RoamAbout Access Point
User's Guide

9032848

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Application of Council Directive(s):	**89/336/EEC** **73/23/EEC**
Manufacturer's Name:	**Cabletron Systems, Inc.**
Manufacturer's Address:	**35 Industrial Way** **PO Box 5005** **Rochester, NH 03867**
European Representative Name:	**Mr. J. Solari**
European Representative Address:	**Cabletron Systems Limited** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG13 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EC Directive 73/23/EEC** **EN 55022** **EN 50082-1** **EN 60950**
Equipment Type/Environment:	**Networking Equipment, for use in a Commercial or Light Industrial Environment.**

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

Manufacturer	Legal Representative in Europe
Mr. Ronald Fotino	Mr. J. Solari
Full Name	Full Name
Principal Compliance Engineer	Managing Director - E.M.E.A.
Title	Title
Rochester, NH, USA	Newbury, Berkshire, England
Location	Location

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World Wide Web	http://www.cabletron.com http://www.cabletron.com/wireless
Phone	(603) 332-9400
Internet mail	support@cabletron.com
FTP Login Password	ftp://ftp.cabletron.com/ *anonymous* *your email address*
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Before calling Cabletron Systems, have the following information ready:

- Your Cabletron Systems service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem.
- The serial and revision numbers of all involved Cabletron Systems products in the network
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)
- Any previous Return Material Authorization (RMA) numbers

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Preface

Overview

The RoamAbout Access Point™ is a 2-port transparent bridge that connects a wired Ethernet (ThinWire™ or 10BaseT) local area network (LAN) and a wireless LAN. The Personal Computer Memory Card International Association (PCMCIA) Type II interface in the Access Point supports the RoamAbout 802.11 PC Card Network Adapter™, a radio frequency device (also referred to herein as PC Card).

This manual describes how to install and configure RoamAbout Access Point. It also describes how to perform problem solving for problems that may arise during installation or operation.

Intended Audience

This manual is intended for the device installer and network manager. This manual assumes that you have a working knowledge of local area networking and bridging functions.

Terminology

The following terms are used throughout this manual. You should be familiar with these terms before you continue.

Term	Definition
RoamAbout Access Point	A 2-port transparent bridge that connects a wireless LAN to a wired Ethernet LAN.
RoamAbout PC Card Network Adapter	A PC Card network adapter, consisting of a radio module and a PC Card, that installs in a RoamAbout Access Point or laptop PC to provide wireless connectivity in a LAN environment. Also referred to in this manual as a network adapter.
wireless LAN	A collection of end-user systems connected together using a medium such as radio frequency or infrared technology.
PCMCIA	Personal Computer Memory Card International Association (PCMCIA), which is a standards body for the type of PC card used in the RoamAbout Access Point.
wireless client	Any portable computer such as a PC, laptop, notebook, or PDA that uses a wireless network adapter for LAN connectivity.
radio module	A wireless network adapter component that consists of an antenna and radio circuitry.
PC Card	A wireless network adapter component, using PCMCIA standards, that provides the digital interface between the host and the radio module.

Conventions

This manual uses the following conventions:

Convention	Meaning
`Courier type`	This special type indicates system output or user input.
[Return]	Refers to a key on the keyboard. For example, [Return] is the Return key and [Tab] indicates the Tab key.
Ctrl/*X*	Hold down the Control key and simultaneously press the key specified by X.
UPPERCASE	Uppercase letters in command lines indicate keywords that must be entered. You can enter keywords in either uppercase or lowercase.
Note	Provides special information about the current topic.

Associated Documents

The following document is available to help you install, operate, and better understand your RoamAbout Access Point:

RoamAbout IEEE DS/PC Card and ISA Adapter Card User's Guide

This manual explains how to install, configure, and troubleshoot the RoamAbout PC Card Network Adapter.

Chapter 1

Introducing RoamAbout Access Point

Overview

This chapter provides an overview of RoamAbout Access Point and its operation, and includes product specifications.

The RoamAbout Access Point (also referred to in this manual as Access Point or AP) connects a wireless client or desktop PC to a wired Ethernet Local Area Network (LAN). An example of a wireless client is a portable PC, such as a laptop or notebook computer. Typically, a single AP is used to enable several portable PCs (forming a wireless network) to connect to a wired Ethernet LAN.

The AP is a 2-port transparent bridge. One port connects the unit to an Ethernet LAN through a 10BaseT or ThinWire cable (or through a MultiSwitch 900 or DEChub 90 Ethernet backplane). The other port connects the unit to the wireless network through a RoamAbout PC Card Network Adapter (also referred to in this manual as a network adapter).

When equipped with the RoamAbout 802.11 Network Adapter, the AP is fully operational with any wireless client equipped with any 802.11-Compliant Direct Sequence (DS) PC Card or ISA network adapter.

The Access Point module is shown in **Figure 1-1**.

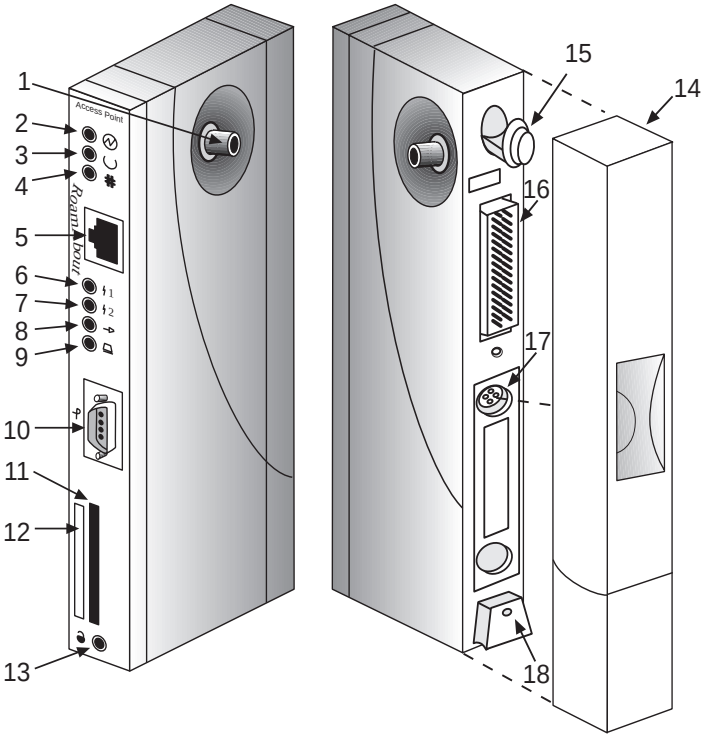
Summary of Access Point Features

The Access Point operates at the Data Link layer of the Open System Interconnection (OSI) model.

The Access Point has the following features:

- RoamAbout Access Point Management Software
- Wireless connectivity to your LAN using a RoamAbout 802.11 PC Card Network Adapter
- Allows wireless clients to roam from one wireless LAN into another wireless LAN without losing connectivity
- IEEE 802.11 Direct Sequence (DS) technology
- 8000 node forwarding address database
- ThinWire (10base2) and 10BaseT support
- SNMP manageability
- Local setup port manageability
- Software selectable full bridge, or workgroup bridge mode of operation
- Protocol independent bridging
- Source and destination address filtering
- Protocol filtering
- Redundancy through 802.1D Spanning Tree
- Configurable rate limiting for protocols and multicast addresses
- Default multicast rate limiting implemented from wire–to–wireless at 100 Kbps
- User-selectable enabling and disabling of default rate limiting
- Downline-load capability (for software upgrades and assigning IP addresses) using BOOTP and TFTP
- Standalone or mountable in a MultiSwitch 900 or DEChub 90
- Power-up diagnostics
- Multi-channel roaming
- RMON support

Figure 1-1: Front, Side, and Rear View of the Access Point™



The module contains the following external parts, LEDs, connectors, ports, and controls:

Item	Name	Description
1	Network Connector (BNC)	Connects the module to a ThinWire network. This connector is not used if the AP is connected to a 10BaseT network, or if the module is installed in a MultiSwitch 900 or DEChub 90.
2	Power OK LED	Lights (green) when the module has power.

Item	Name	Description
3	Module OK LED	Lights (green) when the module passes its power-up self-test. If the module fails the power-up self-test, the Module OK LED is off. If this LED is flashing, the Ethernet or wireless port (or both) has a fault, preventing connection to the network.
4	Wired LAN Activity LED	Indicates the status of the wired Ethernet segment. The LED lights (green) when packets are received on the Ethernet port and then forwarded to the wireless port or the AP's management software. Packets received and filtered are not shown. The LED also lights when the AP's management software transmits packets on the Ethernet port. The data traffic forwarded to the Ethernet port is not shown. The average brightness of the LED indicates the level of activity on the Ethernet port. If the LED is flashing together with the Bridge State LED (6), the Ethernet port has a fault that prevents the AP from establishing a connection to the network.
5	10BaseT Ethernet Connector	Connects the module to a 10BaseT network. This connector is not used if the AP is connected to a ThinWire network, or if the module is installed in a MultiSwitch 900 or DEChub 90.
6	Bridge State LED	Lights (green) when the AP is forwarding packets.
7	Access Point Saturated LED	Lights (yellow) when the AP is saturated. Saturation occurs when the AP cannot forward packets from the Ethernet to the wireless side due to the lower throughput of the wireless network. The degree of LED brightness indicates the level of saturation. The LED dims (and eventually extinguishes) as the network congestion is processed.

Item	Name	Description
8	Wireless LAN Activity LED 	Lights (green) when a PCMCIA network adapter is transmitting or receiving. Packets received and filtered are not shown. The average brightness of the LED indicates the level of activity on the wireless port. If the LED is flashing together with the Bridge State LED (6), the wireless port has a fault that prevents the AP from establishing a connection to the network.
9	PC Card Present LED 	Lights (green) when a RoamAbout PC Card network adapter is correctly installed at power-up.
10	Local Setup Port 	Used to access the AP's local setup utility. Also referred to as a console port.
11	PC Card Slot	Used for RoamAbout PC Card network adapters.
12	Ethernet Hardware Address	Unique physical address of the AP.
13	Reset Button 	Forces a downline load of the AP's software from a load host and resets the AP to its factory default settings.
14	Back Cover	Present on standalone units only. Covers the backplane connector and mounting assembly.
15	Locking Tab	Locks the module into a MultiSwitch 900 or DEChub 90.
16	48-Pin Backplane Connector	Provides network and power connections to the AP when it is installed in the MultiSwitch 900 or DEChub 90.
17	Power Supply Connector	Receives +5 Vdc from the AP's standalone power supply. Not used when the unit is installed in a MultiSwitch 900 or DEChub 90.
18	Mounting Tab	Secures the module to the backplane when the module is installed in a MultiSwitch 900 or DEChub 90.

Product Specifications

This section describes the physical, electrical, and environmental specifications of the Access Point.

Physical Specifications

Table 1-1 lists the physical specifications of the Access Point.

Table 1-1: Physical Specifications

Parameter Value	Value
Width	3.18 cm (1.25 in)
Height	27.31 cm (10.75 in)
Depth	13.34 cm (5.25 in)
Weight	0.68 kg (1.5 lb)

Electrical Specifications

Table 1-2 lists the electrical characteristics for the Access Point.

Table 1-2: Electrical Specifications

Voltage	Current (Amperes)	Power (Watts)
+5.0 V	1.2 A	6.0 W

Environmental Specifications

Table 1-3 lists the environmental specifications of the Access Point.

Table 1-3: Environmental Specifications

Parameter	Description
Operating Environment	
Temperature[1]	5°C to 50°C (41°F to 122°F)
Maximum rate of change	20°C/h (36°F/h)
Relative humidity	10% to 95% (noncondensing)
Wet-bulb temperature	32°C (90°F)
Altitude	Sea level to 2.4 km (8000 ft)
Air flow	Convection cooled
Nonoperating Environment	
Temperature	–40°C to 66°C (–40°F to 151°F)
Relative humidity	Up to 95% (noncondensing)
Altitude	Up to 4.9 km (16,000 ft)
Certifications	CE, CSA, FCC, TÜV, UL, VCCI

1. For sites above 4900 m (16,000 ft), decrease the operating temperature specification by 1.8° C for each 1000 m or 3.2°F for each 3200 ft.

Power Supply Specifications

Table 1-4 lists the electrical specifications of the AP's power supply.

Table 1-4: Power Supply Specifications

Parameter	Value
Input voltage	100 Vac to 240 Vac
Current at 120 V	0.25 A
Frequency	50 Hz to 60 Hz
Power consumption	16 W
Output voltage	5.1 Vdc
Output current (maximum)	1.8 A

Acoustical Specifications

Table 1-5 lists the acoustical specifications of the AP.

Table 1-5: Acoustical Specifications

Acoustics — Declared values per ISO 9296 and ISO 7779

Product	Sound Power Level L_{WAd}, B	Sound Pressure Level L_{pAm}, dBA (bystander positions)
	Idle/Operate	***Idle/Operate***
RoamAbout Access Point	No acoustic noise	No acoustic noise

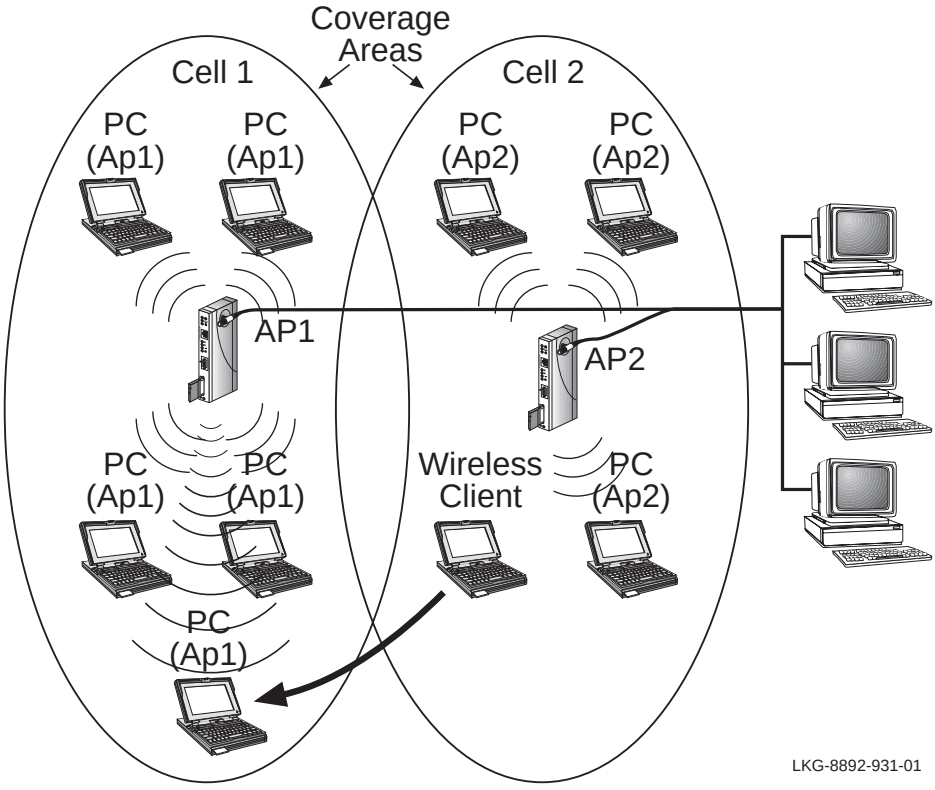
Schallemissionswerte — Werteangaben nach ISO 9296 und ISO 7779/DIN EN27779

Produkt	Schalleistungspegel L_{WAd}, B	Schalldruckpegel L_{pAm}, dBA (Zuschauerpositionen)
	Leerlauf/Betrieb	Leerlauf/Betrieb
RoamAbout Access Point	keine meßbaren Schallemissionen	keine meßbaren Schallemissionen

Roaming

The Access Point enables wireless clients to move from the coverage area of one AP into the coverage area of another AP while maintaining LAN connectivity. This capability is called *roaming*. **Figure 1-2** illustrates a wireless client roaming from one AP coverage area to another.

Figure 1-2: Roaming



In **Figure 1-2**, Cell 1 and Cell 2 share overlapping areas of coverage. As a wireless client moves from Cell 2 to Cell 1, the necessary infrastructure network information is passed from Access Point 2 (AP2) to AP1.

When a wireless client (such as the laptop computer in **Figure 1-2**) approaches the boundary of a coverage area, it enters a promiscuous mode. In this mode, the wireless client searches for a new AP that provides a better quality signal, resulting in more reliable data throughput.

Refer to **Chapter 4** for information about setting roaming parameters.

Access Point Bridging Services

The Access Point provides the following bridging services:

- Store-and-forward capability

  The AP receives, checks, and transmits frames to other LANs, enabling the configuration of extended LANs.

- Frame filtering based on address

  Using the address database and the source and destination addresses from incoming frames, the AP's forwarding and translating process module isolates the traffic that *should not be allowed* on other LANs. This action reduces the total data traffic on an extended LAN by not forwarding the packets that have local destination addresses or packets that are not allowed to be forwarded. This increases bandwidth efficiency.

- Data Link layer relay

  Operation at this layer makes the AP transparent to the protocols that use the LAN connectivity service. This protocol transparency is a key factor in the extended LAN service.

- Dynamic address learning

  The forwarding and translating process module automatically adds new source addresses to the address database while the AP is operating. This *reverse learning* of the address and port association allows automatic network configuration without prior downline loading of configuration data to the AP. Note that the address learning is protocol and management entity independent.

  How long an address remains in the database is determined by an "Aging Timer" that measures how much time has elapsed since data was last addressed to or from a particular node. The timer is set to either 2 minutes or 32 minutes, depending on whether the AP is operating in Full Bridge or Workgroup Bridge mode. If the timer lapses without any traffic, the node's address is removed from the database.

- Full Bridge mode

  When configured for Full Bridge mode, the AP learns addresses from both the wireless network and the wired Ethernet LAN. The AP filters packets based on their destination address and forwards all packets with unknown addresses. The default Aging Timer interval in Full Bridge mode is 2 minutes.

- Workgroup Bridge mode

  When configured for Workgroup Bridge mode (the default operating mode), the AP learns addresses only from the wireless side of the network. In this mode, the AP only forwards packets to multicast addresses, broadcast addresses, and known addresses on the wireless LAN. (Note that this mode helps reduce the amount of traffic to your wireless LAN.) The default Aging Timer interval in Workgroup Bridge mode is 32 minutes.

Configuring Your Access Point

The Access Point has a local setup port that enables you to configure and manage the AP. The local setup port interface allows you to:

- Change wireless parameters to suit your specific requirements
- Set up the AP for roaming and SNMP management.

The Access Point can also be configured using the RoamAbout Access Point Manager from any Windows 95™, Windows 98™, or Windows NT™ system. In addition, the AP also supports Simple Network Management Protocol (SNMP) through any standard Network Management Station (NMS) that supports SNMP, such as *clear*VISN.

Using the RoamAbout Access Point Manager, you can:

- Assign an IP address
- Use a single command to change parameters to *one*, *some*, or *all* access points
- Download future firmware releases to obtain the latest functionality.

The SNMP management capability enables you to manage standard SNMP MIB characteristics, such as protocol filtering and address filtering. To use SNMP management with the Access Point, you must obtain a valid IP address and configure the AP using either the local setup port interface, or by downloading an IP address using BOOTP.

Managing Your Access Point with SNMP

You can manage your Access Point using any SNMP-compliant Network Management Station (NMS). These NMS systems use the MIB objects to manage the system. The Access Point supports the following MIB objects:

- MIB II (RFC–1213)
- IETF Bridge MIB (RFC–1493)
- Ethernet MIB (RFC–1398)
- DEC ELAN Vendor MIB
- HUB PCOM MIB
- RoamAbout Access Point MIB
- 802.11 MIB

For details on the management features of each MIB, consult your NMS documentation.

To enable SNMP management for the AP, use the setup port utility or RoamAbout Access Point Manager, and perform the following tasks (described in **Description of Access Point Installation Menu Options on page 4-12**):

Step	Action
1	Set the in-band interface IP address of the AP.
2	Set the in-band interface default gateway address.
3	Optionally set the SNMP read/write community name (default is “public”).
4	Optionally add SNMP trap addresses.

The remaining chapters in this guide explain how to install, configure, and problem solve the Access Point.

Chapter 2

Preparing for the Installation

Overview

This chapter describes the contents of the shipment, discusses site verification information, and provides instructions for connecting a RoamAbout PC Card Network Adapter to the Access Point (AP).

NOTE

A RoamAbout DS-type PC Card Network Adapter (also referred to as a network adapter) is used in the examples in this chapter. Refer to your network adapter documentation for specific instructions on installing and configuring the network adapter.

Before installing the AP, you must complete the following tasks:

- Review the site preparation checklist (**Reviewing the Site Preparation Checklist on page 2-2**).
- Unpack the unit and check the contents of the shipment (**Unpacking and Checking the Contents of the Shipment on page 2-4**).
- Select the location to install the AP (**Selecting the Location for the Access Point on page 2-5**).

Reviewing the Site Preparation Checklist

Before you unpack and install the AP, review the following checklist to ensure that all site preparation tasks were completed.

General

√ Determine where you will install the AP. Ideally, the AP should be located as high as possible. For more information, refer to **Selecting the Location for the Access Point on page 2-5**.

Hardware

√ Ensure that the Ethernet LAN is in place and operable.

√ If you are installing the AP in a standalone configuration, locate the Ethernet interface device (for example, a ThinWire segment, DECconnect faceplate, or other appropriate network device) to which to connect the AP. Otherwise, if you are installing the AP in a MultiSwitch 900 or DEChub 90, ensure that the device is installed and operable.

√ If you are installing the AP in a standalone configuration, ensure that an appropriate ac power source is within 1.6 m (5.5 ft) of the AP.

√ Ensure that a setup port device (a terminal or PC with terminal emulation software) *or*, a PC to install the RoamAbout Access Point Management Software is available at the site for configuring the AP.

√ Ensure that network adapters are obtained for each portable PC.

NOTE

Computers equipped with RoamAbout ISA or PCI interface cards can also be used in your wireless LAN (either along with, or in place of, the wireless clients).

Electrical and Environmental Requirements

√ Ensure that the electrical and environmental requirements are within the ranges described in the Product Specifications section in **Chapter 1**.

Cabling Requirements

√ **For standalone and DEChub 90 AP configurations**: Ensure that you have two 9-pin DECconnect adapters (H8571–J) and an MMJ DECconnect BC16E cable for connecting the setup port device to the AP.

For MultiSwitch 900 configurations: Ensure that you have a 9-pin DECconnect adapter (H8571–J) and an MMJ DECconnect BN24H cable for connecting the setup port device to the MultiSwitch 900. If your local setup port device is a PC running terminal emulation software, you can use a 9-pin, D-Sub (PC-compatible) serial (null modem) cable.

√ For a standalone configuration, ensure that you have the appropriate types and lengths of cable for connecting the AP to the wired Ethernet. For a 10BaseT connection, use a BN26K cable. For a ThinWire connection, you need a BC16M cable, T-connector (H8223-00), and 50-ohm terminator (H8225-00).

NOTE

Refer to Appendix A for connector, cable and adapter pinout information.

For information on cabling and configuring Ethernet LANs and using DECconnect system products, refer to the *DECconnect System Planning and Configuration Guide*. This guide also provides ordering information.

Unpacking and Checking the Contents of the Shipment

Unpack the unit and check the shipment for damage or missing parts. The shipment includes the following:

- RoamAbout Access Point
- Power supply (included only with the standalone version of the AP)
- RoamAbout Access Point User's Guide
- RoamAbout Access Point Quick Start
- RoamAbout Access Point Management Software (on floppy).

If the AP module is damaged, immediately notify the delivery agent and your sales representative.

Selecting the Location for the Access Point

Before you install your Access Point, select the most appropriate location for the AP in your environment.

You can install the AP in a MultiSwitch 900 or DEChub 90, or mount the AP on a wall, ceiling, or cubicle partition. Ideally, the AP should be located so that a clear line of sight exists between the radio module component of the AP's network adapter and the radio modules on the wireless clients.

NOTE

Minimize the number of obstructions between the AP and the wireless clients it is communicating with. Obstructions, such as walls (especially those made of steel reinforced concrete or masonry), reduce the effective range of the radio transmissions from the network adapters.

To most effectively connect a wireless LAN, locate the AP so that it is centrally located within the group of wireless clients. This enables all wireless clients to be within the AP's coverage area.

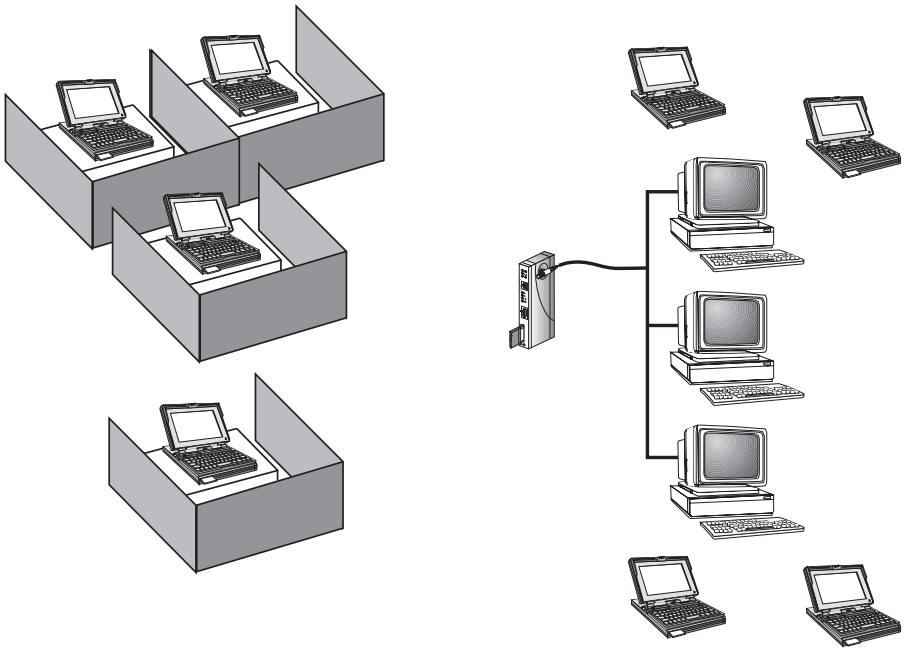
The size of the coverage area (in open air) is determined by the type of network adapter that you use with the AP and wireless client(s). For instance, the DS-type RoamAbout PC Card Network Adapter has an effective range of up to a 550-ft diameter area (in open air). All wireless clients must be within this coverage area to ensure that they can communicate with the AP. Walls, floors, office partitions, and other obstructions reduce the effective range of the wireless network adapters.

NOTE

Refer to the network adapter documentation for specific information about allowable distances.

Figure 2-1 shows a typical configuration using a centrally located, standalone Access Point.

Figure 2-1: Mounting the Access Point in a Central Location



LKG-8805-931-01

For some building designs, centralized mounting may not be practical. If permanent obstructions prevent you from centrally mounting the Access Point, mount it as high as possible.

Chapter 3

Installing Your Access Point

Overview

This chapter provides a step-by-step procedure to install the 802.11 RoamAbout PC Card Network Adapter (also referred to as a network adapter) and the Access Point.

NOTE

Before installing the AP, ensure that all the procedures in **Chapter 2** are completed.

Installing the AP involves the following tasks:

- Installing the network adapter into the AP
- Connecting the AP to the wired Ethernet, or inserting the module in a MultiSwitch 900 or DEChub 90
- Verifying the operation of the AP
- Setting the wireless parameters for the AP
- Verifying the communication link between the network adapters.

Installing the Network Adapter

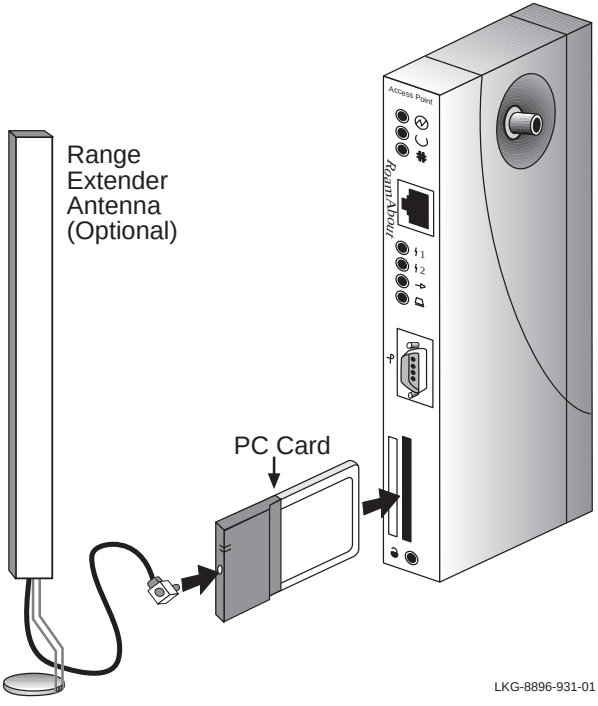
To install the network adapter, do the following:

NOTE

Do not try to insert or swap a PC Card in the AP if the AP power is on or the unit is installed into a MultiSwitch 900 or DEChub 90. Always unplug the AP from the power supply (or remove the AP from the MultiSwitch or DEChub) before inserting a PC Card.

Step	Action
1	Select the appropriate location for the installation of your AP.
2	With the logo on the PC Card facing the same direction as the AP's BNC connector, partially insert the PC Card into the AP's PC Card slot.

Figure 3-1: Installing the Network Adapter in the AP



Step	Action
3	Complete the PC Card insertion: • Gently push the PC Card into the slot until it is firmly seated. You will sense a slight resistance as you insert the PC card. • When properly inserted, the PC card protrudes approximately 1-1/2 inches from the AP.
4	Connect the optional Range Extender Antenna to the PC Card.

NOTE

For additional information about your network adapter, refer to the documentation associated with the network adapter.

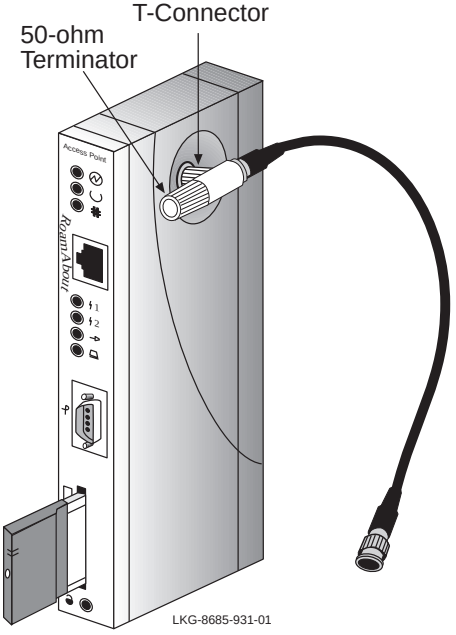
Installing the AP into a Standalone Configuration

This section describes how to install the AP as a standalone module.

Perform the following procedure to install the AP as a standalone module:

Step	Action
1	Select the appropriate location for the installation of your AP.
2	Connect the AP to the wired network using either the 10BaseT or ThinWire connectors, as follows: **To Connect to ThinWire Network —** As shown in **Figure 3-2**, connect a ThinWire cable, T-connector, and terminator to the BNC connector on the AP.

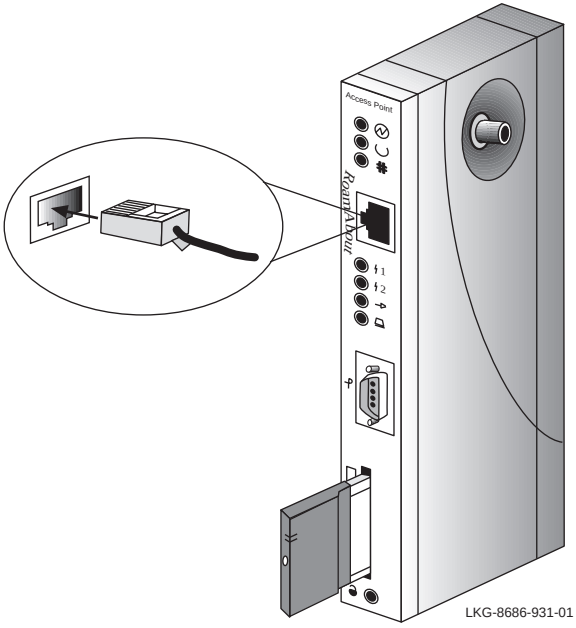
Figure 3-2: Connecting to a ThinWire Network



Step	Action

To connect to a 10BaseT Network — Connect the 10BaseT cable to the 10BaseT Ethernet connector, as shown in **Figure 3-3**.

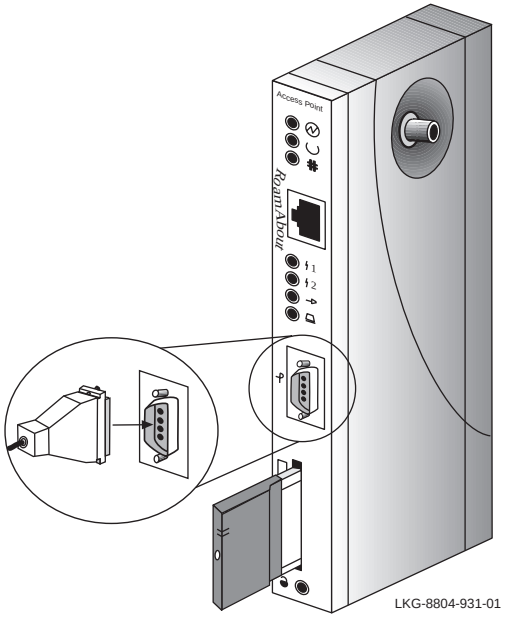
Figure 3-3: Connecting to a 10BaseT Network



3 Connect the other end of the ThinWire cable or 10BaseT cable to an active Ethernet outlet, such as a DECconnect faceplate or other appropriate network device.

Step	Action
4	Connect a 9-pin serial cable to the AP's 9-pin, D-Sub, PC-compatible serial port, as shown in **Figure 3-4**. Note: The pinouts for the AP's local setup connector are listed in **Appendix A**.

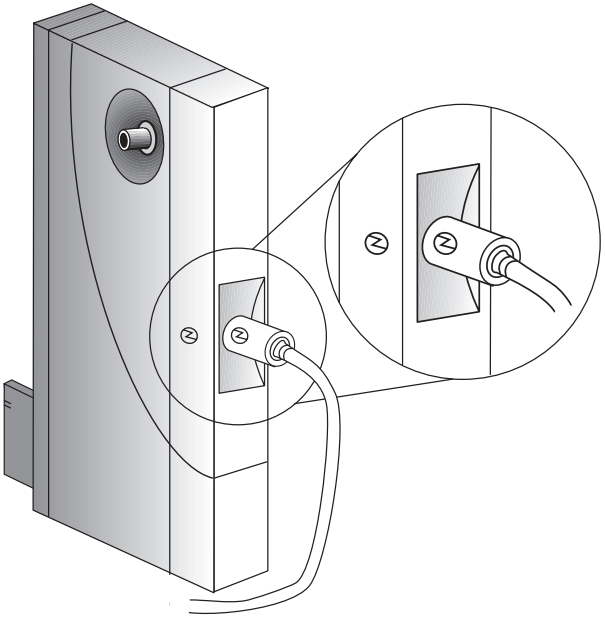
Figure 3-4: Connecting to the Setup Port



5	Connect the AP's power supply cable to the power connector on the back panel of the module, as shown in **Figure 3-5**. Note: The PC Card be inserted before applying power to the AP, as described in **Chapter 2**. Do not try to insert or swap a PC Card in the AP after connecting the AP's power supply to an AC outlet.

Step	Action
6	Connect the power supply to an AC outlet to turn on the AP.

Figure 3-5: Connecting the Power Supply Cable



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Installing the AP into a MultiSwitch 900 or DEChub 90

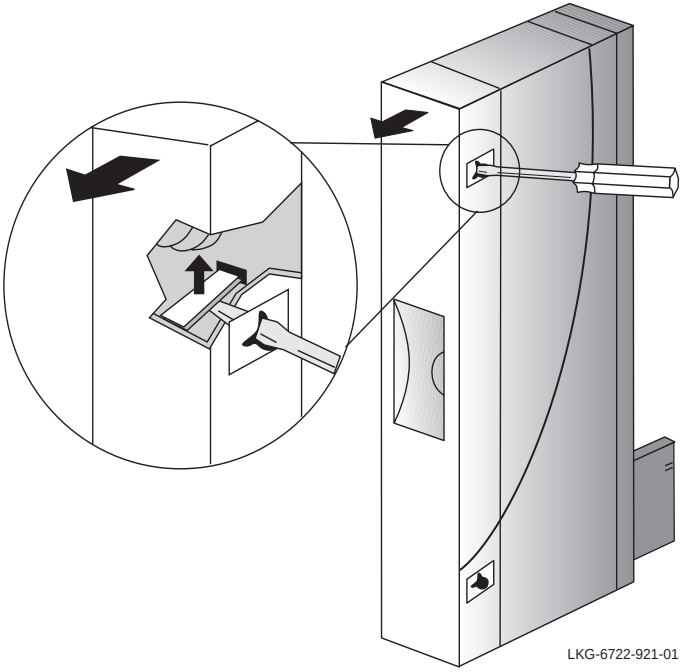
This section describes how to install the unit in a MultiSwitch 900 or DEChub 90.

Removing the Back Cover

If there is a cover on the back of the AP, you must remove it before inserting the AP into the backplane. Perform the following steps to remove the back cover:

Step	Action
1	Lift up the latch on the back cover by inserting a flat-blade screwdriver into the top mounting hole, as shown in **Figure 3-6**.

Figure 3-6: Removing the Back Cover



2	With the latch up, pull the top of the back cover away, pivoting at the bottom of the module.

Seating the Module in the MultiSwitch 900 or DEChub 90

The hot-swap feature allows you to install the module in the MultiSwitch 900 or DEChub 90 without turning off power. Seating the module initiates the power-up sequence.

NOTE

Do not try to insert a PC Card into the AP while the AP is powered on. Refer to **Chapter 2** for instructions on how to insert the PC Card.

Always remove the AP from the MultiSwitch 900 or DEChub 90 before swapping a PC Card.

Perform the following steps to install the AP in the MultiSwitch 900 or DEChub 90:

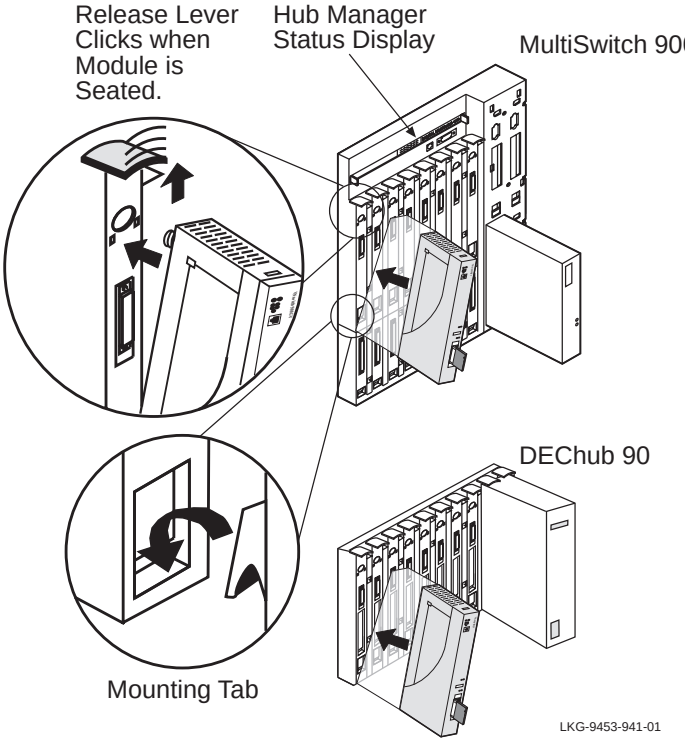
NOTE

When installing the AP into a DEChub 90, you must connect the setup port device to the setup port before applying power to the AP.

Step	Action
1	Place the module's mounting tab into the first mounting slot on the MultiSwitch 900 or DEChub 90, as shown in **Figure 3-7**.
2	Pivot the module on the mounting tab and align the connectors.
3	Firmly push the module onto the backplane connectors until the release lever clicks.
4	Press down on the release lever to ensure that it is locked.

Step	Action
5	Secure the radio module to its mounting point, using the mounting material enclosed in the wireless network adapter kit. For information on how to secure and mount the RoamAbout PC Card Network Adapter, refer to the *IEEE 802.11 PC/ISA Card User's Guide*.

Figure 3-7: Installing into a MultiSwitch 900 or DEChub 90

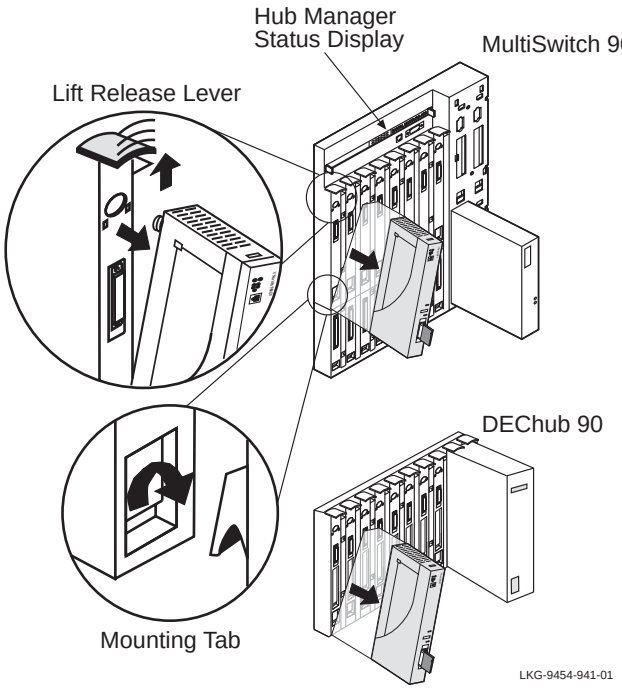


Removing the Module from the MultiSwitch 900 or DEChub 90

Perform the following procedure to remove the unit:

Step	Action
1	Lift the release lever located on the top of the MultiSwitch 900 slot or the DEChub 90 slot, as illustrated in **Figure 3-8**.
2	Pivot the module back on its bottom mounting tab, and disengage the module from the backplane.

Figure 3-8: Removing from a MultiSwitch 900 or DEChub 90



Verifying the Operation of Your Access Point

The Access Point runs a series of self-tests on power-up and reports status using its LEDs.

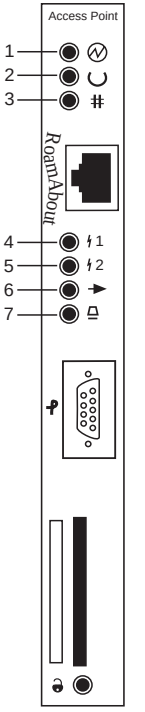
When power-up begins, the following occurs:

Stage	Description
1	The firmware begins running diagnostics, initializes minimal hardware, then sequentially turns LEDs 2 through 6 on and off.
2	After LED 6 turns on and then turns off, the firmware completes its diagnostics and hardware initialization. During this portion of the diagnostics and hardware initialization, LEDs 2 through 7 flash on and then off.
3	The diagnostics then checks to see if a PC Card is properly inserted in the AP. If a card is present, LED 7 lights.

The diagnostics take approximately 10 seconds to complete after power-up. Upon successful completion of the diagnostics, the LED pattern shown in **Figure 3-9** is displayed.

If the unit fails to display the proper LED pattern, verify that you have correctly installed the module according to the instructions in this chapter. If the unit still fails to display the LED pattern shown in **Figure 3-9**, refer to **Chapter 5**.

Figure 3-9: Normal LED Pattern



Item	LED Name	Operational State
1	Power OK	On = power is okay
2	Module OK	On = self-test passed
3	Wired LAN	OK Blinking = network connection
4	Bridge State	On = lights after 30 seconds indicating that the AP is forwarding packets
5	AP Saturated	Off
6	Wireless LAN Activity	Blinking
7	PC Card Present	On = PC Card is installed

Setting the PC Card Parameters

The AP us shipped with default values that allow wireless clients to connect with default settings.

To change these parameters, use the local setup port, or the RoamAbout Access Point Manager described in **Chapter 4**. **Chapter 4** also provides instructions for specifying the AP's SNMP management parameters.

Verifying the Communication Link Between the Network Adapters

The RoamAbout PC Card Network Adapter diskette includes diagnostic utilities that allow you to verify the communications path between network adapters in the wireless LAN. You can run the diagnostic utilities on any wireless station that is within range of the AP.

Refer to the *IEEE 802.11 PC/ISA Card User's Guide* for details about the available diagnostic utilities.

Chapter 4

Configuring Your Access Point

Overview

This chapter describes how to configure your Access Point *locally* from a setup port, or *remotely* from the RoamAbout Access Point Manager or from a Network Management Station (NMS). You can configure the Access Point (AP) in two ways:

- Locally via the Access Point setup port utility

  Local setup port commands allow you to configure the AP using a setup port device (a terminal or personal computer running terminal emulation software).

- Remotely using the RoamAbout Access Point Manager, ClearVISN, or any SNMP management from a Network Management Station (NMS)

  You can use any SNMP-compliant NMS to perform in-band management of the AP. For information about how your NMS performs these functions, refer to the documentation for your specific management station.

Configuring the AP Using the RoamAbout Access Point Manager

The RoamAbout Access Point Manager provides easy setup and software management of RoamAbout wireless networks. This application can assist a user in two ways: as a setup/configuration tool for new RoamAbout Access Points, and as a management tool to assist the ongoing management and support of RoamAbout wireless networks.

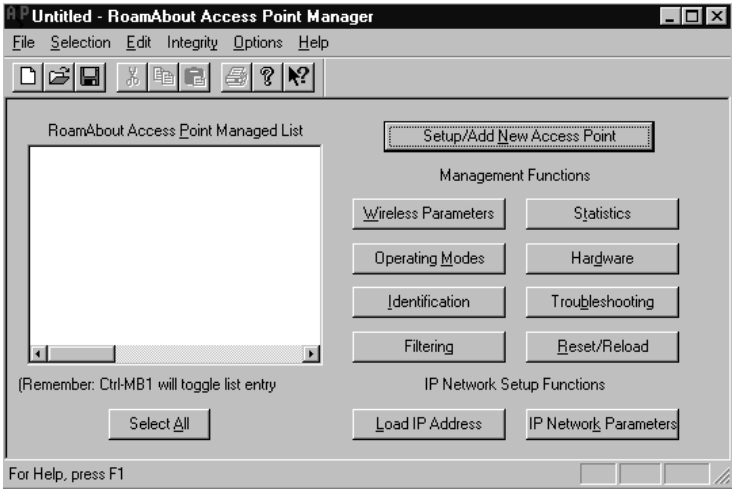
The RoamAbout Configurator has the following features:

- The ability to manage RoamAbout Access Points remotely, without a console.
- The ability to make parameters changes on multiple RoamAbout Access Points in a wireless network with a single command.
- Built in integrity checking for many wireless parameter changes. This will warn the user if a common wireless network management mistakes is about to be made, or if the operation requested is unusual and usually not recommended.
- Integrity checking of an existing wireless network configuration for consistent settings and common management errors.
- Improved wireless network performance through easy packet filtering and recommended filter settings.
- Integrated with a BootP/TFTP application for simple Access Point software upgrades, also called flash upgrades.
- Support for 802.11 radio technology as well as the earlier versions of the RoamAbout Direct Sequence (DS) and Frequency Hopping (FH) products.

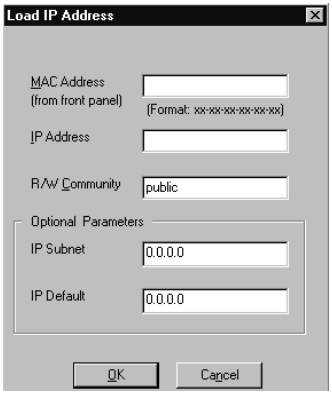
Installation and Setup

To install the Roamabout Access Point Manager, install the floppy disk (disk 1 of 2) in the PC and run **A:SETUP** (this can be done from the Windows Explorer, DOS prompt or via the Start Bar Run option). This software can only be run on Windows 95, Windows 98 and Windows NT V4.0. This software can also be run on either a wired PC or a wireless PC. NOTE: If running it on a wireless PC, you can not upgrade the firmware on the RoamAbout Access Point that you are connected to.

The Setup utility will add a program group to the Start Bar / Programs area with the name RoamAbout. Under RoamAbout you will have a new program called "RoamAbout Access Point Manager". When you select this, the program will start with the following screen.

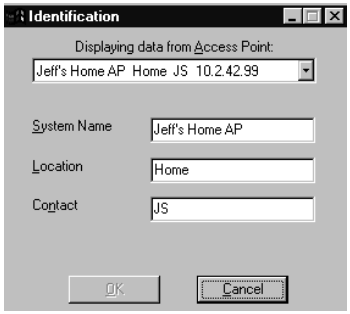


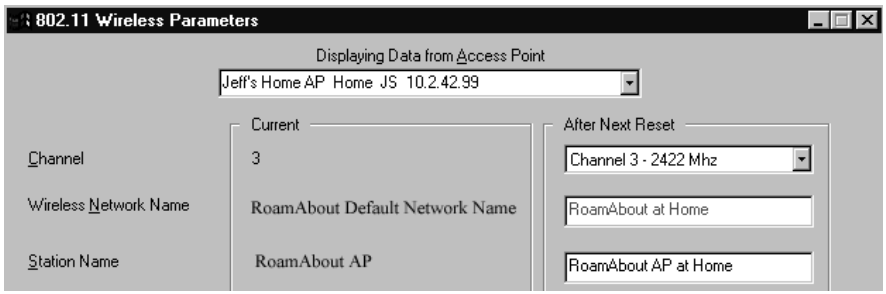
You can add new APs by selecting the 'Setup/Add New Access Point' button. At this point you will be prompted to add a new AP with or without a set IP address. If the AP already has an IP address set, select NO, but if you need to set an IP address on the AP select YES and fill in the required information.



When you first establish communications with the AP, you will be prompted for some general information and then prompted for your wireless parameters. It is highly recommended that you change the 'Wireless Network Name' from the default. ALL APs and clients on the LAN *must* share the same 'Wireless Network Name'.

The figures below show the Wireless Network Name and the Station Name being changed. These changes will take effect after the next AP reset. To reset the AP, select 'Reset/Reload' from the AP Manager and then select 'Reset with Current Settings'.





You can continue at add all your APs within a wireless domain (defined by the same Wireless Network Name) so that they all show up in one Managed List for future changes. Before you EXIT, make sure to save your configuration (you will be prompted). If you are managing APs in multiple domains (different Wireless Network Names) you should save these APs in a separate file name.

Other management functions you can perform from this utility include: basic protocol filters, looking at AP statistics, looking at AP hardware (version numbers, MAC addresses, amount of memory, and card type), troubleshooting (last 4 error messages), and resetting the AP.

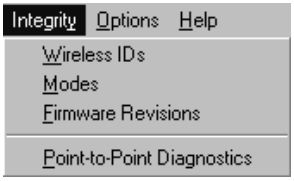
You can do one of three types of resets:

- Reset with current defaults, after changing a parameters.
- Reset with Factory Defaults, if you want to reset all parameters. Note: This also clears out the IP address.
- Upgrade the Flash Memory, by selecting this option if a new version of the AP code becomes available. For minor software upgrades, all your prior changes are retained after an upgrade. If the upgrade consists of a major release, it will be noted in the release notes that all old parameters will be reset to factory defaults (not usually the case).

When *many* wireless parameters are modified, built-in logic provides a warning if you are performing an operation which may be inappropriate for your wireless network. These warnings can be overridden in all cases, but are designed to help you set up the network in a consistent way.

AP Integrity

From the menu pulldowns you can check the Integrity of your APs' configuration. This will insure that all your APs (within a domain) are configured correctly. You can select to check the Wireless, Mode or Firmware integrity. Before going to the pull down, you should hit the 'Select All' button, under the list of APs, so that you insure you check all APs.



Wireless IDs - checks that all APs are configured with the same Wireless Network Name, different station name, same AP density setting, and the same RTS/CTS Threshold.

Modes - checks that all APs are configured with the same Operating Modes (changed with the Operating Modes from the main screen).

Firmware Revisions - verifies that all APs are running with the same version of the firmware.

Access Point Software (Flash) Upgrades

The software running inside the Access Point can be easily upgraded. You should randomly check our www site (listed in the front of this manual) to see the latest information concerning new software releases, new features, and bug fixes.

To load the Access Point with an upgraded version of the firmware, it is suggested that you copy the .bin file from the www site to the same directory as the RoamAbout Access Point Manager. As part of the flash upgrade, you will be asked for the location of the .bin file. After obtaining this information, a BootP/TFTP loader called, NetRider Loader, will be launched, and a flash upgrade request will be made to a single Access Point.

A flash upgrade command, or a reset command of any sort, *cannot* be made to a group of Access Points.

A flash upgrade may cause the loss of the IP address on the Access Point, so the IP address may have to be reloaded. In the meantime, management communications with that Access Point will be lost.

You will see an indication of the flash load on the NetRider Loader screen. After this happens, the Access Point must process the new software, and will be unavailable for a minute or so afterwards. The easiest way to know this has completed is to look for normal flashing of the front panel lights. Until this happens, trying to read data from the Access Point will fail because the Access Point is not responding.

Options

The options selection in the Manager’s main menu allows the user to customize the SNMP R/W community string, and the time-out/retry parameters for SNMP commands. In addition, the toolbar and status bar can be selected or deselected as part of the options menu.

When modifying a community string, there are two primary scenarios to keep in mind. The first is the case where the Access Points already have a user specified community string, and the configurator must use that community string to obtain SNMP information. In this case, the R/W community string is modified in the community string dialog box, and the "Change community string on AP also" check box is left blank.

The second scenario occurs when a user wishes to change the R/W community string on an Access Point itself. In that case, the user makes a change to the R/W Community field and checks the "Change community string on AP also" check box. This causes a change command to be sent to the AP, and the configurator also changes its internal community string to keep in sync with the Access Point.

Configuring the Access Point Using the Setup Port

The setup port (on the MultiSwitch 900, or as a standalone) allows you to access and set Access Point parameters. This section describes how to access the module from either port and how to set those parameters.

Examples of the actual setup screen displays are provided in this section to aid in the description of the setup port and to display the options that are available. Because they are examples only, the displays can vary slightly from the actual screen displays on your setup port device. **Boldface type** in the screen display examples indicate user input.

The format of an IP address is the standard 4-octet dotted decimal notation, where each octet of the address is represented as a decimal value, separated by a decimal point (.). The following is an example of an IP address: `16.20.54.156`

Setup Port Signaling Standards

Signals from the MultiSwitch 900 setup port and from the standalone setup port conform to the EIA-232D signaling standard at **9600 baud** only. To the user, the port appears as a data terminal equipment (DTE) device.

Connecting to the Setup Port

The setup port on the AP standalone unit or the MultiSwitch 900 can be connected to a setup port device (a terminal or personal computer) by using the cables and adapters listed in **Table 4-1** and shown in **Figure 4-1**. Refer to **Appendix A** for the setup port connector, cable and adapter pinouts.

To connect to the Access Point setup port, do the following:

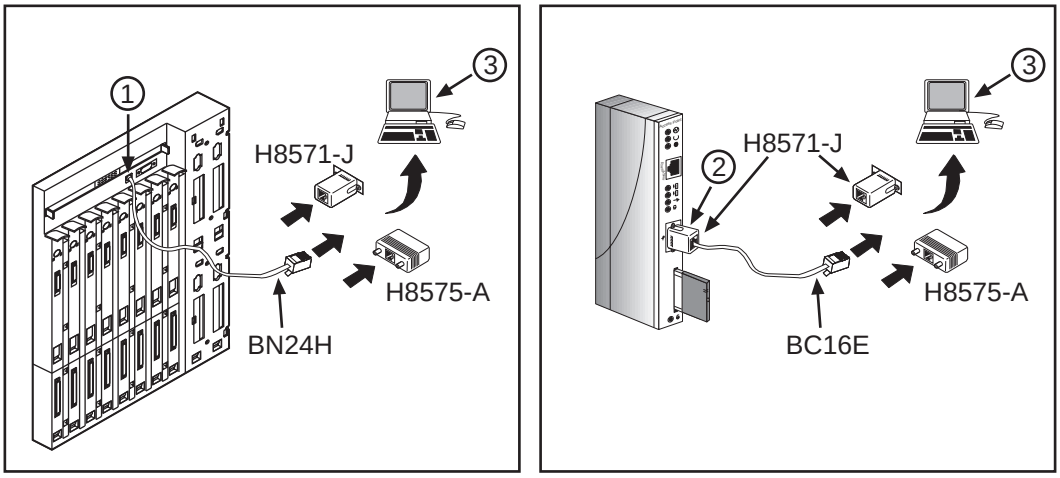
Step	Action
1	Ensure that the transmit and receive baud rates on the setup port device are set to **9600 baud** only.
2	Connect the setup port device to the setup port connector on either the Access Point front-panel serial port or the MultiSwitch 900 setup port.

Table 4-1: Setup Port Cabling

Connecting to a...	If the setup port device is a...	Then use this cable...	With these adapters...
Standalone AP or DEChub 90	PC with a 9-pin D-Sub communications port and terminal emulation	BC16E-xx[1] or any std. PC compatible 9-pin serial cable.	H8571–J (qty = 2)[2]
	Terminal with a 25-pin D-Sub connector	BC16E-xx[1]	H8575–A, H8571–J[2]
	Terminal with a 6-pin MMJ connector	BC16E-xx[1]	H8571–J[2]
MultiSwitch 900	PC with a 9-pin D-Sub communications port and terminal emulation	BN24H-xx[1]	H8571–J[2]
	Terminal with a 25-pin D-Sub connector	BN24H-xx[1]	H8575–A
	Terminal with a 6-pin MMJ connector	BN24H-xx[1]	H8575–A

1.xx indicates cable length in meters.
2.The AP requires an H8571–J also.

Figure 4-1: Setup Port Cabling



Item	Description
1	MultiSwitch 900 setup port
2	Access Point setup port
3	Setup port device

Using the Access Point Setup Port

After you have completed the setup port cabling, perform the following steps to access the Access Point Installation Menu.

Step	Action
1	Press Return on the setup port device a few times until a menu appears. If the AP is connected to a DEChub 90 or is a standalone unit, the Access Point Installation Menu appears. Go to the **Access Point Installation Menu** section. If the AP is connected to the MultiSwitch 900 setup port, the Hub Manager Installation Menu appears (see the following example).
2	Choose option 9; then go to the section titled Start Redirect Mode, as shown in the following example.
3	After you choose the `Start Redirect Mode` option, enter the slot number as shown in the following example.
4	Proceed to the **Access Point Installation Menu** section.

```
DIGITAL MultiSwitch 900
=======================================================

       DIGITAL MultiSwitch 900 INSTALLATION MENU

         [1]  Reset with Factory Defaults
         [2]  Reset with Current Settings
         [3]  Show Current Settings
         [4]  Configure IP...
         [5]  Dump Error Log
         [6]  Downline Upgrade
         [7]  Configure Out-of-Band Port...
         [8]  Start Event Display Mode
         [9]  Start Redirect Mode...
=======================================================
              Enter selection number: 9
```

```
                   Enter selection: 9
=======================================================

      Enter the slot number for redirection (1-8): [n]
      setup redirected to 3: RoamAbout Access Point
      Attempting connection [Ctrl/C to abort]...
```

Access Point Installation Menu

The Access Point Installation menu allows you to set parameters when the AP is initially installed.

NOTE

When installing the AP into a DEChub 90, you must connect the setup port device to the setup port before applying power to the AP.

```
================================================================================

                    RoamAbout Access Point INSTALLATION MENU

                   [1]  Reset with Factory Defaults
                   [2]  Reset with Current Settings
                   [3]  Show Current Settings
                   [4]  Set SNMP Read/Write Community
                   [5]  Add SNMP Trap Addresses
                   [6]  Delete SNMP Trap Addresses
                   [7]  Dump Error Log
                   [8]  Set In-Band Interface IP Address
                   [9]  Module-Specific Options

================================================================================

                          Enter selection :
```

NOTE

The installation menu screens depicted in this manual may vary slightly from the actual screen displays on your setup port device.

Description of Access Point Installation Menu Options

This section describes the options that are available from the Access Point Installation Menu.

RoamAbout Access Point INSTALLATION MENU
[1] Reset with Factory Defaults

This option reboots the AP, causing the module's configured NVRAM parameters to be initialized to factory default values.

NOTE

This action deletes all configuration settings and replaces them with factory default values. All configuration settings will be lost.

Allow approximately 1 minute for the module to reset and complete its self-test.

The following example shows the dialog associated with this option.

```
================================================================================

                      RESET WITH FACTORY DEFAULTS

       * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
       *      IMPORTANT!          IMPORTANT!         IMPORTANT!      *
       * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
       *   This selection will delete the current configuration     *
       *   settings and reset the system with the factory default   *
       *   settings.  All configuration settings will be lost.      *
       * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

================================================================================


                      Press Y to confirm [N] :
```

RoamAbout Access Point INSTALLATION MENU
[2] Reset with Current Settings

This option reboots the AP but leaves the module's configured NVRAM parameters at their current settings.

NOTE

Allow approximately 1 minute for the module to reset and complete its self-test.

The following example shows the dialog associated with this option.

```
============================================================

                  RESET WITH CURRENT SETTINGS

     This selection will reset your system with the current
     configuration settings.

============================================================


                  Press Y to confirm [N] :
```

NOTE

If you change any wireless configuration parameter (Wireless Network Name, Channel, Station Name, etc.), you must select this option to reset the AP.

RoamAbout Access Point INSTALLATION MENU
[3] Show Current Settings

This option shows the AP's current settings.

NOTE

If the module is being configured for the first time, some fields are blank.

The following example shows the dialog associated with this option.

```
================================================================================

RoamAbout Access Point, Wireless-to-Wired Bridge: HW=V1.0, RO=V1.4, SW=V3.n
SysUpTime                                 : 00:26:37   98 resets
SNMP Read/Write Community                 : public
SNMP Trap Addresses                       : Not Configured
In-Band Interface Hardware Address        : 08-00-2B-A3-89-61
In-Band Interface IP Address              : 16.20.40.156
In-Band Interface Subnet Mask             : 255.0.0.0
In-Band Interface Default Gateway         : Not Configured
Wired Ethernet MAC Address                : 08-00-2B-A3-89-61
Wireless Ethernet MAC Address             : 00-60-6D-92-00-FB
Wireless Network Adapter                  : RoamAbout IEEE 2.4 GHz DS
Adapter Revisions                         : Hardware 1.256 Firmware 1.01
Bridge Mode                               : Work Group
Upline Dump                               : DISABLED
Memory                                    : 4194304 bytes

================================================================================


                     Press Return for Main Menu ...
```

RoamAbout Access Point INSTALLATION MENU
[4] Set SNMP Read/Write Community

If you want to perform SNMP management on the AP, you must assign it a community name. The format for a community name is a string consisting of 4 to 31 printable ASCII characters. This community name can be used by SNMP managers for read/write access control. The default community name is `public`.

In the following example, the string `Accounting` is entered as the AP's SNMP read/write community name.

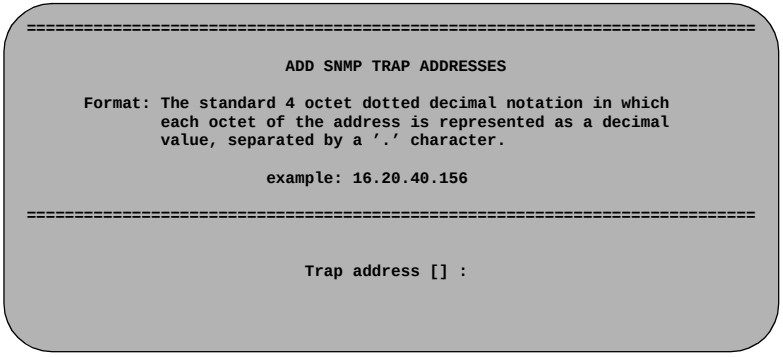
The following example shows the dialog associated with this option.

```
=========================================================================

                      SET SNMP READ/WRITE COMMUNITY

      Format: The format for a community name is a string,
              consisting of 4 to 31 printable ASCII characters,
              that describes the relationship between an SNMP
              agent and one or more SNMP managers. The string
              defines the authentication mechanism that is employed
              to validate the use of the community by the sending
              SNMP entity.

=========================================================================

Enter the community string [public] :
```

RoamAbout Access Point INSTALLATION MENU
[5] Add SNMP Trap Addresses

This option prompts you to enter IP addresses to which SNMP traps are sent from the Access Point. A trap is a defined event or condition detected by the Access Point SNMP agent.

The following example shows the dialog associated with this option.



RoamAbout Access Point INSTALLATION MENU
[6] Delete SNMP Trap Addresses

This option prompts you to select SNMP trap addresses for deletion.

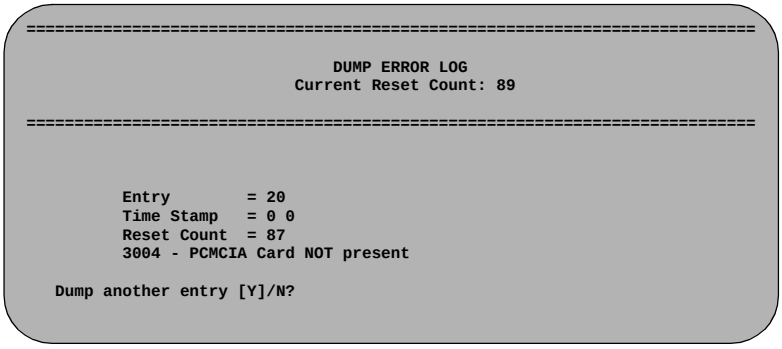
The following example shows the dialog associated with this option.

```
============================================================

                  DELETE SNMP TRAP ADDRESSES

 Format: The standard 4 octet dotted decimal notation in which
         each octet of the address is represented as a decimal
         value, separated by a '.' character.

                     example: 16.20.40.156

============================================================


                        Trap address [] :
```

RoamAbout Access Point INSTALLATION MENU
[7] Dump Error Log

This option displays error log dumps used by support personnel when analyzing system faults. Up to four error log dumps can be stored, and the most recent dump is displayed first.

The following example shows the dialog associated with this option.



RoamAbout Access Point INSTALLATION MENU
[8] Set In-Band Interface IP Address

This option prompts you to enter the AP's IP address subnet mask and default gateway. If you want to perform SNMP management on the AP, you must assign it an IP address. If there is a BootP/TFTP server on the network configured with the MAC address of the AP, the AP will get an IP address from it.

The following example shows the dialog associated with this option.

```
==============================================================================

                          IP ADDRESS CONFIGURATION

      Format: The standard 4 octet dotted decimal notation in which
              each octet of the address is represented as a decimal
              value, separated by a '.' character.

                         example: 16.20.40.156

              To delete the address, enter 0 in the appropriate address
              field.

==============================================================================

                  IP address [16.20.40.156] :
         Enter the Subnet Mask [255.0.0.0] :
         Enter the Default Gateway [] :
```

RoamAbout Access Point INSTALLATION MENU
[9] Module-Specific Options

This option displays a submenu for performing management tasks that are specific to the AP. These management tasks include setting the wireless network and roaming parameters.

The following example shows the dialog associated with this option.

```
================================================================

            Installation - RoamAbout Access Point


                   [1]  Enable/Disable Upline Dump
                   [2]  Upgrade Flash
                   [3]  Show Counters
                   [4]  Dump Error Log
                   [5]  Set Bridge Mode
                   [6]  Show Wireless Configuration
                   [7]  Set  Wireless Configuration
                   [8]  Enable/Disable Default Rate Limiting

                   [R]  Return to Main Menu

================================================================

                            Enter selection :
```

A description of each menu option is described in **Description of RoamAbout Access Point Module-Specific Options on page 4-21**.

Description of RoamAbout Access Point Module-Specific Options

This section describes the options that are available from the Access Point Installation Menu.

[9] Module-Specific Options
[1] Enable/Disable Upline Dump

Option 1 allows you to specify whether the AP's memory is upline dumped in the event the AP crashes. This option invokes the following submenu:

The following example shows the dialog associated with this option.

```
=========================================================

                  Dump Mode Options

                  [1]   Enable Crash Dump

                  [2]   Disable Crash Dump

=========================================================

                  Enter selection [2] :
```

When upline dump mode is enabled, the AP's memory is dumped to any local BootP/TFTP load host that is configured with the AP's address. Upline dump mode is disabled by default.

[9] Module-Specific Options
[2] Upgrade Flash

Option 2 allows you to upgrade the software in the AP's memory.

The following example shows the dialog associated with this option.

```
============================================================

  You have elected to upgrade the Access Point software.


                    *** NOTE ***

  **  This option will stop current operation of the Access Point  **
  **  and attempt to upgrade the software IMMEDIATELY.             **

============================================================
                       Press Y to confirm [N] :
```

When you invoke this option, the software in the AP's memory is immediately upgraded with an image downline loaded from the BootP/TFTP server. Be sure to set up the BootP/TFTP server prior to invoking this option.

[9] Module-Specific Options
[3] Show Counters

Option 3 displays the values of all the counters maintained by the AP.

The following example shows the two-screen dialog associated with this option.

```
Device uptime:    0 00:30:08       ETHERNET Port 0  WIRELESS Port 1
 Individually addressed bytes sent:              0              0
 Multicast bytes sent:                      111446         109406
 Individually addressed bytes received:          0              0
 Multicast bytes received:                       0              0
 Individually addressed frames sent:             0              0
 Multicast frames sent:                       1850           1820
 Individually addressed frames received:         0              0
 Multicast frames received:                      0              0
 Frames deferred:                                0              0
 Single collision:                               0              0
 Multiple collisions:                            0              0
 Excessive collisions:                           0              0
 Carrier check failed:                           0              0
 Transmit Frame too long:                        0              0
 Remote failure to defer:                        0              0
 Block check error:                              0              0
 Frame error:                                    0              0
 Receive Frame too long:                         0              0
 Data Overrun:                                   0              0
 System buffer unavailable:                      0              0
 Collision detect check fail:                    0              0
    Press RETURN to continue
```

```
Wireless PC card counters
      Individually addressed frames sent:              0
      Multicast frames sent:                         156
      Fragments sent:                               1665
      Individually addressed bytes sent:               0
      Multicast bytes sent:                        10380
      Deferred transmissions:                        126
      Single retry frames sent:                        0
      Multiple retry frames sent:                      0
      Transmit retry limit exceeded frames:            0
      Transmit frames discarded:                       0
      Individually addressed frames received:          0
      Multicast frames received:                       3
      Fragments received:                              3
      Individually addressed bytes received:           0
      Multicast bytes received:                      162
      Receive FCS errors:                            220
      Receive buffer not available:                    0
      Wrong station address on transmit:               0
      Receive WEP errors:                              0
      Receive message in message fragments:            0
      Receive message in bad msg fragments:            0

                     Press Return for Main Menu ...
```

[9] Module-Specific Options
[4] Dump Error Log

Option 4 displays error logs maintained by the Access Point. This information is used by support personnel when analyzing system faults. Up to four error log dumps can be stored, and the most recent dump is displayed first.

The following example shows the dialog associated with this option.

```
RoamAbout Access Point
======================================================================

       Product Specific  ERROR LOG
======================================================================



        Entry Number = 58
        Entry Type   = OTHER EXCEPTIONS
        Error Code   = FC000200  Vector offset = 0512
        Error Data   =

                0:0001E8C8   1:00000000   2:20100700   3:C3360200
                4:0000EEAC   5:00050400   6:0001CBAC   7:01001596

   Dump another Log entry [Y]/N ?
```

[9] Module-Specific Options
[5] Set Bridge Mode

Option 5 allows you to specify the bridge operating mode of the AP.

The default operating mode of the AP is Workgroup Bridge mode. If you change the bridge mode, you must select Option 2, `Reset with Current Settings`, from the Access Point installation menu to reset the AP with the new mode.

When the AP is operated in Workgroup Bridge mode, it learns only the addresses on the wireless side of the Ethernet LAN.

When the AP is operated in Full Bridge mode, it learns the addresses on both the wireless and wired sides of the Ethernet LAN.

NOTE

Refer to **Access Point Bridging Services on page 1-10** for a detailed description of Workgroup Bridge mode and Full Bridge mode.

The following example shows the dialog associated with this option.

```
==================================================

              Bridge Mode Options


             [1]   Workgroup Bridge Mode

             [2]   Full Bridge Mode


                *** NOTE ***

    You must Reset the System with Current Settings for
    the new configuration parameters to take effect.
==================================================

                  Enter selection [1] :
```

[9] Module-Specific Options
[6] Show Wireless Configuration

Option 6 allows you to display the current settings of the wireless configuration parameters for your network adapter.

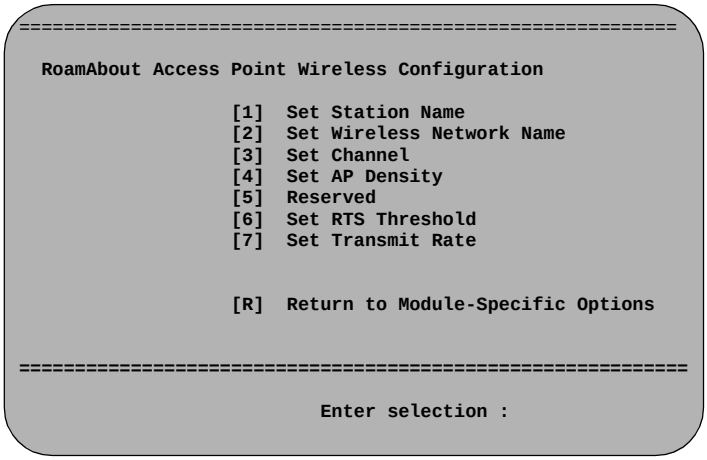
The following example shows the dialog associated with this option.

```
============================================================


  RoamAbout Access Point Wireless Configuration

   Current Station Name          : RoamAbout AP
   Current Wireless Network Name : RoamAbout Default Network Name
   Current Channel               : 2.4220 GHz  (802.11-3)
   Current AP Density            : Low
   Current RTS Threshold         : 2347
   Current Transmit Rate         : Auto Rate Select



                     Press Return for Main Menu ...
```

[9] Module-Specific Options
[7] Set Wireless Configuration

Option 7 allows you to set the wireless configuration parameters for your Access Point.

The following example shows the dialog associated with this option.



[9] Module-Specific Options
[7] Set Wireless Configuration
[1] Set Station Name

Option 1 allows you to set the Station Name for your Access Point. This name is displayed when clients run the Client Utility.

NOTE

Select a Station Name which will help identify the location of the AP.

The following example shows the dialog associated with this option.

```
==================================================

         Set Access Point Name - RoamAbout Access Point

         Current Station Name   : RoamAbout AP

==================================================
 Please enter the new Station Name (max 21 characters):
```

[9] Module-Specific Options
[7] Set Wireless Configuration
[2] Set Wireless Network Name

Option 2 allows you to set the network name for your Access Point.

NOTE

All Access Points must be set with the same Wireless Network Name. This name must also match the names of *all* wireless clients.

The following example shows the dialog associated with this option.

```
============================================================

Set Wireless Network Name - RoamAbout Access Point

Current Wireless Network Name : RoamAbout Default Network Name

============================================================

Please enter the new Wireless Network Name (max 32 characters):
```

[9] Module-Specific Options
[7] Set Wireless Configuration
[3] Set Channel

This option is used to set the center frequency of the Access Point.

The following example shows the dialog associated with this option.

```
============================================================

        802.11 Channel Selection - RoamAbout Access Point

                  [1] 2.4120 GHz  (802.11-1)
                  [2] 2.4170 GHz  (802.11-2)
                  [3] 2.4220 GHz  (802.11-3)
                  [4] 2.4270 GHz  (802.11-4)
                  [5] 2.4320 GHz  (802.11-5)
                  [6] 2.4370 GHz  (802.11-6)
                  [7] 2.4420 GHz  (802.11-7)
                  [8] 2.4470 GHz  (802.11-8)
                  [9] 2.4520 GHz  (802.11-9)
                  [10] 2.4570 GHz  (802.11-10)
                  [11] 2.4620 GHz  (802.11-11)

  ***** NOTE: You must Reset with Current Settings for *****
  *****       the new channel setting to take effect.  *****

       Current Channel         : 2.4220 GHz  (802.11-3)

============================================================

                     Enter selection :
```

NOTE

The example above is for the FCC variant. Other country variants will be different.

---

[9] Module-Specific Options
[7] Set Wireless Configuration
[4] Set AP Density

This option allows you to change the sensitivity of the roaming client. When APs are placed close together, you can change the AP Density to "medium" or "high" to force clients to roam sooner to a closer AP.

NOTE

Clients should be set to the same value as the AP.

The following example shows the dialog associated with this option.

```
================================================

            Set System Scale - RoamAbout Access Point

            Current AP Density     : Low

================================================
Please enter the new AP Density  [1=Low, 2=Medium, 3=High]:
```

[9] Module-Specific Options
[7] Set Wireless Configuration
[5] Reserved

This option is reserved for future use.

[9] Module-Specific Options
[7] Set Wireless Configuration
[6] Set RTS Threshold

The default setting for medium reservation (OFF) works well in most networking environments because it is normal behavior for RoamAbout stations to defer transmissions when they sense that another RoamAbout device is using the wireless medium for network communication.

The medium reservation mechanism enables you to improve wireless performance in network environments where message collisions occur due to the so-called hidden station problem.

Clients will send an RTS (Request To Send) prior to a long data packet and the AP will respond with a CTS (Clear To Send) that clients will hear, causing them to hold off any transmission.

The RTS/CTS exchange also performs a fast collision interference and a transmission path check. If the CTS is not detected, a client can re-send an RTS sooner.

To enable this feature, you must set the RTS threshold to the packet size.

The following example shows the dialog associated with this option.

```
==================================================

            Set RTS Threshold - RoamAbout Access Point

            Current RTS Threshold  : 2347

==================================================

Please enter the new RTS Threshold  [range 0 - 2347]:
```

[9] Module-Specific Options
[7] Set Wireless Configuration
[7] Set Transmit Rate

This option allows you to set up the AP/Radio to operate at 1 Mb/sec, 2 Mb/sec, or 2 Mb/sec with Auto Fall back to 1 Mb/sec (default).

The following example shows the dialog associated with this option.

```
================================================================================

            Set Wireless Transmission Rate - RoamAbout Access Point

            Current Transmit Rate  : Auto Rate Select

================================================================================
Please enter the new Transmit Rate  [1=Fixed 1 Mbit, 2=Fixed 2 Mbit, 3=Auto]:
```

[9] Module-Specific Options
[8] Enable/Disable Default Rate Limiting

By default, the AP is configured to limit multicast traffic to 100Kb/sec (5%). This option allows you to enable/disable this feature.

NOTE

You can change the limit if operating from an SNMP management station.

The following example shows the dialog associated with this option.

```
==========================================================================

                  Default Rate Limiting

                  [1]   Enable

                  [2]   Disable

==========================================================================

                  Enter selection [1] :
```

Chapter 5

Problem Solving

Overview

This chapter contains problem solving information for the Access Point. Refer to the appropriate section for information about solving specific problems.

Basic Problem Solving

The LEDs on the Access Point (AP) show the status of the unit and help you diagnose problems. After the AP is powered up and completes its power-up self-test procedure, the LEDs indicate whether the unit is functioning properly.

When the power-up self-test diagnostics detect a failure in the AP or you suspect a failure, rerun the self-test to verify that the failure can be repeated. Run the self-test by unplugging the ac power cord and plugging it back in.

Using the LEDs to Help Determine a Problem

Table 5-1 summarizes the Access Point LEDs.

Table 5-1: LED Summary Table

LED No.	LED Color	LED Signal	LED On Status	Normal State
1	Green	Power OK	Power is on.	On
2	Green	Module OK	Software is running OK.	On
3	Green	Wired LAN Activity	Indicates activity on wired LAN.	Blinking
4	Green	Bridge State	Indicates AP is forwarding.	On
5	Yellow	AP Saturated	Indicates that packets are being lost due to congestion, or an error condition exists (see Table 5–2).	Off
6	Green	Wireless LAN Activity	Indicates activity on wireless LAN.	Blinking
7	Green	PC Card Present	A network adapter is present in the unit.	On

LEDs that blink do so in one of two modes:

- Normal mode – At a variable (random) rate with varied intensity to indicate the activity level during normal operation.
- Error mode – At a constant (steady) rate and intensity (for example: ON, OFF, ON, OFF, ON, OFF . . .) to indicate an error.

Table 5-2 describes possible Access Point problems and recommended corrective actions.

Table 5-2: LED Problem Solving Summary

If...	Then...	Do This...
Power OK LED (1) is off.	AP does not have power.	Verify that the outlet has power. Check the power connection to the AP. Replace the power supply. Return the unit (contact your sales representative).
Module OK LED (2) is off.	Either the module is performing hardware diagnostics, the Ethernet connection is bad, or the AP hardware is defective.	Verify the Ethernet connection. If the LED still fails to light, return the unit (contact your sales representative).
Module OK LED (2) is blinking in Error mode (constant rate and intensity), and is blinking in unison with the AP Saturated LED and in unison with either the Wired LAN or Wireless LAN activity LED.	The AP is not connected to either the wired LAN or wireless LAN.	Check to see which network activity LED the Module OK LED is blinking in unison with, and verify the appropriate connection.
Wired LAN Activity LED (3) is blinking with a short on once per second.	AP is not connected to the wired network, or there is no activity on the wired LAN.	Verify that the AP is physically connected to the network.
AP Saturated LED (5) is blinking in Normal mode.	AP is dropping packets due to excessive traffic.	Examine your configuration to determine if there are one or more users transmitting excessive amounts of data.
AP Saturated LED (5) is blinking in Error mode.	This indicates an error condition exists.	See Module OK LED description.

Table 5-2: LED Problem Solving Summary (Continued)

If...	Then...	Do This...
Wireless LAN Activity LED (6) is blinking a short on once per second.	There is no activity on the wireless LAN. If you know there is activity on the wireless LAN, then this status indicates that the PC Card has an incorrect wireless parameter or is not operating properly.	Reconfigure the wireless parameters. Ensure that the AP and all wireless clients in the AP's coverage area have the same wireless parameters. Verify that the PC Card is installed properly.
Bridge State LED (4) is on.	Self-test in progress, or a spanning tree reconfiguration is underway. Otherwise, this status may indicate that there is a redundant AP handling the network traffic and that this AP is in Standby mode.	Wait until self-test or reconfiguration ends. If the AP is in Standby mode, verify your network configuration to determine whether there is another AP configured to operate in the same coverage area.
Bridge State LED (4) is blinking.	Downline load is in progress.	Wait for downline load to complete.
PC Card Present LED (7) is off.	There is no PC Card installed in the slot, or it is not properly inserted.	Turn off power and insert the PC Card into the AP.

Table 5-3, **Table 5-4**, and **Table 5-5** list common conditions and the corresponding states of the LED indicators.

Table 5-3: Normal Operating Mode LED Patterns

LEDs[1]							
1	2	3	4	5	6	7	Meaning of LED Pattern
●	●	⊕	●	○	⊕	●	Normal operating mode.
●	●	⊕	○	○	⊕	●	AP is okay but waiting for Spanning Tree.
●	●	⊕	●	⊕	⊕	●	AP is okay but occasionally saturated.
●	◍	⊕	○	◍	◍	●	PC Card is defective or the radio module is not connected to the PC Card.
●	◍	◍	○	◍	⊕	●	Ethernet problem after power-up.

1. ● =on, ○ =off, ◍ =steady blinking, ⊕ =random blinking

Table 5-4: Diagnostics LED Patterns

LEDs[1]							
1	2	3	4	5	6	7	Meaning of LED Pattern
○	○	○	○	○	○	○	No power; failed power supply; no power at outlet.
●	◌	◌	◌	◌	◌	○	PC Card not inserted properly.
●	○	○	○	●	●	◌	Diagnostics still running.
●	○	○	◍	◍	◍	◌	Ethernet connection broken.
●	○	○	○	◍	○	◌	Failure while initializing/testing the memory.

1. ● =on, ○ =off, ◍ =steady blinking, ⊕ =random blinking, ◌ =any state

Table 5-5: Network Loading/Upline Dumping LED Patterns

LEDs[1]							
1	2	3	4	5	6	7	Meaning of LED Pattern
●	●	○	⊕	○	●	◌	Waiting for downline load from load host
●	●	⊕	⊕	○	●	◌	Downline loading image from load host
●	●	⊕	⊕	○	○	◌	Software error detected while downline loading image from load host
●	●	⊕	⊕	○	⊕	◌	TFTP file not found
●	●	○	○	○	○	◌	Waiting for retry of TFTP load
●	●	○	●	●	●	◌	Upgrading Flash
●	●	○	◍	◍	●	◌	Flash upgrade successful
●	○	◍	○	○	●	◌	Invalid (wrong) load image
●	○	○	◍	○	●	◌	Unsuccessful Flash upgrade
●	○	○	○	◍	●	◌	Invalid load image: corrupted image
●	○	◍	◍	○	●	◌	Invalid load image: image too large
●	○	◍	○	◍	●	◌	TFTP error
●	○	◍	◍	◍	●	◌	Software error or number of retries exceeded
●	○	◍	◍	◍	◍	◌	Hardware error

1. ●=on, ○=off, ◍=steady blinking, ⊕=random blinking, ◌=any state

Access Point Reset Button

You can force a downline load of the AP's software from a load host and reset to factory parameters by pressing the `Reset` button on the front panel of the AP during a power-up cycle. When you press the `Reset` button (as the unit is powering up), the LEDs cycle through three times to indicate that the AP recognized the reset request. If the LEDs do not function properly after resetting the AP to its factory settings, remove the AP, and contact your sales representative.

Appendix A

Connector, Cable, and Adapter Pin Assignments

Overview

This appendix lists the connector, adapter, and cable pin assignments for the RoamAbout Access Point. **Figure A-1** illustrates the 10BaseT connector pin and signal assignment. **Figure A-2** illustrates the setup port connector pin and signal assignment. **Figure A-3** and **Figure A-4** illustrate the pin assignments for the cables associated with the setup port. **Figure A-5** and **Figure A-6** illustrate the pin and signal assignment for the adapters associated with the setup port.

Figure A-1: 10BaseT (8-pin MJ) Connector Pin Assignments

Pin	Assignment
1	No connect
2	Receive (RX)
3	Ground
4	No connect
5	No connect
6	Transmit (TX)
7	Data Terminal Ready (DTR)
8	Data Set Ready (DSR)

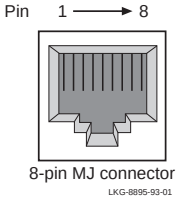


Figure A-2: Setup Port (DB-9) Connector Pin Assignments

Pin	Assignment
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	No connect

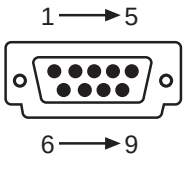


Figure A-3: BN24H Cable Pin Assignments

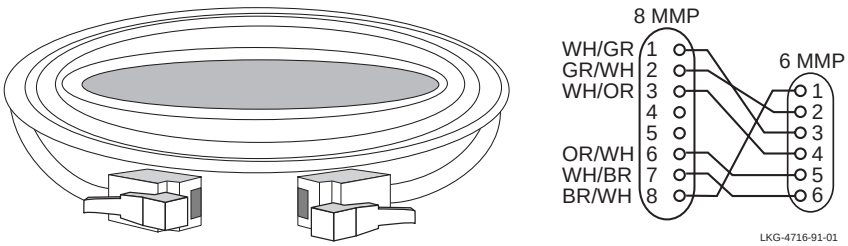


Figure A-4: BC16E Cable Pin Assignments

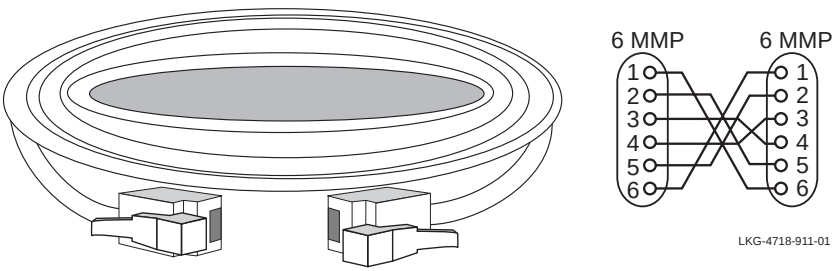


Figure A-5: H8571-J Adapter Pin Assignments

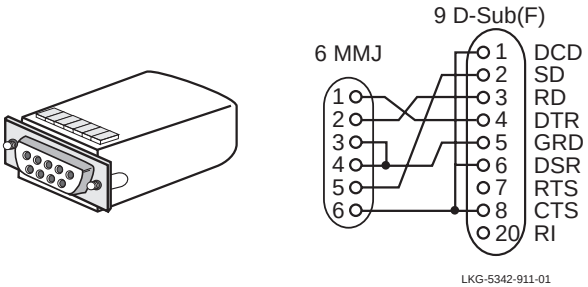


Figure A-6: H8575-A Adapter Pin Assignments