



WiNRADiO AX-31B Planar Antenna

by Bob Grove

WiNRADiO, an Australian company famous for innovative computer-hosted receiving products, has just released their AX-31B active VHF/UHF antenna. Although designed primarily for their own receiver line, the antenna works just as well on any VHF/UHF scanner or other receiver. It is not capable of transmitting.

The planar (flat plate design) enables the 8.5" x 11.5" board to be hung on a wall, or even on a window. A six-foot length of RG-58/U cable terminated with a BNC connector leads the signals to a nearby radio.

Architecturally, the layout incorporates a log-periodic dipole array (LPDA) antenna design etched on both sides of a fiberglass circuit board; an integral, solid-state preamp is part of the same board. The antenna is impedance-matched to the input of the amplifier by an RF transformer.

Powered by the 9-volt battery, the amplifier's 25 mA current drain assures continuous operation of many hours before replacement is necessary; a super-bright LED will remind you that it's still turned on! A simple modification, the addition of a resistor, enables the antenna to be powered remotely from an AC adaptor through the coaxial cable.

Claiming a 230-1400 MHz frequency range, we discovered that the unit actually works quite well over a much wider swath of spectrum. Gain is advertised as 20 dB, dropping off as the unit is utilized outside its advertised bandwidth. Technically inclined readers will be relieved to know that the third order intercept point is a healthy 25 dBm, protecting it from generating intermod under most signal receiving conditions.

While the specs show an antenna forward gain of 6 dBi, the small dimensions of the LPDA elements limit its directional response to the higher end of its bandwidth. At lower frequencies it is essentially omnidirectional.

Since the AX-31B is not intended for outdoor use, it's only fair to compare it with other indoor antennas. We selected a Uniden BC3000XLT hand-held scanner, its factory rubber duckie antenna, and a Condor whip for our test. A synopsis of observations at my indoor location, along with an indication of the best antenna at each sample frequency(*), can be found in Table 1.

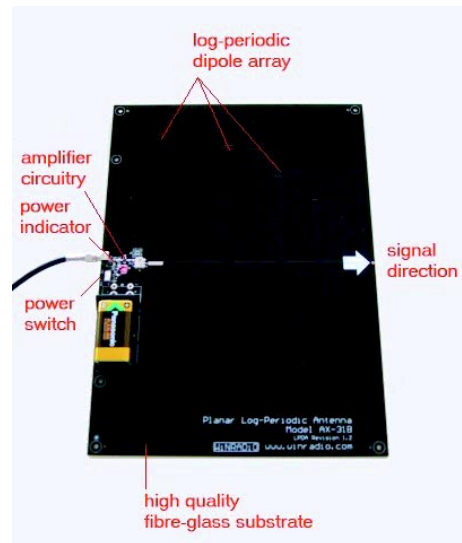
The Bottom Line:

We are eternally in search of the perfect antenna: small, wideband, potent, and immune to interference. It doesn't exist. Signal capture

is a function of element size and placement, and active (amplified) antennas require power, generate noise, and are subject to overload problems like intermodulation and desensitization.

But the AX-31B has its niche. Exhibiting decent gain, acceptable noise figure, and high overload immunity, it works well in the upper VHF/UHF land mobile frequencies, and its low profile invites unobtrusive placement next to a wall or window.

It can even be used in a pinch for upper shortwave frequencies – as low as 15-20 MHz



or so – but doesn't work much better than a few feet of wire randomly run around the room, and it is just as vulnerable to interior electrical interference from appliances, electronic accessories, and power lines.

Nonetheless, for the new genre of wideband scanners which tune down into the shortwave frequencies, the AX-31B offers significant improvement over the factory-supplied whip, and since those scanners commonly have just one antenna port, the AX-31B can be that one antenna.

While a good rubber duckie like the Condor may work just as well on some frequencies, it is not always convenient to set the radio where the whip works best. By experimentation, the AX-31B can be located at an optimum spot for reception and the cable run to the monitoring position.

There is no substitute for an efficient outdoor antenna. But there are cases where such

an installation is impractical or even impossible. Given its few limitations, the AX-31B is a welcome addition to the cadre of listening tools.

The AX-31B planar antenna is available for \$129.95 plus shipping from most WiNRADiO dealers, including Grove Enterprises for \$109.95 (PO Box 98, Brasstown, NC 28902; 1-800-438-8155 or visit <http://www.grove-ent.com>)

Table 1: A Comparison of Indoor Antennas

FREQ. MHZ	ORIGINAL WHIP	CONDORAX-31B
27.185 (CB)	Undetectable	Some signals *Much stronger
49.845 (Baby monitor)	Undetectable	Good, some hiss *Full quieting
88.1 (FM broadcast)	Trace	Good, some hiss *Full quieting
88.5 (FM broadcast)	Undetectable	Undetectable *Receivable
109.8 (Airport VOR)	(Equal)	
151.550 (VHF hi)	*Good, some hiss	*Good, some hiss Weaker
162.400 (NOAA weather)	Readable, hiss	*Full quieting *Full quieting
171.025 (IFLOWS)	Very weak	*Full quieting *Full quieting
407.225 (Mil trunking)	Very weak	Undetectable *Moderately strong
411.550 (Hydrotelemetry)	Strong, some hiss	Strong, some hiss *Full quieting
453.075 (UHF mobile)	Weak	Weak *Full quieting
462.750 (UHF mobile)	(Equal)	
475.050 (UHF carrier)	Undetectable	Undetectable *Receivable
499.750 (UHF TV)	Noisy	Noisy *Full quieting
855.7375 (UHF trunking)	(Equal)	
864.7375 (UHF trunking)	(Equal)	
996.000 (VOR)	(Equal)	
1090.000 (Aircraft DME)	Weak, receivable	*Receivable Undetectable

NOTE: Results will vary with signal direction and propagation, placement and polarization of the antenna, and location of the installation. Directivity is present at the higher frequencies only, becoming omnidirectional (nondirectional) lower, and will be influenced by nearby metal masses.