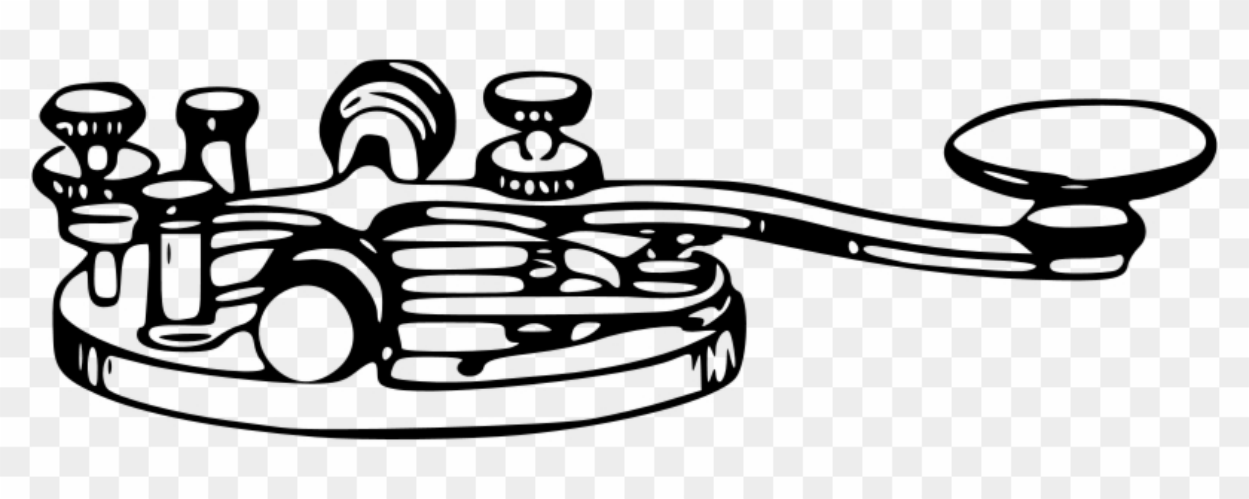
QSA-5

Marin Amateur Radio Society Monthly Newsletter

Established 1933 **April 2025**



When all else fails, you can count on Amateur Radio

From Our President:

A few gentle reminders: I still have 29 badges from the recent order to distribute. I will be at the Friday 4 April in person club meeting, Sunday 13 April 10 am babble class at the clubhouse and of course the 27 April North Bay 2 Meter Critical Mass and Car Rallye at 10 am. The badges don't do me any good sleeping in a bag.

As I write this on the last day of March, those of you who have not yet renewed your MARS membership will officially be past due. By the time you read this the past due reminders will already be sent out. At the end of April, I will start trimming the QSA-5 email list to current members. If you have not done so already, please take a moment to go to https://w6sg.net/site/members/renew-2/ to renew. If you don't remember if you have renewed, you can go to that link and when you try to renew it will tell you if you are current.

We are a better club when we are active. I am pleased to see that we have a number of ongoing projects. I want to call out a few of them.

Our HF net is back on the air. Every Sunday morning at 9:30 am on 3915 kHz LSB with Marc Bruvry KF6VNT as net control. Please check in. We are adding antennas to the clubhouse so we can be active on other bands and make our workbench more useful for testing your radios. The next step will be UHF and VHF antennas on the roof of the clubhouse.

A question I get asked frequently is "Does the club have a list of repeater frequencies?" The short answer is that we do but… You can see it at https://w6sg.net/site/on-the-air-new/repeaters/ but it only lists MARS owned and operated repeaters. There are many more repeaters in the area that are not owned by MARS. A more inclusive, although still incomplete list can be found on the Public Service Frequency List link on that page.

A few months back I was approached by a new member, J Hamilton-Roth KO6FIR asking about such a list. I gave him the recommendations above and explained why our lists are incomplete. Rather than thanking me and moving on Jay asked why this is not a club project to keep a current list. My response was to ask if he would want to take on the task. He agreed and has been collecting various repeater list that are available online and then actually testing the repeaters listed. He has even gone on to get some of these lists updated. Jay just came to me with a request for help. There are two repeaters listed that require radios neither he nor the club possess and he asked if we could identify members who have the required radios and would be willing to verify if they are active.

Frequency	Offset	Tone Up / Down	Location	County	Call	Use	Modes	
927.3500	-25 MHz	131.8	Novato	Marin	KM6PA	OPEN	FM	◯
1287.9000	-12 MHz	88.5	Corte Madera	Marin	W6RLW	OPEN	FM	◯

If you are interested in checking out these repeaters or in participating in ongoing testing and upkeep of the repeater list please email repeaterlist@w6sg.net

73 de wa6uds

From the Editor:

Spring is finally here, and with it comes a preamble to warmer, sunnier summer days. Of course, we've had our share of rain and cold mornings. The bands have been up and down, frustrating many novice HF operators. However, seasoned veterans know that you must be patient and remember, the bands always get better (at some point). When solar activity keeps you from making contacts, you can use that time to clean up, maintain, and repair your gear! Down time is a great time to build antennas!

This month, we'll start our journey building useful antennas that are cost effective and work well. The majority of the antennas we'll build were designed by Walt Hudson K4OGO from the popular YouTube channel Coastal Waves and Wires. I've tested them out with a 20-watt Xeigu G90 and they work quite well. We'll kick off this series of articles with a primer on very basic antenna theory. I'd be remiss if I didn't mention the following disclaimer: Any antenna design that is presented to readers is built to the designer's specifications and the only difference between the designer's specifications and my antenna is the physical location. I mention physical location because where you use an antenna makes a huge difference in efficiency. I will always give you the geographic details regarding the operating location and Any results will be based on my geographic conditions. Sorry, I don't want anyone to build this antenna in their lead lined basement calling me to complain that it's not working!

A big thank you to Curtiss Kim and the usual suspects for their contribution. Trust me, you'd all suffer greatly if it was left to me to write about club events. With that said, as always, submit your ideas and articles to the QSA-5 and we'll get them into the publication's pages. It takes club members to make our publication worthy. I just cut and paste, throw in my two cents on HF radio, and occasionally

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

03/13/2025

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

Attendance:

President: Curtis Ardourel WA6UDS
Vice President: Ken Brownfield AB6JR
Secretary: James Saltzgaber KM6WWY
Treasurer: Bruce Bartel N6VLB
Director: Richard Cochran AG6QR
Director: Steve Toquinto KB6HOH
Director: Ed Essick K6ELE
Trustee W6SG: Marc Bruvry KF6VNT
Trustee K6GWE: Brian Cooley K6EZX

Adopt agenda:

Approve minutes of: 13 February board meeting

Secretary's Report/Communications: No Report

Treasurer's Report: Bruce N6VLB Was presented in QSA-5

Members Present: Skip Fedanzo KJ6ARL, Milt Hyams KM6ASI, Scott Pasternack KN6ZDM, Dan Sobel N6HLZ, Charlie Benet AI6TT, Gerald McCarthy W6NOV, Jay Hamilton Roth KO6FIR**,** Mark Klein KM6AOW, Larry Bradley KK6QPE, Michael Lam WA6LCN, Rob Rolands NZ6J, Kathy Spicher KM6URP, Larry Loomer KI6LNB.

Committee and other Reports:

1. **Membership:** Curtis WA6UDS- Current Membership is 109, 66% of membership as of end of 2024

2. **Facilities:** Skip KJ6ARL – No cost to club for neighboring tree trimming.

3. **VOAD/RCV:** Skip KJ6ARL – Had UHF Repeater Test between west Marin and stations along the Highway 101 corridor. The test went well except for a problem, undiagnosed, using Mt. Tam UHF 443.250 repeater. When the problem has been diagnosed and repaired, we will retest it in some form, probably reasonably soon. It is not yet known what will be planned for Beacon 2025, May 1st, involving multiple counties, all TBD. Rob NZ6J noted that testing on the 443.250 repeater was done during the March 8th Public Service event and found that communication using it was compromised from various areas.

4. **Technical:** Milt KM6ASI – UHF Repeater 443.250 has issues to the east and south, and also seems to be floating, as Woodacre access is not presently possible. He has contacted Marshall Briggs, DPW telecom tech, to get access to the repeater site. R8 vertical HF antenna has been re-installed on the clubhouse. This is a 40-6m antenna, will not do 80m. Rob NZ6J has done SWR testing and the readings are looking good. The X50 antenna for the dual band radio in the shack has been replaced with an X510, a very significant upgrade. It has approximately 8db gain. See New Business Item 3. Club Station and Antennas for discussion of Gerald's W6NOV new antenna proposals.

5. **Public Service**- Scott KN6ZDM – We have great volunteers. Public Service Kickoff Luncheon received great reviews. First PS event "Marin Ultra Challenge", new event for Inside Trail Racing Saturday March 8th, went very well. APRS tracking worked well. Next event will be Ridge to Bridge, 4/26.

6. **VE Testing:** Jim KM6WWY– No Report

7. **Comm Truck:** Jim KM6WWY- No Report

8. **NBAM:** Bruce N6VLB- Kathy Spicher KM6URP- Red Cross site is in progress. Still need clear weather to complete the Dillon Beach water tank installation. Still waiting for Sonoma County details for backbone sites. The NBAM Steering Committee will be meeting next week to review NBAM budget for forwarding to MARS BOD in April. No update on Bodega Bay, will pick that up at end of this month. Jonathon AK6DB and Kathy picked up radios at the clubhouse after the 3/8 public service event for Bodega Bay. Rob NZ6J- He has installed a computer kiosk in the clubhouse for mesh access if anyone wishes to check it out. Mark KM6AOW– Calsites MOU's have been signed for English Hill and Castle Rock.

9. **Field Day**: Steve KB6HOH- Need COI to Stafford Lake Park. Curtis WA6UDS – he will schedule a Field Day Zoom committee meeting, Wednesday before the April BOD meeting, 4/9/2025. Email Steve KB6HOH or Curtis WA6UDS. if you wish to serve on the Field Day committee.

10. **Picnic:** Steve KB6HOH- Still need to schedule committee meeting and Picnic date. Saturday September 13th proposed.

Old Business:

1. **Donations Committee Charter:** Not completed yet.

2. **New Google environment: Online storage of club records**- Nothing new to discuss.

3. **Keeping public meetings fun:** Curtis referenced a recent QST article on keeping public club meetings fun. People get easily bored listening to long reports. We are looking for more things to have presentations about, less about business reports. Looking for suggestions to discuss at the next board meeting. No action required.

New Business:

1. **How we publish our repeater info –** Continued to April BOD meeting.

2. **Club Badges-** Curtis WA6UDS- In the past, Michael Fischer K6MLF has processed requests for club name badges. He has requested that someone take this task over from him. Curtis sent out an email for badge requests and has 38 orders. Per our website, member cost is set at $20/badge. Wishes to clarify the process for handling club badge purchases. He has placed the current order, total cost = $575.32, $15.14 each, and at $20 each, nets the club $184.68. Following discussion, it was MSC that badges would be sold pre-paid via the club merchandise webpage, placed in lots of 10 or more badges per order. The club will reimburse Curtis for the current order and will purchase future badges directly via club credit card.

3. **Club station and antennas** – Gerald McCarthy W6NOV Presented for discussion his multi-faceted proposal to upgrade clubhouse radio room antennas. (Attachment A). The primary goal of the proposed project is to advance the clubhouse communication capabilities to better meet the original intent of the Alto Volunteer Firefighters gift of the clubhouse to the Marin Amateur Radio Society as well as making the radio room a place where people can learn the radio arts and offer a full suite of Amateur Radio capabilities. Addition of rooftop and ground mounted antennas, coax, coax switches, grounding infrastructure, and connectors would be included. Various combinations of new and

donated antennas were discussed and compared to the $2,200.00 included for radio room infrastructure within the approved MARS 2025 budget. Milt KM6ASI noted that most of the project could be completed within the approved funds. The discussion included that one benefit of the improved radio room facilities would be helpful in making better use of the clubhouse, improved outreach for ham radio as a hobby, and as a training tool. Ken AB6JR moved that we approve to proceed with this project, up to the $2,200.00 currently in the 2025 budget, with agreement of Milt, the Technical Committee, and Marc KF6VNT, the K6GWE station license trustee. Motion was seconded and carried by show of hands.

Good of the Order: Nothing noted

Executive Session: Not Required

Adjourn: 21:10 MSC

Next Regular Meeting 4 April 2025
Next Board Meeting 10 April 2025

Attachment A: CLUBHOUSE COOMMUNICATIONS UPGRADES, GERALD McCARTHY, W6NOV

ATTACHMENT: A

Monday, February 10, 2025

TO: MARIN AMATEUR RADIO SOCIETY BOARD OF DIRECTORS

FROM: GERALD McCARTHY, W6NOV (Layperson)

SUBJECT: CLUBHOUSE COMMUNICATIONS UPGRADES

RECOMENDATION

Board consideration is requested to review potential options for enhancing the communications infrastructure at the MARS Clubhouse.

BACKGROUND

In 1997 the Alto Fire Station was donated to the Marin Amateur Radio Club (MARC) by the five remaining members of the Alto Volunteer Firemen, Incorporated (AVFI). The AVFI deemed the "*Marin Amatuer Radio Club would be a fine group to take over the building. We encourage and train young people to become radio operators and will be* a *working center in the event of a major catastrophe"*.[1]

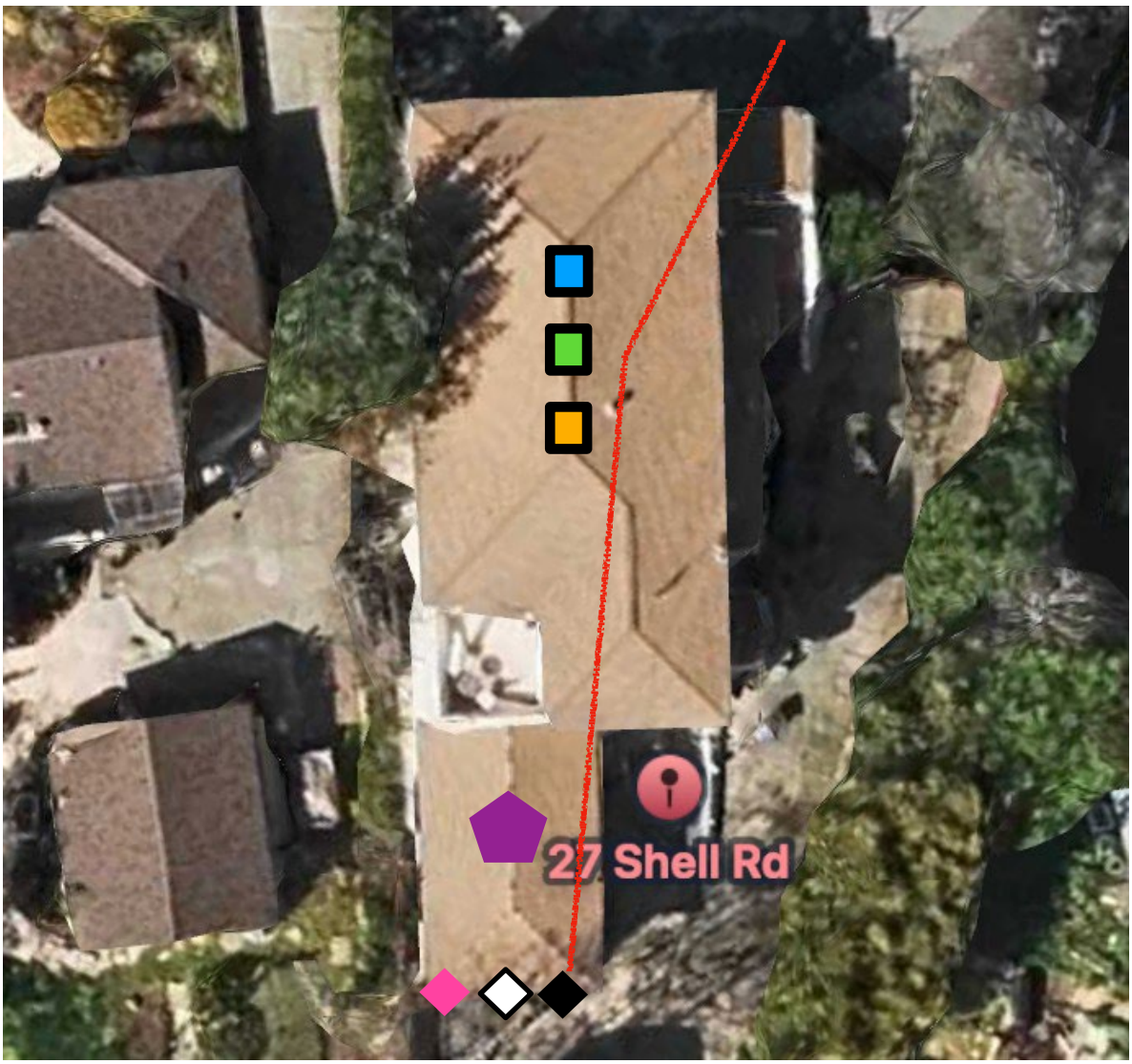
Over the past few years, the clubhouse's communications capabilities have been declining. The high-frequency radio dipole antenna was in disrepair, the vertical Butternut HF antenna mounted to a fence was inoperable, and there was a single VHF/UHF phone antenna operational, a single packet station and until recently, one working HF radio. These factors combine to limited the working infrastructure to the extent that only one of the Marin Amateur Radio Society (MARS) repeater can be monitored at any one time. There would be little argument that the capabilities of the MARS clubhouse would not meet the American Radio Relay League's (ARRL) national "When All Else Fails" campaign to "serve our communities when storms or other disasters damage critical communication infrastructure, including cell towers, and wired and wireless networks." Ironically, the MARS Clubhouse, one of only a few brick-and-mortar structures in the entire United States owned by a radio club, possessed such limited abilities to communicate.

The diminished clubhouse communication capabilities are particularly pertinent during the present time when our nation has witnessed significant natural disasters where amateur operators have been active in response.

[1] Roberts, Hi KO6LS, https://w6sg.net/site/history/alto-clubhouse/ Circa 1997 Mill Valley CA

Furthermore, the County of Marin appears to be withdrawing its support for the Radio Amateur Civil Emergency Service (RACES) program. These factors, when combined, underscore the potential of the MARS Clubhouse as a crucial communication hub during emergency situations.

Below, I will present four distinct options for board consideration to enhance and expand the MARS Clubhouse communications capabilities. It is important to note that these options are not mutually exclusive but rather available on an à la carte basis. The board has the flexibility to select one option, two options, or all options based on its current fiscal outlook. The remaining projects will be deferred to the fiscal year 25/26 or beyond.



RED LINE: OCF DIPOLE

BLUE BOX: PROPOSED VHF/UHF High Gain Antenna. Approximately 19' from dipole. Consider Comet – CX-333 – 2M-220-70cm 5/8 Antenna.

GREEN BOX: PROPOSED DATA ANTENNA (Packet, MESH), Winlink Comet – GP-6 – 2M-70cm Antenna, .

ORANGE BOX: PROPOSED VHF/UHF/1200 MHz Comet – GP-98 – 2M/70cm/ 1200MHz Base/Repeater Antenna. Approximately 6' from new data antennas and 8' from dipole. Also, consider a GMRS only antenna mounted off to the side.

Please note, the gable mounted masts would have nearly 8' of separation

PURPLE POLYGON: FUTURE SATELLITE YAGI SYSTEM

MAGENTA DIAMOND: R8 HF VERTICAL, coax run to radio room to antenna selector switch and run second leg to work bench Icom 706 MRK IIG

WHITE DIAMOND: DUAL BAND Diamond Antenna X510HD Series Base Station Antenna run to the work bench to work bench Icom 706 MRK IIG

OPTION ONE **BLUE BOX** Multi band VHF/UHF antenna

Roof Mount A Single mast	$525	Commercial Grade	
Comet CX333	$210.00	2M/70CM/1.25M	
COMET CFX-324A	$115	2M/70CM/1.25M triplex	
Cindar blocks	$35.00	Ballast ($3.00x12)	
Roofing protector	$35.00	Additional roofing protection	
100' LMR-600 PL-259	$375	W/ factory connectors for exterior	
Waterproofing		Donated	
		Estimate	**$1,300**

Nominal Attenuation	
Impedance:	50 Ohms
Capacitance	23.4 pF/foot
Velocity of Prop	87%

Attenuation / Average Power		
Frequency (MHz)	Nom db/100	Average Power (KW)
30	0.5	4.59
50	0.7	3.53
150	1.2	2.00
220	1.4	1.64
450	2.1	1.12

LMR-600 Data sheet (low loss on UHF and GHz).

OPTION 2 GREEN BOX DATA (WINLINK, MESH, GMRS*)

Roof Mount B Double mast	$650	Commercial grade double mast	
Comet GP-6	$200		
Coax x 2	$550	75' LMR600 w/ PL259's	
MESH Sector	NBAM?		
MESH Onmi	NBAM?		
CAT 5/6	NBAM?		
GMRS Antenna	Donated by K6CE		
Roofing protector pads	$35.00	Additional roofing protection	
Cindar blocks	$35.00	$3.00 each x 12	
Misc mounts and hardware	$75	Fabricate lateral mast for GRMS antenna	
		Estimate	**$1600**

** With the increasing adoption of GMRS across the region, adding this capability would be benefit the Alto and Mill Valley Communities.*

OPTION THREE ORANGE BOX: 2M/70CM/1.2GHz

Roof Mount C Single mast	$525	Commercial Grade	
Comet GP-98 Tri-Band VHF/UHF	$210.00		
DIAMOND MX3000	$110		
80ft LMR600 type w/N Male WP-HST Both Ends	$300.00		
Cindar blocks	$35.00	Ballast ($3.00x12)	
		Estimate	**$1000.00**

OPTION FOUR GARAGE HF VERTICAL (R8) and 2M/70CM COAX TO WORK BENCH

Garage			
R8	Coax to radio room		
Coax		1/2 in Superflex Heliax cable w/ black fire retardant jacket.***	Donated by K6CE
Diamond Antenna X510HD			Donated by K6CE
Coax	Coax to work bench	1/4 in Superflex Heliax cable w/ black fire retardant jacket.***	Donated by K6CE
	*** Can substitute	LMR-400 from	clubhouse - no cost
Connectors	1/2 inch Heliax	PL-259	
		Estimate	**$85.00**

Please note, the price estimates for OPTION 2 DATA (WINLINK, MESH, GMRS) have not been fully vetted.

CLOSING

Proficiency in utilizing a diverse range of communication resources, including VHF, UHF, HF, repeaters, simplex frequencies, local/regional HF networks, and messaging networks such as WINLINK and MESH, will be highly advantageous during a potential natural disaster in Marin County. The MARS Clubhouse serves as an unparalleled resource for the amateur radio service and may play a pivotal role in both during and after a disaster. As Hi Roberts aptly described in 1997 when the building was transferred to MARS "…*will be* a *working center in the event of a major catastrophe"*, annual financial investments focused on updating, upgrading, and otherwise enhancing the communication capabilities of the MARS clubhouse will enable the membership to better practice the radio arts, emergency communication preparedness, which will in turn benefit the communities we serve.

References:

What make a good Amatuer radio communication facility: https://scc-ares-races.org/operations/eoc-equip.sht

https://www.arrl.org/ https://www.arrl.org/ares

https://w6sg.net/site/

Marin Amateur Radio Club

Balance Sheet Comparison

As of March 31, 2025

	TOTAL	
	AS OF MAR 31, 2025	AS OF MAR 31, 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	75,472.61	61,598.56
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	**$77,551.01**	**$66,969.46**
Other Current Assets		
Uncategorized Asset	0.00	385.00
Total Other Current Assets	**$0.00**	**$385.00**
Total Current Assets	**$77,551.01**	**$67,354.46**
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	**$136,534.01**	**$126,337.46**
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	-3,443.45	-11,811.45
Total Equity	**$136,534.01**	**$126,337.46**
TOTAL LIABILITIES AND EQUITY	**$136,534.01**	**$126,337.46**

Marin Amateur Radio Club

Profit and Loss

January - March, 2025

	TOTAL	
	JAN - MAR, 2025	JAN - MAR, 2024 (PY)
Income		
Christmas Party Income		640.00
Donations	1,029.00	350.00
Dues	90.00	175.00
Rent	8,100.00	10,400.00
Unapplied Cash Payment Income		385.00
Total Income	**$9,219.00**	**$11,950.00**
GROSS PROFIT	**$9,219.00**	**$11,950.00**
Expenses		
Accounting	195.00	180.00
Awards	400.00	
Car & Truck	34.94	
Christmas Party		2,970.23
Contractors		11,000.00
Equipment < $2,500	431.48	
Food	496.08	
Garbage	158.22	148.50
Housekeeping		48.65

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	39.00	
Other Business Expenses	575.32	
Public Service Expense	1,922.70	444.50
Reimbursable Expenses	154.09	20.00
Repair & Maintenance	922.50	14.71
Repeater		1,655.17
Taxes & Licenses	4,164.36	4,049.67
Utilities	1,004.75	1,109.62
Water	214.85	79.54
Web Services Expenses	0.00	
Total Expenses	**$12,286.78**	**$23,611.45**
NET OPERATING INCOME	$ -3,067.78	$ -11,661.45
Other Expenses		
MESH Grant Disbursement	375.67	150.00
Total Other Expenses	**$375.67**	**$150.00**
NET OTHER INCOME	$ -375.67	$ -150.00
NET INCOME	**$ -3,443.45**	**$ -11,811.45**


LIFE IS SIMPLE
EAT
SLEEP
DX
HAM RADIO

MARS Club News

NARCC Need You

From Curtis Ardourel WA6UDS

Greetings

The Northern Amateur Relay Council of California or NARCC which is the organization that coordinates repeater frequency pairs in our area, and of which we are a member is seeking help with their annual financial audit. The text of their request follows.

From: Jim Aspinwall [mailto:President@narcc.net]
Sent: Monday, March 17, 2025 12:59 PM
To: President Director
Subject: Seeking an Audit Committee Volunteer

Seeking an audit committee volunteer from the general membership to help complete our annual audit.

Please contact Treasurer @ NARCC.net if interested.

Every year the NARCC Board organizes an Audit Committee to review the previous calendar years financial caretaking by the Treasurer. The 2025 Audit Committee was approved at the last Board Meeting on 1/23/2025 with Mike Patterson, who serves as NARCC VP, serving as Audit Chair, and as Auditors, Ismail Ozguc, a Board Member and a volunteer from the General Membership. All financial documents, Bank Statements have been provided to the Audit Committee via Google Docs by the Treasurer, The Audit Committee is actively reviewing those documents and submitting questions via a joint email with Jack Kirk Sr, NARCC Treasurer. The goal is that the Audit Committee will share their findings at the April 5th NARCC Membership Meeting.

If you are interested please respond as instructed and identify that you are from MARS. Please also let me know at WA6UDS@W6SG.NET

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

Our mailing address is:
Marin Amateur Radio Society
PO Box 6423
San Rafael, CA 94903-0423

Mondo Fondo

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.

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 Apr 12th, Jul 12th, and Oct 11th. Please mark your calendars. The next session is coming up in a few weeks.

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

radio operators, were authorized to administer exams, significantly streamlining the licensing process and encouraging greater participation in the hobby.

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

The importance of the VE program extends beyond its practical function of administering exams. It has been instrumental in promoting the growth and diversity of amateur radio. By making the licensing process more accessible, the program has lowered barriers to entry, enabling individuals from all walks of life to become licensed operators. This inclusivity has helped amateur radio remain relevant in an era of rapid technological change, attracting new generations of operators who bring fresh perspectives and innovations to the field. The VE program has thus played a crucial role in ensuring the continued vitality of amateur radio as a dynamic and evolving pursuit.

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

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

2025
North Bay 2-Meter Critical Mass
Calendar

2025

April 27th (fourth Sunday; third is Easter) Michael
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

Due to the weather, it was decided to hold the March critical mass at the MARS Clubhouse at 27 Shell Road, Mill Valley, CA 94941. The event was held at the usual time 10:00 to 12:00 pm. The following items and information come from Rob NZ6J:

The topics covered were:

1. Phonetic phun with Michael K6MLF
2. Winlink hands on training. Bring your computer, iPad or Phone. While Winlink is primarily a Windows app, there are Winlink equivalents on other platforms.

Here's what Copilot has to say:
"Winlink is a versatile tool for amateur radio operators, and it can run on various platforms. Here are some options:

1. **Windows**: Winlink Express, also known as RMS Express, is the most common Winlink client and is designed for Windows. It supports various modes like VARA, ARDOP, and PACTOR.
2. **Linux, macOS, and Windows**: Pat is a cross-platform Winlink client written in Go. It provides both a modern GUI and a powerful command-line interface. It supports major modes like VARA, ARDOP, PACTOR, and AX.25.
3. **macOS (M1, M2, M3-based Macs)**: You can run Winlink on the latest Mac hardware using Pat and modems like VARA and ARDOP through a version of WINE called Crossover.

Each platform has its own setup and configuration process, so you can choose the one that best fits your needs and preferences. If you need more detailed instructions or help with installation, feel free to ask!"
Please bring at least one of the above clients! The training does not require a sound card or other RF connection, but if you have one, feel free to bring it with a radio, and connect to the Winlink gateways at the Club house.
I hope everyone can connect to the AREDN mesh through the Club's ***mars-aredn*** WiFi access point, and send a message to the internet at large through a ***Telnet post office***. This is the best scalable way to use Winlink in a disaster.

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

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. March was a slow news month for amateur radio, so this is a repeat from the previous month:

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. We found one new article of great interest.

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

https://www.arrl.org/news/the-k7ra-solar-update-826

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/