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A Wider Windom

—broadbanded sans transmatch

It has been nearly fifty years since Loren Windom W8GZ started experimenting with an off-centerfed dipole which would catch the fancy of generations of hams.

The principle was simple: While a centerfed dipole exhibits a 75-Ohm resonant response on its half-wave frequency and near that on the third harmonic, it is far from an allband antenna. Would it be possible to locate a feedpoint other than the center which would show a common impedance on several harmonically-related ham bands? Loren Windom decided to find out.

After considerable experimentation, he determined that a point 14% away from the center of the antenna (that is, 36% from the end) exhibited a nearly identical feedpoint impedance on even multiples of the half-wave frequency. Rf signals at 3.5, 7, 14, 21, and 28 MHz would see an impedance of approximately 400 Ohms under ideal free-space conditions. Early amateurs used single-wire feed, approximating the correct feedpoint impedance. Later, 300-Ohm open-wire line was used, as was TV twinlead.

But, as many amateurs have found out, longwire antennas cut for the CW portion of the bands begin to balk at signals in the higher portions of the phone bands.

With these limitations in mind, I decided to see if the off-centerfed antenna could be reconfigured to accommodate phone operation without the use of an external tuner.

Dozens of individual experiments were devised, each involving a gradual change in feedpoint, feedline length, total dipole length, and individual lengths of each dipole leg. Results were frustrating. When one band would represent a 1:1 swr, another would show a zillion to one! The problem was not so severe on 75 and 40 meters because subtle dimensional changes were not so critical, but at 20 meters and above the roof came in!

Initial trials were done with a 4:1 balun transformer connected directly at the antenna feedpoint. I then remembered a comment published somewhere that it is often better to isolate the balun with a length of balanced line first. The literature reported that a length of 44 feet, or multiples thereof, seemed to be ideal.

I could not get that length to work. Nor did I find a harmonically-related 67-foot length to be of advantage. But at 47-48 feet of 300-Ohm feedline, the antenna tamed down considerably. Swr readings were reasonable on all bands, and with some judicious pruning of antenna length, the swr was reduced even further.

The magical combination, at least at my location, with the antenna elevated about 25 feet above ground, seems to be a 134-foot dipole divided into 90- and 44-foot sections. This combination results in a feedpoint 17% off center (33% from one end).

Early versions of 300-Ohm-fed antennas were generally matched by running the feedline directly to an antenna tuner in the shack or by matching the feedpoint impedance with a 4:1 balun transformer. The transformer was almost always made from two bifilar-wound B & W self-supporting coils mounted on ceramic standoff insulators and secured inside an aluminum Bud box. It was a large contrivance, but it worked!

Nowadays, with the ready availability of ferrite core materials, the physical size and the balun may be reduced considerably. Kits may be ordered from advertisers found in the pages of *73 Magazine*, and commercial units are available already assembled.

The balun transformer which we used was the world-famous W2AU, marketed by Unadilla (Microwave Filter Company, 6743 Kinne Street, East Syracuse NY 13057) for $14.95 and carried by many amateur radio supply houses.

Ferrite-core balun transformers typically perform uniformly from 3-40 MHz, but ours seemed to work well down to 160 meters.

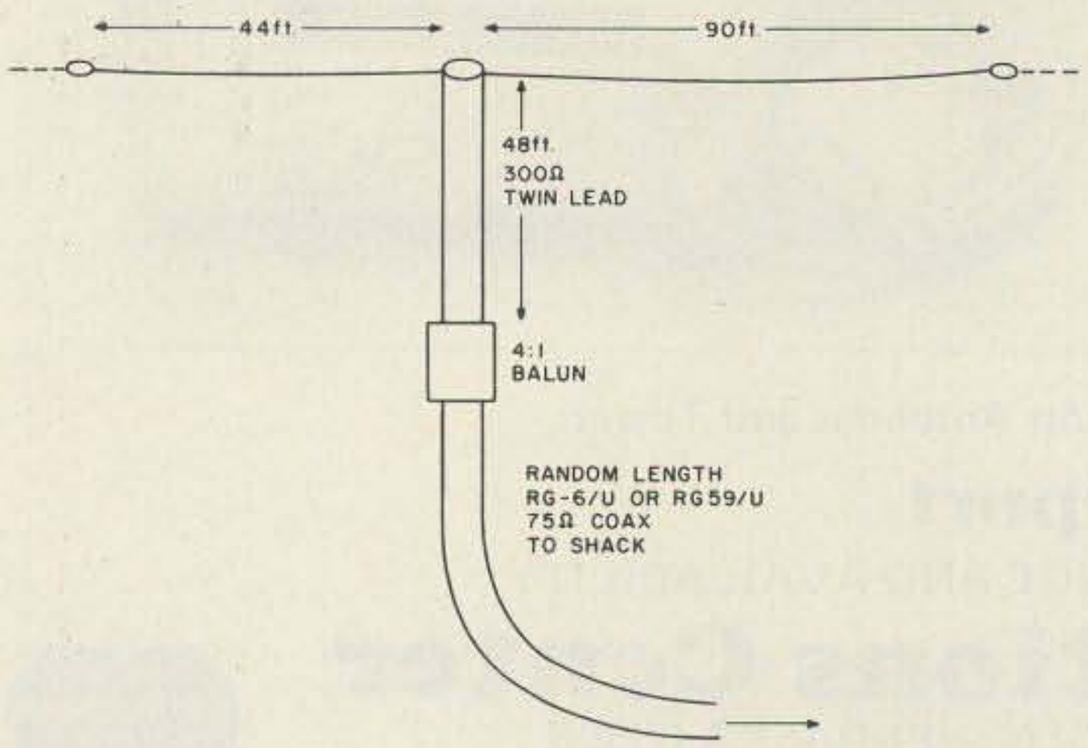

Fig. 1. Construction details of the phone man's Windom.

We did not try transmitting on 6 meters, but reception from 100 kHz to 50 MHz was phenomenal!

It is recommended that the experimenter who intends to put up one of these modified Windoms should start with measurements slightly long and prune the antenna down to proper performance. Begin with a 48-foot feedline, 93 feet of wire for the long end of the antenna, and 46 feet for the short end.

Three strain insulators will be needed, one for the middle and one on each end. Galvanized stranded-steel guy wire is probably the best all-around antenna wire for this purpose. It is strong, corrosion resistant, inexpensive, and easily soldered. It is readily available at most hardware stores.

After passing the antenna wire through the end insulators, wrap it lightly around itself so that it can easily be changed in length for tests.

For feedline, use a 48-foot length of outdoor 300-Ohm TV twinlead to start with. It may be trimmed to 47 feet if juggling the antenna length does not bring the swr down to a satisfactory level.

For the run to the shack, 75-Ohm coaxial cable is recommended. Unless transmit power is to exceed 300 Watts, RG-59/U will work just fine. If you have a length of RG-6/U cable-TV coax, it will work just as well. Its slightly larger diameter may require some vinyl jacket shaving at the ends to accommodate a conventional adapter sleeve for the PL-259 connectors.

I found the easiest way to erect the antenna was to tie a rock to the end of a roll of nylon twine, unwind thirty feet or so, and heave it over an upper limb of a tree. The twine is cut from the roll and tied to an end insulator. It is easily hoisted over the branches. The process is repeated at another tree at the far end of the antenna. Such an arrangement makes it easy to lower and raise the antenna during tuning procedures, as well as provides access to the antenna for repair or severe weather protection. The lower end of the twine may be tied to an inconspicuous nail driven into the tree trunk.

A typical chart of swr versus frequency for one off-centerfed antenna, which I personally use, is shown below. The antenna is 134 feet in total length, fed at a point which divides it into 90- and 44-foot lengths by a 48-foot length of heavy-duty outdoor 300-Ohm TV twinlead. A Unadilla 4:1 balun transformer connects the twinlead to a random length of RG-6/U, 75-Ohm TV coax to the shack.

FMHz	SWR
1.8	2.0
3.5	1.3
3.6	1.4
3.7	1.3
3.8	1.3
3.9	1.4
4.0	1.3
7.0	1.5
7.1	1.3
7.2	1.1
7.3	1.1
14.0	2.7
14.25	2.4
14.35	2.0
21.0	3.5
21.25	1.8
21.45	1.2
28.0	3.0
28.5	1.8
29.0	2.5
29.5	1.9

Signal reports have been outstanding. Even with less than 100 Watts input to the rig, it was hard to call CQ without receiving a reply, often from several stations, commenting on the strength of the signal.

Carefully pruned, the phone man's Windom antenna is an inexpensive way for any ham to get top performance on all HF bands without having to resort to a transmatch. ■

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