

An-Ten-Ten-nas

by

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In each issue of the *News*, we shall try to clarify a significant cluster of ideas used in antenna work. Our object is to help you make the best decisions about the antenna you buy or build with out imposing our own prejudices on you. The more you understand, the better your choices will be.

No. 20: The Rotatable Dipole Revisited

Some years ago, I presented in the pages of *10-10 News* a rotatable dipole made from aluminum rods with a PVC section as the center insulator. I suggested that the antenna might give surprisingly good results if you could not find money or room for a beam, since it allows you to move the broad dipole lobes in the favored direction even with hand turning.

The idea was not new with me, but an adaptation of an Ed Tilton-Lew McCoy antenna I read about many years ago in *QST*. Now WB9OMC has built his own version out of even more basic materials. The idea is worth reviewing every so often to make sure all newcomers are aware of it, so I'll let Duane tell his own story—with a few interlinears.

The WB9OMC Rotatable Dipole

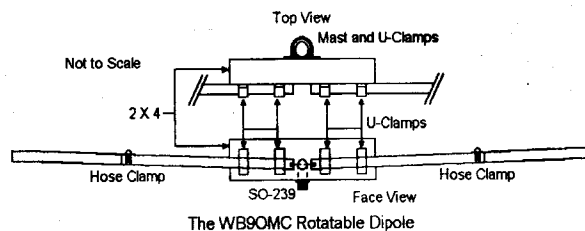
The antenna I used during much of the Summer, 1997, 10-10 Phone contest was something simple suggested by a friend, KB9CF. I home brewed a rotatable dipole of sorts some time back and finally got a chance to really see it perform even though I had no rotor for it.

It's something like this: the center insulator is a 2x4, about 3 to 4 feet long, used with the 4 side vertically. The tubular aluminum elements are mounted on that vertical side of the 2x4 with a slight upward angle, using a pair of u-clamps. (I'll bet a quality fir (not junk wood) 2x2 would also be plenty sturdy for this application.) The 2x4 also

has similar clamps for mast mounting. The feed point is a panel-mount style SO239 whose center conductor runs up inside the 2x4 and out courtesy of two holes drilled at right angles that intersect. Wood screws hold the SO239 in place. By the way, the mast mounts on the OPPOSITE side of the 2x4 from the elements.

There are two sections of tubing for each of the two element sides, and the outer one can be slid in and out to adjust for minimum SWR, then tightened with a worm-screw type clamp. [Please use a stainless steel clamp with a stainless steel screw. Some cheap ones that say stainless do not have stainless screws, and that part rusts.] I did not cut off any of the excess length from the outer segments figuring that the antenna might be useable anywhere from 6 meters through 10 and 12 meters and while I haven't bothered to check the length, maybe even 15 meters.

[Duane does not say exactly what size tub-



ing, but many hardware depots carry 1, 7/8, and 3/4 inch aluminum tubing. Any two adjacent sizes will nest nicely. You might want to use steel wool to deburr the parts that will slide so that a year from now, they will still move freely. With 4 6' lengths—two of each size—you can easily resonate the antenna at 21 MHz and upward through 10 meters. You might use a marker pen to record the proper setting for readjustment.]

The slight upward angle counteracts the tendency for the elements to droop, and when the antenna is up in the air they do seem to lie just about dead even flat. [If you forget to use the upward gradient, do not worry: the slight natural droop (that allows aluminum to flex and spill wind) will not hurt your signal at all.]

Adjustment for SWR was easy and quick, with about a 1.3:1 having been reached on about 15 feet of mast pipe above ground. During the contest I doubled the mast pipes so I was up

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about 30 feet and was pleased to have the SWR be virtually 1:1. At the wattage I was putting out (around 10 watts) my MFJ948's reflected power needle didn't even budge. That was an unexpected bonus, and found I was being given good signal reports while using it. Also of some help was probably that I had run the feedline with RG8 instead of 58, so quite possibly a reduced loss level didn't hurt matters any.

[Duane's experience with SWR is very natural, since the feedpoint impedance varies with height somewhat until you get over 1.5 wavelengths up in the air (about 50' on 10 meters). The use of the best coax you can buy is always advisable, even if you are running low power. Coax losses are negligible at 80 meters but significant at 2 meters: 10 meters is a kind of transition area where losses for longer runs start to amount to something. For portable operation, RG-58 is fine; for the home station, I tend to use RG-213, with plans to upgrade to some of the newer versions with a bit less loss and more weather resistant jackets. But do not let the fact that you only have RG-58 keep you off the air--use it and operate!]

I would say that it's not exactly highly directional, acting about like you'd expect a dipole to act in that regard. But for a cheap homebrew made partly of surplus parts, some aluminum tubing and blood-n-guts it seems to work pretty darned well. Aside from working nicely on 10 meters for transmitting, I'd bet that it could make a dandy SWL antenna, too.

[The dipole pattern at 1/2 to 1 wavelength up is a kind of peanut shaped affair with broad lobes two ways and good side rejection. This means you only have to turn the antenna if you are 45 degrees off target or more. This is handy when your only rotator is the strength of your arm.]

It has been my observation that when 10 meters is open, I have had good luck with nearly every antenna I have tried, horizontal or vertical. My goal was to cook up something with a bit of directivity--even if the antenna is bi-directional--and to do so cheaply and easily. Everything in this antenna came from the hardware store or Radio Shack or my space hardware jars. The antenna is not fancy, and the 2x4 adds some weight, but I am pleased with the results. In fact,



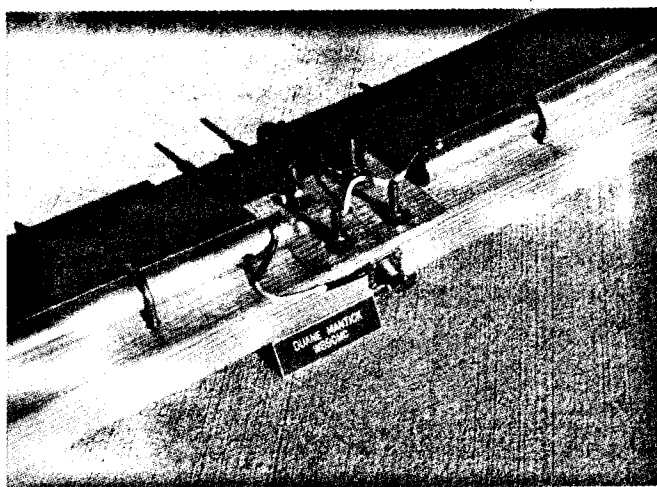
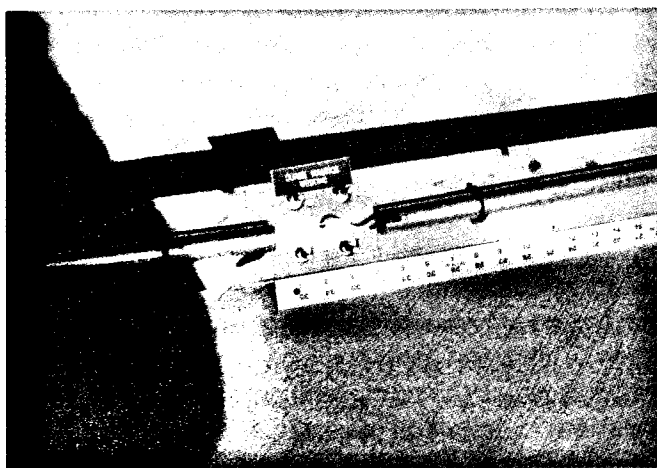
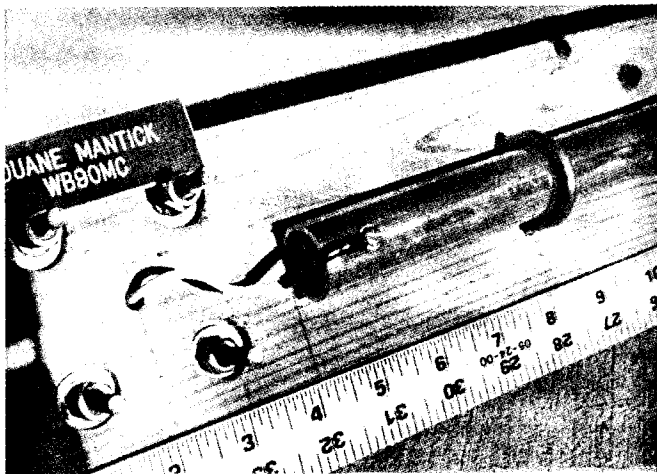
Duane holding his rotatable dipole.

I was surprised by how well it works.

[There are no fancy mathematics to this antenna. Since there is more than enough adjustment range, just start with a length in the ballpark and adjust the sliding elements for minimal SWR. Since precision will be in the adjustment and may vary a bit with local object, terrain, and height, just start with an overall length of 468/f in MHz and work from there. For a center frequency of 28.5 MHz, that is about 16' 5" long. With tubing, this length will be too long, since the formula is for thinner wire elements. Shorten as needed. Something closer to 16' is likely.]

As Duane has shown, the rotatable dipole is easy to build and lends itself to materials you can easily obtain. Do not be afraid of trying variations in the center support and mast connection. At any given height, your signal will be down only by about 1 S unit compared to a 3-element Yagi at the same height. With 10 beginning to open wide, that difference will only make a difference in a pile-up or with early morning very weak backscatter. The rest of the time, you will have more contacts than you can handle.

You will find the photos of the antenna on page 10.



Change of Pace

**With the heat of summer upon us, think about the cold winter weather and Christmas. Work this out.
Christmas Carols**

1. Move thitherward the entire assembly of those loyal in their beliefs.
2. Listen, the celestial messengers produce harmonious sounds.
3. Nocturnal time span of unbroken quietness.
4. An emotion excited by the acquisition or expectation of good given to the terrestrial sphere.
5. Embellish the interior passageways.
6. Exalted heavenly beings to whom hearkened.
7. Twelve o'clock on a clement night witnessed its arrival
8. The Christmas preceding all others
9. Small municipality in Judea southeast of Jerusalem
10. Diminutive masculine master of skin-covered percussion cylinders
11. Omnipotent supreme being who elicits respite to ecstatic distinguished males
12. Tranquility upon the terrestrial sphere
13. Obese personification fabricated of compressed mounds of minute crystals.
14. Expectation of arrival to populated area by mythical, masculine perennial gift giver
15. Natal celebration devoid of color, rather albino, as a hallucinatory phenomenon for me
16. In awe of the nocturnal time span characterized by religiosity
17. Geographic state of fantasy during the season of Mother Nature's dormancy
18. The first person nominative plural of a triumvirate of far eastern heads of state
19. Tintinnabulation of fascillating pendulums in inverted, metallic resonant cups
20. In a distant location the existence of an improvised unit of newborn children's slumber

CHANGED YOUR CALL or ADDRESS ?
 NOTIFY 10-10
 ADDRESS ON PAGE 31

Official 10-10 Badge

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