



Splatter

the newsletter of the Longmont Amateur Radio Club

Volume 10 Issue 107

Feb. 2022

**Our February General Meeting
was held on Wednesday, February
16th, via Zoom,
at 6:30 pm.**

Alan Bishop (K0ARK), spoke about BCARES (Boulder County Amateur Radio Emergency Services) at this meeting.

For more meeting info, please see page 2!



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**February Meeting was on Zoom on
Wed, Feb. 16th, at 6:30 pm.**

[https://us06web.zoom.us/j/81928642821?
pwd=WXNSTjdEdHd5emZaaDRaaENQdnFWZz09](https://us06web.zoom.us/j/81928642821?pwd=WXNSTjdEdHd5emZaaDRaaENQdnFWZz09)

See p. 2 for more info.

February General Membership Meeting

Our General Meeting was held on Wednesday, February 16th, at 6:30 pm.

Allen Bishop (K0ARK), presented on
BCARES (Boulder County ARES).

Some requests for when you join our meetings:

- When you fill out your name, *please add your call sign after your first name*. (Example: Chuck (K0ITP) Poch). If you don't have a call sign yet, just put "no call." *You can change your name with the 3 little dots at the top right corner of your screen.*
- You will be muted automatically. (If you need help getting in, call out on our club repeater via VHF, UHF, or on EchoLink). Be sure to have your video going and your volume up, so we can see/hear you!

The Zoom meeting started at 6:30 pm with social time, ask an Elmer, meet a Board member, and general questions. The *actual meeting* began at 7:00 pm, with intros and club business, and then the presentation began at approximately 7:15 pm.

Going forward, this Zoom info will be the same for all Monthly General Meetings.

Our Zoom Meetings are usually held and found on this link:

[https://us06web.zoom.us/j/81928642821?
pwd=WXNSTjdEdHd5emZaaDRaaENQdnFWZz09](https://us06web.zoom.us/j/81928642821?pwd=WXNSTjdEdHd5emZaaDRaaENQdnFWZz09)

Meeting ID: 819 2864 2821

Passcode: 787437

Find your local number: [https://us06web.zoom.us/j/
kcsybGuZpe](https://us06web.zoom.us/j/kcsybGuZpe).

If you had to miss this meeting, you can see our meetings at
<https://w0eno.org/meeting-presentations/>.



Ham Jargon



Dogbone Insulator — Non-conductive component (usually nylon, ceramic, or glass) that physically connects two or more items that should not be connected electrically, such as radiating elements, guy wires, and structural braces, typically part of an antenna system.

LARC's YouTube Channel

Check out videos of many of our previous meetings and activities at:

<https://www.youtube.com/channel/UC0bX61lXfLHEvix6msKzITg> or by going to the club web site at w0eno.org and selecting Presentations. Subscribe to our channel so you don't miss out!

If you miss a meeting or you don't drive after dark, you will still be able to watch them here!



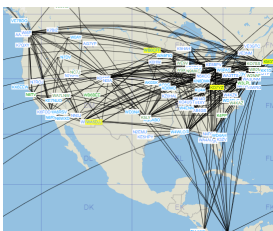
Help Support your Club with your Online Shopping!

Did you know your purchases can make a difference? *When you shop for anything at smile.amazon.com/ch/84-1056239, Amazon Smile donates to the Longmont Amateur Radio Club — at no cost to you!* Last quarter, they sent LARC \$38 as their donation from our members' shopping. Every last dollar helps! *You can also just click on the picture below to log into your Amazon account to shop and to help your Club at the same time.*



When you go to this link, you enter your own username and password, just like you normally do. You can also go to smile.amazon.com and select Longmont Amateur Radio Club. *Shopping with this Amazon link doesn't cost you anything – Amazon provides this donation, and every little bit helps our club!*

Useful Ham Radio Web Site



<https://www.dxmaps.com/spots/mapg.php?Lan=E>

Collection of real-time maps showing worldwide activity on any amateur band. Gives you an idea of where you can reach if others in area are engaging in a QSO to that region.

“February days are a marketing gimmick; love happens every day.”

- Randeep Hooda

6 more weeks of winter? Punxsutawney Phil thinks so!

LARC is keeping up with what is going on with Covid-19. I ask all members to be safe & take care of yourselves. Boulder County has lifted mask restrictions. At this time, we will stay virtual with our meetings. If you would like to meet in small groups, we can meet at 350 Terry Street or the Clover Building at the Fairgrounds. Contact me for details.

We have several upcoming events. Keep an eye on the website and emails for information.

Join the Tuesday night and Thursday night nets for fun and educational talk! Want to try being a net control station (NCS)? Contact Jerry (NØOUW) or me for details! We have a challenge for you!

Our LARCFest (hamfest) is coming in late April — get involved and help this be a great event!

Do you have an idea for a presentation, or do you know someone who would like to present to your club? Contact a board member and let's get them in front of us! We are looking for presenters for our 2022 General Meetings.

Keep your ideas coming for new events and/or activities for the club.

I always mention the appreciation award I do for our club members. If you know someone who deserves an extra “Thank you” or “Above and Beyond,” please let me know! I’m looking for recipients for our 2022 awards and recognition. Please tell me your thoughts.

Congratulations to the 2022 Above and Beyond recipient so far:

- January “Above & Beyond” recipient Steve Shearer (KØSTE) - for all the monetary and volunteer hours you put in to support the club.
- February — tbd
- March—tbd
- The rest of the months for 2022 — tbd Who can YOU recommend?

I have always said that this is your club. How can you help? We’re looking for volunteers for our LARCFest 2022 Committee (it’s only 2 months away!), Christmas Party, and other club events. If you can help or want to become more involved with your club, please contact a board member.

As always, please contact me with any questions, comments, suggestions, or concerns.

Thank you and 73,

Charles Poch - KØITP

LARC President

KØITP@WØENO.ORG





Net — Tuesday Night Hamlet Net, 7:00 pm

The Club sponsors an informal net for newer ham radio operators on Tuesday evenings at 7:00 pm. Learn how to use nets, ask questions, discuss ham radio topics, get familiar with your radio & make new friends on the club's linked repeaters on 147.270 and 448.800 MHz, Tuesday nights at 7:00 pm. *For more information about this net, click on the title above.*

You can also reach our nets on the internet via [EchoLink!](#)

Take our Poll!

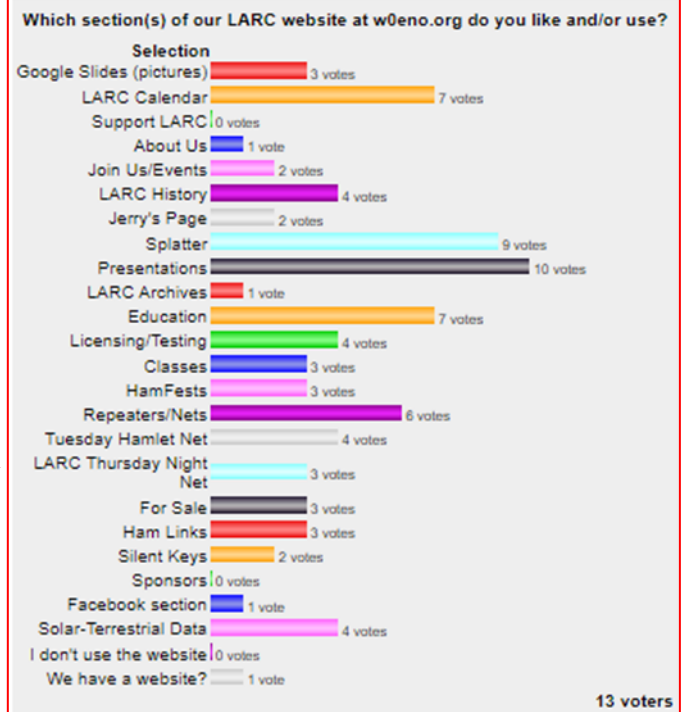
Please take LARC's quick and fun [February Poll](#) by answering this poll question. Feel free to add any comments you would like. After you have finished and submitted it, you will be given the option to see a summary of all the responses so far. Your answers and identity are completely anonymous if you wish. Please select the answers that apply! If clicking on the polls below doesn't take you to the poll, please go to: <https://vote.pollcode.com/88989787>

Net — Thursday Night Club Net, 8:00 pm

The Club also sponsors an informal net each week on Thursday evenings at 8:00 pm to chat about whatever is on your mind and to announce upcoming Amateur Radio Club activities. You will find the net on 147.270 and 440.800 MHz on Thursday nights at 8:00 pm. *Click on the title above for more information.*

**STAY CONNECTED
TO YOUR FELLOW
HAMS! GET ON
OUR NETS!**

**Jan. Poll
Results —
Thanks for
voting!**



**Take our
February
Poll Now!
It will only
take about 2
minutes!**

What kind of Ham activities do / would you enjoy doing?

- Club meetings
- Reading the Splatter
- Reading the Club Website
- Volunteering to Help with Club Events
- Volunteering to Help other Hams
- Volunteering for LARC Community Service
- Going to Hamfests
- Getting on Hamlet Net
- Getting on LARC Net
- Building Radio Gear/Kits
- Building antennas
- Radio in the Park
- Parks on the Air
- Summits on the Air
- Social Events
- What else would you like to do? Put in comments.
- Fox Hunts

pollcode.com [free polls](#)

TAKE OUR FEBRUARY POLL!

Either click on the poll on the left, or go to:
<https://vote.pollcode.com/88989787>

We want to know your thoughts! Please also add your comments!

Upcoming Special Events and Contests

As found on ARRL.org and other web sites, here are some selected upcoming QSO Parties and Special Events that you could get on to pass the time while stuck in your house over the next 30 days. See the links below for more information, rules, logs, and QSL card information. Some just provide an email address to get more info other than what's on the ARRL web site. They all present a great opportunity to get on the air and have some fun! Plan your calendar!

Start Date	End Date	More Info
02/16	02/20	2022 Speedweek/Daytona 500 www.n4dab.com
02/17	02/17	HL Hunley Commemoration https://www.tridenthams.org/hl-hunley
02/19	02/20	ARRL Inter. DX Contest, CW http://www.arrl.org/arrl-dx
02/26	02/27	North American QSO Party, RTTY http://www.ncjweb.com/NAQP-Rules.pdf
02/27	02/28	North Carolina QSO Party http://ncqsoparty.org/rules/
03/05	03/06	ARRL International DX Contest, SSB http://www.arrl.org/arrl-dx
03/06	03/06	NSARA Contest http://nsara.ve1cfy.net/?page_id=82
03/12	03/13	Oklahoma QSO Party http://k5cm.com/okqp.htm
03/12	03/13	Idaho QSO Party http://www.pocatelloarc.org/idahoqsoparty/
03/13	03/14	Wisconsin QSO Party http://www.warac.org/wqp/wqp.htm
03/15	03/20	CLARA Chatter Party https://clarayl.ca/chatter-party/
03/19	03/20	Virginia QSO Party https://www.qsl.net/sterling/VA_QSO_Party/2022_VQP/2022_VQP_Main.html
03/26	03/27	CQ WW WOX Contest http://www.cqwp.com/rules.htm

See tons of QSO Parties and Contests at <https://qsoparty.eqth.net/index.html>

- See these and also more Special Event Stations at http://www.arrl.org/special_events/search/page:1/model:Event
- You can see much more QSO Party and Contest Information at: <https://www.contestcalendar.com/contestcal.html>
- To learn more about having fun with QSO Parties, take a look at this link: <http://www.arrl.org/files/file/QST/This%20Month%20in%20QST/April2019/KENNEDY.pdf>



2022 BOARD OF DIRECTORS

President: Charles Poch, K0ITP
Vice President: Michael Ritchie, W0KKI
Secretary: Pat Engstrom, W1PGE
Treasurer: Don Lewis, KE0EE

ADDITIONAL VOLUNTEERS:

Membership: Steve Shearer, K0STE
Technical: Mark Skelton, N7CTM and
Bryan Gonderinger, AF0W
Publicity: Steve Haverstick, KF0AGY
Splatter Editor: Kat Gonderinger, W0UM
Planning/Special Events: Doug Altman,
KE0SI & Mark Mollenauer, KD0GOC
BCARES Representative: Jerry Schmidt,
N0OUW
Repeater Trustee: Bryan, AF0W
Education: Kat, W0UM & Bryan, AF0W
LARCfest Chair: Dick Paige, KE0VT
VE Team Leads: Aaron, AJ7R & Kat, W0UM

Contact Us:

Email to: board@w0eno.org will reach all members of the Board.

Board meetings are held on the first Wednesday of each month at 6:30 pm. General Club meetings are held on the third Wed. of each month at 6:30 pm.

Current Club meetings are held online using Zoom and are open to all. Join us!

If you have a suggestion for a topic or for a guest speaker, or would like to present a topic yourself, please send email to [Chuck, K0ITP](mailto:Chuck.K0ITP).

If you have a general interest article about ham radio that you would like to see in a future issue of Splatter, please email it to [Kat, the Splatter Editor](mailto:Kat,theSplatterEditor).

Articles received by the 25th of the previous month will be considered for publication in the issue for that month.

Longmont Amateur Radio Club
P.O. Box 86
Longmont, CO 80502

LARC is a non-profit organization organized exclusively for one or more of the purposes as specified in Section 501 (c)(3) of the Internal Revenue Code Vol. 17. No.6.

Repeaters:

VHF:

147.270 MHz (+) 600 kHz, 100 Hz CTCSS

UHF:

448.800 MHz (-) 5 MHz, 88.5 Hz CTCSS

Echolink:

W0ENO-R, Station #8305

Visit & Post on our Facebook Page!

Our club has a Facebook page — did you know that? Feel free to share your ham-related posts, projects, activities, and news at:

<https://www.facebook.com/LongmontAmateurRadioClub/>.

We'd love to have our members active on both our LARC web site at w0eno.org AND on our Facebook page, so check it out, share, and post today! Tell all your ham operator friends!

Find us on 

Thank You!

Many thanks to our special contributing authors for this month's Splatter:

- Doug Altman, KE0SI
- Ralph Bilal, WD0EJA
- Bryan Gonderinger, AF0W
- Ed Mohrman, WA7EM
- Dick Paige, KE0VT
- Chuck Poch, K0ITP
- Steve Shearer, K0STE



Call for Articles!

I am constantly looking for articles to publish in the Splatter monthly newsletter. Topics should apply to Amateur Radio, or other closely-related topics of interest to most ham operators. Tell us about your ham radio activities and projects. Articles (250-500 words) of things you have done and/or built (with pictures!) are always of interest.

Submissions may be edited for spelling, grammar, content, or length if necessary. The deadline for submissions is the 25th of each month; however, submissions received after the deadline will be considered if they fit into the newsletter. If a late entry doesn't make it into the current month's news, it may be used in one of the following months.

[Kat, W0UM, Splatter Editor](mailto:Kat,W0UM,SplatterEditor)

LARC VE Exam Session Information

LARC sponsors a VE Exam Session every month. Upgrade your license before FCC fees start up! Our regular *LARC (ARRL VEC) Exam Sessions* are given on the fourth Saturday of the even-numbered months — (but on the 2nd Saturday for December), and our *LARC/Patriot VE Exams* are given on the third Sunday of the odd-numbered months.

January VE Exam Session Results

Our LARC Patriot VE Team held an Exam Session on Sunday, January 16th, led by Kat (W0UM) and Bryan (AF0W) Gonderinger. Also assisting with this Exam Session were David Casem (AD0UF), Lynn Mears (K0CLM), Charles Poch (K0ITP), Mike Stember (AE0MS), and Steve O'Loughlin (WB0LT). Thank you to our volunteer examiners for your service! We couldn't have done it without you!



At this session, 6 candidates were tested, which resulted in 1 new Technician, 2 new Generals who passed Technician also, 2 upgraded Generals, and 1 upgraded new Amateur Extra. There were a total of 8 passed exams in all.

License	#
Technician	1
General	4
Extra	1
Total	6

Congratulations to everyone who passed their exams!

February Exam Session on SATURDAY, Feb. 26th @ 10 am

Our next VE Exam will be with the LARC ARRL VE Team led by Aaron Rees (AJ7R), on Saturday, February 26th, at 10 am, at the Terry Street Professional Building at 350 Terry St., Longmont, 80501, *upstairs in the Onyx Room*.



Because this is an ARRL Exam Session, a \$15 test fee applies.

If you'd like to take an exam at this session, please go to <https://w0eno.org/licensing-testing/> and fill out our contact form.

Upcoming LARC VE Exam Schedule

Date	Day	Time	Exam Session Info	Exam Options
Feb. 26	Sat	10:00 am	LARC ARRL VE Team	In person on paper
Mar. 20	Sun	9:00 am	LARC/PVET VE Team	In person on laptop or tablet, or on paper
Apr. 23	Sat	10:00 am	LARC ARRL VE Team	In person on paper

Ham Enthusiast Breakfasts Every Saturday Morning

Want some social time with other ham radio operators in a small group? Join us for breakfast!

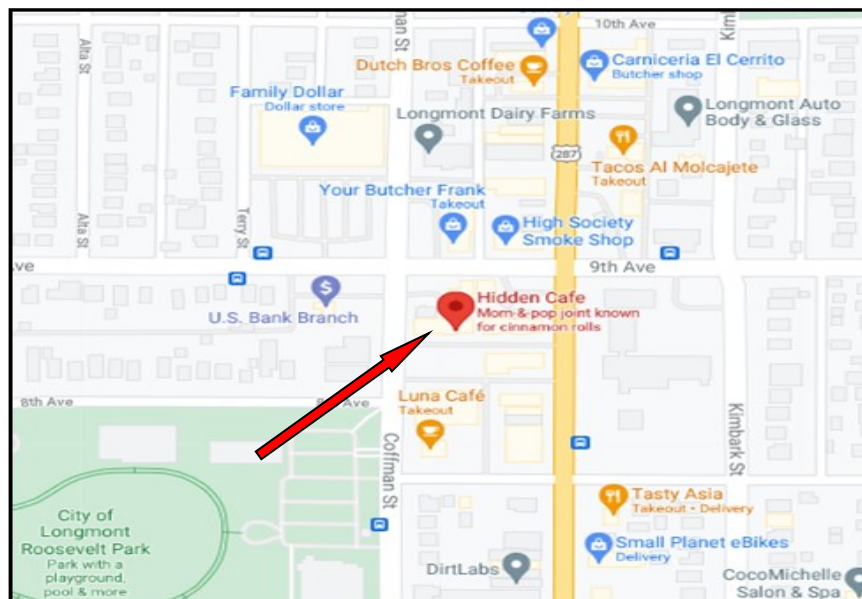
Saturday morning breakfasts meet at 8:00 am every Saturday.

Join us on Saturday mornings at the **Hidden Café in the Towne Square Shops, at 829 Main Street, #5 in Longmont.** It's easiest to enter the parking lot from Coffman Street, just south of 9th Avenue.



These are hosted by Don Lewis, KE0EE.

We hope you will join us on a regular basis for breakfast. If the group gets much larger, we will relocate to a larger restaurant. Get on the 8 pm Thursday Night Net to confirm the location, and/or check our website to see if the location has changed.



LARCFest is Coming! Get Ready!

Dick, KE0VT

We are so excited that after a two-year break from the Covid pandemic, Boulder County has re-opened their facilities for us to hold our usually-annual hamfest!

The 2022 LARCFest will be held on Saturday, April 30, at the Boulder County Fairgrounds. It will be operational from 8:00 am until 12 Noon, with load in to begin at 7:00 am, and load out by 12:30 pm.

Many volunteers are needed for this big event — to be on the planning committee and/or to volunteer at LARCFest, contact Dick Paige, KE0VT by phone at 720-220-1931 between 9:30 am and 6:00 pm on weekdays. We need YOUR help!

More info, including table and entrance fees will be announced in the March Splatter and on the web.



We had seven new LARC members join us in January. When you meet them or hear them on the air, please give them a warm welcome!

LARC Newest Members — January		
Call	First Name	Last Name
KFØFTJ	Trevor	Stone
None	Steve	Cacka
NOZfV	Bob	Smith
KFØHLM	Susan	Hickok
KDØYBD	Bruce	Iverson
None	Thomas	Carter
KJ7FAY	Isaac	Stiles

Following the meeting, a random name of the attendees was drawn, and the winner was Tom (WØAQQ). Tom decided to donate the prize back, and it will be used in a future door prize drawing.

Our club is always looking for additional donations of door prizes to give away at the meetings. If you have something you can donate for a drawing, you can contact me at the email or cell number below. It does not have to be a ham radio item — but anything that could be beneficial to another member.

Stay safe, and hope to see and/or hear you at the next LARC General Meeting, whether it is a virtual meeting or in person. Any questions or issues, feel free to contact me.

73,

Steve Shearer (KØSTE)

Membership Chairman

KØSTE@WØENO.ORG

membership@w0eno.org

303-915-9942



Field Day is “the most popular on-the-air event held annually” by the ARRL. This year, it falls on June 25 and 26. With the new year comes some rule changes and updates.

The first is that maximum peak envelope power (PEP) output for a transmitter used by anyone submitting a log will be 100 Watts, and the high-power category will be removed from the rules.

Some of the temporary rules added for COVID such as Class D (home) stations contacting other Class D stations, and club aggregate scoring will be added permanently.

Finally, the media publicity bonus point will only be awarded for actually obtaining publicity (which can be as easy as posting information to Facebook, Twitter, or Instagram).

For more details on the rule changes, see: <http://arrl.org/news/some-new-rules-going-into-effect-this-year-for-arrl-field-day>. For more information about Field Day, see: <http://www.arrl.org/field-day>

LARC is still finalizing plans for the club's field day event, as we are unable to use Izaak Walton Park this year due to construction. Keep an eye on the club web site at: <https://w0eno.org/> for updates!



2022 Beijing Winter Olympics Special Event Station



The Chinese Radio Amateurs Club (CRAC) has announced that the Beijing 2022 Olympic and Paralympic Winter Games special event station BY1CRA/W022 is now active on FT8, SSB, and CW on 160 – 10 meters and will operate until the games close on February 20.

For more information, see: <http://www.southgatearc.org/news/2022/february/beijing-winter-olympics-special-event-ham-radio-station.htm>.



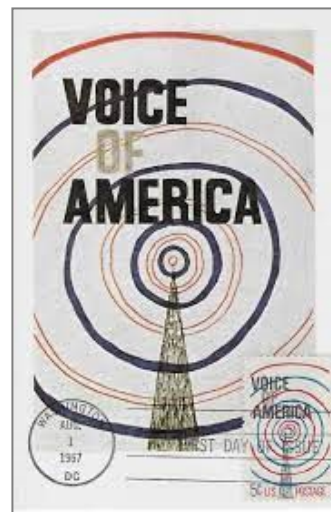
VOA 80th Anniversary

The Voice of America (VOA) is a federally-owned international broadcaster of the United States. It was established formally in 1942, but was broadcasting as early as 1939.

The VOA currently has five broadcasts in English; and world-wide broadcasts in 47+ languages. It has been broadcasting for 80 years this month. The VOA broadcast is heard in many countries, and has been a long-standing source of information, both during wars and during peace time.

For more information about the VOA, refer to the following sites:

- <https://www.voanews.com/>
- https://en.wikipedia.org/wiki/Voice_of_America
- <https://www.insidevoa.com/a/3794247.html>



Heil Sound Changes Ownership



Mention the name “Heil Sound,” and many amateurs immediately think of ham radio headsets and microphones, but as we found out when company founder Bob Heil (K9EID) presented at the March 2021 LARC General Meeting, the company is about much more than that.

The new owners are Heil Sound President and CEO Ash Levitt (KD9JQS) and Director of Operations Steve Warford, who promise to carry on the Heil tradition of excellence while bringing new products to the market.

For more information, see: <http://arrl.org/news/heil-sound-changes-hands>.

If you are new to amateur radio, when you hear the term “pileup,” you may think it’s something bad – like a multi-car accident on the highway. In actuality, it’s either a good thing (if you’re on the receiving end), or a challenge if you’re trying to get into one.

The term refers to a situation where a large number of stations are trying to make contact with a single station – for example, a Parks on the Air or Summits on the Air station, or perhaps a rare DXpedition which is operating from a faraway location.

If you’ve ever seen a White House press briefing, when they get to the part where the journalists can ask questions, and everyone starts yelling out the name of their organization in an attempt to get the attention of the presenter, you’ve seen an example of a pile up!

When you are the station trying to manage the flood of incoming calls, it is called “working the pileup.” When you are on the other side and trying to make contact with the single station, you are said to be trying to “break the pileup.”

There is a fair amount of skill involved in both sides of the pileup, and with any skill, it takes time and experience to become proficient, but you also don’t have to be an expert to have fun!

For some tips, see the following:

- KB9VBR - Managing the Pile-Up: <https://youtu.be/wHMij1JrT64>
- <https://www.hk3c.ca/index.php/how-to-break-a-pileup>
- <https://www.onallbands.com/your-first-pileup-techniques-for-success%E2%82%BF/>
- [http://www.cqdx.ru/ham/ham radio/best-practice-the-pile-up-management/](http://www.cqdx.ru/ham/ham%20radio/best-practice-the-pile-up-management/)



From onallbands.com



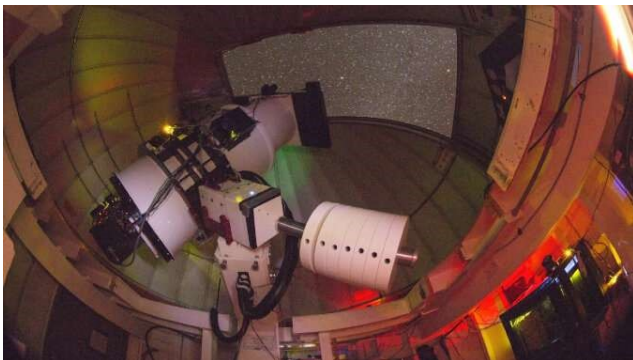
The ATLAS Scanner

A new telescope system was added to our world's asteroid defense system called the Asteroid Terrestrial-impact Last Alert System (ATLAS). Although two telescopes working since 2017 have done a great job so far, they only cover the northern hemisphere well. NASA has funded two more telescopes in the southern hemisphere in South Africa and Chile to search at different times of the day. Even smaller asteroids, such as a 20 meter (~65 feet) diameter could wipe out an entire city, so it is important to find as many as we can.

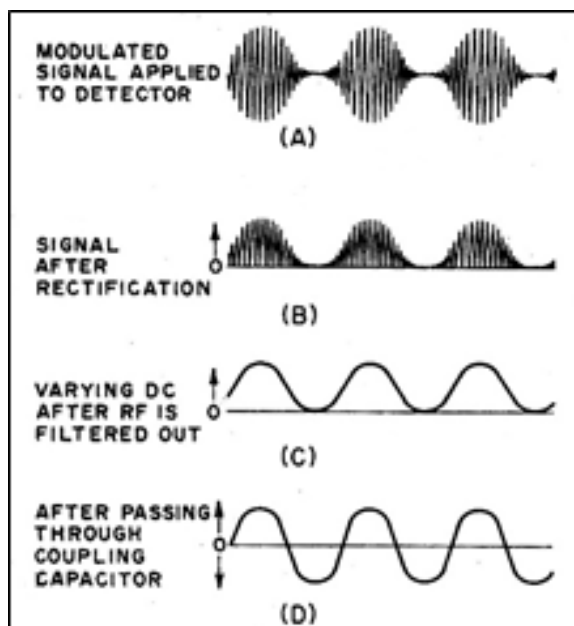
This new system will help to provide at least 24-hours' notice of the viewed asteroids, and it works alongside the Pan-STARRS (Panoramic Survey Telescope and Rapid Response System) and the Catalina Sky Survey (CSS) to show the hazardous asteroids that may be in our area of the universe.

For more information, click on the following links.

- <https://www.universetoday.com/154400/a-tracking-system-is-now-scanning-the-entire-sky-every-24-hours-looking-for-dangerous-asteroids/>
- <https://en.wikipedia.org/wiki/Pan-STARRS>
- <https://catalina.lpl.arizona.edu/>



Last month, we went through the stages of a Single Sideband (SSB) transmitter. We saw how a Balanced Modulator mixed audio and a carrier signal to producing a double sideband suppressed carrier output. That is passed through a crystal filter which only allows through the desired sideband. This is then up-converted to the desired transmit frequency and then sent to the power amplifier. We saw several of these stages on Spectrum Analyzer displays. We saw how a SSB signal requires less than 1/2 of the spectrum of an AM signal and concentrates the power in that narrower signal. Now, how does the other end work? How does a receiver turn that SSB RF into audio?



The simplest form of an AM receiver is a *diode detector*. Some of you built (or have seen) a crystal radio. A crystal radio has some form of inductor/capacitor-tuned network connected to an antenna (usually a random wire) to capture the desired signal's RF. That RF is a carrier (usually in the 500 KHz to 1.5 KHz AM broadcast band) modulated with voice or music (usually in the much lower 1KHz – 10KHz audio range).

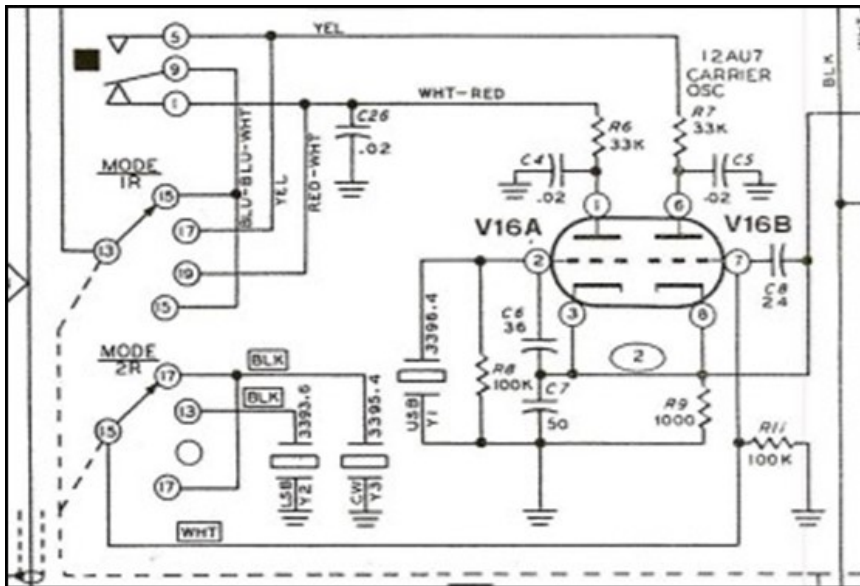
In this usage *crystal* is a diode — a rectifier which allows only the positive half cycle of the RF thru. A capacitor filters out the high frequency carrier and only lets the modulation signal thru. This weak output is enough to drive a headphone or tiny speaker,

In 1964, my novice HAM station had a Knight R100 receiver. In those days, AM was dominate and SSB was very new. Since receiving AM was what most people wanted to do, the R100 was designed with a diode detector – like the crystal radio. The basic radio didn't work for SSB or CW. When you received a SSB signal, the output was "Donald Duck" sounds. So, the R100 had a *Beat Frequency Oscillator* (BFO). It inserted a replacement carrier in the IF stage prior to the diode detector. You had to very carefully adjust the BFO frequency with a knob on the front panel.

A few years later in Ham radio, SSB and CW were dominant and AM was rarely used. Also, it got cheaper to replace the diode detector and BFO with a more complex crystal-controlled *local oscillator* (LO) and product detector to be used in demodulation. In this case, the element called a *crystal* is not a diode/rectifier. It is a material that will oscillate at a very precise frequency determined by the thickness of the material. So, in the late 1960s Heathkit HW100 (and most superhet radios since then), the frequency of the Local Oscillator (LO) is adjusted to properly demodulate Lower Sideband, Upper Sideband or CW. Below is a snip from the HW100 schematic. This oscillator is the same piece of hardware that is used with the transmit Balanced Modulator. You see 3 crystals setting the LO frequency about

>> continued >>

1.5 KHz lower than the (suppressed) carrier for LSB, 1.5 KHz above carrier for USB and 600 Hz lower for CW. The higher or lower LO frequency properly mixes with the sideband suppressed carrier signal. In both these cases, the LO is shifted to the middle of the sideband signal. The 600 Hz lower LO produces a tone that most CW operators find comfortable for copying code.



Single Sideband has made the receiver design much more critical. AM is a lot more tolerant of local oscillators that are slightly off frequency or contain harmonics. Sideband quickly goes from pretty good to terrible with minor receiver problems.

In Software Defined Radios (SDR), the above mixing and frequency changing is done mathematically within general purpose computers in low cost

models or specialized gate arrays in high cost/high performance models. Operations such as mixing and filtering lend themselves to trigonometry and analytic geometry solutions.

More sophisticated analog SSB receivers produce superior results by synchronizing the LO with the incoming RF. That is, aligning the up and down swings of the 2 signals. This usually involves phase lock loop (PLL) circuitry.

Next month – we start the study that leads to building our own 1 transistor audio amplifier. Through a set of brief study steps, we will learn how to bias a transistor into its active/linear region to function as an amplifier, how to calculate its input impedance, its output impedance and its power gain. Having done this “homework,” we will meet at a TBD date in April for an hour or so to build and test the amplifiers we designed.



Do you have more amateur radio equipment than you can keep track of? Do you remember the bands covered by your G5RV antenna? Can you find the manual to your antenna tuner?

If you've ever run into problems like these with managing your ham radio equipment, then you'll want to take a look at Stuart Thomas' web page titled "Amateur Radio QR Codes" at: <https://kb1hqs.com/2022/01/04/amateur-radio-qr-codes/>.

In it, he details a system he uses to organize and label his gear using QR (quick response) codes which he can scan with his phone to find out information about the item.

QR codes have many uses, directing a user to a web site, supplying WiFi credentials, showing multimedia content – you may have noticed them being used in restaurants to direct your phone to a site where you can place your order electronically.

For more info:

- QR Codes: https://en.wikipedia.org/wiki/QR_code
- KB1HQS Amateur Radio and Adventure: <https://kb1hqs.com/>



Here are some exam questions from the current exam pools. Go ahead and answer them, and then check your answers on page 21. Let's see how you do! We recommend hamstudy.org to study with flashcards and also to take your practice tests. It keeps track of your weak areas for you!



Technician Exam Review -- Question T9A08

What is the approximate length, in inches, of a quarter-wavelength vertical antenna for 146 MHz?

- A. 112
- B. 50
- C. 19
- D. 12

General Exam Review -- Question G9A08

If the SWR on an antenna feed line is 5 to 1, and a matching network at the transmitter end of the end of the feed line is adjusted to 1 to 1 SWR, what is the resulting SWR on the feed line??

- A. 1 to 1
- B. 5 to 1
- C. Between 1 to 1 and 5 to 1 depending on the characteristic impedance of the line
- D. Between 1 to 1 and 5 to 1 depending on the reflected power at the transmitter

Extra Exam Review -- Question E9A08

What is antenna bandwidth?

- A. Antenna length divided by the number of elements
- B. The frequency range over which an antenna satisfies a performance requirement
- C. The angle between the half-power radiation points
- D. The angle formed between two imaginary lines drawn through the element ends

Upcoming Hamfests and Conventions

You can use this info to plan some of your upcoming winter and early spring travel to get away from our cold winter weather. You will find the local events in bold print.

Some conventions and hamfests may have been canceled or postponed due to the Covid pandemic. Check the hamfest event calendar on the ARRL website calendar to be sure it's still on at <http://www.arrl.org/hamfests/search/page:1/model:Event>.

Date(s)	Description	Location
02/20	The Swapfest http://n0ara.org	Brighton, CO
03/05	Elk City Hamfest http://sites.google.com/view/wcoarc/	Sayre, OK
03/05	Irving ARC Hamfest http://irvingarc.org	Irving, TX
03/12-13	QSO Today Virtual Hamfest http://www.qsotodayhamexpo.com	online
03/19	ARRL West TX Section Convention https://hamfest.w5qgg.org/	Midland, TX
03/26	Radio Society of Tucson Hamfest http://k7rst.org	Tucson, AZ
04/08	Oklahoma State Convention http://greencountryhamfest.org	Claremore, OK
04/30	LARCfest!! (Longmont Amateur Radio Club)	Longmont, CO

If you snowbird in Florida over winter, be sure to check out all the many Florida hamfests in the above ARRL link.

LARC Calendar of Events for 2022

Chuck, K0ITP

I would like LARC to host at least one club event each month. Some are still in planning, but this is what we have planned so far. We're open for suggestions on the "tbd" months!

If you would like to host an event, or have ideas for an event you think would be of interest to club members, please contact me at k0itp@w0eno.org. Let's get involved in these events, and come up with ideas for other events that sound fun!

Date	Day	Event	Date	Day	Event
Feb. 26	Sat	ARRL VE Exam	July	tbd	tbd
Feb. 26	Sat	Fox Hunt	Aug. 06 or Aug. 13	Sat	Radio in the Park
Mar. 12	Sat	Antenna Building	Aug. 06 or Aug. 13	Sat	Boulder County Fair Parade
Apr.	tbd	Fox Hunt	Sep.	tbd	tbd
Apr. 30	Sat	LARC HAMFEST!!	Oct. 29	Sat	Longmont Halloween Parade
May	tbd	tbd	Nov. 12	Sat	Turkey Trot
Jun. 25	Sat	ARRL Field Day	Dec.	tbd	LARC Christmas Party

Upcoming RMHAM University Classes

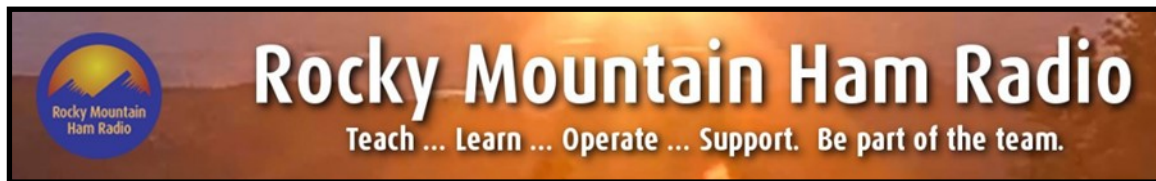
Rocky Mountain Ham (RMHAM) is offering free and very interesting classes for the rest of this class season.

If you are interested in taking one (or more), you can register at:

<https://www.rmham.org/cgi-bin/rmham-u/signup>.



Date & Time	Presenter(s)	Topic
Mar. 12, 8:30am	John W0VG Willem AC0KQ Gary WB5PJB	Data Transmission via Radio HF, VHF and UHF data communications using packet, pactor, VARA and related methods. How to use WinLink, BPQ and PAT to send and receive messages. Zoom Meeting ID: 864 1974 1417 Passcode: 220340
Apr. 09, 8:30 am	Rob NØRPF	Balloons and things relating to Rob and others from EOSS Edge of Space Sciences will present on balloons, pico-balloons, and other high flying interests. Zoom Meeting ID: 863 4524 9878 Passcode: 327259
May 14, 8:30 am	TBD	Applications of Software Defined Radio Remote receivers and transmitters, direction finding, signal processing and other interesting applications of SDR. Zoom Meeting ID: 863 3471 6368 Passcode: 296183



RMHAM Past Presentation Videos Available

Past presentation and class videos are available if you cannot make it to the classes.

Upcoming RMHAM University classes and Tech Talks are listed at: <https://www.rmham.org/rocky-mountain-ham-university/>. Presentations are free, and classes (not Tech Talks) have the option of in-person attendance.



I recently came across the web site for the St. Louis Metro ARES/RACES group and found a web page titled “Emergency Communicator’s Notebook.” It’s got a lot of great tips and procedures for participating in a deployment with ARES/RACES. Of course, your local group will have their own processes, but you’ll likely find some great info here.

Check it out at: <http://www.stlares.org/trn-emcom-notebook.html>.

Our local ARES/RACES group is Boulder County Amateur Radio Emergency Service (BCARES). You can find more information on their web site at: <http://bouldercountyares.org/>, or talk to Jerry, N00UW.



Your Support is Making a Difference! Thank You!

Last quarter (from Oct. 1 through Dec. 31st, 2021), King Soopers (The Kroger Co.) donated \$72 from 8 households who have connected their loyalty cards to the charity of our club! Link your King Soopers or City Marketplace loyalty cards to the Longmont Amateur Radio Club on their web site at <http://www.kingsoopers.com> or for City Market at <http://www.citymarket.com>.

Also, between July 1st and September 30th, our Amazon Smile program donated \$24.01 into our LARC bank account. When you shop on your Amazon account from smile.amazon.com/ch/84-1056239, Amazon will also donate a small portion (out of their own pocket, not yours) of your purchases to LARC. See p. 3 for more information.

Support your club by linking your loyalty card and shopping with Amazon Smile!

Answers to The Fifth Degree — What Do YOU Know — Questions from p. 18

Exam Level	Question	Answer
Technician	T9A08	A
General	G9A08	B
Extra	E9A08	B

Last month's article was about using the correct mode to check SWR. One of the modes discussed was **AM Modulation**. What is this modulation?

AM stands for Amplitude Modulation. It is the most basic and oldest voice modulation we have. How is it produced in the transmitted?

You start with a carrier. This is a constant radio frequency signal. Let's use 7.200 MHz. You have an oscillating circuit that produces this constant frequency. Sending this out on the air, you will detect a signal from your radio, but if you are listening on the AM mode, you will hear nothing. Even the noise will go away if the signal is strong enough.

However, we want human speech to be sent on this signal. We can do this, and this is why we call it a "carrier." This is the media that delivers the voice from your radio to the receiving radio.

In the radio, the voice signal from a basic audio amplifier is mixed with the carrier. The circuit for this is called a "mixer." Both of these signals are fed into one amplifying device. What you get out is an Amplitude Modulated signal. It is fairly simple, but what does the AM signal consist of?

If 2 signals are mixed together (RF carrier and audio), you will get 3 signals out.

You still have the RF carrier (7.200 MHz), however when it was mixed with audio, it developed 2 other signals. These are called "sidebands."

Your audio signal, for example has a frequency of 1,000 Hz. This will vary with your voice, but let's keep it constant for now. We can hear this tone. When it is mixed with the RF carrier, one result is another signal that is the sum of the 2 frequencies. $7.200 \text{ MHz} + 1,000 \text{ Hz}$. This is called an upper sideband, or USB.

If you raise the audio frequency the upper sideband will increase in frequency, and vice versa.

The other signal is the difference or subtraction of the signal. Or $7.200 \text{ MHz} - 1,000 \text{ Hz}$. This is called the lower sideband, or LSB. This signal is interesting. It works backwards. If you raise the audio signal, the radio frequency gets lower and vice versa. The lower sideband has been used for encryption in the past. Therefore, when your voice frequency goes up, the signal frequency goes down.

Enough for now. Next article will address another characteristic of AM and how we receive it.

Your questions are welcome. I will try and answer them in future articles. Email me at wd0eja@isotronantennas.com.

73,
Ralph, W0EJA
Bilal Company
Isotron Antennas



Okay, as promised, LARC is holding an event every month.

For February, mark your calendars, we are having a fox hunt!

February 26th, 2022 from 1PM to 3PM. Bring your HTs and antennas and help find the fox.



Foxyxy (LARC's unofficial mascot) is lost and needs your help!

Due to current conditions and restrictions we can not start the hunt until 1PM on Saturday Feb 26th, 2022. The picture below shows your search area for finding Foxyxy.

Foxyxy's tracker is on 145.060 and is broadcasting the Club's call sign via Morse Code at 30 second intervals.

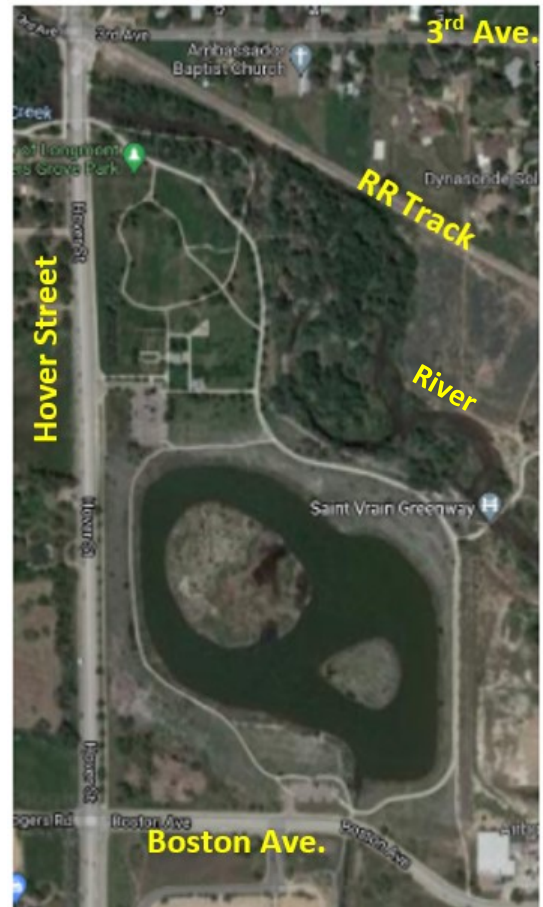
Find Foxyxy and send a picture of it to me at KØITP@wøeno.org to verify that you found Foxyxy.

Any questions contact me at the above email address.



March has another event coming up as well.

March 12th, 2022 from 9 am to 12 pm. Didn't have an antenna to find Foxyxy? Come out and build one with me at the Clover building at the fairgrounds. If interested contact me so I can give you more details.



April - We will have another fox hunt. This time only home brew antennas will be allowed. More to come on this, and our **LARCFest is scheduled for Saturday, April 30th!**



On the Amateur Radio subreddit on Reddit (<https://www.reddit.com/r/amateurradio/>), Martin Crossman, KI4CFS, asks “How can WE individually help grow the Amateur Radio Hobby with more active members?” He also has a web page detailing his answers at: <http://ki4cfs.com/what-can-we-do-to-grow-the-ham-radio-hobby/>



Note his inclusion of the word “active.” Getting new hams licensed is a great first step, but how do we get (and keep) them active in the hobby?

This Reddit topic generated a lot of discussion and ideas – this is an issue that comes up with some regularity in amateur radio discussions. Take a look at the above links, and if you find something that resonates (ha!) with you and which you think we as a club could promote, then by all means bring it up with the Board (email board@w0eno.org) or on one of our two weekly club nets (<https://w0eno.org/nets/>) – we’d love to hear your thoughts about it!

Winter Field Day Results

Doug, KE0SI

Our Winter Field Day was held on Saturday, January 9th. We had a total of 42 QSOs, including 40 in 22 different states, and 2 in Canada, with seven different operators making these contacts. The 40 and 20 meter bands were used, with 3 CW and 4 phone contacts on 40 meters, and 35 phone contacts on 20 meters. The operators participating were as follows:

Operator	Contacts	% of Total
KF0FTJ	10	24
KN6CFI	9	21
WA7EM	8	19
KF0FEC	6	15
KN6CF	4	10
WB4FAS	3	7
KE0RWV	2	5

Everyone who participated had a good time, and quite a few other hams had some social time with each other, which hasn’t happened in a long time because of the pandemic. Stay tuned for future events, and be sure to join us!



You may have wondered if you could use your HT to listen in on radio traffic at an airport. While some radios can do this, many (like the Baofeng UV-5R) cannot for two main reasons.

The first is that aircraft radios use AM, while the HTs used for amateur radio use FM, and those two modes are not compatible. The second is that the VHF aircraft band operates between 108 and 137 MHz, while the amateur radio 2 meter band is between 144 and 148 MHz, so you are unable to tune your HT to the frequencies used anyway.

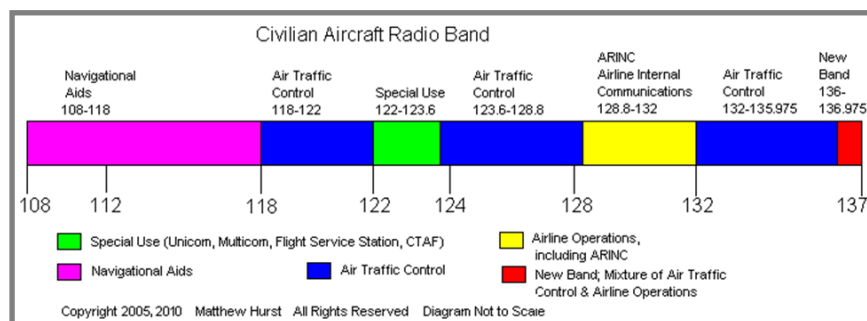
Some radios, such as the Yaesu FT-60, do support reception of the aircraft VHF band as well as AM, so you are able to monitor transmissions, but cannot transmit. You can also use a scanner or USB software-defined radio (SDR) stick to listen to air band traffic.

Now back to the original question posed in the title – why does aviation use AM instead of FM? The simple answer is that it allows the receiving station to hear multiple transmitting stations at the same time (or at least hear that there is more than one station transmitting). This can be crucial to preventing missed communications.

With FM, there is something called the “capture effect” where an FM receiver will “lock on” to the strongest signal it receives, and the user may be completely unaware of other weaker signals.

Even AM cannot prevent human error, however. This video by RSA Academy covers an aviation accident that even AM could not prevent: <https://www.youtube.com/watch?v=2GJnq4xm000>. For more info, see the following links:

- RTL-SDR Quick Start: <https://www.rtl-sdr.com/rtl-sdr-quick-start-guide/>
- FM Capture Effect: https://en.wikipedia.org/wiki/Capture_effect
- About FM (ARRL): <http://www.arrl.org/files/file/General%20Class%20License%20Manual/About-FM-Silver-QST.pdf>
- Aviation Radio Bands and Frequencies: <https://www.smeter.net/spectrum/aviation.php>
- Monitoring Aviation with a Scanner: <https://www.scannermaster.com/Articles.asp?ID=393>
- Radio Scanner Guide: Aviation: <http://radio-scanner-guide.com/RadioScannerGuidePart3C-CivilAircraft.htm>



The ARRL has announced the ARRL World Wide Digital Contest which will run from 1800 UTC on June 4, ending at 2359 on June 5, 2022. All non-RTTY modes are permitted. Bands used will be all the HF contest bands plus 6 meters. Maximum peak envelope power (PEP) is 100 Watts, so you don't need a big station to participate.

Since the contest exchange is just the station's 4-character grid square, digital modes like FT4 and FT8 will work without any special changes.

The contest features an interesting scoring system where each contact is worth 1 point plus 1 point for each 500 km / 310 miles between contacts.

For more details on this contest, see: <http://arrl.org/news/arrl-announces-new-world-wide-digital-contest> and <http://arrl.org/arrl-digital-contest>.



LARC Logo Apparel — Reduced Prices!

These are great clothes to wear for all our club-related activities, and to show your pride for our club at other ham events and around town! They also make great gifts for your favorite hams!

Order your items today at <https://forms.gle/AgZQSMhrRtR1tLEG8>.

					
Short-sleeved Shirt \$32	Long-sleeved Shirt \$40	Fleece Jacket \$43	Soft-shell Jacket \$55	Cap \$16	Patches SM \$4 LG \$6

Are Your LARC Dues Current?

Did you know that your dues and/or annual renewals can be paid online at the club website (w0eno.org) using PayPal? You don't have to have a PayPal account; you can pay with a credit card (Visa, MC, Discover, AmEx), or select 'bill me later.' You can also join or renew by mailing a check to the club (LARC, P.O. Box 86, Longmont, CO, 80502), or by giving payment to Steve Shearer (K0STE) at a club meeting when we start having them in person again. *If you aren't current on your dues, you are moved to a different mailing list and may not get club info, emails & this Splatter newsletter. Get them paid up, send email, and you're back on list!*

Yearly dues are only \$20 per year for an individual or for a family at the same address. You can find membership information by clicking on the Membership link on our club web page. Contact Steve at membership@w0eno.org if you need to know your current dues status.

Calling All Business Owners, Restaurants, Services, and Retail Shops!

Advertise with LARC in the Splatter!

The Splatter newsletter is published once a month. You can advertise your business with us at very reasonable prices!

Your ad will run for a one-year period (12 months) from when your first ad runs.

Get more business by offering a special promotion code for our readers, or by offering a deal on certain products — or just advertise your business!

Donate to LARC for Monthly Drawings

When you donate products or gift cards to our club for the drawings at our monthly meetings, we will run a business-card sized ad for you or for your business in our next monthly Splatter for free!

You also will be mentioned in the next month's Splatter newsletter and in the final issue of the year as a donor to our Club for the year, as well as on our w0eno.org web site. You will also get a donation receipt from our Treasurer.

If you can make a donation, please send your information to Steve Shearer at k0ste@w0eno.org.

PROMOTE YOUR BUSINESS WITH SPLATTER ADVERTISING

Ad size and cost – *per year.*

Business Card	2"h x 3.5"w	\$100
Quarter Page	4.2"h x 3.25"w	\$200
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Full Page	8.5"h x 7"w	\$500

The above prices are per year – not per month. (12 months of ads)

Your advertisement will be seen by amateurs throughout Colorado, the Rocky Mountain States, and even the rest of the United States. Splatter circulation is approx. 1,500.

Send Ad and/or Contact us for more details at:

Splatter@w0eno.org

Checks are to be Made out to Longmont Amateur Radio Club. LARC is a 501(c)(3) corporation.

Support Your Club!

Usually, our annual April LARCFest (hamfest) is our biggest fundraiser each year for LARC. In 2020 and 2021, however, they were both cancelled due to the Covid-19 pandemic. We are trying to raise funds for the club in other ways to be able to support more activities and events for our members, support our community, and also to keep our repeaters up-to-date and add new technology.

1. Get a King Soopers or City Market card and link it to our club. Every time you shop, LARC earns a small portion donated by the grocery store! See the directions at: <https://www.kingsoopers.com/i/community/community-rewards>. Select Longmont Amateur Radio Club as your charity (organization # VW736).
2. Do all your Amazon Ordering on Amazon Smile. Doesn't cost you a cent extra! For every order you submit, Amazon sends LARC a small percentage of your sales amount. Go to https://smile.amazon.com/gp/chpf/homepage/ref=smi_chpf_redirect?ie=UTF8&ein=84-1056239&ref=smi_ext_ch_84-1056239_cl
3. Donate directly to our club on our LARC website at https://www.paypal.com/donate/?hosted_button_id=3Y4UZGXS9W. You can use PayPal or a debit or credit card, and you will be sent a receipt from our club treasurer.
4. Volunteer to participate in or to lead ham-related activities for the club members. Your specific skills and knowledge will be a big help to enrich our club! You'll have a lot of fun, too!
5. Advertise your biz or skills with the Splatter. See page 27 for more details. We want your business!
6. Purchase or gift our LARC Logo Wear, and LARC receives a small percentage of your sale! So far, we have a cap and shirt — more items coming soon! These are a great fundraiser for our club! Be proud to wear to ham radio events everywhere! These are purchased, embroidered, and patched by a local business owner who is also a LARC member! These make great Holiday Gifts



Click here to shop at AmazonSmile
and Amazon will donate to LARC

amazonsmile
You shop. Amazon gives.

*See them all on page 26! Reduced Prices!
Get your items now!*

- Short-sleeve Shirts (\$32) embroidered with your call sign, name if desired, and our LARC Logo patch.
- Long-sleeve Shirts (\$40) embroidered with your call sign, name if desired, and our LARC Logo patch.
- Fleece Jackets (\$43) embroidered with your call sign, name if desired, and our LARC Logo patch.
- Soft-shell Jackets (\$55) embroidered with your call sign, name if desired, and our LARC Logo patch.
- Caps (\$16) emblazoned with our LARC Logo patch on the front with your call sign embroidered on the back.
- Individual Patches \$4 (2.5") and \$6 (3.5")
- See the pictures of these new items on page 26 of this Splatter.
- To order any of our LARC Logo Items, go to <https://forms.gle/AgZQSMhrRtR1tLEG8>

Editor's Note

I welcome and thank you for any news items you submit for publication in the LARC Splatter.

Please note that all articles submitted may be edited for spelling, grammar, and length. Files in the form of DOC, DOCX, RTF, PDF, and TXT are all accepted.

If you would like a picture included, please send them in separate files, in JPG or PNG format. If you would like a caption under the picture, please specify what you would like your caption to say.

Longmont Amateur Radio Club

LARC is organized for educational and scientific purposes and to provide public communication services to the local community and adjacent areas through the operation of Amateur Radio. The Club holds regular meetings for the business of the Club, for the presentation of papers, amateur radio topics and their discussion.



Longmont Amateur Radio Club 2022 Leadership Team & Committee Chairs

Position	Name	Call Sign
President	Charles Poch	KØITP
Vice President	Michael Ritchie	WØKKI
Secretary	Pat Engstrom	W1PGE
Treasurer	Don Lewis	KEØEE
Technical Committee	Mark Skelton	N7CTM
Membership Committee	Steve Shearer	KØSTE
Past President	Jerry Schmidt	NØOUW
Publicity Committee	Steve Haverstick	KFØAGY
Planning Committee	Doug Altman	KEØSI
Repeater Trustee	Bryan Gonderinger	AFØW
LARCFest Committee	Dick Paige	KEØVT
Special Events Coordinator	Mark Mollenauer	KDØGOC
License Exam Coordinator (ARRL)	Aaron Rees	AJ7R
Education Coordinator/Instructor	Kat Gonderinger	WØUM
Education Coordinator/Instructor	Bryan Gonderinger	AFØW
Splatter Newsletter Editor	Kat Gonderinger	WØUM

Please Visit LARC's Sponsors & Supporters

(there's always room for more!)

Spaces for entrepreneurs to set up an office, as well as meeting and conference rooms available.



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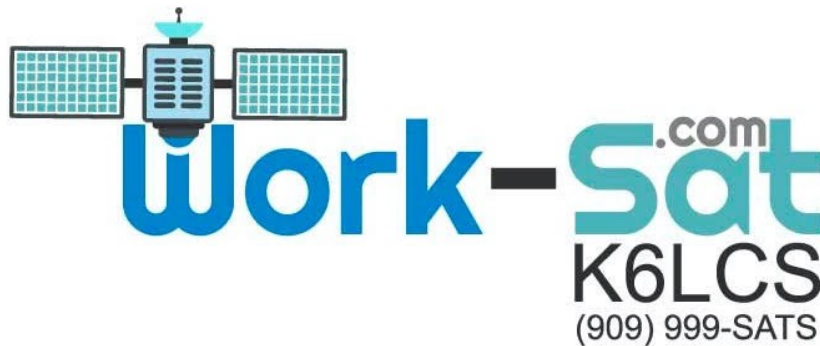
Shop with King Soopers to get them to donate to LARC!
Read more about it on page 28.



Jim Andrews, KH6HTV

Get your FREE ATV Handbook at
[https://
kh6htv.files.wordpress.c
om/2021/02/an-55a-atv-
handbook-1.pdf](https://kh6htv.files.wordpress.com/2021/02/an-55a-atv-handbook-1.pdf)

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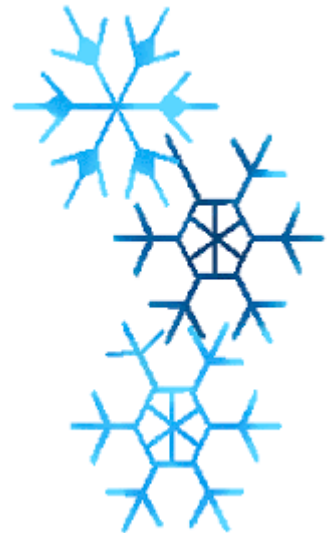
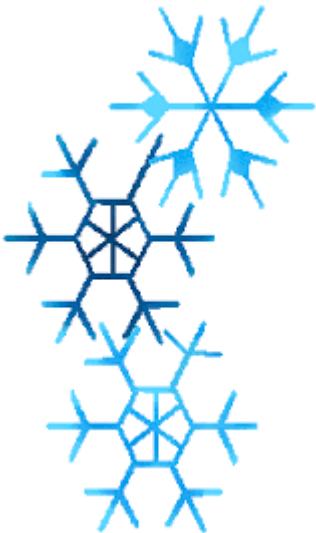
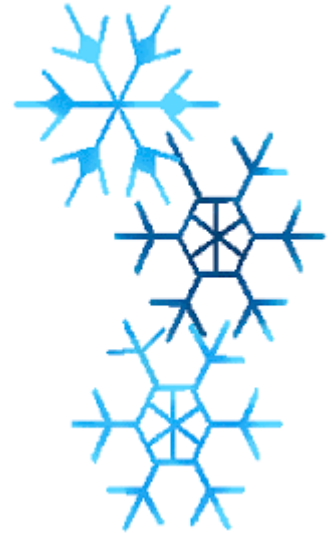
Clint Bradford, K6LCS

work-sat.com

January Winter Word Scramble Answer Key



SWEATER
DECEMBER
FROST
FIREPLACE
SNOWFLAKE
BLIZZARD
WINTER
JANUARY
ICICLE
HOCKEY
BLANKET
MITTENS
SNOWMAN
SKIS
FEBRUARY



February Puzzle

F C I M P E D A N C E R E S C
 R T A N O I T A L U D O M O O
 E N G P R O T C E T E D N O E
 Q A D V A E L M E R Z D J V U
 U N T E K C I T L U U T I R L
 E O O W X N I R H C G T R X U
 N S K I U E F T T F O R E E Z
 C E I L T J L O O M K E R H H
 Y R A N E A R O O R T X E W S
 F B I S S J G R P R D E H C L
 I I R G L U T A A I V L P O F
 O O L Z A C L N P S D P S A V
 M H I T E Y S A U O H U O X G
 T P M L E C J N T O R D N R Z
 C A E I E R S N N O F P O S Q
 P C S I M P L E X R R U I B S
 W K V U O B T T L X N B S Y Q
 H E K T A I E N U D Q D F G N
 R T S Y C A P A C I T A N C E
 S C I N O M R A H O F F S E T

Antenna	Ionosphere	Balun	Modulation	Capacitance	Morse
Capacitor	Offset	Coax	Ohm	Conductor	Packet
Detector	Phonetic	Dipole	Propagation	Duplexer	QSO
Electromotive	Resonant	Elmer	Simplex	Filter	Sunspots
Frequency	Tesla	Ground	Ticket	Harmonics	Transceiver
Hertz	Yagi	Impedance	Zulu	Insulator	

Longmont Amateur Radio Club

P.O. Box 86

Longmont, CO 80502-0086

w0eno.org

Membership Application

Tax Deductible Donation to LARC: \$20 per year [] New Member: [] Renewing Member Payable via PayPal with [sent application](#).

First Name: _____ Last Name: _____ Birth Year: _____

Address: _____ City: _____

State: _____ Zip: _____ - _____ Call Sign: _____ Class: _____

E-mail: _____ (needed for correspondence)

H-Phone _____ C-Phone: _____ B-Phone: _____

I am a member of: [] ARRL [] BCARES [] VE

DISCLAIMER AND WAIVER: I apply for membership in LARC. I understand that some LARC activities are potentially hazardous. If I am injured or killed while participating in a LARC activity, I and my heirs agree to hold harmless LARC and its officers, directors, and members.

SIGNATURE: _____ DATE: _____

OTHER LICENSED FAMILY MEMBERS (Same Address) (No extra cost)

Name: _____ Call: _____ Signature: _____

Name: _____ Call: _____ Signature: _____

Name: _____ Call: _____ Signature: _____

Note: A tax deductible receipt will be provided.

THE CHECKED MEETING TOPICS ARE OF INTEREST TO ME

Training Class for [] Technician [] General [] Extra [] Volunteer Examiner

Band: [] HF [] VHF [] 222 [] UHF [] 900MHz [] Other _____

Mode: [] CW [] SSB [] AM [] FM [] ATV [] Other _____

Digital: [] SSTV [] PSK31 [] MFSK [] PACKET [] FT8 [] APRS [] Other _____

Electronics: [] Components [] Circuit Analysis [] Amplifiers [] Other _____

Other Topics: [] Antennas [] Propagation [] Satellites [] Kit Building [] Fox Hunts [] Soldering

[] DSP [] DX [] ARES [] Contests [] QRP [] HamFests [] Emergency Preparedness

[] Community Service Events [] Other _____

[] Other _____ [] Other _____



ARRL The national association for
AMATEUR RADIO®

Membership Application

Application for use by ARRL Affiliated Clubs

Contact Information

I am a brand new member or my membership has been lapsed for 2 or more years. My club will keep \$15 of my dues.

I am renewing (includes lapsed members of less than 2 years). My club will keep \$2.00 of my dues.

Name _____ Call Sign _____

Address _____

City _____ State _____ ZIP _____

Email _____ Phone _____

Date of Birth ____/____/____ **Get an annual birthday coupon (US only)**

My Family Member is Joining or Renewing: (\$10 per member)

Name _____ Call Sign _____

Name _____ Call Sign _____

Your Annual Membership Dues – Circle Your Choice/s.

	1 Year	2 Years	3 Years	
US	\$49	\$95	\$140	Monthly <i>QST</i> or <i>On the Air</i> via standard mail for US members
Youth	\$25			Must be 21 years old or younger AND the oldest licensed Radio Amateur in the household
Canada	\$62	\$120	\$177	Monthly <i>QST</i> via standard mail for Canadian members
International	\$76	\$147	\$217	Monthly <i>QST</i> via standard mail for International members
International/Canada – no print magazine	\$49	\$95	\$140	Digital magazines
Family	\$10	\$20	\$30	Must reside with primary member and have corresponding membership dates; no extra copies of magazine
Blind	\$10	\$20	\$30	No delivery; all other member benefits apply. Requires a one time signed and dated statement of Legal Blindness

Additional membership options available online at www.arrl.org/join. US Memberships include \$21 per year for magazine subscriptions. Dues are subject to change without notice and are non-refundable. Memberships may not be combined with any other promotion or special offer.

I do not want my name and address made available for non-ARRL related mailings.

Choose your print magazine:

QST, ARRL's membership journal for active radio amateurs (12 monthly issues)

On the Air – New! Beginner-to-intermediate-level help and advice (6 bimonthly issues)

All members can access the digital edition of both magazines

Payment Information

Please charge my ARRL dues less my club's commission. I have paid the commission directly to my club.

\$ _____ Total Charge to: Visa MasterCard Amex Discover Check Enclosed

Card Number _____ Expiration Date _____

Card Holder's Signature _____

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Toll free (US) 1-888-277-5289 or 860-594-0200 ■ www.arrl.org/join