# Netwave®

# AIRSURFER® PRO
# WIRELESS LAN PC CARD

*IEEE 802.11 Standard Compliant*

**USER'S GUIDE**

## FCC  NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved in writing by Netwave Technologies, Inc. may void the user's authority to operate this equipment.

# CONTENTS

# QUICK INSTALLATION FOR WINDOWS 95

1.  Boot your PC and wait until Windows 95 is up and running.

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**NOTE**

**If you have previously installed an AirSurfer® or an AirSurfer Plus® PC Card on your computer please follow the instructions in the Network Driver Removal section of this manual before proceeding with the installation.**

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2.  Insert your AirSurfer Pro Wireless LAN PC Card into your PCMCIA Slot.

3.  Windows 95 will automatically detect your card and display a "New Hardware Found" dialog box, identifying the "Netwave AirSurfer PRO Wireless LAN PC Card".

4.  Insert the AirSurfer Wireless LAN PC Card Windows 95/NT Installation disk into your 3_ floppy drive (A:).

5.  Click "Next".

6.  Select the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" option.

7.  If Windows 95 asks for the Windows 95 CD-ROM, enter the path to the Windows 95 setup files—either the drive letter of your CD-ROM drive or the directory of your Windows CAB files (these are often in C:\WINDOWS\OPTIONS\CABS).

8.  If Windows 95 asks for the ASPNDIS3.SYS file, enter "A:".

9.  If you are running Novell's IntraNetware Client 32, place the IntraNetware Installation CD in your CD-ROM drive when prompted.

10. Windows 95 will now ask you to restart. Select "No".

11. Click the *Start* button, select *Settings, Control Panel.*

12. Double click the "*Network*" icon.

13. Within the *Configuration* tab, select the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" item in the network components list and click on *Properties.*

14. Select the *Advanced* tab, and select the appropriate values for your SSID (default = "Default SSID") and DS Preferred Channel (default = "1"). If you do not know which values to choose, contact your network administrator. Improper values will result in a failure to communicate with the wireless LAN. Select the "Network Mode" to "Ad Hoc" or "Infrastructure" dependent upon the type of network you are using. Change other parameters only as directed by the network administrator.

15. After changing the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" configuration, click OK.

16. Go to the *Protocol* tab. Add the appropriate protocol(s) for your network.. Contact your network administrator if you have any questions regarding protocols on your network. Follow the prompts for the Windows 95 setup files to add protocols to your setup. Click "*OK*".

17. Click *"OK"* in the Networks dialog box.

18. Click *"Yes"* when prompted to restart your computer.

19. When Windows 95 restarts, the AirSurfer PRO Adapter will be operational. Look for the green link integrity LED on the AirSurfer PRO PC Card. This indicates a connection with an 802.11-compliant Direct Sequence Access Point (when setup in Infrastructure mode) or another 802.11 Direct Sequence Wireless LAN Adapter (when setup in Ad Hoc mode).

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**NOTE**

**If you experience any difficulties with installation, see the Diagnostics and Troubleshooting section of this manual for more detailed instructions and troubleshooting notes.**

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# QUICK INSTALLATION FOR WINDOWS NT WORKSTATION 4.0

1. Boot your PC and wait until Windows NT Workstation 4.0 is up and running.

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**NOTE**

**If you have previously installed an AirSurfer or an AirSurfer Plus PC Card on your computer please follow the instructions in the Network Driver Removal section of this manual before proceeding with the installation.**

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2. Insert your AirSurfer Pro Card into your PC Card Slot.

3. Insert the AirSurfer Wireless LAN PC Card Windows 95/NT Installation disk into your 3_ floppy drive (A:).

4. Click the *Start* button, select *Settings, Control Panel.*

5. Double click the "*Network*" icon.

6. Click on the *Adapters* tab.

7. Click *Add.*

8. When the Network Adapter Option List has been built, click on "Have Disk", then type in A: when prompted.

9. Select the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" option.

10. When the Netwave adapter configuration dialog box appears, select the appropriate values for your SSID (default = "Default SSID") and DS Preferred Channel (default = "1"). If you do not know which values to choose, contact your network administrator. Improper values will result in a failure to communicate with the wireless LAN. Select the "Network Mode" to "Ad Hoc" or

"Infrastructure" dependent upon the type of network you are using. Change other parameters only as directed by the network administrator.

11. Click *OK.* The appropriate files will then be copied to your laptop.

12. Go to the *Protocol* tab. Add the appropriate protocol(s) for your network.. Contact your network administrator if you have any questions regarding protocols on your network. (You will most likely need your NT Workstation Setup CD to add protocols to your setup. Click "*OK*".

13. Click *"Yes"* when prompted to restart your computer.

14. When Windows NT restarts, the AirSurfer PRO Adapter will be operational. Look for the green link integrity LED on the AirSurfer PRO PC Card. This indicates a connection with an 802.11-compliant Direct Sequence Access Point (when setup in Infrastructure mode) or an other 802.11 Direct Sequence Wireless LAN Adapter (when setup in Ad Hoc mode).

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**NOTE**

**If you experience any difficulties with installation, see the Diagnostics and Troubleshooting section of this manual for more detailed instructions and troubleshooting notes**

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# INTRODUCTION

> **NOTE**
>
> This manual applies to the following adapter type: AirSurfer Pro.

The Netwave AirSurfer PRO PC Card, shown in Figure 1, allows wireless connection of a PCMCIA-capable laptop, notebook, or other portable computer to an IEEE 802.11 industry standard local area network (LAN) utilizing DS radios. Netwave supports fully wireless networking or wireless access to a cable-based network (access to a wired network requires a separate companion product called the AirSurfer PRO Access Point).

The Airsurfer PRO products support the highest data rates permitted under the IEEE 802.11 specification. The AirSurfer PRO PC Card connects to the computer internally upon insertion into a PCMCIA slot conforming to the Personal Computer Memory Card International Association's (PCMCIA) PC Card Standard, Release 2.1.

The Netwave AirSurfer PRO PC Card is compatible with Type II and larger PC Card slots.



**Figure 1. Netwave AirSurfer PRO PC Card**

## SOFTWARE

NDIS3 drivers for Microsoft Windows 95 and Microsoft Windows NT are included on the "For Windows 95/NT Installation" disk. An NDIS4 driver for Microsoft Windows CE and Windows 98 and an ODI driver will be available from Netwave's website in a future release.

Operation with server-based networks requires one or more AirSurfer PRO Access Point units (sold separately) for connection to the wired network.

See the *Network Driver Installation* section for instructions on how to configure and use the AirSurfer PRO PC Card with each network operating system.

In addition to the Installation Program, the AirSurfer PRO PC Card includes additional software on the Netwave Utilities Disk for PC Card configuration, diagnostics and network management. See the section *Netwave Utilities* for information on this software.

## INTRODUCTION TO NETWAVE NETWORKING

Netwave's AirSurfer PRO PC Card and its companion unit the AirSurfer PRO Access Point (sold separately), provide freedom from network cabling for users of "Independent" or "Ad Hoc" networks or "Infrastructure" networks implemented with Access Points and using peer-to-peer and server-based local area networks. There are several ways wireless networking can occur:

### AirSurfer PRO Direct Sequence Spread Spectrum Products

The Netwave Airsurfer PRO PC Card and AirSurfer Pro Access Point use an RF transmission technique known as Direct Sequence Spread Spectrum (DSSS), often abreviated as DS. DSSS modulation has the effect of suppressing radio frequency interference in the same frequency band.

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**NOTE**

**IEEE 802.11 DS Product will only interoperate with other DS type IEEE 802.11 products.**

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The IEEE 802.11 DSSS service is a channelized service which uses channels 1 through 11 in the U.S. and Canada, channels 1 through 13 in Europe, channel 10 and 11 in Spain, channels 10 through 13 in France and channel 14 in Japan.

Mobile User's PC Cards must be set to the same channel as the Access Points to which they are connected. Access Points may be co-located in the same area to accommodate more users. When Access Points are colocated, they should be set to channels separated by at least five channels (eg: Access Point #1 set to Channel 1, Access Point #2 set to channel 6, Access Point #3 set to channel 11). Upon completion of installation, the AirSurfer PRO PC Card is initially set to default channel 1.



**Independent networking without an Access Point:** This is a purely wireless, standalone network set up between two or more workstations equipped with an AirSurfer PRO PC Card. Peer-to-peer network software such as Microsoft Windows 95 or Microsoft NT is required. This is also called an "ad hoc" network because it can be set up for a specific but temporary task, such as a meeting of the Finance Committee, then dissolved when the task is complete.

**"Infrastructure" networking with either peer-to-peer or server-based networking with an Access Point:** The AirSurfer PRO Access Point provides wireless access to an existing wired network. This could be a peer-to-peer network running, for example, Windows 95, or a server-based network such as Novell NetWare. The wireless Netwave workstation must have the corresponding network software to communicate on the wired
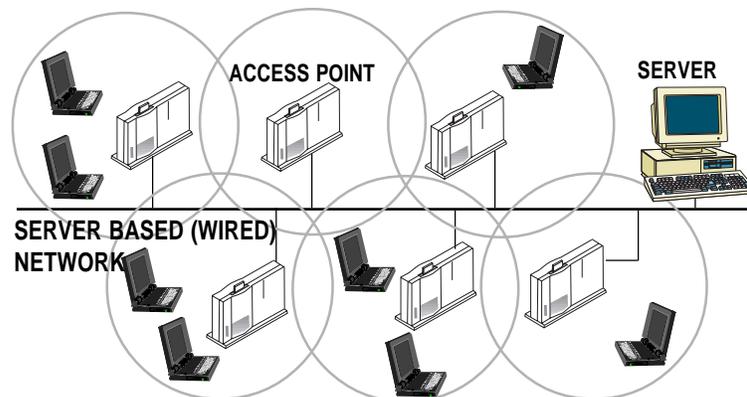


**Netwave Workstations (with AirSurfer PRO PC Cards Installed)**

network, and it must be configured to communicate with the Access Point. This is also called an "infrastructure" network because the wireless portion of the network interacts with an existing cabled network.

On a network with multiple AirSurfer PRO Access Points installed, the mobile user can roam freely within the Extended Service Area (ESA) of the Access Points without losing connection to the wired network. An Extended Service Area is the total area of coverage of all Access Points in the network with the same SSID.

### Transmission Range

The transmission range of the Netwave AirSurfer PRO PC Card is approximately 100 meters (about 300 feet) indoors, and up to 500 meters in an open environment. AirSurfer Plus Access Point range is also about 100 meters. Building structure and electrical interference may affect transmission, resulting in a range of more or less than 100 meters. These factors should be considered and tested when planning a Netwave network, and especially before permanently installing any AirSurfer PRO Access Points.

### Site Survey Utility

A Site Survey utility is provided to assist with the process of determining the optimum number and location of Access Points for your environment. See the section Netwave Utilities for information on this procedure.

### Netwave Utilities

The Netwave Utilities supplied on the Netwave Utilities Disk are designed to facilitate Netwave network design and operation.

▲ The Site Survey utility assists you in planning and installing a Netwave wireless network. The Connection Quality utility provides information about the connection quality of the Netwave wireless network.

▲ The Site Survey utility monitors not only the signal strength, but also the availability of the AirSurfer PRO Access Point, and the traffic on the wired LAN.

▲ The AirSurfer Properties utility allows you to configure your Netwave Adapter for different SSID (networks) in real time without rebooting your computer.

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**NOTE**

**The Netwave Utilities require Windows 95 or NT.**

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For a complete description of the Netwave Utilities and how to use them, see the section Netwave Utilities.

### The Netwave Access Point

For information on installation and operation of the Netwave Access Point, see the Netwave Access Point User's Guide supplied with that product.

# HARDWARE INSTALLATION

Follow the instructions in this section to unpack and install the Netwave
AirSurfer PRO PC Card hardware.

## UNPACKING AND INSPECTION

After opening the Netwave AirSurfer PRO PC Card box, remove the
contents and make certain that all components are included and that none
have been damaged during transportation. Retain the packing materials in
case you have to return the unit for service.

## PACKAGE CONTENTS

Use the following list to check the contents of the package:

▲ Netwave AirSurfer PRO PC Card

▲ Netwave AirSurfer PRO PC Card User's Guide

▲ Product Registration Card

▲ License Agreement envelope containing a 3.5-inch Installation and
Utilities Diskettes

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**NOTE**

**Please fill out the Product Registration Card supplied with
the AirSurfer PRO PC Card and return it immediately. Your
information will be entered into our support database.**

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## ADDITIONAL REQUIREMENTS

To operate the Netwave AirSurfer PRO PC Card on a network, you will need the following:

1. For independent networking without an Access Point, at least one other Netwave workstation running the same supported network operating system. See the section on *Network Driver Installation* for information about systems for which drivers are supplied.

2. For wireless access to an existing wired network, a Netwave AirSurfer PRO Access Point (sold separately) attached to the network and the appropriate workstation driver software for connection to the network. See the section on *Network Driver Installation* for information about systems for which drivers are supplied.

## NETWAVE AIRSURFER PRO PC CARD INSTALLATION

The AirSurfer PRO PC Card is compatible with Type II and larger PC Card slots. Installation and removal procedures vary on different computers.

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### CAUTION

**If you are using Card and Socket Services on your PC Card computer, the computer can be powered on or off when you insert or remove the AirSurfer Plus PC Card. If you are not using Card and Socket Services, the computer should always be turned OFF whenever the AirSurfer Plus PC Card is inserted into or removed from the PC Card slot. Windows 95 always uses Card and Socket Services, but always "stop" the PC Card before removing it from the computer.**

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## INSERTING THE AIRSURFER PRO PC CARD

1. Power down the computer. For Windows 95, see the Quick Installation Guide.

2. Grasp the PC Card by the edges with the Netwave logo facing upward and the 68-pin connector next to the insert slot.

**Figure 1. Netwave AirSurfer PRO PC Card**

3.  Insert the card into a PC Card slot and push it in until it is firmly seated. The PC Card default is slot or socket 1. See your computer documentation for slot information. To change the default setting, use the Netwave Installation Program or see the *System Setup and Configuration* section.

4.  Turn the computer back on.

## REMOVING THE AIRSURFER PRO PC CARD

1.  Power down the computer.

2.  Follow the PC Card removal instructions specified in the documentation for your computer.

# SYSTEM SETUP AND CONFIGURATION

## NETWAVE AIRSURFER NETWORKS

Netwave's AirSurfer PRO PC Card provides standalone wireless networking or, with the addition of a Netwave Access Point, access to existing wired networks. The wired network can be a peer-to-peer network OS such as Microsoft Windows 95 or server-based running software such as Microsoft Windows NT. Wireless access to and interaction with these networks is managed through a network identifier called an SSID. The Netwave Installation Program will use the default SSID value of "Default SSID" under the "Install" option or allow you to modify the SSID settings under the "Custom" option. Every LAN accessible by the AirSurfer PRO PC Card is identified by an SSID string. SSIDs allow for the deployment of multiple independent wireless LANs in the same shared location.

Network users can change SSID numbers in the Netwave Installation Program. Access Point SSIDs can be changed by the Network Administrator using utilities supplied with the Access Point.

Individual network users can indicate which of the available SSIDs or networks they want to access from their workstation by including the SSID keyword in their network configuration file along with the SSID number of the network they wish to access.

**Netwave Network Guidelines**

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**NOTE**

**In order for a mobile unit to roam seamlessly from one Access Point to another, the SSIDs of the AirSurfer PRO PC Card and the Access Point must be the same, and the Access Points must be installed on the same logical Ethernet segment.**

**To avoid login confusion, use different SSID strings for Access Points belonging to different Netwave networks that may or may not be on the same logical Ethernet segment. This will prevent a mobile unit from connecting to the wrong Access Point.**

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The SSID keyword is placed in the configuration file for your network driver. PROTOCOL.INI is the configuration file for the NDIS driver. You can have one SSID listed at a time. The software will attempt to connect to the stated SSID.

To connect to a wired network through a Netwave Access Point, the AirSurfer PRO PC Card must be configured with the same SSID number as the Access Point. The factory default SSID is "default SSID".

Appropriate network software must also be installed and loaded on the Netwave PC Card workstation before a connection to a network can be established.

For additional information on default and custom settings and the use of keywords in configuration files, see the heading *Driver Parameters* later in this section.

## HOW TO MODIFY THE SSID

SSID is a Netwave security feature. Only mobile units and Access Points with the same SSID number can communicate with each other.

**Setting the SSID with the Installation Program**

1. Choose CUSTOM install and specify whether or not the workstation is connected to the network via an Access Point (Y or N).

2. Enter the SSID (it must match the SSID of the network the users wish to access).

The network SSID will be computed by the installer program and displayed in the SSID field. This SSID setting will be incorporated into the driver configuration file (PROTOCOL.INI for the NDIS3 driver).

### Setting the SSID Temporarily with the AirSurfer PRO Properties Utility

1. Run the Windows-based utility AirSurfer PRO Properties (see the Netwave Utilities section).

2. Tab to the Network SSID field (or press Alt+N) and change the SSID string, then choose Connect (or press Alt+C),



**SSID = Johnny's Group**

**SSID = Marketing**

**SSID = Engineering**

**SSID = Jerry's Pad**
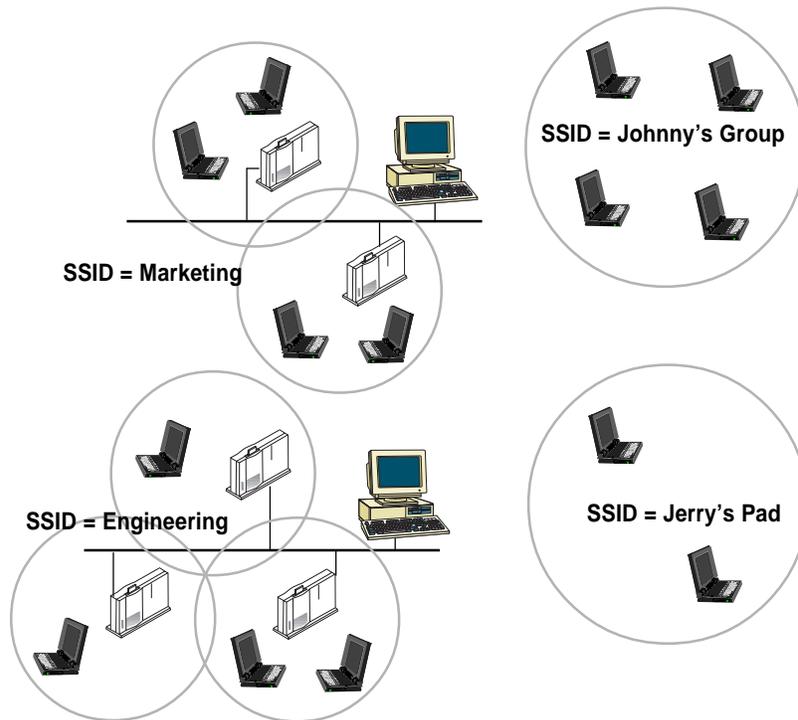
**Netwave SSID Settings for Netwave Networks with and without an Access Point**

**OR**

3. Select a different SSID (network) from the list at the bottom of the screen (press Alt+D to go to the list field), and choose connect.

   If you use the AirSurfer Plus Properties utility to modify the SSID, **do not reboot your computer**. The new SSID will remain effective only until you reboot. After rebooting, the SSID used will be the one defined in the driver configuration file.

### Setting the SSID Manually Using a Keyword

Edit the PROTOCOL.INI file with the SSID of the network the users wish to access.

The PROTOCOL.INI file is usually in the C:\WINDOWS directory.

The factory default SSID setting is "Default SSID". SSID strings may be from 0 to 32 characters. After modifying the SSID manually, *you must reboot the computer*.

## CARD AND SOCKET SERVICES

The Personal Computer Memory Card International Association (PCMCIA) has developed two software specifications governing the use of PCMCIA cards (also called PC Cards) in personal computer systems. The software components that implement these specifications are called Socket Services and Card Services. This software supports the ability of PCMCIA-aware device drivers (known as clients) to share PC Cards, sockets (also called slots), and system resources. Card and Socket Services provide a centralized resource in support of the common functionality required by different clients.

Netwave recommends that Card and Socket Services be used with the AirSurfer PRO PC Card. If your PCMCIA computer is not equipped with Card and Socket Services, ask your computer manufacturer or dealer for details on how to obtain them.

# NETWORK DRIVER INSTALLATION

This section provides detailed installation instructions for the network drivers supplied on the Netwave Network Drivers Disk. These instructions are designed to be used for manual installation without the Netwave Installation Program. Read the section *System Setup and Configuration* before attempting to install and load a network driver.

## NETWORK DRIVERS

The Netwave AirSurfer PRO PC Card supports an NDIS3 network driver. An ODI driver will be available on our web site in the near future. An NDIS4 driver supporting Windows CE and Windows 98 will also be available soon on our web site. To determine which of these drivers you need for your networking environment, find your network operating system in the alphabetical listing by vendor in this section under the heading "Installing Network Drivers." Examples of network operating systems referenced are Microsoft NT and Microsoft Windows 95.

The network driver installation instructions in this section are designed to be used with AirSurfer PRO PC Card factory-default settings. For a detailed technical discussion of the parameters required for configuration of your PC Card, see the section *System Setup and Configuration*.

### Installing Network Drivers

An alphabetical listing by vendor of network operating systems supported by the AirSurfer PRO PC Card follows. Under each listing are instructions for installing the PC Card driver as part of your initial installation for that type of network.

See the section *System Setup and Configuration* for information on installation and configuration procedures that may be required prior to driver installation.

## INSTALLATION FOR WINDOWS 95

1. Boot your PC and wait until Windows 95 is up and running.

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### NOTE

**If you have previously installed an AirSurfer® or an AirSurfer Plus® PC Card on your computer please follow the instructions in the Network Driver Removal section of this manual before proceeding with the installation.**

---

2. Insert your AirSurfer Pro Wireless LAN PC Card into your PCMCIA Slot.

3. Windows 95 will automatically detect your card and display a "New Hardware Found" dialog box, identifying the "Netwave AirSurfer PRO Wireless LAN PC Card".

4. Insert the AirSurfer Wireless LAN PC Card Windows 95/NT Installation disk into your 3_ floppy drive (A:).

5. Click "Next".

6. Select the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" option.

7. If Windows 95 asks for the Windows 95 CD-ROM, enter the path to the Windows 95 setup files—either the drive letter of your CD-ROM drive or the directory of your Windows CAB files (these are often in C:\WINDOWS\OPTIONS\CABS).

8. If Windows 95 asks for the ASPNDIS3.SYS file, enter "A:".

9. If you are running Novell's IntraNetware Client 32, place the IntraNetware Installation CD in your CD-ROM drive when prompted.

10. Windows 95 will now ask you to restart. Select "No".

11. Click the *Start* button, select *Settings*, *Control Panel.*

12. Double click the "*Network*" icon.

13. Within the *Configuration* tab, select the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" item in the network components list and click on *Properties*.

14. Select the *Advanced* tab, and select the appropriate values for your SSID (default = "Default SSID") and DS Preferred Channel (default = "1"). If you do not know which values to choose, contact your network administrator. Improper values will result in a failure to communicate with the wireless LAN. Select the "Network Mode" to "Ad Hoc" or "Infrastructure" dependent upon the type of network you are using. Change other parameters only as directed by the network administrator.

15. After changing the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" configuration, click OK.

16. Go to the *Protocol* tab. Add the appropriate protocol(s) for your network.. Contact your network administrator if you have any questions regarding protocols on your network. Follow the prompts for the Windows 95 setup files to add protocols to your setup. Click "*OK*".

17. Click *"OK"* in the Networks dialog box.

18. Click *"Yes"* when prompted to restart your computer.

19. When Windows 95 restarts, the AirSurfer PRO Adapter will be operational. Look for the green link integrity LED on the AirSurfer PRO PC Card. This indicates a connection with an 802.11-compliant Direct Sequence Access Point (when setup in Infrastructure mode) or another 802.11 Direct Sequence Wireless LAN Adapter (when setup in Ad Hoc mode).

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**NOTE**

**If you experience any difficulties with installation, see the Diagnostics and Troubleshooting section of this manual for more detailed instructions and troubleshooting notes.**

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## INSTALLATION FOR WINDOWS NT WORKSTATION 4.0

1. Boot your PC and wait until Windows NT Workstation 4.0 is up and running.

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**NOTE**

**If you have previously installed an AirSurfer' or an AirSurfer Plus' PC Card on your computer please follow the instructions in the Network Driver Removal section of this manual before proceeding with the installation.**

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2. Insert your AirSurfer Pro Card into your PC Card Slot.

3. Insert the AirSurfer Wireless LAN PC Card Windows 95/NT Installation disk into your 3_ floppy drive (A:).

4. Click the *Start* button, select *Settings, Control Panel.*

5. Double click the "*Network*" icon.

6. Click on the *Adapters* tab.

7. Click *Add.*

8. When the Network Adapter Option List has been built, click on "Have Disk", then type in A: when prompted.

9. Select the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" option.

10. When the Netwave adapter configuration dialog box appears, select the appropriate values for your SSID (default = "Default SSID") and DS Preferred Channel (default = "1"). If you do not know which values to choose, contact your network administrator. Improper values will result in a failure to communicate with the wireless LAN. Select the "Network Mode" to "Ad Hoc" or "Infrastructure" dependent upon the type of network you are using. Change other parameters only as directed by the network administrator.

11. Click *OK.* The appropriate files will then be copied to your laptop.

12. Go to the *Protocol* tab. Add the appropriate protocol(s) for your network.. Contact your network administrator if you have any questions regarding protocols on your network. (You will most likely need your NT Workstation Setup CD to add protocols to your setup. Click "*OK*".

13. Click *"Yes"* when prompted to restart your computer.

14. When Windows NT restarts, the AirSurfer PRO Adapter will be operational. Look for the green link integrity LED on the AirSurfer PRO PC Card. This indicates a connection with an 802.11-compliant Direct Sequence Access Point (when setup in Infrastructure mode) or an other 802.11 Direct Sequence Wireless LAN Adapter (when setup in Ad Hoc mode).

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**NOTE**

**If you experience any difficulties with installation, see the Diagnostics and Troubleshooting section of this manual for more detailed instructions and troubleshooting notes**

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# NETWORK DRIVER REMOVAL

This section provides detailed instructions on the removal of the AirSurfer®
and AirSurfer Plus® drivers from your Windows 95 and NT systems. Please
follow the instructions completely. If you have any questions regarding the
loading or removal of network drivers in your system, please contact your
network administrator.

### AirSurfer Driver Removal Instructions For Windows 95

Netwave AirSurfer® and AirSurfer Plus® products both operate with our
2.5x and our 2.60 drivers. Removal procedures are different, however,
depending on the driver you have loaded. To determine which driver you
have please do the following:

1. Click on you *Start* Button, select the *Find* submenu, select the *Files or Folders* option.

2. Type in ASA*.*

3. If the system finds files named ASANDIS3.SYS and ASAVXD.VXD you have the 2.60 drivers installed. Proceed to the <u>2.60 Driver Removal for Windows 95</u> section.

4. If the system fails to find the files named above, type in CNW*.*

5. If the system finds files name CNWNDIS3.VXD, you have the 2.54 (or lower) drivers installed. Proceed to the <u>2.5x Driver Removal for Windows 95</u> section.

### 2.60 Driver Removal For Windows 95/NT

1. Begin by shutting down card socket services for the Netwave PC card.
   a. Click the PC Card icon in the taskbar.
   b. Click the "Stop AirSurfer" button, then REMOVE the card from the slot when prompted. (Removal of the card is essential at this point!)

1.  Click on the "Start" button, go to "Settings", "Control Panel", "Network", highlight the *Netwave AirSurfer Plus Wireless LAN in Netwave Mode* adapter, and click remove.

2.  For Windows 95 (assuming 95 is installed in the WINDOWS directory):
    Delete these files: C:\WINDOWS\SYSTEM\ASA*.*
    Delete these files: C:\WINDOWS\INF\NETASA.INF
    Delete these files: C:\WINDOWS\INF\DRVDATA.BIN
        and DRVIDX.BIN (for Win95 versions 9.5.00b or later)

    **Run sysedit:**

    a. Select the SYSTEM.INI window;

    b. Menu select: Search, Find, and enter "ASA".

    c. Delete the line that reads "device=ASAVXD.VXD"

    d. Menu select: File, Save

    e. Menu select: File, Exit

1.  For Windows NT (assuming NT is installed in the WINNT directory):
    Delete these files: C:\WINNT\SYSTEM32\DRIVERS\ASA*.*

2.  Click "Run" and type "regedit" to open the registry editor.

The user is advised to consult their network administrator for assistance while performing any modifications to the Windows 95/NT Registry. Removing any settings other than the instructions listed below can make your Windows 95/NT system unusable.

a.  Menu select: Edit, Find, and enter "netwave".

b.  Delete any entries that are found (by pressing the DEL key)

**NOTE:** If the "found" selections show up in the right portion of the window, press F6 to toggle to the left window, then press the DEL key.

c. Press F3 to continue searching (deleting all found entries).

d. Menu select: Edit, Find, and enter "asandis".

e. Delete any entries that are found (by pressing the DEL key)

**NOTE:** If the "found" selections show up in the right portion of the window, press F6 to toggle to the left window, then press the DEL key.

f. Press F3 to continue searching (deleting all found entries).

g. Menu select: File, Exit

1. Delete the C:\NETWAVE directory

2. Delete the Netwave AirSurfer Program Group

   For Windows 95: from C:\WINDOWS\START MENU\PROGRAMS

   For Windows NT: from C:\WINNT\PROFILES\ALL USERS\PROGRAMS

3. Delete the ASASTA32.EXE file

   For Windows 95: from C:\WINDOWS\START MENU\PROGRAMS\STARTUP

   For Windows NT: Hit Ctrl-Alt-Del, Select Task Manager, Click on the Process tab,

   Highlight ASASTA32.EXE, click End Process, Yes, then Close Task Manager,

   Delete the file from C:\WINNT\PROFILES\ALL USERS\PROGRAMS\STARTUP

4. **SHUT DOWN** the PC, do not warm boot or use restart from the shut down menu. The reason for this is to let Windows 95/NT "clean" the registry while shutting down.

### 2.5x Driver Removal for Windows 95

1. Begin by shutting down card socket services for the Netwave PC card.
   a. Click the PC Card icon in the taskbar.
   b. Click the "Stop AirSurfer" button, then **REMOVE** the card from the slot when prompted. (Removal of the card is essential at this point!)

1. Remove the Card from Windows Network definition.

   a. Click on Windows Start Button, then Settings, and then Control Panel.

b. Double click on the Network icon to open Network dialog box.

c. Single click on the Xircom Netwave Credit Card Adapter then click on remove. Select "Yes" to confirm deletion of this Netwave adapter.

1. For Windows 95 (assuming 95 is installed in the WINDOWS directory):
   Delete these files:  C:\WINDOWS\SYSTEM\CNW*.*
   Delete the file C:\WINDOWS\INF\NETCNW.INF

2. Run sysedit:

   a. Select the SYSTEM.INI window;

   b. Menu select: Search, Find, and enter "CNW".

   c. Delete the line that reads "device=CNWVXD.386"

   d. Menu select: File, Save

   e. Menu select: File, Exit

1. For Windows NT (assuming NT is installed in the WINNT directory):
   Delete the file C:\WINNT\SYSTEM32\DRIVERS\CNW*.*

2. Remove card configurations from the Windows/NT registry
   The user is advised to consult their network administrator for assistance while performing any modifications to the Windows 95/NT Registry. Removing any settings other than the instructions listed below can make your Windows 95/NT system unusable.

   a. Click on Windows Start Button

   b. Click "Run" and type "regedit" to open the registry editor.

   c. Double click on the "HKEY_LOCAL_MACHINE" folder.

   d. Double click on the folder "Enum"

      ii. Double click on the folder "PCMCIA"

      iii. Place focus (click) on the folder "XIRCOM-CREDITCARD-NETWAVE-F441"

      iv. Press "delete" key on the keyboard and click "yes" to confirm deletion.

    a. Double click on the "HKEY_LOCAL_MACHINE" folder

       i. Double click on the folder "System"

       ii. Double click on the folder "CurrentControlSet"

       iii. Double click on the folder "Services"

       iv. Double click on the folder "Class"

       v. Double click on the folder "Net"

       vi. Under the folder "Net" find which folder contains information in the right window which references "DriverDescription". This description would contain "Xircom CreditCard Netwave Adapter". Place focus (click) on this folder under "Net" and press "delete" on the keyboard and click "Yes" to confirm deletion.

    a. Close the registry

1. Run sysedit;

    a. Select the SYSTEM.INI window;

    b. Menu select: Search, Find, and enter "CNW".

    c. Delete the line that reads "device=CNWNDIS3.VXD"

    d. Menu select: File, Save

    e. Menu select: File, Exit

1. Delete the C:\XIRCOM directory

2. Delete the Xircom CreditCard Program Group from C:\WINDOWS\START MENU\PROGRAMS\

3. **SHUT DOWN** the PC, do not warm boot or use restart from the shut down menu. The reason for this is to let Windows95 "clean" the registry while shutting down.

# NETWAVE AIRSURFER PRO UTILITIES

This section provides information on utilities supplied with the AirSurfer PRO PC Card. The Netwave Utilities include Netwave Control Panel and Netwave Connection Agent. These are designed to facilitate Netwave network design and operation. In particular, these utilities

- •Assist you in planning and installing an AirSurfer PRO wireless network.
- •Provide information about the link quality of the AirSurfer PRO wireless network.
- •Allow you to configure your AirSurfer PRO PC Card for different SSIDs (networks), in real time without rebooting your computer.
- •Provide notification of loss of network services when you move out of range of your AirSurfer PRO network and restoration of the connection when you move back into range.

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**NOTE**

**The Netwave AirSurfer PRO Utilities require Windows 95 or Windows NT.**

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The Netwave AirSurfer PRO Utilities include "client" utilities that can be used to configure the Netwave mobile workstation itself, and "client/server" utilities that support the link between the workstation and a NetWare server on the wired network. A brief description of these two types of utilities follows.

### Netwave Control Panel

The Netwave AirSurfer PRO Utilities setup program NWSETUP installs the Netwave Control Panel and Netwave Connection Agent Client on your mobile unit. It adds icons to the Netwave AirSurfer Program Group for the Netwave Control Panel, Site Survey, Connection Quality, and AirSurfer Properties utilities, described later in this section. The Netwave Control Panel places a toolbar on the screen for single-click access to the utilities in the Program Group.

### The Netwave Control Panel Toolbar

To activate the Netwave Control Panel toolbar, double click on the Netwave Control Panel icon in the Netwave PC Card Program Group. A toolbar with four icons will appear at the top of the screen. The name of the utility will pop up when the cursor is placed over the icon for that utility.

This toolbar can be moved around the screen, but it will always float on top of all other windows, for easy access to the Netwave AirSurfer PRO Utilities. Each Netwave Control Panel utility can be launched by clicking once on the appropriate icon in the toolbar. They can also be run by double clicking the icon in the Program Group or using the menu that displays on the toolbar when the Control Panel icon is clicked. The name Netwave Control Panel refers both to the toolbar and to the entire "suite" of Netwave AirSurfer PRO Utilities.

### Moving the Toolbar

To move the toolbar, click on the Netwave Control Panel icon (the button farthest to the right on the toolbar) to display a menu. Choose "Move Netwave Control Panel" from the menu. A miniature title bar will appear across the top of the toolbar. Place the cursor on the title bar, hold down the mouse button and drag the toolbar to the location of your choice, then release the mouse button. The new location will be saved. To remove the title bar, click "Move Netwave Control Panel" again on the menu.

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**NOTE**

**The Control Panel utilities can also be added to the Microsoft Office toolbar. See your Microsoft Office user documentation for instructions.**

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## PLANNING THE AIRSURFER SITE

For more detailed information on site planning and installation, see the AirSurfer PRO Planning and Installation Guide supplied with the Netwave Access Point. The following is an overview of site planning using the Site Survey utility.

**What is a Sit e Survey?**

A site survey is part of the planning process for installing an AirSurfer PRO wireless LAN at your site using the Netwave Access Points to connect to your wired network. It will help you determine how many Access Points are needed at their optimal placement for the best wireless connection in your desired area. Before starting the site survey, some preliminary site evaluation and calculations have to be done. Both the initial site survey and later evaluations of results can be facilitated with the Site Survey utility provided on the AirSurfer PRO Utilities Disk supplied with the AirSurfer PRO PC Card.

**Site Survey Preliminary Requirements**

The following items are needed for an AirSurfer PRO site survey:

- A set of blueprints or floor plans of your building environment

- A Netwave AirSurfer PRO Access Point connected to a power outlet (the Access Point does not need to be connected to the wired LAN to conduct a site survey)

- AirSurfer PRO PC Card hardware and software (including the Site Survey utility) installed in your portable computer

- AC power extension cord

Additional items such as a ladder, drawing tools, or paper and scissors may be needed, depending on the planning and site survey methods chosen.

Refer to the *Netwave AirSurfer PRO Planning and Installation Guide* for wireless network planning and installation instructions.

**The AirSurfer Site Survey Utility**

The AirSurfer Site Survey utility helps Netwave users to:

• See the link quality between the mobile unit and the Access Point

• Determine how many Access Points are needed to cover the desired service area, and where they should be placed

• Verify wireless link quality after the initial installation, and make adjustments to optimize coverage and minimize interference due to building structure and materials or other radio devices.

A ROAM NOW function is included. This permits the user to force the mobile unit to roam and select the Access Point which provides the best performance.

To start the Site Survey utility, click the leftmost button on the Netwave Control Panel toolbar, or double-click the Site Survey icon in the Netwave AirSurfer Program Group.

Netwave Site Survey is a tool to help plan the installation of a Netwave network. It displays a list of all the Access Points the AirSurfer PRO PC Card has access to in the SSID (network) it is configured for, providing there is more than one Access Point in that SSID.

If your mobile unit is registered with an Access Point, you will see the link quality updated in a bar gauge on the right side of the Site Survey window as you move around an Access Point's Basic Service Area. A numeric value, description, and color are also shown.

**Green** Good link quality between the mobile unit and attached Access Point. For best results, Link quality should register "good" most of the time at the locations where the AirSurfer Plus PC Card will be used to access the wired LAN.

**Yellow** Fair link quality between mobile unit and Access Point. Link quality is less strong, but unit is functional and performance is acceptable. Further weakening could be due to distance from the Access Point, obstacles (such as steel, brick, concrete), or radio interference. If the gauge consistently displays only "fair" link quality, consider adding an Access Point in that area, or relocating Access Points to improve coverage.
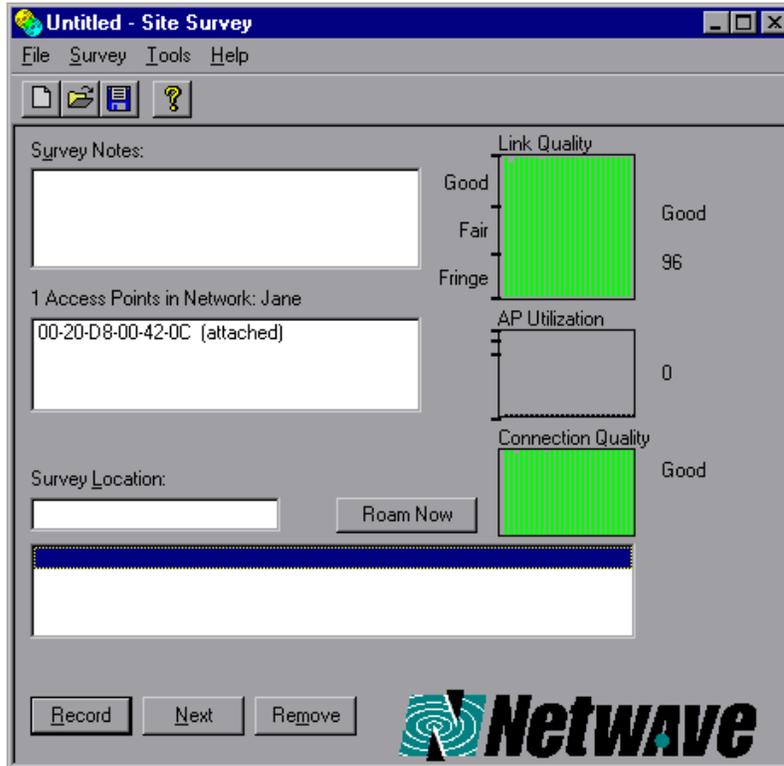
**Site Survey Screen**

**Red** "On-the-fringe" link quality between the mobile unit and attached Access Point. Link quality is very weak because the mobile unit is close to the edge of the Access Point's coverage area or because of obstacles (steel, brick, concrete) or radio interference. If the gauge consistently displays "fringe" quality, an additional Access Point is recommended for that area.

You can record the link quality at a particular location in your site by clicking Record. A dialog box pops up as the link quality is sampled once a second for ten seconds. Click OK when the sampling is complete to record the link quality and the survey list at the bottom of the window. Or click Cancel at any time to stop sampling. If you click Cancel at the end of the sampling, the average link quality is not added to the list.

To survey your site, make a list of key locations within the Access Point coverage area you will survey, record the link quality at each one, then save the survey in a file. Later you can open the file in Site Survey or with a spreadsheet or word processor. Site Survey can also print a survey report.

You may want to take notes about the placement of the Access Point for a results comparison later. Repeat this process for each Access Point coverage area you want to survey.

### Using the AirSurfer Site Survey Utility

Before performing a site survey, the AirSurfer PRO PC Card must be installed on the mobile unit and a AirSurfer PRO Access Point must be positioned and powered on. Refer to the *AirSurfer PRO Planning and Installation Guide* for additional instructions for wireless network planning and installation.

1. Choose File/New
2. Click in the Survey Location box or Press Alt+L.
3. Type the name of the first location in your survey.
4. Click Next or press Alt+N to add the location to the list. (If you use Alt+N, the cursor will stay in the Survey Location box, ready for entry of the next location.)
5. When you have added all the locations you want to survey, choose File/Save to save the survey.
6. Proceed to one of the locations on the list and highlight it.
7. Press Enter or Alt+R to choose the Record button and check the link quality.
8. Press enter to accept the measurement when it is done. The link quality and registered AP are saved in the list for that location.
9. Press Alt +N to go to the next location.
10. Repeat steps 6 through 9 until your survey is finished.
11. Enter notes in the Survey Notes box if you want to record some details about your setup for the survey.

12.  Choose File/Save to save your survey. (If you choose File+Save As you can save the survey in a new file and leave the original, blank file with all the locations ready for another survey. You might want to do several surveys with Access Points in different locations and compare the results.)

13.  Move on to the next Basic Service Area, with the AirSurfer Plus Access Point, and repeat steps 1 through 12 for that area.

You can always record a new measurement at an existing location in your list by selecting that location then choosing Record. Click Cancel if you don't want to replace the measurement. There is a blank item at the end of the list for new measurements. If you choose the last item then choose Record, a new measurement is added to the list.

### AirSurfer Connection Quality

The AirSurfer Connection Quality utility indicates the quality of the wireless connection between the AirSurfer PRO PC Card in the portable PC and the AirSurfer PRO Access Point with which it is connected. Quality can be affected by distance, radio interference, and how "busy" the Access Point is. A ROAM NOW button is included to enable the user to force the unit to roam and select the Access Point which provides the best performance.

This utility can be run in the background, so the user can check the connection quality to the network at any point while moving around in the Netwave service area.

When you first run AirSurfer Connection Quality, you will see a window that shows the connection quality, the Access Point your mobile unit is registered with, and SSID. The window will display green, yellow, or red depending on the connection quality which is a factor that determines when a mobile unit will be "handed-off" to the next Access Point that provides better connection.

**Green**  indicates a good connection between the mobile unit and Access Point. The connection quality should be green most of the time at the locations where the AirSurfer PRO PC Card will be used to access the wired LAN.

**Yellow**   indicates fair connection quality between the mobile unit and Access Point. Connection quality is less strong, but unit is functional and performance acceptable. Further weakening could be due to distance from Access Point, obstacles (steel, brick, concrete), radio interference, or how busy the Access Point is. If the window consistently displays yellow, consider adding an Access Point in that area, or relocating Access Points to improve coverage.

**Red**   indicates poor connection quality between the mobile unit and Access Point. Connection quality could be poor because the mobile unit is close to the edge of the Access Point's coverage area, because of obstacles (such as steel, brick, concrete), radio interference, or because the Access Point's utilization is high. If the window consistently displays red, an additional Access Point is recommended for that area.

**Cyan**   (light blue) indicates that the mobile unit is configured to operate in "ad hoc" mode and another mobile unit is detected in range. The window displays this message: "Netwave ad hoc network in range" and the SSID number.

If you minimize the window into an icon, you will see a square of the appropriate color with the connection quality description inside: good, fair, poor. Using the minimized display, you can keep the utility running and visually check the connection quality at any time. To return to the standard window, double click on the icon or click once on the toolbar icon. Window position and state (minimized, maximized) are saved automatically when you exit the program.

### AirSurfer Properties

The AirSurfer Properties utility allows you to change the SSID settings for the AirSurfer PRO PC Card without rebooting your PC. You may create independent service areas (networks) by entering an SSID string that will be used by all members of the independent wireless network.

You may connect to an SSID (network with Access Points) by entering the SSID for that wireless network segment. If there are several AirSurfer PRO groups within an organization, you can switch from one group to another on the fly, simply by changing to the SSID of the new group, or selecting it from a stored list, without having to modify configuration files or reboot the computer.

**NOTE**

**If the Access Points for the new SSID you select in the ASP Properties window are on a different Ethernet segment from the Access Point you are currently connected to, you may not be able to log on to that network segment. Also, while you can change the SSID , ASP Properties does not allow you to select a particular Access Point to connect to.**

To make a list of frequently used SSIDs, type in the SSID, then click Add. Your settings will be added to the list at the bottom of the window. When you click Close, the list is saved.

To use an SSID in the list, select the SSID you want and click Connect. The utility will connect you to that SSID. (If you double-click a SSID, you will be connected and the utility will close).

If you enter an invalid SSID, you will get a message box telling you the proper range. If you select an SSID already saved in the list, the SSID will also appear in the corresponding fields above.

### The AirSurfer Surf Start Utility

The Airsurfer Surf Start Utility is placed in the startup folder so it is loaded automatically when Windows 95 starts. Surf Start is a utility that resides in the WIN95 system tray on the task bar. It indicates visually the quality of the wireless connection. Double-clicking on the Surf Start icon will launch the more detailed AirSurfer Connection Quality Utility.

# DIAGNOSTICS AND TROUBLESHOOTING

This section describes LED indicators, a diagnostic utility that can be used to verify AirSurfer PRO PC Card operation, and basic troubleshooting measures. For error messages, see Appendix B.

## AIRSURFER PRO PC CARD LED INDICATORS

LED indicators on the antenna of the AirSurfer PRO PC Card will operate when: (1) the card is inserted into a PC Card slot, (2) the computer is powered on, and (3) a network driver has been loaded.

Green (solid)      indicates connection to an AirSurfer PRO Access Point

Green (flashing)   indicates connection to an independent "ad hoc" AirSurfer PRO network (NOT used with Access Point).

Amber              Intermittent ON indicates the driver has been loaded and there is no transmit or receive activity on the AirSurfer PRO segment of the network. Rapidly flasing indicates transmit and receive activity on the AirSurfer PRO segment of the network.

## TROUBLESHOOTING

**Problem**: The Green LED flashes once on power-up, but does not stay on or intermittently flash.

Either your Network Drivers are not properly loaded or your AirSurfer Wireless PC Card adapter parameters are not configured properly for your network.
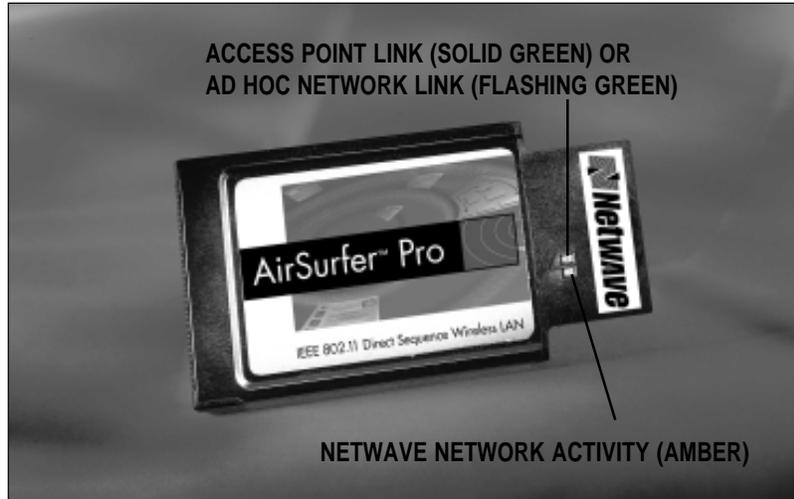
### Driver Installation Troubleshooting

Your drivers will not load properly if your AirSurfer PRO card  resources have a conflict. Ensure that there are no resource conflicts.

**For Windows 95:**

1. Click the *Start* button, select *Settings*, *Control Panel.*
2. Double click the *System* icon.
3. Click on the *Device Manager* tab

**ACCESS POINT LINK (SOLID GREEN) OR**
**AD HOC NETWORK LINK (FLASHING GREEN)**

**NETWAVE NETWORK ACTIVITY (AMBER)**

**AirSurfer PRO Network Activity**

4. Double click on the *Network Adapters* option

5. Double click on the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter"

6. Check in the *Device Status* box to see if the device is working properly

7. If not, click on the *Resources* tab

8. In the *Conflicting device* list, verify that there are no resource conflicts with the Input/Output range, the Interrupt Request or the two Memory Range settings.

9. If there are, for each conflict, highlight the category (e.g. Input/Output Range), then click *Change Setting.* Scroll on the value selection until the *Conflict Information* window indicates that "No devices are conflicting." Again, do this **for each conflict**.

**For Windows NT Workstation 4.0:**

1. Click the *Start* button, select *Administrative Tools, Diagnostics*

2. The first window displays the resource usage for IRQs. Ensure that there are no conflicts. If there are, note the conflict, and look for unused IRQs.

3. Click on the *"I/O"* button. Again, ensure that there are no conflicts. Note any, and the open I/O ranges.

4. Click on the *"Memory"* button. Again, ensure that there are no conflicts. Note any, and the open Memory ranges.

5. Click *"OK"*

6. To change the resource use of your AirSurfer Wireless PC Card adapter, click on *Start, Settings, Control Panel*

7. Double click the *Network* icon

8. Select the *Adapter* tab.

9. Highlight the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" and click on *Properties*.

10. Make any required changes to your IRQ, I/O, or Memory Ranges.

11. Click *"OK"*

12. Restart your computer.

If there are no device conflicts, your adapter drivers may have not installed properly. Please follow the removal instructions in the Network Driver Removal section of this manual, and follow the installation instructions for your operating system.

### Card Configuration Troubleshooting

If your adapter has the incorrect wireless network settings, it will fail to communicate. Ensure that the configuration is correct. If you do not know your SSID and PYH Parameter settings, please contact your network administrator. These settings must match the other wireless resources—Access Points (Infrastructure Mode) or other wireless network adapters (Ad Hoc)—in order to work properly.

**For Windows 95:**

1. Click the *Start* button, select *Settings, Control Panel.*

2. Double click the *Network* icon.

3. Highlight the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" and click on *Properties*.

4.   Ensure that the SSID and PHY Parameters are set correctly. Make any changes, if necessary.

5.   Click *"OK"*

6.   Restart your computer.

**For Windows NT Workstation 4.0:**

1.   Click on *Start, Settings, Control Panel*

2.   Double click the *Network* icon

3.   Select the *Adapter* tab.

4.   Highlight the "Netwave AirSurfer Wireless LAN in 802.11 Mode Adapter" and click on *Properties.*

5.   Ensure that the SSID and PHY Parameters are set correctly. Make any changes, if necessary.

6.    Click *"OK"*

7.   Restart your computer.

If you continue to have problems, please contact Netwave Technical Support department at (925) 737-1613 or at **support@netwave-wireless.com.**

**Network drivers are loaded but the PC Card cannot access the network.**

1.   Verify that the PC Card is configured with the same SSID as the Access Point through which it is attempting to access the network, or as the other workstations on the ad hoc standalone network you wish to connect to.

2.   Be sure the PC Card is an authorized user of the Access Point through which it is attempting to connect. If "User Authentication" has been enabled on the Access Point, the PC Card's Ethernet address must be on the User List of the Access Point.

**The amber LED on the AirSurfer PRO PC Card is not blinking, or no LEDs are blinking.**

Reboot the computer.

# APPENDIX A:
# GLOSSARY OF NETWAVE TERMS

**Access Point**

A Netwave device providing access to a wired network from workstations with AirSurfer PRO PC Cards installed.

**Ad hoc (independent) network**

A standalone AirSurfer PRO network consisting of two or more AirSurfer PRO workstations but no AirSurfer PRO Access Point and, therefore, no connections to a wired network. An ad hoc AirSurfer PRO network generally requires peer-to-peer network software such as Windows for Workgroups or Windows 95. *See* **Peer-to-peer network and Server-based network.**

**AirSurfer LAN**

A cordless local area network technology designed by Netwave for mobile computing users who want cable-free access to a corporate network or the ability to set up a temporary cordless network at any time or place.

**AirSurfer PRO PC**

*See* **AirSurfer PRO workstation.**

**AirSurfer PRO PC Card**

Netwave's cordless network adapter, using PC Card technology, and designed for cable-free networking among standalone workstations or cordless access to a wired network through a AirSurfer PRO Access Point.

**AirSurfer PRO workstation**

An IBM PC desktop or portable computer with AirSurfer PRO PC Card hardware and AirSurfer PRO software installed.

**Card Services**                PCMCIA-compliant software that interfaces with Socket Services and automatically provides management of system resources (such as interrupts and memory windows) for PC Cards initialized in a PCMCIA computer.

**Configuration utility**        A Netwave utility program designed to facilitate initialization of an AirSurfer PRO PC Card in any PCMCIA environment. Also called a resource manager. The AirSurfer PRO version of this program is designated ASPCFG.EXE.

**Driver software**              *See* **Network driver.**

**Ethernet address**             *See* **IEEE address.**

**IEEE address**                 A unique hardware address assigned through the IEEE to each and every device that can be attached to an Ethernet network. This address consists of six hexadecimal numbers, sometimes separated by spaces or dashes, for example, AE-34-2C-1D-69-F1. It is sometimes referred to as the hardware, MAC, network, or Ethernet address.

**IEEE 802.11 Standard**         A standard developed by the Institute of Electrical and Electronic Engineers which defines the requirements for implementation of wireless LANs.

**Independent Network**          See **Ad Hoc (Independent) Network.**

**Installation program**         A Netwave utility designed to facilitate AirSurfer PRO PC Card configuration and installation of network driver software.

**Keyword**  A text string used with a value in a configuration file, to set a parameter for the AirSurfer PRO PC Card. Keywords are only required when the factory-default value of the parameter cannot be used in a particular PCMCIA environment. These parameters can be set with the AirSurfer Installation Program or manually by including the required keyword and setting in the appropriate driver configuration file (for example the PROTOCOL.INI file for the NDIS driver).

**MAC layer**  The media access control (MAC) layer or data link layer of the ODI reference model is the interface to higher software levels. The AirSurfer PRO MAC layer provides an asynchronous data delivery service that is equivalent to the service provided by Ethernet. It is a best effort datagram delivery service with low delay that supports typical bursty LAN applications such as file access, client/ server applications, printing, and email.

**Mobile Unit**  See **AirSurfer PRO Workstation.**

**NDIS**  The Microsoft Network Driver Interface Specification (NDIS) defines a hardware-independent MAC-layer network device driver. The AirSurfer PRO NDIS driver conforms to version 3 of this specification.

**Network driver**  The software that makes it possible for a network adapter card such as the AirSurfer PRO PC Card to operate on a network.

| | |
|---|---|
| **Network operating system** | (NOS) The software that provides management of local area network operations and services. Examples of network operating systems are Microsoft Windows NT and Novell NetWare. |
| **ODI** | The Open Data-Link Interface (ODI) network driver specification from Novell allows several protocols to run simultaneously on one LAN adapter. |
| **OSI reference model** | A seven-layer scheme describing the various functions required for network and computer communications. OSI stands for Open Systems Interconnection, which is the International Standards Organization's (ISO) program for standardization of data communications. |
| **PCMCIA** | The Personal Computer Memory Card International Association (PCMCIA) is a standards organization that has developed standards for a "PC Card" that fulfills the same function as the AT bus on standard desktop computers: it provides universal, non-proprietary expansion capability. |
| **Peer-to-peer network** | A network consisting only of workstations and peripheral devices, with no centralized, dedicated server. An example of peer-to-peer network operating system is Microsoft Windows 95. In AirSurfer networks, if a peer-to-peer network does not include access to a wired network through an AirSurfer PRO Access Point is called an ad hoc or standalone network. *See* **Ad hoc network, Server-based network.** |

**Physical layer**

The physical layer is the lowest level of the OSI reference model for data communications. It includes transmission media such as cabling or, in the case of AirSurfer, radio waves. Netwave's AirSurfer technology has been designed to provide a level of reliability at the physical level comparable to that of wired LAN adapters.

**Resource manager**

*See* Configuration utility.

**ROAM NOW**

A function button which permits the operator to force the mobile unit to roam and select the Access Point which provides the best performance at the moment the button is pressed.

**Roaming**

This is a feature of an AirSurfer network that allows the AirSurfer user to move about freely within range of the other AirSurfer workstations or Access Points on the network, without losing connection to the network. In a network with multiple AirSurfer PRO Access Points, for example, a "roaming" user can move out of range of one network-attached AirSurfer PRO Access Point and into range of another AirSurfer PRO Access Point without being disconnected.

**Server-based network**

A server-based network is a local area network on which network processing and storage are located on a dedicated workstation or "server" to which other devices on the network are connected. In AirSurfer PRO terminology, a server-based AirSurfer PRO network, by definition, must include at least one AirSurfer PRO Access Point giving Netwave workstations access to the wired network on which the server is located. A AirSurfer PRO network that does not include an Access Point is called an "ad hoc" network. *See also* Peer-to-peer network and Ad hoc network.

**Service area**

An AirSurfer PRO Access Point connected to a wired network provides a service area with a radius of 100 meters (approximately 300 feet) indoors and up to 500 meters in an open environment around the Access Point. A PC equipped with an AirSurfer PRO PC Card can access the wired network from within that service area. Additional Access Points can be added to the network to provide a larger service area. PC users can "roam" from one service area to another without losing connection to the network

**Socket Services**

A PCMCIA BIOS-level interface that hides the hardware implementation from PC Card vendors' drivers. It identifies the number of PCMCIA sockets in the computer and detects when a card is inserted into or removed from a socket.

**Spread spectrum**

A radio technology used by AirSurfer products that transmits and receives over a bandwidth of several megahertz, allowing for avoidance of both interference and eavesdropping through a technique known as Direct Sequence Spread Spectrum. Spread-spectrum radio can penetrate walls and other solid obstacles. Netwave products have been approved to operate in the sections of the radio spectrum used by the AirSurfer products.

**SSID/ESSID**

Service Set Identifier. An identification string of 1 to 32 characters defining a logical network. If the users are operating with an Access Point, the logical network is defined by an Extended SSID (ESSID).

**Transmission range**

The maximum distance from an AirSurfer PRO Access Point or AirSurfer PRO PC Card at which communication with another Access Point or PC Card can still be expected to occur. This distance can be made greater or less by environmental factors such as building structure or the presence of electrical interference. The indoor range of the AirSurfer PRO PC Card and Access Point is approximately 100 meters (300 feet) indoors and up to 500 meters in an open environment.

**Wired LAN**          A local area network in which compo-
                       nents (workstations, servers, printers,
                       bridges, routers, etc.) are connected by
                       cabling.

**Wired network**      A transmission network, such as a
                       telephone system or local area com-
                       puter network, in which transmission
                       occurs over physical wires or cables
                       connecting the components.

**Wireless**           Without cables or wires. Generally used
                       to refer to communication operations
                       in which transmission occurs by radio
                       and not through a system of wires
                       connecting transmission devices. *See*
                       **Cordless.**

# APPENDIX B:
# 24-HOUR GLOBAL SUPPORT SERVICES

**Customer First**

Netwave Technologies, Inc. is committed to delivering complete Customer Satisfaction. We endeavor to make all of our products reliable, easy to install, and easy to use. If you need additional technical assistance after reading the user documentation and README file, Netwave Technologies provides global access to a wide range of service and support offerings.

Telephone numbers and electronic addresses for worldwide access to Netwave service and support are listed on the following pages.

**www.netwave-wireless.com**

Our website provides access to current network drivers and associated software, driver installation instructions, technical bulletins, and a wide variety of company and product information.

**Call In**

You may also speak with a Support Engineer during the local Technical Support hours listed.

**Internet E-mail**

If you have a connection to the Internet, you can leave a message for a Support Engineer at **support@netwave-wireless.com**.

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**NOTE**

**Please fill out and return the Product Registration Card supplied with the product. Your information will be entered into our support database.**

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**Netwave Technologies, Inc. Worldwide Access**

**www.netwave-wireless.com**

**The Americas and Asia-Pacific**

Netwave Technologies, Inc.

6663 Owens Drive

Pleasanton, California 94588

**Direct Line to Technical Support**

925-737-1617 Technical Support

(8 a.m. to 5 p.m. U.S. Pacific Time)

925-847-8744 Fax to Technical Support

**support@netwave-wireless.com**

**Europe, Middle East, and Africa**

Netwave Technologies, Ltd.

Brooklands House

65 Park Street

Camberley

Surrey  GU15 3HE

United Kingdom

Phone (in UK): +44-1276-671707

Fax: +44-1276-676676

# APPENDIX C: LIMITED WARRANTY

## Warranties

As the original purchaser, you receive these warranties from NetwaveTechnologies, Inc.:

### Hardware

Your AirSurfer PRO Wireless LAN PC Card, including any AirSurfer PRO AC power supply component(s) (collectively, "Products"), will be free from defects in material and workmanship and will perform in substantial compliance with your user's manual(s) accompanying the Products for a period of five years of your date of purchase as long as you properly use the products.

### Software

Software accompanying these Products (including driver, utility software, etc.) and the magnetic media containing the software are warranted to perform in substantial compliance with the specifications contained in your user's manual(s) for two years from your purchase date. Our warranty does not cover or provide you with rights to upgrades or updates.

You are responsible for your choice of applications programs or related reference materials. Given the wide range of third party hardware and applications software products you might use our software with, you understand that Netwave does not warrant the compatibility or the uninterrupted or error free operation of our software.

Upon our confirmation of a covered defect or failure, at our option we will repair or replace the affected item or will refund your purchase price if repair or replacement is not possible or practical. Replacement products or repaired items may be a new or a refurbished item. Our warranty on items serviced under warranty will be five years for **hardware** and, two years for **software**, 90 days from return to you of software/magnetic media or the remainder of the original warranty, whichever is longer. Repair, replacement, or refund are the exclusive remedies available to you from Netwave for products and software.

## Your Obligations

Your warranty rights will be honored provided you

1. Read and follow your user's manual(s) for installation, setup, software setup, and operating guidelines,

2. Use the Products and software only in suitable physical or operating environments as described in your user's manual(s) and for purposes for which the Products and software are intended.

## Warranty Service

If you think there is a problem or defect with your purchased item, your point of contact will be

**In the U.S.A.**

> Netwave's Technical Support department at (925) 737–1613 or email **support@netwave-wireless.com**.

**Outside the U.S.A.**

> Contact your local Netwave supplier or Netwave regional office or email **support@netwave-wireless.com**.

Your Netwave contact will discuss your problem to confirm the defect. If warranty or return service is needed, you'll receive a *Return Material Authorization* (RMA) number.

Ship your return Product, **with the RMA number clearly visible on the outside of the shipping package**, to:

**From the U.S.A.**

> Netwave Technical Support
> 6663 Owens Drive
> Pleasanton, CA 94588
> RMA # _____

**From outside the U.S.A.**

> Contact your local Netwave supplier or Netwave regional center for shipping instructions.

Returned Products must include all other components from your original package, including the Product and any power adapters, software diskettes, and user manual(s). Be sure to enclose a copy of your purchase receipt or other proof of purchase confirming that you are the original purchaser.

## LIMITATIONS

Our warranty is subject to the following limitations:

a. We do not cover or accept liability for any injury, damage or failure caused by misuse, abuse, acts of Nature, accidents (e.g., dropping the Products or software diskettes), electrical mishaps, causes beyond our control, or claims by other than the original purchaser.

b. We will not honor, and will consider our warranty voided, if there has been any (1) tampering with the Product's external label or serial number, (2) attempt to open the Product's case, (3) attempted or actual repair by anyone other than an authorized Netwave technician, or (4) installation or use with any AC power supply component(s) other than the original Netwave AC power supply components(s) provided in the product package.

## DISCLAIMER

THIS LIMITED WARRANTY IS THE ONLY WARRANTY WE MAKE FOR THE PRODUCT AND SOFTWARE. TO THE EXTENT ALLOWED BY LAW, NO OTHER WARRANTY APPLIES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY, OF FITNESS FOR A PARTICULAR PURPOSE, OR OF NON-INFRINGEMENT. NETWAVE WILL NOT BE LIABLE OR RESPONSIBLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES (e.g., LOST PROFITS, LOSS OF OR DAMAGE TO ANY COMPUTER EQUIPMENT OR RELATED DATA).

### Additional Rights

Some states or countries do not allow exclusion or limitation of incidental or consequential damages, or limitations on the length of an implied warranty, so the above limitations or exclusions may not apply to you. Our warranty gives you specific legal rights, and you may also have other rights which vary from state to state or country to country.

# APPENDIX D:
# SOFTWARE LICENSE AGREEMENT

Netwave Technologies grants you a nonexclusive license to use the copies of software programs supplied with this product on the following terms:

**YOU MAY:**

a. Use the software program on any computer or network but only in conjunction with any Netwave hardware product;

b. Permit any other individuals to use the software program either directly or on a computer network, but only if there is no more than one user for each Netwave hardware product in use in conjunction with such use;

c. Make only those number of backup and archival copies of the software program in machine readable form as are essential to backup use of the software program, provided that you reproduce all proprietary notices on each copy.

**YOU MAY NOT:**

a. Modify, translate, reverse engineer, decompile, disassemble, create derivative works based on, or copy (except for archival purposes) the program or the accompanying documentation;

b. Rent, transfer, sublicense or grant any rights in the program or accompanying documentation (including any time-sharing arrangement) in any form to any other person without the prior written consent of Netwave;

c. Remove any proprietary notices, labels, or marks on the program and accompanying documentation.

Failure to comply with any of the above restrictions will terminate this license. This is not a sale. Title and copyrights to the program and accompanying documentation and any copies remain with Netwave except that title to software programs shipped by Netwave through an agreement with another manufacturer is owned and retained by the original manufacturer

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The SOFTWARE and documentation are provided with RESTRICTED RIGHTS. Use, duplication, or disclosure by the Government is subject to restrictions as set forth in subparagraph (c)(l)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013, or subparagraphs (c)(l) and (c)(2) of the Commercial Computer Software-Restricted Rights at 48 CFR52.227-19, as applicable. Contractor/manufacturer is Netwave Technologies, Inc., 6663 Owens Drive, Pleasanton, California 94588.

This Agreement is governed by the laws of the State of California.

# APPENDIX E: SPECIFICATIONS

AIRSURFER PRO PC CARD SPECIFICATIONS

| | |
|---|---|
| **Size:** | 4.0 in x 2.13 in x 0.20 in (101.6 mm x 54.0 mm x 5.0 mm) |
| **Weight:** | 1.6 oz (45 g) |
| **Operating Temperature Range:** | 32 °F to 131 °F (0 °C to 55 °C) |
| **Storage Temperature Range:** | -4 °F to 149 °F (-20 °C to 65 °C) |
| **Humidity:** | 95% maximum noncondensing |
| **Memory Size:** | 128K SRAM packet buffer |
| **Transmission Range (indoors):** | 50 m to 100 m (200 to 300ft indoors) (1500 - 2000 in open space) |
| **FCC Certification** | 47CFR PART 15, Class B |
| **ETSI Certification** | TO BE OBTAINED |
| **CE MARK** | TO BE OBTAINED |

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