

AOR LA400 and LA800 Loop Antennas

By Bob Grove W8JHD (All photos courtesy of author)

This month *Monitoring Times* takes a first look at two new AOR Active Antennas – the AOR LA400 and LA800 Loop Antennas.

Loop antennas are popular among serious AM band DXers and many shortwave broadcast listeners. Their sharp directivity allows them to be mounted in an orientation that minimizes interference, both from co-channel broadcasters as well as local electrical interference, and which favors desired signal bearings. Typical loops can be rotated to favor specific signal sources.

All receiving antennas can be subdivided into two classes, active and passive. Active antennas are equipped with amplification devices, while passive antennas depend entirely upon their hardware configuration for gain.

Among active antennas are simple whips with base-mounted preamplifiers like L&F Engineering's H800 and H900, and loops with integrated amplification like the AOR LA-400 and LA-800 reviewed in this article. Some models have remote tuning (like the two AOR



AOR LA400 Active Antenna Control Box – The control box has a front panel power switch, band switch, and fine tuning control. A BNC connector atop the case permits direct loop attachment or accommodation for a remote cable

units) while others are integrated with the loop mounted vertically on top of the tuner/amplifier box.

The advantage of the remote loop design is its ability to be positioned away from the listening position in a location of less interference and/or better signal pickup. The entire loop/control box assembly may be suspended from a glass window with a user-provided suction cup hook.

❖ AOR LA400 Active Loop Antenna

AOR recently released a new small footprint active antenna – the AOR LA-400 magnetic loop. The “magnetic” reference alludes to the fact that a radio wave is electromagnetic, possessing both electric (positive and negative voltages) as well as magnetic (north and south polarization) properties.

The wire loop of the LA-400 antenna is actually enclosed in an aluminum shield which prevents the intrusion of the electric component in the arriving wave front, but allows the ingress of the magnetic portion of the field. The major advantage of such field discrimination is its resistance to local noise interference which may be predominantly electric in nature.

❖ Let's Take a Look

The compact LA-400 is capable of receiving signals from 10 kHz through 500 MHz, a substantial bandwidth, indeed. It comes with about 3-1/2 feet of BNC/BNC coaxial cable to interconnect the control box with the receiver, handy for use with many new wide-frequency-coverage receivers which utilize BNC connec-

tors. If you're using a shortwave-only receiver, you'll probably need a BNC/PL-259 adapter. An AC wall adapter is provided to power the 20 dB amplifier.

The 12 inch loop is plugged directly into the top of the control box, but for remote mounting, the user may substitute up to 65 feet of coaxial cable to interconnect the loop with the control box. Such remote mounting will also require the short LAN control cable to be replaced by a longer cable.

The front panel sports a power switch, a rotary band switch, and a fine tuning control. Four positions of the band switch allow selection of frequency bands from 150 kHz to 30 MHz. A fifth position selects a broadband amplifier allowing un-tuned reception continuously from 10 kHz through at least 500 MHz.

❖ Now, Let's Try it Out!

With the LA-400 sitting on my radio bench, I plugged its output into my WiNRADiO G39DDCe wide coverage receiver. As with any indoor antenna, I knew this would not be an interference-free location.

Table One: LA400 Magnetic Loop Antenna Specifications

Frequency Range	10 kHz - 500 MHz
Unaligned Range	10 kHz - 150 kHz and 30 MHz - 500 MHz
Gain	20dB minimum
Operating Temperature	14 to 140 deg F
Power Requirements	9-15 VDC, 80mA @ 12VDC
Antenna Impedance	50 ohms
Sizes:	
Loop	12 inches (305mm diameter)
Loop Element	12-inches (W) x 14.4-inches (H) x 1.5-inches (D)
Control Box	4.6 inches (W) x 2.3-inches (H) x 4.4-inches (D)
All Assembled	11.8-inches (W) x 16.7-inches (H) x 4.43-inches (D)
Weight: Loop Element	7.7 ounces and Control Box 10.5 ounces
Supplied Accessories:	12-inch control cable (LAN type); AC power supply; BNC (F)/BNC (F) RG-58U coaxial cable (38-inch), and a printed user manual.

Note: LA400 is not intended for transmit purposes and is not waterproof (for indoor use only).

My first experiment was to test the directivity of the loop on local AM broadcasters. Selecting the broadband mode, the loop exhibited its expected bidirectional pattern from the lowest frequencies well into shortwave. Above that, the pattern becomes distorted with the loop finally behaving more like an omnidirectional whip



AOR LA400 Active Antenna Package Contents – The AOR LA400 comes with the remote-mountable loop, tunable preamplifier, AC wall adapter, BNC RF cable, LAN control cable, and operator's manual.

antenna at VHF and UHF.

Within the tunable range, the adjustable selectivity is quite sharp, an advantage to avoid receiver overloading from the amplified antenna, always a concern for multi-band portable radios with their notoriously limited dynamic range.

The claim of at least 20 dB gain holds true throughout the specified frequency range of the LA-400, and while the upper frequency limit is advertised as 500 MHz, we found the unit usable through at least 900 MHz in its passive (unamplified) state.

While the LA-400 certainly does work well as a desktop antenna, the abundance of interference emitters in a modern indoor environment would dictate moving the loop to a window sill or other less electrically-abusive location.

The AOR LA-400 (ANT75) active loop antenna is available for \$520 plus shipping and handling from Grove Enterprises.

❖ AOR LA800 Active Loop Antenna

While most other loops concentrate on one narrow portion of the radio spectrum, the new LA800 from AOR, like its LA400 cousin mentioned above, is also a very broadband device. Receiving signals over a large swath of spectrum from 10 kHz to 500+ MHz, it is especially suitable for the newer generation of wideband receivers with only one antenna input.

The loop is a husky 31.5 inches in diameter, constructed of inch-wide, thick walled aluminum pipe. But it's light weight, only three pounds including its secure, weather-tight, ABS plastic control box.



AOR LA800 Active Antenna Package Contents

The kit of materials as shown in the accompanying photos includes the loop and control box assembly, 33 feet of RG-58/U coax cable with BNC connectors, 33 feet of control cable, the amplified remote tuner unit, AC power supply, and two U-bolts for mounting the loop control box to a mast pipe.

❖ Operating the Unit

As with any outdoor antenna, it's best to secure this AOR loop to an outdoor pole away from electrical wires. Since the aluminum pipe



AOR LA800 Active Antenna on Pole

(actually a Faraday shield) permits only the magnetic field to reach the inner antenna wires, it is naturally resistant to local electrical interference.

The outdoor assembly is ruggedly constructed and resistant to a variety of hostile weather conditions including temperature (-18 to +140 degrees Fahrenheit).

Once operational, the loop should be turned in a direction which either rejects local electrical interference on the shortwave and medium wave broadcast-band frequencies or which favors the greater number of desired signals. Some listeners install their loops on a lightweight TV rotator to allow it to be remotely adjusted to face incoming signals from any direction.

Although the LA800 specifications show a 10 kHz to 500 MHz operational frequency range, like the LA400 we reviewed above, we found that our review sample worked well up to at least 900 MHz with only a small reduction in gain.



AOR LA800 Active Antenna Control Box

But the frequency-tunable preselector circuitry only works from 150 kHz to 30 MHz and it is razor sharp. Above and below that swath of spectrum, the assembly functions as a broadband preamplified antenna.

The loop directivity is confined to frequencies below about 30 MHz; much above that and it's omnidirectional, like a whip.

The integral 20 dB preamplifier is powered by 9-16 VDC as provided by the supplied AC wall adapter. Current drain is 14-100 mA depending on the band chosen.



AOR LA800 Active Antenna ABS Plastic Box with Top Element Circuitry

❖ A Word of Caution

A common mistake made by hams is to accidentally transmit when the active loop is connected to a transceiver. Even the briefest event can cook the preamp transistors. Such damage is most easily characterized by a distinct loss of signal strength across the entire spectrum. Naturally, this misuse is not covered under warranty.

❖ Let's Check it Out

With the loop dangling from my wife's porch plant hook, I connected the cable to a wide-frequency-coverage receiver. When the power pushbutton is pressed on the LA800 control unit, a blue pilot light is illuminated indicating successful power-up.

There is no gain control. A six-position switch determines the band to be monitored, and a rotatable control knob peaks the desired center frequency anywhere in the 150 kHz-30 MHz range. Tuning is razor sharp, requiring a delicate touch for exact setting.

I found reception to be very adequate on all bands. Even at the upper VHF/UHF ranges, performance compared very favorably to a dedicated, elevated VHF/UHF antenna.

Although the LA800 may seem pricey, you're paying for quality of construction, performance, and unusually wide frequency coverage.

The LA800 (DS-LA800) is available for \$770 plus shipping and handling from Grove Enterprises.

Table Two: LA800 Super Loop Antenna Specifications

Size	Loop Element 31.5-inches (W) x 38.1-inches (H) x 3.3-inches (D) and Control Box 4.7-inches (W) x 1.5-inches (H) x 4-inches (D), Loop size Diameter 30.7-inches (to the pipe center)
Frequency Range	10 kHz - 500 MHz; Aligned range 150 kHz - 30 MHz (Five band selectable) and Unaligned range 10 kHz - 150 kHz/30 MHz - 500 MHz
Weight (Approximate)	Loop Element 49.4 ounces (Excluding mount U-bolts) and control box 8.5 ounces
Total Gain	20dB minimum
Supplied accessories	AC power supply; control cable (LAN type) 35 feet; BNC (F)/BNC (F) RG-58U coaxial cable 35 feet; two U-bolts for mast-mounting, and a printed user manual.