

Stealth Antennas for Amateur Radio

By: *Charles W Bushell, KC8VWM*

This list of Ultra Stealth antenna has been created here in hopes of assisting the radio amateur community who may be otherwise restricted or limited in terms of antenna installation possibilities so they can remain active while serving to address any required need for those individuals who may be seeking just such a solution.

Station antenna limitations or restrictions are no reason for becoming discouraged or not becoming active in ham radio. It's still possible to enjoy the hobby without the need of installing underperforming or inadequate antennas. Nor is there any need to install big towers with multiple Yagi arrays on them in order to achieve worthwhile results.

For many years now, hams have tried to hide or disguise antennas for a multitude of reasons and you might be surprised to find out that some of these reasons are not necessarily limited in scope to antenna restricted communities.

Other reasons for installing stealth antennas are for landscape – aesthetics reasons, for purposes intended to avoid detection by inquisitive neighbors or city ordinance officials who like to question and personally investigate everything out of the ordinary or unusual and for many other similar reasons.

In the past, flagpole antenna designs have been popular and viewed by hams as one possible solution to the problem, but recently there have been restrictions involving the installation and display of flags in some restricted communities. Similarly, some hams have attempted to install very thin gauge wire in hopes it won't be seen. However, this approach has limited success as such antennas are not particularly effective because these designs are not mechanically strong enough and break very easily when subjected under stress.

Additionally, such thin wire antennas often remain detectable despite their best efforts to "hide" them from view because they are often revealed and easily detected by sunlight reflections. Some hams have attempted to paint such wires using non reflective colors but these often remain visible to people who are curious with an eye for detecting even the slightest details.



KC8VWM
(Credit Line: www.qrz.com)



Real Flag Pole Antenna made by KX9DK

Credit Line for the Figure:
<http://www.hamuniverse.com/kx9dk4btvflagpole.html>

Similarly, hams have loaded up aluminum rain gutters to use as antennas. While these can work in some last resort situations, they are not particularly effective either because the joints between the guttering can cause intermittent connection issues often resulting in causing TVI interference. Also, the fact these rain gutters surround the home, makes them susceptible by design to picking up local noise sources generated from inside the home which of course serves to degrade and limit reception abilities.

My proposed solutions are specifically intended to resolve these issues because we are not hiding anything at all and they are specifically designed to function as "antennas." In fact, instead of hiding them, we are just going to install these antennas in plain sight for everyone to see! The difference in these stealth antenna designs is in the fact we are using the art of camouflage and a little creativity to our distinct advantage.

Therefore to address the issue of operating a highly disguised and yet effective antenna design that are 100% camouflaged in plain sight, we need to become more creative in our approach. These top 10 stealth antenna designs I am proposing are cost effective to construct using readily available materials by both experienced and inexperienced hams alike, simple to understand in concept, creative in terms of ultimate stealth and yet achieve capable good performing antennas intended to achieve the desired objective.

Many will note these better performing stealth antenna designs can be configured for either vertical or horizontal operation or they can even serve to function as both! They also play very well in terms of multiple bands when used with an antenna tuner and some designs are exceptional performing antennas in terms of single band operation without the need of any tuner at all. Any of proposed stealth vertical antenna designs listed will realize better performance results after installing some buried ground radials around them. This can be achieved by using a good quality pizza cutter to cut a path for laying the ground radials just slightly below the ground surface. Doing this in moist soil after a good rainfall, will prove itself relatively easy to do. Installing ground radials will serve to improve your signal performance while at the same time, remaining stealth and completely out of sight.

Here are KC8VWM's top 10 Ultra Stealth antenna designs....



Figure 1

Weather Vane

Credit Line for Figure 1:

<http://sciencestockphotos.com/free/astronomy/slides>

1. Weather Instrument Antenna:

Another ground mounted vertical inside PVC pipe. The Weather Vane should be constructed out of plastic. Attach a cheap plastic thermometer and a fake homemade rain gauge to the side of the PVC for maximum effect. Alternatively if horizontal orientation is your preference, you can use "guy" wires to support the PVC "weather instrument pole." It is these so called supports that hold up the "weather instrument pole" that are used as the actual inverted V antenna. This way you will know exactly what the temperature of your antenna is at all times.

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2. Solar Powered Light Pole Antenna:

With advancements in low cost solar powered portable L.E.D. lighting technologies now available, It's easy to employ portable security lighting anywhere on your property without the need for any additional electrical work and you will have no ongoing electricity costs. Similar in concept to installing antennas in restricted communities, a solar light is ideal for situations where lighting may be restricted or challenging to install. Radio opaque poles with low cost solar powered light fixtures attached on them can be installed virtually anywhere for an added sense of security and can be specifically designed and adapted for your radio operating needs.

If a big signal on 20m is your objective, try properly spacing and co phasing two security lights.



Figure 2
Solar Energy Light Pole

Credit Line for Figure 2:
<http://www.eco-sino.com/Home/solar-energy>

3. Satellite TV Dish Antenna:

People will often throw these away so there free for the taking in many cases. These make an excellent prop for installing a ham radio antenna because people are used to the idea of homes using satellite dishes so seeing one installed in the backyard is not unusual.



Figure 3
Satellite Dish Pole

Credit Line for Figure 3:
<http://www.prc68.com/l/FTA.shtml>

To start the antenna installation, place a 10 foot steel pole in the ground with a satellite dish mounted on top at the furthest point of the property in the backyard such as along the fence line. Run a “feed line” from any corner of the house extending over the back yard running to this satellite dish. The “feed line” is actually not a feedline at all. Rather it’s an End Fed Zep” wire antenna which is now supported by a TV satellite dish pole. Good DX!

If any neighbor asks why the “satellite dish feed line” is extended over the backyard to the dish mounted on the pole, simply explain that running it along the ground means it would get all tangled up in the lawnmower. All you need to do at this point is simply observe the dumbfounded look on their face as such an explanation makes perfect sense. That is, if they should even bother to ask at all. This design should work well for many hours of SSTV viewing enjoyment or the operation of any other mode for that matter.

4. Disguised Portable AM/FM Radio Dipole:

The fake and non functional “patio radio” should be purchased at a yard sale for 2 bucks and is hopefully not working at all. The design chosen should have detachable speakers which will actually function as the dipole antenna when the speakers are stretched out from the radio and “mounted” in a location such as below an awning or on the railing of an outdoor patio deck at a condo community, or even outside on the apartment balcony etc.

The extending detachable speakers and are just empty plastic shells with no speakers actually installed inside them. The “power cord” leading to the radio prop is removed and replaced with coaxial feed line. Now the coaxial cable feed line serves to resemble an ordinary power cord. This power cord is used to connect your rig to the dipole antenna.

The so called speaker wires are attached to the coaxial feed line on the inside of the radio. Feel free to become creative and gut the inside of the radio and install a remote antenna tuner or matching network inside the radio instead. Some of the knobs on the outside of this radio could be redesigned to function with variable capacitors installed inside and serve to function as an antenna tuner. Just remember that the controls labeled on the AM/FM radio as “tone” now means “tune” instead.

Mount the speakers, and “plug in” the stereo “power cord” with the PL259 connector attached to the end into the back of your rig. You are now on the air in full dipole stereo but this portable AM/FM radio will never bother any of your neighbors with any loud music.

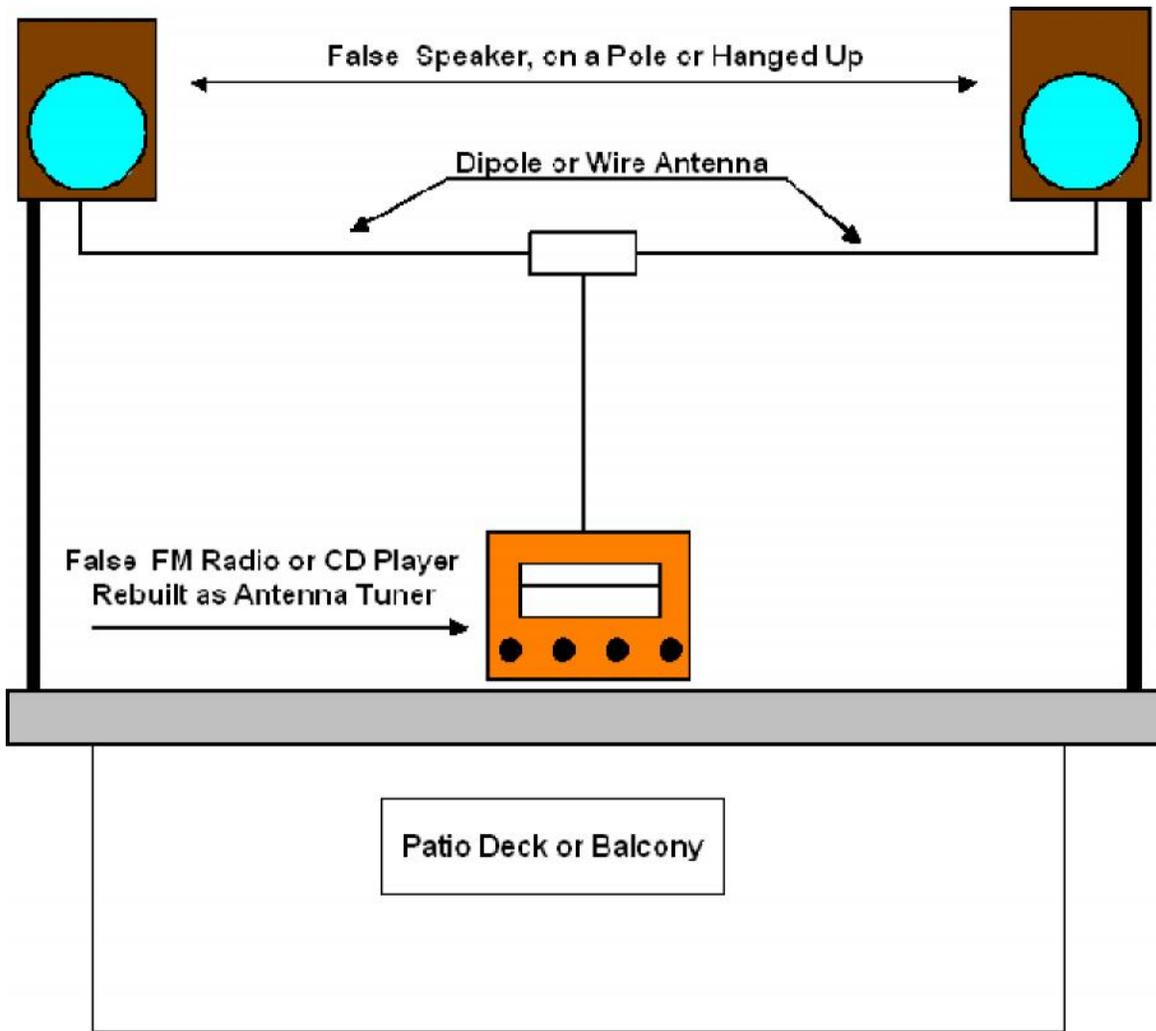


Figure 4

Disguised Portable AM/FM Radio Dipole

5. Purple Martin Birdhouse Antenna:

Not so uncommon is the ground mounted vertical wire antenna design installed inside PVC pipe. In this case, the PVC pipe holds up the birdhouse. If installing two antenna's are better than one, you may choose to install a separate horizontal antenna using "guy" wires to support the PVC pole. It is these so called supports that hold up the birdhouse pole that we will use as an actual inverted V antenna system. If you should ever be questioned about its existence, be sure to babble on about how much you love bird watching. I would suggest you break out a bird species identification book and start flipping through pages while showing them pictures of birds. I would even start emulating a few bird call sounds during the conversation just for fun. For example, making dove bird call sounds into your closed hands will be particularly humorous. Observe how quickly they will go away and never bring up the "birdhouse" subject ever again.

6. Fishing Rod Prop antenna:

This is just a simple 20 foot crappie pole propped up against the house, patio, fence, deck or on a balcony etc.



**Figure 5
Bird house**

**Credit Line for Figure 5:
<http://www.anderson.cc/masts.html>**



**Figure 6
Fishing Poles**

**Credit Line for Figure 6:
<http://bluegillfishing.us>**

To disguise your antenna, you simply surround the bottom of the crappie pole with an old fishing tackle box, portable cooler and fishing net to provide your new stealth antenna with maximized visual effect. Of course, only you will know the black "fishing line" on the pole "is" actually the wire used for this vertical antenna design. Multiband operation can be achieved simply by installing a remote antenna tuner or matching network hidden inside the cooler which is placed beside the antenna.

Feel free to install a real nice fishing lure and hook on the end of your antenna too as I suspect this design will catch the really big fish in the DX pileups.

7. The Tire Swing Vertical



Figure 7
Tire Swing

Credit Line for Figure 7:

<https://jenkstherapy.com/treehouse-and-farm-photos/>

This is simply a regular rope and tire hanging down from a high location in the tree.

Go ahead and attach the rope to a small tire so it just looks and functions like an ordinary tire swing. Try to locate the tire close to the ground as your feedline will need to enter through a hole drilled into the bottom of the tire and connect to your vertical antenna wire.

The vertical antenna wire should be the same color as the rope if possible (black rope and wire is a good choice). The antenna should be somewhat woven into the rope strands before installation. A matching network or remote antenna tuner can be built right into the tire itself if desired. Don't forget to bury some radials below the ground around the tire swing vertical and use bury flex feed line running to the house. This design is particularly effective if you have a 30' tree and are seeking to install a long vertical monopole antenna for operating in the 40m and 80m frequency range but it also works well in others.

Now stand back, take a good look at the tire swing hanging from the tree in the backyard and please tell me where the "antenna" is located exactly?

8. The Badminton Net Antenna.

The dipole is weaved into the netting. The feed line connects to the center of the dipole antenna which is built directly into the net. Feedline goes directly into the ground below. (The feed line can run on the inside one of the metal rod supports to hide it.) Alternatively, an inverted V antenna is used as supports for the poles.

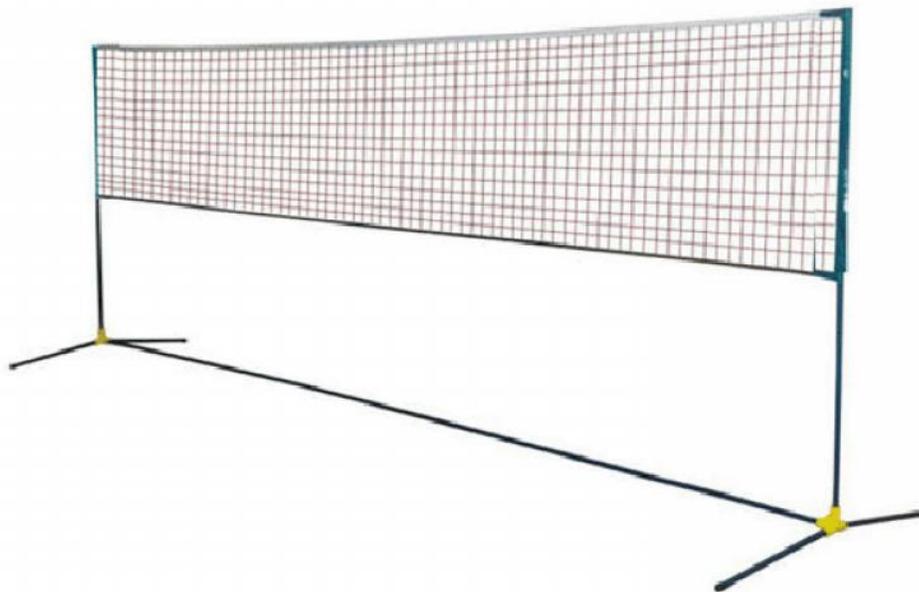


Figure 8 Badminton Net

Credit Line for Figure 8: <http://www.allwhitebackground.com/badminton-net.htm>

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Besides the idea you are now always going to operating "net control", this badminton net is actually fully functional as an antenna too. So be sure to invite some people over from the HOA to help improve your score. They will never know it's an antenna.

9. The Bicycle Prop Antenna.

This is a good antenna situation especially for apartment dwellers with balconies or condo dwellers with small outdoor patios. However, it also works well in other situations too such as urban family dwellings in HOA's. You can attach your favorite screwdriver antenna (or even a 20 foot telescopic crappie pole) to a bicycle but be sure it has a nice orange flag on top.

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Since this antenna is actually mounted on the bicycle itself, it's not really considered to be an antenna installed on the house by the HOA, so no one will actually care about it being installed on your bicycle.

The bicycle should be placed (permanently stored?) in a desirable location like up against a wooden fence, (a metal fence makes a nice ground plane) beside a tree or even resting up against a patio deck, patio furniture etc.... Geez, those darn kids are always parking their bikes just about anywhere huh?

Chain it up wherever you decide to leave this bicycle in permanent storage and run some bury flex feed line underground. Attach buried radials around the base of the bicycle if you like and take your bicycle antenna for a spin around the bands.



Figure 9
Bicycle with Flag Pole

Credit Line for Figure 9: <http://bicyclepatents.com/arizona-whip-lighted-flagpole/8/>

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10.Patio Umbrella Loop

Seems patio furniture is not uncommon to use at condos with backyard patios, apartment dwellers with balconies or even the HOA homeowners with attached decks. Therefore while a protruding vertical may not always prove to be a viable option, we may consider using a horizontal loop carefully woven into the covering material on the outside overhanging edge of the patio umbrella.

First we need to consider most of the patio umbrellas that are commonly sold and included with patio furniture in "sets" will not do as they are not very large enough in terms of outside diameter to accommodate an antenna loop. However, some patio umbrellas can be separately acquired and these are quite large when fully deployed. These one's are typically found available at home supply stores for around \$100 or so. These will come with a very sturdy pole and are sometimes attached to large "Y" shaped steel tubes which sit directly on the ground below which offer the umbrella its own independent support. This means the umbrella can be moved around the yard in a portable manner which has some advantages in some instances in terms of operating the antenna loop away and in lesser proximity from the operating dwelling.

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Some of these umbrellas can be permanently mounted directly to a wooden deck structure at the base using bolts. The deck mounted pole option would serve to place the antenna loop higher off the ground. Others may utilize other mounting or support methods. These umbrellas will usually have a cranking winch arrangement which serves to deploy the horizontal loop and with some umbrellas it's even possible to tilt the loop antenna at different angles using the umbrella's tilt function.

In conclusion, I would like to encourage you to share, circulate or publish this list with others and add your own ideas or suggestions to this list if you like. "How to" or actual photos of your own stealth antenna construction installation are a big plus and they serve to help others conceptualize your ideas, tips and suggestions.

73! Charles, KC8VWM

Charles would be happy answered to questions about antenna design provided at the article: [kc8vwm at yahoo dot com](http://www.kc8vwm.com)

Figures added by VA3ZNW.



Fig 10 Patio Umbrella

Credit Line for Figure 10 <http://www.ipatioumbrella.com>

Credit Line for Article: <http://forums.qrz.com/index.php?threads/10-ultra-stealth-antenna-designs-for-hoas.260566/>