Number 44 on your Feedback card

The ISOTRON 80

Good things come in small packages.

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As most of the ham radio community is aware, the amateur bands were not at their best during the months of October and November of 1995. So was that a good time to try to evaluate an antenna? Well, after thinking about it, I believe it was! If it will work under poor conditions we all know it is going to *really* perform under great conditions!

I received a letter from Ralph Bilal asking me if I would like to review one of his ISOTRON antennas and compare it to other antennas that I have had at this location. I jumped at the chance because I have seen the ISOTRON antennas advertised and, frankly, I thought that they were kind of an odd-looking antenna—too small to be effective and, at most, good for someone in an apartment, operating portable, or perhaps in a mobile home park. Was I surprised! (More about that later.)

"This antenna is not just something to use until you can get a* real *antenna—it truly is a real antenna and I would recommend it for any permanent station."

Ralph said he would send me the ISOTRON 80 antenna, as I happen to be very active on 75 meter SSB. By the way, I have been a ham for about 40 years, so I think I have seen and tried almost every type of antenna that has come along. I especially like to make wire antennas: loops, longwire, dipoles, curtains, etc., and anything that is out of the ordinary. Looking at the picture of the ISOTRON 80, it certainly fits into the out-of-the-ordinary category!

Assembly

About a week passed and I was at home on my lunch break when the UPS truck pulled up. The driver handed me a box that looked too small to contain an 80 meter antenna and that felt as if it must be a box of feathers—it weighed scarcely 6 pounds! I quickly opened the box and, to my surprise, there was hardly anything in it that even came close to looking like an 80 meter antenna. Everything was neatly packaged; nothing rattled around in the box. In fact, each little package was secured to the box with some kind of epoxy. Looking at the contents I admit I kind of chuckled and thought: This is not going to be much of a test—it's too small to do much on this band.

Later that evening I read the assembly instructions and decided that since it was so small I would put it together in the basement. Downstairs we went and in about 20 minutes I had this strange-looking antenna put together.

Operation

Well, what now? I had a 10-foot piece of coax so I decided to hook it to the antenna and my TS-440S. To my surprise, the signals were pretty good in spite of being in the basement with an antenna that didn't look like it would do anything on 75 meters (it looked more like a 2 meter antenna).

The next day I considered trying to get the antenna outside and on the tower, but there was about a week of windy, rainy weather, so there was no chance to work with the antenna. I kept looking at it and wondering if I was wasting my time, but my curiosity was getting the best of me. Out to the garage I went and found a couple of sections of TV mast pipe. I put them together and fastened the ISOTRON 80 to the mast pipe. The wind was still blowing and the temperature was around 25°F, so I had to make quick work of getting this antenna into a position where I could see if it would do anything at 20 feet.

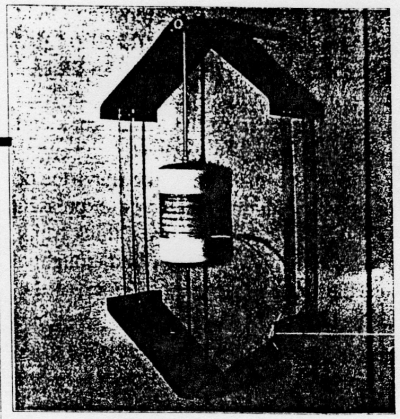

***Photo A.** The ISOTRON 80. Photo by Will Sosa.*

I took a couple of sawhorses and made a support to hold the 20 feet of mast and antenna up in the air in the middle of the back yard. It wasn't pretty, but at least it was off the ground.

Back to the basement and the rig. Signals were not bad considering the conditions. I wondered where the resonant frequency was going to be. According to the instructions, without the tuning stubs the antenna should come into resonance around the high end of the band. Much to my surprise, without any adjusting the resonant frequency was 3.940 with a 1.1 to 1. So would the signal get out when the antenna was only 20 feet off the ground?

I was able to work several stations with 58 59 57 reports in the middle of the afternoon. I was interested to see what the signals would be when I checked into the Mid States WX net meeting on 3.940 at 6 p.m. CST that evening. I have been on this net for many years and most of the fellows know what my signal should be. No one seemed to notice any difference in the signal! When I told them what I was using, there was the same disbelief that I had felt when I first saw the antenna.

Switching between the dipole and the ISOTRON, I noticed that the ISOTRON didn't seem to pick up as much noise as the dipole.

The dipole's and the ISOTRON's signals were comparable in the receiving mode. In transmitting, at some times the dipole would run about 1 to 2 S units stronger and at other times my signal was about the same. The

dipole was at 35 feet and the ISOTRON was at 20. I was impressed!

Performance

The next step was to get the ISOTRON up in the air on the tower. Finally, the forecast was for 50°F, so I decided to run a new line of RG58U coax to the tower. I asked the XYL to come out and hold the ropes while I went to the top of the tower, and in a couple of hours the ISOTRON was up at 57 feet. Now for the big test!

Into the shack I went to see if this little thing was really going to do much on the 75 meter SSB portion of the band. I checked again for the resonant frequency and found that the antenna had changed and was now resonant at a much lower frequency, 3.867, with a 1.4 to 1.0 SWR. I use a solid-state rig; I wanted to know what the band width would be as anything above a 2 to 1 SWR causes the output to be reduced. I found that I was at a 2 to 1 SWR at 3.893 on the high side of 3.867, and a 2 to 1 SWR at 3.843 on the low side of 3.867. By using the built-in antenna tuner I was able to cover the whole 80 meter band with no problem.

I am currently using a Kenwood TS-440ST driving a Dentron MLA-1200 amplifier with a Dentron Super Tuner. I was pleased to find that the ISOTRON accepted the 1,200 watts PEP without any problems. (It is rated at 1,000 watts PEP, 500 watts CW, according to the manufacturer.)

I am still stunned at the performance! It exceeded my *wildest* expectations—I was jumping in and out of different QSOs getting signal reports and comparing them to those of the dipole antenna; the ISOTRON was outperforming the dipole, which was mounted at 35 feet! I wondered if it favored a certain direction but found that it is omnidirectional, just as the Bilal Co. .said it would be.

In using the antenna over the past couple of weeks I have found that it has performed above and beyond what I thought would have been possible for such a compact antenna. I think the best report I have received so far was from WØNUJ in Coldsprings, MN, who gave me a report of 59+30, and K9TCC (about 12 miles from me) was running 59+15 with his dipole antenna. I have compared signals many times against the dipole and have found that on stations close in (75-100 miles) at times the dipole was slightly stronger by maybe 1 to 2 S-units. On stations worked over 100 miles the ISOTRON 80 has given me better signal reports.

Some other reviews that I have read of the ISOTRON antennas report that they make great antennas for those who live in restricted areas (apartments, mobile home parks), Field Day sites, or portable sites, and that they are a quick way to get a signal on the air. This is true, but I would like to say that this antenna is not just something to use until you can get a real antenna. This is truly a *real antenna* and I would recommend it for any permanent station.

"I can picture them all on one tower with no wires, control cables or antenna rotors."

How does it work?

How do the ISOTRONs work so well? For an antenna to work, it should be electrically resonant. The ISOTRONs are made electrically resonant by using only two components: the large coil in series with the capacitive plates of the antennas. (Match comes automatically with the right combination of the two components at resonance.)

There is more that is necessary for an efficient antenna. An antenna needs a certain amount of area to couple radiation to the atmosphere, sometimes referred to as the "capture area." However, this is an *area*. The area can be any shape or form. The laws of physics for this pheromenon do not specify appearance. The ISOTRONs have this radiation area. They exceed or equal (depending on the model) the area of a conventional half-wave dipole (#12 wire). In simple terms, the Bilal Co. has designed the ISOTRONs into a three-dimensional package. The performance speaks for itself! I'm pulling the dipole antenna down at this QTH and the ISOTRON 80 is going to be *the* antenna. In fact, I'm wondering about the other bands-160, 40, 20, 17, 15, and 10. I can picture them all on one tower with no wires, control cables or antenna rotors. 73

Dear Customer:

It is much easier and more reliable to see how an antenna performs when it is installed the same way the standard dipole would be.

The Reviewer from 1996 set up the Isotron as to be his permanent antenna.

Jim chose one of the hardest popular bands to install an antenna in order to put the Isotrons to the test. The low frequency of 80 meters make antennas in general susceptible to ground losses and for the most part the size of the antennas is intimidating.

Even though you may not be able to have this kind of set up with the Isotron it will help you see how well the Isotrons work.

This article is just one of many proofs that there is a way to design an antenna for the HF frequencies that is easy to install and at the same time will work for you!

Best of 73,

Ralph Bilal

Ralph Bilal WD0EJA