intelligence **M** *everywhere*™

Getting Started with Motorola

WHiSP SM

Warranty Information

Motorola offers a warranty covering a period of one (1) year from the date of purchase by the retail customer. If a product is found defective during the warranty period, Motorola will repair or replace the product with the same or a similar model, which may be a reconditioned unit, without charge for parts or labor.

1. **Congratulations!**

> You have purchased a Motorola WHiSP radio, the latest innovation in
> high speed wireless networking. The Motorola WHiSP radio lets you
> easily network at high speeds with no wiring.

- Network speeds of 10baseT.
- Small compact design
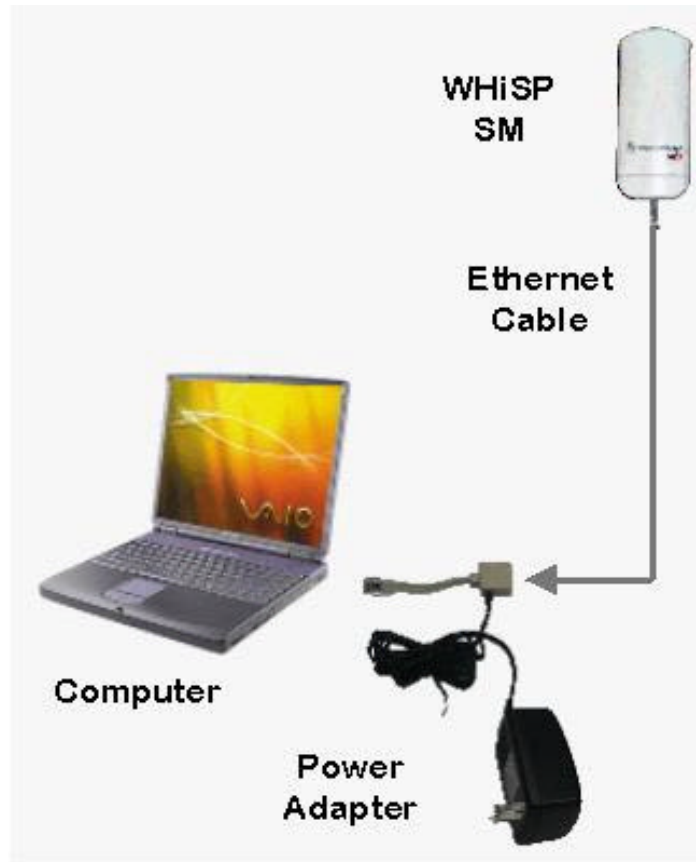- No special set up on your PC.

2. **Getting to Know your Radio.**

- The base cover snaps off the gain access to connectors and LED's.

WHiSP SM

**RJ45
Connector**

**Connection
LEDs**

Base Cover
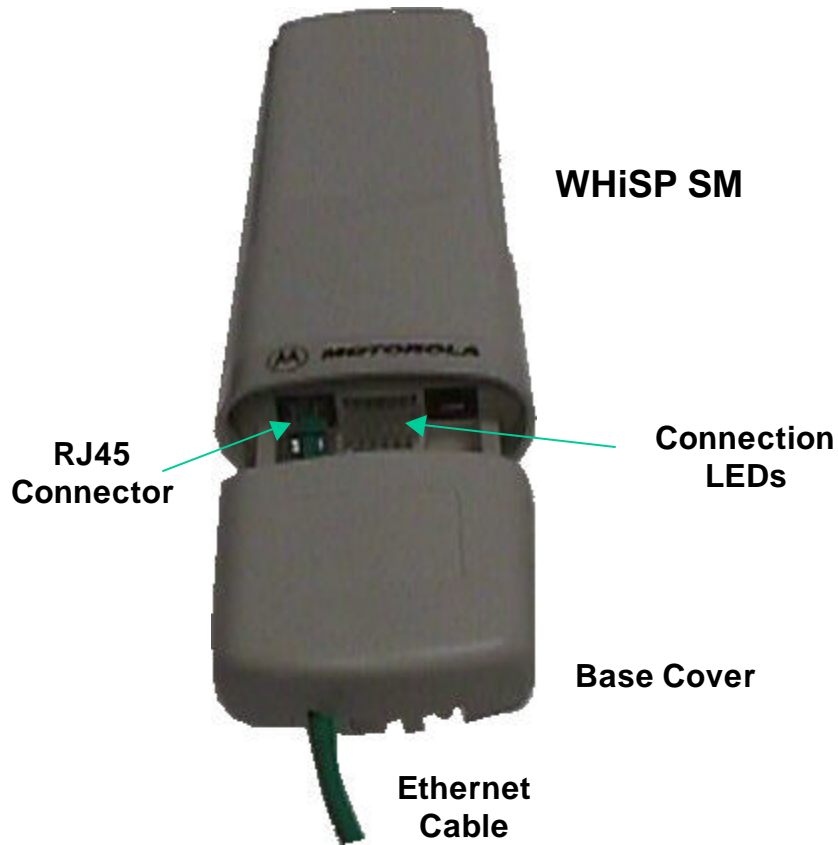
**Ethernet
Cable**

Installing WHiSP

Mount your WHiSP radio in a location where it is facing the transmitting tower

- Plug the power adapter's Ethernet patch into your PC Ethernet port.

- Connect an Ethernet cable between the other side of the power adapter Ethernet patch and the RJ45 socket on the WHiSP SM.

- See the section on "Aligning your WHiSP" in the trouble shooting section of this manual to insure best performance.

- IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the following antenna installation and device operating configurations must be satisfied. The antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Installers and end-users must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Configuring your computer

Your PC will not require any special setup beyond proper installation of Ethernet drives & drivers. Configuration of your computer's TCP/IP parameters will be specified by your ISP. However, you will need to temporarily configure your computer's TCP/IP parameters in order to configure your WHiSP radio.

Configuring your Windows 98 computer

These instructions are for Windows98 and presume you have already installed your Ethernet card or Network Interface Card (NIC), and have installed TCP/IP protocols. If these are not yet installed, they must be installed before proceeding.

To temporarily reconfigure your TCP/IP protocol to configure your WHiSP radio, first begin by RIGHT clicking on the Network Neighborhood icon on your desktop. A side menu appears, and you must LEFT click on the bottom item labeled "Properties".

Presuming your Network Interface Card (NIC) or Ethernet card is already installed along with the TCP/IP protocol, you will see both under the list of network components installed.

Click the TCP/IP protocol item in the component list to highlight it, and then click on the "Properties" button.

This will bring up the TCP/IP Properties screen shown next.
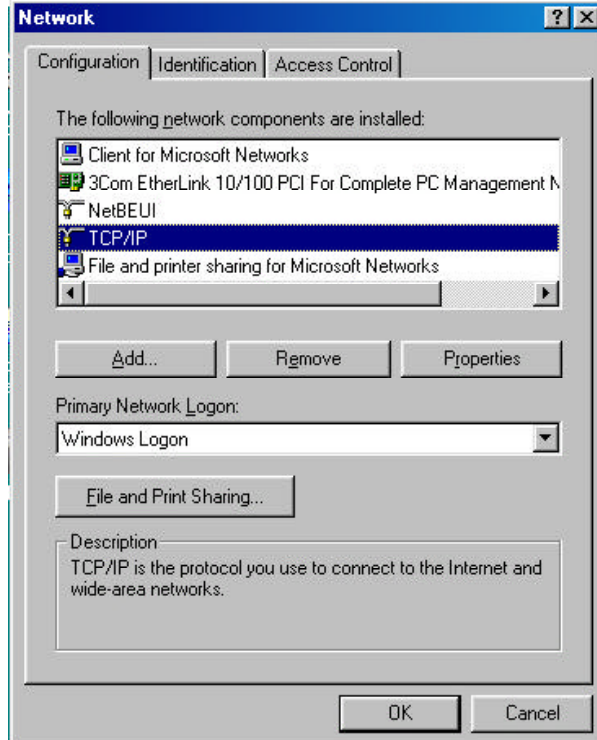
In order to configure your WHiSP radio, you must temporarily assign a fixed IP address to your computer.

Click the radial "Specify an IP address" so that a dot appears. Then you may enter a temporary IP address and subnet mask. Enter the IP address 192.168.100.4, and subnet mask 255.255.255.0.

You may then click OK, and OK again to the Network Properties dialog. Your computer will copy some Windows install files, and may ask for the Windows CD if Windows install files (called CAB files) were not copied to your hard drive at installation time.

Your computer will typically indicate that it needs to reboot before the settings take effect. You will need to reboot before proceeding to configure your WHiSP radio.
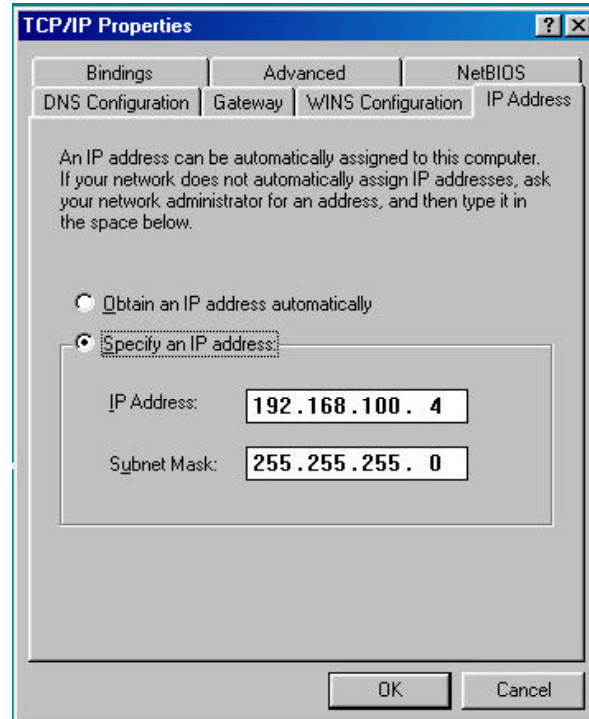
After configuring and alignment of your WHiSP radio, follow the service provider instructions for returning your TCP/IP properties to "**Obtain an IP address automatically**" or other "**specific IP address**" assigned value as instructed. Expect your system to reinstall files (or ask for the Windows CD if CAB files are not copied on your hard drive) and request reboot each time TCP/IP parameters are changed. You may return your TCP/IP parameters to the specific temporary IP address at any time to review or reconfigure your WHiSP radio.

Configuring your Windows 2000 computer

To temporarily reconfigure your TCP/IP protocol to configure your WHiSP radio, first begin by RIGHT clicking on the Network Neighborhood icon on your desktop. A side menu appears, and you must LEFT click on the bottom item labeled "Properties".
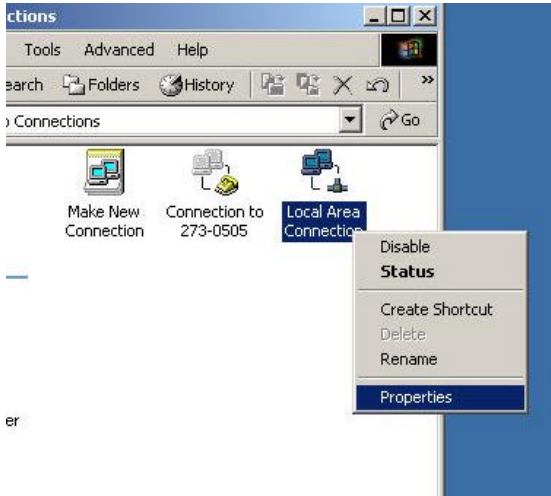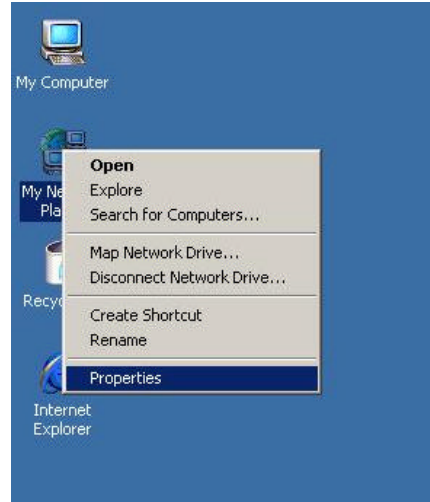
When you click properties a new window will come up, it will look something like this. When this window comes up, RIGHT click on the icon labeled Local Area Connection. Once again LEFT click the properties button that is on the very bottom of the box.

Presuming your Network Interface Card (NIC) or Ethernet card is already installed along with the TCP/IP protocol, you will see the card listed under the "Connect using" field, and the Internet Protocol (TCP/IP) under the list of components used by this connection.

Click the TCP/IP protocol item in the component list to highlight it, and then click on the "Properties" button.

This will bring up the TCP/IP Properties screen shown next.
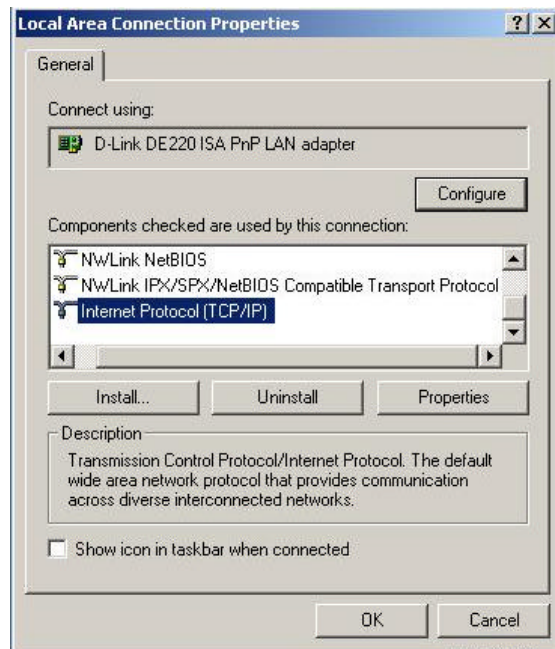
In order to configure your WHiSP radio, you must temporarily assign a fixed IP address to your computer.

Click the radial "Use the following IP address" so that a dot appears. Then you may enter a temporary IP address and subnet mask. Enter the IP address 192.168.100.4, and subnet mask 255.255.255.0.

Once you have entered the IP address and subnet mask, you may click the OK button, since you are using Windows 2000 you will not need to restart your computer.
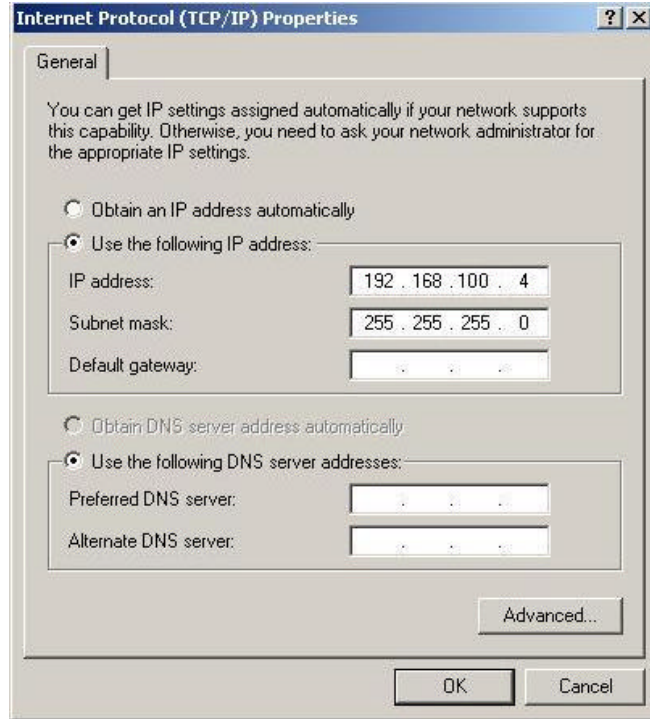
After configuring and alignment of your WHiSP radio, follow the service provider instructions for returning your TCP/IP properties to "**Obtain an IP address automatically**" or other "**specific IP address**" assigned value as instructed. Since you are using Windows 2000 you will not need to restart your computer. You may return your TCP/IP parameters to the specific temporary IP address at any time to review or reconfigure your WHiSP radio.
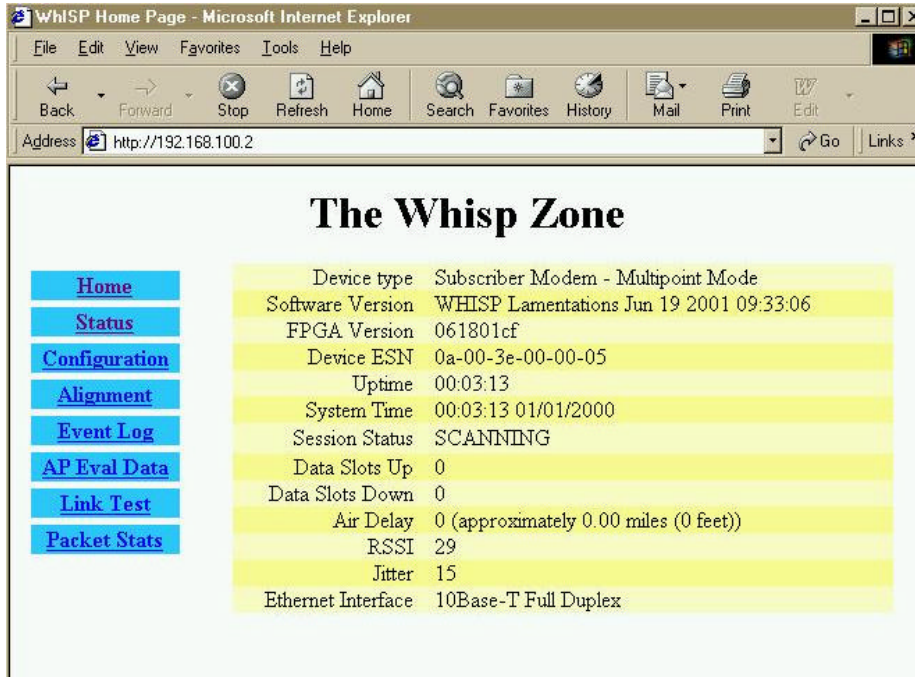
Configuring the WHiSP radio

Once your computer TCP/IP properties have temporarily been assigned a IP address 192.168.100.4, you may communicate with the WHiSP radio. Open your web browser (such as Microsoft Internet Explorer) and enter the radio default address: 192.168.100.1. If the WHiSP radio is powered and properly connected to your computer, you will see the WHiSP radio homepage or status page open in your web browser. These web pages are within the WHiSP radio, and no connection with the Internet is required. Various web pages within the WHiSP radio can be selected from the choices on the left.

Home
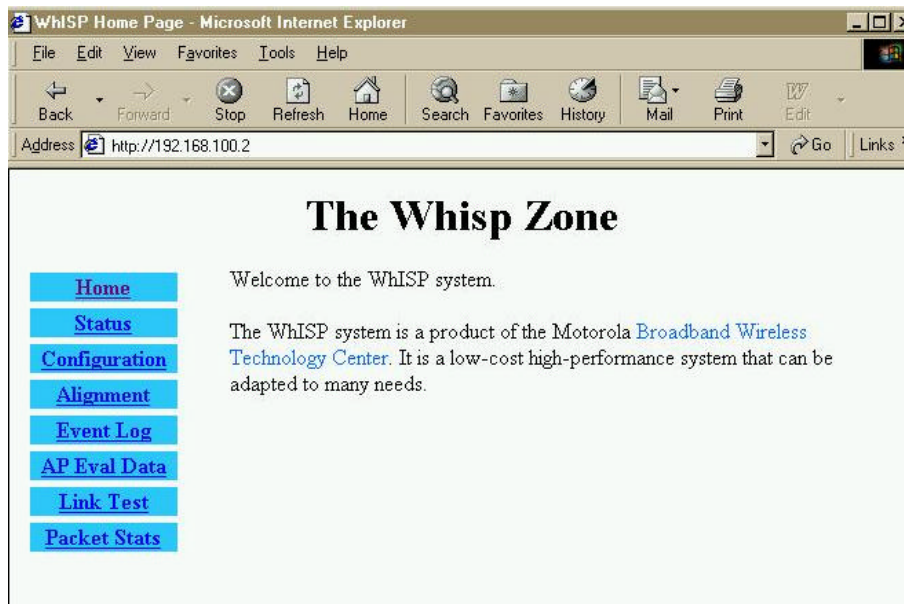
This is the WHiSP Zone **Home** page. You may select any of the other pages within the WHiSP radio, such as the **Status**, **Configuration**, **Alignment**, **Event Log**, **AP Eval Data**, **Link Test**, or **Packet Stats**.
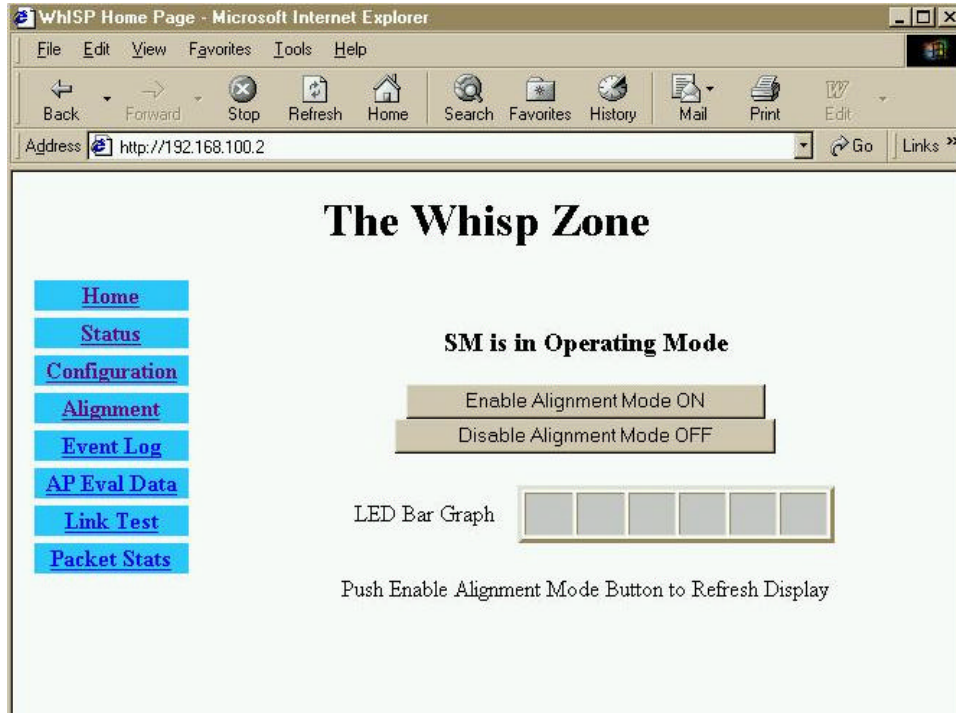
Status

| Device type	should read **Subscriber Modem – Multipoint Mode**. Any other label indicates an inappropriate preconfiguration of the WHiSP radio
Software Version	should be noted in the event you have technical difficulties and need to contact technical support
FPGA Version	should be noted in the event you have technical difficulties and need to contact technical support
Device ESN	is the Link Layer Ethernet Address assigned to your WHiSP radio. Every WHiSP radio, Ethernet card, or Network Interface Card (NIC) will have a unique number preconfigured
Uptime	is the length of time your WHiSP radio has been operating since power was last applied
System Time	is the time set by the wireless service provider
Session Status	Scanning/Registering/Registered/Aiming This information is for use of technical support
Data Slots Up	This information is for use of technical support
Data Slots Down	This information is for use of technical support
Air Delay	This information is for use of technical support
RSSI	This information is for use of technical support
Jitter	This information is for use of technical support
Ethernet Interface	10/100 Base T, either half or full Duplex This information is for use of technical support

Configuration
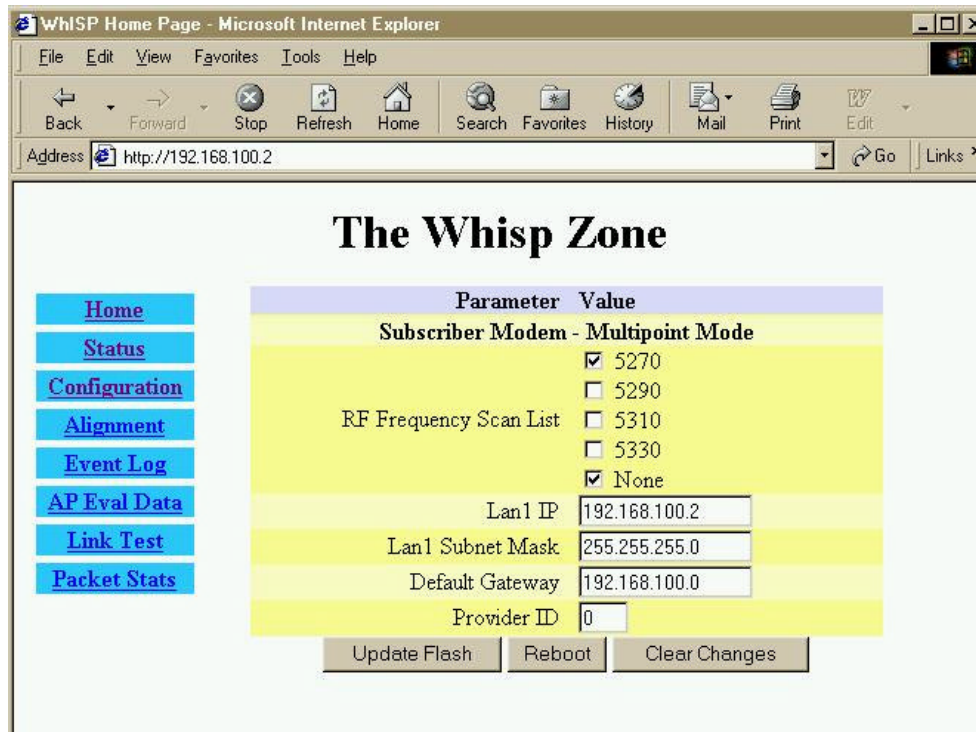
| Device type	The second line should read **Subscriber Modem – Multipoint Mode**. Any other label indicates an inappropriate preconfiguration of the WHiSP radio
RF Frequency Scan List	Check only RF Frequencies as instructed by your Wireless Internet Service Provider (ISP). Only check "**None"** should you be instructed by your service provider's technical support.
Lan1 IP	is preconfigured to the address **192.168.100.1** for all subscriber modems. Change this only at the instruction of your service provider's technical support.
Lan1 Subnet Mask	is preconfigured to the value **255.255.255.0** for all subscriber modems. Change this only at the instruction of your service provider's technical support.
Default Gateway	is preconfigured to the address **192.168.100.0** for all subscriber modems. Change this only at the instruction of your service provider's technical support. This may be password protected.
Provider ID	is the time set by the wireless service provider
Update Flash	overwrites configuration previously saved to the WHiSP radio. Changes will not take effect until the radio is power-cycled or rebooted.
Reboot	Initiates a radio reboot.
Data Slots Down	This information is for use of technical support
Clear Changes	Re-displays current configuration of WHiSP configuration.

Alignment
Normal Operating Display

Operating Mode	This will read **SM is in Operating Mode** or **SM is in Alignment Mode** as an indication of the currently selected mode.
Enable Alignment Mode ON	Click this button to put the radio into Alignment Mode, or to update the Alignment Mode bar graph (should it not automatically refresh every second).
Disable Alignment Mode OFF	Click this button to return the radio back to normal operating mode when alignment is satisfactory (aim the radio for maximum number of LEDs on the bar graph)
LED Bar Graph	Reflects the received signal strength from the service provider's access point. Proper alignment is when the bar graph shows the maximum number of lit LEDs. While in this mode, the LED bar graph can be observed on the radio itself, such that it is unnecessary to have visibility of the computer screen while orienting the WHiSP radio.

Alignment
Alignment Mode Display
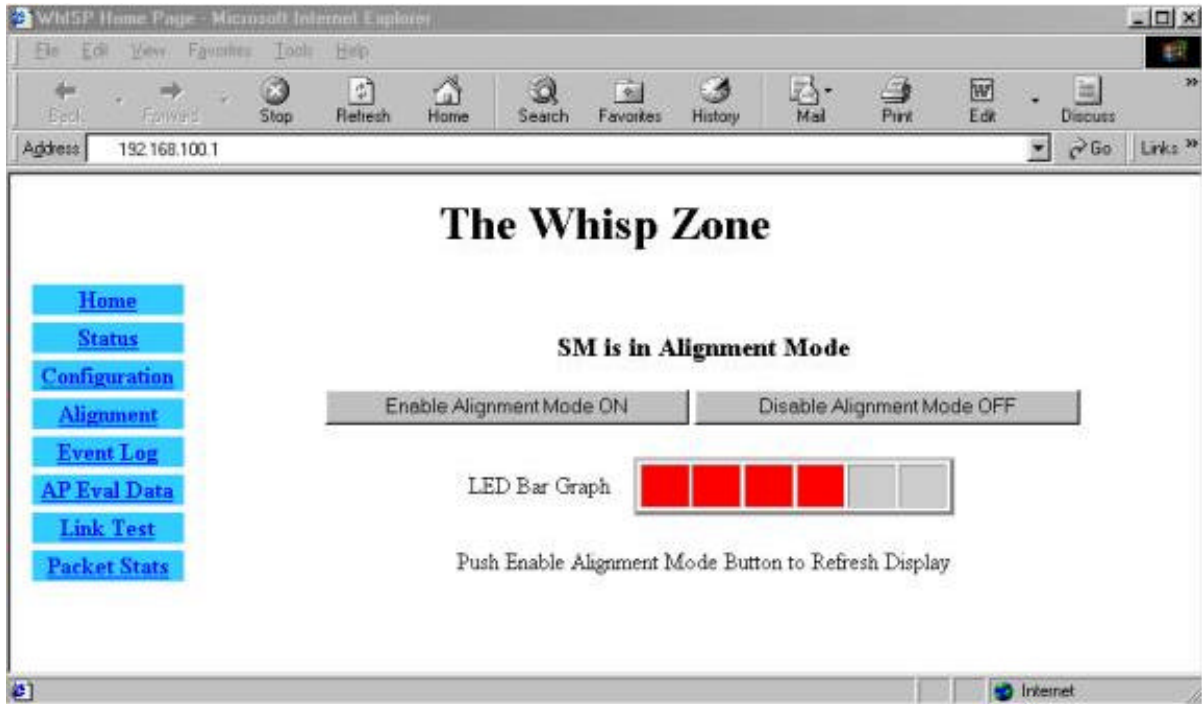
Select "Alignment" on the "WHiSP Zone" web page to obtain the alignment mode web page. Click "Enable Alignment Mode ON" to display a bar graph of signal strength. This will assist in adjusting the WHiSP radio for maximum alignment (maximum signal strength). While the LED bar graph appears on your PC screen, the LEDs located inside the WHiSP radio Base Cover will display the identical bar graph. Using either of these LED bar graphs orient the WHiSP radio to maximize the signal strength. When done, disable the alignment mode, by clicking on the "Disable Alignment Mode OFF" button on the WHiSP zone web control.
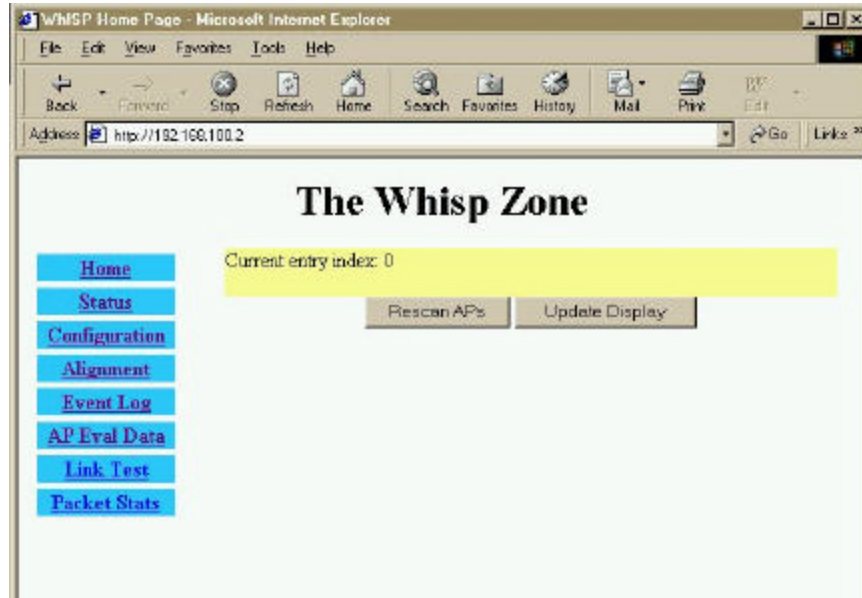
Event Log
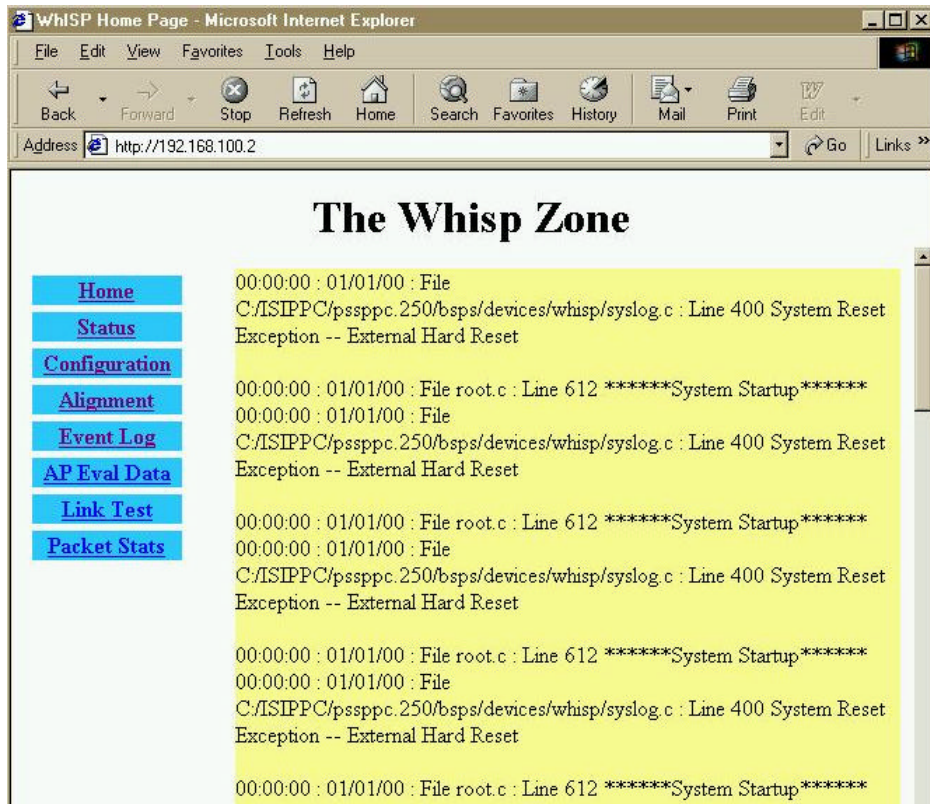
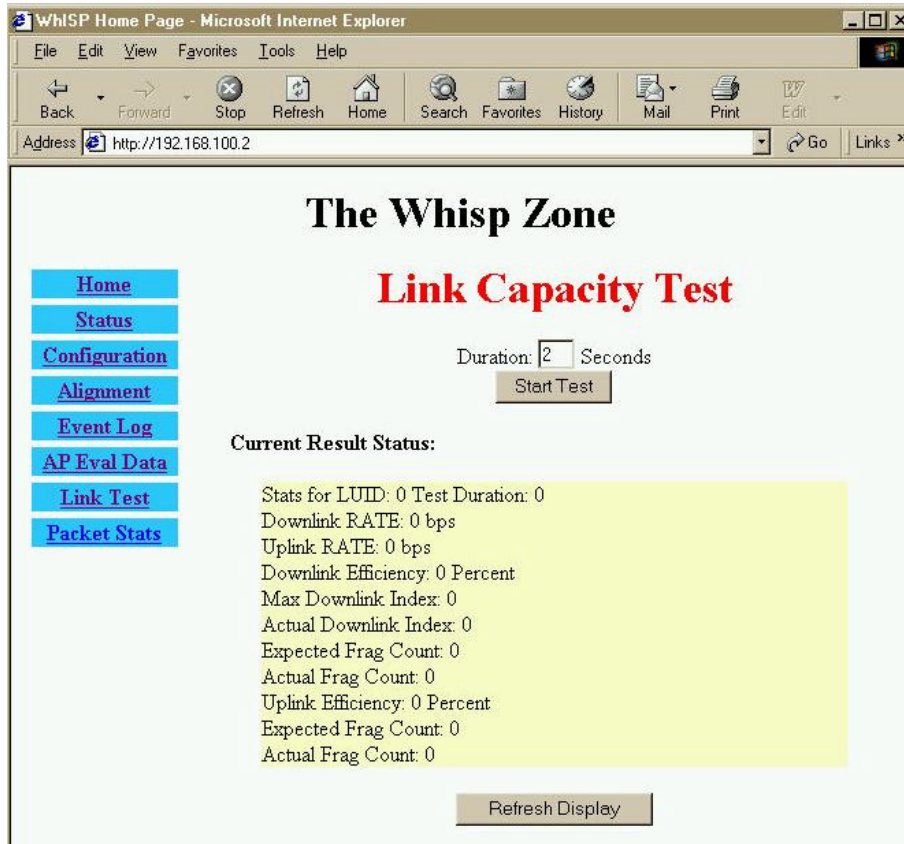Information on Event Log is for tech support personnel only.

The user should not clear this data unless instructed to do so by tech support personnel.

AP Eval Data

Information on AP Eval Data is for tech support personnel only.

Link Test

Information on Link Test is for tech support personnel only.

Packet Stats

Information on Packet Stats is for tech support personnel only.

Specifications

Operating Frequency Range
    U-NII Mid band   5.25 to 5.35 GHz

Access Method   TDD/TDMA

Data Rate
    Multipoint   10 Mbps

Modulation Type   High Index BFSK/4FSK
(Optimized for interference rejection)

Carrier to Interference (C/I)   3dB Ber $1*10^{-4}$

Receiver Sensitivity   -84dBm $1*10^{-4}$

Error Floor   Better than 10^{-9} BER, unfaded

Operating Range (All Weather)

                                 Up to 2 miles with integrated antenna

Transmitter Power   Meets FCC UNII ERP Limit

DC Power   24 VDC @ 0.3 Amp (active state)

Interface   10 Base-T, RJ45
Rate auto negotiated (802.3 compliant)

Protocols Used by WHiSP   IPV4, UDP, TCP, ICMP, Telnet, HTTP, FTP, SNMP

Protocols Supported by WHiSP   Switched Layer 2 Transport with support for all common Ethernet protocols including IPV6, NetBIOS, DHCP, IPX, etc.

Software Upgrade Path   Remotely downloaded into FLASH via RF link

Network Management   HTML, TELNET, SNMP

Environmental
    Wind   190 km/hr
    Humidity   Relative Humidity 95% at 35?C
    Temperature   -30? to +65? C

Physical
    Dimensions   8.5"H x 4.0"W x 1.1"D (21.6 cm x 10.2 cm x 2.8 cm)
    Weight   Approx 1 lb, 0.5 kg