

# MERCURY AMATEUR RADIO ASSOCIATION

## MARA - NORTH AMERICA - NORTH EAST



# MAY 2008

# NEWSLETTER

**MAY IS NATIONAL HAMBURGER MONTH CELEBRATING ONE OF NORTH AMERICA'S MAJOR FOOD GROUPS. PASS THE MUSTARD AND KETCHUP, PLEASE!**

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*E-mail your comments, ideas, or submissions to [marane@mara.net](mailto:marane@mara.net)*

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## VIEW FROM THE TOP

### RETAINING HAMS

I was trading emails with Shirrel, N3DIX, recently, regarding the license courses I've been teaching, and the topic of operator resources came to mind. As the Stakes concentrate on bringing new Hams into the ranks, we are beginning to see similarities between our work and the missionary work of the Church. There are those who have always wanted what we have and receive an opportunity to join. Then comes the effort needed to attain the goal. Some participate in the preparation eagerly, but become discouraged and drop out of class. Others are committed to the first goal sufficient to achieve it, but once attained they are not prepared to make an investment sufficient to participate. Even when resources are provided, the participation often wanes with time. Sound familiar?

And the answer is so similar. Each of our new operators needs to have someone with whom to discuss the hobby. To Hams, this comes quite naturally. I know that Hams can talk for hours about the hobby we enjoy so much. As long as the new or prospective hams know how to reach

someone off the air as they develop, and then on the air after licensing, this will help them become part of a community. Interestingly enough, there are a lot of non-LDS hams. I have developed a whole new circle of friends since becoming a ham that I would probably have never known, and many of whom would not have a friendly association with a Latter-day Saint.

There is great wisdom in giving people responsibility; something to watch over and a sense of contribution. How tied to the Church would you feel if your only contribution to the Church was tithing?

The last is to help them continue learning. We may reach plateaus in our progress as other things command our focus, and setting appropriate priorities is essential. Basic participation can keep your operator skills functional, but stretching those skills through a turn as the net control station for our Saturday morning net can help you increase proficiency.

I encourage you to be actively engaged in your sphere, and enjoy the hobby, as well as any formal responsibilities you hold. Remember that many hands make light work.

73  
Bruce, N3IA

**IN NEXT MONTH'S NEWSLETTER ...**

**REPORT ON THE 2008 MARA  
NORTHEAST ANNUAL MEETING.**

## **TECH STUFF**

### **THE HALF WAVE ANTENNA – PART 2**

#### **END FED HALF WAVE**

Perhaps you don't have the room in your back yard or the necessary two trees to hang the dipole covered in the March 2008 newsletter.

The end fed version of the half wave antenna requires only one tree or pole and is even easier to build than the dipole, though it does require additional equipment in the form of a simple tuner.

Because it is fed at one end, rather than the middle, the exterior wall of the shack can provide the near end suspension point.

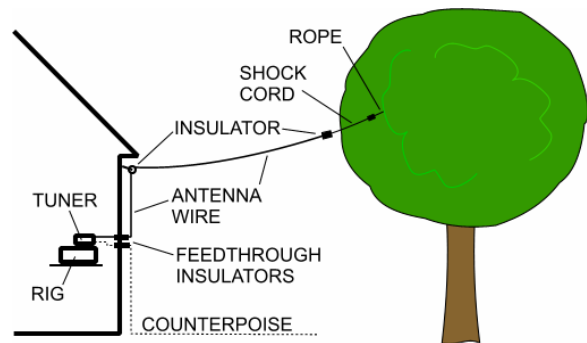


Figure 1 – End fed antenna. The insulator next to the house can be a plastic or nylon pulley while the one at the tree could be made from a piece of plastic pipe. The feed through insulators allow the antenna and counterpoise wires to exit the house.

The formula for a half wave antenna, whether fed in the middle or at the end, is still the same.

$$\text{LENGTH IN FEET} = 468 / \text{FREQUENCY IN MHZ}$$

With the end fed version, the length is not quite as critical as with a dipole. Cut it to length from the formula, adding a couple of extra feet, just in case. Normally the tuner will take care of minor measurement error. If you find that you cannot achieve a decent match with your particular tuner (close but with the capacitor either fully closed or fully open and the SWR is still dipping at that point) then it may be necessary to adjust the length of wire by either lengthening or shortening.

Another nice feature of this antenna (and any half wave antenna) is the fact that any multiple of a half wave will have the same impedance characteristics. Cutting the antenna for 80 meters allows it to be used on 40, 20, 15, and 10 with the appropriate tuner. It may work on 30 and 12 meters but they are the odd relatives of the family and do not fall as exact multiples.

The antenna wire may simply be connected to the output terminal of the tuner and from there to a high point at the far end for outdoor operation.

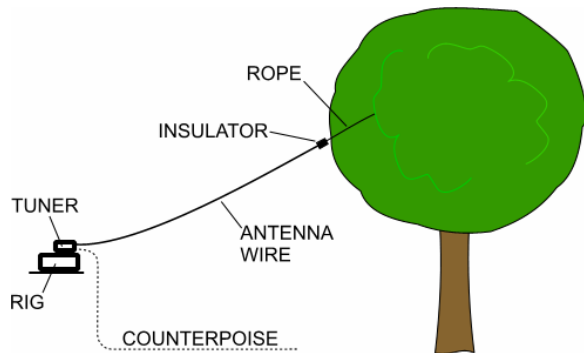


Figure 2 – Can't get much simpler than this for a station. Handy if you're operating from a picnic table or at a camp site. Take care to tie down the tuner in case the wind blows the antenna around.

Some conventional wisdom says that the vertical portion should be taken as high as possible and the remainder strung along the horizontal. Other conventional wisdom sources say to have half the length in the vertical and half in the horizontal (perhaps for people who can't make up their minds!). For most of us, the wire is taken out through the wall or window of the shack, up the side of the building as high as possible and then out to the end support.

If you're really into cheap, or to see if things will work before you go to a lot of trouble making a permanent installation, stick a length of window foam sealer strip on the underside of the lower window sash and lay the wire or wires (separated by several inches) to the outside, closing the window down to keep things in place.

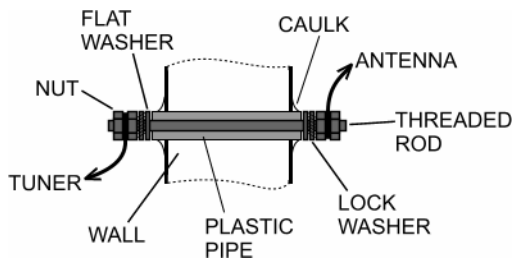


Figure 3 – Wall feed through. Two required if you need a counterpoise wire. See the text for details on the counterpoise.

Those of us who own our homes, and whose xyl's have no objections, can install 1/2 inch plastic pipe/tubing through the wall and feed the wire inside that, or use threaded rod with nuts, lock washers and flat washers. (See figure 3) Other's, in a rental property or with a less radio-friendly xyl, may choose a kindlier, gentler method of exiting the building. Cut a piece of

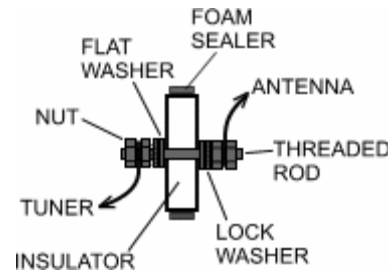


Figure 4 – Window feed through. For security purposes, drill a small through-hole in each of the top corners of the lower window sash into (but not through) the upper sash. Insert a nail or small diameter screw to prevent the window from being lifted from outside.

plywood or plastic window material to fit the width of your shack window x 3 - 4 inches high. If you're using wood, paint to match the window trim and to protect against weather. Drill holes of appropriate size and install suitable feed through conductors. Three sixteenths (3/16) inch threaded rod works well, as do #10 bolts and hardware. I wouldn't run a kilowatt through this but normal transceiver output will be no problem. Adding foam sealer strip on the top, bottom, and sides keeps the drafts and bugs out. (See figure 4)

Use a screw hook to fasten a 2 – 3 inch nylon pulley under the eaves. Feed the antenna wire through this and out to the end support.



Figure 5 – Screw hook. Not to be confused with a sky hook which is another item altogether!

If you have a convenient pole at the far end to provide support, you've got it made. Most of us have to make do with a tree; not that trees are

bad, just that they move in the wind! Never tie the antenna support line directly to the tree.

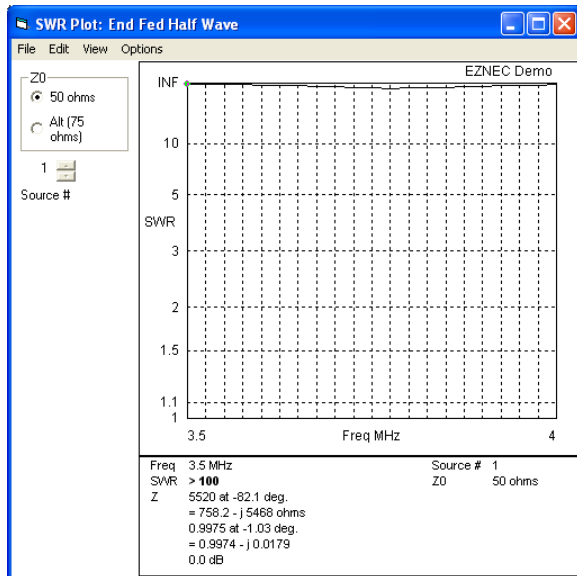


Figure 6 – SWR plot of a half wave wire cut for 3.8725 MHz (half vertical/half horizontal). No counterpoise or tuner in the circuit. The wire is resonant and if you measured it with a GDO (grid dip oscillator) it would indicate with a deep dip. The SWR is very high and nowhere near 50 ohms - and that's why a tuner is needed.

Instead, use a shock cord between the end insulator and the support rope. An even better solution than tying to the tree is to take the line through the branches to a concrete block on the ground. Much easier to adjust tension on the wire with rope and block than having to climb the tree. See the March 2008 newsletter for more detail.

### Counterpoise

A counterpoise is a length of wire attached to the tuner ground to fool your antenna system into thinking it has the required RF ground connection. You may be able to tune your antenna without a counterpoise if there is sufficient capacitive coupling between your equipment and ground. If you find that you have trouble doing so, cut an additional piece of wire ¼ wave length long, attach it to the ground terminal of your tuner, and route it outdoors. It doesn't have to be buried, just lay it on top of the grass (or snow). If this happens in the summer time and you have to mow the lawn, fasten it

down with some “staples” made from solid wire or old fashioned coat hanger.

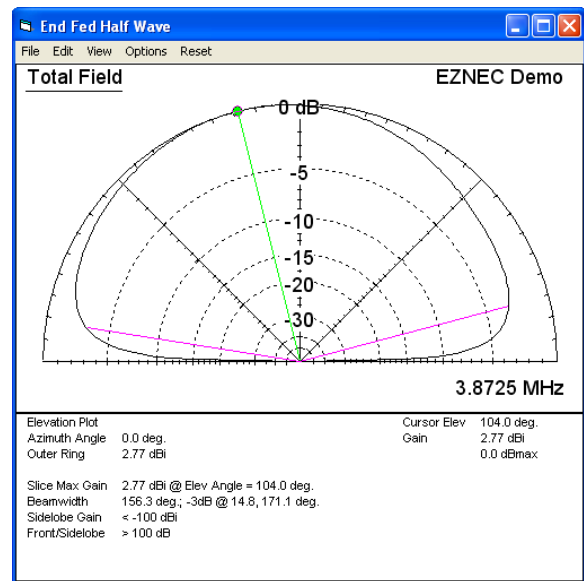


Figure 7 – Two dimensional view of the field. RF is radiated at high angles. Not great for DX but not bad for a simple all purpose antenna

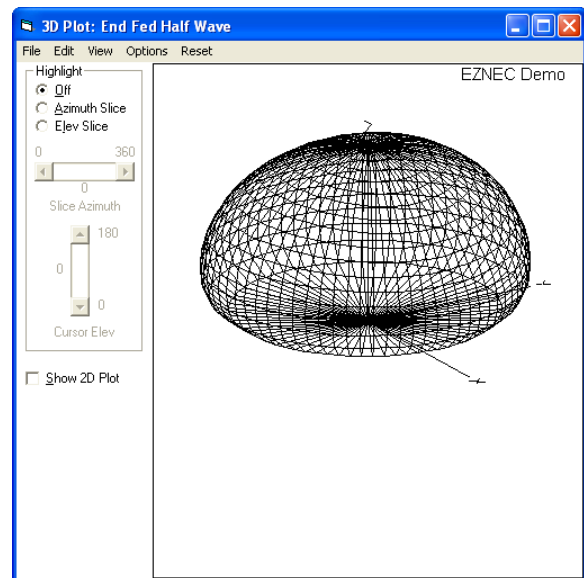


Figure 8 – Three dimensional plot. The bottom or feed point of the antenna is located in the center at the junction of X and Y, the wire then going vertical up the Z axis and horizontally on the X axis.

Information on [AA5TB's web page](#) indicates that you may be able to get away with as little as .05

of a wavelength. You'll have to experiment to find out if that works.

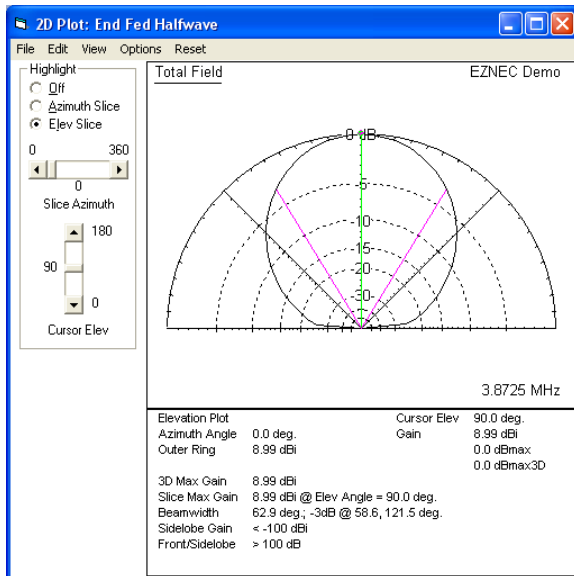


Figure 9 – Same antenna as before but the vertical portion is 20 feet and the remainder is horizontal. Notice that more of the RF is now heading upwards. Even worse for working DX than the previous example, but fine for local and regional communications.

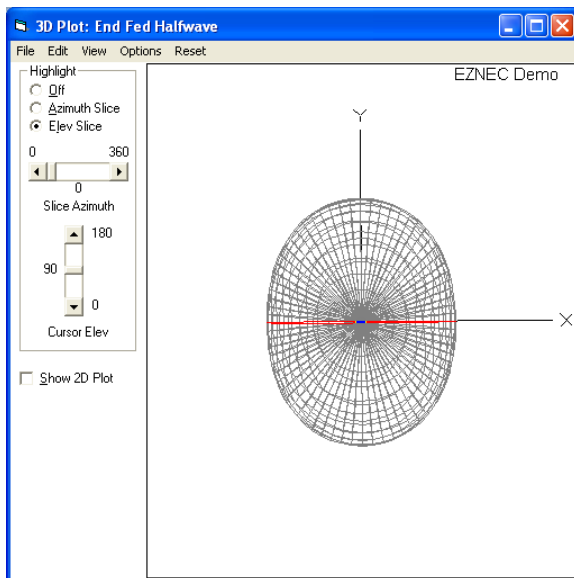


Figure 10 – Same antenna as in figure 9. You can see the flattening in on the sides of the pattern compared to figure 8. The wire is strung from left to right along the X axis.

## Tuner Design

If you already have a tuner in the shack, try using it to load your newly installed end fed antenna before rummaging through the junk box or scrounging for parts to build another. Should your existing tuner not provide a match then the circuit in figure 11 might work for you.

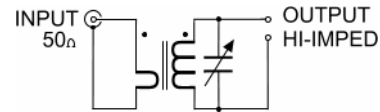


Figure 11 – 50 ohm to high impedance output tuner for end fed half wave antenna.

Depending on a whole lot of variables, like vertical section height, horizontal section length, conductor diameter, height above ground, conductivity of the ground, nearness to other conductors, wet or dry conditions, etc., etc., your actual antenna impedance will vary from the theoretical. Your tuner may be able to compensate for these or you may have to adjust the number of primary turns to make things work.

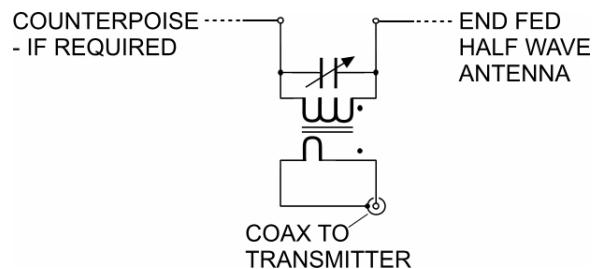


Figure 12 – Antenna and counterpoise connections to high impedance tuner.

Figure 13 shows a tuner built for 75 meters from the circuit in figure 11. The capacitor is salvaged from an old Command Set with an insulated shaft added. The transformer is constructed with an Amidon T200-2 (red) 2-inch OD iron powder toroid. The primary winding is 4 turns and secondary is 29 turns, both of 18 gauge insulated copper wire. The input is on the left and has UHF and BNC series connectors. The output has a pair of banana jacks and a UHF series connector. The BNC on the input

and the UHF on the output are not required but were added for other antenna experiments. The base is a cheap plastic cutting board sized on a table saw to fit the bottom of the container.

A DOS software program called [ENDFEED.EXE](#) will provide impedance (resistance and reactance) values for your end fed antenna given a few variables that you enter.



Figure 13 – High impedance output tuner built from the circuit in figure 11 and housed in a Rubber Maid food storage container. The copper wire under the two sets of connectors was a common ground for experimenting and has since been removed.

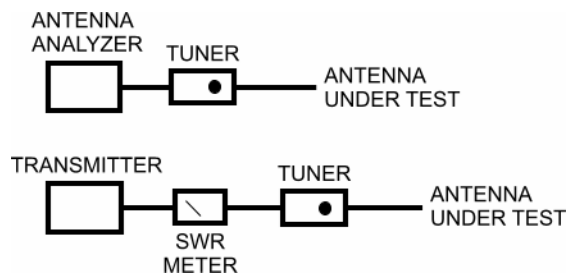


Figure 14 – Test setup using either an antenna analyzer or a transmitter and an SWR meter.

With a correctly designed tuner, and using a counterpoise, you should be able to tune for a low SWR (under 1.5:1). Certainly this one's no three element beam, but from the EZNEC calculations shown in figures 7 thru 10, it should work well for general net and rag chewing use.

## WEB SITES OF INTEREST

Dipole length calculator – good for end fed half wave too!

<http://www.radioing.com/hamradio/antcalc.html>

Window feed through article for ARRL members

[www.arrl.org/members-only/tis/info/pdf/O104064.pdf](http://www.arrl.org/members-only/tis/info/pdf/O104064.pdf)

End fed antenna

<http://www.njqr.org/n2cxantennas/halfer/index.html>

More end fed antenna with counterpoise information

<http://www.aa5tb.com/efha.html>

High impedance tuner info...

[http://www.aa5tb.com/efha\\_wrk.html](http://www.aa5tb.com/efha_wrk.html)

## MENTOR PROGRAM

N3IA's editorial in this month's VIEW FROM THE TOP makes a strong argument for the need of mentoring those just starting out in amateur radio and those who are already licensed but might need a little help now and then. Does anyone wish to volunteer as a mentor to another ham or would-be ham, or would you like to have an Elmer (mentor) of your very own? Let VE1VQ know of your desire and it will be posted here. We can learn together.

I'll start by volunteering...

### Mentor Volunteer

1. VE1VQ – Dave [ve1vq@eastlink.ca](mailto:ve1vq@eastlink.ca)
2. you??

### Need a Mentor

1. you??



**MAKE PLANS TO ATTEND THE 2008 ANNUAL MEETING THIS MONTH AT THE CHERRY HILL CHAPEL IN CHERRY HILL NJ.**

**INFORMATION IS POSTED ON THE WEB SITE – <http://ne.mara.net>**

**UPDATES/CHANGES WILL BE POSTED THERE AND ANNOUNCED ON THE NET**

## **SWAP SHOP**

**BUY – SELL – TRADE - GIVE AWAY**

**YOUR AD HERE – NO CHARGE!**

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**TUNER** – I AM LOOKING FOR A KW VERSION OF THE JOHNSON VIKING MATCHBOX, A TENTEC 238 OR A PALSTAR AT1500CV, IN GOOD CONDITION. E-MAIL

[ve1vq@eastlink.ca](mailto:ve1vq@eastlink.ca).

I CAN PICK UP AT ANNUAL MARA MEETING IN MAY. – VE1VQ

## **DI-DAH-DI-DAH-DIT**

For as long as I can remember, I have been curious. Curious about how things worked. Curious about why things were the way they were. I was likely one of those kids who kept asking why, why. Maybe I have a “curiosity gene”?

Perhaps that is why, for work, I got into the technical side. As a technician, I can tear a thing apart, figure out how it works and what is broken, fix it, and put it back together. I’m still amazed (even after all these years) when things work!

Being a ham has taken me in an RF direction, an area where fewer go these days as everything becomes more and more digital. There again, the hands-on side appealed to me; being able to build and test, modify and test again.

I’ve never been a great operator, never been much interested in DX, collecting QSL cards, or rag-chewing. Oh, I’ve participated in a few of the local Field Day’s some years ago (Ok – many years ago!). My idea of a good radio time is build something, get it to work, make a contact or two (if it is a rig), then tear it down and build something else.

None of my children are interested in amateur radio, but the grand kids are coming along. One of them, now nine years old, has a habit of asking why. Perhaps she will be the one who has inherited my “curiosity gene”. I can only encourage, and teach, and lead by example.

And that’s about all any of us can do.

Until next month,  
VE1VQ