

# CQ REVIEWS:

## The AEA IsoLoop<sup>®</sup> HF Antenna

BY BUCK ROGERS\*, K4ABT

**T**he UPS truck has its own sound as it rounds the curve just down the ridge from my home here on Pheasant Ridge. I have my ears tuned to listen for that sound, because eight out of ten times that vehicle is coming to this QTH.

On this particular day I met the delivery person at the door and signed for the 3 foot by 2 foot box. Hurriedly I made my way to the computer room, where many of my packet-related projects begin. It took all of 60 seconds to open the box and organize its contents on the floor.

Before me lay the makings of the AEA IsoLoop<sup>®</sup> multi-band antenna. Except for the tightening of two screws that were purposely loosened for shipping reasons, it was fully assembled. There are some brackets and "U" bolts that are to be added to the antenna, but they are purposely left for the user to install. The IsoLoop<sup>®</sup> can be installed either vertically or horizontally, depending on the operator's preference.

It took a moment to go over the list of supplied parts and connectors. All I needed was a "hank" of four-conductor control cable with shielding (five conductors including the shield) and an equal length of my favorite coax. Well, I already had enough coax to reach the IsoLoop<sup>®</sup>'s mounting location, but the control cable was a different story.

### No Problem

I made a quick phone call to the local supply house to determine if they carried the type and size of control cable that I needed. The friendly voice at the other end of the line informed me that it was no problem as long as I didn't need over 1000 feet. A short trip to town and back, and I was about to be in business.

### The Owner's Manual

Oh, I almost forgot to tell you about the "fat" installation and operating manual

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that you must digest before going to the roof. Only 16 pages of documentation. They're kidding. Nothing in amateur radio comes with only 16 pages of documentation. I poked around in the box to see if I had somehow overlooked or mislaid the "book." Much to my pleasant surprise, everything I needed to know about this antenna was contained in the 16 pages of text and illustrations.

### The Best Is Yet To Come

Some of the reports I'd heard about this "new-fangled" IsoLoop<sup>®</sup> from AEA said that it could be mounted anywhere—apartments, condos, attics, treetops, RVs, and (with a good bumper mount) on the tail end of a pick-up truck. I would hesitate to do the latter, but as many of you know, hams are prone to nonconformity.

The antenna can be mounted vertically to provide a directional pattern rather than the omni-directional, horizontal pattern. Mounting it vertically with a rotor enables the user to "null" an interfering signal. I elected to mount the IsoLoop<sup>®</sup> in the horizontal plane. While I was at the local supply house, I purchased one of the roof-mounted tripods and a 10 foot mast section. The tripod is now mounted to the roof, and that is where the IsoLoop<sup>®</sup> resides.

The two 5-pin DIN connectors (supplied with the IsoLoop<sup>®</sup>) were installed at each end of the control cable, and the two PL-259 connectors were placed on the RG-8. Running the cables, installing the tripod, and attaching the antenna were all accomplished in less than an hour with no rushing and only one installer—*me*.

I must admit, the more I looked at that "compact," 12 pound, 32 inch square antenna, the more anxious I became. I hurriedly completed the installation by attaching the tuning motor, control box to the small power supply (supplied with the IsoLoop<sup>®</sup>).

### It's Warm in Georgia

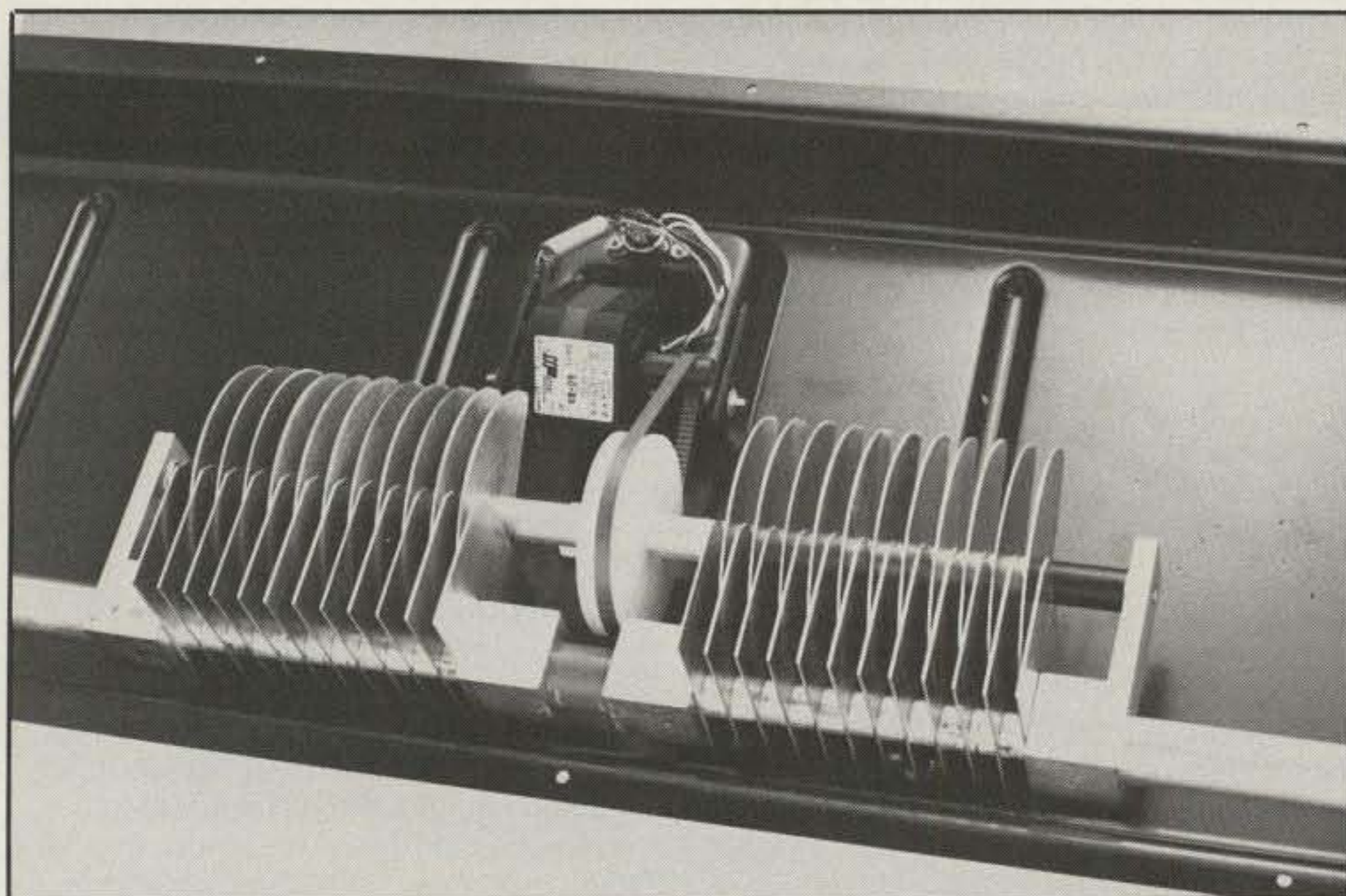
I was perspiring heavily after climbing down from the hot rooftop. My wife, Jean



The AEA IsoLoop<sup>®</sup> antenna can be mounted on a small TV-type tower. It is quite small (about 3 feet square) and can be used horizontally or vertically.

Ann, WB4EDZ, must have sensed my thirst, because she walked in with a cold glass of iced tea. This was the perfect moment to stop and read the operating instructions again, about a half-dozen steps. Now tell me, is that like saying "the glass is half full" or "the glass is half empty"? In any case, the tea glass was completely empty by the time I finished reading the steps about how to operate the IsoLoop<sup>®</sup>.

I connected the coax from the IsoLoop<sup>®</sup> to the three-antenna coaxial antenna switch, and flipped the switch to the position that has the IsoLoop<sup>®</sup> connected. I proceeded to tune the Yaesu FT-747 around the 20 meter band. Zilch! I moved the switch to the port with the old 20 meter antenna, and there on 14.105 LSB was the ever familiar sound of 300 baud packet. The signals were running in the neighborhood of S6 to S9, as is the case around 6 PM each evening in Central Georgia.



The motor-driven tuning section is well made and very high-Q. Part of the reason for the high-Q is that all of the metal connections in the antenna have closely machined and welded connections, therefore ensuring perfect bonding.

I began to wonder if I had a problem in the new coax, or if the signal difference was attributed to the old 20 meter antenna being suspended about 20 feet higher than the IsoLoop®.

### Wait, Hold It!

I remembered someone telling me that the IsoLoop® has a very sharp bandpass, and the sharp bandpass serves two purposes. One purpose is to attenuate

signals from nearby frequencies so that overload will not affect the user's operation, and the second reason is the IsoLoop®'s narrow bandwidth can suppress TVI and harmonics. Since the bandwidth is tunable, the IsoLoop® is a very sharp tunable filter that radiates.

I reached for the IsoLoop®'s control box, moved the tuning "speed control" to "fast," and pressed the motor control to the right. Six or eight seconds passed, and suddenly the S-meter seemed to



The LC-1 control box is fed with four-conductor shielded cable. It has two basic controls. One is for rotation direction, and the other governs the tuning speed.

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jump upward. The IsoLoop® tuning section performed just as it had been designed to do.

## Bingo!

The instructions explained all this to me, but I hadn't realized how sharp the tuning really was. Now I understood the reason for the speed control on the tuning motor.

Wow! The signals were high, then dropped off as I went through resonance of the frequency I was listening on. I moved the "speed control" knob back to about mid-range and moved the switch to the left. This time the S-meter movement was not as rapid, and I was able to set the IsoLoop® to the peak of the signals.

Rocking the coaxial switch between the old antenna and the IsoLoop® port, the IsoLoop® appeared to have the edge by two to four S-units. The signals that were running S6 on the old antenna were now closer to an S9. I was beginning to get the feel for this new combatant of the zoning ordinances.

## Ready To Go For A Spin

Well, "It's great as an SWL antenna, but how does it talk?" I connected an antenna tuner with a built-in SWR bridge to the line between the antenna and the coax-switch port. I was ready to test the antenna in the transmit mode, so I placed the 747 into the LSB mode and turned down

the power control. I set the antenna tuner to the "Direct" mode so that only the SWR/wattmeter portion would be used. The antenna-tuner portion was *not* active in the antenna system.

I peaked the IsoLoop® for maximum receive signal on 28.195. This is one of the HF spots I like to use, because we are allowed to run 1200 b/s on HF above 28 MHz. I use 1200 b/s a lot now that 10 meters is hot during the day and evening hours. I work a lot of 1200 b/s stations on 28.195 and 28.190, and I use the WW6L BBS and other BBSes on 28.180 and 28.185.

## Connected to OA4BR

Activity on 28.195 has diminished since the Conference node was removed, and I was surprised to see a familiar callsign of a friend near Lima, Peru. "Zip," OA4BR, and I have had QSOs here on 10 meters occasionally, and we recently spent some time in an eyeball QSO at the Orlando Hamcation. Our contacts on 10 meters were mostly through a node in south-east Arizona. For the moment I forgot that I was about to tune the rig into the IsoLoop® and began to concentrate on giving Zip a try.

There was a difference in the incoming signals that day, and the difference was I was seeing Zip direct. I quickly typed in the familiar connect request (C OA4BR)

and hit the enter key. Expecting the normal two or three tries before I would get the "Connected to OA4BR," I leaned back in the chair and took a sip of melted ice (tea-flavored water). I quickly set down the glass when the "Connected to OA4BR" popped onto the screen on the first try. Remember, I was connected to Zip directly, not through a node. Wow—really great! Was it conditions, or was it the antenna? It didn't matter. We were having fun batting it back and forth, discussing the Hamcation at Orlando.

It was not until we had concluded the QSO that I realized I'd been operating with the power control of the 747 turned down to (according to the wattmeter) below 20 watts. In other words, I was QSOing with Zip directly from the IsoLoop® with less than 20 watts. To say the least, I was and I continue to be impressed.

Saturday morning I had more good DX QSOs, some on 20 meters and more on 10 meters. I got in a few slow-scan pictures on 14.230, too. Time and again the IsoLoop® did a good job of working out.

My 747 is supposed to have an output somewhere near 100 watts, but it strains to make it to 80 watts on 10 meters. Therefore, I don't get too concerned when running the IsoLoop®, because it has a power rating of 150 watts. The antenna would probably handle more power on packet, as packet lengths are normally short in duration.

## A Radiating Antenna Tuner

I've long since retired the antenna tuner to the lower HF bands, and I let the IsoLoop® take care of any communications at the upper (14 MHz to 29.990 MHz) HF frequencies. I've used the IsoLoop® on every amateur band in the 14 MHz to 30 MHz spectrum, and I have yet to see the SWR move above 1.2:1.

It didn't take long to discover the manner in which the IsoLoop® functioned and to realize that it can be explained simply as a remote-controlled antenna tuner that radiates. The stepper motor controls the tuning of the IsoLoop® by driving a variable capacitor in the very high-Q tuning circuit located up at the antenna. The direction and speed of the capacitor is controlled by the control box at the operator position. Keeping all this in mind, this very high-Q tuning circuit could be the reason why this small antenna might appear to defy the laws of physics.

True, it is not a full-size, four-element beam with broad bandwidths, but it could very easily be the answer that many of us who are hampered by space and height restrictions are looking for.

The AEA IsoLoop® is priced at amateur net \$319.95. See your amateur equipment distributor, or contact AEA (Advanced Electronic Applications), Inc., 2006 196th Street SW, Lynnwood, WA 98036 (telephone 206-775-7373).



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