Introduction

Welcome to 2024! Winter is still in session and the potential still exists for winter storm warnings into and through March so stay alert. Also, we will be transitioning into spring here in the Midwest which means the opportunity for severe thunderstorms and tornados. We need to be alert and aware of the weather conditions and ready to deploy for spotting at any time.

WooHoo another election year is in full swing with all of the mud-slinging, name calling, gut wrenching sarcasm and general ill-will that we've all come to expect. It's funny that in the world's leading constitutional republic, we have to resort to that sort of thing but there it is. On that note, don't forget that the ECA annual meeting is in June. If you want to run for an office, that's your opportunity. I can't promise no mud-slinging but I trust we can keep it to a minimum and allow civility to reign.

Speaking of government, just a bit of advice to all hams, The FCC ULS system has your e-mail in it so if your e-mail changes, you need to go in and modify your profile in the CORES and ULS systems. It's not that hard to do but should be done or they will not be able to access you via e-mail. Make sure your license is up to date and doesn't expire (or hasn't expired) in 2024. Updating your license involves a $35 fee but it's good for another ten years so be sure not to let it lapse unless you want the fun of taking the tests again. There is a grace period but why let it expire?

If you are a ARRL member, you will notice an up-charge for your membership this year and even more if you want paper copies of QST. Regular membership (full membership) is $59/yr and if you want paper copies of QST it is $84/yr. You may not be excited about it but that's that. ECA membership, however remains the same at $15/yr and our newsletter has been electronic for many years without 30% of it dedicated to advertising. The articles and content are from our membership so enjoy reading it and contribute what you can. Past newsletters are on our website along with several other interesting downloadable files.

Check out our website at www.w0eca.org.

Remember that our nets are according to the following schedule:

Regional Emergency Management Net – every Monday night at 1900 hrs on DEM-VHF-1 repeater.

ARES® Net – 2000 hrs on the 145.490(-) CTCSS 141.3 Hz repeater

ARES Traveler's Assistance Net – As required in the event of a winter storm warning issued by the National Weather Service.

Our meetings are on the second Thursday of the month at 1900 hrs at the County EOC at 1400 TR Hughes Blvd near Tom Ginnever behind the County Police building. All are welcome to attend our meetings and all radio amateurs are welcome to check in to our ARES® nets.

EMCOMM and You

If you all are wondering what value amateur radio really has in public safety in this part of the country, you are not alone. With seemingly fool-proof communications systems in the public safety world, what possible value can ARES and amateur radio have? One thing you can be very certain of is that fools are very clever and there are always issues with any communications system, particularly if there is infrastructure involved with the system.

The value of amateur radio is an almost complete lack of infrastructure. There are digital modes that depend on computers and there are interties with the internet but amateur radio can still function without these modes. Amateur radio has the advantage that each operator owns his/her own equipment. No support structure is required.

This carries with it the risk that said equipment may not be maintained to the same level as many of the public safety systems. It is important for each of us as amateur radio operators to make sure our equipment is in top operating condition. We represent a segment of the overall communications assets in our community, the part that will function when all else fails assuming we are trained and ready to deploy when the disaster occurs. Part of readiness is ensuring your communications systems are properly functioning.

What is required to do to ensure your equipment is operating properly? There are actually several things you can do including the following:

1. Ensure all handheld batteries are properly charged and/or your supply of batteries is refreshed on a regular basis (watch the shelf life shown on the batteries).
2. Ensure your transceivers are netted on frequency using a service monitor or accurate frequency counter.
3. Check the deviation of your FM transceivers on a service monitor or deviation meter.
4. Check and properly maintain your antenna systems. This may include:
   a. Eliminating and preventing corrosion
   b. Ensuring connections are clean, tight and protected
   c. Ensure guy wires or ropes are in good condition and not dry-rotted, kinked, frayed or otherwise damaged
5. Check your feed-line to ensure there is no damage and connectors are properly soldered.
6. Ensure microphone connections are good – particularly RJ-45 connectors which can get dirty and intermittent.
7. If your system has a power supply. Ensure the voltage is correct and has adequate current capability to power your system(s).
   a. A 100 Watt HF transceiver will require a 30 amp regulated power supply
   b. A 50 watt VHF/UHF transceiver will require a 10 amp power supply

Generally, a good quality 30 amp power supply will be adequate. Switch-mode supplies are much lighter than linear supplies so that should be a consideration.

Do your best to ensure a well operating station and you can be part of the communications assets that may be needed in an emergency.

- DE N0PNP

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Technical Articles

The first technical article is from Gerry Schapp (AE0MY) on GPS dongles for Winlink.

GPS Dongles for Winlink and Clock

The HiLetgo VK172 G-MOUSE GPS USB Receiver Dongle for $12 from Amazon is what's used for input to Winlink for GPS input and GPS2Time for GPS input and pc clock correction accurate to 1 microsecond. I bought the first G-MOUSE thinking two applications could share the one com port that Windows 10 assigned it as soon as it was plugged in without a special driver that HiLetgo recommended. It worked fine with one application at time. Rather than try software for port splitting, another G-MOUSE was ordered as well as a 5 port USB hub. I suppose one dongle could have been switched between applications but there may be a time when two apps would need input at the same time. The two receivers and the USB hub sit on the window sill in my basement.
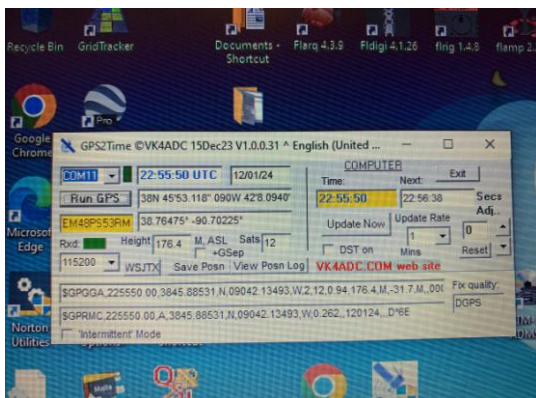
The red lights flash green when a signal is received.

We need newsletter articles. If you have an interest, let us know. Share your passion for radio with the group. Maybe we can all learn something from it.

The COM port assigned by Windows when the dongle is first plugged in the USB hub popped up on the Device Manager Screen: type device manager in lower left corner search box on Windows PC, click on Device Manager in upper right area of open window, click on Ports (COM & LPT), a drop down list appears, and a new USB device is assigned a port and it is displayed at the end of the list, and this com port should be entered in Winlink> setting>GPS, Google Earth Pro or any other app that needs GPS input.

GPS2Time is software made available free of charge by Doug Hunter VK4ADC, an Australian Ham, it is a means of synchronizing your PC clock using a GPS receiver. The download is available by searching Google for GPS2Time, then VK4ADC's Web on the Google search, then VK4ADC Utilities on the web page where you will find GPS2Time.

I thought the directions were straight forward and the ability to receive 12 satellites that are 176 miles away while these GPS dongles are sitting on my basement window sill is definitely another Rip Van Winkle moment for me.

- 73 Jerry Schapp   AE0MY

*Great article Gerry, thanks for sharing.*

End-Fed Half Wave Antennas

I warned you there would be more to come...

The End-Fed Half Wave or EFHW antenna is essentially a wire antenna that doesn't need a tuner. The unique thing about an EFHW antenna is the tuned transformer that is used to match impedances with the feed-line. QRPGuys have a very nice little kit to build your own EFHW antenna. Theirs is for QRP operation (obviously) but the same concepts can be used for higher power antennas. The components will obviously get larger and heavier but that's the tradeoff.
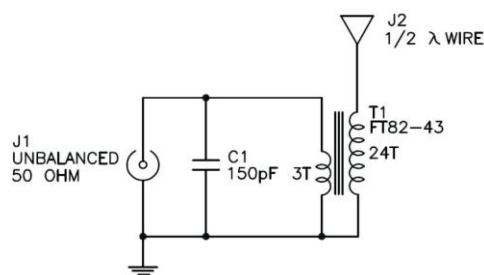
As you can see above, the schematic is relatively simple. The three primary turns are bifilar with the first three turns of the secondary.
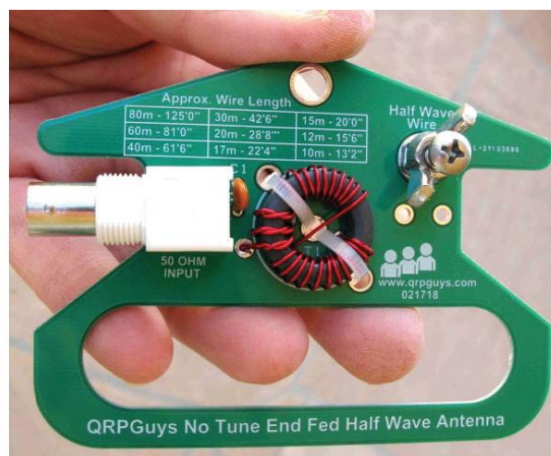
The turns ratio of the transformer is 3:24. The impedance of the wire antenna itself is about 3200 ohms and the feed impedance is 50 ohms (unbalanced). As you can see from the figure below, the impedance is a reasonable match without the tuning capacitor. The capacitor helps tune the circuit producing a very nice match in the 20 meter band. Using half-wave lengths of wire for the various bands allows use of the same transformer/capacitor for impedance matching for the various bands.

The capacitor is 150 pF at a kilovolt or so (since RF voltages can get quite high, especially if the VSWR is high) and does a very nice job bringing the VSWR down by creating a tuned transformer or a resonant circuit with the antenna wire's complex impedance, the transformer and the capacitor. I have constructed the 40 meter EFHW from the QRPGuys kit and built one of my own for 20 meters. It is important to use the right torroid core material, with an appropriate permeability. Material 43 (Nickel-zinc) seems to work well or perhaps a similar permeability material. Be very careful about this because it will affect the efficiency of the antenna. Material 61 (Nickel-zinc) and 43 look very much the same but the permeability is VERY different. Material 43 has a permeability of 850μ where the material 61 permeability is 125μ which is too low for this application. Material 33 (Manganese-zinc) is actually better from that perspective with identical permeability to material 43, however, material 33 has low volume resistivity and isn't much good at frequencies over 1 MHz. It is important to look at ALL of the material specifications. Material 43 has high volume resistivity and is good up to 50 MHz.

The QRPGuy's kit has a list of wire lengths to use for their antenna according to the following table:

80m – 125'0"	30m – 42'6"	15m – 20'0"
60m – 81'0"	20m – 28'8"	12m – 15'6"
40m – 61'6"	17m – 22'4"	10m – 13'2"

These measurements get you pretty close to the right lengths for minimum VSWR. As always, cut long and trim shorter as required.

If you're into the mathematics, the ARRL published an analysis of the QRPGuys antenna in QEX for July/August 2022 by Gerald Julien Lemay (VA2GJ). His article digs deep into the physics of transformers and how the capacitor parallel to the primary reduces the VSWR. From what I've read, a short length for a counterpoise also helps reduce VSWR. My rendition of the QRPGuy's antenna doesn't require a counterpoise but a screw terminal is on the enclosure to use one if desired. Otherwise, the coaxial feed-line shield is the counterpoise as in the QRPGuy's design – not always a good idea – especially at higher power levels.
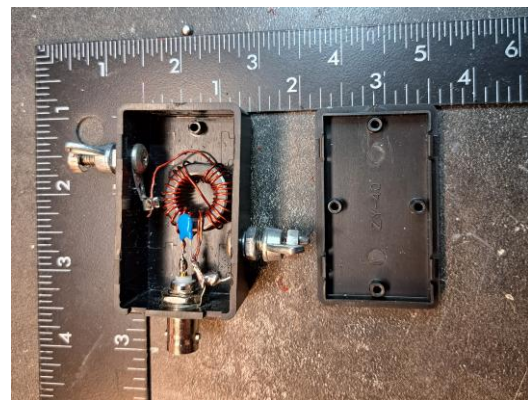
For more information on torroid cores, materials and what the specifications mean look at the following website: https://k7mem.com/Ind_Toroid_Cores.html.

- N0PNP 73

Fox Hunting Tools

With spring coming, it's time to start thinking about fox hunting and how to locate a stuck transmitter. Some of the fundamental tools include a directional antenna of some sort – typically a small beam antenna. Most of our fox hunting is done on VHF frequencies so a three element VHF beam antenna meets the need. When you get closer to the transmitter, it might be appropriate to look at the third harmonic of the VHF frequency. A UHF beam is appropriate for hunting on the third harmonic. Let's say you are hunting a fox on 146.565 MHz. The third harmonic is 439.695 MHz. As a group, we built some VHF beams. There are some pretty simple designs on the internet for 70 cm beams as well.

The above photo is one which I have built with an offset attenuator attached to the handle with the equipment shuttle described in a previous newsletter. The VHF beam we built as a team is shown below.

As you can see, the VHF beam also has an offset attenuator on board. Other good tools include a Time Direction Of Arrival (TDOA) antenna system. A kit was made available to members a few years ago. There may be a couple of kits left if anyone os interested. The TDOA antenna is an actively switched system that switches between the two dipoles to sense which receives the signal first. When facing the signal source, both receive the signal at the same time resulting in a null in the tone from the receiver. The photo below is an example of a TDOA antenna system.
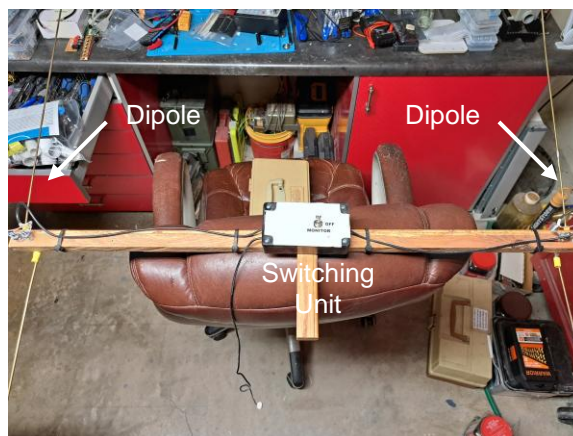
Please ignore the junky workshop – it is an active shop so it will not always be clean. Note the two vertical dipoles spaced about ¾ λ apart. There are other tools that work for foxhunting.

Arrow makes a VHF/UHF crossed beam which is 4 element on VHF and 6 elements on UHF with a diplexer to combine the two to one receiver.

It is critical to remember not to transmit with the TDOA antenna or the offset attenuator attached to an antenna – it could damage your transmitter and **WILL** damage the TDOA switching unit or offset attenuator.

This is just a few examples of foxhunting tools. Other antenna types such as loops, etc. are also useful for foxhunting.

Remember to complete your Missouri Section ARES® Skills Book. If you have not downloaded it yet, you can get it on the www.w0eca.org website or the MOARES website.

ECA OFFICERS (2023-2024):

Following is the officers as of the July 2023 meeting:

- Bill Moss, KE0RXS as President
- Mark Hall, AE0ME as Vice President
- Jeff Young, KB3HF as Secretary/Treasurer
- Ken Humbertson, W0KAH as Director

- Wayne Garrison, KB0BZR as Director
- Wayne Ault, WD6EZQ as Past President Director

Skills Training

ARES® Grab and Go Deployment Checklist

It's been a while since we had a run through of the ARES checklist for team activation. The following is an example of a checklist that would be applicable for St. Charles County ARES®:

RADIO RELATED
☐ 2 meter HT plus 12 hours worth of batteries (a dual band 2M/440 is better)
☐ Consider a waterproof bag to protect it from the elements
☐ 1/2 wave gain antenna for better performance and a magnetic mount antenna
☐ AC to DC adapter and auto cigarette lighter plug cable to power HT
☐ Remote speaker/microphone or headset
☐ Headphones with correct connector to plug into radio, for use in noisy areas
☐ Extra coax for antenna and connectors and adapters for radio
☐ Wunnenberg's Street Guide Map book or other maps
☐ Repeater listing frequency Directory
☐ Users manual for your radios or cheat sheets
☐ Message forms, writing pads, pens and clipboard
☐ SCCARES/ECA badge, copy of FCC license
☐ MO. ARES® Skills Book (filled out with certificates)

☐ Appropriate clothes for the weather, terrain and duration.

CLOTHING
☐ Hat, sunglasses and sunblock during warm sunny weather
☐ Extra set of clothing suitable for the time of year
☐ Extra jacket and vest with Scotchbrite tape

OTHER NECESSARY ITEMS
☐ Food, water, and needed medicines for at least 12 hours
☐ First Aid Kit, First Aid and CPR training?
☐ Night time gear, flash, light extra batteries and bulb, reflective vest, flares in vehicle
☐ Small tool kit, gas and water shut off tools

EXTRA ITEMS
☐ Second radio with 12 hours of battery power
☐ Base station antenna (i.e. J-pole and mounting hardware) or equiv.
☐ 50 feet of coax with connectors
☐ Scanner radio and frequency list of local public safety agencies
☐ Large 12 volt battery, Gel or deep cycle, charger, 100 feet of AC power cord, 12 ga.
☐ Poster paper, markers and tape for signs
☐ 3-way electrical adapter (for 2 prong outlets)
☐ Whistle
☐ Waterproof paper/writing utensils

PERSONAL PROTECTIVE EQUIPMENT
☐ Hardhat – ANSI Z89.1-2003 Type 1, Class G (preferable)
☐ Leather work gloves – 2 pairs
☐ Nitrile gloves - box

☐ Reflective vest for summer operations
☐ Safety Green reflective jacket for cooler weather
☐ Steel shank and toed leather boots

This is a lot of stuff to carry around so you may want to get a plastic tub you can load in the back of your car and arrange things so you know how to find them if you should need them. There are vacuum ziplock bags to store the extra clothes and jackets in – remove the air and they fold up and store nicely. The hundred feet of 12 AWG extension cord is a bit heavy and the 50 feet of feed-line could also get heavy depending on what type of feed-line you use. The likelihood of using digital modes is low if you are deploying in an emergency. Those modes are better in an EOC or some sort of forward base that is a somewhat environmentally controlled area. The emergency deployment is usually a tactical voice net with fielded units which consist of two to three-man teams. It may be a "carry only what you need" deployment so much of your kit may be left in your car. Some deployments may only require a handheld with extra batteries. A wire J-pole for a backup antenna in the event of difficult communications is a good idea – it fits in your pocket and you can carry a ten foot piece of RG-58 feed-line in another pocket. It's amazing what a decent antenna can do for you if you're in a bad spot.

- Bill (N0PNP)

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Items For Sale

We have a few items for sale including the following:

- Various meters and test equipment including frequency counters, capacitance and inductance meter, see below:
  - o 50 MHz B&K Model 1801 Freq Meter for $20
  - o Heathkit 2240 LC Bridge for $20
  - o RF Applications Model D-144 VHF Deviation Monitor with manual for $20
  - o Antennas, power supplies, etc. for various prices depending on the unit
  - o Small stereo amplifiers (10 to 15 Watts) for around $20
  - o VHF Amplifiers, etc.

I also have a 102 pin SMD PIC development kit if anyone is interested for **$50**. This kit is brand new and is the EasyPIC V7 for the 102 pin SMD PICs. That's less than half the price if ordered directly from Mikroelektronika. Software tools and library examples are free online and compilers for PIC Basic and C are available online.

If you're interested in a -30 dB tap for using an oscilloscope as a station monitor, let me know and I can put one together for you ($35 ea.).

I still have a couple of two-tone paging decoder boards built and tested for $25 each. I have one in a box for $30.

If you have interest in any of these things, send an e-mail to william.a.grimsbo@gmail.com and I will get back to you. If you have any items you would like to advertise for sale send in an e-mail and we will try to get them in the next newsletter. Please keep these things to radio or emergency-related items in keeping with the intent of the newsletter. Thanks.

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THIS AREA IS FOR YOUR CONTENT. THIS IS YOUR NEWSLETTER. LET'S SEE WHAT YOU ARE DOING IN YOUR SHACK. WHAT ANTENNA PROJECTS HAVE YOU DONE? WHAT NEW RADIO DID YOU GET – TELL US ABOUT WHAT YOUR SHACK LOOKS LIKE – SHOW PICTURES. THE WONDERFUL THING ABOUT AN ELECTRONIC NEWSLETTER IS THAT YOU CAN PUT AS MANY PICTURES AS YOU WANT IN THE ARTICLES. SEND ALL ARTICLES TO william.a.grimsbo@gmail.com AND WE WILL DO WHAT WE CAN TO GET IT IN THE NEXT NEWSLETTER.

DON'T WORRY ABOUT SPELLING AND GRAMMAR, MOST OF US DON'T AND THAT'S WHY YOU HAVE AN EDITOR (THANK HEAVEN FOR SPELLCHECK 'cause I can't spell either).

Net Control Roster

Week	NCO	Callsign
1	*Jim Combs/Richard Tadlock	KF0HFB/KF0JEJ
2	Ken Humbertson	W0KAH
3	*Paul Orf/Jeff Young	AD0YL/KB3HF
4	*Zach Bush/Bill Grimsbo	KF0FXJN0PNP
5 (Floater)	*Don Weir/Bill Grimsbo	KZ8E/N0PNP

* First name/callsign is the primary and the second name/callsign is the backup.

The scheduled Net Control Operator is responsible for finding a replacement if he/she is unavailable for their scheduled net or paging. Any EMA volunteer interested in becoming a Net Control Operator on either the EMA Training Net or the ARES® Net should contact Bill Grimsbo (N0PNP) at william.a.grimsbo@gmail.com.

Some things to remember:

NCOs - If someone does not open the net by 5 min after the designated time, one of the other NCOs are requested to open the net, take check-ins and handle any traffic as appropriate.

NCOs - If you are unavailable to run the net, please make arrangements – in advance – to have one of the other NCOs run the net in your place.

Membership - The net is a very important method of keeping involved with what is happening with the Association and ARES® - Please consider it part of your weekly calendar (i.e., check in and let us know you are still out there).

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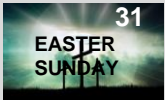
Calendars

March 2024

Sun	Mon	Tue	Wed	Thu	Fri	Sat
31 EASTER SUNDAY					1	2
3	4 EM Net at 1900 ARES Net at 2000	5	6	7	8	9
10 DAYLIGHT SAVINGS TIME	11 EM Net at 1900 ARES Net at 2000	12	13	14 ECA Meeting 1900 hrs	15	16
17 ST. PATRICK'S DAY	18 EM Net at 1900 ARES Net at 2000	19	20	21	22	23
24	25 EM Net at 1900 ARES Net at 2000	26	27	28	29	30

Notes:

1. All meeting locations are subject to change depending on room availability. Tune into nets for latest information.
1   DEM Net is on DEM-VHF-1
2   ARES Net is on 145.490(-) MHz. CTCSS: 141.3Hz
3   Have a Happy and Easter

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April 2024

Sun	Mon	Tue	Wed	Thu	Fri	Sat
31 EASTER SUNDAY	1 EM Net at 1900 ARES Net at 2000	2	3	4	5	6
7	8 EM Net at 1900 ARES Net at 2000	9	10	11 ECA Meeting 1900 hrs	12	13
14	15 EM Net at 1900 ARES Net at 2000	16	**17**	18	19	20
21	22 EM Net at 1900 ARES Net at 2000	23	24	25	26	27
28	29 EM Net at 1900 ARES Net at 2000	30	31	1	2	3

Notes:

1 All meeting locations are subject to change depending on availability. Tune into nets for latest information.
2 DEM Net is on DEM-VHF-1
3 ARES Net is on 145.490(-) MHz. CTCSS: 141.3Hz

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May 2024

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29 EM Net at 1900 ARES Net at 2000	30	1	2	3	4
5	6 EM Net at 1900 ARES Net at 2000	7	8	9 ECA Meeting 1900 hrs	10	11
12 	13 EM Net at 1900 ARES Net at 2000	14	15	16	17	18
19	20 EM Net at 1900 ARES Net at 2000	21	22	23	24	25
26	27 	28	29	30	31	1

Notes:

1   All meeting locations are subject to change depending on availability. Tune into nets for latest information.
2   DEM Net is on DEM-VHF-1
3   ARES Net is on 145.490(-) MHz. CTCSS: 141.3Hz

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