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DECISION: MAKE or BUY ANTENNA MAST COUPLERS and GUY RING-RETAINERS (GRR)

9/26/18

by

M Craig Lund, KE1Q

In the beginning-

I had attempted a telescopic mast, but had multiple issues with it. So then I started looking for something that wasn't there. I couldn't afford the top stuff, so I went looking and trying 'things'. And I ended up using 1-1/2" EMT (1.740" OD) and making my own rugged couplers after failing to find a practical and strong way to join and reinforce the mast sections. Then I played around ways of raising my new mast-just to realize more awkward situations.

So, in time, my projects morphed into the DIY Winch-It-Up Mast Support and the EMT mast. The mast went up in 5' sections and with a hex and rotator on top climbed to 50' and stayed there for 5 years. I over-did the guy system some, which made me feel more secure. Despite EMT not being designed for this usage, it has provided me with a mast system that works and works well. The HD steel couplers every 5' add strength and rigidity to each joint.

I've since added another mast material, 1.9" OD Fence Rail, which I'm currently using to support my hex and rotator at a height over 50'. As before, I am not skimping on the guy system. It's the best insurance for success up there. The 1.9" comes in several wall thicknesses, so it can be more rigid than the EMT. However, the EMT still occupies a prominent place with me. It's much cheaper than the 1.9", so for many cost conscious installs it might be the best choice. Again, use it with a good guy system.

That's what has brought me to this point in time.

Before we talk about making or buying Couplers to join sections of the mast you may choose to build, you need to pick between the two mast options that the Couplers are sized to fit. They are:

1.9" OD Galvanized Fence Rail OR

1-1/2" EMT (Electrical Metal Tubing) (1.740" OD)

The purchased lengths are cut into 5' sections for ease of installation.

These are the only two materials commonly available that I could find that I felt were suitable mast material for which I could find close tolerance steel to make the Couplers that are needed.

1.9" OD GALVANIZED FENCE RAIL

This is a common material used by fence companies for railings and posts. The 1.9" OD is the actual size though the industry nominal size is 1-1/2" to 1-7/8". It can come in several different wall thicknesses which can add extra strength and rigidity to your mast. Some of the wall thicknesses are 0.065"(16 ga), 0.090"(13 ga), 0.109"(12 ga), and 0.120"(11 ga). Sellers don't carry all wall sizes. I'm using the 0.090" thickness. Of these, the 0.065" is the lightest duty and is the thinnest wall that should be used. The 1.9" comes in lengths usually over 20' long, so cutting or delivery arrangements have to be planned ahead. Five foot lengths are the best for our install because they are the optimal length to be used with the DIY 'Winch-It-Up' Mast Support or with 2-1/2" mast size standoff brackets. Other sources of 1.9" galvanized pipe besides fence companies could be local steel companies and salvage yards. I DO NOT supply 1.9" mast material. It's a local purchase item.

OR

1.740" OD EMT (ELECTRICAL METAL TUBING-INDUSTRY SIZE 1-1/2")

This is a 16 gauge wall (0.065") that is galvanized on the outside and coated on the inside. It is the same or heavier gauge than common telescopic masts which are 18 gauge except for 16 gauge for the top section. It provides excellent results when installed properly. It's local purchase and readily available from local home supply stores in 10 foot lengths.

NOTE: Due to both steel manufacturers' allowable ID and OD tolerances for these products, the fit with the Couplers will be close but not perfect. There can be a small amount of free play, say 0.005-.010" +/- . That's not much and as you raise your mast and put weight on it, it won't be noticeable nor affect your install.

With standard guying and my super strong couplers, I have used both mast materials to safely reach over 50' with no bending or apparent degradation of materials. Despite nay-sayers, especially when discussing 1-1/2" EMT, I believe these mast materials provide exceptional value and a safe method for raising your wire or small beam antenna 'up there'. The last 7 years have proven that to me.

With a small beam/rotator setup on top and raising to 30 feet or more, I recommend a four guy system for at least the top level of guys. At 50' high I use four guys for the two top levels. Using the more rigid 1.9" OD (0.090" wall) material is the wiser choice if installing a small beam/rotator at the top and raising beyond 30' high. Keep in mind that common telescopic are made with 18 gauge for lower sections and 16 gauge only for the small 1-1/4" OD top section. That top 9' +/- section is going to flex in the wind. Both of my mast designs are uniform in diameter from bottom to top-No Skinny Top here. And they provide rugged support and rigidity every 5'.

My mast system is very competitive with telescopic (with freight added), and could even be notably less expensive. If you need more info and instructions on making this choice and the detailed steps to prepare and raise the mast, visit my website at www.bend-gard.com.

At this point, if you're still with me, you can start thinking about making or buying your own Couplers for this mast? If making is your thought, you should have basic do-it-yourself skills, a drill press with clamping vise and other necessary tools.

Cutting the steel into 8" lengths is a job for a metal power saw. Don't attempt with a hacksaw or abrasive wheel saw. Read below to possibly by-pass this step.

Drilling and tapping holes is fairly straight forward as long as you have at least a bench top drill press with a hold-down vise. Read below to possibly by-pass this step.

I can offer several possible purchase choices.

Option 1: I can sell you already cut 8" Coupler pieces of DOM steel to fit the 1.9" or the EMT mast for \$9.00 each and both sizes of Guy Ring Retainers for \$2.50 each (one 1" wide GRR is necessary for each installation). See **Fig 1**. This could save you from the expense of acquiring the correctly sized steel and any problem cutting them to length.



Fig 1

Option 2: I can provide Option 1 plus drilling and tapping the two Coupler holes and then zinc-rich spray painting and the same for one hole on the GRR. See **Fig 2**. The price for the Couplers becomes \$12.00 and \$4.00

for the GRR. Ready to use. NOTE: It will require extra effort for these Couplers without the beveled ends to clear the standoffs. An extra helper may be needed to help guide them through.



Fig 2

Option 3: In addition to Option 2, I can bevel the Coupler's two ends (makes it easier to clear the standoff brackets). The Coupler price now becomes \$14.00 and the GRR remains at \$4.00. See **Fig 3**. Now the Coupler and GRR are ready for installation.



Fig 3

DOM Steel Specifications: use if ordering online from other suppliers.

For the 1.9" OD Fence Rail Mast Couplers you need:

- A513T5 DOM steel sized OD 2.188 (2-3/16")
- ID 1.920"
- Wall 0.134"

Note: This is not a common size so it is not readily available from online steel sellers in small quantities. I found it only in 22' lengths and with a minimum order. My offer is probably your best choice for the 1.9" mast.

OR

For the 1-1/2" EMT (OD 1.740) you need:

- A513T5 DOM steel sized OD 2.000"

ID 1.760"
Wall 0.120"

Note: This size is readily available from online steel sellers. Due to their high volume purchasing, they may be somewhat lower on price than I can offer, but not on freight and I can offer the guy rings in the same shipping box.

If you're still interested in this process and want to order the Coupler/GRR drilled/tapped and painted pieces (Option2) or the beveled pieces (Option3) from me, you can order them through my website, www.bend-gard.com. If you just want the Coupler and GRR blanks (Option 1), order them through my email, craig@bend-gard.com.

USPS Priority Mail shipping is \$15.00 for up through 9 Couplers, 2 Guy Ring Retainers and 4 Guy Rings. This, by my estimates, is a lot cheaper than online company's regular shipping rates. A 5.5% sales tax applies to Maine shipments.

I believe that Option 3 is the best choice considering beveled couplers are easier to work with and all the time and effort you save by not having to process them. And the cost is quite reasonable. If you decide to make your own, email me at craig@bend-gard.com for manufacturing instructions.

CONDENSED INSTRUCTIONS for MAST CONSTRUCTION

1. Determine choice of mast material and planned mast height. Choose either 1.9" OD Fence Rail or 1-1/2" EMT (1.740" OD, 16 Gauge). Purchase from local sources. Purchase or make the Couplers needed (one per joint) and the one GRR for the top.
2. Cut mast material into 5' lengths. 3. Drilling 5/16" holes in your mast material. If mounting a small beam/rotator, the GRR should be about 1" below the beam or rotator. This minimizes any unsupported mast exposure. If installing a wire antenna, place the GRR in its' best functional position for your setup. Center punch for the hole, remove the GRR, then drill The GRR hole (one wall only). Install the GRR with pan head bolt. 4. On 8" couplers, overlap a coupler on the two top 5 footers halfway (4") so the ends touch. Center punch the two spots, remove the Coupler, and drill through one wall only. Install coupler. Check fit by installing 5/16" Pan Head bolts. File 5/16" hole to fit, if necessary. Continue fitting couplers with 5 footers until finished. Mark all couplers and mast ends so they will match-up correctly when raising the mast, ie 1-1, 2-2, 3-3, etc. See Fig 4,5.



Fig 4



Fig 5

For more detailed instructions on mast construction, visit my website.

What you need to raise the mast: At minimum, you need a pair of standoff brackets and a wall to mount them. The standoffs should have a minimum

of 4' separation and the lower one should be about 6' from the ground. You should be able to comfortably reach the top standoff from a ladder. If you work by yourself, I suggest you check out my DIY Winch-It-Up Universal Mast Support. Besides being able to work by yourself, it supports the mast's weight without tightening the standoff clamps and uses a strap winch to more easily raise a heavier mast.

RAISING the MAST

1. Join your two topmost sections together (1-1, 2-2) and stand them up in the standoffs loosely tightened. Place a Guy Ring over the GRR. Install your antenna now, if convenient. Any required holes should already be pre-drilled. As the mast goes up, slide a guy ring on the mast from the bottom every 10 feet. Hold it in place with tape, if it's in your way, until the next section is added. Then the guy ring will rest on the top of that next coupler. If using my winch-it-up, use the strap when the mast gets heavy or cumbersome. Otherwise, raise by hand, probably with a helper.
2. Attach guy ropes when convenient, but before the guy ring gets beyond easy reach. I used the Pythagorean Theorem to determine lengths and then added a few extra feet.
3. Attaching the winch's strap (if using one) to the 5 footers. Using a 2" muffler clamp attach it about 6-7" from the bottom of the 5 footer in the mesh just above the strap's hook. See Figs 6, 7. When fully raised add the next section. Reverse the winch's direction allowing that 5 footer to sit on the ground. Release the muffler clamp, lower the strap, then clamp to that new bottom section. Repeat until finished. Watch and adjust the guy ropes during this process. When fully raised tighten the standoff brackets and all guy ropes. I anchored mine with screw eyes and rope tighteners. See Fig 8.



Fig 6



Fig 7



Fig 8

If raising the mast by hand, you need a helper to add the 5 footers while you hold the mast in place.

Much more detailed info can be found at www.bend-gard.com. Read all the links, have necessary tools/equipment and be careful/safe.

DIY 'Winch-It-Up' Antenna Mast Support

Uses & Construction Procedures

by
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This is an up-dated and simplified version of a previous article appearing here under the title of KE1Q's 'Winch-It-Up' Universal Mast Launcher.

Goal of this DIY project: Construct a rugged 4x4 pressure treated DIY Winch-It-Up MAST SUPPORT that is suitable for permanent wall mount, stand alone or portable use. It's designed for use with 5' sections of mast. And, this could be an alternative to many 'FALLING DERRICK' mast raising situations?

General Info:

The mast support includes a strap type winch to assist in the mast raising, to hold it in place, and to support its' weight while adding the 5 foot sections of mast you will use. This support consists of locally purchased components except possibly the standoff brackets available from many online suppliers. See Ending Notes for type used.



Figure 1



Figure 2

This support is 10-1/2 to 12' high when assembled (Figure 1) and has its' two main sections made from a 4x4x12' or 16' pressure treated (pt) beam. The longest (bottom) section has to accommodate the adding/removing of 5' mast sections and space for a strap winch . So, you need about 6-1/2' of open space to the top of this lower section. The top section can vary from 4 feet to 5-1/2 feet long. The shorter length could be better for portable use if reaching the top standoff bracket is a long reach with a step ladder. Between the lower and top sections is a 1" space to accommodate the winch's strap. Figure 1 shows the top section with 4 feet due to easier ladder accessibility. For permanent use the full 12' length is recommended.

Figure 2 shows my mast support attached to the end of my 14' high garage.

Before you start cutting, you need to decide which mast option is best for your needs. It will help you determine the length of each section. Read all of the options before starting to cut. Note: All of the options share common features.

Option 1: PORTABLE USE

If you are interested in portable use, you can design your own base (Figures 3, 3a). I used four re-bar stakes to anchor the base and four 'L' brackets 2x4x1/8" thick. Generally, the lower 4x4 is 6-1/2' long and the top is 4' plus in length.

Option 2: WALL MOUNTED-PERMANENT.

If attaching to a building, there is no need to construct the base. Generally, the lower 4x4 section is 6-1/2' long and the top is 5-1/2'.

Option 3: STAND ALONE-PERMANENT-3

Place a shorter 4x4 piece in a bucket of cement and bury in the ground. This 4x4 is on the right side in Figure 4. Then take your 4x4 mast support (either lower section first or all-together)and attach it to this

shorter 4x4 with two 3/8" x 8" bolts (left side 4x4 in Figure 4). Attach it in a position that allows for the 6-1/2' clearance from the ground. If this option is your choice, the lower 4x4 is 6-1/2' in length and the upper is 4 to 5-1/2' long depending on your ease of reaching the top standoff bracket.

Option 4: STAND ALONE-GUY ROPE SUPPORTED.

This option utilizes the PORTABLE mast support option 1 with base attached.

On popular smaller mast diameters this can offer an alternative to the 'FALLING DERRICK' method for mast raising and be reused over and over. This is especially the case when open space is limited.

If you're raising one or more masts just as a support for a light weight antenna system and looking to reach 25-50 feet (approximately), this should work for you. In this case you'll use the mast support (when it's completed) to raise your mast to the desired height. Then, adjust the mast's guys so they are not quite tight, disconnect the standoff brackets' front straps and the winch strap, loosen the mast support's guys by a foot or so, and remove any rebar rods used. Now, with an extra helper(s), slightly lift the mast by hand while holding it vertical (maintaining firm control) and slide or tap the support's base out from under. With the foot or so of guy rope slack, the support won't tip over from the top. To finish, secure the lower section of mast and tighten the mast's guys and remove the support's guy ropes. **WARNING: Do Not lose control of the mast. Keep the mast in the vertical position. Maintain your grip on it. Follow standard guying practices. You might want to try out this procedure with the mast at 20-30 feet or so, just to get the feel of the process. I've easily performed this at a 40 foot level.**



Figure 3a



Figure 4



Figure 3

CUTTING THE 4 X 4 INTO SECTIONS

Note: A list of materials I used is included at the end of this project (excludes base materials).

This support is made from a 4x4x12' or 16' pressure treated (pt) beam. My permanent install is mounted to my garage and my backyard portable is ground base mounted so both bottom sections are cut to 6-1/2'. If using a bottom mount rotator, add the rotator height to that total (unless you mount the rotator after your bottom 5 footer). Your lower standoff needs

to have a 6-1/2' open clearance to allow the 5' sections with couplers attached to be easily inserted. Your top section should be 4' or more. If you don't have enough of the 12 footer left for 4', start with a 4x4x16' instead of a 12 footer. Adjust your cut to keep at least a 4' spread between the standoffs.



Figure 5



Figure 6



Figure 7



Figure 8

INSTALLING CONNECTORS between the two 4x4 sections: First, cut two pieces, each 15" long, off of the 1 x 4 x 8' pt board. Then, place the two 4x4 sections on a flat surface lengthwise and inline with a 1" space (winch opening) between them. I placed a 4 foot level against one side of the 4x4s to assure a good alignment. Place one 1 x 4 x 15" piece equally overlapping both 4x4s so that 7" overlaps on each 4x4 (See Figure 5). Mark on the 7" overlap area on one of the 4x4s for 4 holes (see pics) to

be drilled with a 13/64" bit (a 3/16" bit should work ok though it will be a little bit tighter when screwing in the 5/16 x 2-1/2" lag bolts to follow).

Either hold the 1x4 piece in place with your free hand or elevate that 4x4 so you can place wood clamps, then drill one hole in about 2-1/2" going through the 1x4 then into the 4x4. Screw a 5/16 x 2-1/2" lag bolt with washer in until about tight (See Figure 6). Check the alignment of the two pieces and correct any movement, then fully tighten that lag bolt. Now drill a second hole and screw in a lag bolt.

With one end being secured with 2 lags, move to the other end of that 1x4. Check 4x4 alignment. Mark for your holes and drill one as before and screw in the lag almost tight and check your alignment again. Tighten that lag and drill another hole and lag it. Now the two sections of 4x4s are bolted together on one side.

Flip the 4x4s over to do the other 1 x 4 x 15 brace.
Note: I marked for four lags on each end of the 1 x 4 x 15" pieces, but only three are necessary. You can decide.

Now you can finish each brace with either the three or four lag pattern. (See Figure 8)



Figure 9



Figure 10

INSTALLING THE FLASHING over the top of the bottom 4x4 section. See Figure 9. Cut a piece of flashing at least 12" long and overlap it on the top end of the lower 4x4. The flashing will cut down on the friction when moving the strap. Fold it flat on the edges and nail it as tight as possible. I used four roofing nails on each side.

INSTALLING THE STANDOFF SUPPORTS AND BRACKETS (Figure 9):

Cut two pieces of 1x4 into 12" lengths. Place one 1 x 4 x 12" support about 1" from the top of the 1" winch strap opening (Figure 9). This will be the side holding the mast so attach it on a side with a 1" opening. Offset and drill two 13/64" holes in the center area and attach with 5/16 x 2-1/2" lag screws. Center the standoff bracket (See Notes for size and type) on the support and mark for the holes. Drill 5/16" holes and secure with 5/16 x 1-1/2" hex bolts with washers and nuts. Next mount the top standoff support just below the top of the structure in the same manner as the lower one and attach the standoff bracket. Try to align the top standoff as close to vertical as possible with the lower standoff.

MOUNTING THE GUY ROPE SCREW EYES (eye lags)-for Portable and Stand Alone use-NOT needed for wall mounted permanent installs. Place the three 1/4 x 3" eye lags a couple of inches below the top standoff support. Place them on the three other sides from the standoff support side. Drill three staggered 3/16" holes then install. Your lowest level of guy rope support attaches here.

MOUNTING THE WINCH (Figure 10). It's easier to install in the flat position before standing the support upright. Position it on the back side from the standoff brackets and down from the 1" opening in a comfortable position, say 18". Mount it as square as possible.

Ending Notes:

Figure 11 shows the orientation of the mast to the left side. This allows the winch to be installed and function properly. Also, note the winch's strap is at the bottom of a 5' mast section -ready to be raised. Figure 12 gives you a view of the 'guts' of the mast support and how mast sections are coupled together and raised. It shows the winch at the top of its' travel with the next 5 footer already in place. The winch strap is then lowered to the bottom and clamped to that lower 5 footer about 6-7" up.



Figure 11



Figure 12

Standoff

3-4" standoffs of the Strap type-See Figure 12. They need to be able to accommodate a 2-1/2" mast pipe.

Brackets:

The mast support structure is now complete. For more information relating to this article and companion masts, visit <http://www.bend-gard.com/>.

GENERAL INVENTORY LISTING:

- 1 ea 4 x 4 x 12' (or 16', if needed) pt(pressure treated) beam
- 1 ea 1 x 4 x 8' pt board
- 16 or 20 ea 5/16 x 2-1/2" lag screws(hex heads)
- 4 ea 5/16 x 1-1/2" hex bolts, USS
- 5/16" flat washers
- 4 ea 5/16-18 nuts (threads to match bolts)
- 3 ea 1/4 x 3" screw eyes (eye lags), if needed
- 3 ea lag screws to fit winch (5/16 x1-1/2" fit mine)
- 1 ea 12" piece of 3" to 3-1/2" flashing w/8 roofing nails
- All of the above came from a local hardware and lumber store except the flashing which I had laying around.
- 1 pr 3" standoff brackets. Mine were hand-made on a manual bender. 3-4" standoff brackets are commercially available.
- 1 ea strap winch 1500# came from local discounter.

Companion Mast Info:

The previous article generated questions as to what type of mast would work with this support. In short, most masts made with 5' sections and less than 2-1/2" OD will work. In my case, I've used two different sized mast materials with Couplers of my own design.

The antenna mast materials used with this support so far have been either 1.9" OD fence rail (sized in several wall thicknesses-I used 0.090") available from local fence suppliers or 1-1/2" EMT (1.740" OD x 0.065" wall) available from home supply/electrical stores. They are cut into 5 foot sections and joined together with 8" long DOM steel Couplers. One Guy Ring Retainer, about 1-1/8"+/- wide, is needed to hold the top Guy Ring in place. If you are interested in making your own couplers and guy ring

retainer, DOM steel can be purchased from online or local steel suppliers. Steel specs and machining instructions can be had by emailing craig@bend-gard.com.

Guy Rings required for these two mast sizes are of the Max-Gain Systems, Inc design. GR-175 fits the EMT and GR-2 fits the 1.9" fence rail.

Lightning and Grounding by John Armstrong – KG5LWD

Living here in East Texas, there is always a good chance lightning will be around during a thunderstorm. This makes grounding and lightning protection for our radio equipment paramount.

I would surmise that if we did Google searches or looked on ham radio forums, we could end up spending a lot of our time going through all the articles and information on the topic. It may be a very useful endeavor to look at least some of the information to educate yourself on grounding your radio shack. And I would suggest to discount those who nay-say the importance of grounding. These folks don't seem to know diddly squat and are not your friends.

Take a visit to PolyPhaser web site and view their informative tutorials on lightning protection. And while you are at it, take a look at Lyncole, Harger and ICE (Industrial Communications Engineers web sites as well and look at their tutorials on the topic. Once you look that these web sites, you will see that there is absolutely no short cut to lightning protection. Your entire radio shack and home needs to be addressed for a complete solution to address the dangers of lightning. It isn't "if" your shack will be hit, it's only a matter of time; maybe the next thunderstorm.

It may be a safe assumption that each of us have either had our station hit by lightning or come close to it. After all, East Texas during the spring and summer months, is the ideal place for a lightning strike. During a violent thunderstorm, the number of lightning strikes can number in the thousands in the area within a very short period of time as the storm passes through. We all have seen these storms and know what they capable of doing to our radio stations.

The one thing to keep in mind about lightning protection is proper grounding and surge protection. It works well. One of the keys to achieving good protection is to set up a low resistance grounding system and ensure the installation is done properly with the right materials. Some folks have gone as far as disconnecting their equipment and placing it into a Faraday Shield Box. As for me, I usually stay off the air during these times and disconnect the antenna and attach the end of the coax cable to a ground rod.

I think the cell phone industry is a good model to follow as an example for grounding, though most of us can not afford to do what they do as a standard practice. That industry typically loses 20 sites a year to lightning. Yet there are over a half million cell phone sites throughout the nation on the Verizon, Nextel, Cingular, Sprint and other systems. And

when these sites are struck by lightning, it is due to their DSL lines being hit and not the radio equipment.

The cell phone industry has a practice of grounding the top of their towers, base of the towers and where cables enter the buildings. Their facilities have a ground halo inside of each and the equipment is grounded to NEC codes specifications. All incoming and outgoing lines are surge protected. They utilize a minimum of four 20' long grounding rounds. They also use surge protection on the AC panel entry and ensure all facility grounding is bonded together.-

For the most of the lightning strikes, power lines take majority of hits with pole flash-overrods passing electric surges below 10,000 volts. However, that still means a lot of voltage going down the power line. And your home can be next in line when the voltage arcs over the primary and secondary portion of the transformer on the pole. This is where your AC panel needs to have a surge protector installed to protect against those voltage spikes. Most radio operators worry about their radio gear, but they should also worry about expensive equipment like refrigerators, TVs, stereos and computers. Not only can this equipment be damaged, there is also a potential for fire when these voltages come down the line.

A simple surge protector for around \$100 can protect your home and electronic gear when installed at the service panel. There are surge protectors like the Intermatic Panel Gard model number IG1240RC surge protector that costs around \$60 not including the two additional circuit breakers. This surge protector has LED lights to indicate the status of your surge protector and whether it has taken a hit from a voltage spike. Connection of this surge protector is accomplished through the connection of three wires inside the breaker box.

Lightning rods are another thing to consider. We all know lightning is an unpredictable energy phenomenon and has a mind of its own. It may totally disregard your 100' tall antenna tower and decide to strike the roof of your home and eventually into the wiring located in the attic space. The ground in the wiring makes connection all the way back to the master ground coming out of your AC panel. The lightning strike will look for the easiest (lowest impedance) path to mother earth. And as you know, East Texas is prone to thousands of lightning strikes during severe thunderstorms that rumble though the area each spring and summer. This makes lightning rods a good investment, provided you can afford them. National Lightning Protection out of Denver, Colorado manufactures all the necessary components you need to install your lightning rod system. Their web site provides a ton of great information on lightning protection. Also, the [National Lightning Safety Institute](#) provides fundamental information on lightning protections as educational materials. This would be a good place to start your research.

One thing to keep in mind about copper wire and straps is that copper straps have lower impedance than copper wire and much of the lightning's energy is found in the RF spectrum.

In summary, if you have a tower for your antenna, it may very well be advantageous to ground your coax at the top of the tower as well as at the base. Install a good quality surge protection device to take care of those high voltages entering through your AC service panel. At the same time, install a couple of grounded Alpha Delta Coax switches. During storms the coax switches are in the grounded COM position. Ensure that all equipment is grounded to a master ground buss bar on the back of the operating station. And if you can afford it, have a disconnect on the master

line feed to your shack. All of this will help reduce the possibility of damage from a lightning strike. It's not a fool proof system, but it certainly does help. Oh, be sure to have plenty of ground rods installed around the tower and home.

What has been described above is basically a standard methodology used in the cell phone industry, public service and computer industry. Their communications systems are operating 24/7, 365 days a year and so far, this methodology has worked well for them and minimized damaged by lightning strikes for many years. Just view this type of lightning protection as an insurance policy. You never plan on having an accident when you drive your car. In a similar fashion, you never plan having your home or radio equipment hit by a huge voltage spike caused by lightning. Don't count on your home's insurance policy to pay for all the damage caused by lightning since it does not cover the tedious part in your efforts of replacing, reprogramming, and rebuilding parts of your ham shack.

Hams as Preppers **by John Armstrong – KG5LWD**

One of the last things I want to do in ham radio is to bring up politics and religion. That's one of the best ways to lose a friend since everyone has an opinion. After all opinions are like...er...noses since everyone has one (I had to clean up that well known statement regarding another part of the anatomy).

But given the vitriol that seems to be taking place around the nation on political topics I thought I would breach the topic of "prepping". The issue has been indirectly raised in newspapers around the nation lately due to the fact some nationally known columnist like Victor Davis Hanson are now mentioning civil war happening in our nation.

I won't get into the specifics of the reasoning behind this since it would serve no purpose other than stirring the pot. But, the feelings are real among various segments of our society and they are beginning to prepare or speeding up their preparation for when the SHTF.

In case you have not seen the acronym SHTF, it means when the Sh# Hits the Fan.

As ham radio operators, I feel most of us have prepping running in our blood. The only difference between radio operators is the enthusiasm or dedication towards being prepared for when something does happen in our society. For some, that day seems to be fast approaching.

For the dedicated Hamfest attendee, he/she may be looking for antenna connectors that he bought for a bargain basement price. Another brings home a spool of coax cable, one or two battery packs for his HT and a newly purchase soldering iron to replace the one getting ready to bite the dust in his radio shack tool box.

In short, ham radio operators acquire all sorts of parts and radio gear that will be needed at sometime in the future. And those items may be used as bargaining chips for some other piece of equipment and traded away in the transaction.

But, if you were to look into a radio operator's ham shack, you could swear a lot of those items stored there are breeding. But they aren't. It's all a prepper mindset coming out in what is being collected and stored over time.

This mindset often spills over into other aspects of a ham radio operator's life. The radio operator may go to Costco or Sam's Club and buy a case of beans, a super pack of toilet paper, extra tubes of tooth paste or one of those large bottles of aspirin, ibuprofen, cartons of bottled water, beans, flour, rice or what ever.

The typical ham radio operator is an individual who is most likely to have a whole assortment of tools on hand, collect extra wire, have an ample supply of batteries and flashlights on hand, an assortment of HT radios and a generator to power appliances or the entire home. If you name it, he's probably got it stored away somewhere.

And nowadays, there are more and more hams who have gone to a simpler way of life by living off the grid by using solar power or other forms of alternative energy such as wind. Not only do these radio operators live off the grid, they are learning to manage their power requirements within the home...they have become their own energy managers. They have become farmers raising their own food stocks and learning how to preserve those foods for long term storage.

Now over the years, we've seen greater numbers of ham radio operators look into prepping. These radio operators are typically broken up into two groups; hams who consider their radio use as a hobby, while the other hams use their radio for more practical reasons. For the latter group, hams use radio as a vital link to others to keep in touch and as part of their preparedness for when the SHTF. This type of radio operator usually has multiple HT radios on hand. In fact, he/she may have more HTs than he does family members. Often times he is a regular participant in nets and keeps his radios going when there is an expectation he can talk with someone who he knows. And his HF rig may be a solid basic unit that he picked up at a hamfest for a song and dance and pines for enough room in his yard to put up a good antenna.

Then on the other hand, the ham who considers his radio use merely as a hobby typically likes to collect QSL cards that are mounted on the walls of his shack from folks he'll most likely never meet since they are often times clear across the country or in another nation. As he's collecting these cards, many times it's on a \$3500-\$5000 rig he bought online and is also one who wishes he had room for a bigger and better antenna.

If you consider the two different types of hams, they sound pretty much alike, don't they?

Well, there's not much difference between these two types of radio operators. Perhaps the biggest similarity is attributed in the way they look at radio in disaster situations and to utilize their skill sets to use in assisting the community during times of civil or natural disaster.

But, when the hobbyist radio operator becomes a victim of calamity, that's where the similarities end. He is not set up to take care of his own personal needs because no food, energy, medical and self defense needs have been taken into consideration. A ham radio operator who becomes a victim of calamity can not help the community because he/she is too busy scurrying

about looking for supplies, food and energy that have already been scarfed up by the general population. In essence, this operator is in a deep pile of doo-doo.

Consequently, the ham radio operator who treats his radio use as a hobby may want to look around the home and determine what things need to be done to make his home, food supply, energy needs and security better during times of disaster.

For instance, take a look at your home's water heater to make sure it is secured in place so that it won't fall over in an earthquake situation. How about meals? Do you have at least a three day prepackaged/prepared supply of food and water for each member of the household in the event you need to leave your home after some catastrophic event? Do you have several weeks supply of food and water if necessary? What happens if you run out of bottled water? Do you know how safely purify water from lakes, streams, rain, etc? These are things that need to be talked about with family members and acted upon. Don't just talk since talk is cheap. You've got to act upon things.

Now consider this. Some will say prepping costs too much money to accomplish. Well, that's not true. If you buy your food in larger quantities as compared to one or two small cans of tomatoes, soup, fruit, etc, you'll be surprised at how much you can save by buying in bulk. The unit cost is typically much less. On top of this, buying all this food doesn't need to be done at one time. You can use a practice known as "painless food storage". The goal is so spend the same amount on your food stocks per paycheck period, but buy items such as food, water, batteries in bulk quantities at lower prices and build your reserves that way.

Now let's consider money.....CASH. If you keep money in the bank, the bank makes use of your money whether you like it or not. It's important to maintain your bank accounts to pay your bills and operate your home on, but keep the rest of the money in a fire-resistant safe in your home or office along with important papers such as wills, auto titles, property deeds, inventory of property, credit card info, etc.

How about a safe in your home? You need to find a good safe to store your cash and important papers in for protection. Often times you can find a good safe on Craigslist for a good price. Many times folks who are moving from their homes are faced with moving safes that are heavy and a real pain in the neck to move. These safes are harder to sell and home owners may be happy to just give you the safe if you'll haul it off.

There is one note on gun safes. Some folks will spend hundreds if not a couple of thousand dollars on one. For the most part, these safes are pretty worthless even though they are pretty fancy looking and appear to have good locks. The problem with these safes is that most of them are not UL rated for fire resistance. If you store your valuable papers and ammo together in these safes, the ammo will cook off and destroy your valuable papers and the guns along with them.

And finally, get some training on handling firearms and defending yourself and property. When the SHTF, there will be people wandering the streets and breaking into homes to get what ever they can to survive

or steal. Anarchy will rule the day and police resources will be stretched in ways you've never seen before in this nation. You must be proactive in defending your food resources, your home and other property because authorities will be unable to do so. This is one reason why your second amendment is so vitally important today.

So, let me answer the sixty-four thousand dollar question on whether if you should or should not prep. The response would be "WHY WOULD YOU NOT PREP"? This is part of being a practical ham radio operator.

LETARC MEETINGS

City of Longview Fire Training Facility, 411 American Legion Blvd, Longview, TX.

LETARC's monthly meeting held the fourth Saturday of each month at 0900 hrs at the Longview Fire Training Facility at 411 American Legion Boulevard. Talk-in on 147.34 (+136.5). Presentations, free coffee and donuts and friendship!

The VE Sessions have also been moved to the fourth Saturday of each month at LeTourneau University. The time of the day not not changed. It still takes place at 2:00PM.

Minutes of the August 2018 Monthly Meeting Of The Longview/East Texas Amateur Radio Club

The August 2018 monthly meeting of the Longview East Texas Amateur Radio Club was called to order at 9:00 am Saturday, August 25th by President Jim Quinn, AA5CX. Introductions of members and guests were made. The minutes from the last meeting were read and approved after a motion was made by John Armstrong, KG5LWD, and seconded by Mary Jane Burnett, KG5PZR. Next the treasurer's report was read and approved after a motion was made by James Bray, KG5OFX, and seconded by John Zenter, AE5OY.

Our program presenter was John Zenter. He spoke on the Kenwood handytalky which is D-Star compatible and is comparable to the ICOM. We also watched a short video. Afterwards the business portion of the meeting began after a short refreshment break.

President Jim Quinn, AA5CX, opened up the meeting.

1. Ross Bennett was asked if there were any new updates to the tailgate sale. He replied that there were no new updates that he knew of. He emphasized that the sale is going to be a pretty big deal.
2. Jim Quinn reported that that the expected date of completion for the radio room at MIMS VFD is still October 1st.
3. Jim Liberacki reported on the Yamboree. He has made a form for people who are interested in ham radio. The forms will be kept at

the table and when the Yamboree is over, he will give any filled out forms to Dave Luckak, our training instructor, who will follow-up with the interested people.

4. Jim Quinn brought up elections again for the year 2019. He asked club members to be thinking about serving on the board next year. We will take nominations at the next meeting.

VE testing will be held this afternoon, August 25th, at 2:00 at LeTourneau University. The monthly informal dinner will be Sunday, September 9th at the Butcher Shop Restaurant at 6:00. With no further business to conduct, the meeting was adjourned.

Treasurer's Report for August 21, 2018 to September 22, 2018

Brought forth from the last reporting period: \$9,741.39

Income for this period:

Membership Dues (Renewals)

Robert Parham (2018)	\$25.00
Ray Spengler (2018)	\$25.00
Total Income	\$50.00

Expenses for this period:

Donuts for August meeting (Adan)	\$34.00
Terry Johnson (equipment insurance)	\$198.59
Jim Quinn (cash withdrawal for batteries)	\$300.00
Total Expenses	\$532.59

Ending Balance (as of September 22, 2018): \$9,258.30

EVENTS AND CONTESTS

October 2018

15-19 [School Club Roundup](#)

27-28 [EME - 50 to 1296 MHz](#)

<http://www.arrl.org/contest-calendar>

REGIONAL CLUBS

Click on underscored name to visit site.

[Tyler](http://www.tylerarc.org/) <http://www.tylerarc.org/>

[Nacogdoches](http://w5nac.com/) <http://w5nac.com/>

[Athens](http://www.athensarc.org/) <http://www.athensarc.org/>

[Cedar Creek](https://k5ccl.wordpress.com/) <https://k5ccl.wordpress.com/>

[Marshall](http://marclub.net/) <http://marclub.net/>

[Minden](http://www.n5rd.org/) <http://www.n5rd.org/>

[Shreveport \(ARCOS\)](http://www.qsl.net/nwllarn/arcos.htm) <http://www.qsl.net/nwllarn/arcos.htm>

[Shreveport \(SARA\)](http://www.k5sar.com/) <http://www.k5sar.com/>

[Rusk County \(Henderson\)](http://www.ruskcountyarc.com/) <http://www.ruskcountyarc.com/>
Four States (Texarkana) <http://www.4444sarc.org/>
[Palestine-Anderson County](http://www.pacarc.org/) <http://www.pacarc.org/>
[Navarro, Freestone, Limestone and Leon County](http://www.nflarc.com/) <http://www.nflarc.com/>
Panola County (no website)
LeTourneau University – LUARC (no website)

Other Ham Clubs

Fond du Lac Amateur Radio Club, Fond du Lac, WI
<https://www.fdlhams.com/>

The Rare Ones Of New Orleans

Do a little rag chewing with a group of really nice fellows living in and around the Big Easy on 40 Meters – 7.260 Mhz (+/- 5 kHz) – Most Evenings About 1930-2130 CST.
<https://therareonesofneworleans.loga.us/>.

“The “Rare Ones” of New Orleans was resurrected on February 22, 2017 after much deliberation and thought by nine (9) amateur radio operators in the Greater New Orleans Area. The purpose of the group is to promote the amateur radio HF Communications, the City of New Orleans, and the Audubon Zoo.



The original “Rare Ones” of New Orleans was established in 1965. The current “Rare Ones” are the third generation of this fine group, and are

excited to promote our wonderful City’s unique culture, history and fine traditions. To learn about the History of the “Rare Ones” please click on the following link: [History of the “Rare Ones”](#)

The “Rare Ones” of New Orleans also promotes the Audubon Nature Institute. To show our appreciation for the Zoo, each member of the “Rare Ones” has adopted an animal figure to represent a personal connection with the Audubon Zoo. Of course, if you’ve been to the Zoo, they all asked for you! Well, the “Rare Ones” all ask for you to check in with us on the air waves!

One of the goals in resurrecting the “Rare Ones” of New Orleans is to provide a place where displaced New Orleanians could “pull up a chair” and chat with someone back home. Sharing childhood stories and memories with our displaced friends and family brings a great satisfaction to the “Rare Ones”.

The “Rare Ones” of New Orleans love to tell the story of the City of New Orleans to new comers as well as displaced former New Orleanians. By all means, don’t be a stranger and come by for a spicy taste of New Orleans!”

Upshur-Gregg County Yamboree-ARES

The Upshur-Gregg ARES, facilitated by LETARC, is setting up a radio station on the Yamboree grounds in Upshur County on October 18-20 for three days from which we will conduct VHF and

HF communications with a special event call sign. The station will attempt to do three things: Recruit members for LETARC, Introduce ARES to the community it serves, and acquaint visitors with HAM radio. The event is made possible by the efforts of many members of LETARC so it should actually be considered a LETARC public service and recruiting event.

ETX LETARC Tail Gate Sale

This event is co-sponsored by the Regional Amateur Radio Clubs and the **Texas Broadcast Museum**.

When: Saturday, November 10, 2018, 7:00 AM till 12:00 PM

What: Free tailgate sale. Bring all of your new, old, & used amateur radio equipment that you would like to sell. This is an outdoor event and will be held rain or shine. **The Texas Broadcast Museum is planning on having an auction to sell off lots of stuff that are duplicates, triplicates or just not of real interest to the Museum. There will be various old radios, video and audio equipment people will find interesting. Vintage Radio & Phonograph Societies from Dallas and Houston have been invited to attend. Antique and classic cars will be on display. There is a donation to tour the museum: Adults \$6 , Seniors, Military, Students & First Responders \$5, Kids 3-11 \$3 Under 3 free**

A separate flyer on this event will be emailed to LETARC membership and other radio clubs in the East Texas area to forward on to their memberships.

Useful Links

LETARC Web Site
<http://www.letarc.org>

Radio Tools and Utilities for amateur radio operators
<http://www.dxzone.com/catalog/Software/Utilities/>

eham.net – Product Reviews
<http://www.eham.net/reviews/products/41>

Android Apps – Tools
<https://play.google.com/store/search?q=ham%20radio%20tools&c=apps>

ARRL
<http://www.arrl.org/>

Freedom Link

<http://www.freedom-link.org/>

Testing – Get Upgraded

LETARC is working with LeTourneau University to help with facilities for VE testing. We would like to extend our sincere appreciation to the University for helping facilitate this endeavor.



Directions to LeTourneau Campus

Upon entering the main entrance to the campus, turn right at the stop sign and follow the road around past the Solheim Center parking lot on the right to the first intersection. The building across the street and to your right is Glaske Center. Turn right and go to the parking lot at the rear of Glaske Center. Enter Glaske Center rear entrance and go to classroom 103.

Now that you know where the place is, why not study a little and upgrade your license. If you have a Technician's license, you can upgrade to the General. And if you pass the General exam, the VE Volunteers will offer you the opportunity on the day of your exam to test for the Extra at no additional cost.

January is membership renewal month. Please complete the form on the following page to renew your membership and mail your check to the address shown at the top of the application. Application on last page.

Testing on the 4th Saturday of each month.
2:00 PM – VE Session at LeTourneau University is located on 2100 S. Mobberly Avenue in Longview, TX in the Glaske Engineering Center, Room C103.

NO NEW HAM LICENSES TO REPORT.

Nominations for 2019 LETARC Officers



WE WANT YOU!

Nominations for the 2019 LETARC Board members will begin in August 2018 and continue though the time club elections are currently held in December 2018 (See **Proposed Amendments to LETARC Constitution on Page 8 of**

this newsletter). As it now stands, current board members are pretty burned out since they have served multiple years since no one else has stepped up to the plate to take over the reigns of the club leadership. Most, if not all board members, have indicated they will no longer be willing to serve in 2019.

LETARC needs folks in the current membership to step up to the plate and take on leadership roles and provide some fresh ideas and a new direction they feel the club needs to go.

See Pages 14 and 15 of this newsletter for form to submit Nominations for 2019 Officers and proposed amendments to LETARC Constitution for electing club officers.

Nominations for 2019 Officers

President _____

Vice-President _____

Secretary/Treasurer _____

Media Director _____

Equipment Manager Jim Rogers _____

Nominations for election committee (Up to three people)

You may nominate yourself and do not need to sign this nomination form. The election committee will be appointed by the current board and those appointed will be responsible for talking to the nominees to assure they are willing to hold office. The Longview East Texas Amateur Radio Club can only grow and prosper if we have members who are willing to help it grow. Please consider serving.

NOTICE FOR AMENDING LETARC CONSTITUTION – CONSTITUTIONAL MEETING

Proposed amendments to the LETARC Constitution were presented at the July 27, 2018 LETARC Board Meeting on whether club elections should be moved from December to November in order to increase club participation and give the new slate of officers time to meet and plan for the next year. During the last month of the year, the Christmas Holidays present a problem since the club meeting in December seems to closely coincide near the holiday and interfere with attendance and voting on new officers. The move to a different month such as November for elections would alleviate this issue. This proposed change would require amending LETARC's constitution and notice is hereby being given to the membership of LETARC for that purpose.

As per the LETARC Constitution, proposed constitutional amendments shall be published in two successive issues of the newsletter along with a notice of a constitutional meeting. The constitutional meeting will be held in conjunction with a regular membership meeting in October 2018. The voting members present at such a meeting shall constitute a quorum. A two-thirds majority of the quorum shall be required to pass a proposed amendment.

Proposed Changes to LETARC Constitution: Article 1.2 and Article 1.25

ELECTION OF OFFICERS

- 1.2 Election of officers will be held at the ~~December~~ **November** meeting. A nominating committee will select candidates to present to the general meeting. Every effort will be made to have at least two candidates for each office. Even if only one is running, a vote will still be required to accept or reject the single candidate. Voting will be by secret ballot, simple majority required.

- 1.25 Ballots shall be MAILED to all members by the end of ~~November~~ **October** so that any member that can not attend the ~~December~~ **November** meeting may cast a vote by mail.

LETARC OCTOBER 2018 CALENDAR

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14 Cotton Patch	15	16	17	18	19	20
21	22	23	24	25	26	27 LETARC Meeting VE Testing
28	29	30	31			

October 14, 2018 at 6:00PM – Cotton Patch, 1228 McCann Rd, Longview, TX 75601

October 27 . 2018 at 9:00 AM – LETARC Monthly Meeting at City of Longview Fire Training Facility, 411 American Legion Blvd, Longview, TX.

October 27, 2018 at 2:00 PM – VE Session at LeTourneau University is located on 2100 S. Mobblerly Avenue in Longview, TX in the Glaske Engineering Center, Room C103.

**LETARC MEMBERSHIP
APPLICATION
PO BOX 5613
LONGVIEW, TX 75608-5613**

Membership: * New * Renew

Calendar Year: 2018

Date: _____

CALL SIGN: _____ LICENSE CLASS: _____

LAST NAME: _____ FIRST NAME: _____ MI: _____

ADDRESS: _____

CITY: _____ ZIP: _____

TELEPHONE: _____ CELL PHONE (optional): _____

E-MAIL ADDRESS: _____ DATE OF BIRTH: _____

ARRL MEMBER? * YES * NO

=====

TYPE OF MEMBERSHIP (check one)

- Full Membership: \$25.00 per year. A full member shall be an FCC licensed Amateur Radio Operator
- Family Membership: \$35.00 per year. A family membership is available to members of the same family, provided they reside at the same residence. Each member has the same privileges and same membership requirements as a full member.

Privacy: Member names, addresses, (including e-mail addresses and other personal information shall not be supplied to any third party without expressed consent of the individual.

Signature: _____ Date: _____

=====

Please list **all** of your Amateur Radio **Interests**: [Examples: Contesting, CW, 6 meter, 1.2 GHz, Kit building, ISS, AMSAT, Emergency Communications].

Entered master database;__ Confirmation letter sent:__ Entered master email list:__

For use by LETARC