Number 12 on your Feedback card

by Dave Pelaez AH2AR/5

Bilal Company
137 Manchester Dr.
Florissant CO 80816
Telephone: (719) 687-0650

The Isotron 40

The neighbors might think it's a futuristic bird feeder, but it's really a compact, horizontally-polarized 40 meter antenna!

Let's face it . . . a 40 meter antenna that is small enough to fit inside a trash bag probably puts out about as much signal as a dummy load, right? Also, if it looks unconventional, it must not work as well as a normal antenna, right? Surprise! Both of these premises are incorrect! The Isotron antenna is an excellent example of one that shouldn't work because it simply doesn't "look" right . . . at least this is what I thought before actually buying one of these antennas. But work it does! Much to my surprise, the Isotron 40 meter antenna has performed so well it has now become a part of my permanent HF installation. As long as the antenna is electrically correct, and laws of physics aren't broken, many unusual antenna designs are possible. And this antenna has proven to be no exception. Let's take a closer look at this extremely compact HF antenna that could be the answer for hams with antenna space limitations.

In business since 1980, Ralph Bilal WDØEJA has actually designed six different Isotrons for 160, 80, 40, 20, 15 and 10 meters. A search for the "textbook" name for these antennas came up "empty." I discovered that Mr. Bilal coined the term "Isotron" to describe his design which is really quite unique.

Construction

I found the instructions provided were excellent. Assembly time is about 40 minutes, start to finish. The only tools that are required are a screwdriver, pliers, and a small wrench. You must purchase a five-foot mast section in order to fully assemble the antenna, as the mast section is not included. There is no need to break out the soldering gun or wire stripper. The SO-239 connector is pigtailed at the factory and the coil assembly is pre-wound, stripped, and tinned. The total part count is 10, and all fastening hardware is stainless steel.

Installation

Wayne would indeed grimace. I decided to mount the antenna for testing in the attic, knowing full well of the E-Fields that would be present (another good reason not to run the amp!). This installation was to keep myself in good graces with the XYL. As we had just moved into a newly-constructed home, I had earlier ruled out putting up a dipole, as the closest "attachment point" for a wire antenna was a transplanted sapling that I had earlier mistaken for a large Texas weed. So up went the Isotron.

Tuning

The most challenging part of the assembly is the tuning of the antenna to find its resonant point. Mr. Bilal has compiled a detailed step-by-step process to make this "black art" less tedious. In fact, the instructions are complete enough so you do not have to rely on a noise bridge to adjust the antenna's resonant point. Tuning this antenna is a matter of pivoting a capacitance hat that is attached to an aluminum rod from the vertical, and past the horizontal, rotating the rod to the "front" of the antenna. The instruction booklet contains some neat tricks and shortcuts on how to arrive at the desired resonant point. These helpful hints are a product of a whole lot of "corporate memory" that greatly assists the new Isotron purchaser in avoiding the potential pitfalls of bringing the antenna to resonance. For in-band utilization, no trimming of the coil is required; however, the instruction manual explains the procedure for trimming the coil if the antenna is going to be used for out-of-band activities (MARS CAP FAA etc).

Once the resonant point is found, you will notice a dramatically steep resonance skirt. In my installation, I have a minimum centered 1.1 to 1 VSWR and a usable 3 to 1 VSWR about 150 kHz up and down the band. More typically, a 250 kHz tuning range can be expected. This "usable" tuning range will vary, depending on the installation environment. An Isotron in the clear, as opposed to one located next to metal attic ductwork, will behave differently. Past the usable range, the VSWR ends up going off the chart very quickly.

Operation

My first perception after tuning the antenna was that I had the transmission line hooked up to an in-the-clear dipole. I listened up and down the band, and the usable bandwidth was very active with many signals. The atmospheric noise level seemed to be a bit quieter than "normal." Frankly, I was expecting to hear only a few of the "big guns" on the band, but I was pleasantly surprised to hear an active band. After one final check of the VSWR, I broke into about a half dozen QSOs. I was also surprised that I could work 'em. This was not expected, especially with my compromise attic installation. I tried another "test" later in the week with some friends who were about 40 miles out (ground wave). It was interesting to note that the station on the other end was experiencing a high noise level due to a distant thunderstorm. He was using a long-wire antenna, and we both were running about 100 watts.

Up to three different Isotrons can be connected in parallel; however, the manufacturer recommends the utilization of a noise bridge, as mutual coupling causes the overall impedance to become an average of the three antennas, making the tuning process extremely complicated.

How Does it Work?

I have successfully kept an active 40 meter schedule with KK4LW/7 who lives in Fort Collins, Colorado. I've been amazed that we have been able to consistently communicate from Dallas using an attic antenna about the size of a small Texas watermelon. Just remember one thing: The "feed point" does not require the placement of bird seed between the coil and the plates. 73

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