ECA Newsletter

Volume 24, Issue 1 **January 2023**

Introduction

Welcome to 2023! Who would have thought it would come so quickly?

Winter is in full swing at this point with the winter weather alerts and the whole nine yards. As always, ECA is ready with our Traveler's Assistance Net. This net provides travelers through the St. Charles County area with weather, road and traffic conditions. Now if we only had someone to shovel our driveways, we'd be set.

If you are interested in some How-To articles, this newsletter has some quick and easy projects in it and some training to help you check a few more boxes in your training skills book. One article is on how to build a simple "inverted-V" dipole for HF emergency communications.

Speaking of skills, the skills workbook is in circulation - have you been filling yours out? Each meeting and work day/exercise and newsletter we've had can add a checkmark to your skills workbook. Remember to keep them up to date.

Exercise planning should begin soon for the 2023 year. If you would like to plan an exercise or participate in planning, contact Bill (N0PNP) or Jeff (KB3HF) to get involved. We usually have a spring foxhunt, Amateur Radio Field Day in June and Simulated Emergency Test (SET) in October so get involved early.

ARES® needs another net control operator to fill in on the Mondays when the other operators are not available. If interested, contact Bill (N0PNP). Scripts and net activation codes will be made available to those that serve as net control operators.

Remember that we have a few exercises each year – Usually a Spring fox hunt, a summer event – Field Day, and the Fall Simulated Emergency Test. These are important events to attend and we hope to see you all at them. Being a member is more than just checking into a net a couple times a year. We'd love to see you at the meetings and events. Hopefully soon we will be starting our quarterly dinners – they are always a good time around good food. We'll try to coordinate via e-mail when we have these events.

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 on 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

"VHF/UHF ANTENNAS

A good antenna, mounted as high as possible without incurring large feedline losses, is more important than high transmitter power. Not only does it provide gain to both the transmitter and receiver, but a higher gain antenna may also allow output power to be reduced, thus prolonging battery life. In relatively flat terrain, if possible use a mast-mounted single or dual-band antenna with at least 3dBd gain.

If you are operating in a valley, the low angle of radiation offered by a gain antenna may actually make it difficult to get a signal out of the valley. Low or "unity" gain antennas have "fatter" radiation lobes and are better suited for this purpose. Unity gain J-poles are rugged, inexpensive and easily built. For directional 2-meter coverage with about 7-dBd gain, a three or four element Yagi can be used. Collapsible and compact antennas of this type are readily available. For permanent base station installations, consider a more rugged commercial 2-way collinear antenna. Most 2- meter versions will also perform well on 70cm. Commercial open dipole array antennas will work well for a single band, and are more rugged than a fiberglass radome encased collinear antenna.

A magnetic mount mobile antenna is useful for operating in someone else's vehicle. They can also be used indoors by sticking them to any steel surface, such as filing cabinets, beams or ductwork, even up-side down.

Hand-held radio antennas, known as +"rubber duckies," have negative gain. Use at least a ¼ wave flexible antenna for most operations, and consider a telescoping 5/8-wave antenna for long- range use in open areas where the extra length and lack of flexibility will not be a problem.

"Roll-up J-pole" antennas made from 300 ohm twin-lead wire can be tacked up on a wall or hoisted into a tree with heavy-duty string. In addition to unity gain, the extra height can make a big difference. Even a mobile 1/2 wave magnetic mount antenna can be used with hand-helds when necessary." – IARU Emergency Telecommunications Guide Rev. 1 dtd. 1 January 2015

This is good information from the IARU Guide. We should pay attention to the reliability of the equipment we use and that applies to the antennas as well. The typical rubber-ducky is fine for close communications but will not be effective over long distances or even some short distances depending on topography. We should not allow the antenna to be the weakest link in our communications system – especially when we spend significant money on the transceivers. One thing that the manual didn't say much about is the half-wave antenna. The nice thing about a half-wave antenna is that it does not need a ground plane. Many automobiles where we may find ourselves serving are primarily fiberglass. The typical magnetic-mount antenna does not work well on non-magnetic surfaces. This lesson was learned in Joplin and other disasters. In my go-kit I keep a rolled up dual band J-pole and a tape measure beam for UHF and VHF as well as various magnet-mount antennas, push-up poles, collinear antennas and feed-line.

Put some thought into how you would deploy and what you might need and add it to your go-kit. Don't forget about a good antenna.

- DE N0PNP

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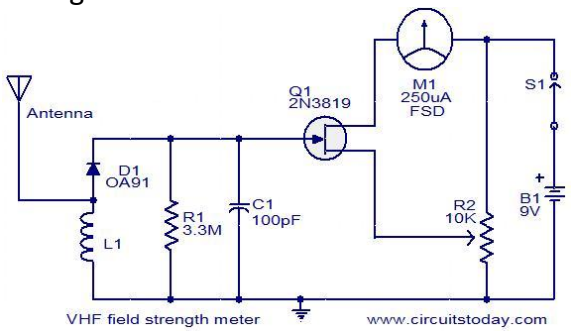
Technical Articles

Super Cheap Field Strength Meter for Fox Hunting

I took the following schematic from the Radio Circuits webpage and built it into an enclosure from an old satellite field strength meter.



The circuit is very simple and not particularly sensitive (I know it sounds strange but sometimes that's exactly what you need). You would use this FSM if you are in the vicinity of the fox but can't quite see it. First zero the meter with the R2 potentiometer, then with your beam connected, turn around until you see maximum deflection of the meter – that is where your fox is located. All of the parts are pretty easy to find and the circuit is very easy to build. My enclosure didn't have enough room inside for the battery (see photo) but it works being on the outside. If I have to replace the battery, at least I don't have to open the enclosure. This is not a highly accurate instrument; you are just looking for maximum deflection of the meter. Almost any 250 μA meter movement will do the trick. If you don't have a 250 μA meter lying around but have other movements, you can experiment by adding a resistor between Q1 and M1 to reduce the current to M1. It might take some experimentation or you could just put a potentiometer in and adjust for good deflection with a strong signal. If you can't find an OA91 diode, I used a germanium 1N34, 1N60 or something similar. This circuit is not that picky.

The photo below is what mine looks like:

I found the "Satellite Finder" for a dollar at ReStore by Mid Rivers Mall. Every now and then, you find something worth taking apart there and the proceeds go to Habitat for Humanity.

By the way, L1 is just six turns of #20 enameled copper wire around a ¼ inch plastic form – pretty easy to make.

With my tape measure beam, this gives me a nice narrow detection angle with virtually nothing off the back of the beam – perfect if you know you are pretty close to your target.

- 73 DE N0PNP

We need articles for the ECA newsletter. Please send any articles to william.a.grimsbo@charter.net. If you need some help pulling together an article, let us know and we can help. Text (.txt) and Document (.doc or .docx) files are fine.

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Building an NVIS Antenna: Homebrew AS-2259/GR

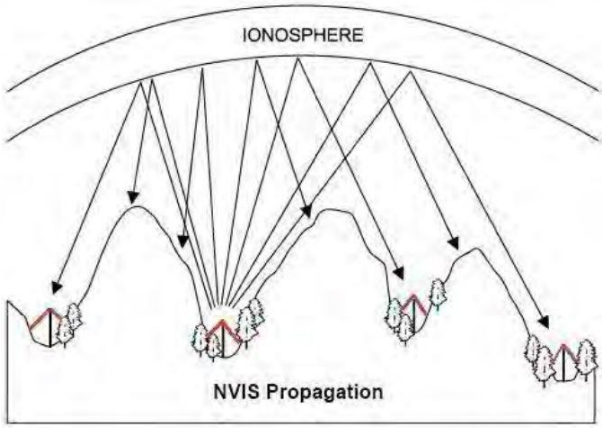
By Zack Bush, KF0FXJ

After a successful ECA Simulated Emergecy Test in 2022, we had several solid takeaways; One of them was the obvious benefit of the ECA's NVIS antenna. This antenna was used to make a MARS contact as part of the test - We had several observers inside the Emergency Operations Center and several more outside at the trailer. The operators in the trailer could hear the contact perfectly and copy the test message, and the observers in the EOC could barely hear them, if at all. After helping set up the antenna and seeing the basic parts and ease of deployment, I decided to build one myself. I used information from a DX Engineering NVIS antenna building guide, but with some modifications in materials and supplies; While the article had a lot of great information and provided measurements for the wires and ropes, the guide was geared to direct the builder to buy all possible parts from DX Engineering. I can appreciate the sales push, but I compiled some alternatives that make for a more durable antenna (in my opinion, anyway).

Before we get into the antenna itself, a bit of background on NVIS antennas; The following information and photos are taken directly from the DX Engineering NVIS antenna guide – I did not write the following, but I could not have written it any better, that's for sure!

From DX Engineering's "A Practical NVIS Antenna for Emergency or Temporary Communications"

"Near Vertical Incidence Skywave (NVIS) is a propagation mode which uses high angle radiation to send signals almost straight up to be reflected back to Earth for very effective short to medium distance communications. This mode of operation makes it ideal for in-state communications during disasters or other emergency situations. The military has used NVIS techniques for decades to provide short haul communication with other units on the ground. NVIS only works at frequencies from 2 MHz to 10 MHz. The signal must penetrate the D layer of the ionosphere, and bounce off the F layer. Lower-frequency signals will not penetrate the D layer; higher frequencies will not bounce off the F layer at these sharp angles and just goes out into space. Remember the Maximum Useable Frequency (MUF) For amateur radio operators, we're looking at 40 and 80 meters primarily for NVIS use.



A good NVIS antenna will not work well at DX distances. Antenna gain is a zero sum game. There is a fixed amount of energy

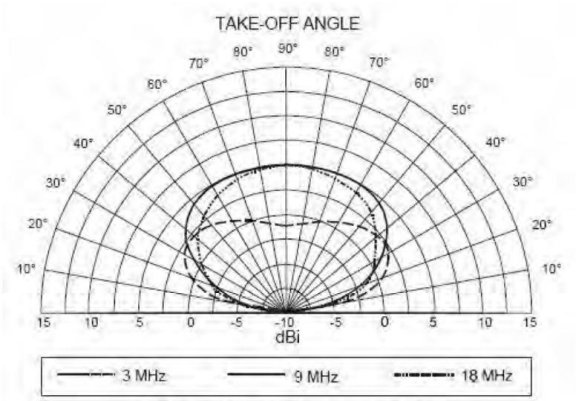
radiating. If we push it all out in one direction (the near-vertical angles), we have to take it away from another direction (the low DX angles).

Regular height dipoles or vertical antennas have a lower take off angle and your signal may be heard three states away, but not in your state due to the skip zone. This skip zone is the area between the maximum ground wave distance and the shortest sky wave distance where no communications are possible. Depending on operating frequencies, antennas, and propagation conditions, this skip zone can start at roughly 10 to 20 miles and extend out to several hundred miles, preventing communications with the desired station. The other term called ground wave is where your signal does reach someone closer. A ground wave signal can go up to approximately 50 miles if conditions, including terrain and obstacles, are favorable.

Using no skip zone or ground wave, the NVIS mode is used for making reliable HF communications below 10 MHz effective for a range to 600 miles. The NVIS propagation mode works best on HF below 10 MHz since these high angle radio waves are reflected back to Earth. Most often a low dipole is the best antenna to use and will provide reliable communications. This makes a NVIS antenna an excellent choice for emergency communications and for staying in contact with other amateur radio operators in nearby locations.

Dipoles only exhibit directionality once they reach 1/2 wavelengths above ground. However, NVIS antennas are located from 1/4 to 1/10 wavelength above ground.

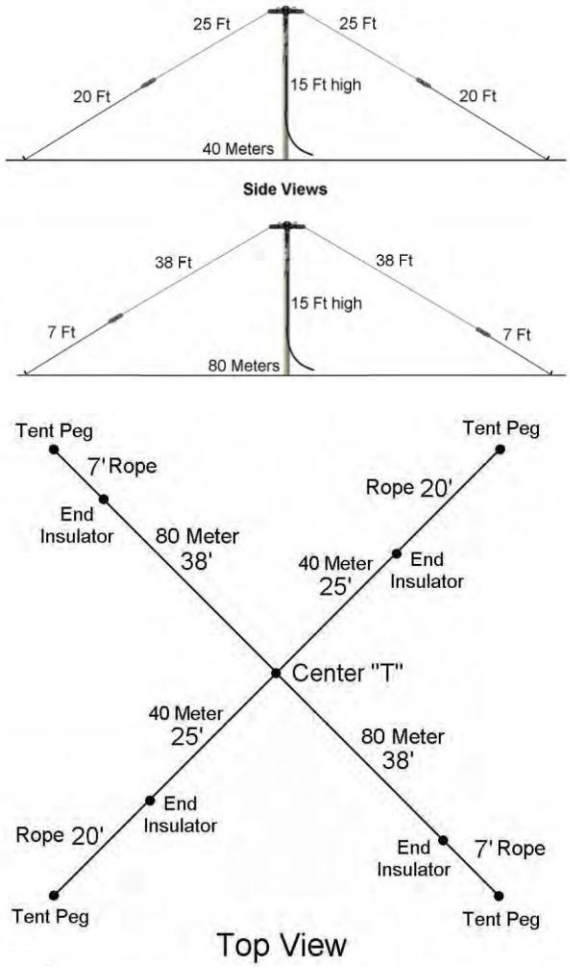
Vertical RF energy radiated at a low enough frequency is reflected back to earth at all angles.
The effect is similar to taking your garden hose with a fog nozzle and pointing it straight upwards.
The water coming back down gives you an omni-directional pattern without dead spots. It's a continuous circular radiation pattern coming back down. Since it is omni-directional, dipole orientation is not important.



AS-2259 Vertical Radiation Pattern

The higher the angle, the lower the frequency needed to work properly. Therefore lower amateur radio frequencies such as 40 and 80 meters are ideal for NVIS use. NVIS generally requires takeoff angles of 70 degrees or higher. Radio waves directed vertically at frequencies higher than the critical frequency pass through the ionized layer out into space.

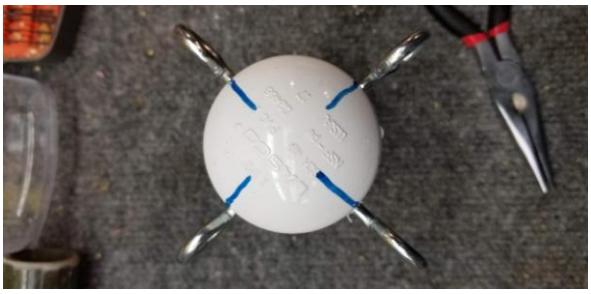
The military uses a dual band NVIS antenna known as the AS-2259/GR. It consists of two crossed inverted "V" dipoles positioned at right angles to each other and is supported at the center by a 15-foot mast. The antenna was designed for military use from 2 to 10 MHz (some references say 2 to 30 MHz). The dual dipole wires do the job of providing guying support for the mast."



Okay, enough of the dry stuff and time for the fun stuff – The primary data I took from the guide above was the lengths of the wires and rope; The only parts I bought from their guide were the End Insulators, Package of 8 (DXE-UWA-END-KIT) and the coax, DXE-8XDX100 - 100 Feet of RG-8/X. I could have sourced the insulators anywhere or made some of my own, but I decided to go with the ease and speed of the $8 ones when I ordered the cable. Now I must clarify that a significant amount of advice, input, and materials came from Bill Grimsbo, N0PNP – I could not have completed this project without his help!

The antenna calls for 16 feet of fiberglass poles, and I was able to source 20 feet total, for extra height if needed or an extra pole in case of breakage. The first challenge was to build a cap for the top of the pole – The military one was a specialty product (of course) and if it can be found, it is usually part of a kit and a bit expensive. The one in the DX guide seemed a bit susceptible to breakage and slipping, and I wanted something a bit sturdier. For the cap, it was built from 1 ½ inch PVC pipe – the inside diameter fits right over the top of the pole perfectly.

I measured and cut a piece of the 1 ½ in pipe to fit over the pole and left enough clearance over the top of the fiberglass so that once an end cap was added, the entirety of end cap area would clear the fiberglass pole – this is important because we are going to be drilling holes and screwing things into the end cap and we do not want to damage the fiberglass. The next step is to mount anchor points into the end cap for the antenna wires, 4 supports in total; I chose #6 ring bolts.



Before drilling the holes, I hammered the end cap onto the pipe ad firmly as I could, not bothering to use glue – the bolts drilled in are more than sufficient to keep the cap from coming off. I taped over the bolts with masking tape and spray painted the cap with Krylon (trying to match the poles as close as possible). The final product didn't turn out too bad, but the paint wasn't perfect from painting when it's cold outside – The 2nd cap in the picture was made to support an end-fed wire or inverted V for additional antenna options using the same pole (but not at the same time as the NVIS).

The four eye bolts will soon hold the wires, and the two posts on each side are "hanger bolts", coarse threaded on one end and machine threaded on the other end; Those will be used to connect the ends of the wires to the feed point harness via ring terminals. The wire dimensions are as follows:

- 40m - 25ft wire, 20ft paracord (2 lengths)
- 80m - 38ft wire, 7ft paracord (2 lengths)

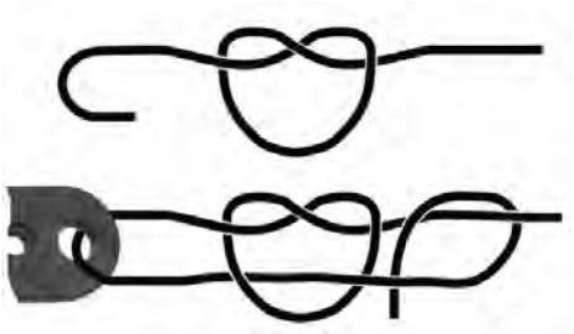
To secure the wires to the cap, I opted for small clips and the DX engineering insulators; These will have a clip on one side and the wire itself on the other:

For the feed point, I took a short piece of RG8x with a PL-259 on one end and the other end was stripped back, creating two leads; One from the center conductor and one from the shield. The antenna wire is 14ga stranded copper. I stripped the antenna wires back (brown wire in the picture above) and paired them as follows:

- One wire from each band (one 40 and one 80, so one of each length) to the shield lead
- The other wire from each band to the center conductor lead

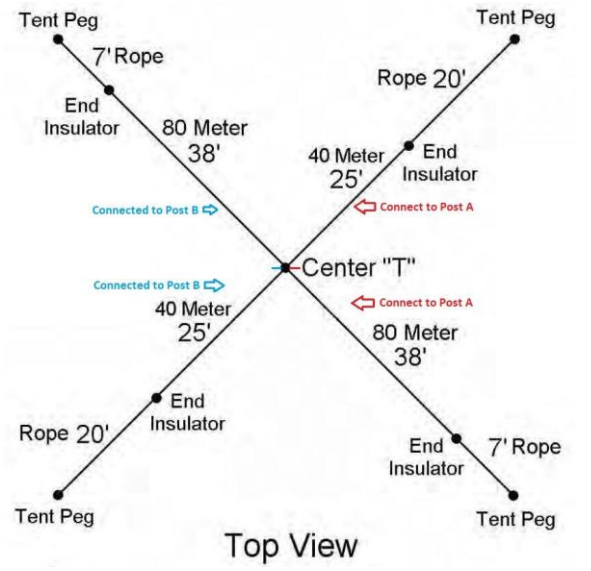
The ring terminals are then secured to the posts on each side of the cap; Since the posts are in the same cap without insulation, I packed some leftover foam from a pelican case to prevent arcing or shorting.

The other end of the antenna wire is secured to another insulator along with the corresponding length of paracord outlined in the plans (diagram above and below). The knot for the paracord was a square knot looped through two holes on the insulator, and the wire was secured as directed by the DX Engineering plan:



The finished antenna cap looks like this, and the deployment and wiring is outlined in the diagram below; The ropes are secured to the ground with standard tent stakes. The final piece of the antenna is the base; There are two ready-made base options, one is a unique fiberglass base originally used to hold camouflage netting (pictured left) and the other is a metal tripod that takes three to six additional poles to set up (pictured right). Due to the limited number of poles I had and the cost of the metal tripod itself, I went with the netting base on the left; It fits the poles perfectly, but will probably require a few tent stakes to hold it in place (picture below is from

eBay, still waiting on the base it to arrive). I hope to be able to set up the single-pole / round base configuration in the field by myself, but I can already hear the Benny Hill theme song playing in the background...



I have yet to get it set up and tested (awaiting the base to arrive) but a few more important points – The antenna will require a tuner, 100ft of RG8X coax, and the tent stakes to anchor the wire/rope guys to the ground. The antenna is self-guying, so the tripod base is not required – but the tripod is an option that may make it easier to set up with one person. For the alternate cap I made, I did acquire some guy rings that fit in between the poles and have holes to attach guy lines (shown in the final picture below) – two large ones for the lower points and a smaller metal one (made that one myself) for the highest guy point.

A different configuration substitutes 450ohm ladder line and a remote tuner (tuner installed at the base of the antenna). The alternate configuration may yield better performance, but requires a remote tuner and ladder line in addition to the pieces listed above – main difference for the build using the ladder line is to skip the coax pigtail and connect the ladder line directly to the cap, one lead on each post.

Transport of this antenna may be a bit tricky, but I use a fishing pole bag for one of my other antennas, and I expect it would work well for this one as well. On a final note, here is the parts list for my build their sources:

- Fiberglass antenna poles (5) – hamfest / ebay / local ham
- 1 ½ in PVC pipe (3ft.) and end caps (2) – Lowes / Home Depot / Menards
- Wire insulators (8) – DX Engineering / Amazon
- Paracord (100ft roll) – Menards / Amazon
- 14ga stranded copper wire (approx. 135ft) – hamfest, DX Engineering, local ham, Lowes, etc.

- #6 eye bolts (box of 20) – Lowes / Home Depot
- #6 – 1/4in hanger bolts (2) – Lowes / Home Depot
- ¼ bolts, lock washers, ring washers (bag of each) – Lowes / Home Depot
- Metal clips (4) – Lowes / Home Depot
- Krylon Green Camo spray paint – Lowes
- RG8x coax (101 ft, 1ft for the pigtail) – DX Engineering / Amazon
- PL-259 Connectors (3) – RF Parts Company, model RFU508-X (online)
- Not required, but large guy rings are fiberglass sheet cur to shape, and metal guy ring is electrical box cover with hole cut in the middle

- **Zack Bush, KF0FXJ**

Had enough yet?

Editor's Note: *I had to trim this down just a little and reformat it. I think I got the important stuff in the article. Thanks Zach for this informative article.*

Return to TOC

ECA OFFICERS (2022-2023):

Following is the officers as of the July 2022 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

Return to TOC

Skills Training

The Simple HF Dipole for Emergencies

The dipole antenna is a very simple and very effective antenna. All you need is two quarter wave lengths of wire and a 1:1 balun. You can get by without a balun if need be but it is recommended since a dipole is a balanced antenna. Balun kits are available from https://www.amidoncorp.com/ab200-10-kit-1/ and consist of a torroid core and enameled copper wire to wrap in whatever configuration you need to match impedances or just provide the unbalanced to balanced conversion. This balun kit is around $12 and is good from 1.8 to 30 MHz.

There are a number of variations of the dipole antenna. I use an inverted Vee since with it you only need one push-up pole and it takes up less space than a fully horizontal dipole. Also, since it is not in free space and actually is close to the ground, the launch angle is relatively high so there are the advantages of it being near vertically incident. To calculate the length of each side of the dipole, use the following formula:

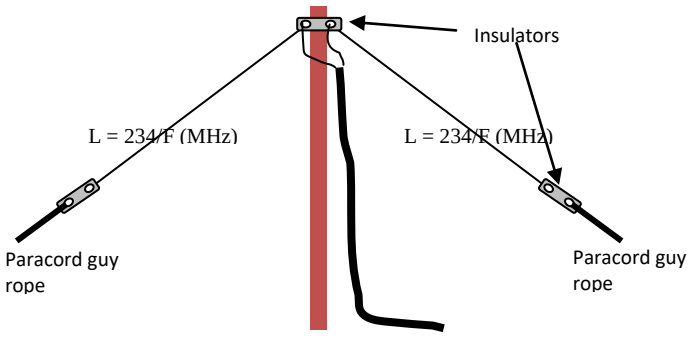
L = 234/F (MHz)

As with any wire antenna, cut it long and trim to frequency. For the typical ham bands the following table shows an approximation of the length of a single leg of the dipole antenna:

Band	Leg Length	Total Length
160 m	130 ft	260 ft
80 m	60 ft	120 ft
40 m	32.5 ft	65 ft
20 m	16.5 ft	33 ft
10 m	8.2 ft	16.4 ft
6 m	~ 4.5 ft	~ 9 ft

These are approximate lengths – always cut a bit long. You can always cut some off but it is harder to add more on.

When cutting the wire, assume a little extra to fold over in an insulator for your guy ropes as well. For guy ropes, I like to use paracord since it is durable and cheap. You will need an area at least 1.5 times the length of the dipole to ensure the ends of the dipole are high enough not to be an RF shock hazard to folks walking under them. Sloping the wires in an "inverted V" also reduces the impedance of the antenna. The angle at the vertex should not be less than 90 degrees. The reduced impedance also means you should get good VSWR just using 52 ohm coaxial cable to drive it.



The diagram above shows the simplicity of the wire dipole "inverted V" antenna. This antenna is very effective and very simple to build. Making it a multi-band antenna is also easy by cutting for the various bands, putting insulators between each band length and using an alligator clip across the insulator to tune to the next band. Another method which is a bit more complex is the fan dipole which ties resonant legs together for various bands at the feed point and the resonant part of the fan will radiate. There is a more complex iterative tuning process for the fan dipole but it is effectively a very similar method. The wire for the legs can be solid copper, stranded copper or copper clad steel. I recommend copper clad steel since it does not stretch as much as the softer copper wires and at HF frequencies, most of the current is carried on the skin of the conductor.

The simple dipole can be rolled up and tossed in your go kit for emergencies. It's easy to assemble and works very well. To learn more about the various types of wire antennas, refer to the ARRL Antenna Handbook which can be ordered via www.arrl.org.

- N0PNP

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Items For Sale

We have a few items for sale including the following:

- Three element beam antenna kits for DF'ing - $10. Four still available
- TDoA DF'ing kits (Time Direction of Arrival) - $12. Two available
- **Sinclair Labs Duplexer Model Q-202GR. Set up for 145.490 TX and 144.890**

RX. Four cavity Q-circuit (pass/reject) rack mount unit. Looking to get $200 for the unit. Spec sheet is available online. I'd really like to get this one out of my basement.

- **Two paging tone decoders for the 145.490 repeater two-tone paging tones - $25.00 each built and tested.***
- Various meters and test equipment including frequency counters, capacitance and inductance meter, see below:
  - ***50 MHz B&K Model 1801 Freq Meter for $25***
  - ***Heathkit 2240 LC Bridge for $20***
  - ***Heathkit IT-121 FET/Transistor Tester for $10 with the manual***
  - ***RF Applications Model D-144 VHF Deviation Monitor with manual for $20***
  - ***Antennas, power supplies, etc. for various prices depending on the unit***
  - ***Small stereo amplifiers (10 to 15 Watts) for around $20***
  - ***Two -10dB TX RX Systems Inc. Taps for station output monitoring with N connectors for IN/OUT and a BNC for the tap - $25 ea.***
  - ***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 a third 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 have interest in any of these things, send an e-mail to william.a.grimsbo@charter.net 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.

***For use with the 145.490 repeater paging system.**

Return to TOC

Happy New Year from the ECA officers – we hope you have a very prosperous 2023!

This area is for your material. If you have done something interesting in Amateur Radio or you have a DIY project, sketch up an article and some photos and we'll publish it in the ECA Newsletter. It can be Amateur Radio related, public safety related or just something useful to other folks. If you need help putting an article together, send an e-mail to william.a.grimsbo@charter.net.

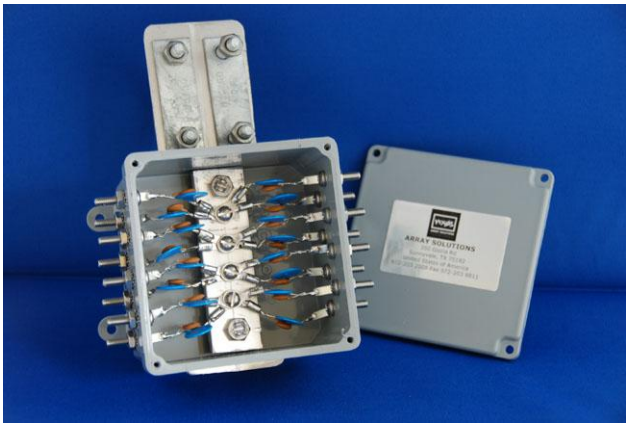
Editor's Note:

A few months ago, we had some articles on lightning protection and a presentation at one of our meetings. Below is a few links to where you can get or make a lightning protection device for your antenna rotator:

- ***https://www.arraysolutions.com/as-8sp, https://surgestop.com/surge-products/m-348.html***
- ***https://thewireman.com/product/m349b-rotor-line-switch-suppressor-120-volts-or-less/***

  or

- ***https://morsetutor.com/2015/05/rotator-lightning-protection/ if you are a DIY type of person***



Remember that the best we can really hope for is to mitigate the damage done by lightning, we cannot prevent lightning or really completely protect against it. There are many options out there but most use Metal-Oxide Varistors (MOVs) (see photo above) which provide some mitigation but fuse easily and should be considered a one-shot device that should be regularly checked as part of your antenna/system maintenance. The typical failure mode is a short-circuit for these devices (in many cases, they will explode due to the heat built up in them when they short) so fuse your rotator power carefully to prevent further damage. If you decide to build your own, remember that the ratings of the MOVs is important to ensure they dissipate an appropriate amount of energy. You will need to know the operating voltages on each line for the rotator and choose an MOV that is appropriate for those working voltages. The commercial devices vary in cost from about $100 to much more expensive. Take this as just one more bit of information for protecting your station.

- N0PNP

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Tell Us All About It!

If anyone has interest in articles on HF operations or if anyone wants to present an article on HF, please write it up and send it in for publication. Subjects like voice compression for SSB (how much is good and how much compression is too much) or perhaps what the specifications for your HF rig really mean. What is the difference between normal HF operation and QRP or QRPP operation? What was the most distant QRP contact you've made – tell us about it. Have you refurbed an old rig? Tell us about the challenges of getting parts, etc.

The list of possibilities is endless. We like articles on your station and its capabilities. Our Member's Mark section is for you to tell us all about yourself and what your capabilities are as an emcomm operator and just what you do for fun.

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Net Control Roster

Week	NCO	Callsign
1	Paul Orf	AD0YL
2	Ken Humbertson	W0KAH
3	Jeff Young	KB3HF
4	Bill Grimsbo	N0PNP
5 (Floater)	Bill Moss	KE0RXS

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@charter.net.

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

January 2023

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

Notes:

1 All meeting locations are subject to change depending on room 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
4 There will be normal nets on the 31st

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February 2023

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30 EM Net at 1900 ARES Net at 2000	31	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	Valentine's Day 14 	15	16	17	18
19	20 EM Net at 1900 ARES Net at 2000	21	22	23	24	25
26	27 EM Net at 1900 ARES Net at 2000	28	1	2	3	4

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
4 Have a Safe and Happy Thanksgiving

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March 2023

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30 EM Net at 1900 ARES Net at 2000	31	1	1	2	3
4	5 EM Net at 1900 ARES Net at 2000	6	7	8 ECA Meeting 1900 hrs	9	10
	Start of DST **12** EM Net at 1900 ARES Net at 2000	13	14	15	16	St. Patrick's Day **17** 
	19 EM Net at 1900 ARES Net at 2000	20	21	22	23	24
25	26 EM Net at 1900 ARES Net at 2000	27	28	29	30	31

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
4 Merry Christmas and Happy New Year to all

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