Tackleberry Solutions

Book 4 of 5

# Modern Day Minutemen

# Communications

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Owner of Elko Tactical

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# Introduction to Commo

*Communication for every Emergency When the brown stuff hits the whirling blades*

A guide for the beginner to setting up a Communication system when all else fails.

VHF and UHF base, portable and mobile

**By a lifelong Ham and Communication Systems Specialist, for all of you that are not!**

Hi, I am Kent and I am a communication systems specialists, technician and a Ham Radio operator for over 50 years.

I am writing this to help people understand how important communication is in their preparations for emergency, natural disaster or God forbid SHTF or War. I'm going to teach you how you can communicate with others without breaking the bank or you budget.

But before I get started talking about all the radio and equipment and all that stuff. I would like to applaud you for taking this on and I will do my best to explain all this so that anyone can understand it and put it to use in their own prepping plans.

I am going to start this off a bit different than you may think, with a short story that I bet you have never heard of.

# Real World Application

This story begins on a nice sunny day in Kuwait City, Kuwait just before the Iraq army shows up!

A ham radio operator was at home just enjoying the day when all hell breaks loose. Before he knew it, there where tanks and troops all over the place without any warning that his city and country was at war.

However, he had something the Iraq army did not know about, nor did they take the time to check it out, his Ham Radio. He was able to contact the U.S. military via his radio and spent the next days and months telling them all he could see about the troops and tank movements all over the city. The Iraqis never knew what he was doing and all their activities were being reported to the U.S. the whole time.

Just take a second and think about how he felt seeing his country and city being torn to pieces by an invading country! And how he must have felt when his country was liberated, knowing he had a big hand in helping. Even if little or no one will ever know what he did.

I hope I can impress upon you how important communications are in an emergency, natural disaster, SHTF or foreign invasion. I know that communications and the equipment and knowledge to use it correctly is a bit scary for most people. Also, not as much fun as going shooting, hunting or enjoying the outdoors. But if you are planning for SHTF, [or war] you will need to put commo at or near the top of your list of thing you need to do.

I am going to help with all the confusing and unknown stuff so hang on and hold back your skepticism. It's not going to be as bad as you think and it could be fun and help save lives at the same time.

# Quick Definitions

• **UHF** - Ultra High Frequency
• **Line of Sight** - The device is less likely to work if you can't see the person you are trying to communicate with
• **Simplex -** Communication from radio to radio without the use of a repeater
• **Skip -** when your signal bounces off the ionosphere above the earth and comes down somewhere else
• **Gain -** a measure of the ability to increase the power or amplitude of a signal
• **DX -** Any station that is outside of the country
• **RDF -** Radio Direction Finding

# Types of Radios

## *Pros and Cons of FRS*

OK, let's get this show on the road. I want to start by saying, never believe everything you hear or read (even from me), but I will do my best to keep this simple and understandable. So you can use this information.

Radios are like guns and trucks. Everyone knows the best one for you and 90% of the time they are WRONG!

**So, what is the best one and where do I get it??**

Well, let's go to Wal-Mart and see what they have. Wow, they have these walkie talkies that have a 36-mile range that's great! That's way more range than I need to talk to my family and friends and it less than $100.00 for two, WHAT A DEAL! (maybe not) What did I say earlier?

Let me remind you! **(don't believe everything you read!!)**

So, let's look at how good that radio you found at Wal-Mart really is.

First of all, this type of radio is most commonly known as FRS or (Family Radio Service). They work great for what they were meant to do. Which is talking to your family on outings and hunting. The are also great for your wife to help you back up that way to big RV in to the small spot on the side of your house.

The frequencies they operate on are UHF or (ultra-high frequency) and are very much line of sight. What is the line of sight? So glad you asked! Line of sight means, if you can't see the person that you're talking to, you may not be able to talk to them.

Now that is not always true. But if there is a mountain or tall building in the way, or even a heavy strand of trees that could block the signal, a radio on UHF may not work very well. Oh, by the way, the box said the range on this radio is 36-miles, well sorry but that is not true. It sounds good, but wrong. I have tested this type of radio and you may only get about 1 mile. So don't count on what the box is telling you.

One other thing I don't like about this type of radio for SHTF is you can't change the antenna. It is molded into the radio. That is a bad idea for anyone trying to get a better range. Better antenna means a better range. (We will talk about this later) Another thing I don't care for is the radio is stuck to 7 or 22 channels. Normally, no big deal. But for SHTF, you don't want to be stuck to channels because that makes it easy for other people to track you. **You have nowhere to hide. And just in case you didn't know, anything you say, everyone can hear.**

# Types of Radios

*Pros and Cons of GMRS*

Another type of radio that lots of people use is called GMRS **(General Mobile Radio Service). This type of radio is very much like the FRS radios I have talked about above, but they are a little better.**

**This is because they give more power out so that you can talk farther. Also, the antennas can be changed to a better and larger one that will increase the range quite a bit. And you can use a repeater on GMRS to extend the range even farther, but I am not going to count that as a good thing because in a SHTF scenario, there won't be any repeaters to help you, so I will take them out of the equation.**

Everything you do and all the equipment you use should be geared to what we call **Simplex or radio to radio (no repeater), there may not be any so don't count on them.**

As for channels, you are still stuck to 22 or so and again you can't run off and hide with your group so they're too easy to track.

# Types of Radios

## *Pros and Cons of the CB*

I know I am very picky and for good reason! I want the equipment you spend your hard-earned money on to be the best for SHTF/War and work for you and your team, hang in there we have a lot more to talk about.

Let's move on to the most used and easiest to get of all the radios the **CB.**

The good old CB radio. I bet a lot of you have them in your trucks right now and that's a good thing. CB has a lot to offer for the SHTF. Such as everyone has them , they can be bought for under $100.00 and they have an ok range of about 1 to 5 miles. But again CB is line of sight as well, although not as bad as say UHF.

CB radios also have good power (about 5 watts) and can be modified for more. There is another off shoot of CB that some take advantage of. Have you heard of SSB **(single side band)? The cool thing about SSB is it allows you to use much more power and goes a lot farther, and I know you're asking yourself why?**

Well I am not going to get in to why SSB has more power and goes farther because I may lose you in the explanation and that's not what this book is about. But trust me, it does work.

**Here is the bad side of CB**: again, it is channelized. So it only has 40 channels and it is too easy to track. (One of the good things is everyone has one and one of the bad things is that everyone has one) So again, you can't run off and hide where no one knows where you're talking.

Not to mention, in order to get a good range, you need a rather large antenna that is easy to spot. If it's on your house. The smaller antennas for your truck are ok, but because they're smaller, they're a compromise and still easy to spot. it  And everyone knows you have a radio.

One other bad thing with CB is the Skip. Skip is when your signal bounces off the ionosphere above the earth and comes down somewhere else. That is great if you want to talk to someone in Australia or you live in California and you want to talk to someone in Texas. While that could be ok now and then, it could be a bummer when you need to talk to your people. At  certain times of the year, the sun spots are at their highest. The skip from that will prevent you from talking more than 2 to 4 miles or less. but that guy in North Carolina would love to chat with you like it or not!

# Types of Radios

**Well mind blown yet?? I hope not because we have more to talk about, so here we go.**

## *VHF*

Now let's talk about another radio frequency group that I have not touched on yet, VHF or **(Very High Frequency.) Now these frequencies are much lower than UHF, so it has some good and bad points as well.**

Let's start with the good: VHF has a good range. I have used this radio to radio for up to 10 miles and car to car (where you have more power and better antennas) up to 20 miles (depending on the terrain.) So it's a great choice for SHTF. Also, the antennas are still quite small. Only 19 inches for a ¼ wave antenna on your car. **(I will be talking a lot more about antennas later)**

Most VHF hand held radios put about 5 watts and some 8 to 10 watts. That's a lot for a walkie talkie. So you can understand how they can talk much further. However, one feature of most Ham radios is that you can turn down the power output to as low as 1 watt. This way, you are not being heard where you don't want to be.

You can also use short or long antennas to give you the range for the situation you're in. You can change your antenna system to a base station antenna up on a pole or on the outside antenna on the car if you're with a group traveling to make sure you all stay in touch.

I am talking about Ham Radio equipment, as for versatility they can't be beat. They don't have channels, so you're not stuck, and you can move around as you please.

I know you're thinking to yourself **(great but ham radios are anything but cheap.) Well don't freak out yet. You can get a very nice handheld ham radio for around $35.00 and up to about $60.00. So they won't break the bank to bad.**

The BaoFeng radio on Amazon is great for a first radio and it is a duel band radio. That means it has both VHF and UHF in one radio and sells for about $35.00 (if you do a bit of shopping.) My personal favorite is the TYT UV 8000D model. It is a really good radio that is both VHF and UHF. It has a high output of 8 to 10 watts that works very well for a bit more money (around $60.00 .) If you look hard, you can find it with two antennas. One long and one short . They also both come with rechargeable batteries and charger.

**No, I don't get a kick back for telling you about these two radios. They're just great for what we need as preppers.**

Some other features that can be very helpful to us: they have scan so you can hear all the local fire, police and EMS. This way, you know what is going on around you. Also, if you need help ,you can call them, to lend their assistance.

The UV8000D radio can cross band repeat . That can be a game changer if you're willing to learn how to use it. (I will talk about this feature later.)

# Types of Radios

*VHF/UHF*

BaoFeng

TYT

UV8000D

**When you start looking for any of these radios, read the testimonials by other Hams and people using them!** They can tell you a lot about how well they work and hold up under use. As well as weather or not the place you're getting them from is reliable. And that means a lot if you *do* have any trouble.

The down side of both the BadFeng and the TYT, is they're not really easy to program. Although they both come with software for your computer, it does not work (at least I have never been able to make it work.) So you have to buy software from an outside source that does work. Don't let your heart be troubled, either radio can be programmed from the front keys and yes it will take some time to figure it out, but take your time.

You're not worried about repeaters so programming for radio to radio operations is easy on either radio and of course there is always Youtube to help you figure it out. There are a bunch of videos on how to do anything you need to do with either of these radios.

I bet you remember that I mentioned cross band repeat and yes, I will talk about that later!
I have only touched the surface of all the really cool radios and frequencies that are available for a SHTF scenario. I just want to keep it simple and not blow you minds quite yet. I understand that YOU may not think it's so simple, but trust me, this is only the beginning. Don't try and over think it and you will be fine.

Now there are a lot of good radios out there such as Yaesu, Kenwood and Icom. All are great but a lot more expensive. And, in some cases, not as open to what we want to do with them. If you have one that's great, use it in conjunction with anything else you get from here on.

**I have faith in you! You can do this!**

# Antennas

## A Bit about antennas (well maybe more than a bit)

Now that I have talked a bit about the equipment, it's time to explain more about how you put it to work. I'm going to teach you the most efficient way possible how to make that radio do what it's supposed to do.

I want to tell you all a **little secret that no one at the radio store, Amazon or anywhere else will tell you.**
**Are you Curious Yet??**

**Well here it is: it does not matter what radio you get! What matters is what antenna you plug it into, the antenna is the most important part of any station.**

**I like to tell people that your antenna is 75% of any station. If you want to (get out) as they say, you need a good antenna no if and or buts!**

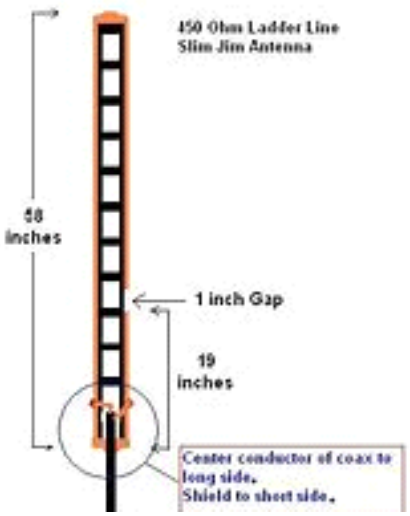
**Did you ever say to yourself when you see that big antenna over that ham's house, "Man that is huge why do they need such a big antenna?" Well now you know!**

We have been talking about VHF and UHF. Both have the same thing in common, they are a line of sight communications system. Which is great for keeping track of your team . As we get into this more, you're going to learn how to send your signal where you want it to go and cut your signal where you don't want it to go.

There is so much you can do if you are willing to take some time to do some research and watch some Youtube.

# Antennas

## Making Your Own




This is a Slim Jim, or some call it a wire J pole. It is a basic antenna for VHF and UHF that is made from a piece of ladder line. It's cheap and easy to make. Might I add that it can be rolled up and put in a pack.

You can build one of these right off this drawing. All you need to know is there. The long leg is 56" to 58" long and it's not that critical just follow all the measurements.

**What you need to know: This antenna can be hung form a tree or from the drapes on your window even hidden in your attic, its only limited by your imagination, it's not rocket science, but it is science. (Are you still with me! Hang in there!)**

I make these antennas for search and rescue teams. They are light and easy to carry in a pack. All you need to do is throw a line over a tree limb and pull it up and you have a very powerful base antenna for your hand-held radio . **This will increase you range by double!**

I have put together some pics to help you understand how to build one yourself.

This picture shows the bottom of the antenna. As you can see, I have shorted the wires together at the bottom, and on one side. I measured up 19" and cut leaving a one-inch gap. The total length of this antenna is 56" on the long side.

**Don't barf yet its only wire and tools!**

# Antennas

## Making Your Own Continued...

This is the top of the antenna and again I have shorted the two wires together. **(and Soldered)**

**Be careful when stripping this cable, you can cut the braid too much or the center wire as well it's not very strong and you need a good connection to the antenna when you solder it.**

This is the coax **(RG58) and how you set it up to be ready to put it on your antenna.** The center conductor goes to the long side and the braid goes to the short 19" side. As you will see in the picture below, take your time. **You don't want any cold solder joints. It will fail on you!**

Be careful when you're cutting off the insulation on the twin lead. The wire is not very thick so you can cut it easily. Take your time and don't get in a hurry. If you cut the wire, you can solder it. However, any time you solder a wire, you make it more brittle. With use it can break form stress.

Here is the coax attached on the antenna it is apx. 4" from the bottom you can move it up and down to get the best match if you have an SWR meter that will cover VHF.

You can see the connector that you will use to attach a longer peace of coax to your radio. Now if you want, you can put a longer piece of coax on the antenna all the way to your radio. I don't because I never know how I am going to use it. This is the most versatile way I know.

Once you get everything soldered, reinforce it with some plain old electrical tape. **Be careful when putting on the tape not to crush the wires together.** They need to stay at the same spacing as they are when you first started the project.

Now this antenna will cover VHF really well but does not work as good on UHF. There are ways to make it work on UHF. However, the construction is much more difficult. So I am not going to get in to that.

# Antennas

## Making Your Own Continued...


- 2-1 or less
- 145.79 to 154.93
- Flat @ 150.00
- 1.7 @ 465.34

Just one more picture showing the frequencies this antenna covers.

145.790 is as low as it will go. That will cover most all the Ham band.

It will go as high as 154.930. That will cover well up into the commercial band.

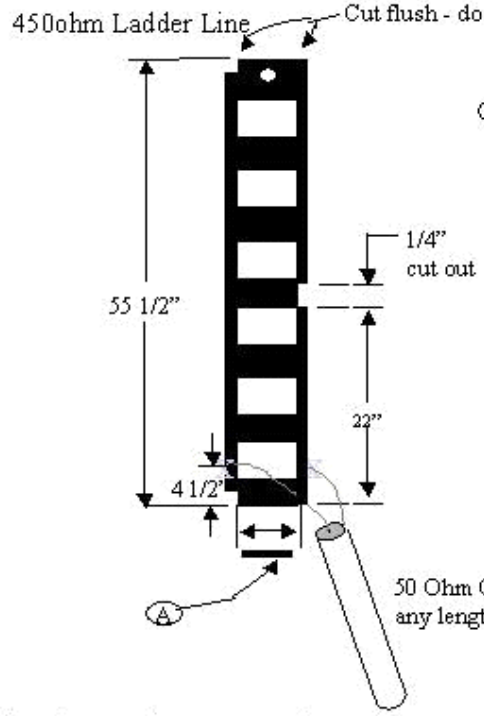
Now I would like to touch on another advantage of this antenna. It has Gain over your hand-held antenna. I know, what is gain? Well that means it will amplify your signal about 3 times over your small antenna on your radio.

Here is an easy way to explain how that works, picture a balloon blown up. It's almost round. Well that is what your signal looks like. When you transmit ,the signal goes everywhere. Including strait up. So you lose all that signal to the stars. Now press your hand down on the balloon. As the top goes down, the sides go out. That is what happens when you use an antenna with gain. Your signal is stronger strait out form you. This way, you don't lose as much to space.

**I hope you're getting this stuff or else!!!!!**

# Antennas

## Making Your Own Continued...




Cut a piece of Ladder line to 56 inches. At the top, cut the wires flush with the insulation. At the bottom, strip 1/2 " insulation from both wires. Bend the wires inward $90^0$ and solder.

NOTES:

1. To enable tuning for minimum SWR, cut the Ladder Line to 59". At the bottom, strip off 4 1/2" of insulation from each wire. Solder a jumper across the two wires and check the SWR. Move the jumper up or down until a good match is found. Solder the jumper in place.
2. The coax is attached 4 1/2 inches above the bottom (51" from the top). Connect the shield to the 22" side and the center conductor to the 55 1/2" side. Tape the coax to the Ladder line to reduce strain on the soldered wire connections.
3. RG-174 coax can be used for runs no longer than about 10 Ft.
4. RG-58 A/U can be used for longer runs
5. Hang antenna away from other objects.
6. Attach a weight to the bottom to keep twinlead straight otherwise large variations in SWR will be observed.

Install appropriate connector for your radio at the other end of Coax (BNC, SMA. PL-259. etc.)

| DISTRICT 24 DOUGLAS & ELBERT COUNTIES, COLORADO | |
|---|---|
| 2 METER - ROLL-UP J-POLE ANTENNA - 450 OHM LADDER LINE | |
| Drawn By: K8VQC | Date: 12 September, 1998 |

This is another version of the wire J pole where the wires at the top is not tied together. Give it a try as well, see which one you like best. I just built one of these, and it's great.

So far, this is the best one I have built. It works on VHF and UHF. It is great for your cross-band. Just follow the plans and you will not need to tune it. This is an ideal SHTF antenna. Make a bunch and have them on hand!!

# Antennas

## Making Your Own Continued...

If you look at the feed line, it specifies 50-ohm coax.

As for how long it should be, that is up to you. But as you will learn, some cable works better than others depending how long the run to your radio.

All of the coax I have listed on the previous page **is 50 ohms. That is all we use in 95% of the antennas for CB and Ham.**

In the picture to the left, I have built one of the wire J poles from the previous page. **It is working great! I have it held up by a PVC pole tied to my deck rail for testing. When you put yours up, hang it in such a way that there is nothing around it to prevent any object from distorting the signal pattern.**

**Like anything, you may put it up anyway you can, but it will work best hanging in free space.**

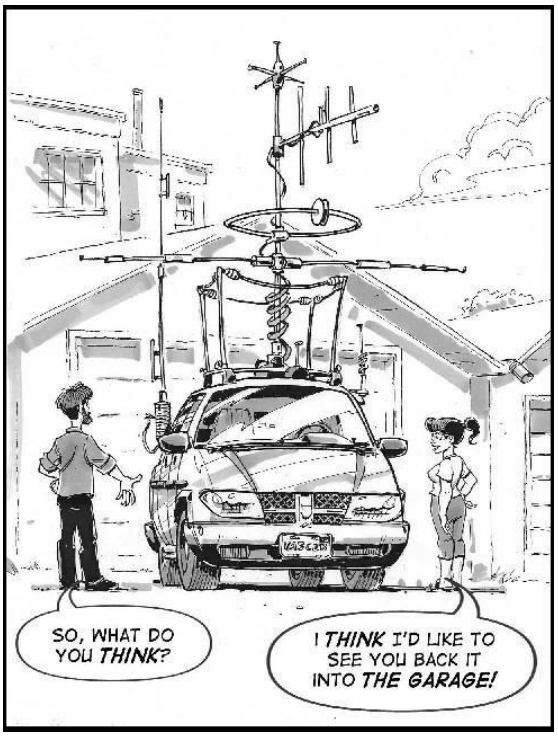
**This antenna is connected to my cross-band repeater. From my car, I can talk to it from over 10 miles away. It will work for you as well. Give it a try and amaze your friends. (What do you think of the view of the mountains out my back-door NICE aren't they?)**

A little about Coax cable (again there all 50 Ohm)

# Coax Cable

## A little about Coax cable (again there all 50 Ohm)

This is what coax looks like on the inside. The one on the left is RG58 and the right is RG8.
RG8 is much larger than the 58. It is most used for base station at your house or a repeater sight on a mountain top. This is because it's a bit stiff and it has less loss for a longer run over 100 feet to your radio.




RG58 is great. It's much softer and smaller for putting a radio in your truck or for short runs. Unfortunately, it has more loss and not that great for long runs. I use this under 50 feet.

There is one more type of Coax. It's called RG8X or RG8 mini. It's in-between the other two and good for short to medium runs of 100 feet or less. It's cheaper than RG8 but has less loss than the RG58. I use this type of coax a lot since it's just easier to work with.

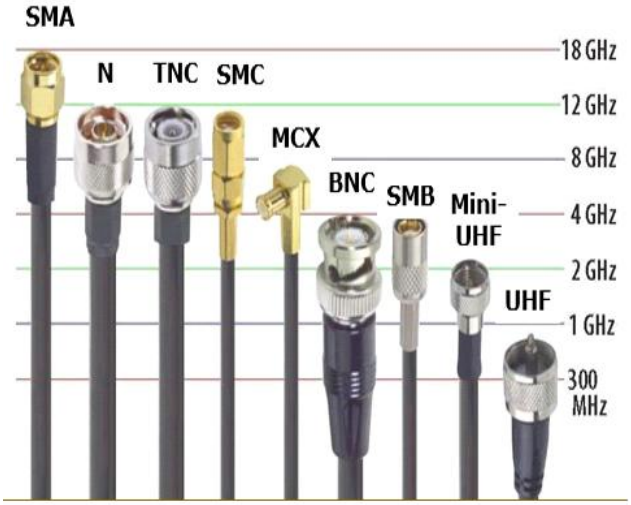
You can find all these cables on Amazon or a good CB shop in the longer lengths. Some truckstops have them in shorter cuts. They don't often have the longer lengths on hand.

I would look for the cables with the connectors you need already made up. You can do the connector install yourself but you will need some special tools. Unless your going to be making a large number of cables , the tools are a bit expensive.

# Connectors

## Types of Connectors

I had better talk about the type of connectors that are most often used on radios, so you can know what one you need.




OK don't freak out just yet, this is not hard because you only need 3 on the chart above. So, starting with the far left is the SMA. This is the most used on the handy talkies. You can get adaptors to make that work for your car or ladder line antenna.

The next one most used is the N connector. I use these a lot. They're the best for the higher frequencies because they have the least loss at the connection point.

And last but not least, is the UHF connector on the far right of the picture. This connector is used on most base and mobile radios. It is the easiest to find at the local Truckstop.

You can get all of these on Amazon for a few dollars. Just put in the connector you want, and search will find it for you. If you look, you can find the coax with the connectors already on it and ready to use in almost any size you need.

If you have one of the Yaesu, Kenwood or Icom handheld, they use the BNC connector.
The rest are not used very often, so just ignore them.

# Connectors

## Types of Connectors

More about the connectors you're going to need for most radios and what they look like.

The connector on the right is a PL259. This is the most common connector used on all CB radios and most mobile and base ham radios. You can find them on coax already made up.

The small connector on the left is an SMA male **(it has the small tip in the middle). It fits the TYT radio. If you have a BaoFeng, it requires an SMA female connector (no tip) so shop carefully.**

This is an SO239. It's the female for the PL259. This Is what the connector looks like on the back of most radios.

The large connector is called an N connector. This is the one I use most of the time because it has the lowest loss at the connection point. But it is the most expensive and a bit hard to find. So if you can't find them, don't sweat it. Use the PL259. It will work fine.

# Connectors

## Types of Connectors Continued...

This is the last connector I need to talk about. It is a BNC. The top is the male and the bottom is the female. This connector is used on all the ham hand held (like Yaesu, Kenwood and Icom.) The male will be on the antenna side and the female will be on the radio.

**Just a little humor for you.**

# Antennas

## The Copper J Pole

I sure hope you don't look like this guy after all that information I just gave you.
Hang in there still more to come.

Another great antenna is called the pipe or Copper J pole. It is made from copper pipe from the hardware store and it works great and it will work on both VHF and UHF at the same time, so if you put up a cross band repeater the J pole would be a great base antenna. This is the same as the antenna above but made from copper pipe, this antenna works very well for base stations and even form a truck, but it is a bit large as you will see if you build one.

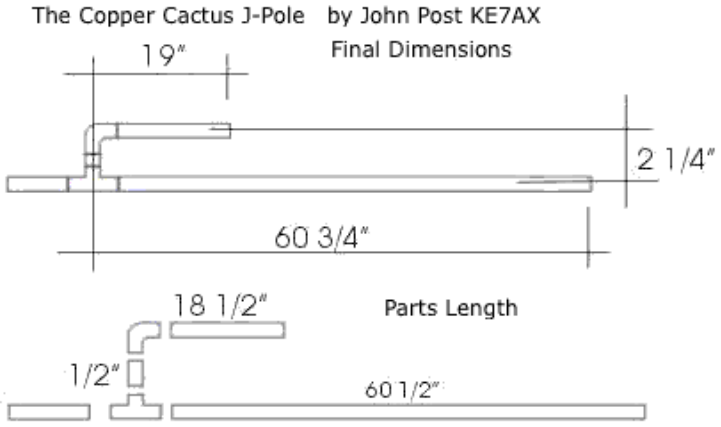
This is a picture of a copper J pole. If you can use a tape measure, can solder with a torch, and use a hack saw, you can make one of these for less than $10.00 in your garage. It takes 15 minutes. This antenna is as good as most antennas you can buy for much more money. I have been using them for years. At one time, I was even making them for sale. I think I sold them for about $20.00. I have many of them out there used by all types of Ham operators.

If you would like to make one of these antennas go to (hamuniverse.com/jpole.html). There you just plug in the frequency you want. It will give you all the measurements you need to build one for whatever band or channel you want. Now let me warn you, you can build one for CB, but it will be quite large and may not hold up in a high wind. Other than that go for it and have fun.

# Antennas

## How to Make the Copper J Pole

So, here are some pictures of my home build J pole as I put it together. The picture below has all the cut sizes and overall length you need to make you own copper J pole.




As you can see by the picture, you have the full length and the cut size for the ½ inch pipe to go by. So get out your pipe cutter and let's go.

The piece that is down below the 3-way joint can be any length. That is what you will use to mount your antenna on a pole. Or again, you can hang it from m a tree, put it in your arctic or just stand it up in the comer of your room.

This is an addition that you can do to make your copper J tunable on the fly. As you can see, it will take a bit more work, but if you're up to it, it's not a bad idea. Make sure you stay with the same dimensions. Make the screw so that it can be just a little longer or shorter overall.

You don't have to put caps on the pipe, but it makes it look nicer. Just remember to add the cap size to the overall measurements so you're not too long.

Ok this is a view of the short section, the elbow and T ready to have the long section installed.

# Antennas

## How to Make the Copper J Pole Continued...

This is all the parts put together. I am using a coax connector. But you can use a screw for the feed line as well. It does not matter how you make the connection as long as it's a good one.

I am using pipe clamps to hold the connector to the pipe. You can use the clamps and put your coax right to the pipes. Remember the center conductor of the coax goes to the long side and the braid goes to the short side.

Put the coax about 2" up from the center of the T. If you have an SWR meter, you can move the feed point up and down for the best tune spot for the frequency that you want. If not, just go for the 2" and you should be good.

And another view of the bottom section of the copper J pole almost done.

# Antennas

## How to Make the Copper J Pole Continued...

And here you have it. The full J pole. I will be doing a little tuning, put some caps on the pipes, add the coax and up to the roof she goes. I hope this helps you get yours going.

Here is something I know you have heard before, **Bigger is better! And when it comes to antenna its very true, but you need to understand that an antenna is cut to the frequency that the radio is using. So not just any long antenna will work on any radio. If you have played around with CB at all, you know that you have to tune the antenna to the radio. Or to be more correct, you tune the antenna to your car on the frequency that you're using. (SWR) (standing wave ratio)**

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## How to Make the Dipole

Now I would like to talk to you about another antenna you can build form stuff you may already have in the shed. it's called a **dipole. The dipole is made from wire and any wire will do.**

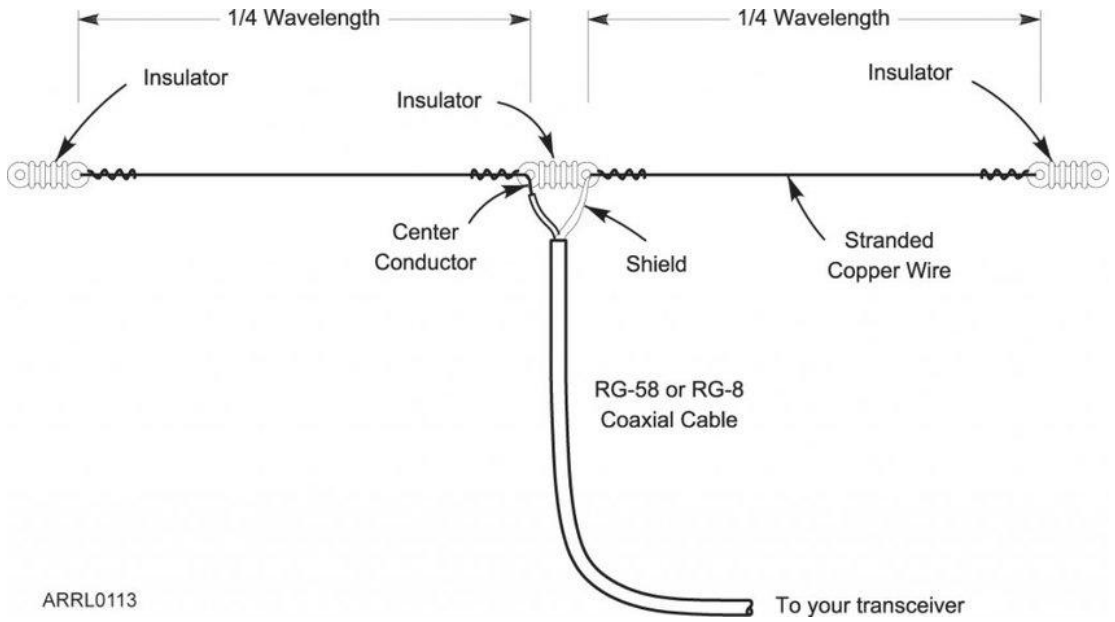
You can make it for any band or frequency you need so here we go. This is the formula to find out the length of a dipole: **(468 divided by the frequency.) This will give you the length in feet for the whole antenna.**

**So let's say I want an antenna for CB (just a demo for you.) I would take the frequency 27.165 - I think this is channel 16 and divide it by 468 = 17.22 feet. That is the full length of a half wave antenna for CB. So you go get the old wire that's been hanging in the shed for years and cut it so that you have two pieces (8.61) feet long each that's about (8' ¾") on each side. Put some kind of insulator (Wood, PVC, Plastic, anything nonconductive) in the middle and an insulators on each end. BINGO you have a dipole. Then you take your coax feed line (RG58. You can get it at your local radio shack if you still have one or any truck stop where they have CB stuff. Put the center wire to one side and the braid to the other side and you're done. You can use insolated or non-insolated wire doesn't matter.**

# Antennas

## How to Make the Dipole Continued...

This is a good antenna. If you make one for CB, you want to hang it vertically form a tree or PVC pole. 90% of all CB (and the same for VHF or UHF) is Vertically polarized. Later when we talk about HF **(high frequency) antennas (which is mostly Horizontally polarized.) This will be the antenna you can build for any band you want to use. More on that later.**



**Well is your Mind blown yet?**

Oh no! If you're not careful, you're going to learn something about antennas! Now you already know more than most CB'ers that I have met over the years.

(I have nothing against CB I have used them for years, in fact I met one or two girlfriends that way. However, they spend more time talking than learning how it works or how they could make it better. )

I don't know about you, but when I got started in CB and later Ham Radio, I was young and did not have a lot of money. So building antennas was the only way to get on the air and enjoy the hobby. This eventually turned in to a job working as a state radio technician. I've been doing what I love for the last 15 years and getting paid for it! I was able to do it without a college degree. I just jumped in, read books and got out the tools and built things.

That is one of the funniest things about radio. That anyone can do it. When you build an antenna, hook it to your radio for the first time and start calling for that DX station **(DX means any station out of the country) and he answers you back! WOW that feels great.**

Another one of my story's!

One day I was testing a Dipole I made out of wire and some parts I had laying around. I just stuck it up on a piece of pipe by the back deck to see if it would work. I started calling CQ **(calling anyone.) I was only using about 15 watts out of my radio. The first person that answered me was a Ham in Russia! Man that was a great feeling. I was able to talk to someone halfway around the world on a piece of wire that was junk a half hour ago!**

# Stealth

## Not Getting Found

Ok, I understand, I will not throw any hard stuff at you for now. I want to talk about something else for a bit to let your brain rest a little.

I am sure you all know this, but every time you key your mic, you are broadcasting to the world. Everyone can hear what you say! You need to take some precautions to keep yourself and your team from being tracked and chased down by people listening to you.

Speaking of that, I have a little story about tracking a signal that I did one time.

**I was talking to a young lady on the CB one day. She would not tell me who she was or where she was. So I told her I was going to find her. She was convinced that I would never find her. Well, I put my RDF (radio direction finding) skills to work and found her in less than one hour! Boy was she surprised! Don't tell me I can't do something with a radio!**

**(I know you want to know. Yes, she was cute!)**

From the time of SHTF until people start to get hungry and desperate, they start forming groups and gangs. There will be a period where there will be little concern about transmitting, but as life gets harder and harder, they get smarter. They could start RDF and come looking for YOU! **So how do you keep yourself form being tracked and found?**

1. Keep moving, either on foot or in a car or truck. Keep moving! Don't stop for long if you can avoid it.
2. Keep transmissions short. Come up with some codes to make your transmission short and still say what you need your team to know. Like the 10 code - we all know what 10-4 means. **(I hope)! So, make up your own meaning for the 10 code to put people off the track.**
3. Nighttime is a bit safer but keep moving a good RDF person will find you. I know, I have done it!
4. Set up a hidden cross band repeater **(more on this later) as far away from your base as possible. This can extend your range and act as a decoy if someone is tracking you.**
5. Use stealth. As you will see later, there are all types of antennas. Most can be made from just wire from lamp cord to electric fence wire. It all works and a wire antenna can be hidden in a tree or under the eve of your house or just held up by hand and then rolled up and moved out.
6. Avoid channelized radios - CBs are the worst.
7. You can, with a bit of reading, learn how to receive on one frequency and transmit on another. The Ham radios will do this very easily. Your stalker will only hear one side of the conversation.
8. Think outside of the box. Use odd frequencies. Do a little homework and listen to make sure that there isn't anyone using that frequency before you pick it for yours.
9. Don't use your names while on the radio. Make up your own call names. When in SHTF, even I won't use my Ham Call. I have a SHTF radio name. **(what's yours?)**

**Now this all depends on you. The sooner you get started the better.**

If I came to you and said I am buying a new gun to have for self-defense, but I don't have any time to train with it what would you tell me?

So now is the time to get started not when SHTF. What if you forgot how to turn the radio on? Or the batteries are dead, and all the antennas and parts are in areas unknown.

You have lots of work to do. You need to find some radios, build some antennas and figure out how you want to do all this before it's too late. **(But I know you can do it! Just dive on it!)**

## You still with me??

# Cross-Band Repeater

## What It Is And How It Works

I mentioned earlier the cross band repeater. Now it's time to explain what it is and how it works and why it could be very important in all types of emergencies. It's about to get a bit technical but hang in there it's not that bad! **Strap in, here we go.**

A cross band repeater is a radio that when it rears a signal on say UHF side of the radio, it automatically passes the signal over to the VHF side of the radio and retransmit it so it can be heard by someone on VHF! Of course, you need to be using a duel band radio.

**(Did I lose you Yet?)** I hope not, but just in case, I will try and put it another way.

So if you have a cross band repeater set up, you can talk to it on UHF and whatever you say comes out on VHF.

So now you're asking **WHAT GOOD is it??**

Well, this could be set up on a hill all by itself with a small battery and antenna to allow you to talk to someone on the other side of the hill where you could not normally communicate.

Remember VHF and UHF are line of sight and if there is a mountain or large building in the way, a cross band repeater could be set up to talk around or over the obstacle!

Another use for a cross-band repeater is as a portable repeater you could have in a small box (like an ammo can) that you could set up in a tree or have in a car or truck that can be moved as needed to keep communications open to your team.

Here is another use for a cross band repeater, how about using it to spy on other groups! Find out what radio frequency they are using and set up your repeater to listen to their radio traffic. You can be miles away and they never know that you're listening to everything they are saying.

So, if they're using VHF or FRS, even GMRS, then you can set up your repeater to listen on one of those frequencies and the cross-band repeater will retransmit back out to you on UHF so that you have it all.

If I forgot to mention what radio can do this, silly me - but the **TYT UV8000D or E can be set up as a cross-band repeater. I am using one at my house right now. Its been working in this mode for over four months without a hitch. I have mine listening to the local Ham repeater so every time someone key's up the ham repeater, my cross-band repeater key's up as well. So it's getting a lot of use all day long and is working like a champ.**

**(Again, think out of the BOX) Or in the box whatever works for you.)**

**Here is a couple of pictures of my cross band repeater, radio, battery and roll up J pole antenna. As you can see, it's not complicated. Add solar and this will run for months out in the field to give you coverage where you need it. (Old ammo can)**

# Frequencies List

## A Reference to Work From

Well if your still here and have not thrown my book across the room or out the window, it's time to give you something to work with as far as frequencies. This is so that you can have a reference to work form. Here is the problem, I can only give you a standard list of basic frequencies because we most likely don't live near each other. So what will work for me, may not work for you at all.

(I have not been pushing you to get your Ham License because I know you may not want to or have the time or whatever, but I hope you will become interested in radio and want to look into getting your ticket. I know that may not work for everyone.)

**So the lists I am going to put here are both Ham and non-Ham frequencies. Be warned, if you try and use Ham frequencies without a license, you will find yourself in a world of hurt. Hams are self-policing and can track you down. The FCC is not someone you want to deal with!**

So, I would stick with non-Ham frequencies from the lists. And again, do a lot of listening before you do any transmitting and radio testing.

Here is the first list. It covers FRS and GMRS frequencies. These are all UHF frequencies.

**Channels and Frequencies**

| Channel | Frequency | Description | Channel | Frequency | Description |
|---|---|---|---|---|---|
| 1 | 462.5625 MHz | GMRS/FRS | 12 | 467.6625 MHz | FRS |
| 2 | 462.5875 MHz | GMRS/FRS | 13 | 467.6875 MHz | FRS |
| 3 | 462.6125 MHz | GMRS/FRS | 14 | 467.7125 MHz | FRS |
| 4 | 462.6375 MHz | GMRS/FRS | 15 | 462.5500 MHz | GMRS |
| 5 | 462.6625 MHz | GMRS/FRS | 16 | 462.5750 MHz | GMRS |
| 6 | 462.6875 MHz | GMRS/FRS | 17 | 462.6000 MHz | GMRS |
| 7 | 462.7125 MHz | GMRS/FRS | 18 | 462.6250 MHz | GMRS |
| 8 | 467.5625 MHz | FRS | 19 | 462.6500 MHz | GMRS |
| 9 | 467.5875 MHz | FRS | 20 | 462.6750 MHz | GMRS |
| 10 | 467.6125 MHz | FRS | 21 | 462.7000 MHz | GMRS |
| 11 | 467.6375 MHz | FRS | 22 | 462.7250 MHz | GMRS |

# PROGRAMMING FILE CHANNEL LIST

## SHTF SURVIVALIST PREPPER FREQUENCIES

## HF - VHF - UHF

FILE NAME: SHTF_SURVIVALIST_PREPPER_FREQUENCIES_HF_VHF_UHF_2013G.CSV

MORE INFO: RADIOFREEQ.WORDPRESS.COM

| MEM CH SLOT | HF UHF VHF | CHANNEL DESCRIPTION | CHANNEL DISPLAY NAME | RECEIVE FREQUENCY MHZ | MODE | TRANSMIT FREQUENCY | PL | TONE HZ |
|---|---|---|---|---|---|---|---|---|
| 0 | HF | HAM 80 METER PREPPER NET | HAM80M | 3.818000 | LSB | SIMPLEX | NO PL | 88.5 |
| 1 | HF | HAM 60 METER SURVIVALIST NVIS | HAM60M | 5.357000 | USB | SIMPLEX | NO PL | 88.5 |
| 2 | HF | MARINE CH 606 EMERGENCY 6215 | MAR606 | 6.215000 | USB | SIMPLEX | NO PL | 88.5 |
| 3 | HF | HAM 40 METER PREPPER NET | HAM40M | 7.242000 | LSB | SIMPLEX | NO PL | 88.5 |
| 4 | HF | HAM 20 METER PREPPER | HAM20M | 14.242000 | USB | SIMPLEX | NO PL | 88.5 |
| 5 | HF | CB CH 3 AM PREPPER PRIMARY | CB 3AM | 26.985000 | AM | SIMPLEX | NO PL | 88.5 |
| 6 | HF | CB CH 4 AM PREPPER | CB 4AM | 27.005000 | AM | SIMPLEX | NO PL | 88.5 |
| 7 | HF | CB CH 9 AM HIGHWAY SAFETY | CB 9AM | 27.065000 | AM | SIMPLEX | NO PL | 88.5 |
| 8 | HF | CB CH 19 AM TRUCKER | CB19AM | 27.185000 | AM | SIMPLEX | NO PL | 88.5 |
| 9 | HF | CB CH 36 USB SURVIVALIST | CB 36U | 27.365000 | USB | SIMPLEX | NO PL | 88.5 |
| 10 | HF | FREEBAND 368 USB SURVIVALIST | FB368U | 27.368000 | USB | SIMPLEX | NO PL | 88.5 |
| 11 | HF | CB CH 27 USB PREPPER | CB 37U | 27.375000 | USB | SIMPLEX | NO PL | 88.5 |
| 12 | HF | FREEBAND 378 USB PREPPER | FB378U | 27.378000 | USB | SIMPLEX | NO PL | 88.5 |
| 13 | HF | FREEBAND 425 USB SURVIVALIST | FB425U | 27.425000 | USB | SIMPLEX | NO PL | 88.5 |
| 14 | HF | HAM 10 METER PREPPER USB | HAM10M | 28.305000 | USB | SIMPLEX | NO PL | 88.5 |
| 15 | VHF | LOWBAND VHF SURVIVALIST 33.4 | LOW334 | 33.400000 | FM | SIMPLEX | PL TX | 151.4 |
| 16 | VHF | AIRCRAFT EMERGENCY DISTRESS | AIREMG | 121.500000 | AM | SIMPLEX | NO PL | 67.0 |
| 17 | VHF | HAM 2 METER PREPPER | HAM 42 | 146.420000 | FM | SIMPLEX | PL TX | 100.0 |
| 18 | VHF | HAM 2 METER CALLING | HAM 52 | 146.520000 | FM | SIMPLEX | PL TX | 100.0 |
| 19 | VHF | HAM 2 METER SURVIVALIST | HAM 55 | 146.550000 | FM | SIMPLEX | PL TX | 151.4 |
| 20 | VHF | MURS PREPPER PRIMARY | MURS 3 | 151.940000 | NFM | SIMPLEX | PL TX | 67.0 |
| 21 | VHF | MURS PREPPER | MURS 4 | 154.570000 | FM | SIMPLEX | PL TX | 67.0 |
| 22 | VHF | SEARCH & RESCUE EMERGENCY | SAREMT | 155.160000 | FM | SIMPLEX | PL TX | 127.3 |
| 23 | VHF | MARINE SAFETY CALLING | MAR16 | 156.800000 | FM | SIMPLEX | NO PL | 67.0 |
| 24 | VHF | MARINE BOAT PREPPER | MAR72 | 156.625000 | FM | SIMPLEX | NO PL | 67.0 |
| 25 | UHF | HAM UHF CALLING | HAMUHF | 446.000000 | FM | SIMPLEX | PL TX | 100.0 |
| 26 | UHF | HAM UHF PREPPER | HAM U3 | 446.030000 | FM | SIMPLEX | PL TX | 100.0 |
| 27 | UHF | PMR PREPPER | PMR 3 | 446.031250 | NFM | SIMPLEX | PL TX | 67.0 |
| 28 | UHF | FRS CH 1 COMMON CALLING | FRS 1 | 462.562500 | NFM | SIMPLEX | PL TX | 67.0 |
| 29 | UHF | FRS CH 2 COMMON CHAT | FRS 2 | 462.587500 | NFM | SIMPLEX | PL TX | 67.0 |
| 30 | UHF | FRS CH 3 PREPPER PRIMARY | FRS 3 | 462.612500 | NFM | SIMPLEX | PL TX | 67.0 |
| 31 | UHF | FRS CH 4 PREPPER | FRS 4 | 462.637500 | NFM | SIMPLEX | PL TX | 67.0 |
| 32 | UHF | GMRS CH 17 SURVIVALIST | GMRS17 | 462.600000 | FM | SIMPLEX | PL TX | 67.0 |
| 33 | UHF | GMRS CH 20 TRAVELERS | GMRS20 | 462.675000 | FM | SIMPLEX | PL TX | 141.3 |
| 33 | UHF | GMRS CH 20 TRAVEL REPEATER | GMR20R | 462.675000 | FM | DUPLEX+5.0 | PL TX | 141.3 |

The list on the previous page is a nice list **(sorry it's a bit hard to read.) But you will notice that there are a lot of frequencies that I have not talked about. Like all of the ones at the top of the list marked HF (High Frequencies.)**

**I will cover this later, but if you have an HF rig or a good short wave receiver, you can listen in on what is going on. That is a good thing because if there is any local news, it may not tell you the truth. But broadcast stations in other countries will be talking about what is going on in the U.S. So being able to hear that is a very good thing. Keep that in mind as you're building your equipment and station.**

This list on the next page has all the Ham Bands. All work very well to communicate statewide, nationwide and worldwide. If you learn when to use each band, best time of day for what band and best time of the year. It all makes a difference.

# US Amateur Radio Bands

**Effective Date March 5, 2012**

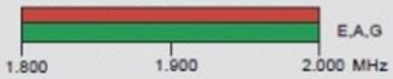
Published by: ARRL The national association for AMATEUR RADIO®
www.arrl.org
225 Main Street, Newington, CT USA 06111-1494

## US AMATEUR POWER LIMITS

**FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.**

### 160 Meters (1.8 MHz)

Avoid interference to radiolocation operations from 1.900 to 2.000 MHz




### 80 Meters (3.5 MHz)


### 60 Meters (5.3 MHz)

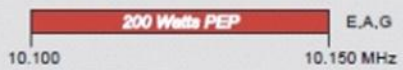

General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated output of 100 W PEP. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such as PACTOR III as defined by the FCC Report and Order of November 18, 2011. USB is limited to 2.8 kHz centered on 5332, 5348, 5358.5, 5373 and 5405 kHz. CW and digital emissions must be centered 1.5 kHz above the channel frequencies indicated above. Only one signal at a time is permitted on any channel.

### 40 Meters (7 MHz)

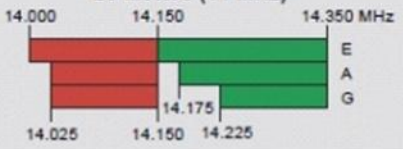

Phone and Image modes are permitted between 7.075 and 7.100 MHz for FCC licensed stations in ITU Regions 1 and 3 and by FCC licensed stations in ITU Region 2 West of 130 degrees West longitude or South of 20 degrees North latitude. See Sections 97.305(c) and 97.307(f)(11).
Novice and Technician licensees outside ITU Region 2 may use CW only between 7.025 and 7.075 MHz and between 7.100 and 7.125 MHz. 7.200 to 7.300 MHz is not available outside ITU Region 2. See Section 97.301(e). These exemptions do not apply to stations in the continental US.

### 30 Meters (10.1 MHz)

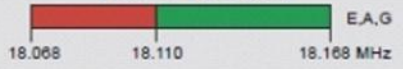
Avoid interference to fixed services outside the US.




### 20 Meters (14 MHz)



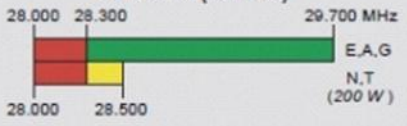

### 17 Meters (18 MHz)



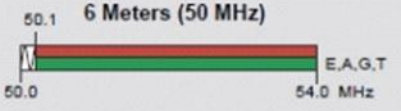

### 15 Meters (21 MHz)


### 12 Meters (24 MHz)


### 10 Meters (28 MHz)

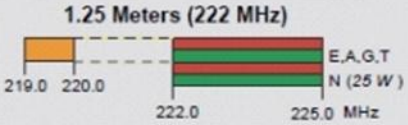



### 6 Meters (50 MHz)



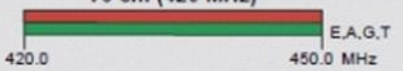

### 2 Meters (144 MHz)


### 1.25 Meters (222 MHz)



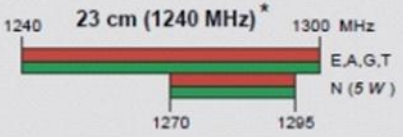

*Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.

### 70 cm (420 MHz)*




### 33 cm (902 MHz)*


### 23 cm (1240 MHz)*




All licensees except Novices are authorized all modes on the following frequencies:

| | | |
|---|---|---|
| 2300-2310 MHz | 10.0-10.5 GHz * | 122.25-123.0 GHz |
| 2390-2450 MHz | 24.0-24.25 GHz | 134-141 GHz |
| 3300-3500 MHz | 47.0-47.2 GHz | 241-250 GHz |
| 5650-5925 MHz | 76.0-81.0 GHz | All above 275 GHz |

* No pulse emissions

### KEY

**Note:**
CW operation is permitted throughout all amateur bands.

MCW is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz.

Test transmissions are authorized above 51 MHz, except for 219-220 MHz

- = RTTY and data
- = phone and image
- = CW *only*
- = SSB phone
- = USB phone, CW, RTTY, and data
- = Fixed digital message forwarding systems *only*

E = Amateur Extra
A = Advanced
G = General
T = Technician
N = Novice

See *ARRLWeb* at www.arrl.org for detailed band plans.

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# EMP

## Protecting Your Equipment

Ok now that you have all this great equipment, we need to keep it protected and ready to use when needed,.

In my career, I've worked with radio transmitters on mountain tops where there is a lot of lightning and other kinds of severe electromagnetic transient. Grounding and protection are very important. I am going to concentrate on an EMP attack, but most of it also applies to natural events such as an intense geomagnetic storm.

Let's start with solar storms. Solar storms would primarily effect the power grid and are not likely to harm things like computers. A solar storm would only disrupt communications temporarily and not likely harm communications equipment. But unlike a nuclear EMP, a solar storm is inevitable!

People ask all the time about a "faraday cage." A solar storm only produces the E3 component of a nuclear EMP. Faraday cages are not that important at ground level.

If it is an EMP, and you have any radio equipment, it will no longer operate unless it is adequately shielded. To be shielded correctly, it needs to be kept inside a complete metallic shielded enclosure. This is commonly known as a faraday cage - preferably in a **nested faraday cage.**

A faraday cage is a total enclosure made of a good electrical conductor like copper or aluminum. Steel is ok but it's very hard to work with.

Small portable electronics, covered with a heavy aluminum foil make a good faraday cage around equipment. Put your equipment in a heavy plastic bag, then wrap the foil around that. Make sure there are no gaps in the foil. For extra safety, you can add another plastic bag and again another layer of foil. This is a truly nested faraday cage.

Something else that can make a good faraday cage is a locking-lid metal trash can,. This can be a very effective electromagnetic shield. You will need to put a liner inside the can (such as cardboard it makes a great liner.)

On a galvanized trash can, the connection between the body of the can and the lid is critical. So only use a new trash can for this purpose. Keep the lid very firmly closed. A good connection with the lid is a must. Don't try to clean up and re-use any used trash can for this. Get a new can and make sure the edges of the can are clean without any dents or miss-shaped areas. If you have the boxes for the equipment, I just wrap the box with foil and place it in my trash can and I am done.

# Car & Truck Radio Installations

## Types, Pros & Cons

So up to now, I have been talking about handheld radios and home made antennas. These work very well and are cheap to build. Anyone can get in do this and make it work.

Now I would like to get into larger radios used for mobile and base installations. Unfortunately, these are a bit more expensive. It also helps to know a little about installing them in your car or truck. Again, it's not rocket science. I will do my best to give you all of the information you need to complete a nice, basic mobile install. I will also show you what other people have done to give you some ideas on how you can do with your equipment that you may not have thought of.

First, let's talk about the mobile radios out there. This will give you a good idea of what you may want for your install. (Keep in mind you don't have to have a radio in every car or truck or ATV.) I will be talking about how you can set them up to move form car to car as you need. You may even find out that you don't even need a mobile radio. That you may get by with just a hand held in your truck but I am going to give you the information anyway.

**The picture above is a bunch of nice radios. Starting top left is a VHF/UHF mobile, top center is a Yaesu 857. This radio can cover VHF/UHF/ HF all in one radio. (Yes, they can do that, but it makes the radio expensive.) Unfortunately, the radios that have it all in one can go down easy. If one parts breaks ,the whole radio is down. Another con is that you can only use one part of the radio at a time. Such as HF or VHF or UHF. You can't tie them together like a cross band repeater. It won't do that.**

This is a radio by the same company that makes the handheld that does the cross-band repeat TYT TH-7800. It is both VHF and UHF. It too has cross-band repeat and it makes a very nice mobile radio. It is rated at 50 watts out on VHF and 35 watts on UHF. I will tell you, I have never seen a radio that has the output power that they have on the advertisement. That's ok, it will have plenty of power to do the job.

You can mount this radio in two ways, you can keep it in one peace and put it under your dash or overhead in a truck. If needed, just set it on a desk with a power supply or a battery and make a base station out of it. It will operate on 12 volts ,so any car type battery will run it just fine. If power consumption is a problem, you can turn down the power to as low as 5 watts (which will do more than you think if you have it plugged in to a good antenna.)

If you need it, you can remove the face plate or the head of the radio and place the body under a seat or somewhere. It's out of the way, and you mount the head up on your dash or somewhere you can see it easily.

If you don't want to mount it permanently, you can put a cigarette lighter plug on the power leads and just plug it in to whatever car or truck you're in at the time. Then take it in the house and use it there.

This is just one of the possible radios out there. Most of the mobile radios on the market will have most, if not all, of the same features. I like this one for two reasons. One, it's not too expensive. You can find it for less than $200.00 If you do some shopping. Two, it has all the features of a much more expensive radio and it works very well. **(I have one of these myself and tested it.)**

**If you want to keep this radio set up to be portable, you can use is a Magnetic mount for your antenna. This enables you to move it form car to truck or Tank if you have one. The magnetic mount antenna system is not as good as a permanent mount antenna, but it works well. I and many other Ham use them every day for that portable system. This is for when we need a quick and easy antenna system for something we are doing.**

**I have even used a magnetic mount in the house to test radios. Just stick it to something metal, like a refrigerator, or a cookie sheet.**

**The downside of most of these radios is they are a bit hard to program. Like the handheld. Take your time and read the book. Don't be afraid to push buttons. You can't hurt it. Just do a reset and start over if you screw up.**


If you're looking for a nice little radio that is duel band, but not expensive, here is one for you. There are a bunch of these on the market. Again, if you shop around, you can find this for under $100.00.

This type of radio has an output of about 25 watts on high power and about 20 or less on low power. Again, don't believe everything you read on the box.

It is a bit hard to program, but it has fewer features. So it's a little easier to understand. It does not have cross-band repeat, but you can put in a small space. Like the center console of your truck. You can mount it almost anywhere. I put one of these in the open space in the console of my Toyota Camry and it fits well. The wife did not throw a fit because there isn't this big radio staring her in the face.

Again, you can put a cigarette plug on it and take It out of the car as you need. Or use it as a base in the house.

One other thing I like about this radio is it is cheap. Again less than $100.00. If you shop around, you can find it for less than $70.00. So if it gets lost or stops working, you're not out a half a month's pay!

If you're worried about the lower power of this radio, I have tested it. With a good rooftop antenna on my car, I can get about 20 miles **(depending on the terrain). So it will work good for you as well (I believe.)**

Here is another great radio from Yaesu. Unfortunately, its only VHF. However it does put out a lot of power (around 75 watts.) If you're looking for a good base, or you just need the extra power, here you go. A radio like this runs about $180.00 or so and is a bit easier to program than some.

Because this radio puts out a high amount of power, you need to make sure you have a good power source and better wiring as well. It can draw up to 15 amps. Most cigarette plugs won't handle this. You need to wire it directly to your battery on a truck or car. Make sure you check your antenna that it too will handle the higher power. Most base antenna will handle this, but mobile antenna may not. So do your homework.

I am not trying to tell you to buy any of these radios, I just want you to understand about some of the information you would need to know when you are shopping for equipment. As you're looking for the right radio for your needs, keep in mind some of the features that they have along with power output and the like.

I do a lot of work with solar systems at my job and for myself. Power consumption is a big factor. Keep that in mind if you are thinking about a solar system as well, solar is the only thing that people may have if there is a large EMP (if they have protected their system and equipment.)

I talked about faraday cages already. You can protect these radios in the same manner. Just make sure that you don't have an antenna connected to your radio if an EMP hits. I don't care how good your cage is, if you have an antenna on your equipment - it's **Dead!**

**I hope I don't need to tell you that you may need back up equipment placed in storage that is protected by a cage if you plane to have it after an EMP. This includes a solar system as well. Even solar panels and charge controllers can't survive an EMP (just so you know.)**

# Mounting Antennas

## Some Antennas and How They're Mounted

Here are some great pictures of other hams and how they set up their cars and trucks. I hope you can get some ideas form this. Understand that there is more than one way to skin a cat.

Here is a good one, dose your truck look like this one? If not, that's ok we can't all be this hard core.

This is a set up for a VHF/UHF contest and yes, we have contests with ham radio. **(it's fun) and fast paced - working as many hams as you can in a 24-hour period (great practice.)**

This is a bit lower key, even if you don't think so. This Ham has used his hitch to mount the HF Ham antenna. This way, he can remove it when not in use. The overhead luggage rack can also serve as a good VHF/UHF antenna mount location for this very nice Jeep without drilling a hole in the roof. **(As we get to HF radios and antennas I will cover this much more.)**

**I want one of these!!!! Here is an army HUMMER set up for HF, other equipment and frequencies they need to communicate. The HF antenna is the fat one on the right.**

# Mounting Antennas

Continued...

**Now this is even a bit too hard core for me! But I am glad to see someone can figure out how to use all this and what is what???**
Don't worry you do not need to get this carried away. I just thought you would enjoy seeing some of the wild and neat things some Hams do and if it gives you an idea **Great!**
I know what you're thinking, what is all that stuff? And I understand. I am looking at it to try and pick out stuff and its hard. There is an HF rig in there, an antenna tuner, some VHF and UHF equipment, and who knows what else, I like all the notes stuck to the roof with tape! Cool.

**(Don't have a meltdown just yet you don't need all that gear anyway)**

This is something much easier to do and will work with any hand held. If you look close, you can see this Ham is using the power from his or her cigarette lighter. A remote mic as well as an antenna on the roof. This works great and is easy to do. If you're done driving, you can also grab your radio, put the rubber antenna on and carry it with you.

Here we see just a nice holder for this Ham's handheld to keep it from flying around the car as you are driving **(Great Idea!)**

Tackleberry Solutions

# Mounting Antennas

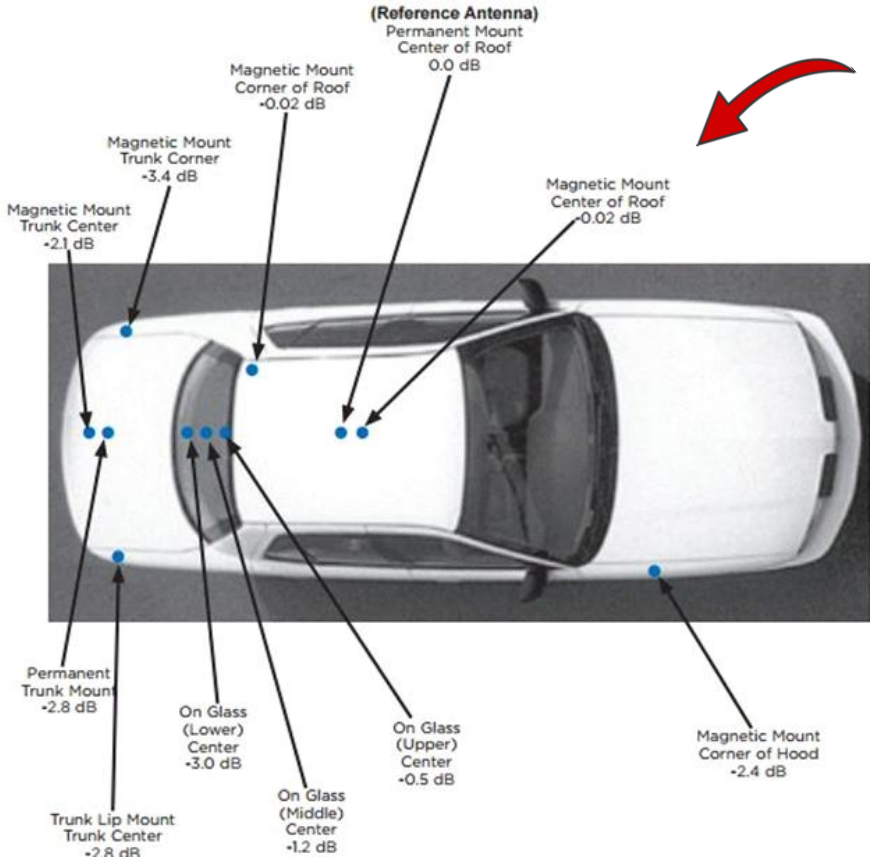
## Mobile Antennae Placement

This type of installation is ok. It's called a trunk mount and does not require you to drill a hole in your car. So it can be done in just an hour or so. It works well. I have this same mount on my car so I did not have to drill. I have had very good luck with it.

I recommend using a good quality antenna like the one you see on this car. It is a duel band antenna and can be found for about $75.00 to $80.00 in any ham store or on Amazon. The only thing you need to be aware of is if you are going to use the FRS or GMRS frequencies, you need to do a little home work to make sure that the antenna you are looking at will work on those frequencies.

**Remember Me!**

**I'm watching you!**




OK now it time to get a bit technical **(SORRY) I want you to know a few things about mobile installations. This is a great chart to understand where you mount your antenna. It makes a difference!**

**First look where you want to put your antenna. Then look to see what the signal loss would be. For example: the trunk mount is as high as -2.8 db. This means you are losing 2.8 db over putting your antenna on the roof which is 0.0 loss in other words NO loss. Now I know you need to put it where you need to put it this is just a reference.**
(If you have a Jeep or other vehicle that is mostly fiberglass you will have to get creative.)

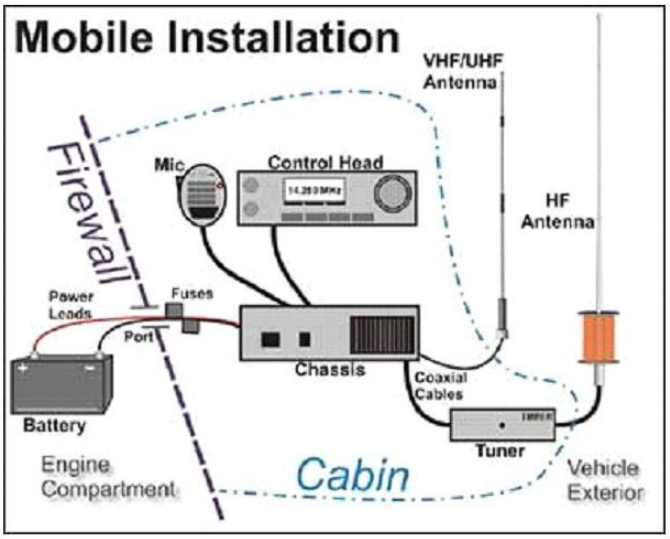
# Mounting Antennas

## Mobile Installation

This is a basic diagram of a mobile installation. Here, the radio has a remote head. Because of this, the body of the radio can be placed in another place like under the seat. It has HF as well as VHF/UHF.

This also shows you how to hook it up. If you're wounding what that thing called a tuner is? Well it's there to help you tune your HF antenna to more frequency and bands. We'll talk about tuners latter as we get into HF, both base and mobile.

**(No this is not my truck but Wow if you need to talk to everyone this is how you do it.)**




**Ok, let's blow you mind a bit more with some other ideas people have done to get on the air.**

**Is this cool or what! This Ham likes to bike and wants to take his ham radio with him.**
So what is all of this. Well, if you look on the back rack, you will see a duel band VHF/UHF antenna. To the right of that, there is a Ham Stick (that is what that antenna is called.) It operates on HF. The insert picture shows his radio placed on the handle bars with his mic and a GPS as well. I am guessing, but the bag on the back is most likely the battery. And on top of the bag could a small solar panel.

This Ham is thinking out of the box. So can you. Use your imagination! I have mounted my radio on my motorcycle. There is no end to what you can do if you try.

# Mounting Antennas

## More Inspiration

Here is another Idea. If you think you need to bug out or just like to camp on your bike. Again, thinking out of the box. This system has VHF and HF. So wherever they go and camp, they can use their ham radio. That can be fun. The long antenna is a ladder line J pole antenna. Just like the one I gave you plains for. They really work quite well.

Remote head radio and antenna on bars!!! And look close just below the head. You can see a Morris Code key with the red paddles! Wow that is hard core! I am a big fan of Morris Code **(or CW) and I did try it from my truck. Let me tell you, it's harder than you think. But what the heck, I like trying new things. How about you?**

Here is another way to use your ham radio. This can be done on VHF/UHF or HF. This ham is up on a high mountain with his HF radio to seeing how far he can talk. So if you like to hike, you don't have to leave your radio behind. Just use your imagination and do a little studying on how to make this system work. You never know where you can talk and who you might talk to!

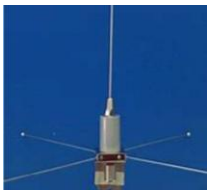
I have done something close to this myself with some ham friends. We go to the highest mountain we can and set up a station. There we work as many other hams as we can. It's a blast to set something up and have it work. **Give it a try!**

# Mounting Antennas

## More Inspiration & The Ground Plain

Here we have someone who may not be able to put an antenna on his roof and still wants to use Ham radio. So you get enterprising and put a mag mount on a metal plate. Then hang it out the window. I can say one thing about this picture, is that the plate is a bit too small for VHF but ok for UHF. You need to put a plate of at least 19" or larger to get it to work best. Again, you do what you can with where you are, and what you have!

This type of antenna needs no tuning at all. Just give it the ground that it needs and you're off and running. Most of the ham antenna are like this one as well, so don't sweat the tuning thing so much. Just do your homework and get an antenna that is made to work on the frequencies you want to use and you're fine.



**So I guess I had better explain what a ground plain is so here we go.** That mobile antenna that you're holding in your hand is only half of the antenna system you need. One half is on a car and the other half is the car or truck itself. That is why I talk about the cookie sheet that is acting as the ground plain. You need something to make up the other half of the antenna. That is why where you place the antenna on the car or truck can make a difference in how it works. The more metal you have under it, the better. As I have talked about early in this book, you tune the antenna to the car, not the radio. So you're tuning the antenna to the ground plain! If you must tune at all, most antenna doesn't need tuning.

**(My wife hates when I use her cookie sheets for antenna and radio testing.)**

I bet you didn't know that bugs and Elmer Fud where Hams **(Surprise!)** **Get your ham ticket and you never know, you may find one or the other of them on the bands some day!**

Picture reference: By Source, Fair use, https://en.wikipedia.org/w/index.php?curid=51646597
By Source, Fair use, https://en.wikipedia.org/w/index.php?curid=52393027

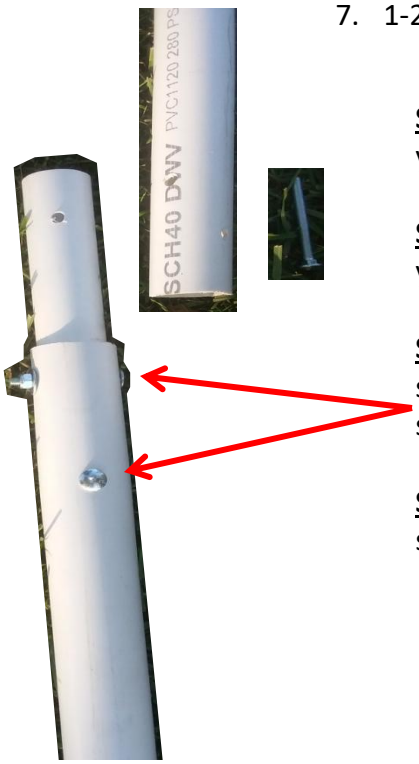
# The Pack -N-Play

## Portable Antenna Tower

The Pack-N-Play tower will give you a better range and is quick and easy to set up. Consisting of 21 feet of 2" schedule 40 PVC piping, this tower can be erected when there is no tree to hang your "Slim Jim" or ladder line J-pole antenna from. The following is a step by step of how to build this. ***Side Note***: This section of this book and pictures where created by Arthur from Tackleberry Solutions. Thus the differences in the instruction.

Materials Needed:

1. 21'- 2" sch 40 PVC
2. 3'-1.5" sch 40 PVC
3. 6-3" x 5/16" carriage bolts w/ nuts and washers
4. 3- 1/4" or 5/16" x 2.5" equipment pins
5. 300' of ¼" rope or 550 cord
6. 1-2" T-Coupling
7. 1-2" Elbow




**Step 1**: Take the 2" pipe and cut it every 5 feet. This should leave you with 4- 5 feet long 2" pipes.

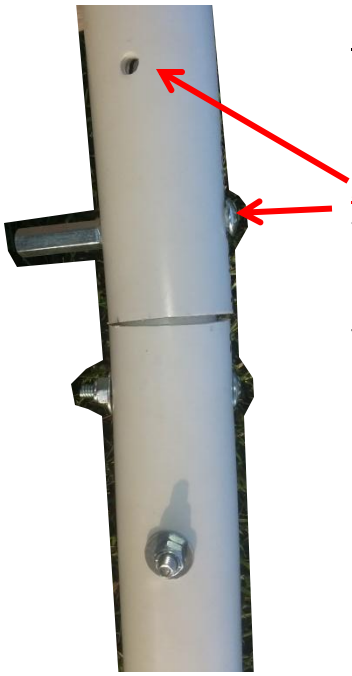
**Step 2**: Take the 1.5" pipe and cut it into 1 foot lengths. Thus giving you 3- 1' long 1.5" pieces of pipe.

**Step 3**: Place the 1.5" about half way into the 2" pipe and drill two sets of holes. Make sure they don't line up. (Make sure that the hole sets are as shown in the picture.)

**Step 4**: Using the carriage bolts secure the two pipes together as shown in the picture.

# The Pack -N-Play

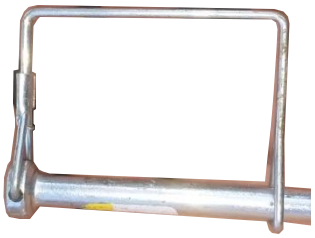
## Portable Antenna Tower

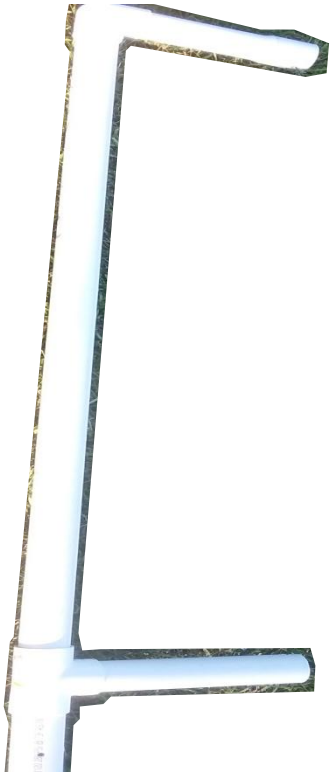


**Step 5**: Slide on the next 5' section of the pipe and drill another set of holes. Secure the pipes together with an equipment pin or another carriage bolt and nut as seen in the picture.

***Note***: While it takes longer to assemble, two more carriage bolts on the new section will hold better in high winds. Thus is why you can see I drilled two sets of holes on both ends of this joint.

This is an equipment pin. You can pick them up at any tractor supply or farm equipment store.



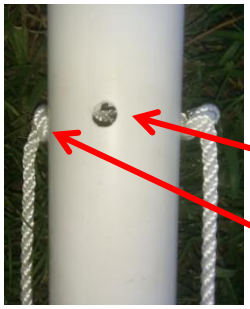


**Step 6**: After linking 3 of the sections of this tower together, you need to focus on the top portion of the tower. Connect the 2" elbow to the top of the last 5' section. Cut off 1' of the 5' section now making it only 4' long with an elbow at the top. Using the T-Coupling, connect the 1' of 2" pipe you just cut off and the 4' of pipe back together creating a section of pipe a little longer than 5' long. With a T- 1' from the bottom and an elbow at the top. Drill holes so as to connect it to the rest of the tower.

**Step 7**: Using the 1' of remaining 2" pipe, cut it into 6" long pieces. Then connect it to the T -coupling and the elbow, as seen in the picture. Finally connect the top section of the tower to the rest of it.

# The Pack -N-Play

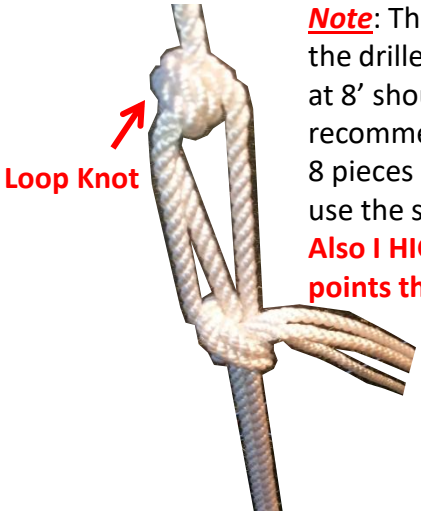
## Portable Antenna Tower



**Step 8**: While your tower is still on the ground and connected, drill hole for rope or cordage to pass through. Drill at 16' from bottom and 8' from bottom.

***Note***: Make sure that the hole sets are 90 degrees from the other hole set.

**Step 9**: Run your cordage threw the pipe and tie knots to prevent them from sliding. (Again see picture.)




***Note***: The rope at 16' holes should be 30' long (per side and measured from the drilled holes) with a loop knot placed at 12.5' from drilled holes. Ropes at 8' should be 25' long with loops placed at 10' from drilled holes. I recommend you use 4 sets of rope at each connection point for the total of 8 pieces of rope. This will better secure the tower in high winds. You can use the same staking points to connect ropes from the 16' and 8' points. **Also I HIGHLY recommend that you use different colored ropes for the 8' points than from the 16' points. This will help avoid confusion later.**

**Step 10**: Drill a hole in the 6" pipes (attached at the top of your tower) and using 550 cordage or string attach your twin lead J-pole antenna. Attach your coax and secure it to the tower with electrical tape or zip ties.

# The Pack -N-Play

## Portable Antenna Tower

**Step 11:** Dig a hole where you wish the antenna to be placed.

***Note:*** With the rope tied down and everything in place you will need an area with approximately 30' in diameter to erect this tower.

**Step 12:** Stand the tower up and place it in the hole. While one person is holding the tower in place, others will need to gab the ropes and start pulling out the slack and driving in steaks to hold the lines in place. As you can see below, I used a screw driver as a steak for this tower.

**Step 13**: The final step. After you get the tower up and secured in place, get a good radio check and make sure your antenna is functioning. The hardest part now is keeping people from tripping on the ropes. I have found that if you will mark the steak point with a chem light, this helps people become aware of the antenna tower and they can avoid it.

***Note:*** If you have spent any time in the military this should look familiar to you. This is a home made VHF version of an O.E.-254

Now back to the commo wizard.

# In Conclusion

## Aliens are Real

Well you made it to the end and you're still alive! That's great! I hope you put this information to good use and do what most people won't do. Communicate and be one of the good guys and not part of the problem!

I hope I have helped you get started in radio for SHTF and any other emergency. With floods and wildfires, earth quakes and who know what, communication is one of the most important things you can do for yourself and your family. I also hope you will get into the hobby of Ham radio. It's worth the time it takes to study and learn how this all works as well as all the other things you are able to do. Like making new friends in your area and all over the world and in all aspects of the hobby. If you like computers, that's cool and there are all sorts of interface possibility's with ham radio. If you're into space, there are ham satellites in orbit right now you can talk to. And don't forget the international space station. There is a ham radio on the station that the astronauts use all the time to chat with schools and groups. You can talk to them with a hand held. That's all it takes.

I have tried not to get too complicated. I wrote this because I have seen other publications like this for the beginner and they're very dry. I see that they're very complicated and hard to stick with for the non-ham. So I hope I didn't give you a brain bleed and I did give you the information you need to do some of these things on your own. I also hope you see that it's not that hard to set up a radio system you can use during an emergency and just for fun as well.

You may be wondering why I didn't talk more about HF radios and antennas. I did not want to make you crazy with all the added info and equipment. They are quite different form VHF / UHF. The antenna are very large and the equipment is much more expensive. So I am saving all that for the next book that I will be working soon. If I have not made you crazy, hang in there, I will have another book to blow your mind soon.

I put this together in conjunction with (Tackleberry Solutions) Arthur, the owner and I worked together on how this book should go. Again, I wanted to keep it as simple as I could and still give you the information you need. I also wanted to tell you things others may not have on how all this works without you wanting to jump off a bridge trying to understand this stuff.

I know it's not as easy as I make it sound to someone that doesn't work with it everyday. But if you get stumped and you're lost so bad your GPS can't even find you, contact Arthur at Tackleberry Solutions. If he can't help find you, he can send you to me and I am sure we can get you back on track. So hang in there, and you will be fine. Yes you may have to spend some money, but I gave you the best for the least that I know of. So I hope this helps you!

Last but not least, I know you may show this to that ham down the street and he will tell you that there is so much more that I did not tell you. But that's the idea. If I told you everything, you would sue me for giving you a brain bleed. I wont to do that, so if you want more, just go on ine and get one of the many books written by people much smarter than me out there and go for it.

Thanks for reading this and best 73's (best wishes) to you.

# QRF Communications
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**Thank You!**