

# The L-400B Active Antenna

Contrary to what you might expect, bigger antennas are not always better—especially when it concerns longwave reception. In fact some of the best working antennas are rather small—take loops, ferrite rods and active antennas, for instance.

Many LF newcomers are reluctant to believe this. They start out using the longest wire antenna they can manage, and then wonder why the band is filled with constant buzzing and brutal static levels. At best they'll log a few local beacons and then conclude that the band is not worth further exploration.

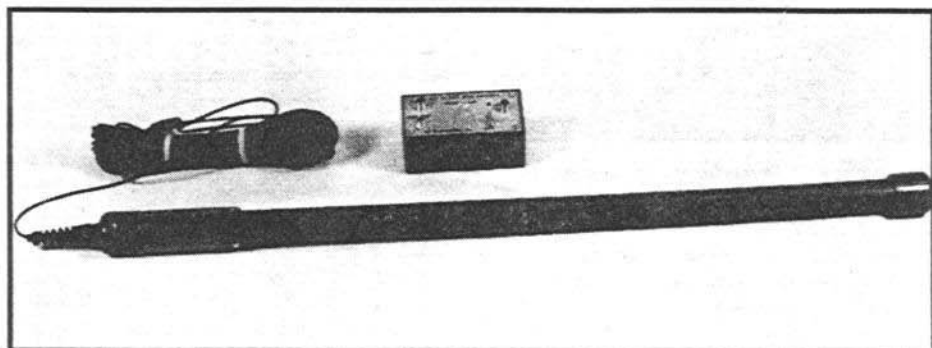
Active antennas are an excellent low noise alternative—especially ones that have been designed specifically for the frequencies below 500 kHz. While the usefulness of *short-wave* active antennas is still being debated within the hobby, active antennas have already proven themselves for LF work. I know several serious listeners who use *only* active antennas for their low band monitoring.

This month, we'll explore one currently popular active antenna—the L-400B offered by LF Engineering Company. I recently purchased one of these units because I needed something to cover the frequencies from 3 kHz to 100 kHz. I also wanted something that could be taken along for portable DXpeditions. What follows are my own experiences while installing and using the L-400B antenna.

Photo 1 shows the antenna system as received from the factory. It comes in two main sections—a waterproof 26" antenna probe (with coax cable permanently attached), and an indoor coupler box. The antenna probe contains the antenna element and amplifying circuitry, while the coupler box comprises the indoor portion of the system.

The coupler contains an on/off switch, power indicator light, and two RCA-style connectors for attaching the antenna and receiver cables. There is also a connector for external DC power which can be used in place of internal batteries, if desired.

Installation of the antenna was mostly a plug 'n play operation. The only hitch I had was getting the two 9-volt batteries into the coupler case. The instructions show a drawing with the batteries nestled side-by-side in the box, but when I tried to do this, I found that it was a very tight fit. It took a bit of effort to get them in correctly.



L-400B Active Antenna (courtesy of LF Engineering Co.)

## ■ Mounting the Antenna

It's been said many times before—Location is *everything* with an active antenna. This was definitely true with the L-400B. When I got the probe near the rain gutters or other antennas on my roof, LF signals be-

The L-400B comes with 50 feet of small diameter coaxial cable—more than enough for most installations. In my case, I only needed about 25 feet, so I coiled up the extra cable inside the radio room and secured it with a tie wrap. Coaxial loss is negligible at these low frequencies, so there was no point in trimming the cable to a shorter length. Besides, by keeping it long, I'm free to re-route the cable in the future, if necessary.

## ■ On the Air Performance

I tested the L-400B with a Drake R8 receiver, which has a provision for switching between two different antennas. I connected my 150 foot wire antenna to one port and the L-400B to the other. This made for an easy "A/B" comparison between the two.

I ran the test during daylight hours with 10 signals on the longwave band. The test frequencies ranged from 24 kHz to 400 kHz. (For frequencies below 100 kHz, I used an LF Engineering L-101 converter ahead of the Drake R8.)

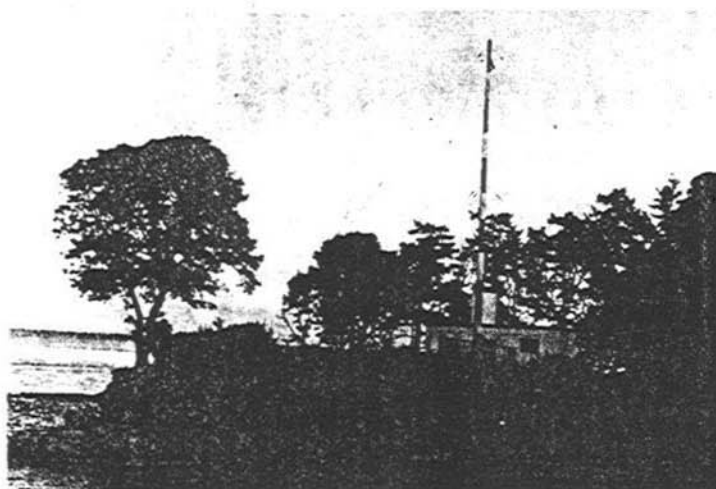
| TABLE 1<br>Signal Strength Comparison |             |                   |                       |
|---------------------------------------|-------------|-------------------|-----------------------|
| Station                               | Freq. (kHz) | 150' Wire Antenna | L-400B Active Antenna |
| NAA                                   | 24          | S9                | 10 dB over S9         |
| WWVB                                  | 60          | S5                | S8                    |
| CF                                    | 74          | S6                | S9                    |
| NSS                                   | 135         | S8                | 10 DB OVER S9         |
| TUK                                   | 194         | S4                | S7                    |
| SSN                                   | 208         | S6                | S9                    |
| R                                     | 317         | S8                | 5 dB over S9          |
| K                                     | 336         | S6                | S9                    |
| AVN                                   | 344         | 5 dB over S9      | 20 dB over S9         |
| RO                                    | 400         | S9                | 10 dB over S9         |

came much weaker.

Because of the antenna's portability, finding the right spot was not a big problem. I simply plugged the antenna into a portable receiver and scouted the roof until I found a suitable location which was 8 to 20 feet high as the instructions recommended.

Physical mounting of the antenna was also a simple process. The probe can be clamped directly to any vertical support, such as a metal pipe or wooden pole. Conveniently, the manufacturer includes a suitable clamp for mounting.

| TABLE 2<br>Specifications for the L-400B Active Antenna |                                  |
|---------------------------------------------------------|----------------------------------|
| Operating Frequency Range                               | 3 kHz to 530 kHz                 |
| DC Power Requirement                                    | two 9 volt batteries             |
| Antenna Probe Size                                      | 26 inches long, 1 inch dia.      |
| Antenna Coupler Size                                    | 4" x 2-1/8" x 1-5/8"             |
| Filter Rejection                                        | -52 dB at 680 kHz                |
| Lowpass Filter Response                                 | 10 kHz-500 kHz +/- 7 dB          |
| Output Impedance                                        | 50-100 Ohms                      |
| Internal Amplifier Gain                                 | 18 dB                            |
| Operating Temperature                                   | -25 to 120 degrees F             |
| Antenna Probe Waterproofing                             | Tested to 2 atmospheres (66 ft.) |
| Price Class:                                            | \$98.00 Postpaid N. America      |



A view of "AP" (378 kHz) at the Active Pass Light Station, British Columbia, Canada. (Photo by B. Cooley, Victoria, BC)

In all cases, the L-400B delivered higher signal levels and exhibited lower noise than the wire antenna. Table 1 shows how the signal strengths compared between the two antennas.

I experienced no broadcast band interference while using the active antenna despite living within 7 miles of a broadcast transmitter site. That is because the L-400B incorporates a lowpass filter that sharply attenuates all signals above 530 kHz. This is a feature you won't find in general coverage active antennas, such as those designed to work from 100 kHz to 30 MHz.

I have the misfortune of living less than 40 miles from a powerful LORAN site operating on 100 kHz, so signals from it are very strong. I did notice a few spots on the dial, particularly at 200 kHz (Loran's second har-

monic) where LORAN signals came sneaking through when using the active antenna. I don't fault the antenna for this, however. It is simply too much signal to expect an amplified system to handle without some overloading.

#### ■ Fine Points

There was just one disappointing thing I noticed with the L-400B and it didn't have anything to do with performance of the unit. On previous LFE products, I have been impressed with the quality of the front panel labeling. For example, on my L-101 converter the front panel is made of polished metal and the labeling is engraved into its surface, making for a very durable and professional appearance.

On the L-400B however, the coupler panel appears to have been spray painted gray with the lettering simply printed on top of that. The lettering is not nearly as clear as with the engraved process. A minor point, perhaps, but something that was immediately noticeable to me.

#### ■ The Bottom Line

If you're looking for a no-fuss, reliable

antenna with full longwave coverage, the L-400B is a solid choice. Mine has been in service for several months now and I'm still adding new signals to my logbook. I have been very pleased with the simplicity of operation and the fact that no tuning is required as you move across the band.

LF Engineering Co. offers a 90 day warranty on the materials and workmanship of each of its products. To get more information on the L-400B or other LFE products, you can write them for a free catalog at: 17 Jeffry Road, Dept. MT, East Haven, CT 06512.

#### ■ Longwave in the Pacific

Brock Whaley, WH6SZ, checked in via America Online with some loggings from his home in Hawaii. Brock reports that he is hearing ZBB (396 kHz) in Bimini, Bahamas, several Far East longwave broadcasters, numerous GWEN data bursts, and a few West Coast AM broadcast stations including KFAX (1100 kHz) and KTNQ (1020 kHz). He says the AMers start coming through about three hours before local sunset.

The next goal on Brock's list is to pull in TUK (194 kHz), the 4 kW powerhouse based in Nantucket, MA. He's had no luck so far but continues to wait for that magic moment to appear. His equipment line-up includes a Palomar loop, homebrew preamp, Sony 2010, and a classic Hammarlund HQ-140X.

As you explore the band this winter, be sure to share your loggings, photos and letters with *Below 500 kHz*. If you have Internet capability you can always reach me at my e-mail address: koc@mdsroc.com.

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**Note: Since this article, the coupler cabinet has been enlarged and the metal panel replaced with a glass epoxy fiber panel. - LFE 1/03**

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