

# The NEWSLETTER

JUNE 2011 VOLUME 11, No. 6

Mercury Amateur Radio Association - MARA - North America - North East

## Field Day 2011 June 25 - 26th

Reserve your favorite  
field - before it's gone!



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# Grandma Mara's RAMBLINGS

**M**ay was kind enough to provide some nice weather, surprisingly even on some of the weekends! On one of those Saturdays, Walter and I arrived at Wendy's house shortly before 9:30 in the morning.

Wendy and her dad were up and out after an early breakfast and had all of the materials laid out in the back yard. The week before, we had looked over the various trees and measured the distances between them and the rear of the house. One nice tall maple reasonably close to the house on the rear lawn looked to be the best choice. Even the limb growth had co-operated leaving what looked to be a couple of open gaps for the legs of the V.

Wendy had convinced her brother to be the designated climber, with the baking of two triple batches of chocolate chip cookies. Once he got as high as he felt comfortable in going, he fastened a four inch plastic clothesline pulley to a tree limb above his head and dropped a length of twine to the ground. With the twine he pulled up a run of 1/4 inch rope and fed it through the pulley. Then using the rope, he hoisted the center insulator, wire and trap assemblies. We tied off the ground end of the rope to a concrete block at the base of the tree. Next he tossed the weighted ends of another two lengths of twine to the ground on opposite sides of the tree trunk, pulling back up some bright yellow nylon rope. The ground crew used those to pull the wire and trap sections down through the limbs. Once those had been arranged so as to avoid those same tree limbs, and keeping the angle at approximately 90 degrees, they were tied to two more concrete blocks. Walter had suggested the blocks rather than tent pegs as they could more easily be moved for mowing the grass. The yellow rope was for visibility!



**A wire clamp used to secure the ends of the wire segments on Wendy's inverted V antenna.**

The coaxial cable was laid temporarily on top of the grass over to the house (to be buried the following weekend) where Walter set up his antenna analyzer. He found that Wendy's brother being a few feet under the apex of the wire had negligible effect on the readings. After many adjustments to the wire segment lengths, starting from the highest frequency (shortest wire sections) and finishing with the

lowest frequency (end sections) - and the promise of another few double batches of cookies - the wire ends were secured with wire clamps, and Walter proclaimed it to be good! Connecting the coax and firing up the transceiver with an SWR meter verified the analyzer readings.

All of this took us into the afternoon with only a short stop for sandwiches, chips and soda at lunch, and the odd bathroom break!

It would have been much easier if this had been mounted on a pole or tower, rather than a tree with limbs to get in the way. However, when you are just starting out in ham radio and you don't have a lot of spare change, you make do with what you have. Isn't that true ham spirit?

## CULTURED CORNER by ANØNMS

*If not in May then why not June  
To raise a wire high,  
And clear the limbs to reach the heights  
Up where the birds do fly.*

*To send out signal loud and strong  
To reach the distant station,  
And get a special dx card  
Received with great elation.*

*Perhaps distant Ulan Bator  
Or Italy or Spain  
Or some far off and remote land  
- maybe the state of Maine.*

*And if I cannot find the time  
To be a radio nerd,  
At least I will have been so kind  
To provide a perch for birds.*

### GOT SOMETHING YOU CARE TO SHARE?

A construction project, pictures of your station... home or mobile; a station installation at the chapel, or Field Day, a trip in the woods or some remote location with your portable rig, or maybe an antenna in your back yard. Whatever it is, share it with us. Send it to one of the e-mail addresses shown on page 1.

# TECH STUFF

By VE1VQ

As well as getting an antenna out in the clear as much as possible, it is also necessary to have an effective material as a radiator. The old thing about a particular tuner being able to tune a piece of wet string may be so, but it will make a much better dummy load than any sort of efficient radiator.

If you think that gold would be the best conductor for antennas, then you would be wrong! Silver is the best, followed by copper, then by gold, and lastly aluminum. The problem with gold and silver are expense and the fact that pure or nearly pure gold and silver are too soft to support their own weight. Since copper is a very close second in relative conductivity as compared to silver, the choice is clear (or should be). This article will examine several of those materials commonly available (not including the wet string).

Metal	Relative Electrical Conductivity @ 20°C	Relative Thermal Conductivity @ 20°C
Silver	106	108
COPPER	100	100
Gold	72	76
Aluminum	62	56
Magnesium	39	41
Zinc	29	29
Nickel	25	15
Cadmium	23	24
Cobalt	18	17
Iron	17	17
Platinum	16	18
Tin	15	17
Lead	8	9

Relative electrical conductivities of common metals.

## COPPER

The first choice is, of course, should be copper. Stranded is to be preferred over solid single strand as the former is less prone to stretching and work hardening, leading to premature breakage. The longer the length (larger spool) purchased usually means lower cost per foot.



A myth has been circulating for years (and still continues to be spread by well meaning but ignorant hams) that bare wire 'gets out' better than covered. The material used for wire coverings

is transparent to radio frequency (RF) energy in the high frequency (HF) range. The covering does have an affect on the final physical length of the antenna by making the resonant length one to two per cent shorter. Proximity of the conductor to other conductive material such as rain gutter or even wet leaves and tree branches can affect the length more than this. Cut it a couple of feet longer than the calculations indicate and trim to resonance.

The question often raised is, 'What size wire should I use?' and the answer is often, 'How much do you want to spend?' or more likely, 'Whatever you can get for free!'

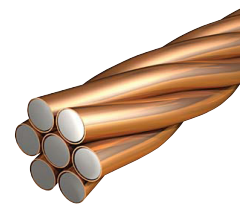
Bare hard drawn #12 AWG (American Wire Gauge) solid copper from the [WIREMAN](#) is priced at \$0.19 per foot while FLEXWEAVE™ (stranded) #12 AWG with extra tough black polyethylene jacket goes for \$0.50 per foot. Other wire from this source is available that is just as suitable and at a lesser cost per foot. Check out your local Lowes or The Home Depot for #14 or #16 THHN<sup>1</sup> covered solid (single conductor) and stranded copper in 500 foot rolls for best pricing.

If you can find a suitable length of stranded copper speaker wire or lamp cord (also known as 'zip cord') at a good price, you can split it in two for lighter weight or left 'as is' doubled up for extra strength. Sizes range from 10AWG to 22AWG. Numbers 18, 20 and 22 doubled up (not split) would be fine for an antenna as would any of the larger sizes split into single conductors. Don't worry about the 'oxygen-free' speaker cable. That's another bit of hype designed to part audiophiles from their money. Basic garden variety stranded copper speaker wire or lamp cord will do everything that its more expensive relatives will do for radiating your signal. AWG 14 and 16 stranded will stand up as dipoles, end fed L, and Vees. Smaller sizes may have to be doubled to prevent breakage. Heavier is better but costs more. Always trade-offs!



## COPPERWELD

A layer of copper is placed over a steel core, in the manufacturing process, giving some of the conductive benefits of copper with the strength of steel. If you are going for huge long-wire or loop antennas then this is for you. Earlier single strand versions of this were about as ornery as wire could get. Working with a coil of this could poke your eye out if you weren't careful. Modern versions have more copper to steel content and are much easier to work with, and comes in both solid and





stranded versions and various sizes. This stuff will last longer than any other copper conductor. Pricing at [thewireman.com](http://thewireman.com) web site starts at \$0.07 per foot.

## ALUMINUM

Aluminum wire got a bad name back in the decade between the mid '60s to mid '70s when the price of copper spiked and electrical contractors switched to aluminum because of the cost difference. A lot of installers simply used the fixtures intended for copper. Over time, the dissimilar metals reacted with disastrous results for homeowners. In the late '80s manufacturers alloyed another metal with aluminum to lessen the problems. Now with proper fittings and connectors, aluminum will work just fine in residential situations. Or so 'they' say!

For antennas there is no problem in its use. Look at all the beams made from it! You will probably have to use mechanical connections as soldering to aluminum is a bit tricky. You may find that resistance of mechanical joints increases over time from the formation of aluminum oxide which is not conductive. You also may find that the application of an antioxidant paste will help.

Look in farm supply outlets for electric fence wire. One site I found listed a spool of 16 gauge with a length of 1320 feet for \$24.95



## GALVANIZED STEEL

Another wire available from electric fence suppliers is made from galvanized steel with zinc plating to increase corrosion resistance. With a conductivity of around 29% that of copper, I would not even bother unless you are in the middle of nowhere and can't get anything else. Price per foot is the same as the aluminum wire on the web site for electric fence wire I visited.

I tried this many years ago because I had some. Makes a good combination dummy load/antenna, with the emphasis on the first. Even dummy loads will radiate!

## POLYPROPYLENE FENCE WIRE

### Type 1

Not totally wire, but a polypropylene or similar cord with interwoven strands of stainless steel usually three in number. This is somewhat high in resistance (one type mentioned had a resistance of over 100 times that of regular 14 gauge galvanized, mild steel wire!) and is not



recommended for antennas.

### Type 2

A Canadian innovation, type 2 contains 6 strands of a special aluminum alloy, especially suitable for outdoor use. It has less than 1/100th of the resistance of type 1. The cord used in this line contains a core of fire-resistant fiberglass and is formulated for northern climates.

I've experimented with the two types of this fence wire. Both are very light in weight and relatively high in strength. Type 2 is certainly the best because of its lower DC resistance. Mechanical junctions were used, with twice yearly loosen/tighten to keep the joints clean and as low a resistance as possible. I ended up going back to stranded copper.

## STUFF AT THE END

If you have access to a flea market or know someone who does, you may be able to save money on your antenna wire regardless of which type you choose.

What you use is up to you. Stranded covered copper would be the best choice if you can afford it. After that comes whatever you can scrounge for free or buy at the lowest price. Other than wet string most any antenna material is better than no antenna!

<sup>1</sup> THHN stands for "Thermoplastic High Heat-resistant Nylon-coated." and is a designation for a specific insulation material, temperature rating, and condition of use (suitable for dry and damp locations) for electrical wire and cable.

## QUOTE OF THE MONTH

*The best mind-altering drug is truth.*

*- quote from a T-shirt*

## REPORT FROM THE FIELD

Here is a brief report on the MARA meeting last Friday (20 May 2011) during the Dayton Hamvention. I have attended the Hamvention since I became a ham in 2007. This was my first year hooking up with the MARA folks.

We met for a nice dinner at the China City Buffet located about a mile from the Hara Arena and Englewood Building in Trotwood Ohio. There were about 15 members in attendance, mostly folks from Ohio. I did meet Glen Roberts (KE7FD) from Pennsylvania, Gary Hollenbaugh (NJ8BB), Charlie Lane (KD8KII), Bill Lawson (KC8UGR), and several others from Ohio, along with a brother from Michigan. Next time I plan to write down all the names and call signs.

Afterwards we met at the Englewood facility to attend the Dayton Ohio Stake Emergency Communications Conference (ERS). Dayton Stake High Council Charlie Lane (KD8KII) gave a presentation titled "The Church Welfare System and Communications". Charlie gave an overview of the Church teachings on self reliance, family preparedness, and how emergency communications

is an important part of the Church Welfare System. Then Bill Lawson (KC8UGR) from Columbus presented a report on Columbus/Dayton/Cincinnati area communications. As I listened to both presentations, I was impressed by the support these organizations received from their respective stake leadership. They conducted a Technician's Licensing and testing session to train the necessary operators for the stake with very good results. And, the stake leadership authorized the purchase of radios and antennas to create a 2 meter VHF net between facilities within the stake.

Gary Hollenbaugh (NJ8BB) concluded the evening with a report on the design and installation of an HF vertical antenna at his stake facility. Basically, his unit installed the mounting and antenna radials for a vertical antenna that is slightly below ground level on the facility's back lawn making it virtually invisible. The vertical antenna can be set up and connected to a portable HF radio in

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minutes during an emergency. All this was done as a member's Eagle Scout project with the support of the stake and local leadership.

My goal for attending this conference was to bring home ideas of how I can help my stake in Iowa develop a local emergency communications network. This conference along with the SLAP-N Conference held in St. Louis in March were excellent training sessions and are great examples of cooperation between emergency communicators and stake leadership.

Looking forward to next year.

Michael Dzado  
AC0HB  
Cedar Rapids, Iowa

## DI-DAH-DI-DAH!

This year's annual meeting was scheduled to be convened in Dayton on the same weekend as Hamvention. It originally looked as if there would be enough to hold the meeting, but in the end, not enough could make it.

Now the 2011 Annual Meeting is slated for the 18th of June. Let's hope that enough can find the time and the money to make the trip to wherever the location is set to be.

Besides the election of officers and directors, there are questions up for discussion regarding membership, ways of voting, and whether or not to eliminate the yearly dues. And, yes, likely the ever popular 'where do we stand in regards to LDS emergency communications' question will rise again!

I'd really like to be there (where ever 'there' might be) this year. However, due to personal budget constraints, I will not be able to attend. One of the factors is our price of gas in the two provinces I would have to drive through to cross the CAN/US border - this week (May 25th) as I write this it's at \$4.85 per US gallon!

I hope someone who does attend will be kind enough to take (legible) minutes and also shoot some pictures for me (of attendees), for the record.

And I'll hope for 2012.

Until next month,  
VE1VQ