, W6NOV, and Nancy Coombs, KN6GTR were anxious to experience the requirements of the job. Each of the new VE's echoed a similar theme, that they wanted to help the next generation of amateur radio operators. Membrila, WA6LM, said he had a burning desire to be a VE

ever since he got in the hobby but had to wait until he turned 18 to take the VE exam. McCarthy, W6NOV, said it was all about giving back and it had nothing to do with being a rock star, earning money or making himself more charming. “Without VE’s, there would no future in amateur radio.” Ham, WA6LCU, said being a VE was part of the process to re-immense himself back into amateur radio after an extended layoff. Coombs, KN6GTR, lives in Richmond and made the trek across the bridge to learn from the best. She said she emailed six different radio clubs in her area to make herself available as a VE. MARS responded, inviting her to participate. To become a VE, you must be licensed, have familiarize yourself with the rules and regulations of each test and pass an open book exam. Those holding a General license can only test applicants applying to become Technician amateurs. Extra Class license holders can grade any level. Another first, three of the nine candidates taking the recent tests were women. Saltzgaber mused it might have had to do something with the weather-related problems in the nation’s southeast. All three women testing, passed. The VE’s approved 7 new Technicians, two were upgraded to Generals due to past licenses that had lapsed. One amateur upgraded to General. Saltzgaber was pleased by not only the testing turnout but the support of licensed operators to become VE’s. Also in support roles, JoAnne Saltzgarber, KN6FXH and Curtiss Kim, KM6GUY. The need for amateur radio operators was never more important after the recent storms Helene and Milton in the southeast. Many enthusiasts not only kept lines of communication open but fielded questions about food, fuel and medications. Emergency communication was heroically upheld by amateur radio.

First picture, Ken Brownfield, AB6JR and Nancy Coombs, KN6GTR Second picture, Hugh Patterson, KN6KNB with Luis Membrila, WA6LM Third picture, Jerry Foster, WA6BXV, and Michael Ham, WA6LCU. Fourth picture, Gerald McCarthy, W6NOV with Jim Saltzgaber, KM6WWY, Lead Volunteer Examiner. The following is from Jim Saltzgaber KM6WWY, Lead Volunteer Examiner:

MARS VE Team,

I would like to congratulate you all on a very successful 2024 ARRL/MARS VE Examination program. I would also like to thank each of you for your support and selfless volunteer hours. As you all know, it takes a knowledgeable and dedicated

team to successfully conduct VE sessions, and I am very thankful to have all of you on our team.

I also want to thank the 4 new VE's that joined us for their first time at the October 12<sup>th</sup> session: Luis Membrila WA6LM, Nancy Coombs KN6GTR, Gerald McCarthy W6NOV; and Michael Ham WA6LCN (previously a VE but returning from an extended absence)! Welcome to the MARS VE team!

We had a total of 27 applicants, 25 were successful in obtaining a new or upgraded license. There were 13 new Technician Class hams, 7 General Class upgrades (1 passed tech and general), and 5 Extra Class upgrades. Only 1 Tech and 1 General applicant did not receive a license/upgrade. On the VE side, 15 of our 17 VE's volunteered for at least 1 session, with a total of 31 "VE Sessions". That does not include our "Full Time" Non-VE Assistant, JoAnne Saltzgaber KN6FXH with 4 sessions this year.

I received a great many thanks and appreciative remarks and emails from our applicants. We do provide a very special and necessary service to the Ham Radio hobby, and to the Marin Amateur Radio Society, at no cost to the MARS club. Thank you all again!

**Our 2025 schedule will be Jan 11<sup>th</sup>, Apr 12<sup>th</sup>, Jul 12<sup>th</sup>, and Oct 11<sup>th</sup>.** Please mark your calendars. I look forward to working with all of you again next year.

Jim Saltzgaber KM6WWY

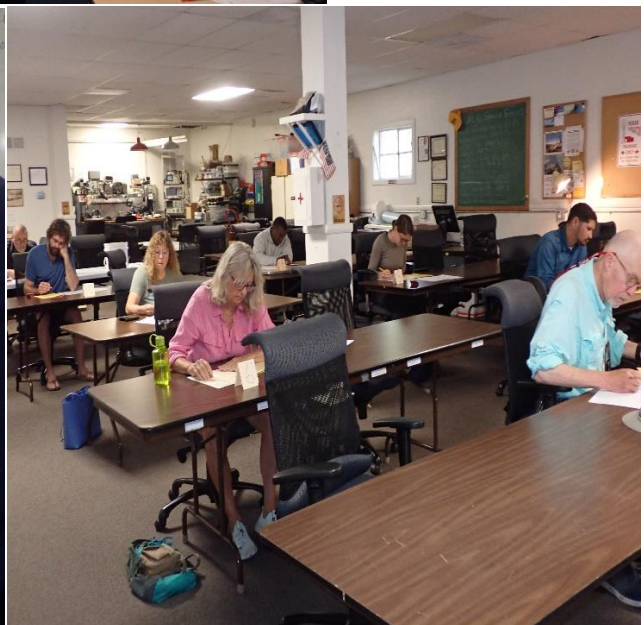
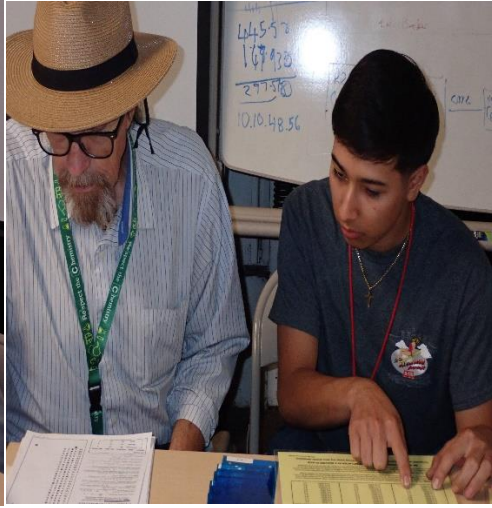
Lead Volunteer Examiner

Marin Amateur Radio Society

27 Shell Rd.

Mill Valley, CA 94941





## North Bay Critical Mass Report

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The topic for November's Critical Mass was a show and tell and employment of Go Boxes. There were many home brew go boxes as well as official go boxes such as the MARIN RACES Yellow Box. There was a short presentation on each, the antennas used in the field with the boxes and a short drill using the boxes. This was an opportunity to try out various radios and gets some ideas for your own go boxes. Attendees were encouraged to bring their go boxes and be prepared to describe their components and show them off.

The gathering took place at the usual place and then attendees dispersed around the grounds to get a chance to set up a station and get on the air. There was a huge turnout for the event!

Milt apologized in advance for conflicting with PACIFICON. Due to the lack of available alternative dates this month, North Bay Critical Mass went ahead with the session as scheduled. For next year, they will avoid the PACIFICON weekend. Here are some photographs from the event (courtesy of Michael Fischer K6MLF):









MARS  
Field Day  
2024

Jim Saltzgeber  
KM6WVY  
CHANNLES, FLORIDA  
DR-7  
Instructions  
for the  
MARS  
Jim KM

CHANNELS

KM6WVY

4730









marin Service Training Community  
EST 1933 w6sg.  
AMATEUR RADIO SOCIETY

YAESU

Jackery  
EXPLORER 150





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## Chromebooks and Ham Radio

The following comes from Rob Rowlands regarding the use of Chromebooks for ham radio needs and projects. Please excuse the way Rob's contribution is formatted on the page but there was a technical issue (your editor is lacking in some layout skills to say the least) and the QSA-5 wanted to make sure it was included in the December issue. Thanks Rob!

# Chromebooks and ham radio

I've had 2 chromebooks over the years and love the instant start up and ability to do most of what I need a computer for. My almost universal use of google docs means I don't miss Microsoft office, and I can move easily to an iPhone, iPad or android pad in the middle of creating a document.

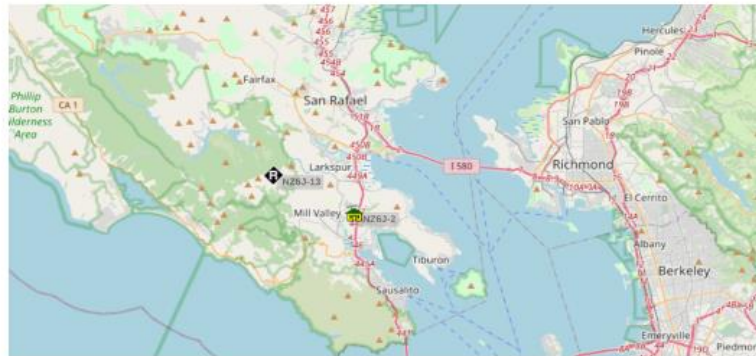
Until now the hardware spec has been pretty much at the low end of the laptop spectrum, but that's changed! The "Chromebook plus" marque dictates a minimum Intel i3, HD screens, 8G of RAM and a generous hard drive. This means the latest software (mostly free!), AI in particular, can target a semi-closed platform much as Apple has done. But not at Apple prices, and I just bought an Acer 14 inch laptop with 512G of hard drive for \$199 from Costco!

The screenshot shows the Costco website interface. At the top, there's the Costco Wholesale logo and navigation links for Warehouses, Account, and Cart. Below that is a search bar and a 'Shop' button. The page displays the product details for an Acer Chromebook Plus 14" Touchscreen Laptop. It highlights a 'Black Friday Deal' and 'Online Only' status. The product description includes: Intel Core i3-N305 - 1920 x 1080 - Chrome OS - 8GB RAM - 512GB SSD - Protective Sleeve Included. The item number is 1815945 and the model is CB514-4HT-359X. The product has a 4.4 star rating from 186 reviews. A 'Share' button is visible. At the bottom, there are three feature callouts: '14\"

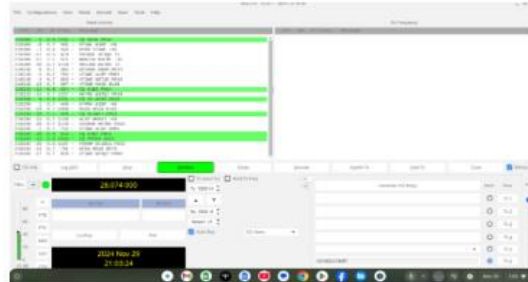
So, what ham radio applications can it run:

- All web based apps including Gmail and access to KPH and other SDRs  
Eg aprs.fi





- The Google Docs suite that's compatible with Word, PowerPoint and Excel
- WSJT-X as a Linux app, that is indistinguishable from any other app, once installed



- Almost all android apps, though they run in a funky phone-oriented window. They can be made more usable by changing from portrait to landscape mode. Eg **Repeaterbook**



- Winlink doesn't run natively but there's an app called **WOAD** that presents differently but is just as capable as Winlink Express.

## 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.

# The Latest Export HF Transceiver

## The Anytone AT6666 Pro and Radioddity QT80

Export radios are becoming a dominant part of the amateur radio transceiver market. Their price point and abilities make them an attractive alternative for the new amateur radio operator wanting to explore the HF bands without having to pay a substantial amount for the privilege of doing so! This month, we're going to look at a new mobile transceiver that has become extremely popular with HF amateur radio operators, the Anytone AT6666 Pro also branded as the Radioddity QT80. It retails for about \$300.00. Let me start by saying, I was first introduced to the radio by Walt K4OGO whose YouTube channel, Coastal Waves and Wires - <https://www.youtube.com/@COASTALWAVESWIRES> - is extremely popular. The bulk of my successful DXing contacts are because of his antenna designs. Walt does videos on many export radios, including this one. He shows himself using this radio in the field, demonstrating its abilities. I have this radio and have been using it for DXing.

What is an export radio? They are radios designed to be sold in a variety of markets, each with their own band restrictions. They often can be easily modified to cover more bands than advertised and sometimes produce more power than they are rated for. The Anytone AT6666 Pro and Radioddity QT80 are such radios.

Both are rated at 80 watts PEP, but actually produce 100+ watts on SSB. They are both sold as 10-meter radios, but will do 10, 11, 12, and 15-meters by moving a jumper up one notch. I purchased the Anytone AT6666 Pro and cannot believe how fantastic a radio it is! What really impressed me is the lack of noise, their noise reduction technology is amazing:

The Anytone AT6666 Pro incorporates a noise reduction circuit that significantly improves audio quality during both transmission and reception. This technology helps to reduce background noise, interference, and static, resulting in clearer and more intelligible communication.



The noise reduction circuit utilizes digital signal processing techniques to analyze the incoming audio signal and identify and remove unwanted noise components. This allows for a cleaner and more focused audio experience, especially in noisy environments.

By minimizing background noise, the noise reduction circuit also helps to improve the overall signal-to-noise ratio (SNR) of the transceiver. This can lead to improved sensitivity and the ability to receive weaker signals, which is particularly beneficial for long-distance communications.

Then there's the clarifier built into the radio. The clarifier function in the Anytone AT6666 Pro is a valuable tool for fine-tuning the received frequency to ensure accurate reception and transmission. It works by slightly shifting the frequency of the received signal, allowing you to compensate for slight frequency offsets between your transceiver and the station you are communicating with.

The clarifier can be adjusted in small increments, typically in steps of 500 Hz or 5 kHz. By carefully adjusting the clarifier, you can eliminate any frequency drift or error, ensuring clear and intelligible communication.

The clarifier function is particularly useful in situations where the other station may not be transmitting exactly on the desired frequency. By using the clarifier, you can fine-tune the reception to compensate for any frequency offset, resulting in a clearer and more enjoyable listening experience.

The radio has a both channel and VFO mode. The VFO mode allows the radio to function as a traditional HF transceiver. You have a choice of six background colors for the screen. While it doesn't have a waterfall, it does have a solid SWR display. The radio is the standard 13.8 volts and should have at least a 15 A power supply. There's no built-in tuner. I use one of the mini antenna tuners, the ATU-100 EXT by N7DDC. It covers from 1.8 to 50 MHz. They were listed on Amazon during the Black Friday/Cyber Monday sales for \$70.00. That little tuner is first rate!

As with most of these radios, there's a learning curve because the radio's buttons and knobs often do more than one thing. You also have to press multiple buttons to access certain menu features and functions. Having tested this out on the 10, 12, and 10-meter bands, it's a winner. The 100-watt power on SSB makes hard to hear contacts loud and clear. You do have to play around with the noise controls

and clarifier to get the incoming acoustics to sound more natural. But that's a small price to pay for all the radio's features. Talking to a contact in Northern Italy this morning, he gave me a signal report of 59+. Not bad for a \$300.00 transceiver. We'll have a more detailed analysis of this radio in the January issue of the QSA-5.

### **Key Features:**

- **High Power Output:** The AT6666 Pro delivers impressive power output, with 80 watts on AM/SSB and 50 watts on FM. This allows for strong, clear transmissions over long distances.
- **Noise Reduction Technology:** The built-in noise reduction technology helps to minimize background noise and interference, improving the overall audio quality of both transmissions and receptions.
- **Dual Watch Function:** This feature allows you to monitor two frequencies simultaneously, increasing your chances of catching important traffic or calls.
- **Programmable Memory Channels:** The AT6666 Pro offers programmable memory channels, allowing you to store your favorite frequencies and quickly access them.

## **HF Radio 101**

### **Operating SSB on the HF Bands**

#### **Introduction**

This month, in this beginner's guide to HF radio, we'll take a deeper dive into operating SSB (Single Side Band) on the HF bands. In January, we'll look at the

established way of CQ, making contacts on the bands. This article is meant as a brief introduction to the subject. It covers the things to keep in mind when searching out contacts and communicating with them.

## **Operating SSB on HF: An Introduction**

I'm going to cover a lot of information regarding operating on SSB because it's very different from the VHF/UHF world. Everything that follows is important. However, there is one technique that cannot be stressed enough, listening. We'll dig deep into good listening techniques because there's a lot to it. In fact, you'll get far more contacts if you have good listening skills. More on that later!

Single Sideband (SSB) is a popular and versatile operating mode in HF (High Frequency) radio, offering a wide range of communication possibilities. However, operating SSB effectively requires a combination of technical knowledge, practical skills, and a deep understanding of the mode's nuances.

One of the fundamental skills for successful SSB operation is tuning the transceiver accurately. This involves adjusting various settings to ensure that the transmitter and receiver are operating on the same frequency and with the correct audio frequency shift (AFSK). Proper tuning is essential for clear and intelligible communication.

Another important aspect of SSB is managing audio levels. The microphone gain, audio output level, and compression settings must be adjusted to achieve optimal audio quality and prevent distortion. Understanding how to balance these factors is crucial for effective SSB communication.

In addition to technical skills, SSB operators must also develop good listening habits. It is essential to be able to recognize and interpret the audio signals received on the airwaves. This requires practice and experience, as well as a good ear for audio quality.

SSB can also be challenging in terms of signal-to-noise ratio and interference. Operators must be able to identify and mitigate these factors to ensure clear and reliable communication. Techniques such as antenna selection, proper grounding,

and noise reduction can help to improve the signal-to-noise ratio and reduce interference.

Finally, SSB requires patience and perseverance. It may take time to develop the skills and experience needed to operate effectively in this mode. Don't be discouraged by initial challenges and keep practicing until you achieve your desired level of proficiency.

By mastering these skills, you can unlock the full potential of SSB and enjoy the many benefits it offers, including long-distance communication, high-quality audio, and efficient use of the available spectrum. Here are some essential skills you need for good SSB communication:

- **Microphone technique:** Proper microphone technique is crucial for good audio quality. Effective microphone techniques are crucial for achieving high-quality audio in SSB (Single Sideband) communication. By using proper microphone technique, you can enhance the clarity and intelligibility of your transmissions, making it easier for others to understand your messages.

One of the most important aspects of SSB microphone technique is maintaining a consistent distance from the microphone. Speak at a natural volume and maintain a consistent distance to avoid clipping or distortion. Experiment with different distances to find the optimal position for your voice.

Another key factor is microphone placement. Holding the microphone too close to your mouth can introduce plosive sounds, while holding it too far away can result in muffled audio. Experiment with different placements to find the position that provides the best balance of clarity and sensitivity.

Additionally, be mindful of your breathing. Excessive breathing sounds can be distracting to listeners. Try to control your breathing and avoid blowing into the microphone. Practice speaking clearly and enunciating your words to ensure that your messages are easily understood.

- **Frequency control:** Maintain accurate frequency control to avoid interfering with other stations. Frequency control is a critical aspect of HF (High Frequency) radio communication, ensuring accurate and reliable transmission and reception. A variety of techniques are employed to maintain precise frequency control, particularly in modes like SSB (Single Sideband), where frequency stability is essential for maintaining audio quality and preventing interference.

One common technique used in HF radio is **crystal-controlled oscillators (XOs)**. These oscillators generate a stable frequency based on the resonant frequency of a quartz crystal. XOs are widely used in transceivers due to their accuracy and reliability. However, they can be sensitive to temperature variations, which can affect frequency stability.

To address temperature sensitivity, **oven-controlled crystal oscillators (OCXOs)** are often used in high-performance transceivers. OCXOs maintain a stable temperature environment for the crystal, ensuring more precise frequency control. This is particularly important for applications where high levels of frequency accuracy are required.

In addition to hardware-based solutions, **software-based frequency correction** can also be used to improve frequency stability. Some transceivers incorporate software algorithms that can detect and correct frequency deviations. This can help to compensate for variations in the oscillator's frequency and maintain accurate transmission and reception.

- **Listening practices:** Develop good listening habits to understand the nuances of SSB signals. Listening is a fundamental skill in HF (High Frequency) radio communication. It allows you to monitor the airwaves, identify potential contacts, and assess the propagation conditions. Effective listening practices can enhance your communication experience and increase your chances of making successful contacts.

One of the most important listening techniques is **active listening**. This involves paying close attention to the signals you hear, identifying the mode being used, and understanding the content of the transmissions. Active listening requires focus, concentration, and a good ear for audio quality.

Another valuable technique is **frequency scanning**. This involves systematically sweeping through different frequencies to identify active stations and potential contacts. By scanning the bands, you can discover new frequencies to operate on and connect with a wider range of operators.

When listening for contacts, it's important to be patient and persistent. The HF bands can be crowded at times, so it may take some time to find an open frequency. Don't get discouraged if you don't hear any activity right away. Keep scanning the bands and be prepared to call CQ (calling all stations) to announce your presence.

Finally, it's essential to listen respectfully to other operators on the air. Avoid interfering with their transmissions and be mindful of the etiquette of the band you are operating on. By practicing good listening habits and following the rules of the airwaves, you can contribute to a positive and enjoyable HF radio experience.

- **QSO etiquette:** Follow standard operating procedures and etiquette. QSO etiquette is essential for maintaining a harmonious and enjoyable HF (High Frequency) radio environment. By following these guidelines, you can contribute to a positive and respectful community.

First and foremost, it's important to be clear and concise in your communications. Avoid using excessive jargon or technical terms that may be unfamiliar to others. Speak clearly and enunciate your words to ensure that your messages are easily understood.

When calling another station, be patient and wait for a response before repeating your call. Avoid excessive calling, as it can be disruptive to other operators. If you don't receive a response after a reasonable amount of time, move on to another frequency.

Once a QSO is established, be courteous and respectful to your fellow operators. Avoid interrupting others and allow them to complete their transmissions. If you have a question or comment, wait for a pause before speaking.

Finally, be mindful of the frequency you are operating on. Some frequencies are designated for specific types of communication, such as DX (distance) contacts or contesting. Avoid interfering with other operators on these frequencies and

respect the established rules and customs. By following these QSO etiquette guidelines, you can contribute to a positive and enjoyable HF radio experience.

### **More on Listening and Listening Skills**

I want to talk about developing listening skills using my own experience. Listening is much more than sitting next to your transceiver's speaker (or headphones) and following the back and forth between operators. While there are some basic methods that all amateur radio operators follow, there are subtle differences between operators. There is a cadence or rhythm to a QSO and you need to work within that rhythm or cadence. Otherwise, you'll have a problem making contacts successfully.

Successful HF (High Frequency) radio communication requires a combination of technical knowledge, operational skills, and effective listening practices. Listening is a fundamental aspect of HF radio, enabling you to monitor the airwaves, identify potential contacts, and assess propagation conditions.

Here are some key listening skills that contribute to successful HF radio contacts:

- **Focus and concentration:** The ability to maintain focus and concentrate on the incoming signals is essential for effective listening. Tune out distractions and pay close attention to the audio cues.
- **Audio recognition:** Develop your ability to recognize different types of signals, including voice, CW (Continuous Wave), and digital modes. This will help you identify potential contacts and determine the appropriate mode to use.
- **Signal interpretation:** Learn to interpret the characteristics of the received signal, such as signal strength, quality, and fading. This information can help you assess the propagation conditions and adjust your operating parameters accordingly.
- **Frequency scanning:** Practice scanning the HF bands to identify active frequencies and potential contacts. This involves systematically sweeping through different frequencies and listening for signals.

- **Patience and persistence:** HF radio can be unpredictable, and it may take time to establish a successful contact. Be patient and persistent and keep trying different frequencies and modes until you find a suitable match.
- **QSO etiquette:** Follow proper QSO (contact) etiquette to ensure a respectful and enjoyable communication experience. This includes listening carefully to other operators, avoiding interference, and being courteous in your interactions.

By developing these listening skills, you can enhance your ability to make successful contacts in HF radio and enjoy the many benefits of this exciting hobby.

Here's how I make contacts on the HF bands. After finding a signal that is clear enough to understand, I dial it in, getting it as clear as possible. Then I write down the frequency. You'd be surprised at how many beginners make a contact, write down the other person's callsign on a scrap of paper, then move on to another frequency. An hour later, when they go to log their contact with QRZ or Logbook of the World, they can't remember the contact frequency.

After writing down the frequency, listen for the other person's call sign. It may take a while but if you make contact with them, ask for their callsign, and they give it to you too quickly to get everything, you may not get a second chance. Yes, there are times when you have to jump right in, but many of the DX contacts you encounter are doing a long session. This means you have time to get their callsign.

Listen to the way in which the operator completes one contact and goes to the next. Sometimes, they'll give their call sign and say Q-R-Zed. Sometimes they simply say Q-R-Zed, giving their call sign every few minutes. You're going to face pile ups in which a hundred amateur radio operators are all giving their callsign at the same time. You can often hear other operators saying their callsigns. Make a mental note of which one is chosen by the operator and where in the QRZ jumble of voices it occurs. Sometimes, it's the first person to get the start of their callsign into the microphone. Sometimes, it's someone at the end of the pile up whose callsign can be heard in full. Sometimes, it's the biggest amplifier and booming signal that wins. You have to do some listening to know how to proceed.

Don't give up. Try at least five times, take a break, and try three more times. You could even come back to that station and frequency. If the bands are really open



and there are a lot of DX stations, I'll listen to one, write down the frequency and callsign, move on to another station and repeat the process until I have three or four frequencies and matching stations. Then I can bounce between them, looking for lulls in the pile ups. The point here is to listen, I sometimes just practice my listening skills on bands I don't want to make contacts on to develop my listening skillset. It wasn't until I developed listen skills that I started to make successful and plentiful contacts.

## 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. Our first article comes from MIT:

**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/>

**Ham radio operators prepare for active hurricane season:** A good piece regarding the preparation amateur radio operators did for the recent devastating hurricanes.

<https://www.fox8live.com/2024/06/24/ham-radio-operators-prepare-active-hurricane-season/>

**2024 Pacificon Inspires Next Generation of Radio Amateurs:** A nice article from the ARRL about the convention and bringing amateur radio to new generations of operators.

<https://www.arrl.org/news/2024-pacificon-inspires-next-generation-of-radio-amateurs>

**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/>

**Estate Planning for Hams (What happens to all your stuff?):** This is an important topic. Brought to you by the ARRL.

<https://www.arrl.org/news/estate-planning-for-hams-what-happens-to-all-your-stuff>

**Amateur Radio Communications SAG Wagon Support for Cycling Events:** A great Article from Cycle Chat regarding the assistance that amateur radio clubs provide for cycling events.

<https://www.cyclechat.net/threads/amateur-radio-communications-sag-wagon-support-for-cycling-events.299152/>

**Ham radio may be more important than you think:** Addressing the importance of

amateur radio.

<https://www.mystateline.com/news/ham-radio-may-be-more-important-than-you-think/>

**Amateur radio club has changed my life:** This is a wonderful article that touches on the benefits of amateur radio for folks with disabilities

<https://www.bbc.com/news/articles/cd17nj8wpl8o>

## 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. Looks like there's nothing new at the FCC (once again):

**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>

**Job Posting: FCC Recruiting Field Agents:** In case any of you have wanted to become a field agent. Does it come with a badge?

<https://www.arrl.org/news/job-posting-fcc-recruiting-field-agents>

## Propagation News

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

**The K7RA Solar Update:** This is the K7RA solar update, which is updated regularly:

<https://www.arrl.org/news/the-k7ra-solar-update-855>

**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://grp-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/>