

## 6.2 User's Manual

The user's manual remains unchanged with the exception of the additional antenna documentation shown below. Please note the cautionary warnings on the second page.

## ZoomAir Antennas and Accessories

ZoomAir NICs (Network Interface Cards) are available with either an integrated antenna or with a connector for use with an external antenna. The PC Card (PCMCIA) and ISA models with the integrated antennas continue to be one of the most compact wireless LAN radio cards currently being offered for use in wireless networking at the unlicensed 2.4 GHz band. Now optimal range and data throughput performance can be further enhanced through the use of special ZoomAir NICs and a supporting line of application-specific external antenna options.

For non-ideal installations such as obstructed line of sight applications, the ZoomAir NICs with the **ZoomAir Dipole Antenna 98110-02** is recommended. This dipole antenna attaches directly to the ZoomAir card without the need for any cables. Its radiation pattern is omni-directional; i.e. it transmits and receives equally in all directions. It provides more uniform coverage and up to 30% greater operating distance compared to the ZoomAir NIC with an integrated antenna.

### ZoomAir 2.2 dBi Dipole Antenna 98110-02 Specifications:

Insert Picture	Frequency range	2.4-2.483 GHz
	Gain <sup>1</sup>	4 dBi
	Polarization	Linear <sup>2</sup>
	Nominal impedance	50 ohms
	Connector	Right angle reverse polarity SMA male (plug)
	Dimensions	3.25" length; 9/32" diameter
	Weight	< 0.5 oz

*Omni-Directional to 300 ft in a  
Typical Office Environment /  
1,000 ft Unobstructed Line of Sight*

Expanded Access Point coverage of improved omni-direction range can be achieved through the use of **ZoomAir Patch Antenna 98110-04**. Installation is simple through a 1-meter or 3-meter low loss cable and simple positional mounting (standard hardware). A 6-meter maximum recommended cable length is offered through the use an extension adapter.

### ZoomAir 4.0 dBi Omni-Directional Antenna 98110-04 Specifications:

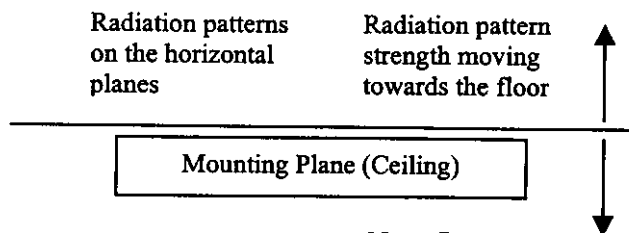
Insert Picture (top down view)	Frequency range	2.4-2.484 GHz
	Gain	2.2 dBic
	3 dBi beamwidth (elevation)	220° (typical)
	Polarization	Right-hand circular <sup>3</sup>
	Nominal impedance	50 ohms
	Connector	Reverse polarity SMA female (jack)
	Dimensions	3"W x 3"H x 1.5"D
	Weight	3.0 oz

*Omni-Directional to 450 ft in a  
Typical Office Environment /  
1,500 ft Unobstructed Line of Sight  
(tested with 3 meter cables)*

### Typical Electrical Performance

Azimuth<sup>4</sup> (Horizontal Pattern) at 0° Elevation:

Elevation (Vertical Pattern):



Note: Some upper floor coverage as well

Over 1-mile line of sight point-to-point connectivity between peer computers or between an Access Point and a single computer is easily accomplished with the **Zoom Air Directional Antenna 98110-13**. Again, installation is straightforward – position/mount the two antennas in a line of sight and connect to the respective ZoomAir NIC cards with one of the available cables.

**ZoomAir 13.0 dBi Directional Antenna 98110-13 Specifications:**

Insert Picture	Frequency range	2.3-2.500 GHz
	Gain	13 dBi
	Polarization	Linear
	Azimuth and elevation beamwidth	35°
	Nominal impedance	50 ohms
	Lightning protection	DC grounded
	Connector	Reverse polarity SMA female (jack)
	Dimensions	8.7"W x 7.9"H x 1.4"D
	Weight	0.77 lb

*~1 Mile Point-to-Point  
in an Unobstructed Line of Sight  
(tested with 3 meter cables)*

**Typical Electrical Performance**

Azimuth (Horizontal Pattern) at 0° Elevation:

**Antenna Products and Application Summary**

*Contact Your ZoomAir Dealer or Reference WWW.ZOOM.COM*

Model #	Antenna Product and Application
98110-02	<i>Spare:</i> 2.2 dBi dipole omni-directional antenna with SMA male/plug connector rated at 300ft coverage in a typical indoor office and over 1,000ft in an open environment
98110-04	4 dBic omni directional with SMA female/jack bulk head connector (for indoors) for improved indoor Access Point coverage or broad peer-to-peer connectivity (maximum recommended cable length is 6 meters)
98110-13	13 dBi directional patch antenna with SMA female/jack connector (for indoors or outdoors) for approximately 1-mile point-to-point connectivity; includes a universal (full adjustable) mounting bracket
22306	3-meter low-loss cable with SMA male/plug connectors (total loss of ~1.0 dB)
22305	1-meter low-loss cable with SMA male/plug connectors (total loss of ~0.5 dB)
TBD	Adapter for use in daisy chaining SMA male-to-SMA male/plug cables (~0.2 dB loss)
33006	<i>Spare:</i> ZoomAir NIC MMCX to SMA female/jack adapter

**Important Installation Note:**

ZoomAir and its resellers or distributors are not liable for injury, damage, or violation of government regulations, or state and local codes, associated with the installation and use of ZoomAir antenna products. Professional antenna installers are recommended if there are any questions, concerns, unknowns, or liability risk with the handling of these products.

**Caution:**

Due to the danger of electrocutions, do not allow antennas to come in contact with electric power lines or close to high voltage electric fields. To avoid any exposure to the radio frequency radiation, antennas should also be mounted to limit any user contact during operation. Finally, the following proximity limits should be met in order to stay within the acceptable FCC radio frequency exposure limits: 3.2cm for the dipole, 3.9cm for the omni-directional and 11 cm for the directional patch.

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- <sup>1</sup> Gain  $\equiv$  Decibel (dBi or dBic for circular) expression for the ratio of the radiation intensity in a given direction relative to a theoretical isotropic (omni-directional) radiator
  - <sup>2</sup> Polarization: Linear  $\equiv$  A pattern requiring antennas to be placed in the same orientation with close attention to polarization alignment angle (alignment should be within  $\pm 5^\circ$  for optimum performance).
  - <sup>3</sup> Polarization: Right-hand circular  $\equiv$  A pattern that reduces the effects of reflections in a typical indoor environment (best suited as an Access Point).
  - <sup>4</sup> Azimuth  $\equiv$  The radiation intensity pattern located in the horizontal plane.

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