AsantéLite Nubus and LC

Network Interface Cards

Installation Guide

Asanté Technologies, Inc.
821 Fox Lane
San Jose, CA 95131

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Part Number 06-00091-00 Rev.A

FCC Information

This equipment is classified as a Class A computing device. Class A devices may be used only in commercial, business, or industrial environments.

This equipment generates, uses and can radiate radio frequency energy. If this equipment is not insulated properly in strict accordance with the instructions in this manual, then it may cause interference in this electronic environment. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against radio frequency interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case, the user at his own risk and expense will be required to correct the interference in a commercial environment.

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Please read through this Installation Guide and think about these questions:

- What do you like best about this Guide?
- What do you think is the least valuable or weakest part of this Guide?
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Fax	(408) 432-6018
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Internet mail	support@asante.com

Technical Support Hours

6:00 AM to 5:00 PM Pacific Standard Time, Monday—Friday

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Chapter 1

Introducing AsantéLite Cards

Thank you for purchasing a network interface card from Asanté Technologies. AsantéLite cards enable you to connect any Nubus machine or LC with a PDS expansion slot to a high speed Ethernet network.

Types of AsantéLite cards

The AsantéLite series consists of Ethernet network interface cards for Macintosh systems with a Nubus or LC PDS bus. AsantéLite Nubus cards support either thick/10BaseT or thick/thin media. For the Macintosh LC family AsantéLite cards offer access to a thin Ethernet network or a 10BaseT network

NuBus Series	Media
	10BaseT and 10Base5 (thick) Ethernet ports
	10Base2 (thin) Ethernet and 10Base5 (thick) Ethernet
LC Series	
	10Base2 (thin) Ethernet
	10BaseT Ethernet

Summary of AsantéLite NuBus and LC card features

AsantéLite cards offer the following features:

- Support for Macintosh computers with NuBus or LC PDS expansion slots
- Compatibility with Apple® System 7, and EtherTalk Phase 1™ and Phase 2 ™
- Compliance with the Institute of Electrical and Electronic Engineers (IEEE) 802.3 standard for 10BaseT (twisted-pair), thin, and thick Ethernet
- Software support for AppleShare™, A/UX, Novell NetWare™ for Macintosh, 3Com 3+Open™, 3Com 3+Share™, Sitka TOPS™, DEC Pathworks™, and other popular network software
- Support for AFP, TCP/IP, DECNet, and LAT protocols.
- High performance true 32-bit internal data transfers with tuned drivers for optimal performance
- Standard 64K RAM
- Troubleshooting software for help in identifying problems
- Math co-processor socket for LC-PDS cards.

AsantéLite EtherTalk Installer software

An Asanté EtherTalk Installer diskette is included with each AsantéLite card. The diskette contains Asanté's EtherTalk driver and Network Diagnostic Utility software. Asanté's EtherTalk device driver enables the network interface card to communicate with the computer.

AsantéLite Network Diagnostic Software

AsantéLite Network Diagnostic Software, *TroubleShooter*, allows you to run tests on your network interface card and monitor network activity. It does not need to be installed to operate your Ethernet card. However, it can assist you in identifying potential network problems.

Chapter 2

Installing AsantéLite Ethernet Cards

This chapter provides step-by-step instructions for installing AsantéLite Ethernet network interface cards and EtherTalk software.

Please make sure you have prepared for the installation by completing each step described in this chapter. Do not open the anti-static bag containing the AsantéLite card without being properly prepared and meeting all requirements.

To install an AsantéLite Ethernet card, you need to perform the following operations:

- Power down your Macintosh
- Install the AsantéLite card
- Connect the Macintosh to the network cable
- Terminate the cable where applicable
- Turn on your Macintosh
- Install EtherTalk software
- Restart your Macintosh

About this chapter

Please read the following section on preparing to install an AsantéLite card first and then refer to the following table for installation instruction for the individual Asanté card.

Apple model	Asanté card	Installation Instructions
Macintosh with NuBus expansion slot	AsantéLite NuBus 10T/thick and thin/thick	page 2-7
Centris 610 with Centris 610 NuBus adapter	same as above	page 2-7
Macintosh LC Color Classic	AsantéLite LC 10T only thin only	page 2-9 page 2-11, 2-12

Preparing to install an AsantéLite Ethernet card

Before you open the anti-static bag containing the AsantéLite Ethernet card, make sure you have the following:

- The required software:

  Apple system software 6.0.7 or higher

  A network operating system (NOS) or a compatible system and application software to run the network, provided by Apple or a third-party vendor.

  The EtherTalk Installer diskette provided by Asanté.

- The appropriate AsantéLite card and Ethernet hardware for your cabling:

Cabling	Requires	Comments
10BaseT	Hub and RJ-45 connector	10BaseT-compliant hub required.
Thin	Pair of 50-ohm terminators and BNC-T connector	One terminator for each end of thin Ethernet cable
Thick	External media adapter and DB-15 (AUI) connector	Connects Macintosh to a transceiver cable. One for each Macintosh connected to the network

- Asanté offers a full range of intelligent and non-intelligent 10BaseT compliant hubs.

  Refer to Appendix B for detailed Ethernet specifications.

Observe the following safety precautions during the installation:

- Consult your network administrator about the card installation and its effect on the network. Do not disconnect the network before informing your network administrator. Other users must be warned of the interruption of network operations.
- Turn off the Macintosh and all peripherals connected to it.
- Use an anti-static strap or other electrostatic discharge equipment when handling the Asanté card or touching any component inside the system. If you are using an anti-static wrist strap, attach it to the chassis once you have opened the Macintosh.
- Handle the Asanté card by the edges and avoid touching the connectors and chips.
- Keep the Asanté card in the anti-static bag until you are ready to install it in the Macintosh.

❖ **Note:** The Network Interface cards are sensitive to static electricity and must be handled very carefully. Improper handling or installation can result in damage to your card and/or your Macintosh. Any damage you may cause to the computer or card is not covered by the limited warranty. ❖

AsantéLite NuBus card

If your Macintosh accepts NuBus expansion cards, use the appropriate AsantéLite NuBus card to connect the computer to your Ethernet network.

The individual cards in the AsantéLite NuBus family are identified in the table below:

NuBus card	Port	Ethernet medium
AsantéLite NuBus - 10T	RJ-45, AUI	Twisted Pair, and Thick
AsantéLite NuBus - Thin	BNC, AUI	Thin and Thick

The AsantéLite NuBus card is installed into an unused Nubus expansion slot on the motherboard.

Refer to your Macintosh User Guide for illustrated instructions on how to open your Macintosh computer.

❖ **Note**: In some cases with thick Ethernet (10Base5) cabling, you may need to set the JP1 jumper ON (as shown below) to force the NuBus card to select the AUI port. This may be necessary when your network does not have 10Base5-compliant Ethernet transceivers. ❖

Forcing selection of AUI port

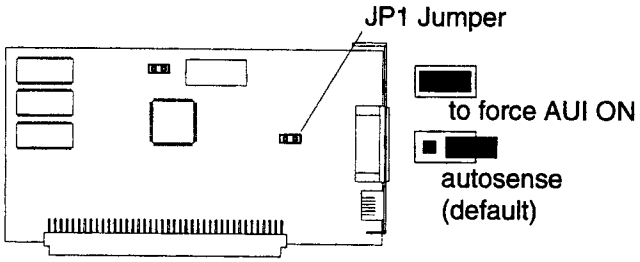

Figure 2-1 Thick Ethernet jumper setting

Installing the AsantéLite NuBus card

1 Power down the Macintosh. Disconnect and remove the power cable.

2 Open the Macintosh.

3 Remove the access port cover. If you are using an anti-static strap attach it to the metal chassis on the Macintosh to discharge any static electricity.

4 Plug the AsantéLite card into the Nubus expansion slot on the motherboard:

- With the card's Ethernet connectors facing the expansion slot access port, carefully line up the card's edge connector with the expansion slot (see *Figure 2-3*).
- Gently press on the card until the connector is fully seated and the card is flush with the card holders at both ends.

With a Centris 610

If you are installing a AsantéLite NuBus card in an Apple Centris 610, you need to use the Apple Centris 610 NuBus Adapter, which is not included with the AsantéLite NuBus card. The Apple Centris NuBus Adapter part number is M1402LL/A.

- Slide the AsantéLite NuBus card into the Centris 610 NuBus Adapter.
- Plug the adapter into the NuBus expansion slot.

5 Close the case.

Connect the Macintosh to the network as described in "Connecting the Macintosh to the network" in this chapter.

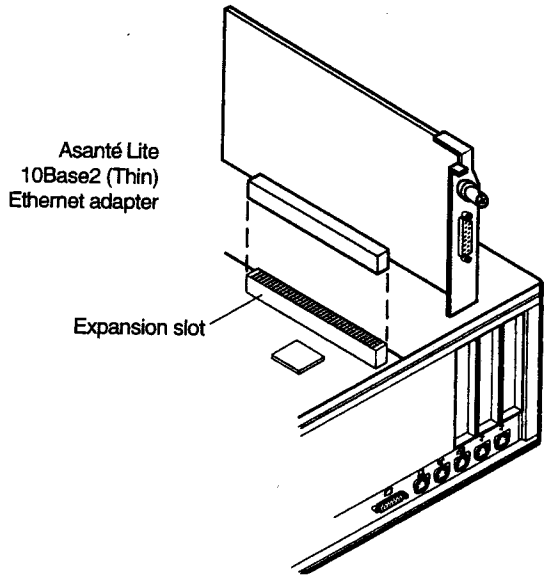

Figure 2-2 Installing AsantéLite NuBus card

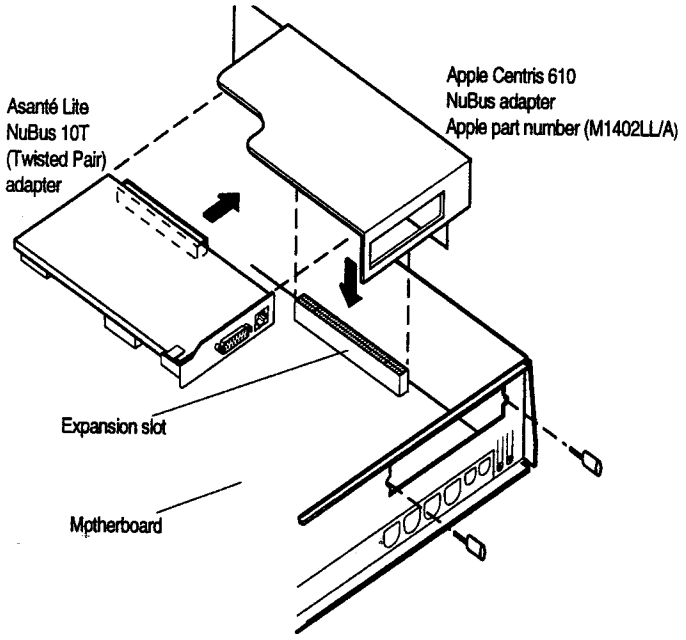

Figure 2-3 Installing AsantéLite NuBus card in an Apple Centris 610

Installing an AsantéLite LC card

If you have a Macintosh with a PDS expansion slot (LC, LCII, LCIII or Color Classic) computer, use the AsantéLite LC card to connect the Macintosh to the Ethernet. The LC cards are compared in the following table.

Card	Network ports	Requirement
AsantéLite LC 10T	RJ-45	10BaseT requires hub
AsantéLite LC TN	BNC	thin Ethernet

To install the AsantéLite LC card into the expansion slot on the motherboard, perform the following steps:

1. Power down the Macintosh. Disconnect and remove the power cable.

2. Open the Macintosh.

3. Using an electrostatic discharge grounding strap touch the power supply case inside the computer to discharge any static electricity.

4. Insert the card into the expansion slot.

   With the card's components facing down, carefully angle its external connector through the Ethernet port, then line up its edge connector with the expansion slot on the motherboard.

5. Gently press on the card until the connector is fully seated. (see Figure 2-4).

Connect the Macintosh to the network as described in "Connecting the Macintosh to the network" in this chapter.

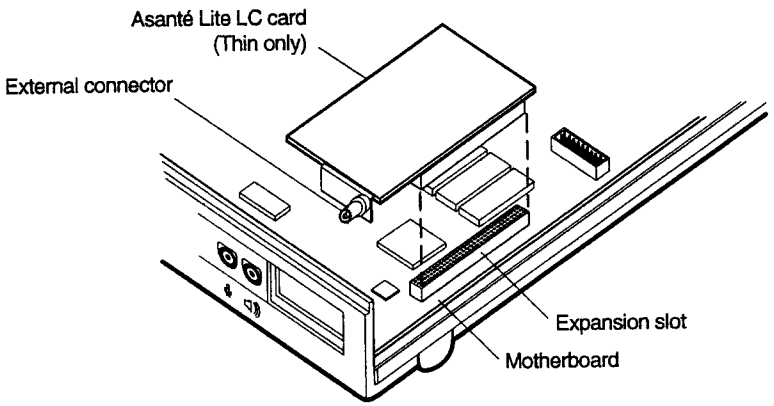

Figure 2-4 The AsantéLite LC card plugged into the expansion slot on the motherboard

Installing an AsantéLite LC card in a Color Classic

1. Power down the Macintosh Color Classic. Disconnect and remove the power cable.
2. Remove the rear access panel case. (see Figure 2-5).
3. Slide out the motherboard.
4. Insert the card into the expansion slot.

   With the connectors facing down, carefully angle its external connector through the Ethernet port.
5. Plug the card's edge connector into the expansion slot on the motherboard.
6. Gently press on the card until the connector is fully inserted.
7. Slide the motherboard back into the Color Classic (see Figure 2-6)
8. Secure the rear access panel case.

Connect the Macintosh to the network as described in "Connecting the Macintosh to the network" in this chapter.

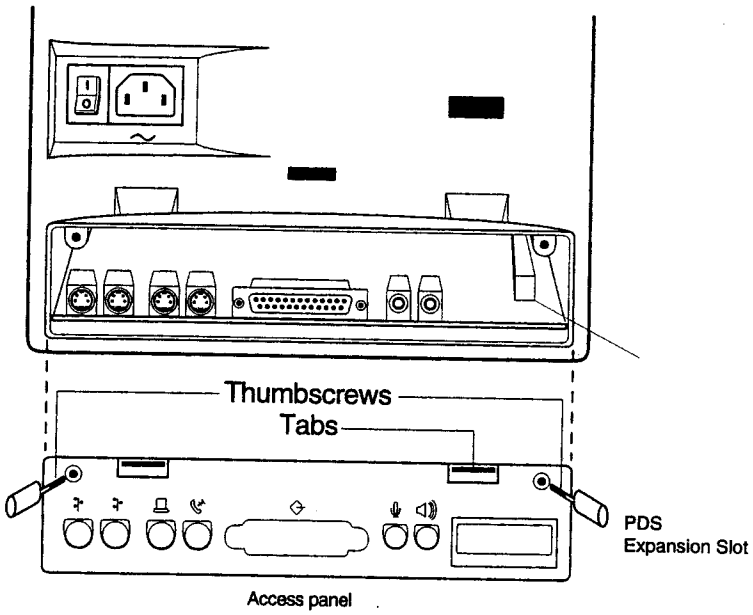

Figure 2-5 The rear panel removed on the Color Classic

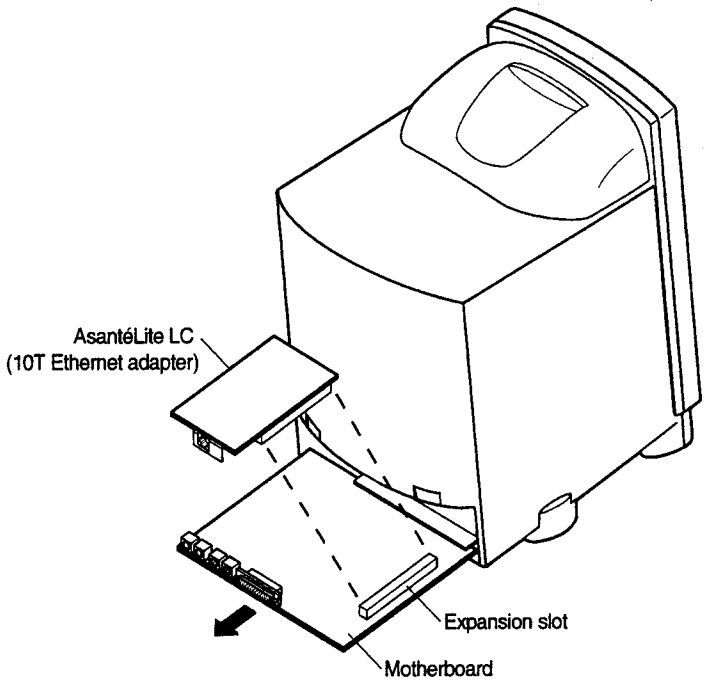

Figure 2-6 Installing AsantéLite LC in the expansion slot in the Color Classic

The Math co-processor option

AsantéLite LC Ethernet cards provide an optional socket for a math co-processor. This socket accepts the Motorola 68882 PLCC Math Co-Processor™. Asanté does not provide a math coprocessor with the AsantéLite Ethernet card. The Math co-processor can be purchased from Apple or your dealer. Please check your Macintosh documentation for the correct math co-processor chip available for your machine.

Installing the math co-processor in the AsantéLite LC card

Caution

- Your Macintosh may already have a math-coprocessor installed in the FPU socket of the motherboard. If so, do not install a math-coprocessor in the FPU socket on the AsantéLite card. It causes the Macintosh to fail at start up or freeze during normal operation.

❖ **Note:** If you have an LCIII machine you must install the math co-processor on the motherboard. ❖

❖ **Note:** If the math co-processor is not correctly installed the network interface card will fail. If you should experience problems with your math co-processor review your Macintosh documentation or contact your Macintosh dealer.❖

Connecting the Macintosh to the network

To connect the Macintosh to the Ethernet cable, perform the following steps:

With 10BaseT cabling

- Plug the RJ-45 connector on one end of the 10BaseT cable into the RJ-45 jack on the card. The RJ-45 connector's plastic tab snaps locked into the jack.
- Plug the other end of the cable directly into a hub or into a 10BaseT wall jack.

With thin Ethernet cabling

Caution

Check with your network administrator before you disconnect the Ethernet cable. Network users must be warned if you are bringing down the network.

- Connect the "T" connector to the BNC port on the AsantéLite NuBus or LC card. The connector slips on, twists, and locks in place.
- If the Macintosh is either the first or last node, terminate one end of the "T" connector using a 50-ohm BNC terminator (for thin cable - RG-58 A/U).

With thick Ethernet cabling

Connect a drop cable to the thick Ethernet cable:

- Plug one end of the transceiver cable into the AUI port on the AsantéLite NuBus or LC card.
- Plug the other end into the thick Ethernet transceiver.
- Connect the power adapter.

Installing the EtherTalk software

An EtherTalk Installer diskette is included with each AsantéLite Ethernet adapter. This diskette contains Asanté's EtherTalk driver, AppleTalk, and other Apple system extensions. Asanté's EtherTalk device driver allows AppleTalk to communicate with the AsantéLite adapter.

Two types of software installations

Asanté provides two types of installations–an **Easy Install** or a **Customize Install**. You should be experienced in network administration to perform the customize install.

For detailed information about each installation, click the **Help** button to display a help screen.

The following table explains which installation to choose:

Choose	When
Easy Install	• You want to install the AppleTalk version on the diskette and the Asanté Ethernet driver. • Your network does not present any potential compatibility problems with the AppleTalk version on the diskette. • You want access to EtherTalk Phase 2 network services.
Customize Install	• When your network has software that may conflict with the AppleTalk version on the Asanté diskette. You have the option to install only specific parts of Apple network software or just the Asanté driver software. Read the ***Read Me First*** file for more information about special situations and installation options. • You want to install EtherTalk Phase 1 network services.

About EtherTalk Phase 1 and Phase 2

EtherTalk Phase1 is limited to 254 devices and allows only one zone. EtherTalk Phase 2 allows up to 16 million devices and multiple zones. Phase 2 also offers optimized network performance.

The Easy Install provides EtherTalk Phase 2, now used by most networks. If you want to access networks using Phase 1, choose the customized installation.

Caution

Before you install Asanté's EtherTalk software, disable all extensions and virus detection programs. Then restart your Macintosh.

1. Read the *Read Me First* file before you install the EtherTalk software. It contains information about your installation and helps you determine if you need to do a customized installation.

   The installation instructions assume that you normally boot from your hard disk.

2. Insert the Asanté EtherTalk Installer Disk.

3. Double-click the **Installer** icon and click OK when the Installer banner appears.

   The Easy Install dialog box appears.

❖ **Note:** To properly install the Asanté EtherTalk software, you must use the installer application. Do not drag the files from the diskette to the System Folder. ❖

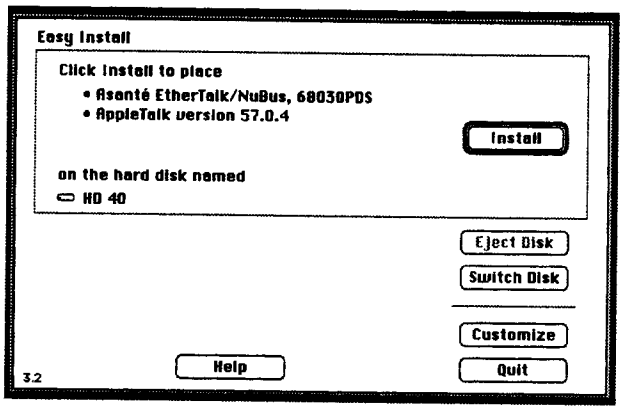

Figure 2-7 The Easy Install dialog box

1 To perform an Easy Install, click **Install.**

The Installer program examines your Macintosh and installs the appropriate EtherTalk driver and AppleTalk.

Click **Restart** when the system informs you that the installation is successful and prompts you to click.

To perform a Customize install:

- Only experienced Macintosh users should perform a customized installation. Open the *Read Me First* file on the diskette for an explanation of each installation option. Consult your network administrator if you do not understand the *Read Me First* file.
- Click, **Customize.**

  A dialogue box appears with a list of software options.
- Select the appropriate software option. Use **Shift-click** to select multiple operations.

  The system informs you when the installation is completed and prompts you to click **Restart.**

2 Click **Restart.**

❖ **Note:** If other Macintoshes on the network have Asanté EtherTalk drivers, we recommend that you upgrade all drivers to the most recent version. ❖

Accessing network services

To make the connection between your Macintosh and the Ethernet network work, you need the following:

- AppleTalk must be active in the Chooser dialog box
- EtherTalk interface must be selected in the Control Panel

Asanté EtherTalk driver software enables AppleTalk to interact with the AsantéLite Ethernet adapter and make a connection.

1 Select Chooser from the Apple menu.

The Chooser dialog box displays the icons for all available device options and the AppleTalk zones you configured.

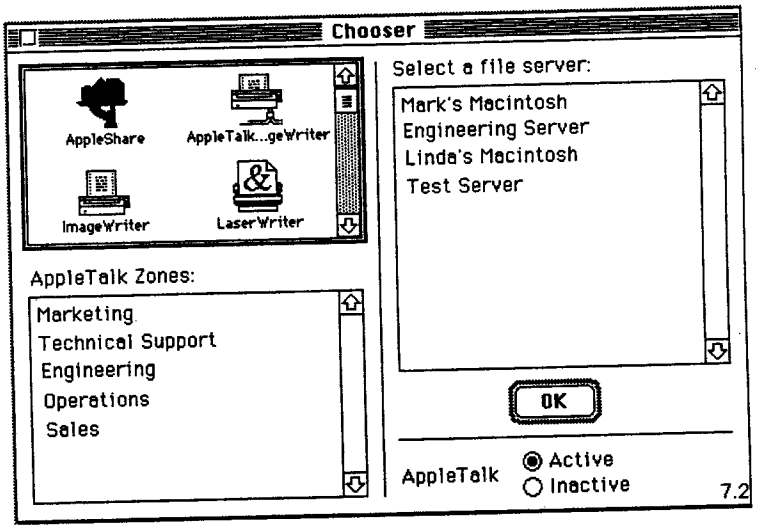

Figure 2-8 An Example of a user's Chooser dialog box

2 Make sure AppleTalk is active.

Click the Active button if AppleTalk is not active.

3 Select Control Panels from the Apple menu.

4 Open the Network control panel.

The Network window contains two types of network icons, **Built-in LocalTalk** and **EtherTalk**.

5 Select EtherTalk.

Click on the EtherTalk icon in the network control panel

❖ **Note**: If you wish to access Phase 1 network services (single arrow), click the Phase 1 icon. If you wish to access Phase 2 network services, (double arrow), click the Phase 2 icon. Click OK to confirm your selection. When you double-click on the Phase 2 icon, the default zone for the node is displayed. If you have more than one network card installed, each card appears as a separate icon, labeled by a slot number. ❖

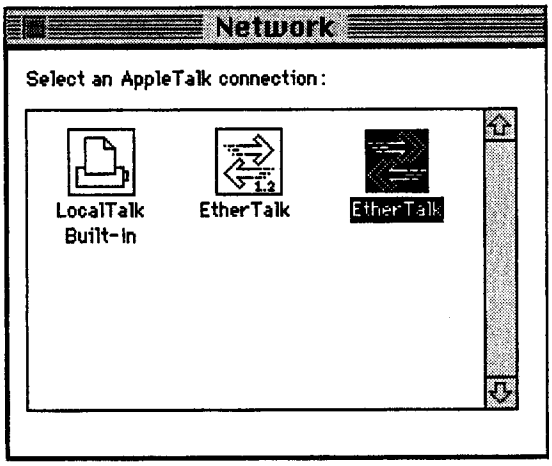

Figure 2-9 The Network control panel

Close the network control panel.

Your connection to Ethernet remains active until you switch to LocalTalk, disconnect the cable, or remove the Asanté interface card.

6 Select Chooser and select a network resource such as AppleShare or another network service.

Chapter 3

TroubleShooter Diagnostic Software

The TroubleShooter diagnostic program is provided on the Asanté EtherTalk installer diskette together with the EtherTalk drivers. TroubleShooter helps you isolate and evaluate problems on your network by running diagnostic tests on the AsantéLite Ethernet card. It also provides configuration information about the Macintosh and the Ethernet card, such as the Ethernet node address.

The TroubleShooter diagnostic program reinitializes and reconfigures your Ethernet connection and sends data out the Ethernet port. Therefore, before you run TroubleShooter, you must:

- Save all open files and close all active applications
- Log out of any active network services

Changing from EtherTalk to LocalTalk

1 From your desktop drag any remote volumes (any connections to network services) into the Trash.

2 Turn off virtual memory and disable virus software, extensions, and inits.

3 Change from EtherTalk to LocalTalk by clicking the LocalTalk icon in the network control panel.

4 Restart.

Starting TroubleShooter Diagnostics

1 Insert the Installer diskette.

2 Open the diskette's directory window and double-click the TroubleShooter icon to start the program.

TroubleShooter warns you to change your AppleTalk connection:

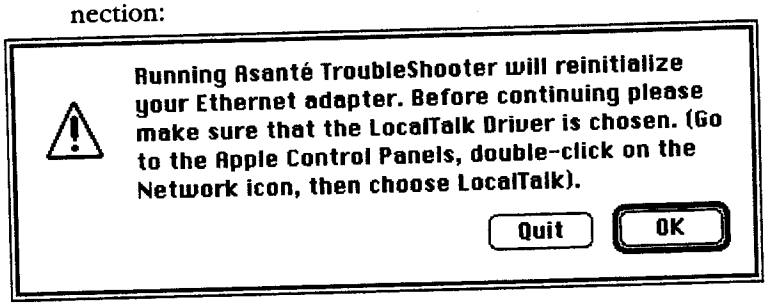

Figure 3-1 TroubleShooter Warning Box

If you need to make this change, click **Quit**, make the change, and restart TroubleShooter.

When you click OK, an about screen appears. Once you click OK in the about screen TroubleShooter loads and **automatically** runs the three default tests.

- **Memory buffer test**

  Writes to and reads from the packet buffer RAM to verify its addressability and operation.

- **Network interface controller test**

  Writes to and reads from the controller register to verify its operation. Also issues a transmit command to verify the network interface controller's integrity.

- **Ping-Pong test**

  Transmits and receives special packets to verify communication with other Macintoshes on the network.

  If the Ping-Pong test fails, check your connectors and cables.

TroubleShooter opens the TroubleShooter window and displays the results of the three tests.

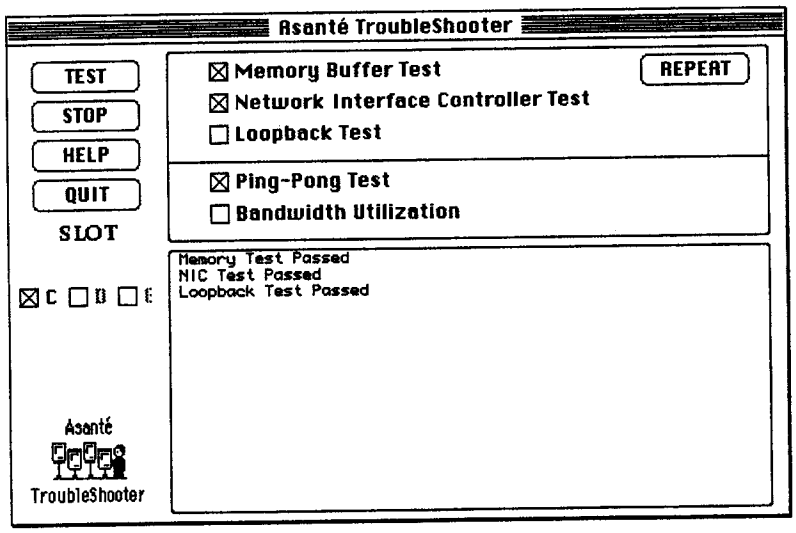

Figure 3-2 TroubleShooter window

Running other diagnostic tests

In addition to the three default tests, TroubleShooter offers the Loopback test and the Bandwidth Utilization test to validate operation of the network interface card.

Running the Loopback test

The Loopback verifies the operation of major components of the interface circuitry, the interface card, the serial network interface, and the thin port transceiver by transmitting and receiving special packets.

If you have a card with BNC connectors, disconnect the network cable and attach the T-connector terminating both ends with 50 ohm terminators.

To run the Loopback test, perform the following steps:

1. Click the Loopback Test checkbox to select the test.
2. Click **TEST** to start the loopback test.
3. If the first test fails, click **REPEAT**. If the tests are "passed" successfully, everything is operating properly.

If you leave your computer connected to the network during the Loopback test, the test may fail due to packet collisions. The test failure does not indicate that the equipment is faulty. Retry the test by clicking **REPEAT**. You need only one successful run to test the product.

If the Loopback test fails repeatedly, please call Technical Support.

Running the Bandwidth Utilization test

1. Reconnect the Ethernet cable.
2. Remove the loopback plug and reconnect the network cable to the Ethernet port on your Ethernet interface.
3. Click the Bandwidth Utilization checkbox to select the test.
4. Click the TEST button to start the test.
5. Data is collected from the moment you click the TEST button to the moment you click the STOP button.
6. Click the STOP button or press any key on the keyboard to stop the test.
7. The performance statistics are displayed in the TroubleShooter dialog box.

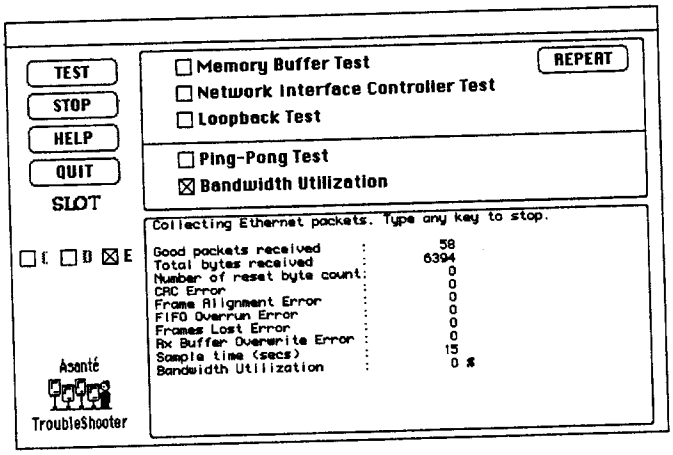

Figure 3-3 Bandwidth Utilization

When you run the Bandwidth Utilization Test it takes a "snap shot" of the network. This test can be used in conjunction with other network analysis tools to identify network problems. Certain network criteria is tested and displayed in the window. A brief description of the criteria is described in the following list.

- **Good packets received**

  Total good packets (error-free) received by the AsantéLite card from the network. This allows you to evaluate the activity on the network. The activity level can be used as a benchmark to determine changes in network performance.

- **Total bytes received**

  Total bytes received by the AsantéLite card from the network. Good Packets received display total packets not the size of each packet. Total bytes received is more specific because it gives the actual byte count.

- **Number of reset byte count**

  This number increments by (1) after every 10^9 byte received by AsantéLite card from the network.

- **CRC Error**

  Indicates the number of packets with CRC (Cyclic Redundancy Check) errors received by AsantéLite card from the network. When a packet is transmitted a mathematical calculation is done on the header and data. This is appended to the back of the frame. The receiver of the packet does the same mathematical computation. If the computations are not equal it is a CRC error and the packet is discarded.

- **Frame Alignment Error**

  Number of misaligned packets received by AsantéLite card from the network. If an Ethernet Frame does not end in an 8 bit boundary it is misaligned.

- **FIFO Overrun Error**

  This occurs when FIFO (First In First Out) is disabled causing an overflow during reception. The reception of the packet is aborted.

- **Frame Lost Error**

  This represents the number of lost frames received by the AsantéLite card from the network.

- **Receive Buffer Overwrite Error**

  This occurs when the receive buffer is full due to heavy network traffic.

- **Sample Time**

  The time from starting test to completion in seconds.

- **Bandwidth Utilization**

  Total bandwidth utilization of the network. If the bandwidth utilization is over 2 percent it will effect the FIFO Overrun Error and Frame Lost count errors.

If a test fails...

If a test fails, TroubleShooter displays an error message in the main dialog box. The error message generally consists of three parts:

- The name of the diagnostic test
- "Failed"
- A possible reason for the failure

Check the connections from your Macintosh to the Ethernet cable, and repeat the tests.

If the test fails repeatedly, make a note of the error message, quit the TroubleShooter diagnostics, and call Technical Support.

Obtaining system configuration information

TroubleShooter provides configuration information about your Macintosh and your Ethernet interface card.

The File menu provides the configuration information in two menu items–Get System Information and Get Adapter Information. The following information is displayed:

Menu	Displays
Get System Information	• System software version number
	• Machine type
	• Memory size
	• ROM version number
	• Installed AppleTalk version
Get Adapter Information	• Summary of the Ethernet interface hardware specifications:
	• Expansion slot used
	• Card type
	• Card's 48-bit Ethernet address
	• Card's buffer size
	• Asanté driver version

Quitting TroubleShooter Diagnostics

To quit TroubleShooter, click the QUIT button in the TroubleShooter dialog box.

Restarting network services

To restart network services, perform the following steps:

1. Restart your Macintosh.
2. Activate AppleTalk in the Chooser.
3. Select EtherTalk in the Network control panel.
4. Go to the Chooser and mount a remote volume or file server.

Asking for assistance

If you're having trouble or if a test has failed repeatedly, call your network administrator or Asanté Tech Support. Before you call, please write down the information in the table below:

Information	Select
Apple system software and AppleTalk version	*Get System Information* in TroubleShooter's File menu
Ethernet interface configuration	*Get Adapter Info* in TroubleShooter's File menu
LEDs on card	

Ways to contact Asanté Tech Support for help:

Telephone	(800) 622-7464
Fax	(408) 432-6018
Applelink	ASANTE.TECH
Internet	support@asante.com

Technical support hours

6:00 AM to 5:00 PM Pacific Standard Time, Monday—Friday

Chapter 4

Troubleshooting

This chapter addresses a few problems you may encounter when installing or using an AsantéLite network interface card. If you are unable to solve a problem after reading this chapter, please call Asanté Tech Support for assistance at 800-622-7464 or 408-435-0706.

Checking the basics

If you have a problem accessing a network node, check the basic requirements listed in the following table:

AppleTalk is active in the Chooser.	✔
EtherTalk is selected in the Network Control Panel. Make sure the same EtherTalk version (Phase 1 or Phase 2) is on the Macintosh as is used by the network.	✔
The AppleTalk zones are visible, when applicable.	✔
The card is properly seated.	✔
The cabling connections are secure.	✔
The LEDs on the card indicate no problems. Refer to Appendix A for information about the LEDs.	✔
The Asanté EtherTalk driver is installed on the start-up disk.	✔

Do you have the current Asanté driver software?

Before calling Technical Support, please check that you have the latest Asanté Ethernet driver in use. If you do not have the latest version, we ask that you obtain it and load it.

To learn the latest version number:

- Call 800-622-7464

  You will obtain the current version number as well as instructions for downloading Asanté Ethernet drivers from Applelink or Internet. If you prefer a floppy disk be mailed to you, please leave a detailed message as instructed.

Running TroubleShooter

Run the Asanté TroubleShooter Diagnostics program to identify problems in the installation. Refer to Chapter 3 for more information.

Questions and answers to common problems

Q The AppleTalk zones are not in the Chooser and I can't connect to my remote file server. What's wrong?

A
- AppleTalk may not be active in the Chooser.
- EtherTalk may not be selected in the Network control panel.
- The Asanté EtherTalk driver may not be properly installed.

Q I can't access the network resources over our thin coaxial backbone.

A If your Macintosh is the first or last system on the backbone make sure the T-connector on the Asanté Ethernet card is terminated with a 50 ohm terminating resistor.

Q Why is the EtherTalk icon not in the Network control panel? I can't connect to the network.

A
- The Asanté EtherTalk driver may not be installed or is not seen by the system.
- Run the Asanté EtherTalk Installer again.
- Make sure the Asanté network interface card is firmly seated.
- Check the connector on the Asanté card for any bent pins.

Q Do I need to remove the LocalTalk connection before I use EtherTalk?

A No.

Q After I restart my Macintosh, the LocalTalk icon is selected, instead of the EtherTalk.

A Make sure that:

- The Asanté EtherTalk driver is on the start-up disk or in the System folder.
- The Asanté card is properly seated.
- The network cable is properly connected.

If LocalTalk is still selected, install the Asanté EtherTalk software again.

Q My system freezes intermittently when I access data on the remote file server. Printing to remote printers is OK. What's wrong?

A Check the software version numbers on your Macintosh.

We recommend you have:

- Apple operating system 6.0.7 or later
- AppleTalk 57.04 or later
- Asanté EtherTalk 5.1 or later
- Mac TCP version 1.1.1 if using Mac TCP

Upgrade your software if necessary. Remove old driver software by running Installer, selecting the **Customize** option, and holding down the **Option** key (**Install** changes to **Remove**). Then install the new software.

Q I can't see any other Macs on the network.

A

- Change to LocalTalk.
- If using system 7.0, turn off virtual memory and restart.
- Run the Asanté Troubleshooter program from the Asanté EtherTalk diskette.
- If the Ping-Pong test fails, check for faulty connectors, frayed or broken cable.

Q I have connected a Macintosh LCII to the Ethernet using an Asanté Ethernet card, and now printing is taking an extraordinarily long time. I am using version 4.0 of the Asanté Universal Installer and Apple System 7.1.

A

- Update the Asanté EtherTalk driver to 5.1.
- We also recommended that all Macs on the network be updated to the same driver version.

Appendix A

AsantéLite Specifications

AsantéLite Nubus	MacII (NuBus) family and Centris with Nubus adapter
AsantéLite LC	LC machines with PDS expansion slot
Standards supported	IEEE 802.3 Ethernet specifications for thick (10Base5), thin (10Base2), and Unshielded Twisted-Pair (10BaseT) media. Phase 1 and Phase 2 EtherTalk. Register-level compatible with Apple Computer's Ethernet cards.
Software supported	AppleShare, A/UX, Novell NetWare for Macintosh, 3Com 3+Open, 3Com 3+Share, Sitka TOPS, DEC Pathworks, and other popular network software.
Protocols supported	AFP, TCP/IP, DECNet, and LAT
On-board RAM	64 KB
Math co-processor	Socket for Motorola 68882 PLCC math co-processor
Power requirements	+5VDC @ 1300 mA max. (thin) +5VDC @ 1000 mA max (UTP) +12VDC @500 mA max (thick) +5VDC @800 mA max. (LC Series)
Operating temperature	0° to 50° C Relative humidity: 10% - 90%, non-condensing
Warranty	3 years

Ethernet address

Each Asanté card has a 6 byte Ethernet physical address beginning with 00-00-94. In the illustration below (see *Figure A-1*) an arrow points to the location of the Ethernet address on each card.

You can also learn the Ethernet address using the *Get Adapter Information* option from the TroubleShooter File menu. The TroubleShooter application is available on the Installer diskette.

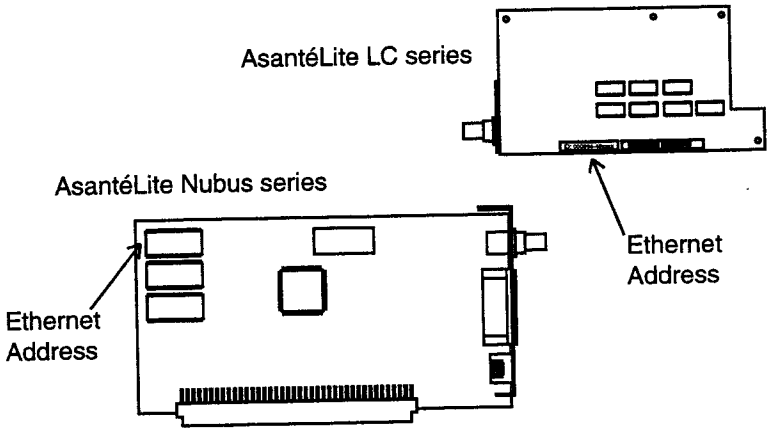

Figure A-1 Location of Ethernet address on AsantéLite cards

AsantéLite LEDS

LED State	Yellow	Green
ON	N/A	Link Integrity ON
OFF	No network activity	Link Integrity disabled
BLINKING	Network traffic	N/A

Appendix B

Ethernet Specifications

Parameter	10Base2	10Base5	10BaseT
Cable	Thin	Thick	UTP
Impedance	50 ohms	50 ohms	100 ohms
Connector on cable	BNC	DB-15	RJ-45
Data transfer rate	10 Mbps	10 Mbps	10 Mbps
Topology	Bus	Bus	Star
Segment length (maximum)	185 meters	500 meters	100 meters
Distance between nodes (minimum)	0.5 meter	1 meter	n/a
Nodes per segment (maximum)	30	500	n/a

A few tips

10BaseT

- The wiring normally called for in 10BaseT is 26 to 22 AWG, which corresponds to the wire gauge of telephone twisted-pair cables. You need two pairs of wiring for each node. Before you think seriously about using your existing phone wiring for an Ethernet network, be aware that older cabling may not be of sufficient quality to support the full 100 meters between a device and the hub.

- When wiring 10BaseT connections, take precautions against splitting pairs. Be sure you maintain the same color mates for each pair used within the cable. If you don't follow a common color pairing, you can mix up the wires preventing the Ethernet signal from being transmitted.
- Be sure to check any cabling you plan to use. Older cabling may not be of adequate quality to support 100 meters between a device and the hub.
- When subdividing cable segments, do not randomly pick any length of cable. The IEEE recommends that Ethernet coaxial cable be subdivided at lengths of 23.4 meters (76.8 feet), or multiples of that length, in order to minimize internal signal reflections. These reflections reduce the signal strength for large networks. On small networks, such as those covering a single floor of a building, these reflections probably won't cause problems.
- You may want to install a wiring system in your building, or you may already have one, that allows you to run a 10BaseT cable to a wall jack.

10Base2 (thin) Ethernet

- The AUI port can support thick or thin Ethernet depending on the type of tranceiver being used.
- When using thin Ethernet make sure you use the RG-58A/U cable as specified by IEEE.

Appendix C

Connector Pin-outs

AUI connector (DB-15)

Pin	Circuit	Signal name
03	DO+	Data Out + (transmit pair)
10	DO-	Data Out -
11	DO S	Data Out Shield
05	DI+	Data In + (transmit pair)
12	DI-	Data In -
04	DI S	Data In Shield
07	CO+	Control Out + (optional)
15	CO-	Control Out -
08	COS	Control Out Shield
02	CI+	Control In + (optional)
09	CI-	Control In -
01	CI S	Control In shield
06	VC	Voltage Common (power pair)
13	VP	Voltage Plus
14	VS	Voltage Shield
Shell	PG	Protective Ground

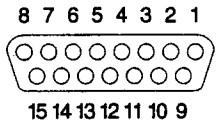

Figure C-1 AUI connector pin number assignment

RJ-45 connector

The pin numbers are for an Asanté 10BaseT card or FriendlyNet Media Adapter positioned correctly with the notch on the 8 pin modular jack oriented down. Pin 1 is the left-most pin, and Pin 8 is the right-most pin.

Pin	Circuit	Signal name	Color code
1	TD+	Data Transmit +	white-blue
2	TD-	Data Transmit -	blue-white
3	RD+	Data Receive +	white-orange
4		Not used	
5		Not used	
6	RD-	Data Receive -	orange-white
7		Not used	
8		Not used	

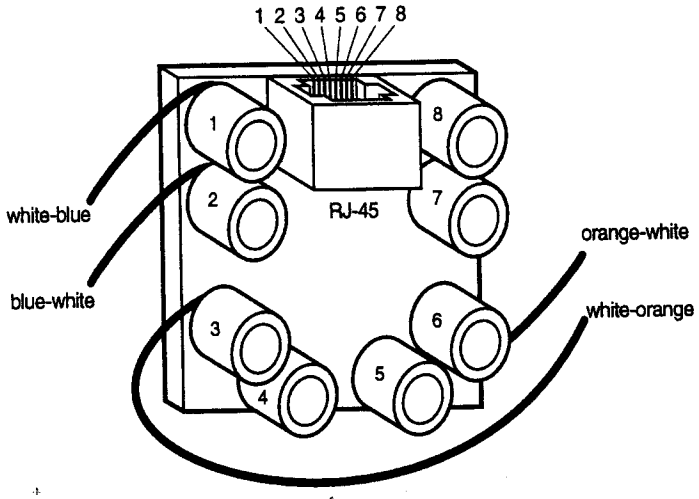

Figure C-2 RJ-45 connector and biscuit block pin-outs

Glossary

Adapter

A device that allows one system to connect to another system.

AAUI (Apple Attachment Unit Interface)

Apple's new Ethernet physical interface, which uses a special connector and requires an external transceiver to complete a connection to the network.

AppleTalk

Apple Computer's networking software and protocols providing the capabilities for communications and resource sharing among computers, printers, and other peripherals attached to the network. AppleTalk can be implemented on a variety of cable systems, including LocalTalk and Ethernet.

AppleTalk Phase 1

AppleTalk Phase 1 is the original implementation of Apple's networking software and protocols. It has a restriction of 255 nodes per AppleTalk network and does not permit multiple zones.

AppleTalk Phase 2

Apple released AppleTalk Phase 2 in 1991. AppleTalk Phase 2 does not have the network and zone restrictions of AppleTalk Phase 1. In the AppleTalk Phase 2 environment an AppleTalk network can have over 16 million nodes. Also, one AppleTalk network can be divided into multiple zones.

AUI port (Attachment Unit Interface port)

Industry-standard port enabling you to connect to thick coaxial cable, fiber-optic cable, and other media.

bandwidth

The capacity of a network to carry information measured by the maximum number of bits per second (bps) the network can transmit. The higher the bandwidth, the greater the amount of information that can be transmitted from one device to another.

BNC

The connector used with the RG-58 A/U thin coaxial cable. The connector looks like a cylinder with two short pins on opposite sides.

bus topology

In a bus network topology, all computers are connected with a single cable with a terminator at each end.

controller card

Another term for network interface card. For MacCon+ cards installed in Mac SE and Mac SE/30 computers, the controller card is the larger of the two printed circuit boards mounted on the Mac motherboard.

CSMA/CD

Carrier Sense Multiple Access/Collision Detection is a communications access method used by Ethernet. A device listens to the network to determine if it's free. If not it waits a random amount of time and then transmits. If two devices transmit at the same time they backoff to avoid collision and then retransmit.

daughterboard

A small circuit board that plugs into another circuit board.

EtherTalk

Apple's data-link software that allows the AppleTalk protocol to run on Ethernet media. For information on EtherTalk Phase 1 and EtherTalk Phase 2, see AppleTalk Phase 1 and AppleTalk Phase 2.

Ethernet

A data link protocol jointly developed by Intel, Xerox, and DEC and subsequently adopted by the IEEE as a standard. It uses the CSMA/CD access.

Hub

A central device that joins several communication channels into a single one. The hub is responsible for processing and transmitting all communications.

IEEE (Institute of Electrical and Electronic Engineers)

An organization whose members include engineers, scientists and students in the electronics field. These members are responsible for setting standards for computers and communication in the United States.

LAN

A LAN (local area network) provides connections between workstations and peripherals such as printers and disk servers in a confined geographical area.

LocalTalk

The name for Apple Computer's network connectivity products consisting of cables, connection boxes, cable extenders, and other cabling equipment for connecting computers and other devices. LocalTalk was formerly called the AppleTalk Personal Network Cabling System.

math coprocessor

A secondary processor that handles high speed arithmetic operations for the main CPU. It relieves the main CPU and increases performance of desktop publishing operations.

motherboard

The main circuit board in the computer. It has sockets used to plug in other boards.

network interface controller (NIC)

A card (or set of chips) that fits inside a computer so that the computer can connect to a network. The card has a connector for attaching the network cable. Sometimes the network interface controller (or NIC) is called simply the *interface card.*

node

An addressable device on a network, such as a LaserWriter or a Macintosh.

10Base2

An implementation of the Ethernet IEEE standard on RG-58 A/U thin coaxial cable, a baseband medium, at 10 megabits per second. The maximum segment length is 185 meters.

10Base5

The original Ethernet medium, an implementation of the Ethernet IEEE standard on thick coaxial cable, a baseband medium, at 10 megabits per second. The maximum segment length is 500 meters.

10BaseT

An implementation of the Ethernet IEEE standard on 24 gauge unshielded, twisted-pair wiring, a baseband medium, at 10 megabits per second. The unshielded twisted pair uses RJ-45 eight conductor plugs at each end. The maximum segment length is 100 meters.

transceiver

A transmitter and receiver of analog and digital signals that comes in many forms

unshielded twisted Pair

A cable made of two insulated wires twisted together to reduce electrical interference without shielding under outer insulation.

Index

S

T

Numerics