The NEWSLETTER

OCTOBER 2013 VOLUME 13, No. 9

Mercury Amateur Radio Association - MARA

North America - North East

"Patience is not passive waiting. Patience is active acceptance of the process required to attain your goals and dreams."

— Ray Davis

CONTENTS

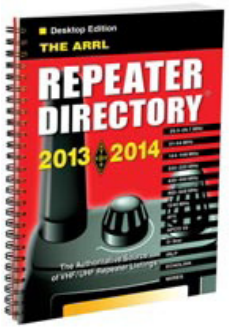
OTHER STUFF

*Links that will take you to web locations referenced in this newsletter are shown in **BOLD blue text**.*

E-mail your comments, ideas, or submissions to marane@mara.net or to ve1vq@eastlink.ca

Grandma Mara's RAMBLINGS

You would be forgiven if you had gotten the idea from last month's column that we spent all of our honeymoon time in and around Freeport Maine, dining on lobster. Not so! Pennsylvania, upper state New York, Massachusetts, Vermont, and New Hampshire came in for their share of the time. Our highway route loosely followed the part of the **Appalachian Trail** running from Maryland to Maine.



There are some lovely scenic spots along in the mountains. We would pull over at some of them and have lunch, or just to admire the view. Most of the time, whether stopped or moving, we had the 2-meter rig on, scanning the area repeaters. The ARRL Repeater Directory was invaluable for knowing what was available in any given area. The one we monitored most was the Mount Washington, NH repeater, **W1NH**, on 146.655 MHz with a PL of 100 Hz. Even mobile, you can hear it over most of New England. It became sort of like an old friend, as did those "regulars" we listened to and sometimes spoke with.

We got to go up Mount Washington on the cog railway. Walter wasn't at all interested in taking the RV up the paved road to the summit. He was happier to let the train engineer do the driving. The day we went to the

top was mostly clear. They warned us that even though it was nice and warm at the bottom, to be sure to take along a coat or sweater as it would be much cooler at the top - and it certainly was!

At 6,288 feet above sea level, you can almost see forever from up there. New Hampshire, Vermont, Maine, and north to Canada. No wonder you can hear the W1NH repeater over such a wide area!

There was only a light breeze the day we were there, but the mountain top held the record for a long time for the highest wind ever recorded.

We wondered what it would be like to live there through the winter. Not a good place to get cabin fever in January! Better though, if you had some ham gear (and your honey). AR

The SPUD GUN and DIPOLE ANTENNA LAUNCHER REDUX

by a contributor, who for job related reasons requests anonymity until retirement.

During the winter of early 2011 the dipole for 80 and 40 Meters was brought to the ground by falling tree limbs. Initial attempts to hang the antenna back in place using the **Wrist Rocket** to propel a lead weight with attached mono-filament line achieved modest heights of about 60 feet.

This was much less than the height of the loblolly pine tree (about 125 feet) used as an end support. Wishing for antenna performance closer to theoretical models at ½ wavelength height it was decided to move the support line higher on the pine tree upon return of better weather and acquisition of tools to accomplish the task.

The KR4LO antenna launcher with a ZEBCO reel attached. The reel is not included with the device, but is readily available from sources such as Walmart. The hand operated valve is shown in the closed position.

Time, Serendipity and Solutions

While attending the April 2011 RARSFEST[1] I ran across **KR4LO** and his spot on the floor where he was displaying his version of a Spud Gun. It is designed to propel metal weights rather than potatoes with an attached mono-filament line over the top of trees and other high supporting structures without having to climb the support system.. After watching a short video, I examined the display article and purchased a production article shown.

Spud Gun Information

If you have never heard of a Spud Gun then take a peek

at the URL[2] referenced below in the footnotes, or type "spudgun" into your favorite search engine. It will provide insight into KR4LO's product. Unlike the traditional spud gun however, KR4LO's version uses compressed air which is more than adequate to propel the weight and attached line over the top of a 100 foot or higher tree. Easily! It can also propel the weight hundreds of feet distant from the launch point.

Description of Launcher

The launch pipe is a narrow ¾ inch interior diameter PVC tube. It nicely accommodates 1 ounce oval steel sinkers manufactured by Eagle Claw. These are available in packs of two weights[3] at the local **Wally World**[4].

A close-up of the the pressure gauge and the air charging valve.

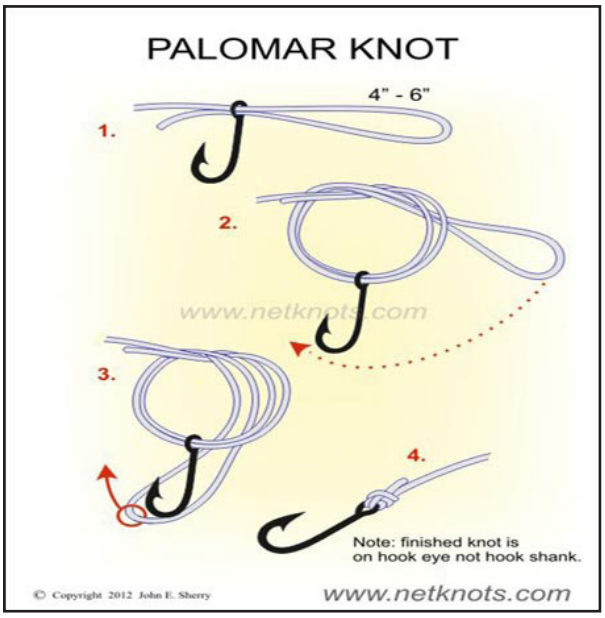
Other weights can easily be utilized but the NLES1 fits easily down the launch tube without the need to use wadding to provide an adequate fit without excessive loss of air pressure from blow-by.

The air reservoir is approximately 2.5 inches in diameter and specified by KR4LO to use pressures no greater than 75 psi (pounds per square inch). Be forewarned if you use 75 psi you will spool off every last inch of line on the reel and more than likely watch the steel weight fly off out of sight with monofilament line trailing it. (This is an experienced based statement.)

A reel is not included with the launcher. The typical Wally-World Zebco reel selling for $4.99 is recommended based on personal experience. Use standard hose clamps available from any automotive supply store to attach the reel to the barrel of the Launcher. The reel usually is sold pre-loaded with mono-filament line. The small amount of mono-filament included proved inadequate for use with trees over 100 feet in height.

Front view of the pressure gauge and valve.

If you are experienced at tying knots then splice an additional length of line and finish filling the reel fill. Alternatively, discard the line on the reel and load it with your choice of line. Monofilament lines are sold which are colored with fluorescent dyes making the line much easier to track and locate at the distant point



where the weight lands. It also helps to paint the weights with International Orange colored paint. Unpainted steel weights are difficult to spot when hanging in a tree or brush and the bright orange helps in searching in thick brush.

Tie the monofilament to the steel weight using a traditional fisherman's knot (see above). Release the bale on the reel and pull enough line off the reel so the weight can be lowered into the barrel and allowed to reach the hand operated valve. Make sure the valve is shut as the weight will simply lower into the air reservoir.

First Shot

KR4LO had recommended a pressure no greater than 25 – 30 psi to zip a line across the top of a 125 foot tall loblolly pine tree. Of course being a non-believer, the KR4LO Launcher air reservoir was pressurized to 70 psi. The thought was the line created a lot of drag and the extra oomph would be needed.

A close-up of the "air firing valve" in the closed position.

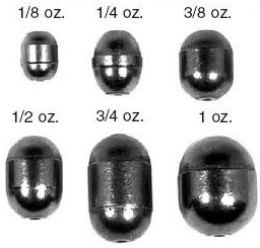
The trial shot was made across the rear two thirds of a one acre home lot. This backed up to an open farm field which extended for about 600 feet to a tract of pine trees in an undeveloped area. Total distance from where the launcher was fired to the edge of the pine forest was about 800 to 1000 feet. The trees in the forest were estimated to be 100 feet tall.

The sinker with attached line was lowered into the bar-

rel and the launcher held at approximately a 45 degree angle. The valve was cracked open, there was an accompanying *whoosh* and the snap of the monofilament line. The steel sinker was observed briefly flying away. The bale on the reel had not been released so the sinker took off as planned but the monofilament was unable to spool off the reel so it simply snapped.

Another sinker was tied to the monofilament, the pressure vessel recharged to 50 psi and another shot readied. This time the bale was released, the valved cracked, the steel sinker took off, the monofilament could be heard spooling off the reel and then once again another snap was heard when the end of the line was reached. The weight was watched flying off into oblivion with approximately 300 plus feet of trailing monofilament line.

It was obvious that the pressure should be much lower. As it turned out, to launch the weight over a 125 foot pine tree, all it took was 20 psi when standing back about 40 feet from the tree and with the launcher raised to about a 70 degree angle. Once this was done the line was quickly in place and within 30 minutes of reaching this epiphany I had lines pulled through the top of a 125 foot Loblolly pine tree as well as a 70 foot Pecan tree[5].



Lessons Learned

1. First off, I should have paid closer attention to KR4LO's video on display at RARSFEST. In that video, it repeatedly displayed lead weights being propelled hundreds of feet at pressures in the 30 psi range.

2. Use lots and lots of monofilament line. The launcher is able to propel the weight hundreds of feet. Nothing is more frustrating than watching your line trail the weight as it flies out of sight with the attached line after snapping when the end of the line is reached.

3. If available, use a fluorescent colored monofilament. This is much easier to see in the foliage.

4. Buy spare steel weights. You will likely lose at least a dozen before getting the hang of using the launcher. (This was part of KR4LO's disclaimer also. He was adamant that it is necessary to buy multiple weights.)

5. I strongly recommend using Eagle Claw NLES1 type weights. They are made from steel and fit the upper tube well enough that there is no need for wadding or other shimming to minimize excessive air flow around the weight as it is propelled out the tube. This should also address environmental concerns.

What Do You Do With Monofilament In The Trees?

Once you locate the monofilament you need to attach another line to it for suspending your wire antenna. Pretty much anymore I use lawn trimmer cord (aka Weed Eater Cord) as a suspension line. The lawn trimmer cord is attached to the monofilament using a cheap grade of vinyl electrical tape. Take about 36 inches of the monofilament and attach the 36 inch point in from the end of the monofilament to the beginning of the lawn trimmer cord so that the monofilament line can be pulled parallel along side the lawn trimmer cord. Attach the monofilament line at about 18 inches in from the end of the lawn trimmer cord leaving the remaining 18 inches dangling. Wind vinyl tape from the beginning of the lawn trimmer cord to where you attached the monofilament about 18 inches in from the end of the lawn trimmer cord using a spiral wrapping technique. Keep the vinyl tape wrapped tightly along the length of the lawn trimmer line to prevent bulges which will grab onto the tree and make it difficult to pull through.

Low cost ZEBCO fisheing reel attached to the launch tube.

Once you have reached the 18 inch in-point, take the remaining extension of the monofilament and pull it back towards the beginning of the lawn trimmer cord. Tape it with one turn at the very end and begin wrapping vinyl tape back from the 18 inch in mark towards the end of the lawn trimmer cord. At the end of the lawn trimmer cord, carefully pull the tape to form a point at the very end of the lawn trimmer cord to facilitate pulling it through the tree. Begin reeling the monofilament back onto the reel and it will pull the lawn trimmer cord through the top of the tree back down to where you stand with the reel.

Once you have the lawn trimmer cord pulled through

the top of the two trees used as suspension points, put the weight launcher away for another day.

Attaching Wire To The Lawn Trimmer Line

I tape solid copper wire to the lawn trimmer cord every three feet until I have the right length of copper wire for the antenna along the the length of the lawn trimmer cord.

Rather then use an insulator at the center of the dipole I attach open wire feeder to the copper wire at mid-point by wrapping each conductor of the open wire feeder conductor around the combination of the copper wire and lawn trimmer cord. Once satisfied the copper wire and open wire feeder are tightly bonded with the wrap, the copper wire attached to the lawn trimmer cord is cut at the center point between the open wire feeder conductors and folded back to either side against the lawn trimmer cord. Then using **Scotch 88 vinyl electrical tape**[6] the connections are tightly wrapped to protect the junctions.

Once the connections are made at the center feed point and taped, the ends of the lawn trimmer cord are pulled to raise the dipole to the desired height.

Why Use Single Strand Copper Wire Taped To The Lawn Trimmer Cord?

If you have watched prices on copper wire then you know it is getting pricey. Being a cheap schmuck and not particularly wanting to hang $20.00 plus of copper[7] in the air I sought out an alternative. 24 gauge copper wire is cheap when compared to 14 gauge or 16 gauge stranded copper. Wire intended for use in shortwave antennae service was going for a nominal $0.17 per foot at the Orlando Hamcation this year. 24 gauge was easily had for less than a penny a foot.

Generic lawn trimmer cord 0.093" in diameter is sold by the local **Tractor Supply Store** for $3.99 for 350 feet on a spool. It definitely meets the price guideline of cheap.

Lawn Trimmer Cord Durability

Strength and Durability tests thus far are subjective. Personal observations indicate 0.093 Lawn Trimmer Cord is tough stuff and although not as strong as Dacron, it has proven adequate to date. My last antenna collapsed after five years due to a huge limb falling across the antenna. K4AME uses it to suspend the ends of his dipoles and had a 160 Meter dipole in service for 20 years before an infamous North Carolina ice storm snapped the lawn trimmer line. So although I have no real objective or quantitative data to compare Lawn Trimmer Cord to steel line or Dacron® line, I am satisfied with the service to date based on my limited experience.

[1] Raleigh, NC Amateur Radio Society annual hamfest

[2] **http://www.instructables.com/id/The-Original-Potato-Cannon/**

[3] Eagle's Claw Brand part number NLES1 egg shaped steel sinkers for fishing

[4] Walmart

[5] Although taught to pronounce the word as pea-con in the public education system I pronounce the word as pee-can.

[6] Scotch 88 Vinyl Electrical Tape is used for its durability in extreme weather and resistance exhibited to UV (ultra-violet) from the sun.

[7] At the 2011 Hamcation in Orlando, 14 gauge stranded copper wire sold for $0.17 per foot. Wire for an 80 meter dipole will cost about $21.25. For a 160 Meter dipole the cost will exceed $40.00.

AR

TECH AND OTHER STUFF

by VE1VQ

WORK BENCH/STATION TABLE

Some of you are aware, for nearly six years now, my wife and I have lived in different parts of Canada. No, we are not divorced or separated - other than by distance! It has become common in Atlantic Canada in recent years for the man of the house to go west to Alberta or British Columbia for higher paying employment. In our case, it was my wife who had the job skills necessary for a position in the Alberta health care system. The plans are that we will eventually retire there, as three of our four children and seven of nine grand children are "out there" as well. So, for now, we have two residences, one in southern Alberta and one in southern Nova Scotia, and I am racking up considerable frequent flyer points.

Here on the eastern side of the continent I have my

HARBOR FREIGHT Work Bench - Item #93454

ham gear in one corner of my office. Since we presently rent out west, I was looking for a work/operating bench for that location. Something I could take with me when we finally retire to our own place.

Harbor Freight has a wood working bench I've had my eye on for some time. Being as the Alberta/Montana border is only an hour away from our southern Alberta residence, and Missoula, MT (the nearest Harbor Freight store) is only another five hours from there, and we were going to Kalispell and Missoula for a few days vacation, anyway...

The bench comes in a cardboard carton and is heavy - over a hundred pounds. Did I mention, we had a Honda Accord?

Did I mention that the bench was on sale the week we were going to be there? Normally it costs $249.99 but frequently comes on sale for much less (sometimes as low as $139.99). The sale price was $159.99 during that week. How could I turn down a deal like that? I read the reviews and most rated it highly.

HF have three of these benches; **Item #93454**, the one I bought, **Item #61488** and **Item #69054**, which appear to be identical except maybe for a very small difference in the front-to-back dimension of the table.

The bench comes in a cardboard carton and is heavy - over a hundred pounds. Did I mention, we had a Honda Accord? Thankfully the center of the rear seat folded down, providing an opening into the trunk for things like skis. Some figuring with a tape measure before the trip began indicated that the box would fit in the trunk and through into the rear seat.

HF wouldn't let me order it on-line to the store location, nor would they let me call the store and put a hold on one. When I reached the Missoula outlet my worries were for naught as they had at least thirty in stock!

The nice young HF salesman brought it out to the sidewalk and helped me lift it into the car. When I got it back across the border and home, I manoeuvred it out of the car and over to the front door of the house, where I opened the box and brought the pieces in separately.

Be careful when you install the drawers in the drawer slides.

The assembly manual was only so-so, with several minor errors and many poor quality pictures. However, since this is a wooden work bench and not a rocket, it was easy enough to work past the problems. Download the **manual from the web site**. The pictures are much better than in the printed copy.

Be careful when you install the drawers in the drawer slides. They do not use the heaviest hardware in the world, and if you mis-align one of them as I did, those little ball bearings are hard to find when they pop out of the track and "escape" to the floor.

Assembly took a couple of hours, not counting the time to inventory the parts or trying to find and put those ball bearings back in the slide. You will need a few basic tools that you probably already have. After assembling it in the living room, I enlisted the aid of my son to move it into a spare room we use for storage. A good solid bench for whatever use you put it to. Even better at the sale price!

If you live in the US and don't have the luxury of having a Harbor Freight nearby, they often have a low flat rate shipping fee. As I write this (in July) the fee is $6.99! If you are Canadian, you will just have to arrange for some vacation time instead.

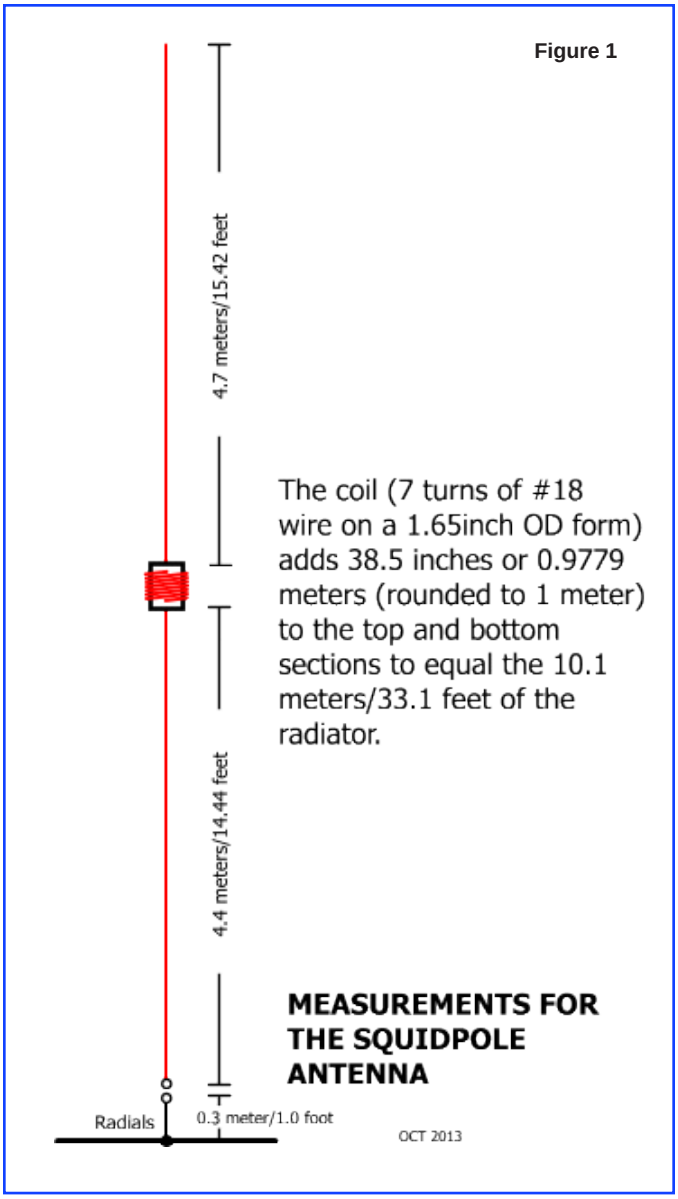
THE FIBERGLASS POLE ANTENNA PART 7

I recently purchased the latest version of EZNEC from **Roy Llewellan's (W7EL) website**. Roy is a great guy to deal with. If you've ordered before, you are entitled to a substantial discount on the already reasonably priced software. After upgrading to the standard version, I realized I needed the + version, which allows for more antenna wire segments than the standard one. An e-mail to Roy solved the problem and I was able to download version 5+ from the web site. The cost was a bit more than if I had purchased the better version to start but a day or so later I had an e-mail from him saying he had credited my credit card the difference.

When the weather isn't conducive to actual outside work, I boot the computer and play with the software. This fall hasn't been all that nice so I've gotten in some quality time on the keyboard.

...when I did a simulation using EZNEC, I discovered the unvarnished truth!

One of the claims for this antenna on the developer's web site is that it works on 40, 30 and 15 meters as is and on 80 and 20 with added base coil networks. I never thought much about the 30 meter claim (although I should have). However, when I did a simulation using EZNEC, I discovered the unvarnished truth! There is nary a dip anywhere near 30 meters! When tuned to 7.1MHz the SWR is calculated as 1.21 to 1. With no change in the vertical element length the next resonant



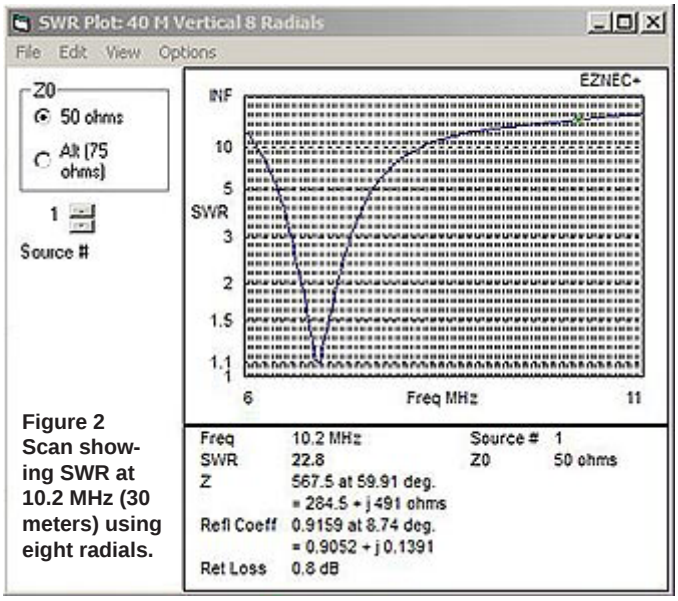


Figure 2 Scan showing SWR at 10.2 MHz (30 meters) using eight radials.

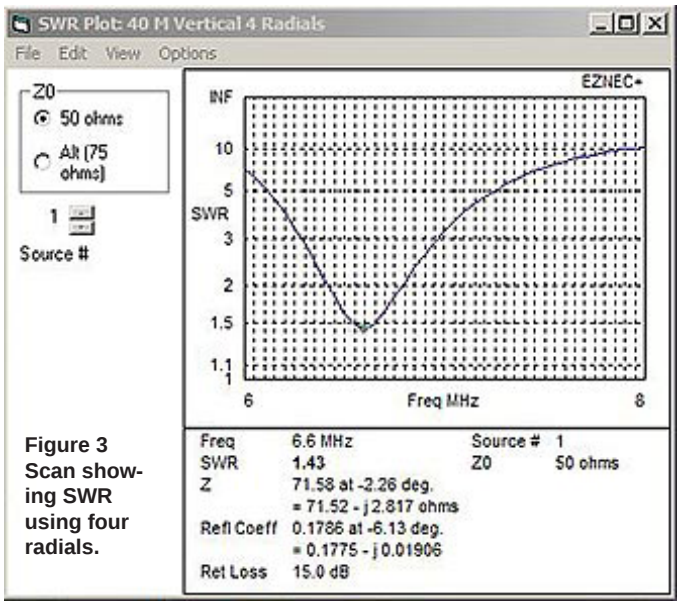


Figure 3 Scan showing SWR using four radials.

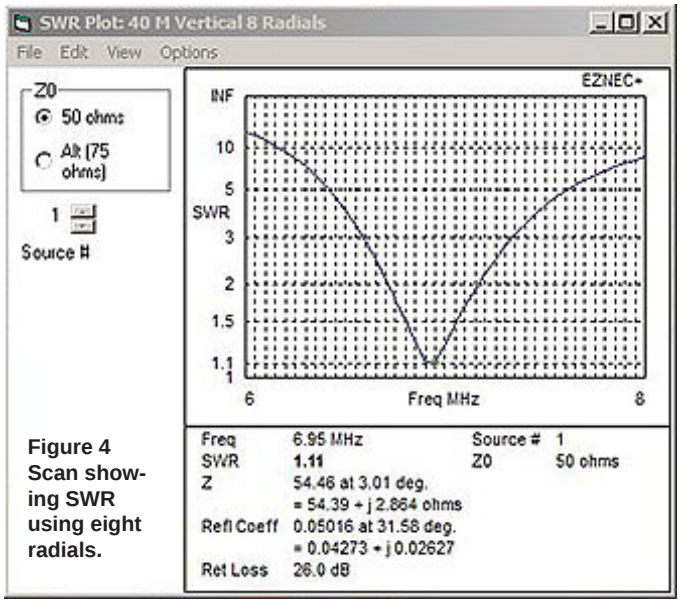


Figure 4 Scan showing SWR using eight radials.

point is 22.35 MHz and an SWR of 1.9. Seeing as the 15 meter band runs from 21.000 to 21.450, there needs to be a little extra length added to the antenna to bring it into a happier place. If you don't want to worry about having to insert an additional bit of wire for 15, you'll need that tuner.

If one reads the text on the web site, you find out **VK7JJ** says a tuner has to be used for 30. That kind of seems like cheating! If you look at Figure 2 over in the right column you will see that the SWR at 10.2 MHz is 22.8 to 1. That will take some tuner to match!

Figures 3 through 9 show the results of increasing the numbers of radials. EZNEC does not allow placing a vertical's radials on the ground, so I had to set them 0.01 of a foot (0.12 inches) high. You might think of the radials as laying on the grass rather than on the bare dirt. And speaking of radials, when they are this close to the earth, they do NOT need to be cut to a quarter

wavelength long. Laying on the ground de-tunes them anyway. Nor do they need to be buried. A lot of web site and book page space has been devoted to the latter. The only reason you should sink your radials (in a permanent installation and using wire) is to avoid someone tripping over them and suing you, or having the lawn mower snarl one up and rip your installation apart. Even then they only need to be just barely out-of-sight in the dirt. None of this four to six inches deep!

...speaking of radials, when they are this close to the earth, they do NOT need to be cut to a quarter wavelength long. Laying on the ground de-tunes them anyway.

The height of the vertical portion of the antenna stays constant at 4.4 meters/14.4357 feet (bottom section) plus 4.7 meters/15.4199 feet (top section) with the coil located at the bottom of the top section.

Note that the resonant frequency - the frequency where the reactance (+/- j) is zero - moves upward as more radials are added. Also note that the resistive portion of the impedance (Z) gets lower in value as the numbers of radials increase, going from 71.52 ohms (four radials) to 35.5 ohms (one hundred and twenty-eight radials). The latter resistive value is very close to the 35 ohms of a vertical over perfect ground.

Eight radials provides an impedance of 47.88 ohms and an SWR of 1.047. It will certainly keep your transmitter happy even if some of your output power is wasted due to ground loss. If the impedance at resonance is 47.88 ohms, then the ground loss equivalent resistance is 47.88 - 35 = 12.88 ohms, meaning 27% of your transmitter power is wasted and not transmitted to the distant station. Increasing the number of radials to sixteen gives a loss of 44.47 - 35 = 9.47 or 21% loss. Going for broke with one hundred and twenty-eight radials gives 35.5 - 35 = 0.5 ohms or 1.4%. Now you know why commercial AM stations use so many radials!

What a lot of amateurs do not realize is that a low SWR does not necessarily mean maximum power transmission.

Figure 10 shows the SWR dips at 6.9 and 22.1 MHz. The difference in the 15 meter resonant points with the numbers on the previous page and this chart is in the graph frequency steps. Figure 10 was done with a wider step to avoid clutter on the chart. The final "built" antenna will have

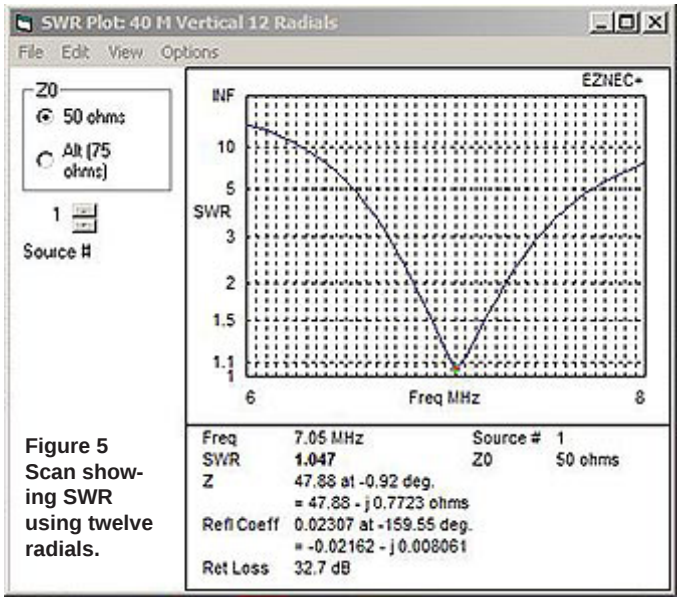


Figure 5 Scan showing SWR using twelve radials.

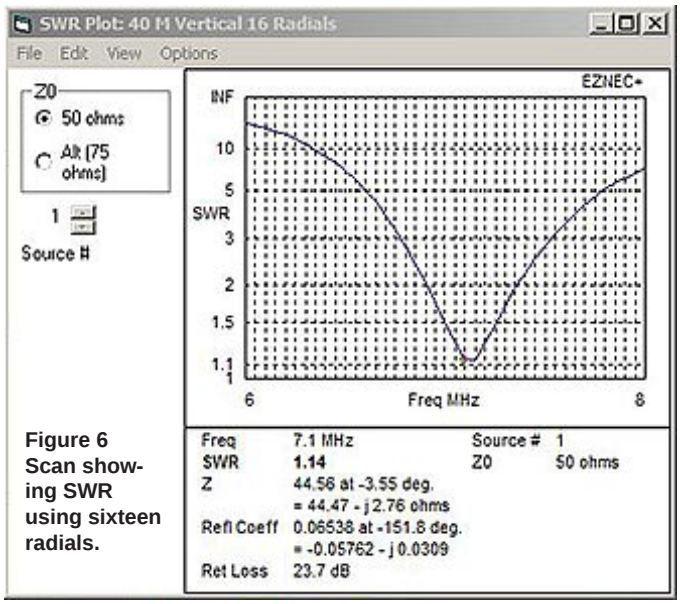


Figure 6 Scan showing SWR using sixteen radials.

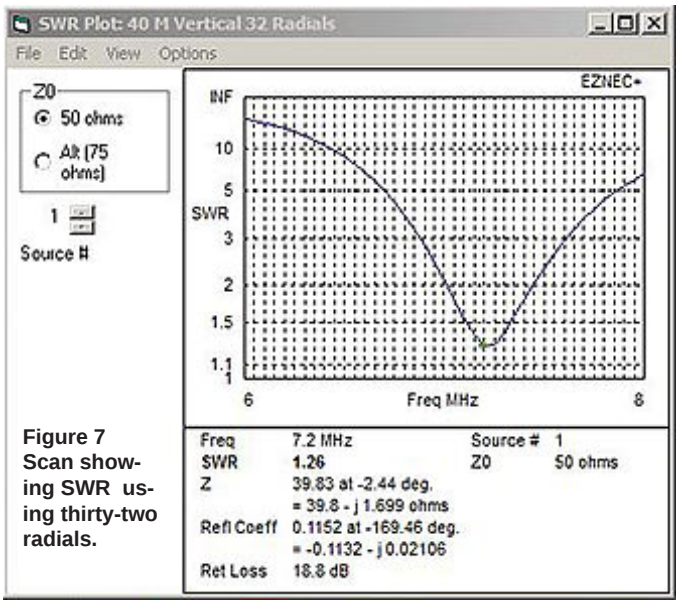


Figure 7 Scan showing SWR using thirty-two radials.

to be adjusted slightly in length to make it resonant within the proper frequency range.

Even though more radials make for more radiated power, the SWR is higher (the impedance is going lower than the happy place of 50 ohms!). What a lot of amateurs do not realize is that a low SWR does not necessarily mean maximum power transmission. It simply means that your transmitter protection circuits are comfy.

Most antenna installations are a combination of trade-offs. Property size, available money, spouse happiness, legal restrictions - those kind of things! Using this antenna with eight radials and a 27% loss also means a 73% efficiency. Increasing the number to sixteen increases the efficiency from 73% to 79%. Going to thirty-two changes the efficiency to 91.7% Is it worth it? Does the extra cost and complexity of set-up warrant it? You have to decide that. The old saying that "any antenna is better than no antenna" holds true.

The whole idea of this exercise is to make a (relatively) simple antenna for 40 meters, once constructed, that is easy to set up and easy to use. A lot of the information presented here is also applicable to a permanent installation using aluminum tubing as the radiator and wire for the radials. My thinking is that using eight tape measure radials is easy, unwinding sixteen is doable, laying out thirty-two is ok because it puts you in the 90% efficiency area, but trying to avoid stepping on many of the sixty-four is approaching excessiveness (sign of a type A personality). AR

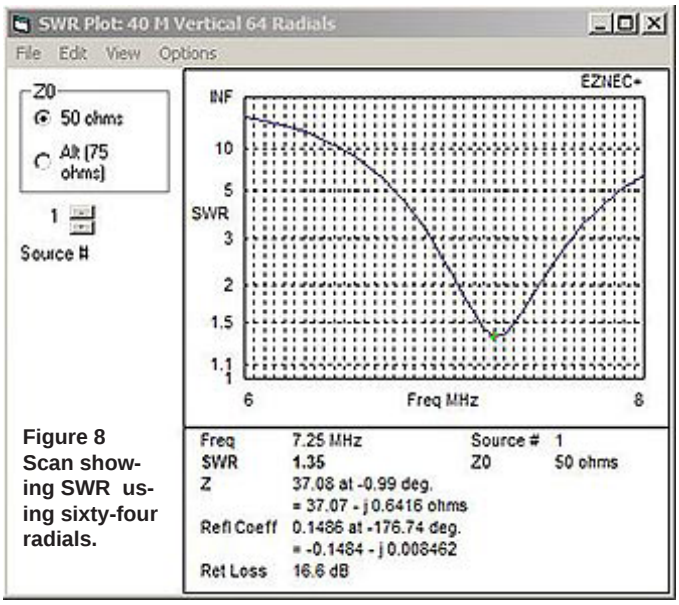


Figure 8 Scan showing SWR using sixty-four radials.

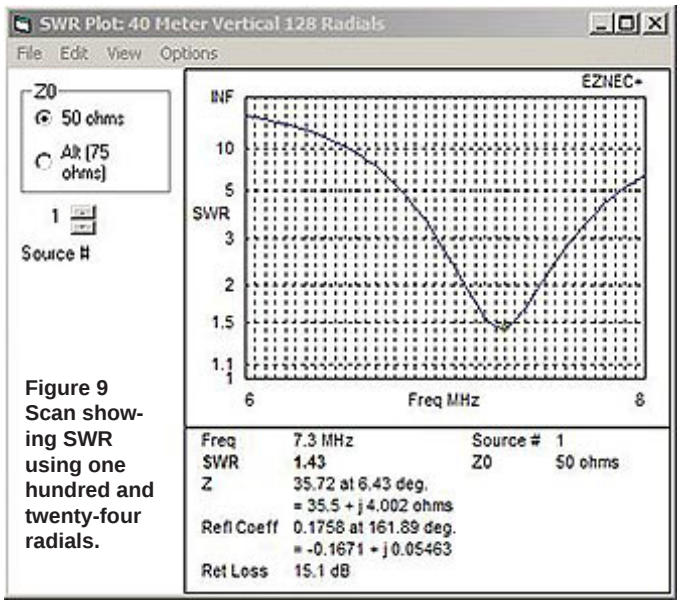


Figure 9 Scan showing SWR using one hundred and twenty-four radials.

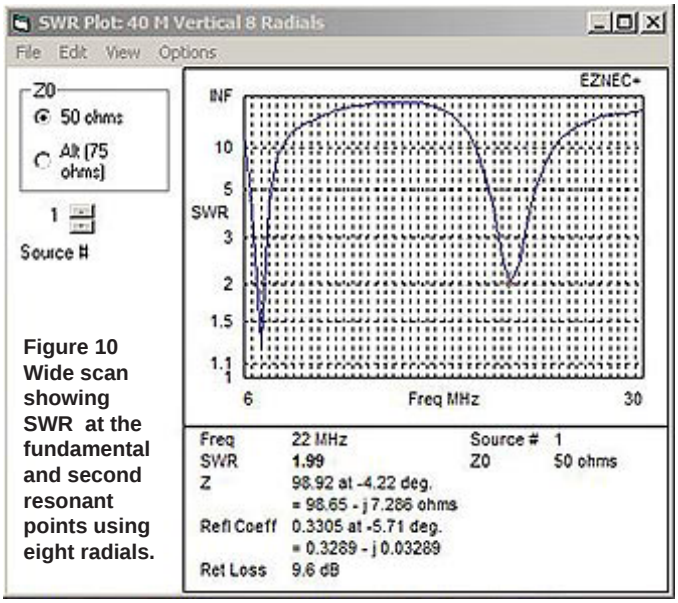


Figure 10 Wide scan showing SWR at the fundamental and second resonant points using eight radials.

SILENT KEY
W2NSD

Wayne S. Green II, W2NSD ("Never Say Die"), of Hancock, New Hampshire, died September 13. He was 91. A well-known and often outspoken figure during what some consider Amateur Radio's golden years in the 1950s and 1960s, Green helmed CQ Magazine for 5 years before becoming the self-proclaimed "El Supremo and Founder" in 1960 of 73 magazine, which he published until 2003.

A hallmark of 73 was Green's iconic, rambling and

wide-ranging "Never Say Die" editorials, in which he rarely missed an opportunity to tweak the ARRL and his magazine competitors for their perceived shortcomings.

Green often was ahead of the curve in promoting such technologies as single-sideband phone, solid-state, FM, and the marriage of computers and ham radio, and he went on to found and publish Byte and other computer-oriented publications. "I live mostly in the future," Green was quoted as saying.

Excerpted from the September 19, 2013 ***ARRL Letter***

QUOTE OF THE MONTH

"Laugh when you can, apologize when you should, and simply let go of what is beyond your control."

Unknown

DI-DAH-DI-DAH

We think we're so free in our ability to access information here in North America! What with our computers and our tablets and our smart phones and our instant connection to the information available on the 'net.

When we think of the stifling of that information, we tend to look down our noses at China and their restriction of the Internet[1,2], or we think about it only happening in some far away third world country with a repressive government.

Either the "P" word or the "T" word seems to be guaranteed to push people into accepting ever increasing limitations on their freedoms.

When you think of Great Britain, do you think of it as the home of the Magna Carter, a champion of freedoms - or the opposite? There is a movement afoot by that government to force restrictions on their citizens' use of the internet. Granted, it is for the restriction of viewing child pornography sites, and I think we all agree with restrictions on that! However, the proposed laws go further and cover (or may be interpreted to cover) more than just that. It may also interest you to know that the British Government has had the power for decades to prevent the news media from publishing any story they don't want "let out" or released to the public.

The same type of law regarding the Internet has been quietly proposed for Canada. Lest you folks south of the border get your smug up, there have been laws or regulations proposed for Internet Service Providers in the US to report or at least make their records available to government without benefit of a warrant. Either the "P" word[3] or the "T" word[4] seems guaranteed to push people into accepting ever increasing limitations on their freedoms. I guess the thinking of many must be, " I'm not doing any of those things so those evil people who are, must be caught and punished by any means possible!". What those many people don't realize is that government never wants to stop with the stated solution to a problem, but to leave the door open or the wording suitably vague, *just in case they "need" to cover something more*.

I did an experiment some years ago. I went to a family web site and clicked on *harmless appearing* links to other sites to see how long it took to get to a site you wouldn't want your child to see. I seem to remember that the minimum number of several tests over an evening of testing was around seven clicks! Sometimes it took over a couple of dozen. Remember, these were harmless looking links! How would you want to be charged for being on a site because of a random mouse click?

I don't expect us to take to the streets in panic over this information. What I do expect is that we will be mindful of our rights and freedoms, and vigilant in the protecting of those things. There has to be a balance between the rights of innocent people and the "need" of government and police for more information. Remember that statement - "I'm from the government and I'm here to help you."? It has become a sort of joke - for good reason.

Until next month,

VE1VQ

[1] The [Chinese] governmental authorities not only block website content but also monitor the Internet access of individuals. - Wikipedia

[2] The size of the [Chinese] Internet police is rumored at more than 30,000. - Wikipedia

[3] Pornography

[4] Terrorism