

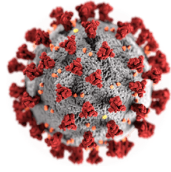
# The WFD Frozen Feedline

<p><i>Inside this issue:</i></p>	<p><b>The WFD Trail from SPAR to WFDA Today</b></p>
<p>Covid rules, W8WFD 2              K8UO, Hvy Reading 3              Solo with Martin 4              Solo cont., Recipe 5              EZ Power Poles 6              Pix, Satellite, Recipe 7              Mt Everest Florida 8              160m Ant, 9              Crossword, Links 10-11</p>	<div data-bbox="803 462 1177 609" data-label="Image"> </div> <p>The inaugural SPAR (Soc. to Preserve Amateur Radio) Winter Field Day was launched in January 2007. It was similar to the ARRL's Summer Field Day in some ways, different in many others, and held on the last full weekend in January. The WFD operating event/contest was popular at first and grew annually until it's aging originators (the SPAR Board of Directors) fell ill and were unable to continue the support needed. In late 2015, the remaining SPAR Board Members handed over the reins and responsibility for Winter Field Day to the Winter Field Day Association (WFDA), who scored the 2015 SPAR WFD entries, and have been publicizing and scoring the event since 2016, from 500 logs submitted in 2017 to well over 1000 in 2020! The WFDA is still a very small operation... just five of us form the WFDA board and a select few others help us with software support, suggestions, and scoring. You can find some of their names to the left. We also owe a debt of gratitude to XYLs who put up with our WFD obsession every year and to those of you who allow use of your photos and stories to help promote it.</p> <p>The WFDA hopes to continue to expand the popularity of Winter Field Day by using social media and online resources to increase participation, including this newsletter. You can help by spreading the word yourself to other Hams, clubs, and on-line groups.</p> <p>WFD uses ALL modes and all non-WARC bands. The object, like the ARRL's Field Day, is to make as many contacts as possible in a 24 hour period. Bonus points are earned for non-commercial sources of power and operation from remote locations. WFD can be worked from the comfort of home, a remote location, outside, or inside... as a single station, a duo, or a multi-op/multi-rig set-up... QRP-QRO, it's <i>your</i> choice. It is a perfect excuse for a club or circle-of-friends social event in mid-winter!</p> <p>There is no membership requirement in this or any other group to participate in Winter Field Day. ANY and ALL are encouraged to join in the fun and submit a log (see the WFD website for rules &amp; instructions).. DX can too!!</p> <p>You can join us in the Facebook WFD Group (<a href="https://www.facebook.com/groups/winterfieldday">https://www.facebook.com/groups/winterfieldday</a>) or check us out the WFD Assn website at <a href="http://www.winterfieldday.com/">http://www.winterfieldday.com/</a>. Rules for WFD, helpful files, and more are available at both locations. We hope to hear YOU on the air in a Winter Field Day pileup on the last full weekend in January every year! 73 and CQ WFD!!</p>
<div data-bbox="105 955 430 1060" data-label="Section-Header"> <h2>WFDA Board:</h2> </div> <p>Tom Phelps W8WFD              Massillon, OH</p> <p>Bill Nangle VE3FI              Kingston, ON</p> <p>Erik McCord WX4ET              Kingsport, TN</p> <p>Dave Tabbutt W3DET              Belhaven, NC</p> <p>Ken Coughlin N8KC              Shelby Twp, MI</p> <p><u>Scoring and rules support:</u>              Jerry Radcliffe N8KLX              Utica, MI</p> <p>As you can see, we're spread all over the continent but we all share a passion for WFD and promoting preparedness for operating under less than ideal conditions.</p>	<div data-bbox="844 1270 1128 1575" data-label="Image"> </div> <p><i>Editor: If you wanna' see our mug shots, click on the WFDA Logo (left) &amp; scroll down.</i></p> <p><i>Keep an eye to the Facebook WFD Group page for announcements, WFD items for sale, advice, and questions answered. I also answer a lot of questions via email and try to be timely, but life can get in the way sometimes. Please be sure to read &amp; reread ALL the rules and definitions before writing.. N8KC</i></p>
<p><b>You'll miss <i>lot's</i> in the WFD News if you don't find the hidden links! Be sure to find 'em all!</b></p>	

# Covid-19 and Winter Field Day 2021.. Rules Changes

Ken N8KC

With the Covid-19 pandemic worsening, the WFDA board asked me to tweak the WFD 2021 rules a bit.



What we've agreed upon is essentially the same as what the ARRL did for Summer Field Day. Since rules on gatherings differ from state to state and country to country, we thought it best to leave our rules basically untouched, but instead add a way for groups/clubs, who will need to operate separately, to have their individual members' scores tallied towards a "Club/Group" score under a separate "club category" in our scoring results.

If you're going to be operating as a group/club *together* under one call sign (as in 8I K8UO), you should **NOT** fill in the "Club" line in your Cabrillo log entry. Your score will be tallied and ranked in the results the way they've always been (in the K8UO case above, it'd be in the 8I class).

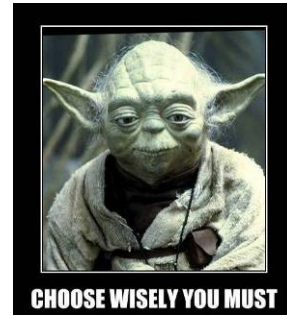
If, on the other hand, your Club/Group cannot or will not be operating as a group together, but instead independently due to Covid-19 restrictions, then you **should** fill out

the "Club" line in the Cabrillo log header. Each individual member will turn in a log with *their own call sign* entered in the topmost "Callsign" field of the Cabrillo log. In this case, each individual member would operate WFD using their own callsign (**not** the club's) and operate under *their own* license privileges. Club members' can operate anyway they wish, QRP, QRO, On alternate power or not, multiple bands or only one, etc... All their individual scores, including bonuses, multipliers, etc will simply be added together to compute a "Club/Group" score that'll be posted in results.

In the case of club members operating independently, it is **extremely important** that the Cabrillo logs they each send in **ALL** have the **exact same** club/group name on the "Club" line in the log file so that our scoring software can sort out the logs correctly and attribute them to the right clubs/groups.

**Club names:** Choose what your club/group uses for your individual entries **carefully**. For instance, if you choose an easy abbreviation like LCARC, or HPARC, you might think there won't be another, but

Lanse Creuse ARC, and Lincoln County ARC, share the acronym..



Likewise with Hazel Park ARC and High Point ARC. Individual members will all

need to put the same identical entry in the "Club" line in their log. Clubs and Groups should be sure to *stress* this to all members and agree in advance to a unique club/group name to go on the logs.

The question was asked if a call sign could be used in the "club" line of the log entry for club/group members operating independently. The short answer is YES, **BUT** that call **cannot** then be used on the "callsign" line of any other WFD log or on the air during WFD.

I hope this is clear enough, but if you have questions, I can be reached on Facebook via message or on the WFD Group page.

Ken N8KC

## W8WFD off-the-grid

W8WFD

With the cost of energy, more people and companies are going Green. We do not have a super high electric bill, but we try to save wherever we can. My system is still in the works.

All panels will be moved near the garage peak in the spring. They will also be mounted so I get an average of tilt from summer to winter for maximum power.



Each panel is 100 watts for a total of 700 watts. The battery bank is 4 100ah deep cycle batteries. Two

Renogy Rover 40 amp charge controllers help maintain adequate charging power for the batteries (*right*). On real cloudy days a 400 watt wind turbine helps supply power. I've also installed automatic charging off the commercial mains in case it's needed.

Presently, I run my shop lights and outdoor security lighting. But the power can come in handy for charging your phone, CPAP machine, etc.

For WFD, I'll be operating from my unheated garage/shop on battery power. Pure, clean DC power. In the near future, more panels will be added along with an increase of the battery bank.

Hope to hear many of you on the air for WFD. I'll be operating SSB and some digital modes with a Yaesu FT897D. Antennas will be a G5RV and End Fed Half Wave.



73 & Good Luck!  
Tom Phelps  
W8WFD



## USECA (K8UO) segueing into WFD

N8KC

As a club, USECA has been doing a radio-related winter event for many years. Almost thirty years ago a group of members who called themselves the “Flying Beers” pulled off a “Hams on Ice” escapade out on the ice of Lake St Clair.



USECA followed up with an “Ice Station USECA” event in January where we set up stations in ice shanties on Lake St Clair about 16 miles north of Detroit. Extension ladders were often the antenna mast as they could be put through a hole in the ice (*shallow bottom*) and extended to offer support for a vertical or a dipole. If the ice was thick enough, a mobile station might actually drive out and set up. We had special QSLs printed for the occasion and it was a hit with members. Folk usually showed up with an assortment of hot soups, cocoa, and their own favorite brand of “Antifreeze”. One of the bigger problems back then was the cold. It didn’t affect the ops much, but the rigs of the day would get flaky if they got too cold.. It was more important to keep the rig warm than the operator.

Then, along came a contest called FYBO (*Freeze Your Butt Off*), sponsored by a QRP group from (*of all places*) Arizona. We jumped into that with gusto, setting up in January Michigan weather in a number of locations, but usually near the lake. The FYBO was a QRP contest,

with points given for how cold it was at your operating position. We did that contest for a number of years, taking first place a few times until there was an issue with scoring the contest and the Scorpions group seemed to back away from taking care of entrants. We were always a multiple station entrant.

Then... after our disappointment with FYBO, we caught wind of the SPAR group holding a Winter Field Day... Jeez, that was right up our alley, as we’d always done ARRL Field Day in a big way, running more than 26 stations one year, a huge mess tent operation, and portable/mobile towers all over the field.

Again the club dove in, reserving Camp Ozanam on Lake Huron where we had stations in almost every building and covered the bands from 160-2m. Again, K8UO placed #1 several times before 2015, when SPAR failed to score the results due to illness of the remaining 4 board members. We thought, at that time, that WFD was a goner.

It took 6 months or so, but an intrepid few pulled together to contact the original SPAR board, offered to score the 2015 contest, and literally saved WFD from fading away with SPAR.

FYI: I wasn’t one of them.. I came along when they needed help with the Face Book group and rules re-writes.

73... Ken N8KC

Grant Date	Effective Date	Print Date	Expiration Date
01/01/2012	01/01/2013	01/01/2009	01/01/2013

Get your General or Extra NOW!  
Joe Ham  
(Licensee's Signature) FCC 600 - May 2007



Built by Hams, for Hams!



**The Santa Claus Net**  
Put the kids or grandkids on the air to talk with Santa. Every night from November 27th to December 24th on 3916 MHz LSB. Have the kids prepared to tell Santa their wish list.

## Thousands of Periodicals..

KC8HMJ

Seriously, if you’re interested in wireless and electronics you should save this link. It’s literally a compilation of thousands of magazines and the articles within, going back many years. Everything the Ham or electronic hobbyist could ever want to read on the roots of radio, early electronics, broadcasting, Amateur Radio, and more.

Give a click on the image at right.. It’ll take you to the website where you can get lost exploring!

Link by Richard Line KC8HMJ



## Solo WFD 2020 with Martin

*Martin K0BXB*

Well, I did it, **Winter Field Day, 2020**. None of my ham friends were available, willing or both, so I ended up working it alone. When I carefully read the rules I realized that I could set up in my detached garage which is more than 30 feet from my ham shack in the house. And... since it is not heated, by leaving the garage door open to the elements, I think I was legal as 10-WI. At least that is what I claimed!

As the pictures show it was truly winter here in southeastern Wisconsin. Thankfully it was not bitter cold, at about 36 degrees all day.



Last year this time was -16! We did have a snow event most of Saturday and overnight adding about 4 inches to the about 5 inches already on the ground. Being a fairly wet heavy snow that clung to everything it tested my three semi-permanently installed "portable" antennas strung from my fiberglass fishing poles considerably. But since I always string them up with light weight bungee cord AND they were supported by those fiberglass poles, though they drooped nicely, one even to the ground, they were intact. A light tap with a broom stick

dropped the snow and they snapped up into place! For the record, I DID NOT use those today as they were already set up and WFD requires that any antenna must be set up specifically for the WFD event.

My antenna for the day was a [Wolf River Coils TIA](#) with the mini coil and their three 33 ft radials. I fed it with a 50 foot RG-58 coax. I used my NanoVNA to make sure the SWR looked good, which it did. I actually set it up Friday temporarily and adjusted the dual coils for the 40 and 20 meter bands and they required no further adjustments when I set it up again Saturday. The dual collars available from Wolf River Coils are a very useful addition to an already good antenna.

My station setup was a temporary table made with a couple of shelf boards laid across a two sawhorses



Martin K0BXB

in the middle of my detached garage. I always wondered why one would have a detached garage in

Wisconsin. Now I know... Winter Field Day! I elected to keep the lights off for the event to make it even more authentic. I had to bring a counter stool from the house to sit on as the height of the saw horses is NOT camp-chair friendly! The arrangement gave me plenty of solid space for everything.

My rig was my [Xiegu G90](#) transceiver with mic and straight key. I had both my [miady 6Ah](#) and [Boienno Power 4.5Ah](#) batteries charged up. Turns



out for my operation either one would have provided ample power. I opted for the miady. Its voltage had only dropped about half a volt after my two hours of operating.

For logging I used the [VLSLogger](#) app on my Android phone, the first time I've used it for anything. It works pretty well. I decided that I would take notes on each contact and then immediately enter it into VLSLogger since I can't do two things at a time very well! I wasn't in a hurry so that worked well for me. I don't do these contests for competition but for fun, for the experience. I logged eight contacts over the two hours. Seven on 20 meters and one on 40 meters.

Observations: I noticed that most of the stations I heard were in the south and southeast! Florida was booming in here. But I logged one station in Arizona as well. Six contacts were CW, the other two were SSB. I learned fairly quickly that there wasn't much use in calling the Big Guns, they were always

## Solo WFD with Martin (K0BXB) ...continued

swamped and never heard me. But, the moderate to weaker stations tended to hear me. I guess in this case, likes attract! Actually, I find that in most contests. The loud stations are too fast and too popular for my little signal and moderate speed. I know for them it's about winning but it would be nice if once in a while they would pause and call for ONLY lower power stations. But that's OK, I'm happy with what I got. It is my choice (*well partly my pocketbook's too*) to run compromise antennas and lower power.

Would I do it again? Probably, but *not* if it were near zero outside! It would be

nice to have some company. I'll work on my friends for next year! In the meantime, time to get to work on prep for Summer Field Day, June 27-28, just five short months away! After suffering through about three hours (including setup) at 36 degrees, I may spend all 25 hours sitting outside unprotected! Except for mosquito netting!!!!

73 Martin , K0BXB

*Editor: Thanks Martin for sharing your WFD experience with us! Hope to hear you in 2021 too!!*

Why pay a middle-man (ARRL, QRZ, W5YI) for EZ and **FREE** on-line licensing tasks? Click the link.. DIY!



## Morse Practice



## Lessons

AA9PW.com

## Sandy's WFD Fruit Cake Cookies

VE3GQG Glen

### Ingredients:

- 1 1/2 Cups brown sugar
- 1/2 cups granulated sugar
- 1 lb. shortening/butter
- 3 eggs
- 1 tsp vanilla
- 4 cups flour
- 1 tsp baking soda
- 3 slices red glazed pineapple, chopped
- 1/2 lb. chopped glazed red cherries
- 3 slices green glazed pineapple, chopped
- 1 1/2 cups chopped pecans
- 1 1/2 cups chopped walnuts
- 1 box of chopped dates
- 1/2 lb. white raisins
- 1 tsp. cinnamon
- 1 tsp. baking powder

### Directions:

Cream shortening/butter and sugar; add eggs, and vanilla. Mix dry ingredients with fruit, and sugar. Form into rolls and wrap rolls in waxed paper, chill overnight. Slice up rolls into cookie patties and bake 15 mins. at 325' Makes about 8 rolls.

Recipe by  
Sandy Garant



## EZ Peazy Power Poles for WFD

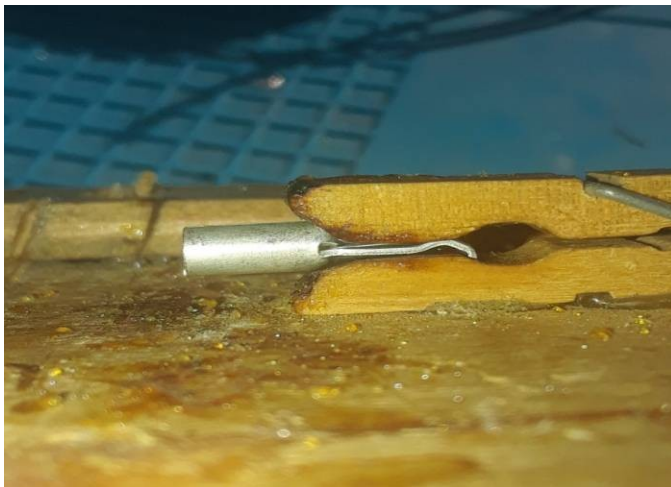
*Jerry N8KLX (aka "ScoreMaster")*

I like PowerPole connectors. They're almost foolproof, can handle a lot of current and can be configured in many ways. For a while, I used a lot of them. I bought mine from Powerwerx. (<https://powerwerx.com/>) What I didn't like was soldering the wire into them. Chasing the connector contact around the work bench was a pain.

Yes, I could have bought the fancy crimping tool from Powerwerx, but it's expensive and it doesn't do all that well with small gauge wire. Instead, I devised a simple fixture for soldering them that is quick easy and almost foolproof. The super-precision fixture is shown below..



It's just a small block of plywood and a couple of mini clothespins. To use the fixture, clip the connector contact into the clothespin as shown below.



Now prep the wire. Strip no more that ¼ inch of insulation from the wire and clip it into the left hand clip so you can tin the wire BEFORE you insert it into the connector contact. See below..



Once tinned, place the wire into the open end of the connector contact. See below..



Notice that I did not push the wire all the way into the connector contact. This is to provide a surface to heat the wire, not the outside of the shell. You want the solder INSIDE the shell, not outside. If you have solder on the outside of the shell, it won't fit into the connector body.

Now solder the wire in place by placing the tip of the soldering iron in that gap between the insulation and the shell, touching the wire. Feed some solder to the joint. When you see solder appear in the top seam of the shell, STOP, you're done!

Now let it cool! DON'T move the wire until you're sure it has cooled. This prevents cold solder joints!

Once you have the connector contact on the wire you can insert it into the connector body. This can be a little tricky. When you have it right you'll feel a little "click" as the tip of the contact enters the slot in the body. Now is a small straight bladed screwdriver to push the connector all the way into the body. You'll hear a small click when it's in all the way. Give the wire a gentle tug to insure that it has indeed locked in place. And you're done!

Where did I get my mini clothespins? I bought mine at Michael's craft store. Here's a link to the site. <https://www.michaels.com/mini-clothespins-by-celebrate-it-entertaining-30ct/10403817.html>

Enjoy! Jerry N8KLX



*Editor: So EZ, Alfred E Neuman Gump can do it!*

A few pics of WFD Stns



Join the WFD fun in 2021

## New Repeater.. And this one counts for WFD Points!

There's a brand new FM repeater in flight aboard the International Space Station. It's FM cross-band, with uplink at 145.99 MHz (67Hz PL) and downlink on 437.800 MHz. Announcements of special operations (*other modes are possible*) will continue to be announced by ARISS.

Launched from Kennedy Space Center last March, the IORS consists of a "space-modified" JVC-Kenwood D710GA transceiver, an ARISS-developed multi-voltage power supply, and interconnecting cables. The design, development, fabrication, testing, and launch of the first IORS culminated a 5-year engineering effort by the ARISS hardware team of volunteers.

ARISS says the new system offers a higher-power radio, voice repeater, digi-



tal packet radio (APRS) capabilities, and a Kenwood VC-H1 slow-scan television (SSTV) system.

There are a lot of Hams who look for the ISS when it passes over on clear nights.. *now* there's a reason to have a dual band VHF/UHF rig and antenna along on those nights!

Seeing as how the ISS is an Earth satellite, it's *also* a valid way to earn the 1500 point satellite QSO bonus! See WFD rules. On a good pass, you could work this with an HT and a handheld beam (I've seen it done), though a better set-up will likely ensure success.

If you'd like to give it a try, or just view the ISS (*it's one of the brightest objects in the sky when visible*), click on the links in the center...

Ken N8KC

## Super Simple Venison Chili for WFD

N8KC

With Deer hunting season just a month or so ago up in the north country, here's a recipe that'll warm your innards on WFD, only takes 1/2 hour & requires little in the way of preparation.

1st thoroughly brown your ground venison in a large skillet in butter, you'll need about a pound to a pound and a half if you like it meaty. Once the venison is done there should be no red meat, some pink is okay. Now, put the meat in a colander and run the hottest tap water you can over and through the meat, rinsing away as much fat as you can and



thoroughly drain (*venison fat is the major reason for a "gamey" flavor*).

Now.. In a large pot or crock, pour in 7 cups of water (*less if you like it less "soupy"*), one 6 oz can of tomato paste, your "Darn Good Chili Mix" and your drained venison. Optional: Add some canned green chilies (*drained*), spice or hot sauce to taste. It'll need to

cook (low/simmer) for about 25 minutes, a little longer in a crockpot.

Serve with sour cream, crackers, & your favorite cheese (Jack, Colby, Cheddar). Mix available in many stores.

## My WFD at Florida's Mt Everest

Charles KN4VGY

Winter Field Day 2020 was my first remote operation and first contest. I was first licensed in June 2019 and upgraded to General soon after in July. I had planned my WFD operation well in advance and applied for and received a special event call sign, W4U. I made the association of "Whiskey 4 U to an old Navy tradition of "Splice the Main Brace" in which you received a ration of Rum or Liquor for completing a hazardous task. (*Ed: Splicing the main brace was a job often required in the midst of battle in the days of sail. The main braces were huge standing rigging lines that braced the masts and yards and were targets of enemy gunners, crippling a ship's maneuverability.*)

Friday, I was late in getting started on my 83 mile drive to Lakewood Park in Okaloosa County, Florida. I had selected this location as it is the highest point in Florida with an elevation of 345 feet. I arrived at 8pm and spent *many* hours setting up my 12'x14' wall tent and other gear, finishing around 3am and falling exhausted into my cot for whatever sleep I could get.



It wasn't long before I heard rain on the tent, but I was comfy with a small fire in my stove. The rain got really heavy, pounding the tent, then would stop for a bit, and once again pound the tent heavily, then stop. It was quite odd, but I was *trying* to get some sleep.. and this certainly wasn't helping matters!

This continued till around 5am when I heard a loud "HELLO.. Okaloosa Sheriffs Department!" I jumped up, still in my underwear, answering, "Hello.. Let me get some clothes on and I'll be right out." The Sheriff response was "No problem.. I'm just checking, but there's no overnight camping allowed here." I quickly replied with "But.. I have permission from Parks and Recreation" and he said "Oh yes.. You must be the Ham Radio operator we were briefed about." I then apologized, saying "..Sorry about you having to get out in the rain.." to which he replied, "..It's not raining, it's the sprinklers!" Good grief! Before hitting the sack Saturday night,

I located the electrical panel for the park and turned off the sprinkler breaker. That night, it didn't "rain".

I operated most of WFD, making 23 contacts (plus one DX). With my soapbox bonuses and multipliers, I had scored over 4000 points and was quite satisfied with my effort. Unfortunately, this was also my first attempt at contesting and log submission, and by the time I got my log ready to send in, it was too late to submit. I was sad about that mistake, but I'm soooo glad I had not pitched my tent over a sprinkler head!

73, Charles KN4VGY

*Ed: Thanks Charles, for sharing your WFD tale with all of us! Charles related in a later email that he's hoping to do WFD 2021 in the "Hambulance" (below) and get a log in on time!*



**This could have been YOUR article..  
Write something for WFD!  
Tell us YOUR story!**



## 160 for WFD? The FCP 160m L.. big sig, small footprint

Do you do 160m on WFD or ARRL FD? It's not a band many take on, from I've seen. I think that's mostly due to the size of antenna required and the effort to set up for it, especially for a solo station. But in WFD's case, it's likely worth the effort, especially for a group, because you can pick up a few multipliers fairly easily.

Another reason many folks don't try 160m is they think it's only populated by nets and ragchewers. While there's some truth to that on most nights, that idea can be quickly laid to rest with one scan of the band on the night of the ARRL 160m contest. The band is hot, hot, hot!

From the Central Midwest where I live, 160 is pretty good for contacts with modest equipment and power from Colorado to the East Coast, with contacts harder to make west of the Rockies. Your location may perform better or worse, but the set-up I have for 160m is pretty simple.. A random wire 120+ feet long, set up as an Inverted L. I have worked Germany on it and some others west of the Rockies, but

I would count those as rather exceptional. I do not use the antenna in the **K2AV link below**, but after reading through it thoroughly, I'm thinking of upgrading my counterpoise (*right now, I simply drive the L from a manual tuner against two 10' ground rods*)

My WFD group (USECA, K8UO) has worked 160m nearly every year we've operated as a group. We've also worked the ARRL 160 CW contest and scoring 1st in our ARRL Section and tops in our division several times. Over the years we've used a coax-fed 160m dipole, a commercially made Inverted L, a ladder-line fed 160 dipole (*allows more efficient use on other bands as needed for multipliers*), and a 450' long dedicated receiving antenna (*a real help with noise reduction if you have a rig that will automatically switch to a dedicated receive antenna*).

So... maybe we'll hear you on 160m for WFD? It's worth it for the multipliers!



**SKYWARN**  
WEATHER.GOV®

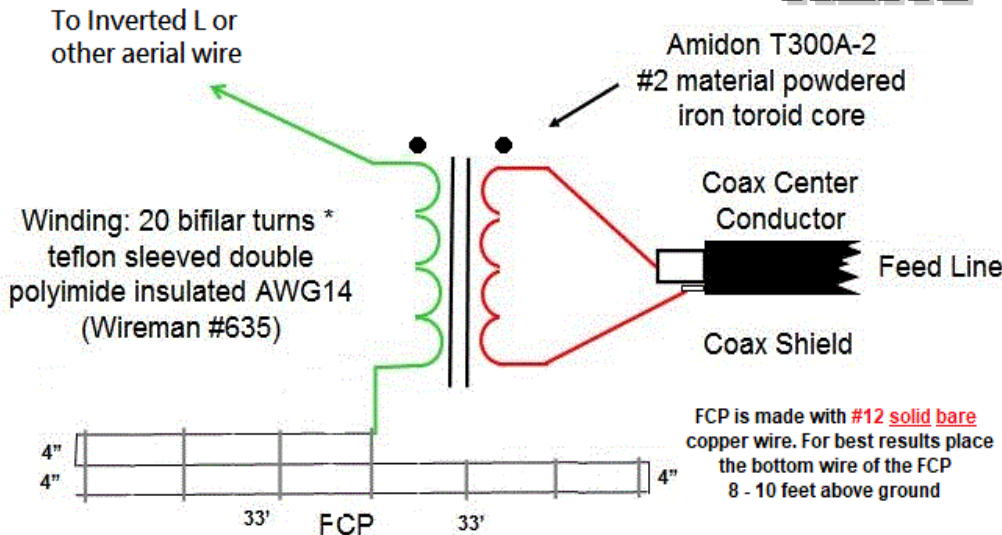


Emergency Comms aren't the only way that hams can provide a service to their community. Every year, major storm systems cause property damage, power outages, and casualties. Click on the links above and below to explore ways you might help your neighbors or become certified.



**K2AV 33 x 33 160m**  
**Folded Counterpoise (FCP)**  
**and Isolation Transformer**

**K2AV**



\* Bifilar turns: Instead of the two windings kept separate, one wire on one side of the toroid and one wire on the other side, the two wires are kept in a pair like a length of zip cord. The PAIR of wires is wound around the toroid twenty times. For this application 15 feet of wire and teflon sleeve, cut in half, provides the required PAIR length of 7.5 feet.

Original Drawing WUUCE updated

# A Ham Crossword

*spcl tnx to Kirt Blattenberger KB3UON*

This month's Amateur Radio crossword puzzle contains the usual collection of science, math, and engineering terms, and also includes special words related to Amateur Radio (clues labeled with asterisk \*). Enjoy.

**ACROSS:**

- 1. \* Next level of Amateur Radio license after Technician
- 5. \* The 'A' in ARRL
- 9. Circular mounting hardware (pl.)
- 11. Unit for 1,000,000 watt-seconds (abbr.)
- 12. Measure of source / load mismatch (abbr.)
- 14. \* Mechanical device for sending Morse Code
- 17. 1E6 nanoseconds
- 18. Electromagnetic interference (abbr.)
- 19. Heat-resistant glass type
- 20. A common RS-232 serial bus command (abbr.)
- 22. Web's most popular radio frequency engineering site (2 ltrs. + 1 wd.)
- 25. Quantum of vibrational energy
- 27. Local Oscillator (abbr.)
- 28. One port of an amplifier
- 29. Science of assuring operation amid dense EM background noise (abbr.)
- 30. Chemical symbol for holmium
- 31. Type of flip-flop
- 32. Chemical symbol for gallium
- 34. Logarithmic ratio (abbr.)
- 36. Opposite of O.D.
- 38. Centimeter (abbr.)
- 40. PC follower
- 41. One port of an amplifier
- 42. Coder/decoder (abbr.)
- 43. \* Ham's code for "Is my transmission being interfered with?"
- 44. International phonetic alphabet letter "H"
- 45. Intel x86 command for " jump if above"

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	55	56		57			58			59	60		61		
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70			71		72					73				74	
		75			76	77				78			79		
80										81					

- 48. 30 kHz to 300 kHz
- 50. Chemical symbol for antimony
- 51. Sound frequency in the human hearing range (abbr.)
- 52. "Calling any amateur radio station"
- 54. Modulation type (abbr.)
- 55. Chemical symbol for lanthanum
- 57. Unit of liquid measure (abbr.)
- 58. Electronic component package type (abbr.)
- 59. Unit of time (abbr.)
- 61. PC follower
- 62. \* The 'L' in ARRL
- 64. Configured a switch to break electrical contact
- 67. A common battery cell size
- 68. \* Hiram Percy \_\_\_\_\_, founder of the ARRL
- 69. Logic family

- 70. Boob tube (abbr.)
- 71. Synchronous Digital Hierarchy
- 73. \* Ham's code for "Are you busy?"
- 74. 1/000 of an amp (abbr.)
- 76. Aircraft bulkhead (pl.)
- 80. \* Type of Morse Code key (pl.)
- 81. Akin to dynamics, with no movement

**DOWN:**

- 1. Software role playing type
- 2. Chemical symbol for neon
- 3. The Microwave Office software company ( a b b r . )
- 4. Chemical symbol for lanthanum
- 5. Chemical symbol for argon
- 6. Minimal Shift Keying (abbr.)
- 7. Chemical symbol for europium
- 8. The stuff in the solder core
- 10. \* Founder of the ARRL (3 wds.)

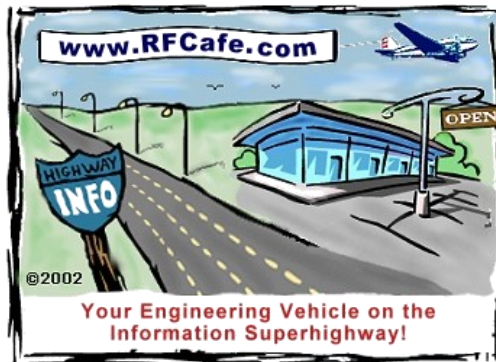
**Crossword clues continued** (down)

KB3UON

- 12. Miniature threaded RF connector
- 13. Refers to the IEEE802.11 networks (abbr.)
- 15. Name for a reflected radar signal
- 16. Elemental compound used for microwave frequency reference oscillators (abbr.)
- 18. Engineering Change Order (abbr.)
- 21. Signal-to-noise ratio (abbr.)
- 23. Conductor type for parallel buse interconnections (2 wds.)
- 24. Last statement in a BASIC program
- 25. It can follow an MS
- 26. Generate a periodic signal
- 32. Chemical symbol for gallium
- 33. \* The "R" in ARRL
- 35. Chemical symbol for bromine
- 36. Band between RF and BB
- 37. \* Next level of Amateur Radio license after General
- 39. Chemical symbol for manganese
- 45. JavaScript (abbr.)
- 46. 300 kHz to 3 MHz
- 47. A BPF specification (abbr.)
- 49. Type of modulation (abbr.)
- 51. Automated Test Equipment (abbr.)
- 53. \* Ham's code for "Station is leaving the net."
- 56. A common battery cell size
- 57. Type of antenna with four-sided loops
- 60. Longitudinal shape-forming structural element
- 61. Antenna (abbr.)
- 62. Period of reduced production

- 63. One state of matter
- 65. High-speed logic family
- 66. Trigger diode that conducts current only after its breakdown voltage has been exceeded momentarily (pl.)
- 72. RF & microwaves magazine founded by Gary Breed, now Summit Technical Media (abbr.)
- 73. \* ARRL's magazine
- 75. Chemical symbol for gadolinium
- 77. Unix, Linux or Windows (abbr.)
- 78. Type of flip-flop
- 79. Opposite of a LO

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