

# 73 Review

by Bill Clarke WA4BLC

# The Carolina Windom 160

The Radio Works

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Price Class: \$95

*Work 160-10 meters with just one antenna.*

Recently, I decided to become active on 160 meters. It was either that or miss out on one of my evening nets for the remainder of the winter. Remembering that this project would be used for SSB rag-chewing and not heavy-duty DX, I went over the various antenna answers that are generally thought of for 160. I eliminated some of them as requiring too much work (ground radials, etc.) or as too limiting (monoband). Then, along came the Carolina Windom 160, from The Radio Works, another version of that marvel W8GZ gave us back in 1928.

In December 1988 I reviewed the Carolina Windom standard 80-10 version. I used it for many months at my Virginia QTH, then moved it to my new QTH. With a tuner, its versatility allowed me to operate on any of the bands, including WARC, from 80 through 10 meters.

This multiband versatility was what attracted me to the 160 version of the Windom. I could use it on top band and all the other bands, too. It could act as a backup to my trusty dipole on 75, and see primary use on 40 and up. Not bad for one wire.

### A "Package of Antenna"

The package the 160 comes in will surprise you. It's a plastic bag, of some weight, containing the wire elements (265 feet of #14 multistrand copper wire), a 22-foot RG-8X vertical radiator, a line isolator, and a matching unit (used like a center insulator). Now, before you ask... if you want, you can order the 160 with #12 stranded copper or copper-weld wire. In locations prone to high winds, the latter may be a prudent choice, but my 160 has experienced winds in excess of 75 mph and suffered no failures.

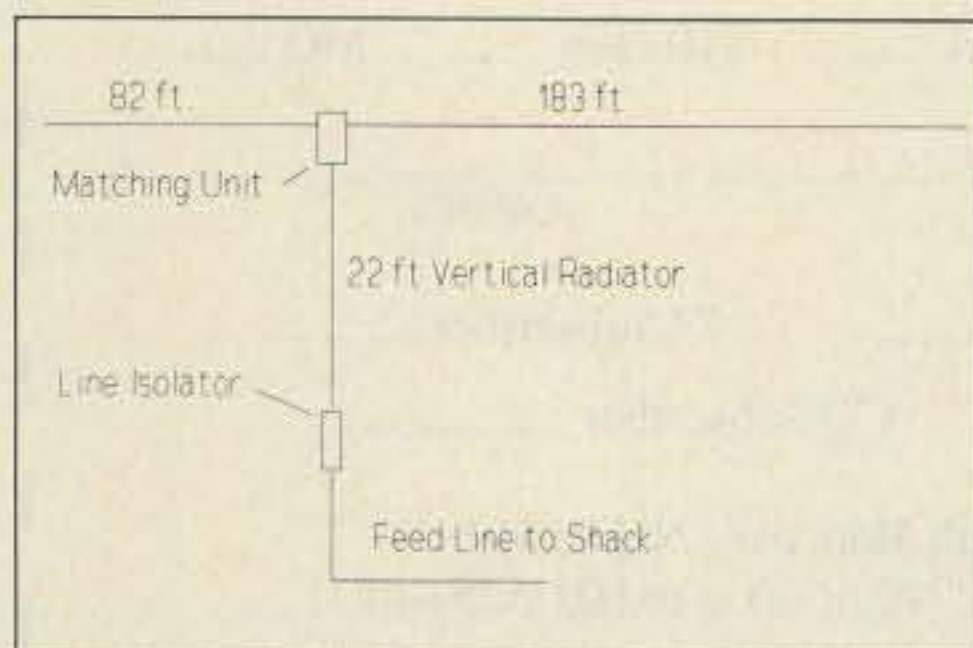


Figure 1. Diagram of the Carolina Windom 160.



Photo A. The Carolina Windom 160 package, unassembled.

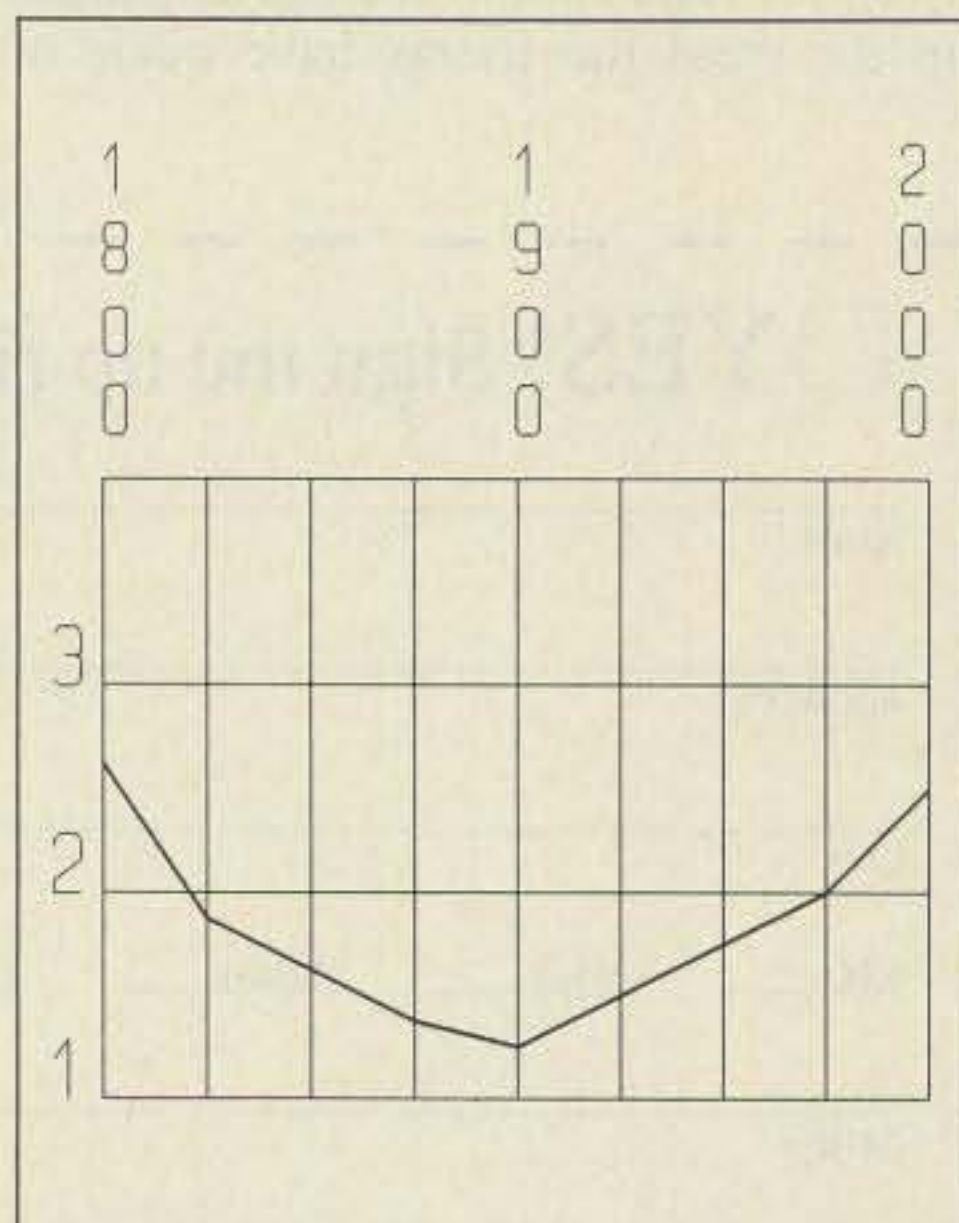


Figure 2. SWR plot of the Windom on 160 meters.

### Installation

I installed the 160 in a drooping dipole manner: the highest point at 48', with the ends dropping down to about 20'. Keeping the ends

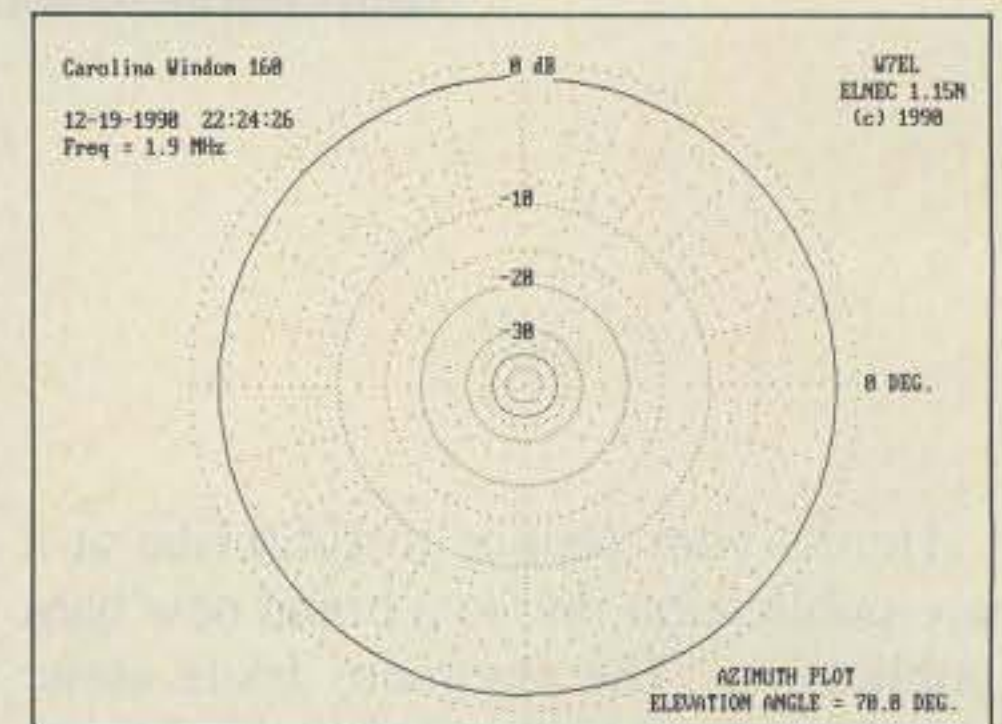


Figure 3. Azimuth plot of the Windom on 160 meters (using ELNEC 1.15M).

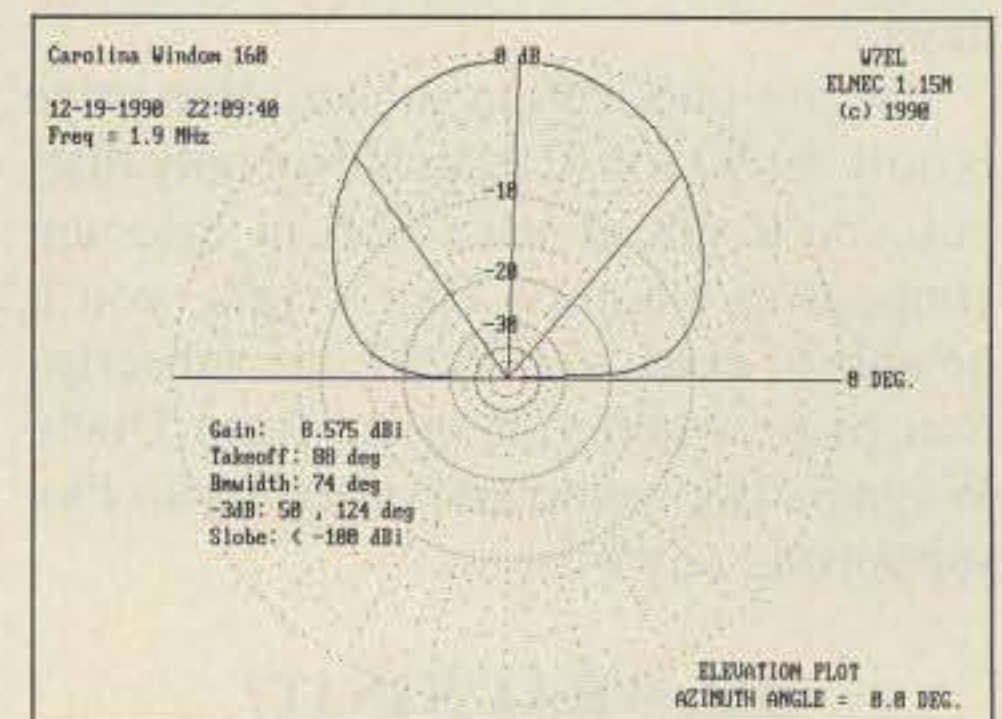


Figure 4. Elevation plot of the Windom on 160 meters.

in the air avoids possible contact with unauthorized creatures (deer, cows, neighbor's kids, etc.). The 160 is supported about 15 feet from the matching unit (center insulator) and vertical radiator. A movable insulator is placed on the long element just for this purpose. This is to eliminate the possibility of interaction between the tower and the radiator. The line isolator is about 18 feet in the air.

### Tuning

The SWR curve is gentle and I am able to operate from 1.825 MHz to 1.975 MHz without needing a tuner. On the remaining bands (80-10), the use of a tuner is mandatory. However, all bands tuned easily and appear relatively broad.

### How It Works

The Windom is fed off-center. In fact, this model is fed about 50' off-center. Therefore, because an unbalanced condition exists at the feed point (the RF current is out of bal-

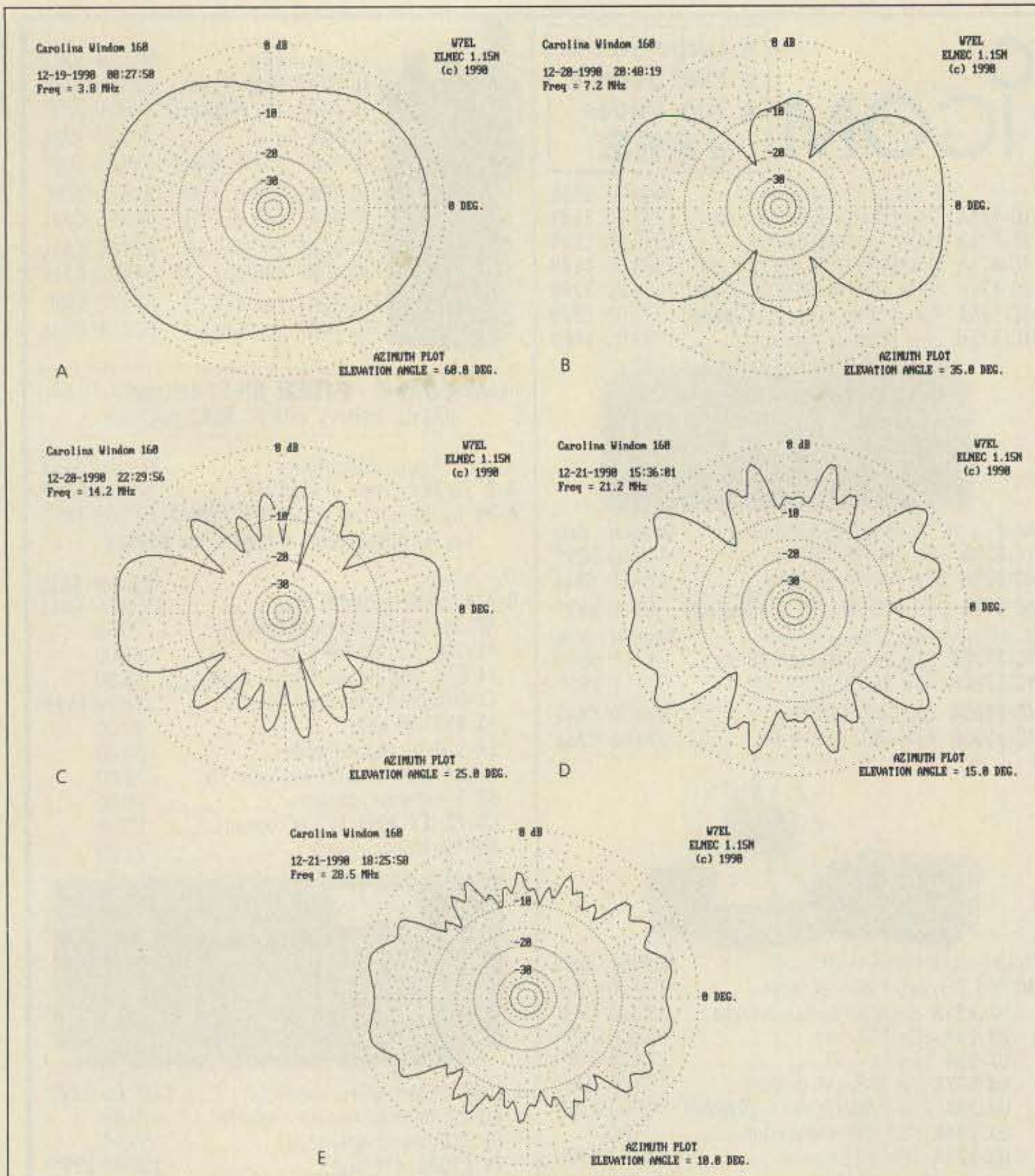


Figure 5. The Carolina Windom 160's azimuth pattern for 75m (a), 40m (b), 20m (c), 15m (d) and 10m (e) meters.

ance), the coaxial feedline will radiate. This is a planned condition and is the reason this type of Windom is so effective on the higher bands.

Naturally, you don't want to have uncontrolled radiation from the feedline. To limit it, a line isolator has been installed at the feed line end of the vertical radiator (22 feet down). From this point to the transmitter there will be no feedline radiation.

The vertical radiator, in the case of higher frequencies, gives the effect of an inverted vertical antenna. The horizontal elements

continue to radiate as would be expected, giving a combination of horizontal and vertical radiation.

As with all multiband wire antennas, some gain and directivity will be attained as the frequency goes up.

#### On The Air

On 160 meters, I consistently work up and down the East Coast and am very pleased with the good reports I get. Of course, you must remember that with the antenna as low as it is (48'), DX will indeed be rare.

#### Specifications

Freq. Coverage	160-10 meters
Gain	As much as 10 dBd
Size	265' H x 22' V
Polarization	Vertical & horizontal
Feed Line	50Ω coax
Matching method	See text
Power rating	1500W recommended
Height	40' (usable at 35')

On 75 meters, for contacts under 1,500 miles, I have found that it is generally 5 to 10 dB down when compared to my 75 meter dipole at the same height. This is a general statement, as there have been exceptions to the rule. Beyond 1,500 miles, the Windom takes over, usually 5 or 10 dB ahead of the dipole.

On 40 meters, there is a slight edge with the Windom. Consistently, whether DX or local, the Windom wins over the inverted vee by about an S-unit.

On 30 meters and up, the Windom is all I have at the present time. There is no tribander or other fancy array to compare it with, but I'm very satisfied with the Windom's overall performance. I did, for a short time, compare the original Carolina Windom to the 160. Although there were a few times when one or the other seemed to be slightly ahead, there was generally no difference. End result: An improved antenna that didn't take away from the original version.

#### The Plots

The plots shown in Figures 3 through 7 were done with ELNEC (see my review in 73, January 1991), and printed on a Canon Laser printer.

#### Nice Points

All the pre-made connections were good and solid. The vertical radiator, a piece of RG-8X coax, is pre-made with an end connector and the line isolator installed. There is a small movable insulator on the longest leg to facilitate hanging the antenna. Coax Seal comes with the antenna... use it, it'll save you grief later on down the road.

#### Problems

Of course, the 160 does have a few drawbacks. Specifically, its size of 265 feet. Having used wire antennas in many difficult and small installations, I can assure you that some bending of the end elements is quite acceptable. Signal degradation will be negligible, unless you actually fold the wires back on themselves. So don't be daunted by restrictive lot sizes.

#### Final Remarks

Would I recommend it? Yes, the Carolina Windom 160 is a really good all-around antenna that works well on the lower bands and exhibits gain and directivity on the upper bands. Due to the vertical radiator, it is a step ahead of the typical multiband wire antenna, as seen in the plots. The size is somewhat formidable, but the Carolina Windom 160 is a single antenna that does it all from local 160/75 round tables to 10 meter DX. **73**

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