A New Year of Ham

John Mitton, UDXA president, gave an engaging presentation in our January 2020 club meeting on *Benefits of Upgrading* (your amateur radio license).

In this issue of the *UVARC Shack*

A few photos from the January meeting, in which we welcomed a flock of new hams and upgrades, and a few from Winter Field Day.

*Brass Tacks* presents a step-by-step CHIRP guide. *My Shack* features K1LOK.

*Dear Annette* expounds on the emergency communication reason for upgrading, whether paint affects antennas, and contacting China. Discussion in *Hot Tips* on how to get more done with less talk. *DIY* for a 160-meter shortened vertical antenna.

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

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Club meetings

Recap

January 2020 club meeting

Many thanks to Joe Costello WH6QV, our roaming photographer, and to Trevor Holyoak AG7GX, our videographer and live-streamer.

Introducing and welcoming new hams into the craft
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

Frank Liebmann, K1LOK

My shack may be my basement office at home, my car, or BLM land in the middle of nowhere, Utah.

Having been interested in ham radio some time ago, I started to study back in the 90s, but the internet came along and diverted my attention until 2016 when I decided I should get a license. I passed my first two exams in January 2017 then became an Extra in June of the same year.

I participate in a few clubs and organizations. Besides UVARC, I'm a member of the Skyline Radio Club, UARC, Utah VHF Society, and ARRL. I am also a member of the 76ers, Mission Trail Net, FARM Net, Wyoming Cowboy Net, Northwest Country Cousins, High Noon Net, and Mercury Rocky Mountain Net; plus, I frequent the SINBAD Off the Wall Net. (Most of these are HF nets.) I also check in to some other HF and VHF nets from time to time.

My antennas are a J-Pole for home VHF, 5/8 wave mag-mount for mobile VHF, a G5RV and a random wire (sloper) for HF at home and a homemade portable vertical for HF in the field. Don't laugh at the vertical; it has gotten me a quarter way around the world on low power SSB. I also use a mystery antenna for these portable operations.

For transceivers I use an Alinco DX-SR8T for HF at home, a Yaesu FT-2900R for 2 meters in my car, TYT TH-7800 for VHF/UHF at home, and a Wouxun KG-UV8T HT.

I like contesting, but I am not a contester. It's a really good test for my equipment. I always will submit a log, even if I only make one contact. Many of those on the other end have spent a lot of time and money on equipment to contact me, so I feel I owe it to them. I've won a few awards like 2019 First Place for Piute County for the 7QP and First Place from Utah for the 2019 New Jersey QSO Party.

– 73, Frank, K1LOK
Winter Field Day
Annual club activity

Each year, during the last full weekend in January, the most winter-hardy hams get out their gear, their logs, and their courage, to brave the winter chill for the love of the craft. Similar to the Field Day in Summer, Winter Field Day (WFD) is an annual event that draws out our inner-most ham.

Like with years past, the goal of WFD is to demonstrate our ability to set up a station or a set of stations in short order away from home and commercial power, and make contacts with other hams far from our location. Amateurs have the option of going it alone or joining with others in a club or association to make these contacts.

WFD takes place for 24 hours straight, so multiple operators spread out over that time helped us operate our four stations. It was a lot of fun to make contacts with hams all over the US, and even in a few other countries, such as Germany and Belize.
Winter Field Day
continued

We’re very grateful to Lawrence Muir, Andrew Gabbitas, Rick Segeberg, and Carl Pockrus for towing and providing their travel trailers for the event, saving all of us from freezing.

Mud and a very dense fog made for an interesting weekend.

Our thanks to all who helped set up, operate, take down, and finish off the pizza. Ted Cowan operated CW for us, and Chad Buttars set up the digital station.

Huge thanks to Chad Bowcut for setting up our mesh communication, which coordinated the logging between the four stations.
Utah Valley Hamfest 2020

The Utah Valley Hamfest 2020 is looming around the corner. It’s an ARRL State Convention and a gathering of amateur radio enthusiasts from Utah and surrounding states. The Utah Valley Hamfest 2020, sponsored by the Utah Valley Amateur Radio Club, will be held on Friday May 8 and Saturday May 9, in the Sorensen Center of Utah Valley University (UVU), 800 W University Pkwy in Orem. Entry fee is $30, or $40 per family (there is an Early Bird discount). The purpose of a hamfest is to host seminars, breakouts, demonstrations, keynote speakers, vendors, small activities (build-it, fox hunt, HT programming, etc.), and door prizes, bringing hams face-to-face from all over. But this hamfest will also provide the following:

- Kiosks such as The Doctor is In (get answers to difficult technical or political questions), The Handyman (get an Anderson connector installed, have some wires soldered, let us attach a PL-259 to your coax, etc.), and Elmer Fudd® (your new best friend)
- Ham Anon seminar, for spouses of those addicted to ham radio
- Information on many aspects of amateur radio, including HF, digital, emergency, APRS, ARES, CW, SOTA, portable, satellites, EME, remote, and much more
- Many aspects of amateur radio not otherwise seen in club meetings and swap meets, such as fox hunts, and a massive eyeball QSO
- Special Event Station K7T to draw attention to the hamfest and get you on the air
- Door prizes from Icom™ sponsored by HamStudy.org

The website for the Hamfest is utahvalleyhamfest.com, and you can sign up there. We’re looking for volunteers and helpers, especially from those who have talents in some specific areas, such as RF technology, EmComm, programming, logistics, antenna building, and more. If you’d like to help out, or at least be part of the planning and organizing, please contact us at info@utahvalleyhamfest.com or 801-368-1865.

UVARC Field Day 2020

Not to be completely overshadowed by the Hamfest, UVARC is also looking forward to one of the biggest events of the year: Field Day. Jeff has been in contact with the weatherman, and assures us that it’ll be a lot warmer this year than during last year’s Field Day, in which it snowed for the first time ever during one of our Field Days.

Gather at the Co-Op Creek site just off Forest Road 451, near Strawberry Reservoir once again. Here’s a link to the map.

UVARC will set up three main stations, and include digital, CW, and SSB, plus a GOTA (get-on-the-air) station, satellite station, and at least two VHF stations.

We’ll be hosting a potluck dinner Saturday at 6 pm, with a sign-up sheet to be published later.

If you’re new to HF, this might be a good chance to get on the HF air for the first time, and experience first-hand what it’s like to communicate with others across the nation without going through a repeater. One step in long-distance emergency communication prep.
Guide to using CHIRP

Unlike cell phones, walkie-talkies, and CB radios, ham radios don’t typically arrive from the manufacturer or store, pre-programmed with a set of channels or frequencies. The programming is left to us, and we can choose to set up our radios manually or programmatically. If we elect to do it by computer, we typically use one of three applications to do the programming: RT Systems, manufacturer (“OEM”) software, or CHIRP. Just so you’ll know, RT Systems is probably the best amateur radio programming software there is, costs around $50, and normally sells with a programming cable as well. But if you want free, and you have the cable, then CHIRP might be for you.

You can use CHIRP to program HTs (handheld transceivers), mobile radios, and some HF rigs. This brief guide is not intended to be comprehensive, in that the focus will be on basic radio settings for analog HTs. CHIRP displays a slightly different interface between any two different transceiver models, so my intention is to remain as generic as possible, and recommendations tend to apply to all models. The example I present here will be for the Baofeng UV-82, a dual-band HT with only two power settings and one *bank* of memory channels. Make sure your transceiver make and model combination is supported before starting CHIRP.

Download the daily build

CHIRP works on Linux and Mac OS, but I’m going to describe its functions with the Windows version, since that’s what most CHIRP users tend to use. Download CHIRP from chirp.danplanet.com and install it on your laptop. After that, you should always download and install the latest daily build of CHIRP before you start programming radios on a given day. If a released build has been pushed to the repository since your own latest version, CHIRP will prompt you to upgrade the software. Always accept the offer to upgrade, and close the CHIRP window while it’s being updated.

Before starting CHIRP, plug your (typically USB) programming cable into your computer and allow Windows to discover the new hardware and install its driver. Be sure to use a cable that has an embedded chip made by FTDI or Prolific, if possible. If you’re not sure which chip it uses, it might still work fine if you’re using Windows 10. Press <Windows-X> (the Windows key and x) and select Device Manager. Open “Ports (COM & LPT)” and take note of which COM port the cable is using, then close Device Manager:

- Network adapters
- Portable Devices
- Ports (COM & LPT)
  - Intel(R) Active Management Technology - SOL (COM3)
  - Prolific USB-to-Serial Comm Port (COM5)
- Print queues
- Processors

With your radio turned off, plug the programming cable into it, make sure you have an antenna attached, and then turn on the HT, the volume set at least halfway.
Start the program

When you open CHIRP, it normally displays a very blank window, showing only the tab titles, so don’t let that worry you:

Click the Radio tab, then Download From Radio:
CHIRP will display the Port, Vendor, and Model dialogue window. Select the COM port number you took note of (that Device Manager displayed for your cable), along with the make (Vendor) and model of radio you’re going to program, then press OK. Also click to Proceed if warning messages appear regarding experimental drivers.

When the Instructions window appears, follow them and click OK:

If all is working as expected, CHIRP will display the Cloning window, to indicate the download progress:

Once the download is complete, CHIRP will populate the Memories spreadsheet with all the frequency and channel information that’s currently stored in your HT, which might not be meaningful if it’s not been programmed previously.

At this point, you’re free to modify the fields to accommodate your own programming frequencies and settings. But there’s an easier way.
Brass Tacks
continued

Go to my Software Programming link and identify your transceiver make and model in the table. Under your general location (UT Co, in this example), find three links, IMG, CSV, and PDF:

Click the IMG link, which (in this example) downloads CHIRP-Baofeng-UV-82-UTC0.chirp and saves it to your Downloads folder. In CHIRP, click File, then Open:

Navigate to your Downloads folder and select the .chirp file you just downloaded. CHIRP will now display a new tab, which contains the frequency memories and settings information stored in the file:

With the Memories tab showing on the left, click the new tab, then click the first Loc number:
Highlight all the rows you want to copy, as you would any spreadsheet, and copy them. Click the first tab, then right-click the first Loc number, and select Paste.

In the Overwrite? window, click All:

Click the Settings tab on the left, and set up some basic settings for your radio. I recommend the following:

**Basic Settings**
- Beep: NOT enabled
- Roger Beep: NOT enabled

**Advanced Settings**
- Dual Watch: Enabled
- Automatic Key Lock: NOT enabled
- Busy Channel Lockout: NOT enabled
- Squelch Tail Eliminate: NOT enabled
- Broadcast FM Radio: Enabled
- STE Repeater Delay: OFF
- RESET Menu: Enabled
- All Menus: Enabled

**Other Settings**
- VHF TX Enabled: Enabled
- UHF TX Enabled: Enabled

**Work Mode Settings**
- VFO/MR Mode: Channel
- Keypad Lock: NOT enabled
- VFO Bandwidth (both A and B): Wide
- VFO Tuning Steps (both A and B): 10.0

**FM Radio Preset**
- FM Preset (MHz): 102.7
In the Service Settings page (only applicable to Baofeng HTs), change both the VHF and UHF squelch settings to the following:

<table>
<thead>
<tr>
<th>Channel</th>
<th>VHF Squelch</th>
<th>UHF Squelch</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>5:65</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>6:75</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>7:85</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>8:95</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>9:105</td>
</tr>
</tbody>
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Now, with settings and memory channels set as you want them, you’re ready to store them into your HT’s memory. Optionally, I recommend that you first save your hard work onto your computer. Click the File tab, then Save As, and give your local file a meaningful name. By default, CHIRP will store its information in a binary file with the .img extension.

Click the Radio tab, then Upload To Radio:

CHIRP will display the Port, Vendor, and Model dialogue window again, only this time the Vendor and Model entries will be grayed out, indicating that you aren’t able to modify them. Click OK to start the upload (Clone) from CHIRP to your HT. Once the upload process is complete, CHIRP will re-start your HT. Turn off the power to your HT, then unplug the programming cable from it.

Epilogue

At this point, your HT is all set and ready to be used. There are many points along the way where something could go wrong, causing you to re-start the procedure, but I’m going to leave them to you as a training exercise. If you run into anything you just can’t figure out, please feel free to shoot me an email.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)
Dear Annette:

I just went to the January UVARC meeting, in which the presenter encouraged people to upgrade their licenses if they haven’t already. One of the reasons he gave for upgrading was to help with communication during an emergency. But isn’t it true that during an emergency, a person can communicate by any means necessary if life or property is in danger? If so, why would I need to upgrade, if I only do HF for an emergency?

David in Orem

Dear Annette:

We licensed American hams are indeed permitted to communicate with licensed amateurs in China. However, we are not permitted to carry out a third-party communication with an unlicensed person in China.

Dear Justin:

Will operating ham radio affect my pacemaker?

Dave in Cedar Hills

Dear Annette:

According to the ARRL, it likely will not, but consult your doctor to be sure.

Dear Orson:

I’m not aware of any type of paint that will noticeably affect your transmission, reception, or SWR, if you’re operating under about 600 MHz. Then again, you might also want to avoid using conductive paint if it’s going to come in contact with both conductors of your antenna.

Dear Annette:

How come you never check into the Ladies’ Net?

Sandra in American Fork

Dear Sandra:

You don’t know that.

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

When you're in real trouble, calling out for help could mean life or death for you or the people with you. And knowing how to get people's attention to obtain that help isn't always obvious.

Use your cell phone

Your phone will be your primary lifeline in most cases. When you find your life, health, or property in immediate danger, call 911. There are times when a phone call might not be available to help you, because many others are calling for help the same time as you. In that case, try texting for help; texts will often get through an overloaded cell tower when a call will not.

Use your radio

If your phone battery is dead, or cell service becomes unavailable, resort to radio. Hopefully you'll have your grab-and-go bag handy, and it'll contain your ham radio. And if you've managed to escape by car, hopefully you'll have a ham radio installed in your vehicle. Here are steps you can take to call for help by radio: (Except for the call sign, the following are not limited to ham radio, and so can be used on other radio types as well.)

1) Listen on your Area frequency (if you're near home), City frequency, and Emergency frequency, for a net or communication already in progress. (Your Area frequency is typically organized by your local religious body or geographic area of citizens. Your Emergency frequency is organized by your county ARES group, or dictated by the Wilderness Protocol.)
2) At an appropriate moment, break into the ongoing net or conversation and announce that you have a problem that needs to be addressed immediately
3) If you don't hear anybody talking, set your radio to scan all the frequencies in memory. When the radio stops on a valid conversation, go back to Step 2.
4) If all else fails, change to your Area, City, or Emergency frequency, and say This is K17ABC, and I need help right away. or This is K17ABC. Could somebody help me right away? or This is K17ABC. Could somebody get me an ambulance right away? Avoid using the words "emergency" or "break"; by habit many equate these words with drills or simulated exercises.

Use any means

If you're experiencing a true emergency, you can do just about anything relatively safely to get the attention of others who can help you.

- Make a loud noise with these (three times, wait five seconds, then repeat)
  - emergency whistle
  - banging metal, such as pots
  - shouting
  - anything else to grab attention
- Post signs, ideally in large, red print
- Send a runner to get help
- If you're outdoors, clear the area, then set three fires spaced evenly apart in a line
- Smoke signals (do you know how? it has nothing to do with Morse code)
- Anything else? Use your creativity safely.

When deciding to use any means available, make sure you balance how much of a danger you're in, with reason. Use your head, and keep safety first in your mind, in spite of the adrenaline coursing through your veins.
The Amateur in You, Part 2

What have you been pondering?

The ham police

Every so often one of us likes to joke that if we sing a line of *Happy Birthday* on the air, or fail to give our call sign, the “ham police” is going to come knocking on our doors. So, is there actually a “ham radio police force” or some such body that listens for rules violations? If so, who are they?

Official Observers

During the dawn of amateur radio, although many rules regarding frequency usage (allocation, bandwidth, power, etc.) and operating procedures were in place, violations were frequent and flagrant, more often because of equipment malfunction, but also due to malicious practices. At the same time, the federal government could not manage the volume of complaints about radio frequency interference and non-compliant stations. With the establishment of the FCC in 1934, the feds worked with the ARRL to establish a team of Official Observers, located at field offices, who helped local amateurs bring their equipment and practices into compliance.

For nearly 85 years, Official Observers have sent notifications to amateur operators for repeated violations, corrective action recommendations, and exemplary practice citations. Many will get on the air and help amateurs improve operating skills or explain how to correct certain problems. Their job is not to listen for every possible violation on every frequency, but more often to act upon complaints reported to the FCC, then referred to the Official Observer for evidence collection. Official Observers themselves do not enforce the rules.

Amateur Auxiliary

The Official Observer program is part of an arm of the ARRL known as the Amateur Auxiliary, which works closely with the Enforcement Bureau of the FCC. Their job is to oversee the work of interference monitoring and violation reporting. Their main objective is to encourage a wider knowledge of, and better compliance with, FCC rules.

Volunteer Monitors

In October 2019, the ARRL, in cooperation with the FCC, established a program called Volunteer Monitoring, which replaced and retired the Official Observer program. The FCC felt that, with the reduced number of field offices in recent years, they had to change their reporting mechanism of compliance violations in response.

The creation of the Volunteer Monitor program re-energized the enforcement efforts in the amateur radio bands. This was done by the FCC shifting the coordination of cases and evidence gathering to the ARRL, retaining for themselves the responsibility for decisions regarding final actions and enforcement. Unlike Official Observers, Volunteer Monitors serve for a maximum of three years, with up to three VMs per ARRL section.

Self-policing

Because the Amateur Auxiliary attempts to help amateurs remain knowledgeable and compliant, they foster the notion that amateur radio is a self-policing system. The idea is that, the better educated the amateur population is, the more compliant they’ll be, and it’s hoped that their general compliance will prompt peers to want to follow the rules as well. This way, while the FCC and Amateur Auxiliary don’t have enough eyes and ears to listen for every issue, they’re counting on all of us to assist and educate other hams.

So, who really is the ham police? You are.
Be brief when it’s your turn

Let's face it...you probably love the sound of your own voice, and can listen to it for hours. Unfortunately, not everybody shares your love for your voice. For many of us, it's easy to get a bit long-winded and start rambling. In short, be brief, but within reason.

Common courtesy

Unlike with cell phones, when you're on the radio, you have a captive audience. I mean, as long as you're talking, there's no way for the others listening to interrupt you or stop you. Are you certain that what you have to say is that much more important than what the other person is saying? Yes, you have a lot to share, but practice common courtesy, and allow others a chance to speak their minds as well.

This is not to say you need to limit your turn at the mic to two-word sentences; in fact, you should feel free to speak. Just think about what you're going to say, then try and be concise, that's all. Sometimes it's just not practical to cut your statement shorter, and that's alright too. The point is to use good judgment and be considerate of other people's time.

Practical reasons

Most radios include a feature known as a timeout timer (or transmit overtime on some transceivers), often labeled TOT, and is typically set for 60 to 120 seconds. Its purpose is to prevent your signal from being transmitted for longer than it should. One reason to limit your transmission time is to prevent "timing out the repeater" or exceeding the repeater's own time-out timer, which is typically set to between three and ten minutes.

If you should ever time out the repeater, the repeater might reset, and possibly reboot its controller, which can take several minutes to revive, preventing everybody from accessing the repeater during that time. If your station has a "stuck mic" or a microphone whose PTT does not release, the repeater might reset repeatedly. If this should happen two or more times within a short period, the repeater could remain "down" until the control operator can revive it remotely. (A hand microphone PTT can get stuck in the "on" position if it's accidentally wedged between the vehicle seat folds, for example.)

If you're involved in an emergency service, like ARES, it's good to practice being concise and to the point anyway. People's lives can be at stake if you take too long to say something.

Guidelines

Here are a few tips that might help you be brief on the radio:

- Try and keep your transmissions down to about thirty seconds, give or take
- If you think you're getting close to your thirty seconds, release the PTT for a second and resume speaking, if you're telling a story or a long joke
- If you can't think of what to say, release the PTT
- Similarly, if you find yourself saying "and, uh........um........um....." a lot, that's also a good time to release the PTT

Finally

By the way, here's a little-known fact: your PTT button doubles as an RTL button. RTL stands for release to listen, so while you can press it to talk, remember you can release it to listen.

And from an old Chinese proverb,

*He that speaketh little, thinketh much.*
*And he that thinketh little, speaketh much.*
Short 160-meter vertical antenna

During one Winter Field Day, around 1 am, I had exhausted every 80-meter SSB (single sideband) contact I could hear. Then, after calling CQ for nearly an hour, I decided to check out the other bands. 40 meters had gone to sleep. 20 meters was non-existent. So, for grins, I decided to tune up on 160 meters. What I found surprised me. CW...SSB...some digital noise. The party had moved to 160 meters! After logging a few contacts there, my faith was restored.

Even among the bravest amateurs, why is it that most hams shy away from 160 meters? Seems the biggest reason is the need for a monster antenna. (Misguided beliefs that nobody uses that band also plays into the mystery, IMO.) A 160-meter dipole is \( 468 \div 1.8 \text{ MHz} = 260 \text{ feet} \). And it needs to be at least \( \frac{1}{4} \) wavelength, or \( 160 \text{ m} \div 4 = 40 \text{ m} (132 \text{ feet}) \) off the ground! Who has that kind of real estate? Not me.

Enter the Short 160-meter vertical antenna. I say *short* because it’s only 25 feet tall, much shorter than the required 130-foot height of a 160-meter vertical antenna would be. It still uses 250 feet of radiating wire, but it’s helically wound, essentially making an antenna out of a huge loading coil. But because of the resulting inductance introduced by this coil, the short vertical requires a capacitance *hat* to compensate. This design was adapted from one by John Miller, K6MM, highlighted in *QST*, June 2009, p. 32—36.

**Parts list**

- One 10-foot 2˝ PVC pipe
- One 10-foot 1½˝ PVC pipe
- One 10-foot 1˝ PVC pipe
- One 2˝ PVC slip cap
- One 1˝ PVC slip cap
- Two 36˝ long 1/8˝ brass rods
- Two bullet splice male for 22 AWG
- Three bullet splice female for 22 AWG
- One 4˝ x ¼˝ eyebolt, washer, wing nut
- One 3˝ x 3/16˝ eyebolt, washer, wing nut
- One #4 x 14 AWG ring terminal
- 250 feet 22 AWG stranded insulated wire
- 13 feet 18 AWG stranded bare copper wire
- Four 131 feet 14 AWG stranded insulated wires
- Two black binding posts
- One SO-239 bulkhead connector
- Duct tape
- One bullet splice male for 14 AWG
- Four ¼˝ ring terminals for 14 AWG
- Two M3-0.5 mm x 14 mm machine screws
- Two M3-0.5 mm hex nuts and split washers
- Three #8 x 14 AWG ring terminals

**Construction**

Cut 2 feet 6 inches off the 1˝ PVC pipe to make it 7 feet 6 inches. Clean and then cover two inches of one end (we’ll call the *bottom* end) of the 1˝ PVC pipe with fifteen or sixteen turns of duct tape. Clean and then cover the area on the 1˝ PVC pipe between 9½ and 11½ inches from the bottom end. Clean and then cover two inches of one end (we’ll call the *bottom* end) of the 1½˝ PVC pipe with seven or eight turns of duct tape. Clean and then cover the area on the 1½˝ PVC pipe between 22 and 24 inches from the bottom end.

Slip the 1˝ PVC pipe bottom end into the 1½˝ PVC pipe top end 11½ inches, with the edge of the duct tape flush with the pipe top. Drill a 3/16˝ hole through both pipes between the duct tape, about 4 inches from the top of the 1½˝ PVC pipe. Remove the 1˝ PVC pipe from the 1½˝
PVC pipe and set it aside. Slip the 1½˝ PVC pipe bottom end into the 2˝ PVC pipe top end 24 inches, with the edge of the duct tape flush with the pipe top. Drill a ¼˝ hole through both pipes, about 4 inches from the top of the 2˝ PVC pipe. Remove the 1½˝ PVC pipe from the 2˝ PVC pipe and set it aside.

On one end of each 131-foot wire, connect a ¼˝ ring terminal for 14 AWG. These are the radials, which you’ll connect to the black binding posts when you’re ready to use the antenna. Drill a ½˝ hole about two inches from the bottom end of the 2˝ PVC pipe, insert the SO-239 bulkhead into the hole, with two opposite anchor holes of the bulkhead aligned vertically, then mark and drill those two holes in the PVC pipe and remove the bulkhead connector.

Cut two 3-inch pieces of 14 AWG wire. Connect a #8 ring terminal to each end of one of the 3-inch wires. On the other 3-inch wire, connect a #8 ring terminal to one end and a #4 ring terminal to the other end. Drill a 1/8˝ hole in the 2˝ PVC pipe opposite the ½˝ hole and about six inches from the bottom end. Drill two 3/16˝ holes about two inches from the bottom end of the pipe and about a third of the way around the pipe from the ½˝ hole, one in each direction. Slip one end of the 250-foot 22 AWG wire into the 1/8˝ hole from the outside of the pipe, then slip it out through the ½˝ hole, strip that end, then solder it to the center pin of the bulkhead connector.

Install the two black binding posts into the 3/16˝ holes and connect them on the inside of the 2˝ PVC pipe by the three-inch wire with the #8 ring terminals. Install the SO-239 bulkhead connector into the ½˝ hole, and secure it with the M3-0.5 mm screws. Connect the other three-inch wire on the inside of the 2˝ PVC pipe between one of the black binding posts and one of the bulkhead connector screws. Place the 2˝ slip cap on the bottom end of the 2˝ PVC pipe.
DIY, continued

*Short 160-meter vertical antenna*

**The capacitance hat**

Drill two 1/8˝ holes about an inch from the edge of the 1˝ slip cap and opposite from each other. Drill two more 1/8˝ holes about 1/8˝ closer to the edge of the cap, but 90 degrees away from the first two holes. Slip the two brass rods into the cap, such that they cross and contact each other, and stick out of the cap equally in all directions. Connect a bullet splice male to one end of a ten-inch piece of 14 AWG wire, and strip about an inch off the other end. Wrap the stripped end around the junction of the brass rods and solder the wire to both rods.

Tie and solder (about 102 inches of) the stranded bare copper wire around the ends of the four brass rod tips. Tie and solder (about 51 inches of) the stranded bare copper wire around the mid-points of the same four brass rod sections. This completes the capacitance hat, which will sit on the top of the 1˝ PVC pipe, and connect to the end of the 250-foot 22 AWG wire.

**Winding the helix**

With one end of the 250-foot wire already connected to the SO-239 bulkhead connector, begin wrapping the 250-foot 22 AWG wire around the 2˝ PVC pipe tightly, ensuring about ½˝ spacing between each turn. It might help to use a few pieces of duct tape every dozen turns, to help hold the winding in place. Once you reach the top of the 2˝ PVC pipe, cut the wire and install a bullet splice female onto one wire and a bullet splice male on the other.
DIY, continued

*Short 160-meter vertical antenna*

Insert the bottom of the 1½˝ PVC pipe into the top of the 2˝ PVC pipe, and continue winding the 22 AWG wire around the 1½˝ PVC pipe. Once you reach the top of the 1½˝ PVC pipe, cut the wire and install a bullet splice female onto one wire and a bullet splice male on the other. Insert the bottom of the 1˝ PVC pipe into the top of the 1½˝ PVC pipe, and continue winding the 22 AWG wire around the 1˝ PVC pipe. Once you reach the end of the 22 AWG wire, drill a 1/8˝ hole in the 1˝ PVC pipe about three inches from the top, and slip the end of the 22 AWG wire into the hole. Terminate the 22 AWG wire with a bullet splice female.

**Using the antenna**

When it’s time to use your short 160-meter antenna, attach the capacitance hat to the 1˝ PVC pipe and connect the bullet connectors. Connect the other two sections and their bullet connectors and securing eyebolts. Attach two of the radials to one of the binding posts and two to the other. Stand the entire assembly upright, securing the bottom section on the ground, and use guy cord to hold it in place. Spread the radials out as far and as widely as possible. Now, get on the air and see what the 160 meter band has to offer! You might find that a vertical, shortened though it might be, can bring you more DX (long distance) contacts than a dipole, due to its low takeoff angle. But because it’s shortened, it definitely won’t be made for QRP (low-power operation), and might require you to run at a full 100 watts.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)
The Voluntary Interceptors

One day, toward the start of World War II, a captain wearing the Royal Signals uniform knocked on the door of a British teenager. The 16-year-old was Bob King. When he went to greet the visitor, he had no idea that soon he would become one of Britain's Voluntary Interceptors, some 1,500 radio amateurs recruited to intercept secret codes transmitted by the Nazis and their cohorts during the war.

"The captain asked me if I would be willing to help out with some secret work for the government," remembers Mr. King, now 89. "He wouldn’t tell me any more than that. He knew that I could read Morse code - that was the essential thing."

The captain had heard about Mr. King through the RSGB (Radio Society of Great Britain), an organization for amateur radio enthusiasts. Many of its members were young folks curious about the possibilities offered by tinkering with radio receivers.

During World War II, dozens were recruited by MI8, a division of the British Military Intelligence, and a covert name for the now-defunct RSS (Radio Security Service). The purpose of their work was to intercept secret wireless transmissions by German and Italian agents in Britain (in places known also as Y-stations).

Mr. King signed the documents the captain had handed him, which, he says, basically stated that he had "read them and knew what would happen to me if I opened my mouth too wide". He was then given the instructions to scan shortwave bands and write down Morse code he discovered on a piece of paper.

Cracking codes

Mr. King worked from his home in Bicester, Oxfordshire, but Voluntary Interceptors were scattered all around Britain. Many used their own radio equipment to eavesdrop on enemy messages. The RSS's original headquarters had been in Wormwood Scrubs, London, but in 1940 it was moved 12 miles north to the village of Arkley when German air raids threatened its analysis and interception efforts.

By mid-1941, the new base, Arkley View, was receiving about 10,000 message sheets a day from its recruits. "I worked for five years scrutinising the logs that came in from the other amateurs, thousands of log sheets with the signals which we knew were wanted, and you could only know it from experience,” remembers Mr. King.
Living in the Past

Continued

"We knew it wasn't Allied Army Air Force, we knew it was German or Italian, various things gave that away, but it was disguised in such a form that it looked a bit like a radio amateur transmission. We knew it was highly important, everything was marked 'top secret,' but only many years later did we discover that it was German Secret Service we were listening to."

"Of course you didn't ask questions in those days; otherwise, you'd be in real trouble." Encoded messages were transmitted to Bletchley Park in Buckinghamshire, the UK's former top-secret code-cracking center. Once decoded, the data was sent to the Allied Commanders and the UK Prime Minister, Winston Churchill.

Secret listeners

Just like thousands of code-crackers working at Bletchley Park during the war, Voluntary Interceptors had to keep quiet about what they were doing. Mr. King says that they were not even allowed to mention anything to their families. His wife only found out about her husband's secret past in 1980, more than three decades after he had stopped his interception activities.

Now that they're allowed to speak up, he seems disappointed that this ghost army of secret civilian listeners has not been given more credit for the part it played in the Allies toppling the Nazis, including the successful invasion of Normandy.

Volunteer Interceptors could talk about their work among themselves, but with nobody else

"The main success of the Voluntary Interceptors was in knowing what the enemy intelligence services were doing, what they believed and didn't believe, and we managed to manipulate them in that way through the agents that we controlled," he said.

John Gould, the organizer of the RSGB's centenary celebrations, agrees. "Not only did the intercepts provide a huge amount of traffic, but through the skills of the radio amateurs 'fingerprinting' the Morse code of the German operators, supported by direction finding, the UK was able to monitor movements of the German forces," he said. "The intelligence gained from these intercepts was reported to have been of significant importance to control enemy agents and other matters such as sabotage and deception activities."

Much of this article was taken from the BBC Technology News website, 07-05-2013, and SWLing Post, 03-2018.
Side of Bacon
A little ham humor

Where guy wires originate: from guy tools
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 / nets / awards / calendar
7:00 pm: Discussion / breakout session
discussions usually involve everybody
breakouts split into separate groups
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?

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

Lynx
Websites for your education and leisure
Training items and topics for nets
Ham Radio Nets
Radio programming
76ers Group and UVARC Group pages
Utah Ham Radio Exam Schedule
Send your input to uvarcshack@gmail.com

Questions of the Month
Test your knowledge (answers next page)

G1BØ6: Under what conditions are state and local governments permitted to regulate Amateur Radio antenna structures?
A. Under no circumstances, FCC rules take priority
B. At any time and to any extent necessary to accomplish a legitimate purpose of the state or local entity, provided that proper filings are made with the FCC
C. Only when such structures exceed 50 feet in height and are clearly visible 1000 feet from the structure
D. Amateur Service communications must be reasonably accommodated, and regulations must constitute the minimum practical to accommodate a legitimate purpose of the state or local entity

E9DØ9: What is the function of a loading coil used as part of an HF mobile antenna?
A. To increase the SWR bandwidth
B. To lower the losses
C. To lower the Q
D. To cancel capacitive reactance
Calendar

What's happening (times are Mountain Time)

Utah County Ham Exam Sessions
BYU J. Reuben Clark Law School building
Sign up at HamStudy.org/sessions
Sat February 15, 2:30 to 5:00 pm
Wed February 19, 7:00 to 8:45 pm
Wed March 18, 7:00 to 8:45 pm
Sat March 21, 2:30 to 5:00 pm
Wed April 15, 7:00 to 8:45 pm
Sat April 18, 2:30 to 5:00 pm
Wed May 20, 7:00 to 8:45 pm
Wed June 17, 7:00 to 8:45 pm

Provo One-day Technician Courses*
Third Saturday Monthly at 8:00 am
BYU Law School Bldg, First Floor
* except May, June, July, and August

2020 Orem Ham Radio Courses
Extra: Tue 10, 17, 24, 31 Mar, 07 Apr
General: Tue 21, 28 Jul, 04, 11 Aug
Technician: Tue 22, 29 Sep, 06, 13 Oct

Club Meeting Calendar (6:30 pm)
Orem Council Chambers, 56 N State St
February 6 March 5
April 2 June 4
July 17* August 6
September 3 October 1
November 5 December 3*
* Actually a potluck at 25 N Main St, Lindon

Regular Nets
RACES Net, Thu 20 Feb 8:00 pm, 147.12
Jackson Hole Net, Mon 8:00 pm, 146.76
UVARC Ladies’ Net, Tue 7:00 pm, 146.78
UARC 76’ers, Wed 7:00 pm, 146.76
UVARC Family Net, Thu 6:30 pm, 146.78
UVARC New Ham Net, Thu 7:00 pm, 146.78
CERT Net, 2nd & 4th Thu 8:00 pm, 146.78
Utah County 6 meters, Fri 8:00 pm, 50.14
6-Pack Net, Fri 9:00 pm, 50.15
Family History Net, Sat 8:00 pm, 146.78
See a larger list of nets at noji.com/nets

Upcoming Contests
ARRL International DX Contest
5 pm Fri Mar 6 to 6 pm Sun Mar 8
State QSO Parties
Mar 14 to 15: OK, ID, WI

CQ WW WPX Contest
6 pm Fri Mar 27 to 6 pm Sun Mar 29
7th Call Area QSO Party (7QP)
7 am Sat May 2 to 1 am Sun May 3
See a larger list at contestcalendar.com

Answers to the Questions of the Month
G1BØ6: D (Amateur Service communications must be reasonably accommodated, and regulations must constitute the minimum practical to accommodate a legitimate purpose of the state or local entity)
E9DØ9: D (To cancel capacitive reactance)
25 UVARC Shack © February 2020
Vendors

For your convenience

Pockrus Joystick J-pole
$25, open-stub aluminum half-wave, dual-band J-pole antenna
$35, 6-meter dipole, $20 for the 220 MHz (1.25 m) antenna
by Carl Pockrus, WE7OMG (email myjpoles@gmail.com to purchase)
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
$20, vertical quarter-wave flexible antenna
by Richard Bateman, KD7BBC, of SignalStuff (and maker of HamStudy)
Super-performing antenna for your HT (handheld transceiver)
Visit SignalStuff and select SMA-Male, SMA-Female, or BNC

Ham Radio Podcasts v1.50
by Trevor Holyoak, AD7GH (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 (email 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
$49, 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
We are the *Utah Valley Amateur Radio Club*, a 501(c)(3) non-profit (EIN 81-360-6416) Utah corporation 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 UARC, the 76ers, UCARES, RACES, the SCATeam, or any other organization, although many of our members and leaders might also belong to the same.

This newsletter 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](http://uvarc.club/join), then sign up at [www.facebook.com/groups/uvarc/](http://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 movement in Utah Valley.

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**Our fearless leadership**

**Presidency**

President......................... Noji Ratzlaff  
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Secretary....................... Caryn Alarcon  
Activities....................... Wendy Shoop  
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**Club Sponsor**

Heath Stevenson  
Orem City Emergency Manager

From all of us to you, 73