

You don't have to be an aeronautical engineer in order to make things fly through the air. AD4UA explains several methods for giving your antennas wings.

Antennas In, Over, and Around Treetops

BY HERBERT L. FOSTER*, AD4UA

Some people tell us that mankind came down from the treetops long ago. However that may be, today the amateur portion of mankind seems bent on going back to the trees. Trees offer a standing invitation to get an antenna up there, and schemes without number have been devised to accomplish this.

One of the most ambitious plans yet worked out featured a giant slingshot claimed to have reached the tops of 150 foot trees. It was published in an April issue of *CQ*, and presented a picture of the designer, N6HR, operating the affair with a smile on his face as big as the rising sun. One is tempted to suggest this to NASA as a possible first stage. Hi!

I've had good results using a crossbow pistol, which appears at fleamarkets and is also offered by mail. It comes in two sizes, one listed as having a 45 pound pull, and a larger one rated at 90 pounds. Both models are useful in this operation. I made a bolt, which is what crossbow people call the arrow, from 1/4 inch

aluminum rod, and a heavier one from the same size of cold rolled steel. I sawed off a piece about 8 inches long and drilled a 1/16 inch hole crosswise about 1/16 inch from one end, which became the rear end of the bolt. I used a 30 pound test nylon kite line, since this is the most limp, curl-free line I've found. Then all burrs and rough edges were filed smooth, and the device was ready for a test.

If you tie a length of kite line through the hole in the rear end of the bolt and place the bolt in the crossbow, it's only necessary to lay the line in wide loops on the ground directly in front of you. The bow-line knot is a very good way to tie the line to the bolt. It's much better than a square knot, which comes to mind first with many people. Estimate the height of the tree, and have about twice this length of line ready. Tie the far end of the line to something heavy, cock the crossbow, and let 'er rip, aiming over the top of the tree. Off she goes, into the wild blue yonder, towing your line behind.

Right here, let it be said that neither this nor any other scheme for the airborne route is going to work well in a wind of any sizeable amount.

It's really annoying to see your projectile sail straight and true right over the top of the target tree only to see the line blown far and wide off to one side. It would be better to QRX for a day that's a little more calm.

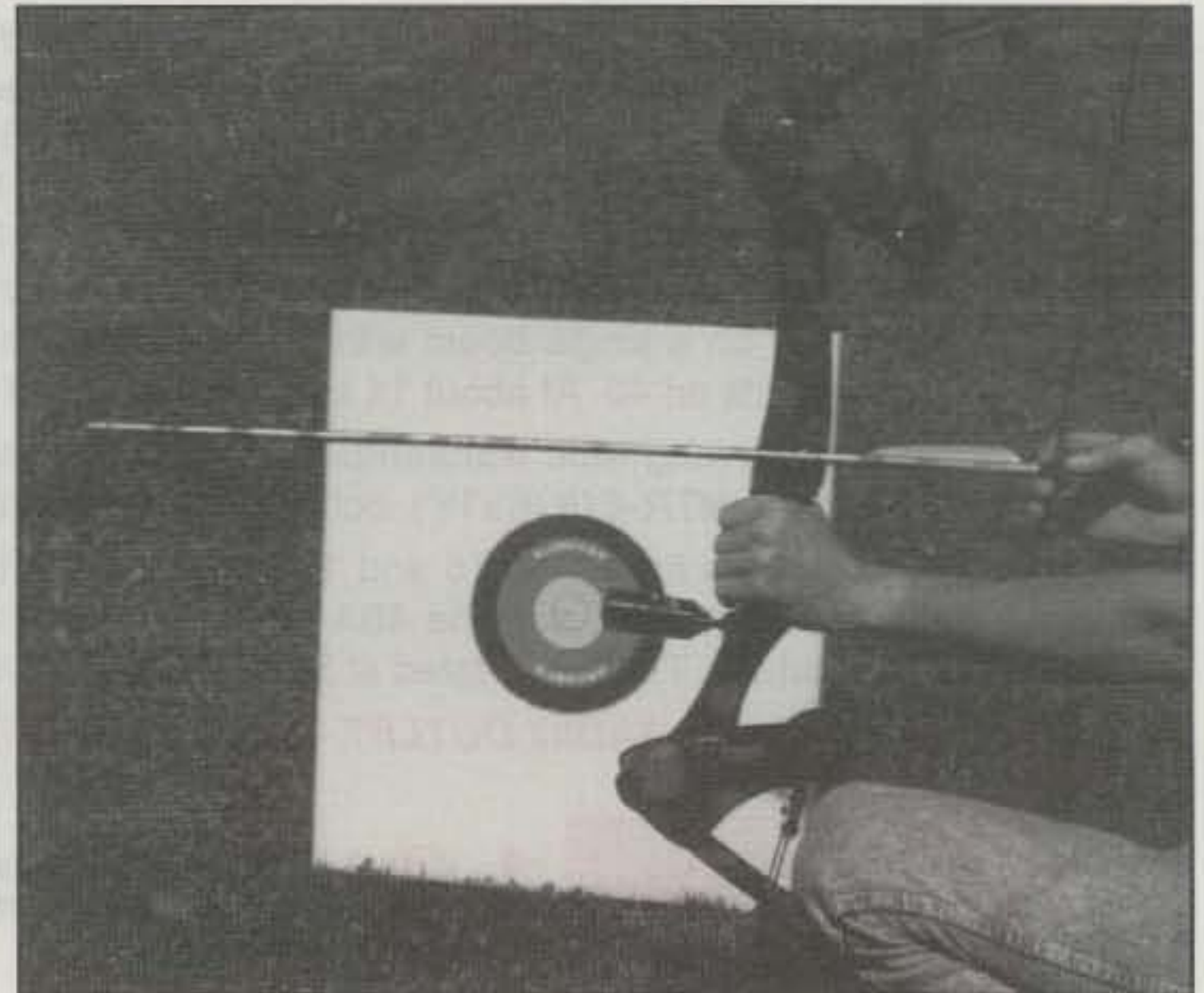
Another point to consider is how open the terrain may be on the other side of the tree in question. In most cases, you need to be able to walk around to the far side of the tree and pull on the line. First, of course, you've attached your antenna to the line, which becomes a messenger line. Then you can pull away on the messenger and watch as your antenna mounts upward into the branches.

Once I fired a line over a pine tree about 50 feet high. My aim was good, and the line went right where I wanted it. However, the bolt came down to earth in the midst of a tangle of brush. Picking up a machete, I started through the mini-jungle after the end of the line feeling like Frank Buck of "Bring 'Em Back Alive" fame. After considerable hacking of brush, I reached the objective, but it was a lot of work. Look for something with a relatively clear spot on the far side, if such a place can be found.

*3020 Pennsylvania Street, Melbourne, FL 32904-9063



Egg-type sinkers in three sizes weighing 2, 4, and 6 ounces each. A wire has been passed through the hole and eyelets formed at each end. They have been spray painted with aluminum paint. The 4 ounce sinker is equipped with a snap swivel.



Game Tracker® attached to a compound bow. It's the black cylinder just below the archer's hand.



My slingshot with Game Tracker® attached.

If you use an insulated wire, you can have it lie amid the branches of a tree and work just about as well as if it were out in the clear, hanging free of any contact with a branch. The wire should also be fairly flexible for easy pulling. Good results have been reported using enameled copper magnet wire. In the small sizes, say about #22, this wire has the advantage of being almost invisible. This can be a big factor in the picture if stealth is your aim.

If you have no such worries about being discovered, a heavier wire will be less apt to break with the movement of branches in the wind. A wire that's heavy enough to be fairly sturdy, black enough to not be readily visible, and insulated, as well as flexible, is sold by the foot in any well-stocked hardware store. Look for #14 stranded wire. You can get it in almost any color you wish, including black.

If rolling your own is not your cup of tea, and if you prefer to use something that's ready made, you can look through the Antennas West catalog. You'll see their ads in *CQ*. They use wire such as this, and better, among other things, and the work is all done.

Great success is also possible with a slingshot of more modest proportions than the monster N6HR dreamed up. One that I like has a bar sticking out in front that helps in aiming the shot. The trick here is to use a projectile light enough to tow your line to the desired height, yet heavy enough to fall easily to the ground. A light weight can tow your messenger high, yet get tangled in the branches and be very inaccessible. As in so many other areas of human endeavor, it's a trade-off. You juggle height attained against getting the weight down within reach on the other side of the tree.



A delta wing kite. This one has a 6 foot wingspread and it can lift a couple of pounds into the air in a modest breeze.

There's a sinker used by fishermen called an "egg" sinker. It's shaped much like a football, with a hole through the long axis. You can put a bare copper wire, about #12, through this hole, and fashion an eye at each end using long-nose pliers. The shape of the sinker, with an eye at either end for tying on a line, is ideal for use in a slingshot. Try a 6 ounce weight if there's a lot of tangled foliage in the way. A lighter weight—say, a 2 ounce sinker—works well in more open growth. It will carry a line to greater heights, but can easily get stalled in the branches. It's a good idea to paint the sinker with a bright color to enable you to find it more easily. Aluminum paint works well.

The method of attaching the messenger line to the sinker and arranging it for easy towing is another point to consider. I made a reel, fastening it to a PVC pipe which I poked into the ground. The idea was that the projectile would pull the line off the reel as it soared into the blue. It worked fairly well, although I found it also worked about as well to simply lay the line loose in wide circles on the ground in front of me. A reel with better bearings might have been the answer.

There's still a better way, though. You can go to almost any hunting-goods store and buy a gadget known as Game Tracker®. This is a copyrighted name, and any salesman in such a store will know about it. It consists of a very light-weight line packaged in a cylindrical container. The end of the line appears at one end and pulls out easily from the coiled line within the tube. At the other end of the tube there's a threaded hole which screws onto a machine bolt built into many bows that deer hunters use. You can also buy a special mounting bolt that can be used to mount the tracker to almost any launching device, including a slingshot. A short threaded bolt is included with Game Tracker®, and this also can help in fashioning a mount. Some ingenuity can really pay off here.

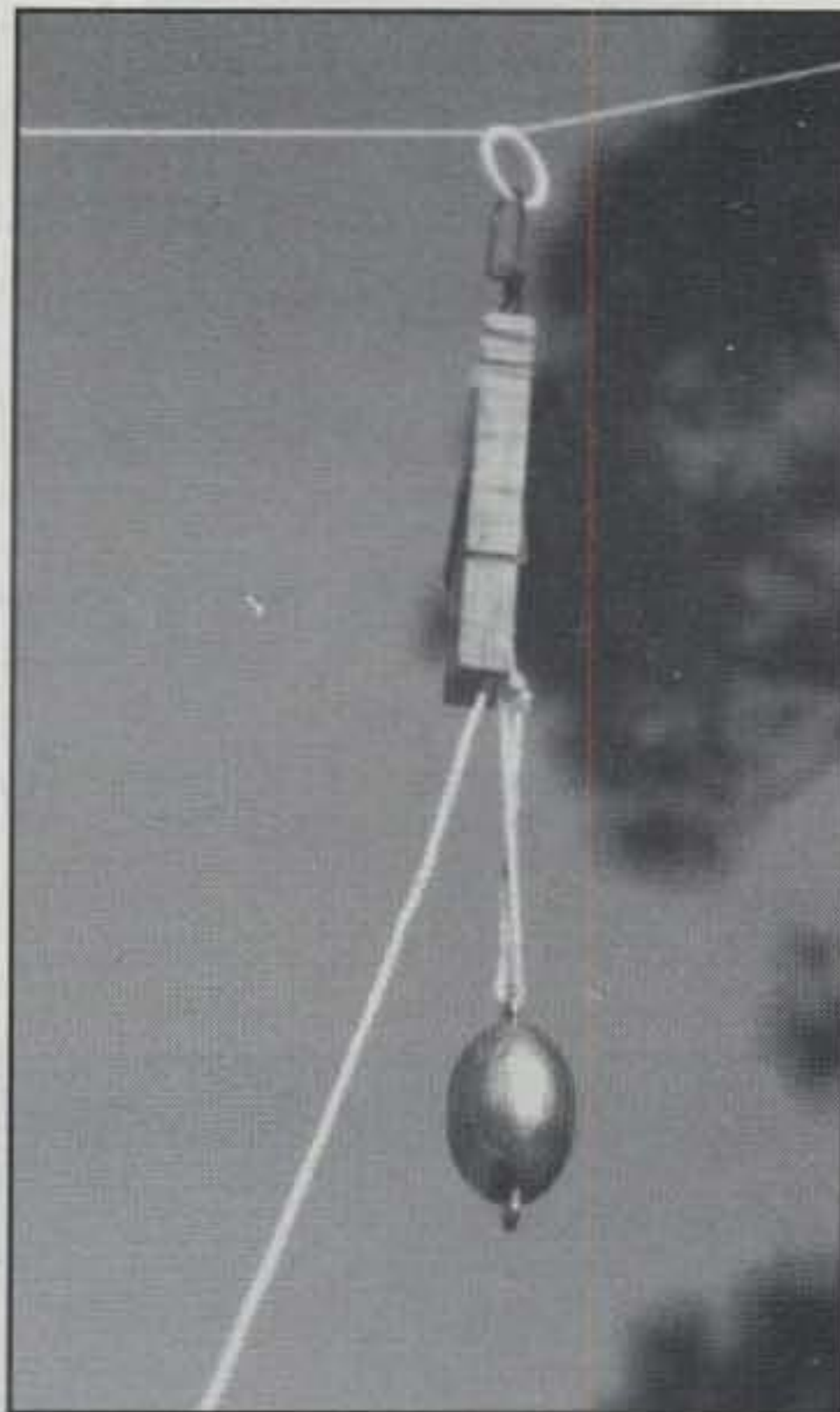
Many deer hunters use a compound bow, and most of these are fitted with a Game Tracker® mounting bolt. In use, an arrow shot by the hunter pulls the line after it, and the hunter uses this to lead him to his target. The device also can be used to get a wire into a tree, which is a purpose the inventor probably didn't think of. Archers fasten the line to the arrow just behind the head, and the act of pulling the line doesn't cause the arrow to go off course. The weight of the line won't give your sinker any trouble either.

My slingshot, as already mentioned, has a rod about 6 inches long attached just below the top, where the missile comes forth when fired. This is provided to help in aiming the shot. It also offers a convenient place to mount the Game Tracker®. You can hang it below this rod, using a hose clamp, with the business end to the front. The projectile you shoot will pull the line from the package with no trouble at all, and your antenna project is on the way. You can also cut the front sight from the rod and attach the abovementioned short bolt that's included with Game Tracker® in its place. One method, and the way I did it, is to place a coupling for 1/2 inch copper pipe over the shortened rod, insert the bolt into this coupling, and fill the space inside it with a gap-filling epoxy paste.

Next consider a kite as a means of lofting a wire into the blue. This method, being an exception to the rule about not doing anything in a wind, is quite effective when all the prerequi-



A wood clothespin with a snap swivel attached. Use a pop rivet through the eye of the swivel and the side of the pin.



Here is a clothespin and ring arrangement ready to carry a nylon twine messenger line over a treetop.

sites are met, but has some iron-clad conditions that must be satisfied.

For openers, you need a kite that will fly steadily and go up easily in a modest breeze while pulling a little weight. Such a kite is a delta wing. A model with a 4 to 6 foot wingspread can be found in most toy shops or any good kite store. The box kite is a real workhorse and will lift great weights. However, it can be tricky to handle. A delta wing is a good flier and is much easier to control. Next you must be able to position yourself upwind of the target tree. It helps a lot if you can get somebody to help.

Having obtained a kite, an antenna, and a helper, take a short break and visit a fabric store where they sell small plastic rings about a half inch in diameter by the bag of a dozen or so. You'll want a couple of these rings and a wood spring-type clothespin. A snap swivel such as is used by fishermen is the last item you'll need.

Now here's how the kite trick works. Get the kite flying and let it go up about 100 feet or so. The winds are a little more steady as a rule as you get up above the ground a bit. Your kite then will offer a nice, steady sky hook.

You might ask your helper to hold the kite line while you attach the plastic ring to the messenger line. You can do this easily by forming a small loop in the line, passing this through the ring, and then looping it back over the ring. It's a lot easier to do this than to explain the motions. With very little experimenting you'll figure it out. Fasten your wood spring-type clothespin, with the snap swivel, to the plastic ring.

Now take the end of the messenger line that will be used to pull your antenna, with an egg sinker attached, and put it in the jaws of the clothespin. Let the sinker hang free.

Either you or your helper should let the kite

climb, carrying the sinker and your messenger line, until the sinker is higher than the target tree. A delta wing kite, when the line is held fast, not letting the kite take any more, will swim forward to a point almost directly overhead. With the weight at the desired height—that is, higher than the target tree—let out a little line. The kite will now move down wind, carrying your sinker and messenger line over the tree. When the sinker has been taken well clear of the tree, you or your helper, whoever has been handling the messenger line, should now give a sharp jerk. This will yank the line free of the clothes-pin, and the sinker will fall to the ground on the far side of the tree. All that remains is to walk around to where the sinker is (it might be buried in the ground, but the line will lead you to it) and pull up your antenna.

So there you have a few ways of raising an antenna into the treetops. There are other ways to be sure, but these are methods I know about. Almost any small kid who spots you engaged in something like this will be eager to help. Be sure to let such a youngster get in on the act. It's a good way to make friends and help amateur radio with an infusion of new blood. Be prepared to answer questions, though. You'll get some good ones.

Once a boy was helping me put a 40 meter antenna into a maple tree which was surrounded by a lot of almost virgin forest. He was a big help in chasing the line and pulling. After we were finished, in an effort to hook him into amateur radio I said, "I'm going to use this to talk to a guy in Florida." Since we were in New York, I thought this might pique his interest. However, this boy, age about nine years, gave me an odd look. He asked, "You went to all this work just to talk to a guy in Florida?" Hi! ■

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