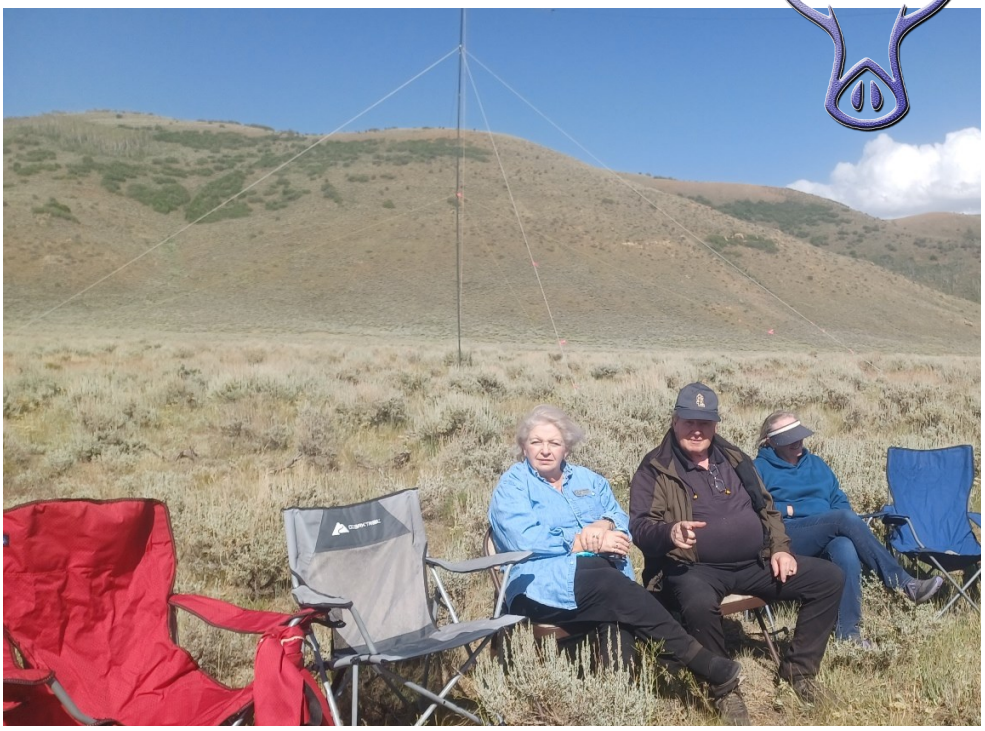
Issue 69
August 2026

Utah Valley Amateur Radio Club

The UVARC Shack

Outstanding in our Field Day



Joann Sadler WJØANN and Cliff Sadler N7RTB, out sitting in their field and enjoying a well-deserved rest after helping with antenna installation just prior to the start of ARRL Field Day 2026 with K7UVA.

In this issue of the *UVARC Shack*

Club meetings features NVIS, plus our Ham Radio Fair.

Silent Key for AG7ZX. *My Shack* spotlights K3CDG. *Amateurs in Action* in the Venezuela earthquake. *Brass Tacks* on fundamentals of the radio spectrum.

Dear Annette on which rigs are made in the US and what a CTCSS encoder is. *Hot Tips* on the misnomer of *simplex*. *DIY* for a 160-meter antenna. *The Amateur in You* on installation considerations and displaying numerals.

Please send your ideas, stories, questions, gripes, and photos to ***uvarcshack@gmail.com***

Inside this issue

Other points of interest

Club meetings

Recap

June 2026 club meeting – POTA

If there ever was a POTA (Parks on the Air) expert, that person might be Brian Jaworski KG7PRD, a state-renowned outdoors amateur radio explorer and mentor. Brian showed us numerous photos of his portable adventures, which included several UVARC members. Brian explained the POTA rules, methodology, maps, tools (pota.app, potamap.us), and many tips for good operation. He gave much-needed information on minimum gear, including radio, antenna, power, and support supplies, like food and water. Brian pointed out that one of the benefits POTA is driving is quality operations. If you've ever thought of doing POTA, this was the presentation you wanted to see. You can see the meeting video here, thanks to Trevor AG7GX.

July 2026 club "meeting" – Ham Radio Fair

We had a terrific turnout at the Ham Radio Fair on July 16 at Pheasant Brook Park in Lindon, probably our largest ever. The club holds the fair in place of the regular monthly meeting, due to the proximity of Field Day, and to offer those who couldn't attend regular Field Day a way to gather and get on the air. Will Barrett W7EBK ran the New Ham Net right from the pavilion at the event. Andrew NV9N (center) was the winner of the Ugly Antenna Contest, for which he took home a Yaesu FT-840 HF transceiver. We've included a few photos starting page 16. Our annual Ham Radio Fair could not have taken place without Adam Cowie KI7RED, the Lindon City Manager. Trevor AG7GX took the liberty of creating a video montage of the event.

By the way, many of our past meetings are recorded and posted on the club YouTube channel.

Silent Key

Memorial for a ham who has passed on

Ham friend and Vietnam Vet **Kevin Smith AG7ZX** passed away on Wednesday 24 June 2026. Kevin has donated the use of his RV a few times for the digital and CW stations at UVARC's Winter Field Day several years in a row, until his health made it nearly impossible for him to get around like he used to.

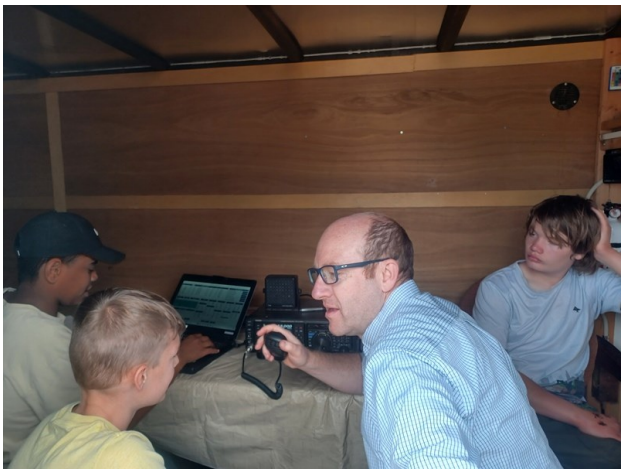
Noji relates the following: *One day Kevin asked me whether it was possible to turn his large metal cage carport into an antenna, and I told him I didn't see why not. By the time I made it to his house about two weeks later to help him analyze it and set it up, however, he had already connected his coax to his metal carport and made contacts with stations in Washington, California, and Texas. I said, "See, you don't need me...you've got this!" I told him he was probably the first CPOTA (Car Ports On The Air) activator I had ever known, and I was proud of him for thinking outside the box and trying out a new idea.*

Kevin was an active member of Provo American Legion Post 13 when he was able. He enjoyed Scouting, and spent quite a lot of time sharing his talents in hamming, gardening, and grilling Texas-style barbecue. Occasionally Kevin would invite a patrol of scouts over to his house and demonstrate ham radio and get them on the air to talk with Curtis McPherson N1JDI.

You can read his obituary here.

Field Day

In photos



Field Day

Continued

Field Day

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Field Day

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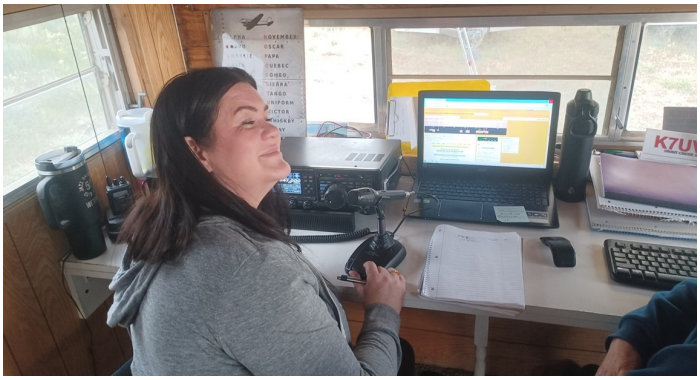


Field Day

Continued

Summary

Entry received at: 2026-07-15 20:22:00 UTC

Submitted by: **Noji Ratzlaff, KN0JI** E-mail: nojiratz@hotmail.com

Call Used: **K7UVA** GOTA Station Call: **K7GSL** ARRL/RAC Section: **UT** Class: **3A**

Participants: **39** Club/Group Name: **Utah Valley Amateur Radio Club**

Power Source(s): **Generator, Battery, Solar**

Power Multiplier: **2X**

Preliminary Total Score: 6,643

Bonus Points:

Bonus	Points	Status
100% emergency power	300	
Media publicity	100	Documented by Media-Event.jpg
Public location	100	
Public information table	100	
Formal message to ARRL SM/SEC	100	Documented by FW_ RE_ Happy Field day to our ARRL leadership from K7UVA.msg
Educational activity	100	
Youth participation (9 x 20, max of 100)	100	
Safety officer	100	Documented by 2026 FD Safety Officer.pdf
Social media	100	
GOTA Station	625	
GOTA Coach	100	
Entry submitted via web	50	
Total bonus points	**1,875**	

Score Summary - Cabrillo log/dupe sheet file: K7UVA.dup

	CW	Digital	Phone	Total	
Total QSOs	350	478	728		
Total Points	700	956	728	**2384**	**Claimed Score** = (QSO points x power mult) = **4,768**

Band/Mode QSO Breakdown:

	CW		Digital		Phone	
Band	QSOs	Pwr(W)	QSOs	Pwr(W)	QSOs	Pwr(W)
160m						
80m	3	100	71	100		
40m	69	100	168	100	600	100
20m	275	100	177	100	2	100
15m	3	100	57	100	1	100
10m			5	100		
6m						
2m						
222						
432						
Other						
Satellite						
GOTA					125	100
Total	**350**		**478**		**728**	

GOTA Station: GOTA Coach - 100 Bonus Points

In the books

My Shack

Highlighting the shack (ham equipment and room) of a member, to give others an idea of the possibilities that might work for them

Craig Gaines K3CDG

From Neighborhood Prep to HF: My Journey into Amateur Radio

My introduction to amateur radio started close to home. My wife, Nicole, has served as our neighborhood's Emergency Preparedness coordinator for years. In the summer of 2025, she asked if I would be willing to step in and help. As part of that effort, she found a ham radio class hosted by Orem City and encouraged me to attend. I agreed, and that quickly turned into something much bigger than I had expected.

I attended my first class in September, taught by Joe Costello WH6QV. His enthusiasm and practical approach immediately sparked my interest in amateur radio. At the end of the session, he recommended using HamStudy.org as a primary tool for preparing for the license exam. After several hours of focused study, I felt ready, and the following day, I passed the Technician exam, receiving my first callsign: KM7CKN. Encouraged, I repeated the same process and, within a week, passed my General exam as well. By December, I decided to push further and pursue my Amateur Extra license. After a couple of attempts, I passed the exam just after Christmas. Shortly thereafter, I applied for and received my vanity callsign: K3CDG.

Another piece of advice I received early on was to join a local club. Through Joe, I discovered the Utah Valley Amateur Radio Club (UVARC) and became a member. Around the same time, I connected with a colleague through the Sheriff's Office who introduced me to Utah County Amateur Radio Emergency Service (UCARES). Through that connection, I met Gavin Grow K9GKG, who helped me get started with equipment, including programming my first handheld, the Baofeng UV-5R for local UHF/VHF use.

As I built out my shack, I added a BTECH UV-25X4 and eventually turned my attention to HF. I purchased a Yaesu FT-891 and quickly discovered that antennas would be my biggest challenge. HF operation has become a major focus for me, particularly programs like Parks on the Air (POTA) and digital modes such as FT8. While I see the value of amateur radio in emergency communications, I've also come to appreciate it as a rewarding hobby.

With over 30 years in law enforcement, I've seen firsthand how chaotic emergency situations can become. Amateur radio offers a way to stay prepared, build practical skills, and contribute meaningfully when it matters most, all while enjoying the learning process along the way.

73, K3CDG

Amateurs in Action

Recounts of ham radio operators who have used their effort and skills to help others in a time of need

Venezuela earthquake

Shortly after 6 pm on Wednesday 24 June 2026 a 7.2-magnitude earthquake, later termed a foreshock, struck in the northwest region of Venezuela. Thirty seconds later a 7.5-magnitude mainshock struck the capital city of Caracas, eventually costing more than 5500 lives and more than $37 billion in widespread damage.

As soon as it was known, people all over the Caribbean and parts of the US were ready to relay health and welfare status and family needs for numerous displaced and needy people.

Domingo Hernandez YV5IZE, director of the Venezuelan Radio Club National Emergency Network, reported, *A large part of the capital is without electricity, and communication systems are operating on battery power. They were already activating their emergency shortwave (HF) frequency and also using digital frequencies and communication modes*. As soon as the word got out, Emergency Communication Coordinators from Colombia, Cuba, Guatemala, Honduras, Nicaragua, El Salvador, and a few other countries who were, at one time or another at each others' throats, were now brothers and sisters of one family, helping and giving, hand-in-hand as it were.

Carlos Gonzales CO2JC

Right after Carlos Gonzales CO2JC of Cuba learned of the quake, he immediately began monitoring for distress calls. Medical doctor and IARU Region 2 Emergency Communication Coordinator, Carlos submitted a request that ARRL allocate 7.135 MHz (40 meters) for emergency traffic handling. *For this reason*, Gonzales said, *we request that all amateur radio colleagues in the Americas and the rest of the world protect this frequency being used by Venezuelan amateur radio operators*. Gonzales also requested North, Central, and South American nations to remain on standby, to render needed assistance.

Ham operators reporting relays on video

You can read more about ham radio involvement in the aftermath of the quake on the IARU Frequency Clearance and the ARRL website.

New Hams and Upgrades

New hams

KM7GFJ = Kayden Call
KM7GGN = Andrew Epling
KM7GNI = Brennan Purcell
KM7GON = Peter Vander Wilt
KM7GOY = Karley Root
KM7GQA = Lauren Holton
KM7GQM = James Johnston
KM7GQN = Douglas Gale
KM7GQO = Gary Koehly
KM7GRP = Ira Roper
KM7GTB = Ryan Weaver
KM7GTV = Jordan Becar
KM7GTW = Benjamin Brunson
KM7GUR = Rebecca Merrill
KM7GVM = Samuel Marchant
KM7GVP = Kaylee Holley
KM7GXC = John Shackelford
KM7GXO = Laura Washburn
KM7GXP = Thomas Dyal
KM7GYI = Ethan Berrett
KM7GZP = Norman Kososki
KM7HBF = David Kirk
KM7HBG = Robert Perry
KM7HBJ = John Quijano
KM7HBX = Spencer Johnson
KM7HDY = Tyler Christofferson

Upgraded hams

W7EBK = Will Barrett (General)
KI7TJC = Paul Penrod (General)
KK7KDK = Elijah Frisbie (Extra)

Congratulations to all these diligent folks! We look forward to hearing you on the radio soon.

Ham Radio Fair

In photos

Ham Radio Fair

Continued

Ham Radio Fair

Continued

Events

Upcoming happenings

2026 UVARC Swap Meet

Heads up! The Utah Valley Swap Meet this year will be 9:00 am Saturday September 26, at the Spanish Fork North Park Pavilion, 1185 N 400 E. One of our few fund-raisers ever, entrance is $5 per person or $10 per family, plus $10 per table to display your wares. The *fee is waived* for outside clubs and service (ARES, RACES, CERT, etc.) groups who want to get the word out.

More than just a flea market, we hold this swap meet annually to provide

- Information on how to get active with many aspects of ham radio, such as HF, digital, APRS, POTA, SOTA, portable, solar, and much more
- A chance for service organizations to invite and inform attendees and recruit members
- Radio programmers who could program your radio on the spot

Bring stuff you want to get rid of or show off, or come and browse the many things that are for sale, in case you find something you need, or both. You'll find many give-away items as well.

Dave Becar KI6OSS plans hold an exam session at the swap meet just outside the pavilion, under the Laurel VEC. Watch for updates on FB and emails, as time progresses. This is a family event, and we'd love to see yours at the Swap Meet!

76ers Annual Ice Cream Social

It's time once again for the 76ers Annual Ice Cream Social, at Leatherby's in Orem, 304 E University Pkwy. Bring your family on Saturday September 5 at 1:00 pm and join us for lunch and treats. They have burgers, fries, and deli sandwiches, as well as world-class shakes, ice cream cones, sundaes, and parfaits.

Elections

The Utah Valley Amateur Radio Club will be holding our annual elections during the monthly club meeting on Thursday September 3 at 6:30 pm. Club members will be voting (in-person only) for the president, vice president, secretary, activities chair, and the technology specialist. If you'd like to throw your hat into the ring and run against any current posts, please let one of the leadership know, and they'll get your name on the election ticket.

DIY Night

Our November 2026 club meeting will be our annual DIY (do-it-yourself) night, where you can be the elmer you were born to be, and learn (or help teach!) a skill or concept to club members. This one will be held 6:30 pm Thursday November 5 at the Orem City Council Chamber Room, 56 N State St (where we hold our club meetings). Come learn about soldering, installing a connector, using Anderson Powerpoles, how to apply heat shrink, how to program a radio, how to analyze an antenna, and more. Info as we get closer.

If you'd like to showcase a concept, please let one of the club leadership know. We'll give you a half-table to set up your demo and poster board or literature!

Brass Tacks

An in-depth look at a radio-related topic

Frequencies and wavelengths (introduction to the radio spectrum)

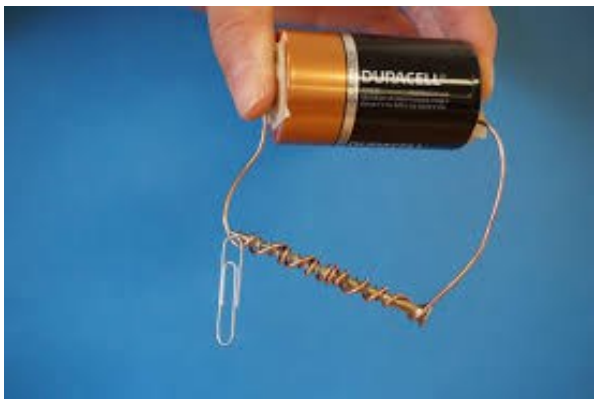
Four years ago we published a one-page summary on the general meaning and definitions of frequencies and bands, but that short article did little to answer the more in-depth questions by the technically curious. This time, let's provide a little more insight on the topic without detracting from the relevant simplicity of the previous article.

To most mortals, the technology of radio is pure magic, enabling one to communicate with another through thin air, as it were. To understand this medium of radio requires some fundamental discussion, which provides the "in-depth" part. But keeping it within the grasp of those who are unfamiliar with the physics is a challenge, due to confining the discussion to within the "introduction" scope as titled.

Start with fields

You've no doubt used a permanent magnet to pick up paper clips or stick notes on a fridge door. It can do so because of an invisible ***magnetic field***. You've also likely seen that magnets not only attract each other, but in certain orientations they repel each other. This means magnets have a ***positive side*** and a ***negative side***, or as we called them in elementary school, a north pole and south pole. You really can't see the magnetic field, but you know it's there, as evidenced by its attraction and repulsion to other magnets.

Another force field that's equally important but not as obvious is the ***electric field***. You can see its effects by rubbing a balloon on a cat, then using the balloon to pick up small bits of paper right afterwards. The balloon collected static electrical charges from the cat, then the balloon's negative electric field attracted the positive electric fields on the paper bits, picking them up.



The permanent magnet is "permanent" because its magnetic field strength doesn't change for a given distance from the magnet. You might also recall that you can create a magnet by winding a wire around a nail, for example, then connecting a battery across the wire. The nail then acts as though it's a permanent magnet while the battery is supplying electrical energy to the wire, and we call that an ***electro-magnet***. In fact, if you reverse the battery across the wire, the nail will still act like a permanent magnet, but with opposite polarity, so that if it attracted one side of a permanent magnet before, it'll now repel that same side of the permanent magnet.

Time for a change

The battery in our magnet experiment produces DC (direct current), meaning that ideally its

Brass Tacks

continued

voltage never changes, and electric current from the battery only flows in one direction. This time, let's replace the battery with the wall socket (please don't try this at home!), which supplies AC (alternating current), meaning that its voltage is constantly increasing, then decreasing, reversing, increasing again, then decreasing again, reversing again, and coming full circle, starting the cycle over.

The effect of AC on our little electro-magnet causes its magnetic field strength to increase, decrease, reverse polarity, increase in the opposite direction, decrease, etc. Now's when the magic starts happening. It turns out that a special natural law tells us ***where there is a changing magnetic field, there will always exist a changing electric field that runs along with it***. Furthermore, that changing electric field will change in perfect rhythm with the magnetic field.

Frequency

Using the AC from your wall socket, then, your electro-magnet can now pick up paper clips and drop them many times a second. How many times a second? Well, the American home wall socket electricity is rated for 60 cycles per second, or 60 hertz (Hz) the way we abbreviate it. This means the strength of your electro-magnet connected to the wall socket will increase, decrease, reverse direction, increase in that direction, decrease, reverse direction again, 60 times every second. We refer to the number of these complete cycles every second as the ***frequency***.

The frequency of your wall socket electricity, 60 Hz, is sufficiently high for most household applications, such as refrigerator motors and fluorescent lights, but very low compared with what's needed for radio. The frequencies of AC that's required for most amateur radio transmission and reception is known as ***RF***, or ***radio frequency***, and is summarized in this table:

Frequency range	Abbreviation	Name	Spelled out
3,000,000 Hz to 30,000,000 Hz	3 MHz to 30 MHz	HF	High Frequency
30,000,000 Hz to 300,000,000 Hz	30 MHz to 300 MHz	VHF	Very High Frequency
300,000,000 Hz to 3,000,000,000 Hz	300 MHz to 3000 MHz	UHF	Ultra High Frequency

That's a lot of goings back-and-forth every second, but that's what's been allocated to us amateurs by the FCC. There are a few allocations in other frequencies, but this table covers the great majority of what we use. For example, some repeaters operate on 146.760 MHz or 147.340 MHz, so according to the above table, they are ***VHF repeaters***.

As this alternating current reaches the antenna, it produces both a constantly changing electric field and a constantly changing magnetic field as we had previously described, The fields increase and decrease at the same rate, and are emitted (sent out) from the antenna ***at nearly the speed of light***. As the fields pass some stationary point, they measure positive, neutral, negative, neutral, positive, etc., just as the signal did in the wire, except now it's moving through the air.

Even though the fields are traveling at nearly the speed of light, their rate of change as measured at the stationary point can be slow or fast. This rate of change reflects the cycles that de-

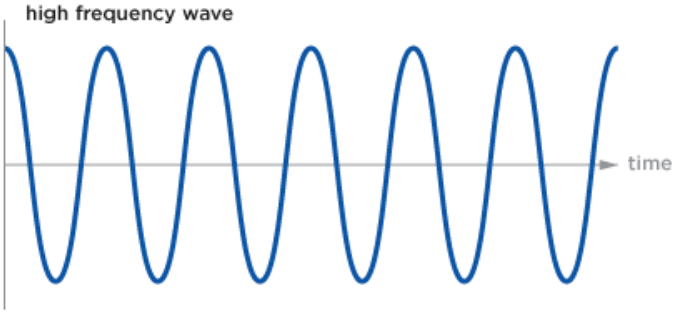
Brass Tacks

continued

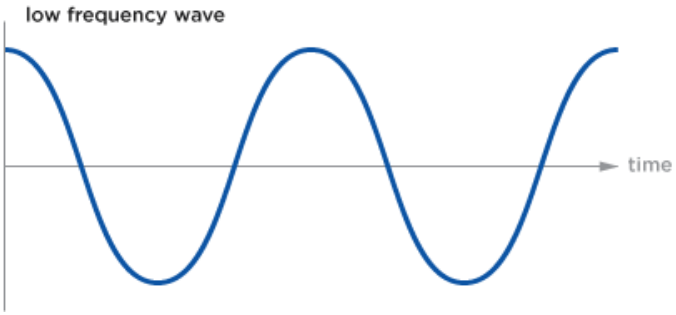
fine the frequency, so it changes at the same frequency. Another name for these tandem traveling fields is a ***radio wave***.

Wavelength

When I was a kid, I used to watch long trains of coal cars go by, and sometimes I would focus on a tall tree on the other side of the train. The tree would appear, then disappear for awhile, then reappear between the coal cars. I recognized that I was seeing the tree appear at a particular rate, or frequency.



A couple of hours later, I would watch a passenger train come by at about the same speed, but because the train was pulling pullman cars, which were longer than coal cars, I would see the same tree less often, or at a slower rate. Even though the speed of both trains was the same, the frequency that I saw the tree was higher with the coal train because the coal cars were smaller. By the same token, the frequency that I saw the tree was lower with the passenger train because the pullman cars were longer.



Each time a high positive point of the radio wave strikes an object, like an antenna, is like the moment I can see the tree between the train cars. This means the higher the radio wave frequency, the closer together the high positive points of the radio wave strikes the object. This "closer together" measurement is known as the wavelength. Just like with the train, the lower the frequency, the greater the wavelength, and vice versa.

As mentioned, radio waves travel through the air at nearly the speed of light, which is about ***300,000,000 meters per second***, continuously cycling positive and negative. As the traveling waves strike an object, it does so at the same frequency it left its source. In fact, we now know that ***the wavelength of a radio wave is the speed of light divided by its frequency***. In other words, the frequency of a radio wave times its wavelength is the speed of light.

frequency times wavelength = speed of light

The problem to be solved

Let's approach the next topic by solving a problem, which in this case is the ability to communicate between point A and point B using radio waves. Radio waves are nothing more than invisible light, kind of like infrared light, except to create infrared light, you only need to connect a battery to an infrared light bulb, and it shines invisible light. But radio waves must be

Brass Tacks

continued

generated by more than a mere battery and a light bulb.

The oscillator

To create a radio wave, we first start inside your radio with an electronic circuit known as an ***oscillator***. An oscillator does nothing more than create a steady ***signal***, or AC electricity we discussed previously, only at HF, VHF, or UHF frequency. Another circuit accepts our voice that we speak into a microphone, and turns the voice into another electrical signal.

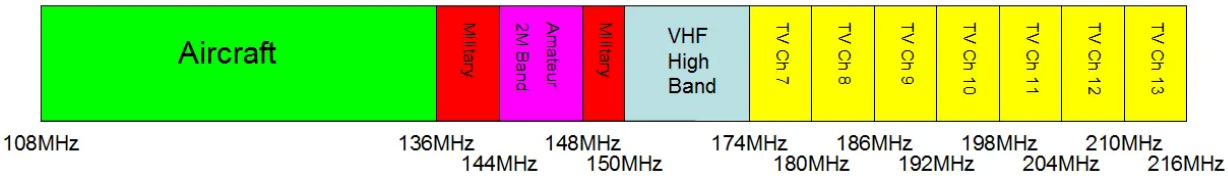
The oscillator signal and the microphone signal combine (a process called ***modulation***) to create a new signal, called the ***modulated signal***. Your radio filters (cleans up) the modulated signal a little, amplifies it (boosts its power), then sends it to an antenna, which converts the electrical signal into radio waves, which are sent through the air in all directions.

If your radio is point A and the radio of your friend is point B, your friend's radio will receive the radio waves that your radio just sent everywhere. Its antenna will convert the radio waves into an electrical signal, your friend's radio will ***demodulate*** the electrical signal, reproduce the voice electrical signal, present it to your friend's radio speaker, and your friend will hear your voice.

Bands

Referring to a radio wave frequency grouping as "VHF" is rather ambiguous because it covers the 300 MHz through 3000 MHz range, as was mentioned. It's also a little cryptic, because it has little relevance to our daily experience. To help identify which sub-range of frequencies our radios are using within VHF, people have decided to divide the VHF range by names called roughly by wavelength.

The frequency range supported by most handheld radios is between 144 MHz and 148 MHz, and we call that range a ***band***, because it looks a little like a horizontal strip resembling a headband:



Recall that the wavelength of a radio wave is the speed of light divided by its frequency. This way, the wavelength of a 150,000,000 Hz (150 MHz) radio wave is

300,000,000 ÷ 150,000,000 = 2 meters

and because the range of frequencies used by most of our handheld radios is between 144 MHz and 148 MHz, which is close to 150 MHz, we call that range the ***2-meter Band***. Many of our handheld radios also support the frequency range from 420 MHz to 450 MHz, and since

300,000,000 ÷ 428,000,000 = 0.7 meters = 70 centimeters

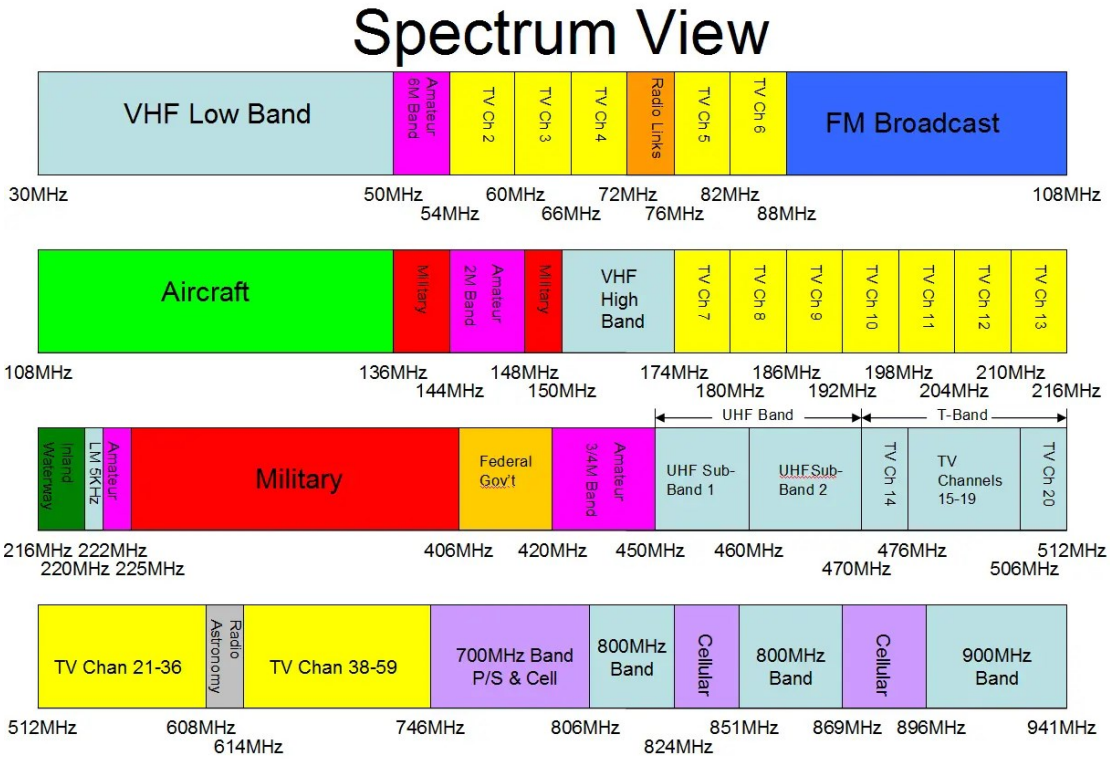
we call that range the ***70-cm band***.

Brass Tacks

continued

The radio spectrum

If we combine all the radio frequency bands into a single grouping, we refer to that collective range the radio ***spectrum*** because of how it appears on a chart if all the different bands were represented by colors. It's a visualization of multiple ranges on a single graphic:



In general, when people refer to the *radio spectrum*, however, they tend to mean *all* the frequencies, not just HF, VHF, and UHF ranges.

Summary

Starting with the concepts of a magnetic field and an electric field as fundamentals, if we use alternating current to generate a changing magnetic field, natural laws state that it results in a similarly changing electric field. Frequency is the number of complete cycles per second the field is changing. Given the speed of a wave, the wavelength is the length between periodically recurring points on a wave, such that the wavelength is the speed of the wave divided by its frequency. Because radio waves travel the speed of light, its wavelength is the speed of light divided by its frequency. Bands are named for their relative wavelengths.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

Dear Annette

What's on your mind? Serious, humorous, technical, and thoughtful answers to your deepest, (mostly) ham-related questions.

Dear Annette:

Are there any HF rigs still made in the US?

Bill in Provo

Dear Bill:

There are indeed a few HF transceivers manufactured in the US. Without listing their entire inventory, here's a list of manufacturers in no particular order:

- FlexRadio
- Elecraft
- Ten-Tec (a Dishtronix company)
- QRPGuys
- LNR Precision
- QRPme

Dear Annette:

I'm looking at used 2-meter desktop radios, and I ran across one that shows it does not have a CTCSS encoder. What's a CTCSS encoder?

Ed in Lindon

Dear Ed:

A CTCSS (continuous tone-coded squelch system) encoder is a circuit that produces (encodes) the tone required by repeaters to allow them to re-transmit your signal. Most of today's 2-meter transceivers have the circuit built into them, but many older units were manufactured before repeater tones became widely required. Some of the older transceivers can be outfitted with CTCSS circuit boards or stand-alone encoders, such as the ComSpec TE-32.

Dear Annette:

I'm not sure who else has this problem, and how they solved it, but I'm getting pretty ticked. I just replaced my coax for the third time because of being chewed by raccoons. I live outside the city, so I'm going to encounter more racoons and rodents than city-dwellers, but there has to be a way to keep critters from chomping my coax. Any ideas?

Nate in Mapleton

Dear Nate:

Here are a number of feed line solutions available to you, to help keep animals from feeding on your cables:

- You can bury your cables underground or route them through PVC pipe or conduit where burying it might be impractical
- Some manufacturers make coax whose jacket is very distasteful to rodents
- You might try consulting an exterminator, since they might have advice I don't, and you likely don't want those disease-ridden creatures on your property anyway.

Dear Annette:

I've read about meteor scatter on the exam study material, and a few people have mentioned it, but is it a useful way to communicate?

Paul in American Fork

Dear Paul:

Meteor scatter is a very unique *weak signal* medium by which to use VHF amateur radio, and can be very challenging for even the seasoned ham to master. Thanks to the weak signal detection ability of WSJT-X using MSK144, one can detect signals far below the noise floor, which is needed for meteor scatter. To answer your question, MS might not be as useful to many, but it's just one more way to enjoy amateur radio.

Got a question for Dear Annette*? Email it to* ***uvarcshack@gmail.com*** *and include your town name. Sorry, no guarantees.*

The Amateur in You, Part 1

What have you been pondering?

Antenna installation considerations (properties and features)

Before we install an outdoor or rooftop antenna, we do our best to think of everything necessary to optimize the benefits of perhaps our most important station component. Still, one or more antenna concerns occasionally evade us until the fix becomes more hassle than it's worth. I'm hoping this expanded checklist might provide you with some reminders during your installation, to help you avoid the mistakes I've had to learn from.

While some of these ideas apply to HTs (handheld transceivers) and mobile solutions, they're primarily focused on a fixed home installation. And since every residence is different, you might need to use your imagination or a good elmer to help you tailor some of them to your own living quarters.

Domestic support

Before committing to any sort of amateur radio antenna installation, be sure to secure the approval of your spouse or significant other who shares your living space. Maintaining a good family relationship is more important than any hobby concern, and failure to prioritize your spouse over your craft will often result in a less-than-pleasant outcome.

Some amateurs face the prospect of incurring the potential wrath of their HOA (home owner association) if they install an antenna on a house within theirs. Unsure how the HOA might react, some will approach their leadership for permission or guidance to proceed, only to be met with resistance due to a supposed cosmetic violation imposed by such an addition. Often, it's simply better to use good judgment and install the antenna, then take it down only if it's discovered, because most HOAs honestly won't care about your antenna until they're forced to answer your question.

Also, being sensitive to the feelings of your neighbors about an antenna that might obstruct a picturesque view or potentially reduce their property value can go a long way toward avoiding an unpleasant confrontation. Instead of approaching them directly about it, however, simply engage your neighbor in casual conversation, then just happen to bring up the prospect of an antenna installation, while listening carefully to their responses.

Aesthetic compromise

If your spouse and neighbor seem to approve of your aerial intentions, return the favor by not going overboard with your project. Prefer to install your antenna in the rear of your house instead of facing the street. Often, a vertical antenna will appear less intrusive than a long wire. And if a vertical is in your plans, keep radials to a minimum.

If the goal is a compromise between performance and aesthetics; your effort to erect a pleasing installation might result in reduced signal output, for example, but might be the best course of action overall. This could therefore place a Yagi, a hex beam, or a cubicle quad out of the question.

Feed line

For most hams, the ***feed line*** is coaxial cable (coax), and typically ***RG-8X*** or ***LMR-400***, depending on the band(s) it needs to carry. Once you've considered what type (model, size) of feed line to install, often the biggest problem is how to route the cable into your home. I recommend against propping open a door or window for it, because temporarily that can damage the cable by repeated pinching, and permanently it can invite little creatures such as insects and rodents inside.

The Amateur in You, Part 1

Continued

Open-wire line, ladder-line, window line, and twin-lead exhibit probably the lowest loss of any feed line. Still, I encourage you to avoid those feed line types unless 1) your total anticipated feed line length is more than 150 feet and 2) you understand well how to work with those feed line types. For one thing, they cannot come near metal like coax can, due to unwanted coupling. For another, they require a special ("balanced") type of tuner. Yet another, they are much more prone to picking up noise because they lack shielding.

It's often difficult to guesstimate the length of coax you'll need just by looking, even if you're adding up tape measure stretches. One accurate way to measure your coax need is to tape actual coax in place around the actual location you plan to run it. That can get a bit time-consuming, but if accuracy is what you need, that might be your best method. Afterwards, however, be sure to add about six loops of eight inches times π, or about 12½ feet, to the length, for an RF choke.

You'll need at least two runs of coax, one from the antenna to the surge suppressor (lightning arrester) on the ground rod, and the other from the surge suppressor to your shack. Be sure the one between your antenna and the surge suppressor includes enough for the RF choke.

As you're routing the coax, be sure to avoid sharp bends, which can cause the dielectric to get pinched, resulting in impedance bumps, and therefore unwanted signal reflections. Where you need to get around corners, attack the edges at an angle, instead of straight-on. Make every effort to avoid nicking or scratching the jacket. If possible, avoid exposing coax to animals that will chew on it. You can purchase rodent-repellant coax, whose jackets are distasteful to animals such as rodents and raccoons. If you choose to bury the coax, be sure to purchase the DB (direct-burial) type.

Feed point impedance

One of the most important antenna considerations is feed point impedance, meaning measured where the feed line meets the antenna or its matching section. The easiest way to measure the feed point impedance is by an antenna analyzer. Using one, you're looking for the lowest SWR your antenna can offer, typically under 2.0:1 or less across the band of choice.

Measure the antenna feed point impedance right where the coax meets the antenna, not back at the transceiver. If you measure the antenna impedance at the transceiver, the coax loss can make the antenna SWR seem lower than it really is. Therefore, if your coax is relatively long, the SWR reading provided by your transceiver can be unreliable.

If the SWR for your antenna is too high, you can bring it down to workable levels by a permanently installed matching section, a balun, or a tuner. A (beta, gamma, pi, etc.) matching section is more practical for VHF or UHF antennas, due to the wavelengths in question. A balun (impedance transformer) is more useful where a large impedance transformation (4:1, 9:1, 49:1, etc.) is necessary, and a tuner is more useful if the transformed impedance exhibits an SWR of around 3.0:1 or lower.

Grounding

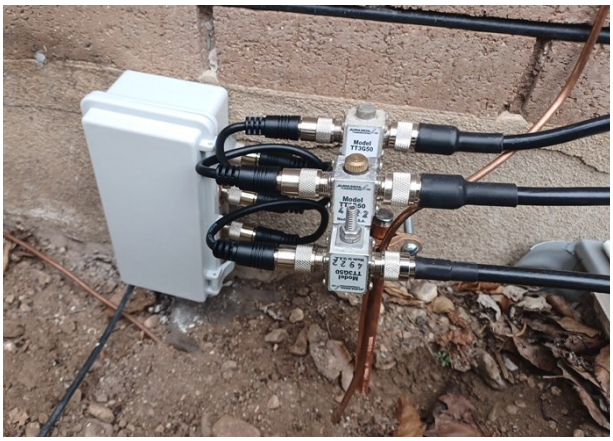
You must ground your outdoor antenna, not for performance, but for safety. If grounding your antenna seems to solve a performance issue, you've got an antenna problem that's being masked by your grounding. By ***performance*** I'm referring to feed point impedance, efficiency, pattern, noise, and bandwidth; essentially, how effectively it works.

Ground your outdoor antenna 1) from its ground conductor by ground wire to a ground rod, and 2) from its ground conductor by the coax shield to a surge suppressor.

The Amateur in You, Part 1

Continued

Once you install your ground rod in the dirt just outside your shack, install a ground clamp and a surge suppressor onto the ground rod. Connect a length of bare solid 4 AWG wire between the base of the antenna mast and a ground clamp on the ground rod, making as few bends as possible. Then, form the RF choke from the coax, connect it to your antenna on one end, and to one side of the surge suppressor on the other.



Feel free to run the 4 AWG bare ground wire from the antenna ***alongside the coax*** from the antenna, and even tie them together. A little outside the scope of this discussion, but be sure to run another length of 4 AWG solid bare wire from your ground rod to the ground of your home service box if possible.

Height

Unless you're installing a ground-mounted vertical antenna, the height of your antenna over ground is important. If your horizontal wire antenna is lower than a quarter-wavelength off the ground, your antenna pattern will likely be omnidirectional. If it's less than a half-wavelength off the ground, it's a little more directional, but meant more for NVIS (state-wide and national contacting) than DX (international).

The height of a vertical antenna is typically measured from its lowest point over ground, not its highest point. The height of a horizontal wire antenna is typically the average between its lowest point and its highest point, especially for a sloper or inverted-V.

Radials and counterpoise

Most of these height qualifications apply to vertical antennas, as long as they are counterpoised, which turns them into a vertical dipole. A counterpoise is simply the missing portion of your antenna if it was a dipole. Many good operators have reported success without using radials, for which I would say that 1) they are lucky, and 2) they might not realize what they're missing.

Radials are important for vertical antennas because they serve as a counter-balance to its vertical radiator. You'll also need to install a counterpoise wire for an end-fed HF antenna, because such an antenna acts like a vertical radiator that's laying sideways.

Conductive proximity

While for performance it doesn't really matter where you string your coax, where you mount your antenna can matter a great deal. Avoid installing it near metallic items, such as gutters, siding, stucco, or a metal shed. Keep your VHF antenna at least eighteen inches from another antenna, and keep your HF antenna at least eight feet from another antenna. Installing on a metal roof should not be a problem.

Locate your overhead power lines, and keep your antenna at least twenty feet from them, even if your power lines are insulated. And that's just for shock safety. For performance (noise, power line hum), first listen for noise using a portable HF radio and antenna near the proposed antenna location. Move your portable unit around to find sweet spots that are the least affected by the noise, then repeat that for another band.

The Amateur in You, Part 1

Continued

Terrain

If your property is a floor higher on one side than another, that sloping land will likely affect your antenna pattern by favoring a downhill direction. This means the opposite uphill direction will just as likely become compromised, possibly preventing some contacts from the uphill direction. Although by no means certain, mounting your antenna higher or using a Yagi beam are possible ways of counteracting such a hill.

Mountains a couple of miles away are not likely to affect your performance unless the tops are greater than, say, thirty degrees above flat ground at your house.

Obstructions

Installing an antenna on a house surrounded by a forest will have little effect on most amateur radio frequencies. Being surrounded by numerous trees will affect VHF much more than they will HF, primarily due to the frequency, but also because of the takeoff angle, which for VHF is nearly horizontal. There will be alight increase in signal attenuation when the trees are wet or snow-packed, but not significantly.

Nearby buildings, large vehicles, and other obstructions will likely affect antenna performance more than trees will. Overcoming these obstacles requires *aperture*, or the amount of surface area the antenna is facing unobstructed. For example, its aperture inside a house is often limited to the window size, while for nearby structures it's limited to the space between the buildings, especially if your neighbor uses stucco.

Mounting hardware

Decide whether you plan to install a rooftop mast using an eave mount or a tripod, or maybe some other method. When installing a tripod, be sure to place roofing pads under the feet to prevent water damage to your roof. Be sure to use lag screws to secure the tripod to the roof, three to each foot. They should be long enough to penetrate the tripod foot, shingles, paper, and plywood, at least 1½˝ for most roofs.

Many people prefer using trees to mount their wire antennas, but I discourage that practice for several reasons. Trees grow, both upward and in thickness, and in time that can both strain your antenna and swallow it. The antenna can also easily work its way loose after repeated wind storms. Some operators use a set of pulleys and weights to work around tree issues, as long as you use UV-resistant rope.

Depending on its height and wind load, your vertical antenna or vertical mast might be tall enough to require guying. In other words, ropes or wires that stabilize the vertical item to prevent it from falling over and potentially damaging your house.

Weather-proofing

You can apply dielectric grease to ensure a good, waterproof connection for all coax connectors that are exposed to the weather, but be sure to also seal them with silicone self-fusing tape. I recommend against sealant paste or electrical tape, because they both can result in a gooey mess if you ever need to remove the connector (more often than most will admit), and electrical tape requires skill to prevent it from coming apart.

Keep in mind when weatherproofing by conduit or piping, that pipes invite two things, no matter how well you seal the pipe: insects and water. There are good resources that can help you seal up your pipes effectively, but be prepared to clean them out in the future anyway.

Final inspection

The Amateur in You, Part 1

Continued

You might have used a level to ensure a horizontally flat or vertical mast, mount, or other antenna part, but nothing beats a visual inspection. Does it look straight to you from a couple dozen feet away? Does it look straight to your spouse?

The three rules of amateur radio are ***test***, ***test***, and ***test***. First test is to analyze your antenna alone by connecting your antenna analyzer as close as possible to your antenna feed point. Make sure the SWR bandwidth looks acceptable for each band you want your antenna to support. This means that the entire portion of the curve on your analyzer that measures SWR 2.0:1 or less fits within the expected antenna bandwidth.

Second test is to make some contacts, first on repeaters, then by simplex for a VHF antenna, or with some distant POTA activator for an HF antenna. Request an honest signal report (please not a "radio check" because your radio will likely be working properly). Call a friend on the phone, ask him or her to get on HF and give you a report. Keep in mind that your location might not be ideal for your friend due to a number of reasons.

Third test, as required by the FCC, you must perform an emissions evaluation on your station and antenna for each band you want to support, both at the controlled and uncontrolled proximity. Record those measurements and post them on your website, your QRZ page, or other publicly available spot.

Coming full circle, be sure that your masterpiece looks pleasing, or at least acceptable, to your spouse, as mentioned at the start of this article. If it doesn't, you'll need to swallow your pride and either adjust your antenna and feed line to his or her pleasing, or take it down. Attempts at bribery, flattery, tradeoff (compromise), or other kinds of manipulation will not likely produce a favorable marital outcome, and is not supported by this author.

Summary

Wow, so many things to be aware of! On the surface, antennas seem pretty innocent, but when you set out to install one outside your house, little concerns begin to emerge. This list allows you to address potential antenna and mounting concerns before they become problems.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

The Amateur in You, Part 2

What have you been pondering?

You might want to display numbers

During the lives of most hams, there comes a time when each must decide how programmed channels are displayed on their radio. The overwhelming majority of transceivers will only display the channel name, the channel number, or the frequency, but not a combination of them. When faced with choosing one or another, most operators tend to select the channel name (also known as the *alphanumeric tag*) as their choice of display, because the six-digit numerals are not very meaningful to them.

Before too long, it becomes apparent to many of these same operators that the labels are not standardized, in spite of some published Standard Load lists. In a hurry, the operator might call a friend and ask to quickly turn to the "ABCXYZ" channel for example, only to find that the friend has no such name programmed in his or her radio. In order to get on the same page, they both switch their displays to show the frequencies instead, coordinate by frequency numbers, and the two can begin communicating by radio.

It turns out that the six-digit frequency is the only thing everybody can agree on. The suggestion here, however, is not necessarily to resign yourself to seeing displays of numerals for the rest of your life, but to find an easy way for you to connect your names or channel numbers with their frequencies. One way of doing this is by keeping a nearby paper list handy. A paper might seem awkward, old-school, and prone to getting lost or damaged, but it does work for many operators.

Another is by purchasing a radio that can display both the channel name and frequency for each channel. Unfortunately, that feature is rare, and typically only found on a few mobile units and a few expensive handheld models. For them, simply use computer software to associate the names with their frequencies, then upload the programming to the radio.

Also, when displaying names of repeaters on the radio, people tend to forget which label goes to which repeater. If the frequency is displayed, it's easy to verify the correct one, whether the offset and tone are enabled, and which shift direction is being used. If a friend is in need of a specific repeater frequency, you won't need to fumble with the menu to place your radio into the ***NAME*** mode to see it.

Finally, whether you set your radio to display names or frequencies is completely up to your comfort level, and you might never experience the problems just mentioned. Neither way is the right way or the wrong way, but it's something you might want to think about.

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Hot Tips

Good info for the new ham, and old stuff to refresh your memory

The misnomer of *simplex*

In amateur radio, when we communicate with another operator on a single frequency, we refer to that operation type as ***simplex***. However, it turns out that what we call simplex really isn't. The industry definition of simplex is ***one-way operation***, which means something is sending a message and nobody and nothing is responding to the message using the same pathway. Examples of this method include broadcast radio, a musical instrument, a protester on a bullhorn, and a siren.

Because of our two-way communication objective, one-way operation in amateur radio is generally not permitted. The few exceptions to the "one-way" prohibition are outlined in Part 97.111(b). One of these is an attempt to make a contact; for example, when I turn on my mobile radio and the channel sounds silent, so I call out "KNØJI, mobile and monitoring" yet nobody answers. In that case, I had made a one-way announcement, but my obvious ***intention*** was to make a two-way contact, which satisfies the exception.

On the other hand, what we amateurs refer to as simplex is permitted, because it is not actually one-way communication. The industry refers to our simplex as ***half-duplex operation***, which is roughly defined as two-way communication using the same pathway, but **one way at a time**. This is how we talk with each other on the radio without a repeater, by communicating station-to-station using one frequency.

Repeaters

Industry defines ***full-duplex operation*** as the ability to communicate both directions simultaneously, like you experience when talking on the phone. Typically, full-duplex requires two separate communication channels (technically ***dual-simplex***) or duplex emulation (***time-division duplexing***). Repeater operation is considered *pseudo full-duplex* operation because it uses a full-duplex (simultaneous two-way) operation to simulate a half-duplex action. In other words, a repeater receives on one frequency and transmits simultaneously on another (called an ***offset***) frequency, yet we use the repeater to communicate through it one-way at a time.

Also, many transceivers and their manuals refer to "repeater" operation as *duplex mode* or *offset mode*, whose setting names reflect the fact that the operation is being conducted using a frequency offset. This allows the transceiver to handle the communication method transparently, allowing us repeater users to talk with others as though we're all on (amateur) simplex or (industry) half-duplex.

HF ***split operation*** is another form of half-duplex, only without the repeater. Using VHF/UHF bands, you can do the same by two radios, one set to a repeater and the other set to reverse operation on the same repeater. In both cases, each operator is transmitting on one frequency while listening on another.

Semantics

Keep in mind that when we start using our ham terminology outside the amateur circle is when it starts getting confusing. This abbreviated chart compares the amateur term with the corresponding industry term for the operating methods we use:

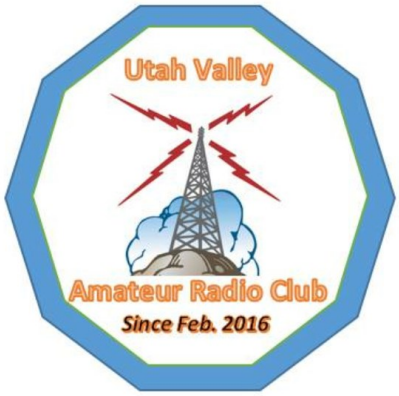
amateurs call it	one-way	simplex	repeater
industry calls it	simplex	half-duplex	full-duplex

So, we can call our single-frequency, station-to-station communication *simplex*; just be aware that purists might be listening.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

DIY

Worthwhile projects you can build on your own



160-meter Inverted-L antenna

A couple of months ago we discussed the ***Top Band***, which is the 160-meter band, and why it's just a little different from the others. One of the big differences is the difficulty in building an effective 160-meter antenna, due to the necessarily large size that accommodates the long wavelengths. Well, as they say, *there's no free lunch*, and I'm not able to concoct any magic top band antenna that can fit in your pocket, yet can work the world. But I can offer an effective compromise that's not quite as large and tall as a full-blown 160-meter dipole.

A favorite of many top band amateurs (as well as some commercial and military) operators from days gone by is the ***Inverted-L antenna***. The antenna is basically an end-fed bent in a right angle to form both a vertical section and a horizontal section. One advantage to the Inverted-L is that, even though the antenna is a ***quarter-wave wire***, you can adjust its length and height according to the needs of your real estate. Another is the fact that it possesses a vertical section, which is great for DX and intercontinental, and a horizontal section, which is ideal for local and NVIS contacting.

The unique feature of this particular Inverted-L antenna is its radial system, which takes part of the antenna underground. That's assuming ***we're going to install it on the ground***, instead of on some rooftop or tall building. If we were going to install the antenna up on a structure, your radials would each need to be about 65 feet long. Yikes. The good news is that the angle of elevation for our antenna is typically between 20° and 35° above the horizon. Some notes for this antenna were taken from this website and this video.

Parts list

280 feet 18 AWG stranded wire with silicone insulation

One 1116det 1:1 unun with SO-239

One pkg garden staples

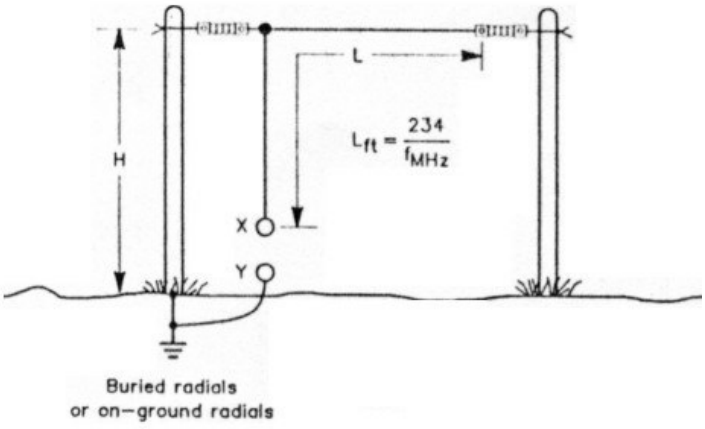
320 feet paracord

Two dogbone insulators

Construction

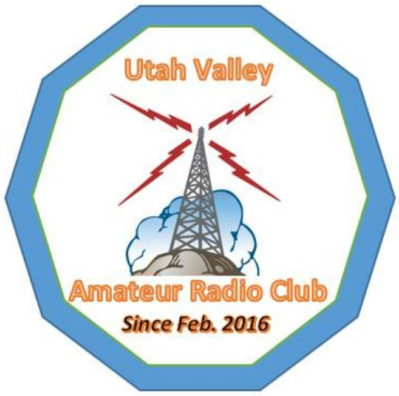
I'm going to keep this one simple, because there's not much detail to construct. The two items I leave to you are the transformer and the masts.

1. Because the Inverted-L whose height (H) is 32 to 35 feet typically presents a reasonably low impedance at the feed point (X—Y), there's no need for a matching transformer (unun) that does much more than attenuate common-mode current; hence the store-bought or home-made 1:1 unun or current balun. The unun has two equal antenna connections, but per



DIY, continued

160-meter Inverted-L antenna



the above diagram, I'll refer to the one connected to the long antenna with the "X" connection and the one connected to ground as the "Y" connection.

2. The masts should be tall enough to comfortably hold your Inverted-L sufficiently high, meaning 40 feet near the fed point (to hold the vertical portion 35 feet high) and at least 30 feet for the far end. The far (30-foot) mast can be made of any material, but if any part of the wire hangs or droops close to a mast, that mast should be non-conductive, like fiberglass. I recommend installing a short fiberglass or PVC mast on the roof, making the total height about 40 feet. The tops of both masts will be strained by the pull toward each other, so be sure to counter-pull them by guy wires pulling on the masts opposite each other.

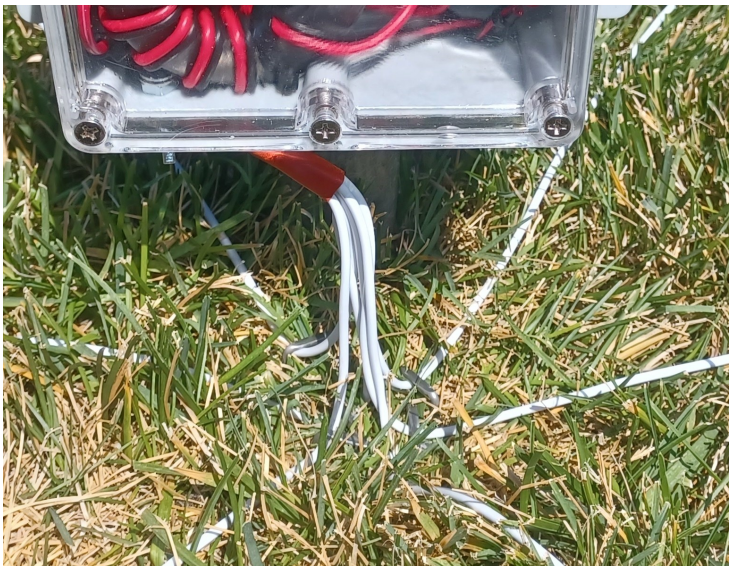
Where you mount the unun (as low to the ground as you can) and ***how*** you get the coax into your house are concerns I leave to your own preference, experience, and imagination. If possible, either use the near (40-foot) mast or drive a piece of wood or fiberglass into the dirt, and mount the unun sideways on that mast a few inches from the ground. I recommend a comfortable working length of RG-8X with PL-259 connectors for your coax.

The antenna wire system

Cut a wire 137 feet long (two feet for mounting). The wire antenna will consist of a vertical radiator and a horizontal matching all made from a single 135-feet wire. Connect one end of the wire to the unun "X" connection and the other end of the wire to an insulator mounted on the distant (30-foot) mast. Be sure to keep every inch of the long wire at least six feet away from any large conductive object, such as gutters, siding, and ground. If you use a pulley system instead of insulators, it will not matter much that the pulleys are metal.

Your long wire will sag, and that's normal, but stretch it tight enough to prevent it from sagging more than a couple of feet. As you're stretching the wire tight, you might notice that the greatest pressure on your masts will be the downward pull, which is why telescopic masts are not ideal for an Inverted-L antenna.

The radial system



Cut six wires 25 feet long each. Electrically connect one end of each of the wires to the unun "Y" connection. Spread out the wires radially evenly from the unun across the dirt / lawn. Staple each wire into the dirt directly below the unun, stretch out the wire straight, then staple the end of the wire into the dirt. Staple each wire at eight to ten more evenly spaced locations along the wire.

Obviously, if the near (40-foot) mast is mounted on the roof, at least half of the radial field will be unavailable. In that case, use all six wires, but staple

DIY, continued

160-meter Inverted-L antenna

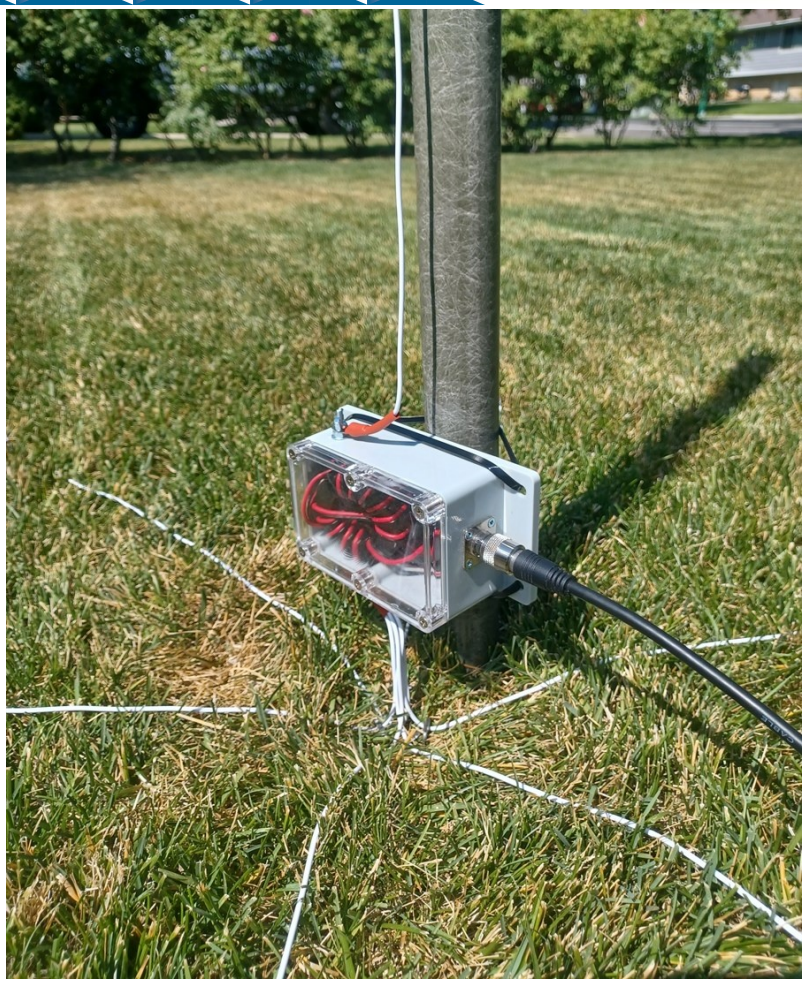
them into the dirt where you can, even though they're closer together.

At this point, the antenna is complete. If you plan to leave the antenna out in the weather, be sure to wrap the coax connectors with self-fusing waterproof tape or similar. Difficult as it might be, if it looks like rain, take down the antenna right away.

Note: contrary to some thinking, one or two or six ground stakes cannot replace the radial wires, because of their reduced ground connection and lack of aperture.

Testing the antenna

Raise the antenna into the location at the height you intend for it. Connect your antenna analyzer through a short piece of coax to the unun, and examine its SWR bandwidth on 160 meters. Once you get it to look fabulous, replace your analyzer coax with your actual working coax, and start making contacts at night. If the band is too noisy, or nobody seems to hear you, check your signal on the WebSDR.



Finished and tied to a fiberglass pole near the ground, showing coax, long wire radiator, and stapled radials

Conclusion

An antenna for 160 meters can be difficult to build, due to living conditions or lack of real estate. The Inverted-L can be an effective compromise antenna for 160 meters if you can lay down radials, which are key for it. Because an Inverted-L is a vertical radiator, height is also key, but its adjustable height and length are another of its convenient advantages.

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Living in the Past

Historical perspective

Forgotten Apollo 11 eavesdropper

20 July 1969, the day of the Apollo 11 moon landing, Larry Baysinger W4EJA of Louisville, Kentucky, made history by being perhaps the first amateur to independently pick up the moon landing dialog using home-grown and surplus equipment.

Ever since the 1950s Larry has had a fascination with radio, and the fact that military surplus equipment left over from World War II was not only abundant but very inexpensive, allowed many tinkerers and DIY enthusiasts like Larry to cobble together their dreams for a song. By the late 1960s Larry was working for WHAS radio 840 AM in Louisville while experimenting on the side with radio astronomy and satellite tracking.

At the time, rumors had already started circulating regarding fake NASA space achievements, and Larry was interested in verifying them by listening in on their conversations. He was determined to either bring to light information NASA didn't want the public to know or demonstrate unedited communication from the lunar surface by a non-NASA amateur.

After a series of successful distant space projects, Larry and friend Glenn Rutherford built a fully steerable 8-foot by 12-foot corner horn made of chicken wire, connected to a customized military receiver with unparallelled sensitivity.

Larry recorded about 35 minutes of the moon landing, including talk among Armstrong, Aldrin, and Collins and the congratulatory message from President Richard Nixon.

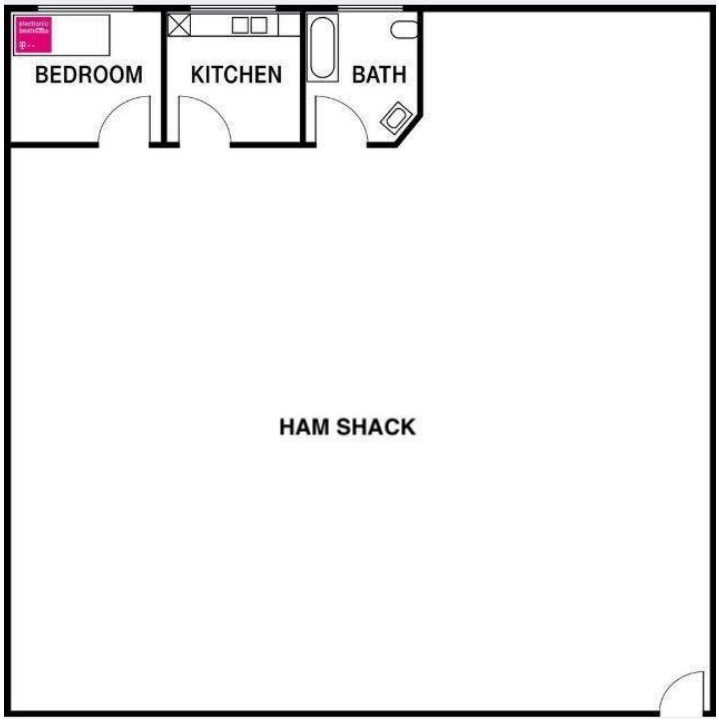
In the end, Larry said that he was disappointed to discover that NASA had not edited anything, but transmitted to CBS everything he had heard himself. He said he was listening directly while his wife and daughter were watching the moo landing TV broadcast, and noticed that he and Glenn were receiving the transmissions about five to ten seconds before his wife and daughter were hearing them.

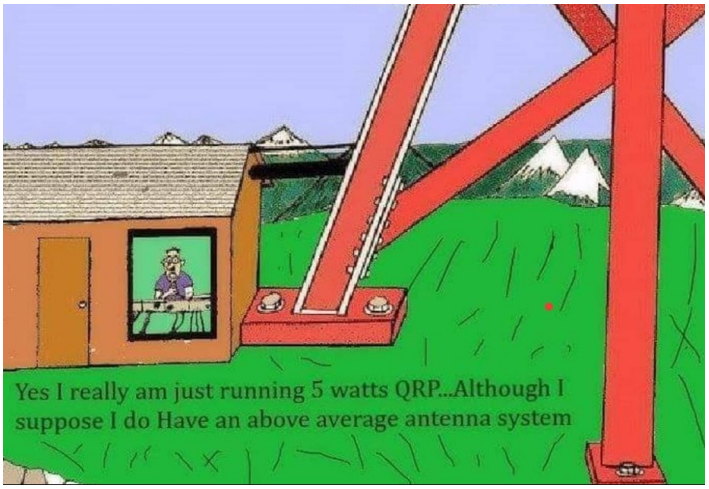
Then, just like that, this story vanished from history, living only on lost university microfilm until recently, when Chris Graney, physics professor in Louisville, uncovered the story in 2009.

You can read more about Larry's adventurous eavesdropping from ARRL and Vatican Observatory and Courier Journal.

Side of Bacon

A little ham humor





For Your Insight

Information you could use

Club meeting format

Here's the usual agenda for club meetings, at the Orem City Council Chamber Room, 56 N State St:

Talk-in frequency on the club repeaters

6:30 pm : Eyeball QSO

socialize / put faces with call signs

radio programmers available to help you

6:45 pm : Call the meeting to order

meeting lineup (agenda)

announcements / calendar / new hams

7:00 pm : Discussion / presentation

7:45 pm : Door prizes

7:55 pm : Dismiss and disassemble

8:00 pm : *Club QSY* to a local eatery

Something you'd like to see at the meetings?

Thanks to Heath Stevenson for making our monthly meetings possible!

Monthly meeting help

We're grateful for the volunteers who help with various tasks that make our club night just that much more friendly and useful to everybody. Monthly, we need help with

- programming radios (thanks, Ralph!)
- taking photos or videos during the meeting (thanks, Joe!)
- operating the talk-in radio
- setting up tables and chairs (thanks, Heath!)

Lynx

Websites for your education and leisure

Ham Radio Equipment
Ham Radio Nets
Radio Programming
Net Training Topics
76ers Group and UVARC Group pages
New Ham Page

Send your input to ***uvarcshack@gmail.com***

Test your knowledge

General and Extra review (answers next page)

G1AØ7 : On which amateur frequencies in the 10-meter band may stations with a General class control operator transmit CW emissions?

A. 28.000 MHz to 28.025 MHz only
B. 28.000 MHz to 28.300 MHz only
C. 28.025 MHz to 28.300 MHz only
D. The entire band

E1AØ1 : Why is it not legal to transmit a 3 kHz bandwidth USB signal with a carrier frequency of 14.348 MHz?

A. USB is not used on 20-meter phone
B. The lower 1 kHz of the signal is outside the 20-meter band
C. 14.348 MHz is outside the 20-meter band
D. The upper 1 kHz of the signal is outside the 20-meter band

Calendar

What's happening
(times are Mountain Time)

Provo Ham Exam Sessions

Provo Fire Station #2, 2737 N Canyon Rd

Sign up at HamStudy.org/sessions/nv7v

Wed 20 Aug, 7:00 to 8:30 pm
Wed 17 Sep, 7:00 to 8:30 pm
Sat 20 Sep, 2:30 to 5:00 pm
Wed 15 Oct, 7:00 to 8:30 pm
Sat 18 Oct, 2:30 to 5:00 pm

*Email **uvhamtest@gmail.com** for info*

Provo One-day Technician Courses*

Third Saturday Monthly at 8:00 am

Provo Fire Station #2, 2737 N Canyon Rd

** September through April*

2025 Orem Ham Radio Courses

Sign up at psclass.orem.org

Technician : Sep 16, 23, 30, Oct 7

Club Meeting Calendar (6:30 pm)

On YouTube Live, and Facebook Live

August 7	September 4
October 2	November 6 *
December 4*	January 8

† *Ham Radio Fair, Pheasant Brook Park*

* *At the Orem Friendship Center*

Regular Nets

UVARC Family Net, Sun 3:30 pm, 146.780
NE UC ERC Net, Sun 9:00 pm, 147.540 (s)
UVARC Maker Net, Mon 7 pm, 146.780
UVARC Ladies' Net, Tue 7 pm, 146.780
DMR Utah Net, Wed 6 pm, TG 3149, CC 1
Utah 76'ers, Wed 7 pm, 146.760
UVARC HF Net, Wed 9 pm, 28.345 / 7.220
UVARC New Ham Net, Thu 7 pm, 146.780
CERT Ham Net, 2nd, 4th Thu 8:pm, 146.780
Utah County 6-meter Net, Fri 8 pm, 50.140
Family History Net, Sat 8 pm, 146.780

See a larger list of nets at noji.com/nets

Upcoming Contests

European HF Championship
6 am to 6 pm Sat Aug 2

North American QSO Party (NAQP), SSB
Noon to midnight Sat Aug 16

State QSO Parties
Sat Aug 23 : HI, OH

State QSO Parties
Sat Aug 30 : CO, KS, Islands

See a larger list at contestcalendar.com

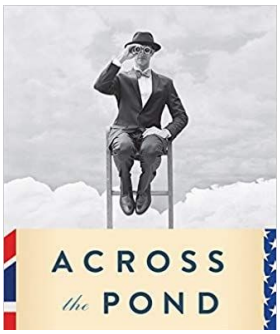
Answers to *Test your knowledge*

G1AØ7 : **D** (The entire band)

E1AØ1 : **D** (The upper 1 kHz of the signal is outside the 20-meter band)

Across the Pond

That is, the Utah Lake 'pond'



Eagle Mountain ham radio activities

A list of amateur radio activities near Eagle Mountain, organized primarily by Dave Becar KI6OSS. Unless otherwise noted, all these activities will be held at the Eagle Mountain City Hall, 1650 Stagecoach Run. Please contact Dave at **ki6oss6365@gmail.com** to register for any of the classes or exams, for any additional information, or questions in general.

August 2026 Technician Course

Thu 13 August, 7 to 9 pm
Thu 20 August, 7 to 9 pm
Thu 27 August, 7 to 9 pm
Thu 10 September, 7 to 9 pm
Thu 17 September, 7 to 9 pm

Ham Radio Exam Sessions

Sat 19 September, 10 am
Sat 26 September, 10 am (Swap Meet)
Open to all, for any license class

October 2026 Technician Course

Thu 15 October, 7 to 9 pm
Thu 22 October, 7 to 9 pm
Thu 29 October, 7 to 9 pm
Thu 05 November, 7 to 9 pm
Thu 12 November, 7 to 9 pm

Ham Radio Exam Session

Sat 14 November, 10 am
Open to all, for any license class

Ham Radio Nets

Eagle Mountain ECT Net
Sundays, 9 pm 147.220+ MHz (151.4 Hz)

Eagle Mountain Chimney Rock Stake
Sundays 8:30 pm 446.500 (s)

Eagle Mountain Central Stake
Saturday 8 pm 145.650 (s)

Vendors

For your convenience

Pockrus Joystick J-pole

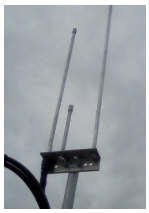
$30, open-stub aluminum half-wave, dual-band J-pole antenna

$40, 6-meter dipole, $20 for the 220 MHz (1.25 m) antenna

by Carl Pockrus, WE7OMG (email omgantennas@gmail.com to order)

Half-wave performance, solid construction, weather-proof, low wind-load

Probably the best-performing outdoor antenna you can get for the price



Super-Elastic Signal Stick

$22, vertical quarter-wave flexible antenna

by Richard Bateman, KD7BBC, of *SignalStuff* (and maker of *HamStudy*)

Super-performing antenna for your HT (handhold transceiver)

Visit SignalStuff and select SMA-Male, SMA-Female, or BNC

Ham Radio Podcasts v1.50

by Trevor Holyoak, AG7GX (email android@holyoak.com)

Stream podcasts (such as *100 Watts and a Wire*, *Amateur Radio Newsline*, *ARRL Audio News*, etc.) or download for later listening

For Android 4.1 and up (ad-free available for purchase)

Club Logo and Call Sign Embroidering

Want your call sign or name (or both!) embroidered on your shirt, your hoodie, your duffle? Or how about a club patch with your call sign?

by Glenna Gardner, WE7SEW (glenna0354@gmail.com or text 801-592-2503)

Call sign or name = $5, Both = $8, UVARC patch = $5, Patch with call = $9

Portable Aluminum J-pole

$60, sectioned, open-stub aluminum half-wave, dual-band J-pole antenna

by Stan, KJ7BDV and Kent, N7EKF (email skantenna@yahoo.com for info or call 801-372-7260)

Complete antenna breaks down into a compact 2″ x 6″ x 12″ package weighing only 3 lbs, perfect for backpacking and portable work where you really need a good 2-meter antenna

HamBadgers

Amateur radio name badges and other products

$10, official UVARC ham radio name badge with the club logo

Visit Ham Badgers and select Ham Radio Clubs > Utah Valley Amateur Radio Club

Email Eric Palmatier at hambadgers@gmail.com or call 919-249-8704

Where everybody knows your call sign

Utah Valley Amateur Radio Club
PO Box 1288
Orem, Utah, 84059-1288 USA

K7UVA
Phone/Text: 801-368-1865
Email: k7uva@arrl.net

Repeaters: 146.780–, 100.0
448.200–, 100.0 224.560–, 100.0
145.250–, 100.0 448.225–, 100.0
Newsletter input?
Email uvarcshack @ gmail.com
Need help?
Email uvarcelmer @ gmail.com

[See all our newsletters on uvarc.club]

We are the *Utah Valley Amateur Radio Club*, a 501(c)(3) non-profit (EIN 81-360-6416) Utah corporation (9752825-0140) that was organized in an obscure Orem fire station on 02-05-2016 to provide amateur radio enthusiasts in Utah County and surrounding areas a way to gather and discuss all things ham. Our primary purposes are to provide a local amateur radio resource, help new hams in their new-found adventures, and to give more experienced hams a reason to share their wealth of knowledge and wisdom in a friendly atmosphere of fellowship. We're an ARRL Affiliate and work in cooperation with the Utah VHF Society, but are not subsidiary to them, to ARRL, ARES, or any other organization, although many of our members and leaders might also belong to the same.

The *UVARC Shack* is copyrighted and published by the Utah Valley Amateur Radio Club, and its purpose is to convey the tone and temperament of the club, to inform and entertain its members, and to entice the rest. To join, go to uvarc.club/join, then sign up at www.facebook.com/groups/uvarc/ to stay informed. For more information about our club or about amateur (ham) radio in general, please email or text or call us.

More than just a club, we invite you to become part of a great ham radio friendship in Utah Valley and around the world

Club leadership

Presidency

President..... Noji Ratzlaff
Vice President..... Chad Buttars
Secretary.....Caryn Alarcon
Activities.....Joe Costello
Technology.....Trevor Holyoak

Board of Directors

Richard Bateman, KD7BBC
Carl Pockrus, WE7OMG
Jeff McGrath, N1SC
Jody Dollar, K7BUX
Jeremy Giovannoni, K7TEH
Brad Kirk, AF7FP
Alma Perry, W1ZGY
Loren Chandler, WB1KE
Harry English, AA1HE
Shawn Hatfield, KJ7SNE
Wade Shearer, KK7RRW

Club Sponsor

Heath Stevenson, KK7KOU
Orem City Emergency Manager

From all of us to you, 73

We love to eat...does it show?