



Aerials The RatTail

Kurt N. Sterba

K6ZWB wrote to Krusty Olde Kurt: "I've just read an antenna booster review in The February 2003 *CQ* magazine that just seems too good to believe."

You'll find this in Karl Thurber's (W8FX) *CQ* column. It's called the RatTail Antenna Booster and it is made up there in beautiful Victoria, British Columbia. There is a little piece of Velcro that attaches to your handheld radio. It has a drawing of a rat on it with a red "eye" that lights up when properly adjusted. Hanging from it is the "tail", an insulated wire about 20" long. You just affix the Velcro to the radio, move it around a bit until the rat's eye lights

up the brightest and it is set to go. The manufacturer says it increases your signal 9 to 12 dB.

Does it really work? Kurt thinks so although he hasn't actually had one to try. How does it work? Well, look at your little handheld. It probably has that stubby little antenna about six inches long. It functions as a quarter wave vertical. Of course a quarter-wave antenna on 2 Meters would be 20" long, so the stubby obviously has inductive loading to make it resonant.

Short antennas like this are inefficient unless they have a good ground system. What is the ground system for your handheld? Just the case and inner works of the rig. Plus your body which is capacitively coupled through the rig's outer finish. Kind of a so-so ground system. The antenna efficiency probably is not too great.

The RatTail adds a quarter wave element to the rig's ground. This gives you a half-wave vertical that doesn't need a ground to work. Thus the efficiency should be a lot better and the signal will be concentrated lower to the horizontal putting the power where you need it. The manufacturer may be a bit optimistic as

to the gain but Kurt is willing to believe that it provides a worthwhile amount.

You could get the same effect by adding the proper length of wire to your rig and then making sure it had current through it. But the RatTail has the indicator light built-in, and the handy Velcro so you easily can hook it up and take it off. Not bad for \$24.95. You can see more at www.RatTailAntenna.com.

Stealth Antennas

One way to make a "Stealth Antenna" to get around deed restrictions or just to keep your neighbors from knowing that you are a Ham operator is to make the antenna invisible by using tiny wire.


WØNQ writes along these lines: "Because I trust you to disclose the truth as you see it, I seek your help in answering the following practical question, which has often troubled me. Through calculation or experience, can you cite the range of theoretical efficiencies of half-wave antennas made with AWG 22 copper wire, for example, as compared with those made with AWG 12 copper wire, for each of the several HF bands?"


A computer program could give exact answers to the questions. Kurt doesn't have one like that. Not to worry! Nothing more than a look at the wire tables in the Handbook and a few simple calculations give answers good enough for Amateur Radio purposes.

Let's look at a 40-meter dipole. The RF resistance of #12 wire of that length (66 feet) is about 2 ohms. The loss due to that resistance is about .1 dB. If you make the dipole from #22 wire the resistance goes up to about 7.5 ohms and the loss to about .5 dB. These losses are not worth worrying about and either size wire will take full legal power.

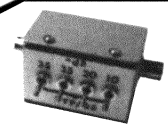
Unfortunately, neither wire is invisible. You have to go smaller. To see just what size to use Kurt is going to go by the practical experience of W6RVQ almost a half century ago (*QST* Febru-

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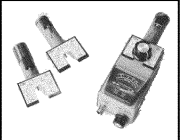




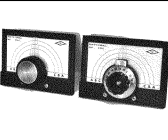
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ary 1965). He first tried #36 enameled wire. "It simply cannot be seen at distances greater than 15 feet under normal conditions, even by someone with 20/20 vision. It also breaks very easily. The elements didn't last very long."

Next he tried #28. "Perfect results. The elements stay up. It seems to be invisible at distances greater than 25 feet." Kurt's calculations show the wire RF resistance to be about 13 ohms and the loss about .7 dB. It should handle transceiver power without difficulty. If you plan to run the full gallon and a half Kurt suggests you run a power test.

It appears to Krusty Olde Kurt that you could operate on any of the HF bands with #28 wire dipoles. His calculations were for 40 Meters and they are just rough calculations. The RF resistance rises with frequency but the dipole length gets shorter. So the efficiency won't be a lot different on the other bands.

W6RVQ had some good tips: "The wire comes with either of two colors of insulation: clear so that the wire is actually a bright copper, and dark mahogany. The lighter colored wire is good for use against a sky background and the darker wire against a roof background. I've tried dipoles, inverted Vs, and phased arrays. All of those antennas were supported at the feed point, since the elements will not carry the weight of the feed line." Kurt also has seen magnet wire with green insulation. This should be good against a foliage background.

More Tips

W6ZMZ (February 1949 *QST*) used #40 wire which Kurt does not recommend. But he had some useful advice: "Handle the wire on a reel and avoid kinks. Forget masts, towers, rope and cable; think of slender sticks, small string and coarse thread. Glass headed push pins will serve for knob insulators. Light rubber bands are excellent strain insulators. Short plexiglas rod insulators are nearly invisible but rubber bands should be used also, as jerk insurance."

Of course the recommended #28 is a lot stronger than W6ZMZ's #40 but these same principles still apply.

— *Have a question for the Krusty one? Send it to Worldradio, 2120 28th St., Sacramento, CA 95818 and we'll get it to Kurt.*

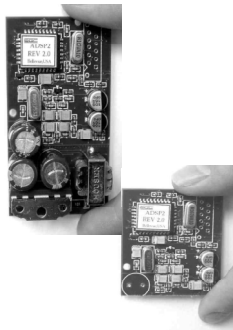
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