CQ Reviews:

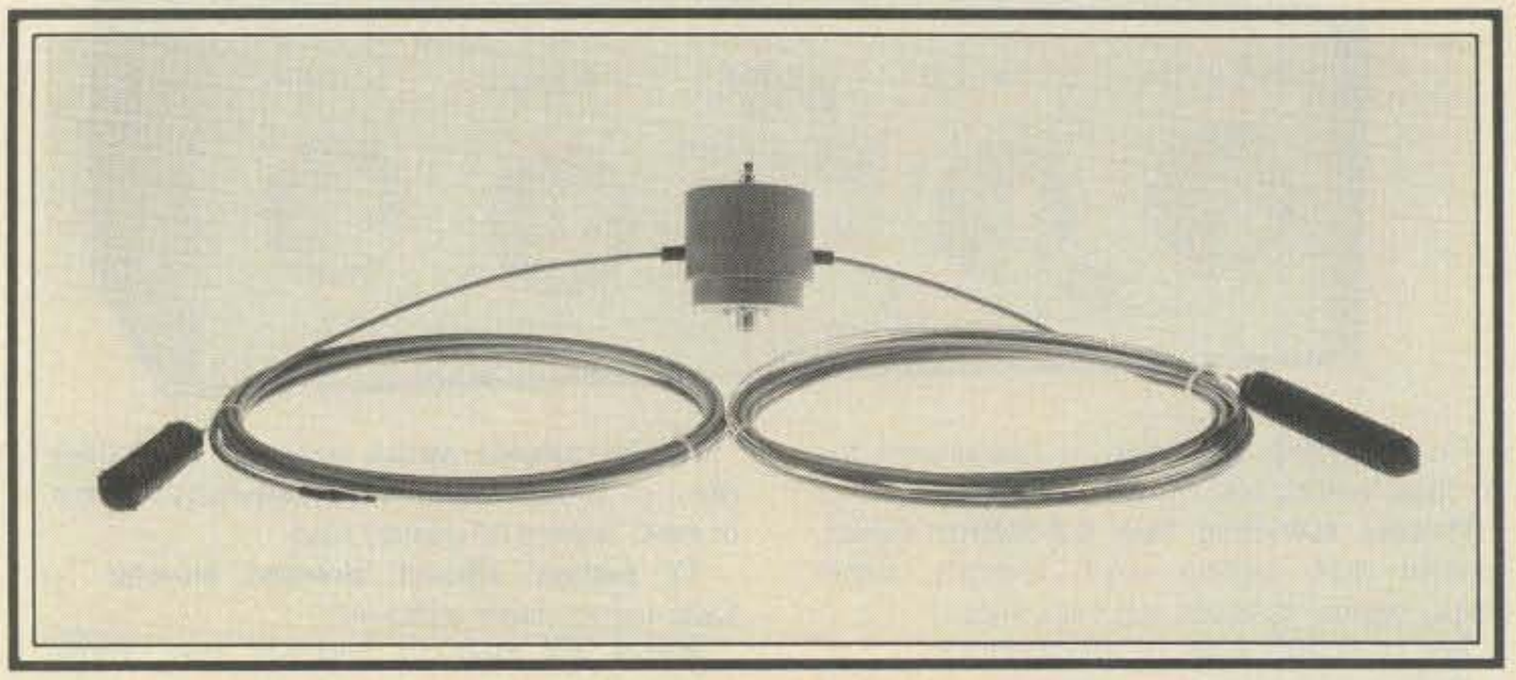
The Snyder Antenna Corp. 80 Meter Broad-Band Dipole

BY LEW McCOY*, W1ICP

Back in January 1982 I stated in my *CQ* article on s.w.r., "I have yet to see an antenna that would present an s.w.r. of less than 3 or 4 to 1 across the 80-meter band." I could have qualified the statement by discussing the "Wullenweber" antenna, which is used by the military and is flat from 3 to 30 MHz but costs several million dollars—not exactly a ham antenna! Actually, a dipole cut for 3750 kHz would run up to 7 or even 10 to 1 at the band edges simply because 80 meters is such a wide band, with a bandwidth ratio of 8 to 1 (500 into 4000).

In all my years of experimenting with 80-meter dipoles—and these included dual systems fed jointly for 3500 and 4000 kHz, matched dipoles also fed jointly on the same frequencies, and "Butterfly" types of dipoles—I never achieved what I considered a "flat" dipole for 50-ohm coax feed (and, I might add, these included the so-called "coaxial dipoles").

However, when my January article appeared, I received an "unsigned" letter taking me to task about my statements, and it appeared that the letter originated from someone in Snyder Antenna Corp. I received the letter on Christmas Eve, but I was determined not to let it spoil my holiday. Normally, I would never answer an unsigned letter, because that is like the ham who gets on the air, tells another ham he is breaking the rules, and then fails to sign his own call! It is just better to keep your mouth shut and forget it. But because it was the brotherly love season, I answered the letter, sent it to Snyder Antenna Corp., and pointed out a few facts of life about antennas. The unsigned letter I had received stated that the Snyder antenna was essentially flat across the 80-meter band. In my letter I had said that if they wanted to put their money where their mouth was, send me their antenna and I would check it out according to their specs and publish the results in *CQ*. I received a pleasant response from their board chairman apologizing for the unsigned letter and stating that they would send me an 80-meter dipole for tests, and it arrived shortly thereafter.



This is the 75/80 meter Snyder antenna. The heavy-duty construction is apparent.

The 80-meter model is extremely rugged, as evidenced by the photo. The installation instructions on the antenna drew me up short because they specified that the feed line should be an exact multiple of a half wavelength. This gets a little sticky, as without exception, the s.w.r. on a line (disregarding the losses in the line) is always established by the impedance of the antenna and the impedance of the line. The line value is always fixed at 50 ohms (assuming 50-ohm coax), so if one divides the impedance of the antenna by the line impedance, the result is the s.w.r., and that does not change regardless of the line length (except for losses). Technically, specifying a half-wave feed line could mean many things, one of which is that the feed line is part of the antenna, which of course is normally forbidden.

Well, I said, so be it, and I installed the antenna exactly as they specified with regard to height and feed-line length. To say I was shocked by the results is putting it mildly! The s.w.r. curve across 80 meters (3500 to 4000 kHz) was as good as or better than their specs! Their requested configuration was inverted V, or horizontal (and I tried it both ways) at least 40 feet high at the apex, and a multiple of a half-wave of feed line. Their s.w.r. curve and mine are shown in fig. 1. However, without getting technical and giving you a lot of reasons, I decided to try the "worst case condition" on that feed-line business, so I added an exact quarter wavelength of coax and tested again. The s.w.r. curve was just about the same as before—excellent!

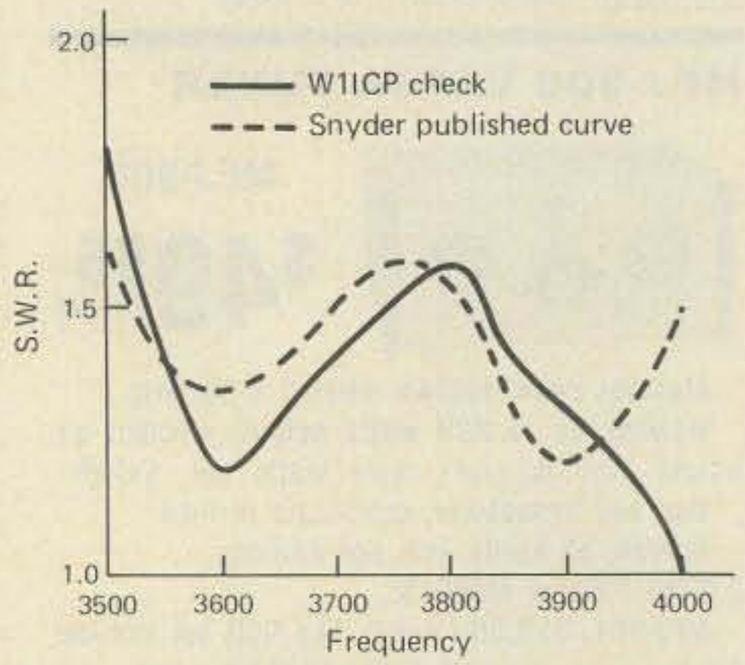


Fig. 1– These are the s.w.r. curves of the 80-meter antenna. The solid line is the one checked by the author, and the dotted line is the curve shown in Snyder's literature. Actually, the differences are small enough to be slight measurement errors. Also note that at no place on the band does the s.w.r. go above 2 to 1.

I talked to the Snyder people on the phone to elicit technical information, but it turns out that patents have been applied for, so in this case you'll just have to take our word that the antenna really works. I'll give you the physical specs in a

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moment, but I would like to add that it is a real pleasure to QSY from 3500 to 4000 without using a Transmatch. Heaven forbid that I would downgrade the use of a Transmatch, but facts are facts: if you don't need one, it is one less device to have to worry about. I worked all over the country with the dipole and got excellent reports—both on c.w. and phone.

Physical Specs

The antenna appears to have two coaxial portions emanating from the center encapsulated transformer. I assume the transformer performs the dual function of balancing (balun) plus taking care of matching. However, that is only an assumption on my part. The whole system is extremely rugged and would easily handle the amateur legal limits. Following is the information given us by Snyder Corp.: "The company that makes the jacketed portion of the elements does not publish their specifications, and will not reveal them to us. We do know, however, that the materials will withstand 225 C, and will bend on a 5-inch mandrell at −55 C. The dielectric will not cold flow, and will tolerate ultra-violet for many years. They are totally non-contaminating. The rubber tubing used for strain relief at the junction of the element and the transformer case also provides a dam against the flow of transformer encapsulant during assembly. The transformers are doubly encapsulated, first with a rubbery compound to protect the toroidal core from distortion, and then with rigid material. The transformer case is coated to protect the plastic from ultra-violet degradation. The hardware and screws in the top of the case are stainless, of course. The SO-239 is Amphenol; we have had trouble with substitutes. The insulators are Telex. They are 6-inch ABS (Cycolac) and are rated at 500 pounds. The shipping weight of the FB-75/80 is 6 pounds; its length is 126'7". The latest price is $124.95 which includes shipping in the continental U.S."

That about tells the story on the antenna. Snyder also makes 160- and 40-meter versions. The instructions are detailed, and it is possible to move the s.w.r. curve by changing the antenna length, but with the very low s.w.r. that I had, I saw no need for changing anything. The antenna s.w.r. curve was plotted using a Collins bridge plus the bridge described by me in Feb. 1982 *CQ* (they both agreed on all checks). Two power levels were used: 25 and 1000 watts.

As you can probably surmise from this review, I would rate the antenna very highly—particularly for a contest or DX operator who likes to jump around 80 with a minimum of effort and maximum speed. One last thing: I checked the antenna with an ohmmeter from end to end, from ends to feed point, etc. There are no hidden resistors to provide that excellent s.w.r. curve!