Club Info:

Our call sign is K6MEP. We invite anyone who is interested in amateur radio to explore our website or attend one of our meetings.
We meet on the second Friday of every month, except in December. Our meetings are held at The Dudley House. The general meeting starts at 19:00. We have a donation table and a “freebie” table. During the meeting we start with a flag salute and introductions. We then discuss club business and then have a social half-hour that begins about 20:00. After the short break, we have a presentation. After the meeting is adjourned, some members go to Toppers Pizza to socialize. Come by, join us, and share your ham radio interests.

The Inside Story

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Message from the President

The Prez Sez,

As I write this message the first day of autumn is this week. My thoughts turn to the many changes in our club (new members and new activities), as well as the changes in our officers, board and committee leaders. We announced during our September meeting that dues are due in October and we will have our annual nominations and elections in November, where our leadership will change.

Looking closer to home, I've noticed the many changes our plants (lots of tomato plants this summer) in the backyard are going through. Most of the leaves have died off and there are large vines trying to ripen the remaining tomatoes. Our Plumeria continue to flower and grow; several are over 8' tall and are looking better than they did in summer.

For most of the country, autumn brings a much different environment. When we lived in Colorado, the trees would have already lost their leaves and the flowers would have been long gone. October will always remind me of change and I located a poem (by Robert Frost), entitled "October" that brings melancholy memories:

"O hushed October morning mild,
Thy leaves have ripened to the fall;
Tomorrow's wind, if it be wild,
Should waste them all.
The crows above the forest call;
Tomorrow they may form and go.
O hushed October morning mild,
Begin the hours of this day slow.
Make the day seem to us less brief.

(Continued on Next Page)

Club Offices	And Keyer	Contributors
President	Robert Shank	KM6RSS
Vice-President	Clement Alberts	KM6OKZ
Secretary	Phil Cohen	WA6BUZ
Treasurer	John Gartman	W6JPG
Board Member	Burt Auerbach	KA6BJA
Board Member	Dave Schmidt	AI6VX
Board Member	Mark Swaney	KD6ASL
Program Manager	Clement Alberts	KM6OKZ
Equipment Mgr.	Denney Pistole	N6HV
Refreshments	Linda Shank	
Facilities	Richard Abbey	WB6AEW
Keyer Editor	Robert Shank	KM6RSS
Webmaster	Robert Shank	KM6RSS
Domain	Phil Cohen	WA6BUZ
Membership	Robert Shank	KM6RSS
License Trustee	Dave Schmidt	AI6VX
ARRL Club Rep.	Dave Schmidt	AI6VX
ACS/ARES Rep.	Burt Auerbach	KA6BJA
Monday Night Net	Robert Shank	KM6RSS
QSL Manager	Ben Holmes	K6QV
Safety Officer	Mark Vodon	KI6PTE
PIO/Trivia	Dana Wentling	KG6WXE
Columnist	Dave Schmidt	AI6VX
Columnist	Denney Pistole	N6HV
Columnist	Steve Noll	WA6EJO
Columnist	John Kitchens	NS6X

The KEYER is published monthly by K6MEP, the Ventura County Amateur Radio Club, Inc. as a means of providing club members the minutes from K6MEP's monthly general membership meetings, the monthly board of directors' meetings, a calendar of events and articles of interest about amateur radio. Layout and logos are the property of The Ventura County Amateur Radio Club, K6MEP.

Submit material by email to KM6RSS@arrl.net.
Our club mailing address is:
K6MEP
PO Box 2103
Oxnard, CA 93034-2103

K6MEP holds general membership meetings at 7:00 PM on the 2nd Friday of each month (except December). Dues are $20 per year.

Message from the President (Continued)

Hearts not averse to being beguiled,
Beguile us in the way you know.
Release one leaf at break of day;
At noon release another leaf;
One from our trees, one far away.
Retard the sun with gentle mist;
Enchant the land with amethyst.
Slow, slow!
For the grapes' sake, if they were all,
Whose leaves already are burnt with frost,
Whose clustered fruit must else be lost—
For the grapes' sake along the wall."

Since I always worry about the wind and its previous destruction to two of my GAP Titan antennas, tying the poem in with Ham radio reminds me to check the guy lines.

- Looking backward:

Our fall picnic was held on September 3rd from 11am to 3pm at the Dudley House. We had over 20 attendees. Thanks to Mark Swaney and Mark Ortega for organizing and cooking, respectively, and to all of those who made generous contributions to our donations jar. Also thanks to those who brought pot luck to share. A good time was had by all.
For photos, see: https://photos.app.goo.gl/8t1NsVkKjM2AJtnx6
The September 9th general membership meeting was held at the Dudley House and on Zoom. We had twenty sign in the roster with guests: Leslie Alcorn (who helped Jeremy KN6JMD with the Zoom set-up), Keith Robison, Yoshio Nakamura KE6ACH and Brad Ormsby W6VO (who joined during the meeting). Our presentation was by Dave Schmidt about AllStar, a radio linking technology. His presentation has been placed on the K6MEP.org website under the "presentations" tab. Thanks to Linda, Ben K6QV and others for bringing refreshments and to all who attended, participated and shared their enthusiasm for Ham radio. (Continued on next page)

Message from the President (Continued)

Looking Forward:
Our next board meeting will be held on October 9th at 19:00 on Zoom; please check the calendar for the credentials.

Our next club meeting is scheduled for October 14th at the Dudley House and will be "Zoomed", thanks to Jeremy KN6JMD. Pedro K6MIL will present "Mazzoni MIDI Automatic Magnetic Loop Antennas Experiments". Our meetings start promptly at 19:00. After the call to order, welcome to our members and guests, and flag salute, introductions are made. Then our committee members are asked to present their status. Following the status report is a request for any new business. A break is taken to get the presentation set up, serve refreshments and have some social time. After the presentation is complete and everyone has asked and received answers to their questions, announcements are made and the meeting is adjourned. Visitors are always welcome to attend our club meeting; bring a friend! Afterwards, many of us go to Toppers for a slice of pizza and a great deal of ham radio discussions.

Safety Share:
October's safety share is from https://www.cdc.gov/niosh/topics/noise/ and the focus is on Hearing Safety.
"Hearing loss is one of the most common work-related illnesses in the United States. Each year, about 22 million U.S. workers are exposed to hazardous noise levels at work. Over 30 million U.S. workers are exposed to chemicals, some of which are harmful to the ear (ototoxic) and hazardous to hearing. In addition to damaging workers' quality of life, occupational hearing loss carries a high economic price to society.
NIOSH Recommendations:
The NIOSH Recommended Exposure Limit (REL) for occupational noise exposure is 85 decibels, A-weighted, as an 8-hour time-weighted average (85 dBA as an 8-hr TWA) using a 3-dB exchange rate. Exposures at or above this level are considered hazardous.
Use the NIOSH Hierarchy of Controls to reduce workplace noise to below the NIOSH REL whenever possible. Use hearing protection when hazardous noise levels cannot be adequately reduced. "
When working at home, please remember to wear hearing protection. I have the sponge as well as the "over-the-head" ear muffs types. Whether I am using a saw, grinder, or generator, I wear PPE including hearing, eye, and body (gloves and protective clothing and shoes) to help keep whatever abilities I have protected.
See you all at the Friday the 14th of October club meeting at the Dudley House with your ideas, energy, and Ham Radio experiences!
73,
Robert Shank KM6RSS
President, VCARC

Minutes of the September 4th, 2022, VCARC Board Meeting

MEETING LOCATION: Zoom

TIME: 19:00 to 20:00

CALL TO ORDER at 19:00 (started when 4 board members entered the meeting)

Welcome all (Mark, Dave, Burt and Robert) with Denney and Stewart as guests. John joined at 19:06.

Minutes: (Phil WA6BUZ not attending) Robert represented Phil.

Mark made the motion with Burt seconding to approve minutes of the August 7th board meeting as published in the September Keyer. All board members present voted “Aye”.

Burt made the motion with Dave seconding to approve minutes of the August 12th regular meeting as published in the September Keyer. All board members votes “Aye”.

Officers Report: (John W6JPG)

Treasurer: John has sent out the treasure’s report to the board members; Mark made the motion with Burt seconding to approve. All board members votes “Aye”.

John to make a $50 payment to the Dudley House for the September 3rd picnic.

Committee Reports:

Youth Committee (Tim KN6JGB not attending)

No report

Members Health and Safety (Mark KI6PTE not attending)

No report

Picnic Committee Report (Mark KD6ASL)

Picnic was well attended; several who signed up didn’t show and there was a number that showed that didn’t sign up. 19 total signed in. $72 was donated at the picnic. Need to schedule fall picnic later in the year for next time. Use pop-ups and move the radio table out from under the pergola.

ARRL Chair (Dave AI6VX)

Dave will contact ARRL (not done yet). 5 members have VEs: Robert, John, Clement Keith and Zak. Dave has sent in his application and has taken the test. Discuss VE training and encourage more members to get their VE so that we can provide training and testing at our club. John will provide Robert with an email address for Michael Bleiweiss KZ7V, who used to run the VE sessions out at the Red Cross.

(Continued on next page)

Minutes of the September 4th, 2022, VCARC Board Meeting (Continued)

Committee Reports (continued)

ACS/ARES Chair (Burt KA6BJA)

Anything to report about the airshow? Mark reported that it went well; has a few suggestions for ACS to make it better next year including having the representative attend more organizational meetings and keeping the ACS trailer available for the air marshal's HTs.

DecemberFest (Robert)

Black Bear Diner has been reserved – 29 plan to attend which hasn't changed since last month

Buffet main and side dishes to be selected by those who will attend

Special Orders:

Inventory (Denney N6HV)

TRW sales results; Denney will bring Saturday August 27th money to John at our September 9th meeting.

Remaining inventory of club items and updated values

Inventory identification and storage process with phasing.

Denney will provide Robert with sold item names and photos to update the inventory held on website.

Unfinished Business:

Micro Field Day

Mark motioned and Burt seconded to have the micro Field Day on October 29th and the 5 board members voted to approve.

Dave motioned and Mark seconded the motion to spend $50 to rent the Dudley House on the 29th and the 5 board members voted to approve. We will make the announcement on the September 9th and October 14th general membership meeting and encourage everyone to attend.

Need the Following Committees:

Membership

Monday Night Net Operators for September (Denney volunteered for the 12th, Burt the 19th and Mark Swaney the 26th.

New Business:

None.

(Continued on next page)

Minutes of the September 4th, 2022, VCARC Board Meeting (Continued)

Announcements:

Our next club meeting is scheduled for September 9th at the Dudley House. Dave Schmidt AI6VX will present “Allstar”.

Adjournment:

Mark made the motion to adjourn with Dave seconding it. All five board members voted their approval and the meeting ended at 20:02.

Minutes of the September 9th, 2022 General Membership Meeting of VCARC

MEETING ADDRESS: Dudley Historical House, 197 N. Ashwood Dr. Ventura CA 93003 and simulcast on Zoom (with thanks to Jeremy KN6JMD for managing the Wi-Fi, operating the computer, camera, microphones, projector and Zoom meeting)

ATTENDANCE: We had twenty sign in the roster with guests: Leslie, Keith Robison, Yoshio Nakamura KE6ACH and Brad Ormsby W6VO (who joined tonight). See the list of board members who attended at end of these minutes.

CALL TO ORDER 19:10

MEETING MINUTES
President Robert welcomed everyone and held the Flag salute.

Introductions:
Robert asked everyone to introduce themselves and then "tag" the next person to continue the process. All of us learned more about our club members and guests.

Committee Reports:
Picnic: We had over 20 attendees to the VCARC picnic on September 3rd. Thanks to Mark Swaney and Mark Ortega for organizing and cooking, respectively. A good time was had by all.

Micro-Field Day: planned on October 29th at the Dudley House; 11-3. Robert and Keith talked about the upcoming Micro Field Day.

Health and Safety: Mark Vodon KI6PTE (not present)

Club Inventory: Denny talked about TRW swap meet. We made about $300.00 on misc. item sales. He plans on going again on September 24th. It's always the last Saturday of the month.

K6MEP Monday Night Contest: (Robert KM6RSS). K6MEP Monday night net totals for 36 weeks are: 587 check-ins with 87 visitors and a 16.31 visitor average. We are looking for net control operators for October.

ARRL Liaison: Dave AI6VX would like the club to participate in the ARRL VE program. His application was sent to ARRL and a week later he received his VE.

ACS/ARES Liaison Burt KA6BJA. We are looking for volunteers for the Share the Road Ride on October 1st. Contact Frank Valdez, KI6OQ frankki6oq@gmail.com.
(Continued on next page)

Minutes of the September 9th, 2022 General Membership Meeting of VCARC (continued)

Committee Reports (continued)

Youth Outreach: Tim KN6JGB wasn't present but had previously mentioned that we didn't get enough interest for a Ham-related STEM table at the Wings over Camarillo.

DecemberFest: (Robert KM6RSS). The date is December 9th and the location is Black Bear Diner at the corner of Harbor and Seaward in Ventura just off the 101. An attendance poll is on groups.io as well as a response sheet on the clipboard in the back of the room. Please let us know if you will join the fun!

Dues: Due in October, payment can be made by check, cash or PayPal via the website.

Election Nominations Reminder: Can start to be collected as early as September. Nominations can be mailed to secretary@k6mep.org prior to the November meeting.

New Business: No New Business

Break time 8:10 Break for socialization and set-up (20 minutes)

Presentation by Dave Schmidt about AllStar a radio linking technology. When you also consider its remote base, linking (full-duplex) and VOIP (for autopatch, remote control, etc.) capabilities, it's amazing.

Presentation ended 9:20 PM

Announcements:

Next board meeting October 9th.

Next regular meeting October 14th Pedro will be giving a presentation on his new loop antenna

Adjournment:

Robert reminded everyone that many of us will continue the camaraderie at Toppers on Main Street in Ventura.

Meeting adjourned 9:25 Bob made motion to close with Keith seconding. The vote was unanimous.

OFFICER ATTENDEES

OFFICE	LAST	FIRST	CALL SIGN	PRESENT
PRESIDENT	SHANK	ROBERT	KM6RSS	X
VP	Clem	Alberts	KM6OKZ	
TREASURER	GARTMAN	JOHN	W6JPG	
SECRETARY	COHEN	PHIL	WA6BUZ	X
BOARD	Swaney	Mark	KD6ASL	
BOARD	Schmidt	Dave	AI6VX	X
BOARD	Auerbach	Burt	KA6BJA	X

K6MEP Monday Night Net Update Robert KM6RSS

Our new Monday Night Net Contest started Monday, January 3rd and will end on December 5th. Contact me to volunteer to be the net controller.

Below are the current Monday Night Net Contest Totals. Our groups.io has all of the Monday Night Net Contest documents in the files folder. Our contest-to-date total over 39 weeks is 634 check-ins with 89 visitors and an average of 16.26.

Week	Monday Night Net Contest Totals to Date	Total	Visitors
1	1/3/2022	15	2
2	1/10/2022	17	2
3	1/17/2022	14	1
4	1/24/2022	20	3
5	1/31/2022	19	1
6	2/7/2022	17	4
7	2/14/2022	14	2
8	2/21/2022	16	2
9	2/28/2022	11	1
10	3/7/2022	14	1
11	3/14/2022	17	2
12	3/21/2022	15	1
13	3/28/2022	13	0
14	4/4/2022	17	2
15	4/11/2022	18	4
16	4/18/2022	15	1
17	4/25/2022	19	3
18	5/2/2022	16	3
19	5/9/2022	12	1
20	5/16/2022	20	7
21	5/23/2022	20	3
22	5/30/2022	20	6
23	6/6/2022	16	2
24	6/13/2022	14	3
25	6/20/2022	18	3
26	6/27/2022	18	2
27	7/4/2022	15	2
28	7/11/2022	11	1
29	7/18/2022	11	1
30	7/25/2022	20	8
31	8/1/2022	17	5
32	8/8/2022	15	2
33	8/15/2022	20	3
34	8/22/2022	17	1
35	8/29/2022	20	2
36	9/5/2022	16	0
37	9/12/2022	17	1
38	9/19/2022	14	1
39	9/26/2022	16	0
	Total	634	89

Heard on the Net by Denney N6HV, Club Equipment Manager

The K6MEP Monday night net is active. Join us at 8:00 PM Monday nights and hear what others in the area have been doing on the radio. You can also get on the net and tell everyone about what you have been doing on the bands, or if you have questions or problems there are members always ready to try and give you a hand.

High lights form the net.

KD6ASL Mark is planning on taking a cruise around Norway to see the Auroras. Major Aurora displays can impact radio propagation. Going to see the Auroras is on the bucket list of my friend.

KM6RSS Robert found corrosion problems with his MFJ 1786 10-30 MHz Loop antenna. He found that the salt air has gotten into control board for the capacitor that tunes the antenna and corroded the copper trace.. He lives a “stone’s throw” from the ocean. Robert is also hunting for one of his 6 Raspberry Pi computers in his four overstuffed garages. Dave’s AI6VX talk has inspired a bunch of members to get on Allstar.

AG6AG Stu has a couple of new videos out. There will be a panel on antennas in the Thousand Oaks city hall board room. It is scheduled for Oct. 17th at 19:00. Contact Stu for more details.

KM6OKZ has got his HP3400 working. Now he’s into calibrating the instrument.

KI6PTE Mark updated us on the help he giving to his friend in Wyoming.

K6MIL Pedro had his landscaper move his heavy loop antenna to his tree.

AI6VX Dave worked China on FT-8; a new country for him. He also bought a signal generator at TRW.

N6QDI Tom got a Raspberry Pi. He also talked about seeing the Delta 4 launch out of Vandenberg Air Force base.

K6QV Ben, is buying a new battery box. Sounds like he is getting ready for Field Day.

KD6UDA Bob, talked about an antenna (he mentioned the KK5JY.net web site) and how he had to rewire the matching balun toroid. The instructions for the antenna are not clear on how to wind the balun.

KF6UV Mike, is working on his antenna and getting his IC237A installed in his car.

KI6YLH Mark, has ordered a new Yaesu radio.

Come join us on the net and on Zoom after the net. Find out what is going on and get your questions answered.

73, Denney N6HV

My Radio's Dead, Now What by Denney N6HV, Club Equipment Manager

Remember The *Hitchhiker's Guide* to the Galaxy? Put a towel over your head and Don't Panic.

We are in a period of tremendous solar activity. We have had daily radio blackouts. You can turn your radio on and hear nothing or just static. Here is a quick check list of things to try and equipment you might want to consider buying to have handy if your radio doesn't seem to work.

First, remember you have a bunch of club members that can help you. Don't go tearing everything apart; it might be a radio blackout.

Second, look for the obvious.

a. Does the radio light up, if it doesn't:

1. Check and make sure the rig is plugged in
2. Does the power supply pilot light, light up.
2. Check the fuse/circuit breaker for the house/shack.
3. Check the wall outlet and plug strip with a lamp or voltmeter.
4. I have had all of these happen to me.

b. Do you hear noise? if you don't:

1. Plug in another radio, any radio to your antenna. That will tell you if it is the radio or the antenna. A cheap (~$25.00) SDR receiver is perfect for this.

2. Try transmitting into the antenna and watch the SWR or your rig's power out indicator. High SWR or no power output could mean something is wrong with the transmission line, tuner, or antenna. Consider buying an SWR bridge before this happens. Many tuners have an SWR indicator built-in.

3. Connect an antenna analyzer to the coax that goes to the back of the radio and check the antenna system match.

c. You hear noise, but no signals.

1. Ask another ham to transmit on the band you're working or if conditions are bad.

2. Tune to 10 MHz and see if you can hear WWV. They can be heard when conditions are bad, but not always.

3. Look at the K6MEP.org web site and see what the band conditions are.

4. See if there is a D layer radio blackout at Space Weather Prediction Center (https://www.swpc.noaa.gov/communities/radio-communications). A big blue blob near the U. S. means 80 meters and maybe 40 meters are wiped out, if it's yellow then 20 meters and below (80 and 40) are dead. If it's red then anything below 30 MHz is dead. Remember, radio blackouts usually only lasts an hour.

(Continue on next page)

My Radio's Dead, Now What (Continued)

5. Try and see if you can hear a signal source or signal generator. I have an Elecraft RF Signal source, it's a bit pricy, but it's a quick check for rig and antenna. You can use a Rig Expert also. Set it to SWR chart and have it scan the frequency you want to listen to. Then connect the output of the analyzer to an antenna like a mag mount (the antenna can be way off frequency) and listen on your rig for the signal from the analyzer sweep by. It works with an MFJ antenna analyzer too, but you have to manually move the frequency on the analyzer. A grid dip oscillator will work also. You can always use a Signal Generator, but those are expensive.

So, before you tear your station apart try a couple of these tests. It could be as simple as calling another ham and finding out there's nothing wrong with your rig or antenna, it could be the sun.

73, Denney N6HV

Photos from “Wings over Marina Park” September 16, 2022

By Burt KA6BJA

Let's Measure Antenna Gain! By Steve Noll WA6EJO

It's easy! Well, somewhat. Let's limit it to small VHF and above antennas. Antenna gain (when actually measured, not calculated) is often measured by comparing to a known gain antenna. What if you don't have a known gain antenna? There is a relatively simple solution if you can come up with two identical antennas. I did so when I designed and ran the West Coast VHF/UHF Conference antenna ranges in 1991, 1992, and 1993. Our club sponsored these conferences here in Ventura at the Holiday Inn. The antenna range was the top of the adjacent parking structure where we measured gain and plotted radiation patterns from 6M through microwaves. Where I did not have a known gain standard antenna I just made a pair of identical antennas and applied the Friis equation.

$$\text{Antenna gain in dBi} = 10\log \sqrt{\frac{Pr(4\pi R)^2}{Pt\lambda^2}}$$

$$\text{Another version: Antenna gain in dBi} = 10\log \left(\frac{4\pi R}{\lambda}\right)^{1/2} \left(\frac{Pr}{Pt}\right)$$

Where
Pr = Power in Watts measured at the receiving antenna
R = Distance from the transmit antenna to the receive antenna in Meters.
Pt = Power in Watts measured into the transmit antenna.
λ = The wavelength used in Meters.

The gain answer is for one antenna in dBi.

Basically you point the antennas at each other, transmit with one and measure the power received at the other.
More distance between them is better. Try to get farther than twice the square of the largest dimension of the antenna divided by the wavelength. That should get you out of the near field. The newborn RF needs a little space to get its act together for an accurate measurement.
(Continued on next page)

Let's Measure Antenna Gain! By Steve Noll WA6EJO (Continued)

Okay, there is one hard part to this. You need to measure the power received at the receiving antenna. Unless you have some sort of a fancy calibrated receiver you will need one of these. Every well-equipped Ham RF lab should have one:

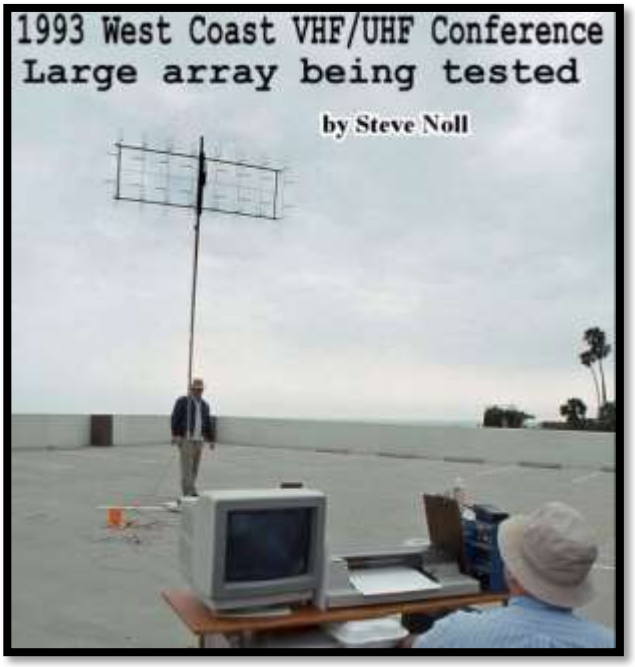
A "Microwave" power meter - a fairly common surplus Hewlett-Packard instrument. They can typically measure RF power at any frequency down to under a milliwatt. With attenuators any high power energy too. The meter itself is the cheap part. The power sensor, and its cable too, are what costs the most, and late model units are really expensive. For now I'm staying with meters that use the lower cost HP 478A power sensor. These also known as a thermistor mount as they actually measure power by measuring the temperature of a resistive element.

Now, let's actually measure the gain of an antenna! I'm picking a ground plane for two reasons. 1) It's easy to build, and 2) no one seems to agree on what the gain of a ground plane is! My research found opinions from -0.85 dBi to +5.31 dBi. That's nuts! For frequency I'm picking the 70cm band, specifically 449.9 MHz. Here I can come up with 50W if needed and there shouldn't be anyone there to interfere with. (Continued on next page)

Let's Measure Antenna Gain! By Steve Noll WA6EJO (Continued)

However, when I started the measurement I was very surprised as to how hard it was to do. I encountered serious problems from reflections and peaks and nulls from the antenna physical locations. I had never experienced this with past antenna gain measurements because all past measurements were made with directional antennas. A ground plane is squirting RF in every direction but up, just looking for something to reflect off of. If ever there was a need for a RF anechoic chamber to absorb RF and eliminate reflections this is it. Not in the budget, however. With any antenna you can encounter signals reflecting off of the ground between the antennas, sometimes in phase, sometimes out of phase. Really can mess up the readings. Some call this "ground gain." This is where not having any ground between the antennas is ideal - like a valley between two mountaintops.

Most of the online ground plane design calculators come up with about 6.25-inches for the ground plane elements. Starting with that I built the antennas on N-connectors with four drooping radials and machined tripod adaptors for them. Tune up was done with a RigExpert AA-1400 to SWR of 1.01:1. Transmit power was 4.3695 Watts. (You must measure this at the antenna!) Received signal levels ranged from ½ to 9 ½ milliwatts. Distance between antennas ranged from 1.5 to 8 meters. Because of the pesky reflections it took 39 gain measurements to get the confidence to say that the gain of a ¼-wave ground plane is 1.32 dBi +/-0.4 dBi. To verify my technique and math I then measured the gain of the only other two identical antennas I had at hand, Two Seavey Engineering SGA-20 standard gain horns. Performed at 2.4 GHz I came within about 3% of the specified gain. The highly directional horns were much easier to measure!



73, Steve J Noll, WA6EJO

Fixing KF6UV's Icom 2730 by Dave Schmidt AI6VX

Michael, KF6UV, had an Icom 2730 mobile rig that wasn't working right. This dual band, dual receive, 50W radio had gone deaf. Mike told me, "It transmits but it doesn't receive! I looked it over and only found some corrosion on an IC that I then cleaned up, but it's still deaf." After a few months of him looking for a repair place to ship it to, I told him I would take a look at it.

Trying the radio out on my base antenna, sure enough the radio was deaf on VHF (the only band Mike had programmed). I then hooked the radio up to my HP 8920A communication test set to measure how deaf it really was. Feeding in a UHF signal, receive sensitivity checked out ok, -110 dBm full quieting. VHF however needed a -70dBm signal, and this was true for both the left and right sides of the radio. Whatever the root cause was, it was likely before the signal split to both sides.

While the radio was connected to the 8920A, I went ahead and checked TX power. There wasn't any! Literally no measureable RF power, not even on UHF. Michael said it would transmit, but it wasn't for me. Something else to check later.
Popping the covers off, I inspected the PC board under a microscope. Nothing obvious was found: no burned parts or cracked solder joints. The SMT chip (an I2C EEprom) Mike had previously cleaned looked good, but I removed it to clean underneath it anyways. Reinstalled, the radio still had the same problems.

"Hmmm, how can I test the receive path to see where the problem is?" A thought I had was to feed a VHF signal through the antenna jack of the radio and use a spectrum analyzer to trace the signal from component to component. If I see a big drop in signal after a component but not before, that part is likely bad. The trouble was this radio however is built almost entirely with surface mount, 0402 sized (tiny!) parts, and the pc board did not have a silkscreen! Parts were unidentifiable!

Thankfully, Icom has a very good PDF service manual for this radio; complete with functional block diagrams, schematics, parts list, component placement diagrams and alignment info. It was invaluable in my troubleshooting; especially knowing which component was which. The schematic showed the UHF and VHF receive paths filled with PIN and protection diodes, capacitors, inductors, and a few dual gate FET working as RF amps. One of these was even right before the signal split off to the left and right channels. That must be it!
Feeding in a VHF signal at low amplitude into the antenna jack, I traced the signal using a spectrum analyzer. That RF amp? It was working. The PIN diodes – they were fine. Caps, protection diodes, inductors, all were fine.
For comparison, I fed in a UHF signal and followed it through the UHF chain. It had almost the same amplitudes. Bummer, the VHF chain looks as good as the UHF chain. I don't see a problem. Continued on next page)

Fixing KF6UV's Icom 2730 by Dave Schmidt AI6VX (Continued)

I kept looking at the schematic and block diagrams. Hmm, what are these varactors used for? Ah, band pass filters. I measured their voltages in operation and they seemed to be working. "But how are their voltages set or adjusted?" Time to look at the alignment procedure. "Wait, what's this step called 'Receive Sensitivity'?" A light bulb turned on over my head. "Could all these problems be because the radio lost its calibration/alignment?" Let's perform an alignment!

Unlike my experience fixing tube radios (boat anchors), aligning this radio was almost 'touch-less'. No pots, caps, or IF cans to turn. No coils to spread or compress. RX alignment of the radio consisted of injecting signals of specific amplitudes and frequencies, with and without a modulating tone, and then pressing a confirmation button. TX calibration consisted of adjusting frequency accuracy, FM deviation, and power levels by rotating the VFO knob until the correct value is measured, then pressing the save button. This is repeated for both the left and right radios, both bands, RX and TX, and 3 TX levels per band. Over 100 steps later, I was done.

The result? It worked! The TX power was now working and correct, and most importantly, VHF receive sensitivity was now excellent and as good as UHF.

The problem originally sure felt like it was a component problem yet in the end it was due to the radio being out of calibration/alignment. I was tickled at how automated the alignment process was. For example, calibrating the VHF squelch level, I could hear the radio sweep the squelch setting to find the edge at which the squelch breaks before stopping and allowing me to save the results. Similarly for setting the band pass filter frequency edges. Definitely not like peaking an IF transformer in an AA5 tube radio.

I believe the root problem was corrosion around the I2C EEprom chip, causing corruption of the calibration data stored in it, but I don't know for sure. The radio was buttoned up and returned to Mike and he has participated in the Monday night net several times already and the radio continues to work well. He's currently re-installing it in his vehicle.

Dave – AI6VX

Trivia by Dana KG6WXE

DID YOU KNOW?

1. 1 in 8 Americans have worked for McDonald's restaurants?

2. McDonald's restaurants sell 3.2 million happy meals a year.

3. In extreme hot weather, trains run slower speeds due to tracks warping or spreading apart.

de
Dana
Kg6wxe

K6MEP Monday Night Net Script (Updated 091922)

"QST- QST- QST. This is (Name and Callsign), with the Ventura County Amateur Radio Club Net. If there is any station with EMERGENCY or PRIORITY Traffic that needs the immediate use of this frequency, please come now.

Hearing none, the following is a QST. This is (Name and Callsign), tonight's net control station for the Ventura County Amateur Radio Club Net. If, at any time, during tonight's net, anyone needs this frequency for emergency or priority traffic, please call net control, and we will respond appropriately.

This is a directed net, open to all amateur radio operators and is sponsored by K6MEP, the call sign for the Ventura County Amateur Radio Club. This net begins each Monday evening at 20:00 local time on the WD6EBY linked repeater system.

The primary frequency of this net is 145.200 MHz with a minus offset and a PL of 127.3 Hz. If the repeater should fail for any reason, we can use South Mtn. repeater on 146.385 MHz with a positive offset and a PL of 127.3 Hz as backup.

All amateurs are welcome to check in **after** the following announcements.

A roundtable will follow the check-ins. A rag chew session may follow the formal net. We will have a Zoom meeting following the net.

At this time I will call on tonight's alternate net control station (Name and Callsign) (Pause for alternate NC check in with "how's my signal "and respond appropriately). If for any reason my station should become inoperable the alternate net control station will proceed with the net.

K6MEP, the Ventura County Amateur Radio Club, meets at 19:00 hours on the second Friday of each month at The Dudley House, 197 N Ashwood Ave, Ventura, CA. The club meeting will also be on Zoom. Our next meeting will be on Friday (Month and day) at the Dudley House and Zoom, where (Name and Callsign) will present (name of topic) and Jeremy KN6JMD will provide Zoom and projector/sound/camera/internet support. We urge any non-members interested in the Ventura County Amateur Radio Club to contact us at K6MEP@qsl.net. Non-members interested in amateur radio are welcome to attend our meetings.
When you check-in, please give your call sign (phonetically), name and if you are a Ventura County Amateur Radio Club member. If you are not a member of the club, please include your QTH or location.
Please check in now. (You can use the quick check in list spreadsheet if it helps in logging check-ins).
(Continued on Next Page)

K6MEP Monday Night Net Script (Continued)

(If the check-ins are completed or there is a lull in the check-ins say:
"Hearing no other check-ins at this time, we will now begin with our Roundtable"
(Start with the first check-in and ask him/her about ham radio activities during last week, also ask another question that you think will spur the discussion, then move on to the next person).

During the Roundtable, pause every 10 minutes and identify yourself with "This is (Name and Callsign), tonight's net control station for the Ventura County Amateur Radio Club Net". Also ask if anyone wants to check-in. If you have completed the check-in and roundtable list, ask "Any last comments?" If none heard, ask "Any late, missed, or visitor check-ins? Please check-in now."

If nothing is heard;
(Closing): This concludes the Ventura County Amateur Radio Club weekly net at _____hours. Thank you for your interest and participation. Thanks to (Name and Callsign) for acting as the alternate net control operator. Also thanks to Paul Strauss, WD6EBY, for the use of the repeater for our K6MEP net.

73, this is (Name and Callsign), tonight's Ventura County Amateur Radio Club net control, signing off and returning the repeater to its normal use.

Selected Contests & Special Events

Please see QST or the ARRL website (www.arrl.org) for any details and QSL information.

Maty Weinberg, KB1EIB, events@arrl.org; www.arrl.org/special-event-stations

Special Event Stations

Working special event stations is an enjoyable way to help commemorate history. Many provide a special QSL card or certificate!

Through Oct. 31, 0000Z – 2359Z, 4A2MAX, Diamond, Mexico. San Max Contest Team. **San Max Special Event**. 7.160 14.180 21.285 28.450. Certificate & QSL. Jose de Jesus Lopez, 5914 San Bernardo Ave., Ste. 4-135, Laredo, TX 78041-2506. **www.qrz.com/db/4awmax**

Through Dec. 31, 0000Z – 2359Z, GB1900HA and **GB1900HW**, South Shields and Hexham, England. Hadrian's Wall Partnership. **Hadrian's Wall 1900 Festival**. 14.200 7.150 145.500 21.300. QSL. LoTW. **www.qrz.com/db/gb1900ha** and **www.qrz.com/db/gb1900hw**

Through Dec. 31, 1000Z – 2359Z, PA100THALES, many cities, Netherlands. PA100THALES Team. **100 Years of Thales Nederland B.V.** All bands, all modes. QSL. Email **pa100thales@qsl.net** for information. **www.qsl.net/pa100thales**

Sep. 25 – Oct. 7, 1700Z – 1700Z, WR4CC, Elizabethton, TN. Carter County Amateur Radio Association. **242nd Anniversary Muster at Sycamore Shoals on the Watauga River and March to Kings Mountain**. 3.900 7.075 14.290 21.350. QSL. Larry Davis, KM4RWO, 172 Carl Taylor Dr., Elizabethton, TN 37643. **www.wr4cc.org**

Sep. 30 – Oct. 2, 0000Z – 0000Z, W4OLB, Maryville, TN. Smoky Mountain Amateur Radio Club. **75th Anniversary**. SSB: 7.220 14.250; CW: 7.050 14.090. QSL. Paul Galentine, 103 Hatcher Ln., Maryville, TN 37803. **www.w4olb.org**

Sep. 30 – Oct. 2, 1600Z – 1400Z, W4T, Toccoa, GA. Currahee Military Museum. **Currahee Military Weekend**. 1.945 3.885 7.270. QSL. Garret Scott, 10236 Birch Hill Ln., Knoxville, TN 37932. **w8bug.com/w4t**

Oct. 1, 1000Z – 1600Z, K8HO, New Vienna, OH. Highland Amateur Radio Association. **Gist Settlement Commemorative Special Event**. 7.225 14.275. QSL. Highland Amateur Radio Association, 21 Highland Dr., Hillsboro, OH 45133. **highlandara@gmail.com**

Oct. 1, 1300Z – 1900Z, W4PCN, Nags Head, NC. Outer Banks Repeater Association. **150th Anniversary: Lighting of Bodie Island Lighthouse**. 7.265 14.265. Certificate & QSL. OBRA SE Station, Carl Hacker, WC5WM, P.O. 1085, Nags Head, NC 27959. **www.obraobx.com**

Oct. 1, 1400Z – 2300Z, NA1KW, Waterford, CT. North American Kilowatt Club. **50th Anniversary of the South East Connecticut Community Center of the Blind Pumpkin Festival**. 7.240 14.040 14.240 18.140. QSL. Chuck Doolittle, 2600 Davis St., Hannibal, MO 63401. **www.na1kw.com**

Oct. 1 – Oct. 2, 1300Z – 1700Z, N4I, Kingsport, TN. Kingsport Amateur Radio Club. **Netherland Inn Harvest Celebration**. 7.185 7.250 14.250 14.320. Certificate. Ricky Johnson, WB4RLJ, 713 Holston St., Kingsport, TN 37660. **www.w4trc.org**

Oct. 1 – Oct. 8, 0000Z – 0000Z, WWØWWV, Fort Collins, CO. WWV Amateur Radio Club. **WWV 103rd Anniversary SES**. 14.280. Certificate & QSL. WWV Amateur Radio Club, P.O. Box 273226, Fort Collins, CO 80527. *Clean sweep certificate available.* **https://wwvarc.org**

Oct. 2 – Oct. 8, 1800Z – 2200Z, KD9FDH, Madison, IN. Royal Rangers Amateur Radio Club. **National Royal Rangers Week**. 28.435. Certificate & QSL. Jerry Barnes, 601 Spring St., Madison, IN 47250. **wjbarnes@cinergymetro.net**, **www.qrz.com/db/kd9fdh**, or **www.facebook.com/780728275651112**

Oct. 2 – Oct. 16, 0000Z – 0000Z, K9E, Metropolis, IL. Massac County Amateur Radio Club. **Fort Massac Encampment**. 7.175 7.250 14.225 14.250. QSL. K9E, P.O. Box 5, Metropolis, IL 62960. **www.w9due.org**

Oct. 5 – Oct 16, 0000Z – 2359Z, W7Y, Cheyenne, WY. Shy-Wy Amateur Radio Club. **Come and Get Wyoming**. 14.320; all bands, all modes, as conditions permit. Certificate & QSL. Shy-Wy ARC, P.O. Box 22483, Cheyenne, WY 82003. *Event is running in conjunction with the 2022 ARRL Rocky Mountain Division Convention*. **www.shywyarc.net/wp/comeandgetwyoming**

Oct. 7 – Oct. 8, 1200Z – 2359Z, NA4CC, Blacksburg, SC. Cleveland County Amateur Radio Service. **242nd Anniversary of the Battle of Kings Mountain, South Carolina**. 7.260 14.260. QSL. CCARS, P.O. Box 864, Shelby, NC 28150. *From Kings Mountain National Military Park*. **www.ccarsnc.org**

Oct. 8, 1300Z – 1800Z, W4D, Moncks Corner, SC. Trident Amateur Radio Club. **Little David Special Event Station**. 7.262 14.262. QSL. QSL Manager/W4D, P.O. Box 60732, North Charleston, SC 29419. **www.tridenthams.org/w4d-ses**

Oct. 8, 1400Z – 2300Z, KNØBSA, Ashland, NE. Mid-America Radio Scouting Group. **Jubilee 2022 — Cub Scouts, Scouts USA, and Venturers Outdoor Event**. 7.282 14.090; FT8 and VHF. QSL. Jeff Beiermann, 5015 Burt St., Omaha, NE 68132. *From Eugene T. Mahoney State Park*. **wb0m@arrl.net**

Oct. 8, 1500Z – 2359Z, W2DQ, Shoreham, NY. Suffolk County Radio Club. **75th Anniversary**. 14.240 7.256 21.295 28.350. Certificate. Suffolk County Radio Club, P.O. Box 302, Medford, NY 11763. *From historic Wardenclyffe Tower/Tesla Tower*. **www.suffolkcountyradioclub.com**

Oct. 8 – Oct. 14, 0000Z – 0000Z, W2M, Middleburgh, NY. Schoharie County Amateur Radio Association. **125th Anniversary of MIDTEL — Middleburgh Telephone Company**. 7.040 7.275 14.040 14.275. QSL. Matt, KD2TBS, P.O. Box 667, Middleburgh, NY 12122. **www.schoharieamateurradio.org**, **kd2tbs@arrl.net**, or **scara.shacknet.us**

Oct. 8 – Oct 16, 0000Z – 1259Z, N2G/K5G/N6G/K7G/N9G, many towns and states. US Affiliate (KFF) of Worldwide Flora and Fauna. **Get Your Park ON! Celebrating Earth Science Week**. All bands, all modes. Certificate. See QRZ for each individual 1×1 call. *See website for details and complete list of 1×1 call signs*. **www.wwff.us**

Oct. 9, 1300Z – 2100Z, W4CA, Roanoke, VA. Roanoke Valley Amateur Radio Club. **Blue Ridge Bonanza**. 7.265 14.265. QSL. Roanoke Valley ARC, P.O. Box 2002, Roanoke, VA 24009. *Multiple stations and frequencies on 20 and 40 meters*. **www.blueridgebonanza.info**

Oct. 9 – Oct. 16, 0400Z – 0359Z, KF2IRE, VE3FIRE, NØF – N9F, East Hanover, NJ. Siemens Fire Safety USA Amateur Radio Club. **Fire Prevention Week Special Event**. 3.800 7.175 14.225 21.250. Certificate & QSL. Steve Masticola, Siemens Fire Safety USA, 8 Fernwood Rd., East Hanover, NJ 07936. *Digital certificate for working any 10 of the 12 stations. Watch for spots*. **www.hamfire.com**

Oct. 9 – Oct. 23, 0000Z – 2359Z, W9Y, Elmhurst, IL. York Radio Club. **Illinois QSO Party Special Event**. 7.050 7.250 14.205 14.250. QSL. Gehl Entwhistle, 370 N. West Ave., Elmhurst, IL 60126. **www.yorkradioclub.com**

(Continued on next page)

Selected Contests & Special Events (Continued)

Oct. 13, 1600Z – 2130Z, W5KID, Baton Rouge, LA. Baton Rouge Amateur Radio Club. **US Navy Birthday Commemoration**. 7.040 7.250 14.040 14.250. QSL. USS *Kidd* Amateur Radio Club, 305 S. River Rd., Baton Rouge, LA 70802. *Operation aboard the USS Kidd (DD-661), a WWII Fletcher-class destroyer.* **www.qrz.com/db/w5kid**

Oct. 15, 1400Z – 2000Z, K4RC, Yorktown, VA. Williamsburg Area Amateur Radio Club. **Yorktown Surrender Day Event**. 7.265 14.265. Certificate & QSL. Certificate: **qslmgn@k4rc.net**; QSL: QSL Manager, K4RC, P.O. Box 1470, Williamsburg, VA 23187. **info@k4rc.net** or **www.k4rc.net**

Oct. 15 – Oct. 16, 1300Z – 0200Z, W2S, Wayne, NJ. Wayne Radio Amateur Emergency Team. **Troop 104 Jamboree-on-the-Air**. 7.185 14.280 147.450. Certificate & QSL. Jim Sadur, 5 Packanack Lake Rd., Wayne, NJ 07470. **www.wraet.com**

Oct. 15 – Oct. 16, 1500Z – 2359Z, WØD, Macon, MO. Macon County Amateur Radio Club. **Lester Dent — Doc Savage Special Event**. 7.040 7.270 14.040 14.270. Certificate. Macon County ARC, P.O. Box 13, Macon, MO 63552. **www.maconcountymissouriarc.org**

Oct. 21 – Oct. 23, 0200Z – 1800Z, W4LSM/K4S, Maryville, TN. Great Smoky Mountain Council BSA/Smoky Mountain Amateur Radio Club. **ScoutFest 2022 GSMC**. 7.210 14.285. QSL. Paul Galentine/ScoutFest, 103 Hatcher Ln., Maryville, TN 37803. **www.w4olb.org**

Oct. 21 – Oct. 24, 0000Z – 2359Z, W1E, Prospect, CT. KB1FGC. **Elmer Tribute Special Event**. 3.540 7.040 14.040 21.040. Certificate. Richard Guerrera, 19 Terry Rd., Prospect, CT 06712. **www.qsl.net/kb1fgc**

Oct. 22 – Oct. 23, 1500Z – 0300Z, KØC, Starkville, MS. Radio Amateur Cancer Survivors. **Relay For Life Knock Out Cancer**. 7.074 7.259 14.074 14.259. Certificate. Caleb Rich, 1384 Louisville St., Lot 10, Starkville, MS 39759. *Donation requested; details on air or see URL*. **https://secure.acsevents.org/site/STR?pg=entry&fr_id=103335**

Oct. 27 – Oct. 31, 0000Z – 2359Z, N7N, Las Vegas, NV. Friends of Nevada Wing. **Nevada Wing Conference and Change of Command**. 7.200 14.250 146.52; General portion of the bands; SSB, FT8 on HF, and VHF on FM. QSL. Bill Aceves, N6YEL, 23612 Glenmoor Dr., Parker, CO 80138-3112. *Please QSL by December 31, 2022.*

Oct. 29, 1330Z – 2300Z, W5DDL, Broussard, LA. Acadiana Amateur Radio Association, Inc. **Celebrating 70 Years of ARRL Affiliation**. 7.265 14.265 21.265. Certificate. Chris Ancelet, N5MCY, 143 Breezeway Ct., Egan, LA 70531. *Event will be held in St. Julien Park*. **www.w5ddl.org**

Oct. 30, 1600Z – 2100Z, WØW, Princeton Junction, NJ. Delaware Valley Radio Association. **84th Anniversary of the War of the World Broadcast**. 7.225 14.255. QSL. Delaware Valley Radio Association, P.O. Box 7024, Trenton, NJ 08628. **webmaster@w2zq.com** or **www.w2zq.com**

Oct. 31, 1500Z – 2100Z, WØYFZ, Anoka, MN. Anoka County Radio Club. **Halloween Special Event**. 7.255 14.255. QSL. ACRC, P.O. Box 982, Anoka, MN 55303. **www.anokaradio.org**

Oct. 31, 2100Z – 2359Z, WA4TRS, Fairview, NC. The Road Show Amateur Radio Club, Inc. **BOO!** 14.275. Certificate & QSL. The Road Show Amateur Radio Club, Inc., 57 Echo Lake Dr., Fairview, NC 28730. *From the graveyard on Bald Mountain.* **wa4trs.org**

Oct. 31 – Nov 1, 1900Z – 0300Z, WØO, Frankenstein, MO. Mid-MO Amateur Radio Club. **Halloween FunXpedition**. 3.538 3.980 14.038 14.340. QSL. *See website for QSL information.* **www.qrz.com/db/w0o**

Certificates and QSL cards: To obtain a certificate from any of the special event stations offering them, send your QSO information along with a 9 × 12-inch self-addressed, stamped envelope (3 units of postage) to the address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information.

Special Events Announcements: For items to be listed in this column, use the ARRL Special Events Listing Form at **www.arrl.org/special-events-application**, or email information to **events@arrl.org**.

Submissions must be received by ARRL HQ no later than the 1st of the second month preceding the publication date; a special event listing for **January** *QST* would have to be received by **November 1**. In addition to being listed in *QST*, your event will be listed on the ARRL Web Special Event page. **Note**: All received events are acknowledged. If you do not receive an acknowledgment within a few days, please contact us. ARRL reserves the right to exclude events of a commercial or political nature.

You can view all received Special Events at **www.arrl.org/special-event-stations**.

Contest Corral

Contest Corral — October 2022

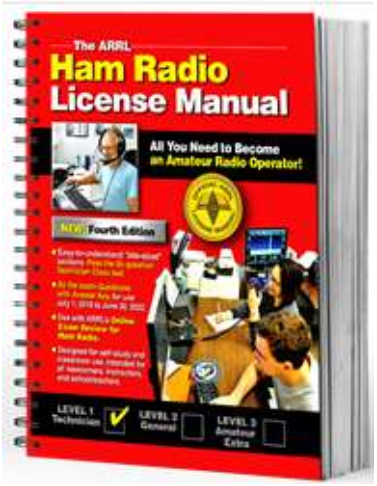
Check for updates and a downloadable PDF version online at **www.arrl.org/contest-calendar**.
Refer to the contest websites for full rules, scoring information, operating periods or time limits, and log submission information.

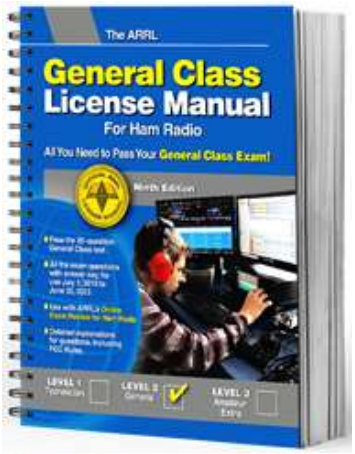
Start - Finish Date-Time		Date-Time		Bands	Contest Name	Mode	Exchange	Sponsor's Website
1	0600	2	0559	3.5-28	Worked All Provinces of China DX Contest	CW	RS(T), Chinese province or serial	www.mulandxc.com
1	0600	2	0600	1.8-28	Oceania DX Contest, Phone	Ph	RS, serial	www.oceaniadxcontest.com
1	1200	2	1159	1.8-28	Russian WW Digital Contest	Dg	RST(Q), oblast code or serial	www.rdrclub.ru
1	1400	2	1400	See rules	IARU Region 1 UHF Microwaves Contest	CW,Ph,Dg	RS(T), serial, 6-char grid square	www.iaru-r1.org
1	1600	2	1100	3.5,7	International HELL-Contest	Hell	RST, serial	www.darc.de
1	1600	2	2200	1.8-28	California QSO Party	CW,Ph	Serial, CA county or SPC	www.cqp.org/Rules.html
1	1800	2	1800	No WARC	SKCC QSO Party	CW	RST, SPC, name, 4-char grid square	www.skccgroup.com
2	0600	2	0900	3.5	UBA ON Contest, SSB	Ph	RS, serial, ON section (if ON)	www.uba.be
2	0600	2	1800	3.5-28	RSGB DX Contest	CW,Ph	RS(T), serial	www.rsgbcc.org
2	2200	2	2359	3.5-14	Peanut Power QRP Sprint	CW,Ph	RS(T), SPC, peanut no. or power	www.nogaqrp.org
3	1900	3	2030	3.5	RSGB 80-Meter Autumn Series, CW	CW	RST, serial	www.rsgbcc.org/hf
4	0100	4	0300	3.5-28	ARS Spartan Sprint	CW	RST, SPC, power	arsqrp.blogspot.com
5	1900	5	2300	432	432 MHz Fall Sprint	CW,Ph,Dg	4-char grid square	svhfs.org
5	2000	5	2100	3.5	UKEICC 80-Meter Contest	Ph	6-char grid square	www.ukeicc.com
6	1700	6	1900	3.5	SARL 80-Meter QSO Party	Ph	RS, serial, grid square or QTH	www.sarl.org.za
6	1700	6	2100	28	NRAU 10-Meter Activity Contest	CW,Ph,Dg	RS(T), 6-char grid square	nrrlcontest.no
6	1900	6	2100	1.8-28,50	SKCC Sprint Europe	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
8	0000	9	1559	3.5-28	Makrothen RTTY Contest	Dg	4-char grid square	www.pi259.org
8	0000	8	2359	1.8-28	QRP ARCI Fall QSO Party	CW	RST, SPC, mbr or power	qrparci.org
8	0300	9	2100	1.8-28, V/U	Nevada QSO Party	CW,Ph,Dg	RS(T), NV county or ARRL/RAC section	nvqso.com
8	0600	9	0600	1.8-28	Oceania DX Contest, CW	CW	RST, serial	www.oceaniadxcontest.com
8	0800	8	1400	902 and above	Microwave Fall Sprint	CW,Ph,Dg	6-char grid square	svhfs.org
8	1200	9	1200	3.5-28	Scandinavian Activity Contest, SSB	Ph	RST, serial	www.sactest.net
8	1200	9	2359	1.8-28,50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
8	1500	9	0500	1.8-28	Arizona QSO Party	CW,Ph	RS(T), AZ county, or SPC	www.azqp.org
8	1600	9	2200	No WARC	Pennsylvania QSO Party	CW,Ph	Serial, PA county, or ARRL/RAC section	paqso.org
8	1800	9	1800	1.8-28, 50,144	South Dakota QSO Party	CW,Ph,Dg	RS(T), SD county, or SPC	www.sdqsoparty.com
8	2000	9	2000	1.8	PODXS 070 Club 160-Meter Great Pumpkin Sprint	Dg	RST, SPC	www.podxs070.com
9	0600	9	0900	3.5	UBA ON Contest, CW	CW	RST, serial, ON section (if ON)	www.uba.be
10	0000	10	0200	1.8-28	4 States QRP Group Second Sunday Sprint	CW,Ph	RST, SPC, mbr or power	www.4sqrp.com
10	0001	10	2359	28	10-10 International 10-10 Day Sprint	CW,Ph,Dg	Name, mbr or "0," SPC	www.ten-ten.org
12	0030	12	0230	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
12	1900	12	2030	3.5	RSGB 80-Meter Autumn Series, Data	Dg	RST, serial	www.rsgbcc.org/hf
15	0000	16	2359	50-1296	ARRL EME Contest	CW,Ph,Dg	Signal report	www.arrl.org/eme-contest
15	0000	16	2359	3.5-28	JARTS WW RTTY Contest	Dg	RST, age of operator	jarts.jp/rules2022.html
15	0001	16	2359	28	10-10 International Fall Contest, CW	CW	Name, mbr or "0," SPC	www.ten-ten.org
15	1400	16	0200	No WARC	New York QSO Party	CW,Ph,Dg	RS(T), NY county or SPC	www.nyqp.org
15	1500	16	1459	3.5-28	Worked All Germany Contest	CW,Ph	RS(T), DOK or "NM" or serial	www.darc.de
15	2000	15	2359	1.8-7,21, 28,50	Feld Hell Sprint	Dg	RST, mbr, SPC, grid square	sites.google.com/site/feldhellclub/
15	2130	15	2230	7	Argentina National 7 MHz Contest	Ph	RS, 2-digit year first licensed	www.lu4aa.org
16	0000	16	0200	14,21	Asia-Pacific Fall Sprint, CW	CW	RST, serial	jsfc.org
16	0700	16	1000	144	UBA ON Contest, 2 Meters	CW,Ph	RS(T), serial, ON section (if ON)	www.uba.be
16	1700	17	0100	1.8-28, 50,144	Illinois QSO Party	CW,Ph,Dg	RS(T), IL county or SPC	w9awe.org/ilqp
16	1900	16	2030	3.5	RSGB RoLo CW	CW	RST, previous 6-char grid square recd	www.rsgbcc.org/hf
16	2300	17	0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
17	1300	21	2359	No WARC	ARRL School Club Roundup	CW,Ph,Dg	RS(T), class (I/C/S), SPC	www.arrl.org/school-club-roundup
17	1900	17	2030	3.5-14	RSGB FT4 Contest	FT4	4-char grid square	www.rsgbcc.org/hf
20	1900	20	2000	3.5-14	NTC QSO Party	CW	NTC member: RST, mbr; non-member: RST, "NM," less than 25 WPM	qsl.net/ntc/party.html
21	1700	23	0100	1.8-28, V/U	Telephone Pioneers QSO Party	CW,Ph,Dg	Chapter nr or RS(T), name	www.tpqso.com
22	0000	23	2359	1.8-28	YBDXPI FT8 Contest	FT8	4-char grid square	contest.ybdxpi.net/rules
22	1200	23	1200	3.5-28	UK/EI DX Contest, SSB	Ph	RS, serial, district code, or serial	www.ukeicc.com/dx-contest-rules.php
22	1400	24	0200	No WARC	YLRL DX/NA YL Anniversary Contest	CW,Ph,Dg	Serial, RS(T), ARRL section or PC	ylrl.net/contests
22	1500	23	1500	1.8	Stew Perry Topband Challenge	CW	4-char grid square	www.kkn.net/stew
23	0000	23	0400	3.5-14	North American SSB Sprint Contest	Ph	Other's call, your call, serial, name, SPC	ssbsprint.com/rules
23	1300	26	0700	1.8-28, 50,144	Classic Exchange, CW	CW	Name, RST, SPC, radio model	www.classicexchange.org
26	0000	26	0200	1.8-28,50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
26	2000	26	2100	3.5	UKEICC 80-Meter Contest	CW	6-char grid square	www.ukeicc.com
27	1900	27	2030	3.5	RSGB 80-Meter Autumn Series, SSB	Ph	RS, serial	www.rsgbcc.org/hf
28	1600	28	2359	3.5-14,21	Zombie Shuffle	CW	RS(T), SPC, Zombie nr or area code, name	www.zianet.com/qrp
29	0000	30	2359	1.8-28	CQ Worldwide DX Contest, SSB	Ph	RS, CQ Zone	www.cqww.com

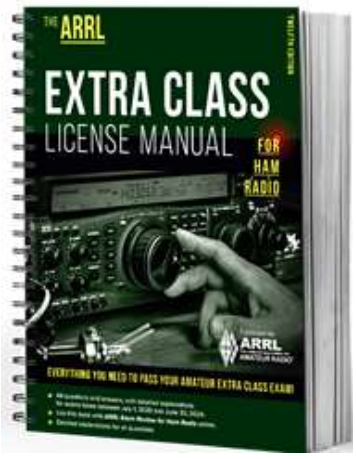
There are a number of weekly contests not included in the table above. For more info, visit: **www.qrpfoxhunt.org**, **www.ncccsprint.com**, and **www.cwops.org**. All dates and times refer to UTC and may be different from calendar dates in North America. Contests are not conducted on the 60-, 30-, 17-, or 12-meter bands. Mbr = Membership number. Serial = Sequential number of the contact. SPC = State, Province, DXCC Entity. XE = Mexican state. Listings in blue indicate contests sponsored by ARRL or *NCJ*. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. *Data for Contest Corral is maintained on the WA7BNM Contest Calendar at* **www.contestcalendar.com** *and is extracted for publication in QST 2 months prior to the month of the contest. ARRL gratefully acknowledges the support of Bruce Horn, WA7BNM, in providing this service.*

Upcoming FCC Exam Session Preparation Sites

(None listed within 100 miles of 93001 on the ARRL Website)

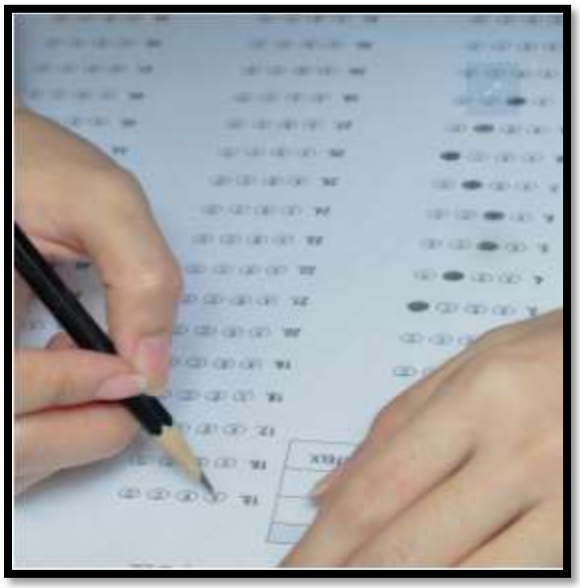






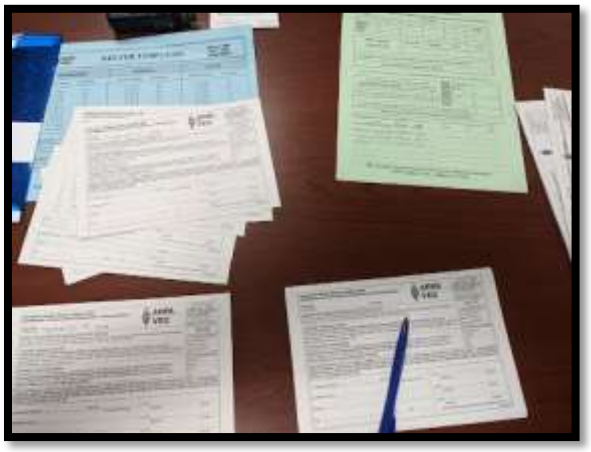
Upcoming FCC Exam Test

Van Nuys CA 91405-4542



10/01/2022
Sponsor: ARES LAX
Date: Oct 01 2022
Time: 10:30 AM (Walk-ins allowed)
Contact: James W. Laage
(818) 368-8710
Email: cllaage@verizon.net
VEC: ARRL/VEC
Location: Valley Presbyterian Hospital
(Health Education Center)
15107 Van Owen Street
Van Nuys CA 91405-4542

Thousand Oaks CA 91360-6861



10/09/2022

Sponsor: Conejo Valley ARC
Date: Oct 09 2022
Time: 8:30 AM (No Walk-ins / Register or Call ahead)
Contact: Andrew G. Ludlum
(818) 370-3402
Email: K6AGL@cvarc.org
VEC: ARRL/VEC
Location: East County Sheriff's Station, Community Room
2101 E Olsen Rd
Proof of vaccination required.
Space is limited. Pre-registration required.
Thousand Oaks CA 91360-6861
Website: http://www.cvarc.org/upcoming-ve-sessions/

On Exam Day Bring the Following Items:

1. MANDATORY BEFORE THE EXAM

FCC Registration Number (FRN): Examinees are required by the FCC to submit your FRN with your license application form. New license applicants must create an FCC user account and register their Social Security Number (SSN) in the FCC Commission Registration System (**CORES**) before attending exam sessions. Registrants will be assigned an FRN which will be used in all license transactions with the FCC. For instructions on how to register your SSN and receive an FRN from the FCC, visit the CORES Registration page and the FCC's Registration instructions page. Per FCC rules, a valid **email address** is also **mandatory** on the application form to receive FCC correspondence, including the official copy of your Amateur Radio license

2. One legal photo ID (identification):

a. State Driver's License

b. Government issued Passport

c. Military or Law Enforcement Officer Photo ID card

d. Student School Photo ID card

e. State Photo ID card

3. If no photo ID is available, two forms of identification:

a. Non-photo State ID card (some states still have them)

b. Birth certificate (must have the appropriate seal)

c. Social security card

d. Employer's wage statement or Minor's work permit

e. School ID card

f. School or Public Library card

g. Utility bill, bank statement or other business correspondence that specifically names the person; or a postmarked envelope addressed to the person at his or her current mailing address as it appears on the Form 605.

4. Students/minors without a photo ID need to bring only one of the above items if a legal guardian presents their photo ID; otherwise two non-photo IDs are required. ARRL will cover the one-time FCC application fee for new license candidates younger than 18-years old for tests administered under the ARRL VEC program. Candidates younger than 18-years old would pay a reduced exam session fee of $5 to the ARRL VEC VE team at the time of the exam. *Minor children (under the age of 18) may be accompanied in the room by an adult during the test.*

5. If applicable, bring a printed copy of your Amateur Radio license or be able to show proof of the license in the official FCC database. Acceptable copies or printouts of licenses are available from the following sources: the official license or reference license printed from the FCC website or license data printed from the ARRL website or QRZ website. The original(s) and photocopy(s) of any Certificates of Successful Completion of Examination (CSCE) you may hold from previous exam sessions. If your license has already been issued by the FCC, the CSCE showing license credit is not needed. The candidate is require to show proof of the current license to the team but the team is no longer required to submit the proof to the VEC. Expired license proof must be submitted to the team and to the VEC for processing to FCC. These photocopies will not be returned.

6. Two number two pencils with erasers and a pen for in-person sessions.

7. A calculator with the memory erased and formulas cleared is allowed. You may not bring any written notes or calculations into the exam session. Slide rules and logarithmic tables are acceptable, as long as they're free of notes and formulas. Cell phone must be silenced or turned off during the exam session and the phones' calculator function may not be used. In addition, iPhones, iPads, Androids, smartphones, Blackberry devices and all similar electronic devices with a calculator capability, may NOT be used.

8. Bring a check, a money order or cash to cover the exam session fee(s)

9. Be aware that some information about you will be made publicly available on the FCC's website (FCC Licensee Privacy) including a felony conviction status. All applicants must answer the Basic Qualification Question (felony conviction status question) on the 605 Form at the exam session. Applicants that answer "YES" for the question must follow these FCC procedures: FCC qualification question instructions

Convention and Hamfest Calendar

Steve Ewald, WV1X, sewald@arrl.org; www.arrl.org/hamfests-and-conventions-calendar

Convention and Hamfest Calendar

A = AUCTION
D = DEALERS / VENDORS
F = FLEA MARKET
H = HANDICAP ACCESS
Q = FIELD CHECKING OF QSL CARDS
R = REFRESHMENTS
S = SEMINARS / PRESENTATIONS
T = TAILGATING
V = VE SESSIONS

Abbreviations
Spr = Sponsor
Tl = Talk-in frequency
Adm = Admission

Alabama (Headland) — Oct. 22 F T V
8 AM – noon. *Spr:* Wiregrass ARC. Headland Town Square, 100 Park St. *Tl:* 145.430 (186.2 Hz). *Adm:* Free. **www.w4dhn.org**

Arizona (Congress) — Nov. 5 D Q T
8 AM. *Spr:* Hassayampa Amateur Radio Klub, Escapees North Ranch, Hwy. 89. *Tl:* 146.580 (no tone). *Adm:* Free. **www.harkaz.org**

ARRL ARIZONA STATE CONVENTION
October 29, Maricopa, Arizona
D H Q T V
7 AM – 1 PM. *Spr:* Maricopa ARA. AkChin Circle Entertainment Center, 16000 N. Maricopa Rd. *Tl:* 145.210 (162.2 Hz). *Adm:* $5. **www.copafest.org**

ARRL PACIFIC DIVISION CONVENTION
October 14 – 16, San Ramon, California
D F H Q R S V
Fri. 7 AM – 5 PM, Sat. 6 AM – 4 PM, Sun. 6 AM – noon. *Spr:* Mt. Diablo ARC. San Ramon Marriott, 2600 Bishop Dr. *Tl:* None. *Adm:* $25 Advance, $30 door. **www.pacificon.org**

Connecticut (Gales Ferry) — Oct. 29 F H R
8 AM – 3 PM. *Spr:* Southeastern Connecticut ARS. Our Lady of Lourdes Parish Hall,1650 Rte. 12. *Tl:* 146.730 (156.7 Hz). *Adm:* $5. **www.secars.org**

Florida (Apopka) — Nov. 5 F H R T
8 AM – noon. *Spr:* Bahia Shrine Radio Unit. Bahia Shrine Center, 3101 E. Hwy. 436. *Tl:* None. *Adm:* $5. Email: **dba327@hotmail.com**

Florida (Bradenton) — Oct. 15 F H R T V
8 AM – 1 PM. *Spr:* Manatee ARC. Bible Baptist Church of Bradenton, 2113 Morgan Johnson Rd. *Tl:* 146.820 (100 Hz). *Adm:* $5. **www.manatee-arc.org**

Florida (Coral Gables) — Oct. 15 F T
7 AM – 11 AM. *Spr:* Flamingo Net ARC. University of Miami Parking Lot 1-109, 1300 Campo Sano Ave. *Tl:* 147.150 (94.8 Hz). *Adm:* Free. **www.flamingonet.8m.net**

Florida (Crestview) — Oct. 15 D F H R V
8 AM – 2 PM. *Spr:* North Okaloosa ARC. Crestview Community Center, 1446 Commerce Dr. *Tl:* 147.36 (100 Hz). *Adm:* $5. Free for age 12 and under and age 90 and above. **www.w4aaz.org/noarc-hamfest**

Florida (New Port Richey) — Oct. 8 F R T V
8 AM. *Spr:* Gulf Coast ARC. Millennium Academy, 10005 Ridge Rd. *Tl:* 146.670 (146.2 Hz). *Adm:* $5. **www.gulfcoastarc.com**

ARRL GEORGIA SECTION CONVENTION
November 5 – 6, Lawrenceville, Georgia
D F H Q R S T V
Sat. 8 AM – 4 PM, Sun. 8 AM – 2 PM. *Spr:* Alford Memorial Radio Club. Gwinnett County Fairgrounds, 2405 Sugarloaf Pkwy. *Tl:* 147.075 (82.5 Hz). *Adm:* $8 Advance, $10 door. **www.stonemountainhamfest.com**

Indiana (Lynnville) — Oct. 15 D F H R T
7 AM – 2 PM. *Spr:* Tri-State ARS. Lynnville Community Center, 416 West Rd. 68, IN-68. *Tl:* None. *Adm:* Free. **www.hamtoberfest.com**

Indiana (Mitchell) — Oct. 8 F H T V
8 AM – noon. *Spr:* Hoosier Hills Ham Club. Lawrence Co. 4-H Fairgrounds, 11265 US Hwy. 50 W. *Tl:* 146.73 (107.2 Hz). *Adm:* $5. **www.w9qyq.org/pdf/hamfest2022.pdf**

Indiana (Shelbyville) — Oct. 15 F H R T
8 AM – noon. *Spr:* Blue River Valley ARS. Shelby County Fairgrounds, 500 Frank St. *Tl:* 145.48 (88.5 Hz). *Adm:* Free. **www.brvars.com**

Iowa (Boone) — Oct. 15 D F H Q R T V
8 AM – 1 PM. *Spr:* 3900 Club. Boon Co. Fair Community Building, 1601 Industrial Park Rd. *Tl:* 146.850 (no tone). *Adm:* $7. **www.3900club.com**

ARRL LOUISIANA STATE CONVENTION
October 7 – 8, Slidell, Louisiana
D F H R S V
Fri. 2 PM – 5 PM, Sat. 8 AM – 3 PM. *Spr:* Ozone ARC. Slidell City Auditorium, 2056 Second St. *Tl:* 147.270 (114.8 Hz). *Adm:* $5. **www.w5sla.net/hamfest-2022.htm**

Maryland (Hollywood) — Oct. 8 F H R T
8 AM – noon. *Spr:* St. Mary's County ARA. Hollywood Volunteer Fire Department Huseman Room, 24801 Three Notch Rd. (MD Rte. 235). *Tl:* 146.64 (146.2 Hz). *Adm:* Free. **www.k3hki.org**

Massachusetts (Bourne) — Nov. 5 D F H R V
9 AM – noon. *Spr:* Falmouth ARA. Upper Cape Cod Regional Technical School, 220 Sandwich Rd. *Tl:* 146.655 (88.5 Hz). *Adm:* $5, under 14 free. **www.falara.org**

Michigan (Gaylord) — Oct. 1 D H R V
9 AM – 1 PM. *Sprs:* Top of Michigan ARC and Thunder Bay ARC. Gaylord Knights of Columbus Hall, 2573 Wilkinson Rd. *Tl:* 146.82 (118.8 Hz). *Adm:* Free. **www.nm8rc.org**

Michigan (Kalamazoo) — Oct. 16 D F S V
8 AM – noon. *Sprs:* Kalamazoo ARC, Southwest Michigan Amateur Radio Team. Kalamazoo County Expo Center, 2900 Lake St. *Tl:* 147.040 (PL 94.8). *Adm:* $7. **www.kalamazoohamfest.org**

Michigan (Muskegon) — Oct. 15 D F H R S V
8 AM – noon. *Spr:* Muskegon County Emergency Communication Services, Inc. Fellowship Reformed Church, 4200 E. Apple Ave. (M-46). *Tl:* 146.820 (94.8 Hz). *Adm:* $5. **www.mcecs.net/Hamfest.htm**

Michigan (Negaunee) — Oct. 22 F H R
9 AM – 1 PM. *Spr:* Hiawatha ARA. Negaunee Township Community Center, 42 M-35. *Tl:* 147.270 (100 Hz). *Adm:* $5. **www.qsl.net/k8iod**

RV RADIO NETWORK 2022 FALL EYEBALL RALLY
October 10 – 13, Branson, Missouri
S
All day, each day. *Spr:* The RV Radio Network. Branson Stagecoach Campground, 5751 MO-165. *Tl:* 146.55 Simplex (no tone). *Adm:* Free, full participation with meals $35. **www.rvradionetwork.com**

Missouri (Kirkwood) — Oct. 29 D F H R V
7:30 AM – 1 PM. *Spr:* St. Louis ARC. Kirkwood Community Center, 111 S. Geyer Rd. *Tl:* 147.150 (141.3 Hz). *Adm:* $4, 3 for $10 advance, $7 door. **www.halloweenhamfest.org**

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(Continued on next page)

Convention and Hamfest Calendar (continued)

Missouri (Sedalia) — Oct. 15 D F H R S T
8 AM – noon. *Spr:* Sedalia Pettis Amateur Radio Klub. Our Savior Lutheran Church Gymnasium, 3700 W. Broadway Blvd. *Tl:* 147.030 (179.9 Hz). *Adm:* $5. **www.wa0sdo.org**

North Carolina (Asheville) — Oct. 15 F H R
8 AM – 1 PM. *Sprs:* Asheville Radio Museum and AWA Carolina Chapter. A-B Tech Community College, 16 Fernihurst Dr. *Tl:* 146.520 (no tone). *Adm:* Free. Email: **ronaldbeaver1320@gmail.com**

Ohio (Green) — Oct. 30 D F H R V
8 AM – 2 PM. *Spr:* Massillon ARC. Military Air Preservation Hangar (MAPS), 2260 International Pkwy. *Tl:* 147.180 (110.9 Hz). *Adm:* $5. **www.w8np.net**

Oklahoma (Ardmore) — Oct. 21 – 22 D F T
Fri. 4 PM – 8 PM, Sat. 8 AM – 2 PM. *Spr:* Texoma Hamarama Association, CORA. Ardmore Convention Center, 2401 N. Rockford Rd. *Tl:* 146.835 (131.8 Hz). *Adm:* $8 Advance, $10 door. **www.hamarama.org**

Oklahoma (Enid) — Nov. 5 D F H R S T V
8 AM – 5 PM. *Spr:* Enid Hamfest. Stride Center, 301 S. Independence St. *Tl:* 145.290 (no tone). *Adm:* $8 Advance, $10 door. **www.enidarc.org**

Pennsylvania (Perkasie) — Oct. 16 D F H R T V
7 AM – 1 PM. *Spr:* RF Hill Amateur Radio Club, Inc. Bucks County Community College, Upper County Campus, Fifth St. and Blooming Glen Rd. *Tl:* 145.31 (131.8 Hz). *Adm:* $6. **www.rfhillarc.club**

South Carolina (Gaffney) — Oct. 22 F H R T
7 AM – 3 PM. *Spr:* Carolina Amateur Radio Emergency Services. Southside Baptist Church, 204 West Oneal St. *Tl:* 145.430 (162.2 Hz). *Adm:* $5. Email: **ki4mjk@gmail.com**

ARRL SOUTH CAROLINA SECTION CONVENTION

October 1, Rock Hill, South Carolina
D F H R S T V
8 AM – 2 PM. *Spr:* York County ARS. Covenant Presbyterian Church, 1830 Celanese Rd. *Tl:* 147.030 (no tone). *Adm:* $5. **www.ycars.org**

Tennessee (Chattanooga) — Oct. 14 – 15 D F H Q R S T V
Fri. 1 PM – 7 PM, Sat. 8 AM – 3 PM. *Spr:* Chattanooga ARC. East Ridge Community Center, 1517 Tombras Ave. *Tl:* 146.790 (107.2 Hz). *Adm:* $10. **www.hamfestchattanooga.net**

West Virginia (Mineral Wells) — Oct. 8 D F H R T V
8 AM – 2 PM. *Spr:* Wood County Emergency Communications. Wood County 4-H Campground, Butcher Bend Rd. *Tl:* 147.255 (131.8 Hz). *Adm:* $5. **www.wc8ec.org**

Wisconsin (Colby) — Oct. 1 D H R T
8 AM – noon. *Spr:* Black River ARA. Colby Lions Pavillion, 103 W. Adams St. *Tl:* 147.150 (114.8 Hz). *Adm:* $5. Email: **kb9blv@yahoo.com**

Wisconsin (Kaukauna) — Nov. 6 D F H R V
8 AM. *Spr:* Fox Cities ARC, Inc. Starlite Club, W2091 County Rd. *Tl:* 146.760 (100 Hz). *Adm:* $5 Advance, $6 door. **www.fcarc.club/hamfest.php**

ARRL WISCONSIN STATE CONVENTION

October 15, Wisconsin Rapids, Wisconsin
H S
9 AM – 4:30 PM. *Spr:* WeComm Ltd. McMillan Library, 490 E. Grand Ave. *Tl:* 146.790 (114.8 Hz). *Adm:* Free. **www.wi-aresraces.org**

To All Event Sponsors

Before making a final decision on a date for your event, you are encouraged to check the Hamfest and Convention Database (**www.arrl.org/hamfests-and-conventions-calendar**) for events that may already be scheduled in your area on that date. You are also encouraged to register your event with HQ as far in advance as your planning permits: See **www.arrl.org/hamfest-convention-application** for an online registration form. Dates may be recorded up to 2 years in advance.

Events that are sanctioned by ARRL receive special benefits, including an announcement in these listings and online. Sanctioned conventions are also listed in *The ARRL Letter.* In addition, events receive donated ARRL prize certificates and handouts. Once the form has been submitted, your ARRL Director will decide whether to approve the date and provide ARRL sanction.

The deadline for receipt of items for this column is the **1st of the second month preceding publication date**. For example, your information must arrive at HQ by **November 1** to be listed in the **January** issue. Information in this column is accurate as of our deadline; contact the sponsor or check the sponsor's website for possible late changes, driving directions, and other event details. Please note that postal regulations prohibit mention in *QST* of games of chance, such as raffles or bingo.

Promoting your event is guaranteed to increase attendance. As an approved event sponsor, you are entitled to special discounted rates on *QST* display advertising and ARRL web banner advertising. Call ARRL's toll-free number at 1-800-243-7768, or email **ads@arrl.org**.

Scientists Trace High-Energy Particles Back To Sun's Plasma

By Robert Lea

The findings could help researchers predict dangerous space weather.

A close-up of the sun depicting solar surface activity and the corona. (Image credit: DrPixel/Getty Images)

Scientists may have discovered when and how high-energy particles that bombard Earth and other objects emerge from violent environments such as the sun's atmosphere.

These high-energy particles pose a risk to delicate satellite technology and to astronauts, and can even affect aircraft flying over the North Pole. Although researchers have been studying these particles for decades, it's been difficult to spot a clear pattern of when flare-ups can emerge and thus to predict when they might occur.

In new research, based on simulations created with supercomputers, scientists identified the plasma in the sun's outer atmosphere as the source of these high-energy particles.

"This exciting new research will allow us to better predict the origin of solar energetic particles and improve forecasting models of space weather events, a key goal of NASA and other space agencies and governments around the globe," Luca Comisso, a researcher at Columbia University and co-author of the study, said in a statement.

The sun's outer atmosphere, the corona, is made up of plasma, meaning the violent conditions have stripped atoms of their electrons. Solar scientists believe high-energy particles are generated in this highly turbulent sea of stripped atoms (ions) and electrons.

This has been difficult to study, however, because plasma moves erratically and unpredictably, so it's been a mystery as to how and when high-energy particles are generated.

Comisso and Lorenzo Sironi, also of Columbia, developed simulations using supercomputers at NASA, Columbia and the National Energy Research Scientific Computing Center that modeled the exact movement of electrons and ions in the solar plasma. This created a good proxy for the corona granting the most exhaustive data yet on when and how high-energy particles form in the region.

The simulations demonstrated that magnetic fields in the corona can accelerate electrons and ions to nearly the speed of light, launching them into space.

(Continued on Next Page)

Scientists Trace High-Energy Particles Back To Sun's Plasma (Continued)

The research helps solve a question pondered by scientists since 1949, when Enrico Fermi first began to investigate magnetic fields in space as the source of high-energy particles observed bombarding Earth's atmosphere. Fermi's work led physicists to suggest that the sun's plasma could be behind many of these particles, with others pelted at Earth from deep space. But proving this hypothesis has been challenging.

While the team's results were based on a simulation, NASA's Parker Solar Probe could help further validate the research, Comisso said.

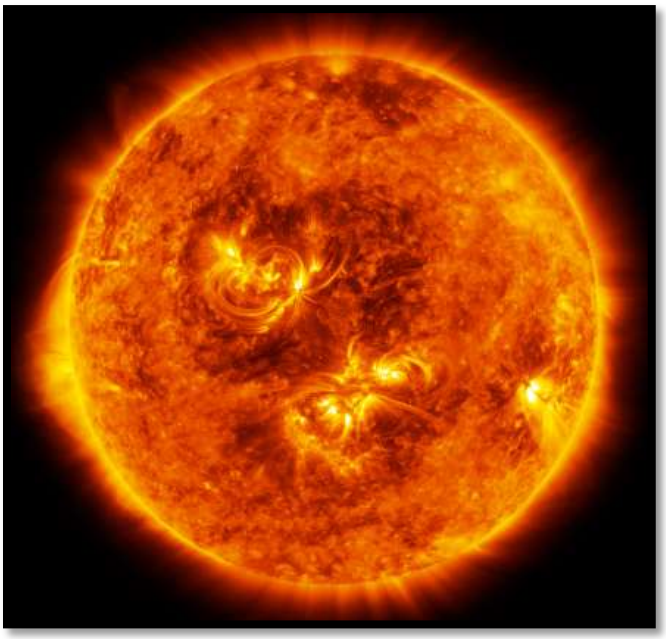
The Parker Solar Probe has been observing our star since the spacecraft's launch in 2018. Part of the mission is to study the turbulent outer atmosphere of the sun. This means the Parker Solar Probe could directly observe the distribution of high-energy particles that are generated in the corona.

The results of the new work also have implications beyond the solar system. All stars are composed primarily of plasma, meaning the vast majority of matter that astronomers see is in this state of matter (which is not a gas, a liquid or a solid).

A better understanding of how plasma accelerates particles could explain high-energy particles seen not just around the sun and other stars but also around other cosmic objects, like neutron stars and black holes.

That opens the door to further simulations that could look at how distant stars, black holes and neutron stars generate their own high-energy particles.

"Our results center on the sun but can also be seen as a starting point to better understanding how high-energy particles are produced in more distant stars and around black holes," Comisso said. "We've only scratched the surface of what supercomputer simulations can tell us about how these particles are born across the universe." The team's research was published Sept. 13 in The Astrophysical Journal Letters.



ARRL Santa Barbara Section Level Appointments by John R Kitchens, NS6X

Under delegated authority of the SM, appointed Section officials manage the station-level appointees and program functions listed above.
The Section Traffic Manager (STM) manages the National Traffic System activity in the section and supervises Net Managers (NM) and Official Relay Stations.

The Section Emergency Coordinator (SEC) implements the section's ARES plan and supervises the following coordinators:

- Assistant Section Emergency Coordinators (ASECs)
- Assistant District Emergency Coordinators (ADECs)
- District Emergency Coordinators (DECs)
- Emergency Coordinators (ECs)
- Official Emergency Stations (OESs)

Additional Section Level Appointments:

- Assistant Section Manager (ASM) (looking for a few in Santa Barbara and San Luis Obispo counties. Would like to have one per club)
- Assistant Section Traffic Manager (ASTM)
- Technical Coordinator (TC)
- Affiliated Club Coordinator (ACC)
- Public Information Coordinator (PIC)
- State Government Liaison (SGL)
- Section Youth Coordinator (SYC)

After you've gained experience as a station-level appointee, perhaps you'll find yourself in one of these leadership roles.

These are positions available. For example, if you are the PIO for your club, let me know. I will verify it, and I will appoint you through the ARRL as a PIO. Or go to the url above, select the assignment you want, complete the form, and submit. You not only receive and official appointment, but you will receive regular emails from Headquarters helping you to do your job. Suggestions for PR contacts, How-To's, sample media releases, and more.
(Continued on next page)

ARRL Santa Barbara Section Level Appointments by John R Kitchens, NS6X

(Continued)

Club Newsletter, From ARRL Headquarters

Did you know that there is a new newsletter, focused on clubs? Clubs can submit info about what they do, how they do it, successes and failures to not repeat. But your club contact info needs to be kept up to date to receive it. Affiliated clubs should submit an annual report, format at ARRL.org, to keep this info updated. Easy to fill in the blocks. Not a "formal" annual report. Just trying to keep Headquarters updated and informed. They cannot help us out in the field if they don't know who we are, and how to contact us.

Ventura County ARES/ACS is in the process of developing a health and welfare traffic handling resource. That requires traffic handling experience and knowledge. I know that there are traffic handlers out there, and those who would like to learn. Let's make ourselves known.

We are working on an ARES handbook for local public emergency coordinators and managers. It will include what we can do, what training we receive and require, capabilities, frequencies used and why, repeaters and simplex/point-to-point systems in place, both VHF+ and HF, and more. Gone are the days where the fire occurs, or the earthquake hits and you can get on the radio and "help". You need to be within a recognized program to be used by public agencies, with proper background checks and accepted training. To work at an EOC, you need to have minimum FEMA/ICS classes, such as ICS100 and ICS200. EC-001, a free online, study at your own pace ARRL class is a start. All ARES volunteers need this class as a minimum.

Below you will find information about the capstone ARES class, EC-016, intended for ARES leaders. Only one person in the Section has completed this course. Who will be the next?

Recommendation for EmComm Training Program-

This form now serves two purposes:
1) To recommend someone from your ARRL Section to take the final assessment of the Public Service and Emergency Communications (EC-016) on-line course
2) To recommend someone to serve as a Mentor or Field Instructor for the ARRL Emergency Communications training program.
Guidelines:
Online Mentors must complete an additional familiarization course to prepare them for their role in the online environment.
(Continued on next page)

ARRL Santa Barbara Section Level Appointments by John R Kitchens, NS6X

(Continued)

Here are some guidelines to consider as you determine who you will recommend to take the Public Service and Emergency Communications Management for Radio Amateurs (EC-016) course, and complete the assessment and earn the course completion certificate:

- General license or higher
- Active radio amateur with on the air experience
- Leadership role in a local club or ARES organization
- Relevant experience in public service capacity
- Demonstrated leadership and people management skills
- Demonstrated public speaking skills and/or skills with training and instruction
- Relevant knowledge and/or experience because of professional role
- Models the best of Amateur Radio values and is in good standing with the Amateur Radio community
- Will represent Amateur Radio well to the general public
- Honest, trustworthy, exercises good judgment

There may also be local emergency response professionals with governmental emergency management organizations, or who work with non-governmental organizations, that would like to take this course.

Those people in this category who are not ARRL members may gain access to the course by signing on for a guest membership or by becoming a member. If they would also like to take the final assessment and earn the course completion certificate they will need an SM recommendation to participate. We will not require these candidates to hold an Amateur Radio license or to have taken the prerequisite Amateur Radio Emergency Communications Level 1/Basic course. However, they will need to meet all of the other course requirements and also pay the enrollment fee for the final assessment. You are welcome to seek the advice of your SECs and other field appointees to determine whom you should recommend to complete this course. It is unrealistic to expect that you would know all candidates personally, so you may need to rely on the recommendations of your trusted advisors. However, we do need to receive the final recommendation from you as the Section Manager.

ARRL Santa Barbara Section
Section Manager: John Kitchens
ns6x@arrl.org

ARRL News

(All photos and icons from ARRL.org or other specified sources)

Girl Scouts Receive ARRL Radio and Wireless Technology Patches

On Saturday, September 10, 2022, the York County Amateur Radio Society (YCARS) in Rock Hill, South Carolina, helped 22 Girl Scouts earn their ARRL Radio and Wireless Technology patch.

Created in 2016, the Radio and Wireless Technology Patch Program offers Girl Scouts opportunities to learn about wireless technology, including amateur radio. Girl Scouts are encouraged to participate in activities that help them gain knowledge and skills in careers and subjects that involve science, technology, engineering, and mathematics (STEM).

The program activity was part of the Girl Scouts Love State Parks annual event. YCARS Outreach Coordinator Vicki Carnes, AD3I, and six other club members presented the program. Other amateur radio operators were available to help the Girl Scouts get on the air and communicate using amateur radio.

Girl Scouts listen to information about amateur radio at YCARS event. (Vicki Carnes, AD3I, photo)

Carnes said some of the most enjoyed activities included a hands-on demonstration of Lenz's law that used copper tubing and a magnet, making and using tin cans with string telephones, and coding and decoding words using the phonetic alphabet. The breakdown for the Girl Scouts participating were: 11 Brownies, four Juniors, four Cadettes, two Seniors, and one Ambassador.

Carnes said YCARS is very involved in the Amateur Radio Emergency Service® (ARES®), and it was an honor to play a small part in these Girl Scouts' journeys through Girl Scouts of the USA. Engaging their members by getting involved with ARES, Girl Scouts, and other charitable organizations is just one way that YCARS serves its community. Read "Club Station" in the September 2022 issue of *QST* for more information about how YCARS has rebuilt itself into being an active club, and other ways that they engage their membership by way of public service.

"ARRL is eager to encourage opportunities to involve scouts with ham radio," said ARRL Education and Learning Manager Steve Goodgame, K5ATA. "Congratulations to YCARS and the Girl Scouts for an outstanding activity," he added.

(Continued on Next Page)

ARRL News (Continued)

David A. Minster, NA2AA, ARRL Chief Executive Officer, na2aa@arrl.org

Second Century

In Celebration of Board Service

Each year during late summer, people who have decided to raise their hand in support of our cause and mission run for office as a Director or Vice Director of ARRL. These are critically important member-volunteer roles, and, much the way they did a century ago, they represent members in specific geographic regions of the country. These elected Board members bring matters of interest, importance, and significance to each Board meeting to ensure their Division has a voice.

Taking on one of these roles can be daunting if done well. Thanks to modern technology, Board members no longer meet in their committees just a few times a year. In fact, our Executive Committee, which used to meet only twice a year between Board meetings, is now able to meet every 8 weeks or so. Once committee and subcommittee meetings are added to the extensive time commitment, which also includes visiting club meetings and hamfests across Divisions that can span more than 1,000 miles, you can see how busy an active Board member is!

After every Board meeting, we publish the minutes for members to read. These minutes are constructed from 2 days of recordings, as well as notes from the meeting, and then are checked by the Board members to make sure there are no errors. The thing that is important to realize is that the Board meeting is not where the business and collaboration of ARRL take place. Yes, it is the place to offer up formal motions with voting, but the actual nuts-and-bolts work of our organization takes place in the work of its committees.

This is why it is so important that, if your Division will be voting this year, you pick the person you feel has the time, energy, and passion to properly represent you! Being a member-volunteer can be wonderfully rewarding. At SEA-PAC this year, a lifelong member came by the booth 10 times or so to share his memories of historic events — events in which he was directly involved — with us. As he left on Sunday, he told me this had been one of the best days of his life. It is powerful to see that kind of passion and love for the hobby from someone who has been in it for more than 70 years.

There's a word I left out of the list of qualities you should consider when voting for a Board member, because it needs to be singled out: *resilience*. Despite the many rewarding moments that make being a member-volunteer worth the giving of one's self, there are those that are quite the opposite. These are the ones that are powered by selfish anger and ignorance, typically propagated in one of the online mosh pits of misery or via email — sometimes even YouTube! I find that these aggressive interactions aimed at Board members, and ARRL staff as well, can be fatiguing, deflating, and frustrating. Being able to recognize these interactions for what they are and rise above them is a skill one develops, and it goes far beyond being "thick skinned."

With all of that said, why would anyone want to raise their hand to volunteer? The answer is: it is remarkably gratifying. The work of ARRL is not just at the Board level; it is at every level. Many of our Board members began their journey as field appointees or as Section Managers. ARRL is a complex organization that oversees the promotion and protection of not just a hobby, but a "hobby made up of hobbies." Beyond the technical and regulatory aspects that we are expected to know and manage, there is a structure and an organization that keeps amateur radio strong!

Another area with which our Board members get involved — and in which some ultimately go on to serve in an official capacity — is international: specifically, the IARU. Each year, volunteers from around the world attend meetings in each of IARU's three regions to represent the needs and interests of their individual member countries. These meetings can go on for a week or more, and these hundreds of volunteers do the untold heavy lifting for amateur radio, on a global basis, that transcends news bites and accolades.

As you see the ballot for your Division come through, whether it is this year or in a coming year, take a moment. These are people who have been moved to serve — on your behalf. On our behalf. It is a calling. It is work. It is rewarding. And we are, in turn, rewarded by their volunteerism and leadership. We have big plans for ARRL volunteerism coming in 2023, so stay tuned!

My home station is finally QRV and I've been on the air — so be radio active! And be that connector — use your own talents to get more hams QRV too. I'll be looking for you.

NA2AA

David A. Minster, NA2AA
Chief Executive Officer

(Continued on Next Page)

ARRL News (Continued)

450 Ω Ladder Line J-Pole for 144 and 440 MHz

Build a J-pole that resonates in both the VHF and UHF bands.

Fred Delaney, K1DU

There are many applications for a dual-band antenna like this one. It could be used for special event stations or as an attic antenna for hams who can't put up an outside antenna due to deed restrictions. The list goes on. This antenna can be used on 2 meters and 440 centimeters, and it is inexpensive and easy to build.

About the J-Pole

I built two J-poles out of 450 Ω ladder line (see the lead photo), one for home use and one backpack version for camping. This J-pole is a ¾-wavelength element with a ¼-wavelength matching stub that operates as an end-fed half-wave antenna. It does not require any radials, and when hung vertically, it has an omnidirectional gain of 2.2 dBi.

The ¾-wave element, in inches, is 8,856 times the velocity factor (VF) divided by the frequency in MHz.

The ¼-wave stub, in inches, is 2,952 times the VF divided by the frequency in MHz.

The VF is the ratio of the speed of propagation in the transmission line to the speed in free space. Here, the VF is 0.91, so the dimensions are:

The ¾-wave radiator is 8,856 × 0.91 / 146 = 55.198 inches, or 55 3/16 inches. The ¼-wave stub is 2,952 × 0.91 / 146 = 18.399 inches, or 18 3/8 inches.

Construction

Cut a piece of ladder line to 57¾ inches long, as shown in Figure 1. Measure 4 inches up from the end and strip the ladder line down to bare wire. From the same end, measure up 20¾ inches, and cut one of the ladder line conductors. This is the stub. Cut out the wire and webbing above the cut, but leave a small piece of webbing near the top for hanging the antenna.

You should end up with 53¾ inches of insulated wire on one side (the radiator) and 16¾ inches of insulated wire on the other (the stub). Right at the point where insulation ends, attach 2 feet of RG-58. Solder the center conductor to the radiator and the shield to the stub. Take a

1-inch-diameter piece of PVC pipe and wind six to eight turns of the coax for an RF choke. Use electrical tape to hold it on the form. This choke will keep RF from traveling down your feed line (see Figure 2). Fit a PL-259 connector to the coax beyond the choke.

Cut a 3-inch piece of wire from the excess wire you cut off, and strip it clean. This is the shorting bar. Use a pair of needle-nose pliers to form a loop, and slide the wire on the 4-inch stripped wire on the antenna. Place it 2 inches down from where you attached the coax, and crimp it. Now, form a loop on the other side of the shorting bar around the other leg of the antenna, making sure it's the same length down from where the coax is connected, and crimp it. Do not solder at this time.

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ARRL News (Continued)

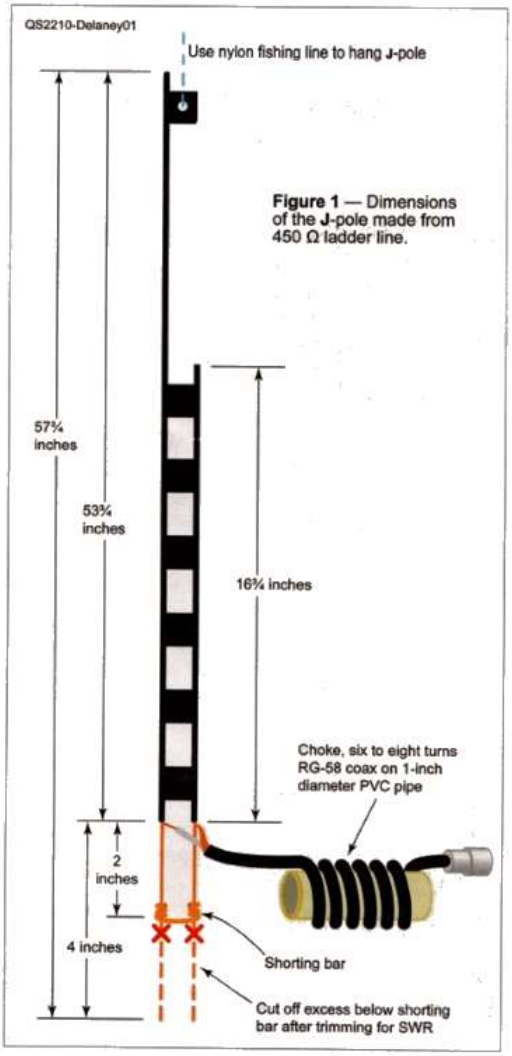

Figure 1 — Dimensions of the J-pole made from 450 Ω ladder line.

Figure 2 — The J-pole feeding end is on the lower left, and the choke is on the right. [Fred Delaney, K1DU, photo]

Adjusting for Low SWR

Now, adjust for the lowest standing wave ratio (SWR). The goal is to get a 1:1 SWR in the middle of the band at 146 MHz, so it will also match with SWR = 1.2:1 at 446 MHz. If you match with 1.1:1 at 144.300 MHz, it will also match at 435 MHz, which is below the 70-centimeter repeater band. There are two ways to match this antenna: trim the elements, and slide the shorting bar. I made a template diagram from my first antenna with correct dimensions, then cut my second J-pole to the template, and I didn't even need to move the shorting bar.

When first cutting the ladder line to obtain a match, cut it longer than needed. Cut the elements at a 1:3 ratio. For example, cut ⅛ inch off the stub and ⅜ inch off the radiator until you are close, and then move the shorting bar for fine adjustment.

Connect an SWR meter at the antenna between the coax stub coming from the antenna and the feed line. Read the SWR at 144.300 MHz and at 147.300 MHz. For example, if you have a 1.1:1 SWR at 144.300 MHz and 1.6:1 at 147.300 MHz, then your antenna is long. Move the shorting bar toward the coax connection to shorten the antenna. If the opposite is true, then your antenna is short, so move the shorting bar toward the end of the antenna to lengthen it. When you have obtained a good SWR match, solder the shorting bar in place. Cut off the excess wire.

You can use any length of coax with the J-pole. When operating the J-pole, keep it away from other objects, because it will couple and degrade the performance. When I enclosed mine in a PVC pipe, the SWR degraded to 2.1:1, but you can still run up to 10 to 15 W with most radios. With the unenclosed non-degraded version (no PVC), there is no problem running up to 50 W. [Be sure to perform an RF exposure assessment with this antenna. — *Ed.*]

Fred Delaney, K1DU, has been a licensed amateur and ARRL member since 1980. He operates CW, RTTY, FT8, satellites, and some SSB. He has built many Heathkits, as well as his own circuits and antennas. Self-taught, he relies on his very big library of ARRL books. Fred has been an ARRL Field Day coordinator for two clubs for many years. Professionally, Fred has been a precision sheet metal tradesman and certified welder for more than 40 years. You can reach Fred at **1980k1du@gmail.com**.

For updates to this article, see the *QST* Feedback page at www.arrl.org/feedback.

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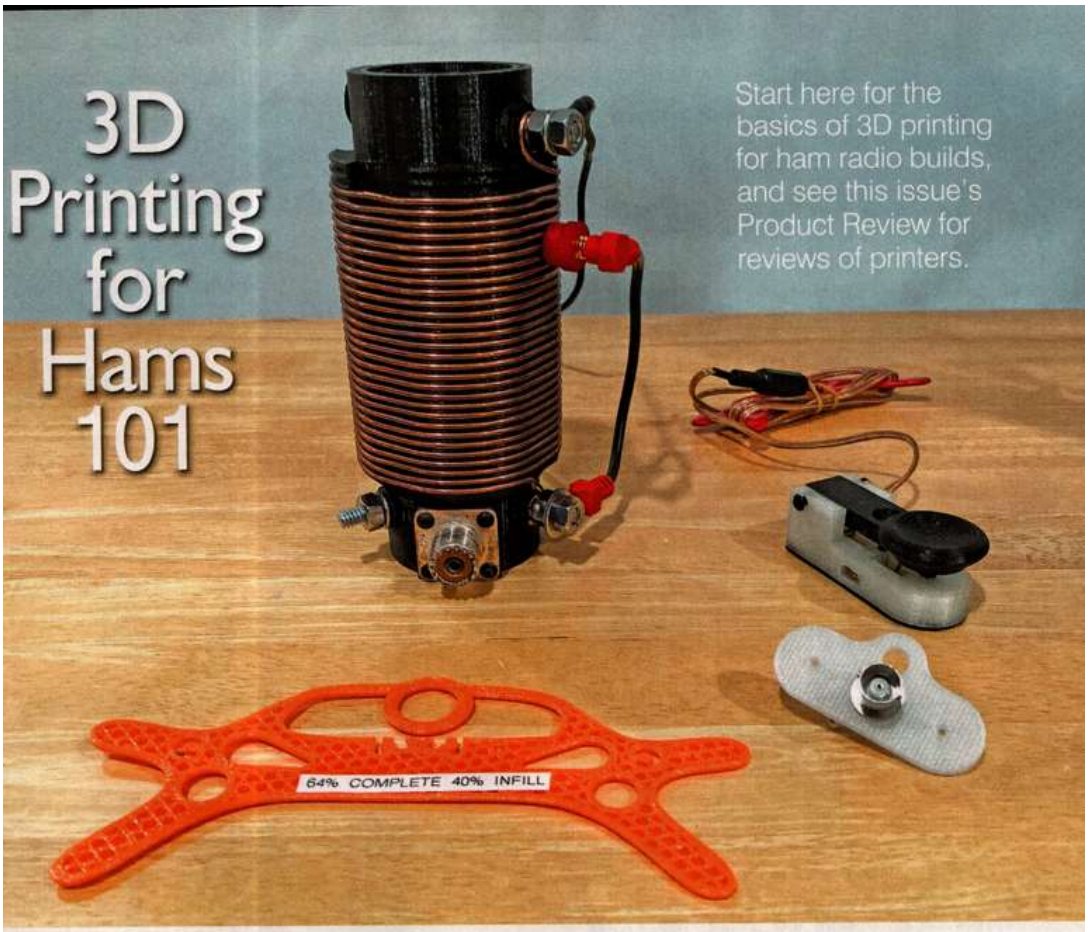
ARRL News (Continued)



Various items 3D printed by W4ALF: an antenna loading coil, a portable Morse code straight key, a QRP dipole center with a BNC connector, and an antenna wire winder.

Christian Bravo, W4ALF

3D printing involves the build of a three-dimensional object from a computer-aided design (CAD) model stereolithography (STL) file. This is usually done by adding thermoplastic material layer by layer with an extrusion-type printer. The process starts with an STL file containing all of the 3D coordinates of an object. STL files are available online to download and open in software that preps the file, adds details specific to your printer, and follows instructions about how you want to print the object.

3D printers for consumer use are now priced at about $200 per desktop unit. The thermoplastic materials used for printing are also readily available and affordable. I've printed several items for myself, including a center support for a dipole antenna, a VFO knob for my Yaesu FT-817ND, and a straight key, to name just a few.

The STL File

There are various file types used for 3D printing — STL, additive manufacturing file (AMF), and Wavefront OBJect (OBJ) — but we will focus on one of the most common, the STL file. An STL file contains the 3D coordinates, or CAD model, that define an object to be printed. It will ultimately be used by slicer software to create a G-code output file that the 3D printer will read and print.

Typically, newcomers to 3D printing will start with ready-to-go STL files that others have created. You can alternatively use CAD software or online tools to create your own. The free and paid versions of *Fusion 360*

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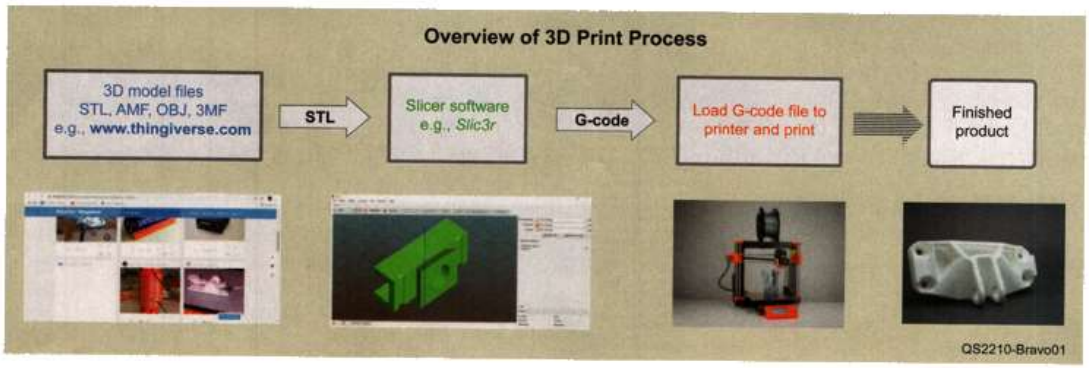
ARRL News (Continued)



and the Tinkercad tool, as well as the free application *OpenSCAD*, are all options to play around with.

Slicer Software and G-Code Files

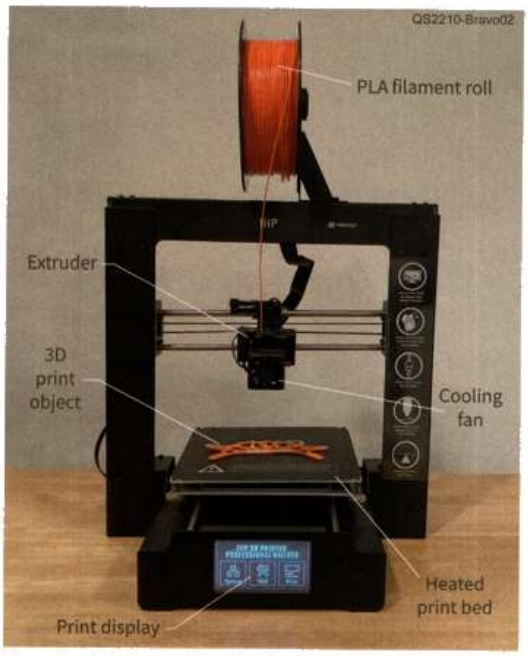
Slicer software like *Slic3r* and *Cura* can be downloaded for free. There is also fee-based software, such as *Simplify3D*. Slicing programs create layers of the object that you want to print by translating CAD drawings into a file that 3D printers can read.

After you have opened the STL file in the slicer program and added the settings for your printer, you can now save a G-code file, which contains commands for how a 3D printer should print a job. It stores instructions in plain text, with each line representing a different command. These commands determine how fast the printer should print, the temperature at which it should be set, where the printing parts should move, etc. An SD card is typically used to get the G-code file onto the printer, but you can also get a Wi-Fi-enabled printer that allows transfer of the file without one.

Your choice of software might be influenced by what works well with your printer, or by what software your friends use — give them a call and ask questions! That's exactly what I did.

Finding Something to Print

Online repositories such as **www.thingiverse.com** include STL files for thousands of printable items that pertain to every interest. As I write this article, a search for "ham radio" yields 28 pages of ham-related files. There are many other popular sites, like **www.cults3d.com**, with a plethora of STL files to browse, load, and print.



Monoprice 3D printer with an 8 × 8 × 8-inch print area and a heated print bed.

The Printer

3D printers operate on the X,Y, and Z axes to deposit successive layers of material onto the print bed until the object is fully rendered. This method is called fused deposition modeling (FDM). The material is a roll of thermoplastic known as a filament, and it is dispensed by the printer through a heated extruder and nozzle. Some printers have heated beds or enclosed print areas to improve layer adhesion. Temperatures at the

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ARRL News (Continued)

An antenna loading coil for portable use printed with polylactic acid (PLA).

nozzle average about 180 °C, but this depends on the filament material being used.

Printer specs will include a particular print area/size capability. This determines the maximum size of an individual print object per print job. Typical print bed sizes are about 8 × 8 × 8 inches. However, this does not limit the final size of the end product. Large items are usually printed as multiple print objects that are later assembled into a larger object.

Desktop 3D printers are now quite affordable, and entry-level models can be purchased for $200 – $300 on Amazon. Some popular brands to check out are Monoprice, Prusa Research, ELEGOO, Creality, and Flashforge. But it's no problem if you're not ready to purchase a printer yet — most public libraries now offer print services for minimal cost or free. There are also third-party, fee-based print services available from many of the same sites that provide STL files, which makes 3D printing as simple as point, click, and purchase.

Print Filament

Typically, a single 3D printer is compatible with at least a couple of different filament types. Filaments are mostly thermoplastics such as polylactic acid (PLA), acrylonitrile butadiene styrene (ABS), conductive PLA, and polyethylene terephthalate glycol (PETG), to name a few. Filaments come in many colors and textures, including translucent or metallic. On average, filament diameters are approximately 1.75 millimeters. Your choice of material will depend on the application; for example, PLA is easy to print, fairly flexible, and biodegradable, and it has high tensile strength, but it is not UV or heat resistant. ABS is more durable and heat resistant than PLA, but it requires increased ventilation during printing. Some brands of filament to consider are HATCHBOX 3D, 3D Solutech, Inland, and even Amazon Basics. Filament rolls tend to run for about $20.

Final Thoughts

Now that 3D printers have become accessible, ham radio operators can benefit from yet another tool for experimentation! Most entry-level printers and slicer software have fairly comparable features. It may be helpful to buy the same one that a friend has, so you can have a reliable resource for setup and usage.

Be patient with your first prints. It takes a few tries before getting the temperatures right for a particular filament, or the print bed-to-nozzle clearance at optimal printing height. For reference, check out an example print of an antenna loading coil created by SA2CLC at **www.thingiverse.com/thing:4525375**. Note that you'll need 10-gauge solid copper wire, gator clips, banana clips, and a spare SO-239 connector to complete this. Buddipole taps also work well for this coil.

Christian Bravo, W4ALF, earned his Extra-class license in 2014. He has achieved ARRL DXCC on nine bands, ARRL WAS on five bands, and most recently, VUCC Satellite and WAS Satellite. He is a CW instructor with CWops CW Academy and is an active participant in Summits on the Air (SOTA) and Parks on the Air® (POTA). Portable low-power operations and CW are his favorite styles of operating. He currently works as a security engineer for Kroger Technology. He can be reached at **w4alf@arrl.net**.

For updates to this article, see the *QST* Feedback page at www.arrl.org/feedback.

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ARRL News (Continued)

Students Experience Amateur Radio in a Hands-On STEM Camp

The Mercer County Amateur Radio Club (MCARC) and DX Engineering teamed up to show Ohio students ham radio basics by constructing antennas, receiving satellite signals, and more.

Joshua Reichard, K8KJR

This past spring, students from Youngstown, Ohio, felt the joy of amateur radio in a STEM camp focused on satellite communications. The Mercer County Amateur Radio Club (MCARC) and DX Engineering partnered with Valley Christian Schools and Mainline Education Foundation to host the week-long camp, which introduced students to basic radio theory, shortwave listening, and satellite operating on the 2-meter and 70-centimeter bands. The 12 students who participated each received their own Tecsun PL-600 SSB shortwave receiver, a pre-programmed Baofeng UV-5R (with transmit disabled), Ward Silver's *Ham Radio for Dummies*, and a variety of other take-home resources, including a Yagi antenna they built themselves.

The city of Youngstown has been ranked with one of the highest childhood poverty rates in the US, and its public school district has been in academic and fiscal distress for more than 15 years. Providing amateur radio education and equipment to disadvantaged students gave them opportunities they may not have otherwise received. The camp was designed as an enrichment education activity to address learning loss due to school shutdowns during the pandemic. It was

Olivia Reichard is featured on local television as she checks the features of her radio.

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ARRL News (Continued)

funded by a federal grant and generous donations by DX Engineering (thanks to CEO Tim Duffy, K3LR) and individual donors.

Inspiring the Next Generation

This was the fourth annual STEM camp organized by Dr. Josh Reichard, K8KJR, former Assistant Superintendent at Valley Christian, and David Richardson, K3KDR, director of a local community computer lab. Tommy Gober, N5DUX, a professional STEM curriculum developer from the nonprofit CYBER.ORG, traveled from Houston, Texas, to lead the satellite portion of the camp — including the antenna build. "It was a pleasure to visit Youngstown, connect with friends in amateur radio, and spend time introducing students to the hobby," said Gober. Dr. Reichard, Richardson, Duffy, Barney Scholl, K3LA, and Carol Scholl, K3LEA, also taught classroom portions of the camp. Local television station WKBN covered the event.

"I definitely plan to get licensed," said Corban Ulery, a seventh grader at Valley Christian. "I have been listening to our local repeater every day and can't wait to get on the air. I'm studying!" The Baofengs were preprogrammed with frequencies for local repeaters, weather, and satellites by MCARC member Al Sangregorio, N8GUY.

Roselyn Wade, an eighth grader, said her favorite part of the camp was "building something and actually seeing it work." The students' eyes lit up when they received their first signals from the International Space Station (ISS) repeater using their own homebrew antennas. Students also experienced the frenetic nature of satellite contacts as they witnessed a live contact between Gober and Grace Papay, KE8RJU, via Saudisat 1C (SO-50). Fortunately, satellite passes, including the ISS, were abundant during the week and students had several opportunities to receive signals.

Building the Tape Measure Yagi

In the most hands-on activity of the week, students constructed their own tape measure Yagi antennas. Various materials were donated and prepared in advance by Dr. Alex Cocco, W3XH, who also created a wooden jig to simplify cutting each element to the appropriate length. Stations were set up in the school's physics lab, and volunteers manned the stations to assist students. "It was very rewarding to see the students build this antenna from start to finish," said Dr. Cocco. DX Engineering donated the feed lines, and Duffy and Carol Scholl manned the soldering station. Cory Gibson, W3JL, and Jeff DeSalvo, N3JD, provided construction support. The design for the antenna is available on Gober's website at **www.n5dux.com/ham/tape-measure-yagi**.

"Though the antennas worked for receiving satellite passes, they are not optimized for transmitting on 70 centimeters," Duffy explained. "Once the students are licensed, we hope to help them build a dual-band antenna suitable for transceiving." A diplexer, such as the simple design by Kent Britain, WA5VJB, may be useful for future builds. Adult volunteers made sure that students exercised caution with the tape measures, which had sharp edges, albeit notched and covered

Tommy Gober, N5DUX, demonstrates a satellite contact with the ISS repeater.

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ARRL News (Continued)

Students and volunteers participate in the SWL Scavenger Hunt.

Dr. Alex Cocco, W3XH, assists students as they test their antennas.

with electrical tape. The students were required to use safety equipment during construction, but the cut edges were an ongoing safety concern. Heat shrink wrap or Plasti Dip may better protect the sharp edges. Duffy also noted it might have been easier to pre-solder terminal lugs so students could easily connect the feed line with a screwdriver. Even though there is always room for improvement, the purpose of the activity was achieved: students experienced the wonder of building their own antennas, connecting them to radios, pointing them to the sky, and hearing signals.

Bright Futures for Student Hams

During the week, students also participated in an SWL Scavenger Hunt with their shortwave receivers. Using wire antennas in the school's parking lot, they heard stations in Europe, South America, and the Caribbean. This activity enabled them to learn about beacon stations, FT8 decoding, WWV time transmissions, grid squares, and the phonetic alphabet. Exploring the world of HF inspired students to persevere in the amateur radio hobby. In just a few hours, they experienced a breadth of topics firsthand, giving them an idea of just how much there is to learn and do in amateur radio.

"I'm working hard to upgrade to my General-class license by Field Day," said Liam Roberts, W8LBR, who was Valley Christian's salutatorian and a licensed Technician prior to the camp. Roberts attended Allegheny College the following fall with a full scholarship to study Environmental Science and Sustainability. "I can't thank Dr. Reichard enough for introducing me to this amazing hobby. This is something I can do for the rest of my life," he enthusiastically reflected. Shortly after the camp's conclusion, Roberts' hard work paid off as he succeeded in earning his General license.

Another camp attendee and daughter of Dr. Reichard, Maria Reichard, KE8SPB, has since earned her Technician-class license. She has made contacts to 50 countries and counting on 10 and 6 meters, and continues to study for her General test. She is also a member of the Young Ladies Radio League (YLRL).

An outline and links to various resources utilized during the camp is available upon request on the MCARC website at **www.w3lif.org**.

Dr. Joshua D. Reichard, K8KJR, is a lifetime educator, licensed school superintendent, and clinical sociologist. He is President of Omega Graduate School in Dayton, Tennessee. Reichard is also Senior Core Faculty of Doctoral Research at the American College of Education and Associate Faculty teaching computer science in the Forbes School of Business and Technology at the University of Arizona Global Campus.

For updates to this article, see the *QST* Feedback page at www.arrl.org/feedback.

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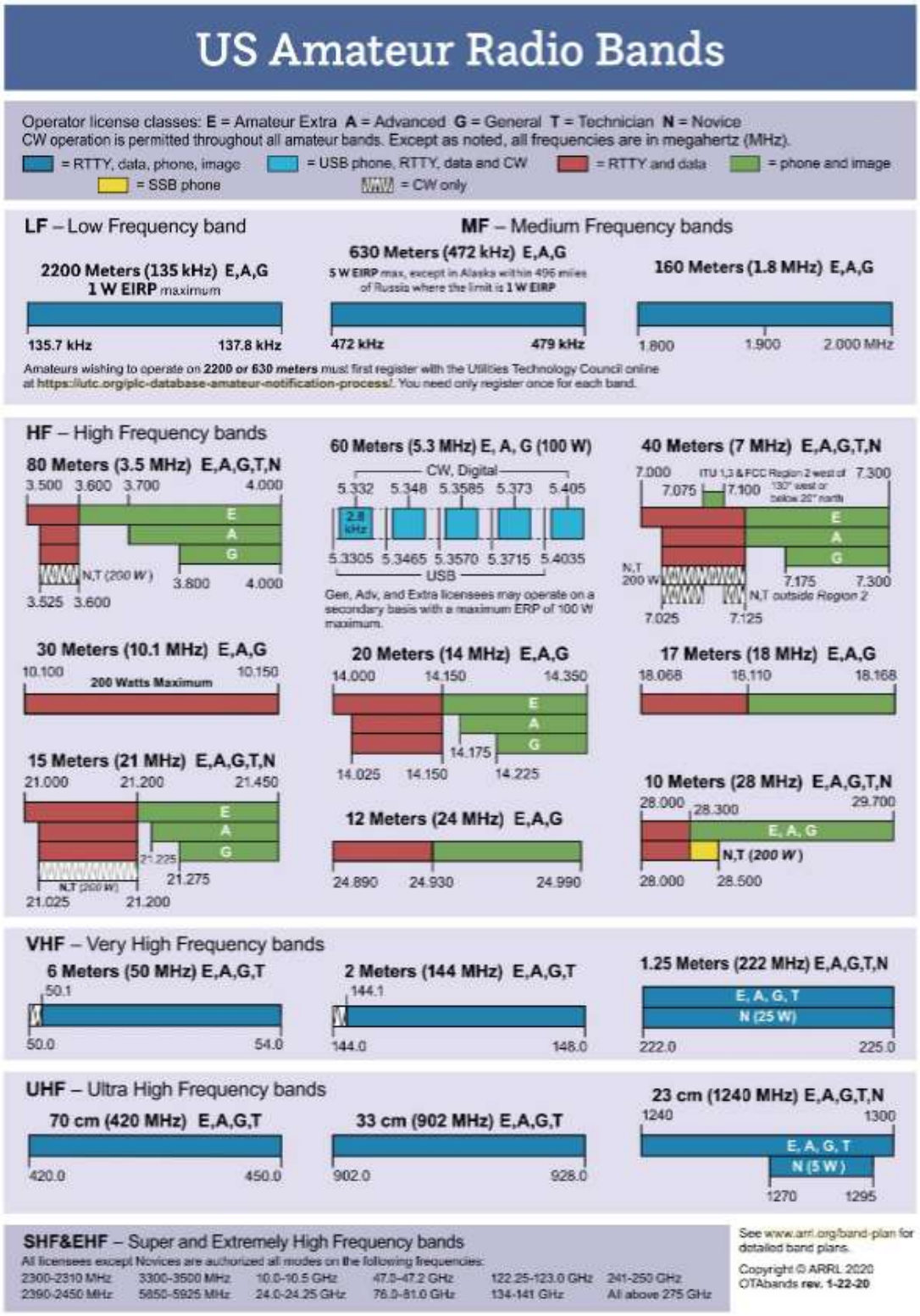
US Amateur Radio Bands



W1AW Schedule

W1AW Schedule

PAC	MTN	CENT	EAST	UTC	MON	TUE	WED	THU	FRI
6 AM	7 AM	8 AM	9 AM	1400		FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
7 AM-1 PM	8 AM-2 PM	9 AM-3 PM	10 AM-4 PM	1500-1700 1800-2045	VISITING OPERATOR TIME (12 PM-1 PM CLOSED FOR LUNCH)				
1 PM	2 PM	3 PM	4 PM	2100	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
2 PM	3 PM	4 PM	5 PM	2200	CODE BULLETIN				
3 PM	4 PM	5 PM	6 PM	2300	DIGITAL BULLETIN				
4 PM	5 PM	6 PM	7 PM	0000	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
5 PM	6 PM	7 PM	8 PM	0100	CODE BULLETIN				
6 PM	7 PM	8 PM	9 PM	0200	DIGITAL BULLETIN				
6:45 PM	7:45 PM	8:45 PM	9:45 PM	0245	VOICE BULLETIN				
7 PM	8 PM	9 PM	10 PM	0300	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
8 PM	9 PM	10 PM	11 PM	0400	CODE BULLETIN				

W1AW's schedule is at the same local time throughout the year. From the second Sunday in March to the first Sunday in November, UTC = Eastern US time + 4 hours. For the rest of the year, UTC = Eastern US time + 5 hours.

♦ Morse code transmissions: Frequencies are 1.8025, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675, 50.350, and 147.555 MHz.

Slow Code = practice sent at 5, 7½, 10, 13, and 15 WPM.

Fast Code = practice sent at 35, 30, 25, 20, 15, 13, and 10 WPM.

Code bulletins are sent at 18 WPM.

For more information, visit us at
www.arrl.org/w1aw

♦ W1AW Qualifying Runs are sent on the same frequencies as the Morse code transmissions. West Coast qualifying runs are transmitted by various West Coast stations on CW frequencies that are normally used by W1AW, in addition to 3590 kHz, at various times. Underline 1 minute of the highest speed you copied, certify that your copy was made without aid, and send it to ARRL for grading. Please include your name, call sign (if any), and complete mailing address. Fees: $10 for a certificate, $7.50 for endorsements.

♦ Digital transmissions: Frequencies are 3.5975, 7.095, 14.095, 18.1025, 21.095, 28.095, 50.350, and 147.555 MHz.

Bulletins are sent using 45.45-baud Baudot, PSK31 in BPSK mode, and MFSK16 on a daily revolving schedule.

Keplerian elements for many amateur satellites will be sent on the regular digital frequencies on Tuesdays and Fridays at 6:30 PM Eastern time using Baudot and PSK31.

♦ Voice transmissions: Frequencies are 1.855, 3.99, 7.29, 14.29, 18.16, 21.39, 28.59, 50.350, and 147.555 MHz. Voice transmissions on 7.290 MHz are in AM double sideband, full carrier.

♦ Notes: On Fridays, UTC, a DX bulletin replaces the regular bulletins. W1AW is open to visitors 10 AM to noon and 1 PM to 3:45 PM Monday through Friday. FCC-licensed amateurs may operate the station during that time. Be sure to bring a reference copy of your current FCC amateur license. In a communication emergency, monitor W1AW for special bulletins as follows: voice on the hour, teleprinter at 15 minutes past the hour, and CW on the half hour.

W1AW code practice and CW/digital/phone bulletin transmission audio is also available real-time via the *EchoLink Conference Server* W1AWBDCT. The conference server runs concurrently with the regularly scheduled station transmissions. The W1AW Qualifying Run texts can also be copied via the EchoLink Conference Server.

During 2022, Headquarters and W1AW are closed on New Year's Day (observed December 31, 2021), Presidents Day (February 21), Memorial Day (May 30), Independence Day (July 4), Labor Day (September 5), Veterans Day (November 11), Thanksgiving and the following day (November 24 and 25), and Christmas Day (observed December 26).