Network Adapter Cards

AT-2400 Series
AT-2450/AT-2451 Series
AT-2500/AT-2501 Series
AT-2700/AT-2701 Series
AT-2745/AT-2746 Series
AT-2801FX
AT-2915 Series
AT-2916T Series
AT-2930 Series
AT-2970/AT-2971 Series

Installation Guide

BOOK II

FOR MICROSOFT WINDOWS FOR WORKGROUPS 3.11, MICROSOFT DOS CLIENT 3.0, NOVELL NETWARE 4.X, 5.X, AND 6.X, LINUX 2.2X AND 2.4X, AND BOOT ROM OPERATING SYSTEMS

Allied Telesyn

Simply connecting the (IP) world

Electrical Safety and Emission Statement

Standards: This product meets the following standards.

U.S. Federal Communications Commission

Radiated Energy

Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: Modifications or changes not expressly approved by the manufacturer or the FCC can void your right to operate this equipment.

Industry Canada

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

RFI Emission   EN55022 Class A, EN61000-3-2, EN61000-3-3 ↪ 1

⚠ **Warning**: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. ↪ 2

Immunity   EN55024 ↪ 3

Electrical Safety   EN60950, UL 1950 (UL/cUL) ↪ 4

⚠ Laser   EN60825 ↪ 5

Important: Appendix B contains translated safety statements for installing this equipment. When you see the ↪, go to Appendix B for the translated safety statement in your language.

Wichtig: Anhang B enthält übersetzte Sicherheitshinweise für die Installation dieses Geräts. Wenn Sie ↪ sehen, schlagen Sie in Anhang B den übersetzten Sicherheitshinweis in Ihrer Sprache nach.

Vigtigt: Tillæg B indeholder oversatte sikkerhedsadvarsler, der vedrører installation af dette udstyr. Når De ser symbolet ↪, skal De slå op i tillæg B og finde de oversatte sikkerhedsadvarsler i Deres eget sprog.

Belangrijk: Appendix B bevat vertaalde veiligheidsopmerkingen voor het installeren van deze apparatuur. Wanneer u de ↪ ziet, raadpleeg Appendix B voor vertaalde veiligheidsinstructies in uw taal.

Important: L'annexe B contient les instructions de sécurité relatives à l'installation de cet équipement. Lorsque vous voyez le symbole ↪, reportez-vous à l'annexe B pour consulter la traduction de ces instructions dans votre langue.

Tärkeää: Liite B sisältää tämän laitteen asentamiseen liittyvät käännetyt turvaohjeet. Kun näet ↪-symbolin, katso käännettyä turvaohjetta liitteestä B.

Importante: l'Appendice B contiene avvisi di sicurezza tradotti per l'installazione di questa apparecchiatura. Il simbolo ↪, indica di consultare l'Appendice B per l'avviso di sicurezza nella propria lingua.

Viktig: Tillegg B inneholder oversatt sikkerhetsinformasjon for installering av dette utstyret. Når du ser ↪, åpner du til Tillegg B for å finne den oversatte sikkerhetsinformasjonen på ønsket språk.

Importante: O Anexo B contém advertências de segurança traduzidas para instalar este equipamento. Quando vir o símbolo ↪, leia a advertência de segurança traduzida no seu idioma no Anexo B.

Importante: El Apéndice B contiene mensajes de seguridad traducidos para la instalación de este equipo. Cuando vea el símbolo ↪, vaya al Apéndice B para ver el mensaje de seguridad traducido a su idioma.

Obs! Bilaga B innehåller översatta säkerhetsmeddelanden avseende installationen av denna utrustning. När du ser ↪, skall du gå till Bilaga B för att läsa det översatta säkerhetsmeddelandet på ditt språk.

Table of Contents

Preface

This installation guide contains instructions on how to install an Allied Telesyn adapter card in your computer and how to load the adapter driver. This guide also explains the AT-Setup program which simplifies the task of installing or updating an adapter driver.

Purpose of this Guide

This guide is intended for anyone who needs to install or update a network adapter card or driver on their PC-compatible system.

How This Guide is Organized

This guide contains the following chapters and appendix:

Chapter 1, Installing the Network Adapter Card, describes how to install an adapter card into your computer.

Chapter 2, Diagnostics, contains procedures for running and using the diagnostics program for your Allied Telesyn adapter.

Chapter 3, Microsoft DOS Client 3.0, contains procedures for manually installing a network adapter driver on a PC-compatible system running Microsoft DOS Client 3.0.

Chapter 4, Microsoft Windows for Workgroups, contains the procedures for installing and removing a network adapter driver on a PC-compatible running Windows for Workgroups 3.11.

Chapter 5, Novell Netware, contains the procedures for installing an adapter driver on a Novell Netware system.

Chapter 6, Linux, contains the procedures for installing an adapter driver on a Linux system.

Chapter 7, AT-2971 Solaris Sparc, contains the procedures for installing the driver for an AT-2971 adapter in a Solaris Sparc system.

Chapter 8, BootROM, contains the procedures for installing and configuring a BootROM on an Allied Telesyn Network Adapter Card.

Appendix A, Translated Safety and Emission Information, contains multi-language translations of the safety and emission statements in this guide.

Document Conventions

This guide uses several conventions that you should become familiar with before you begin to install the product.

Note
Notes provide additional information.

Warning
Warnings inform you that performing or omitting a specific action may result in bodily injury.

Caution
Cautions inform you that performing or omitting a specific action may result in equipment damage or loss of data.

Where to Find Related Guides

The Allied Telesyn web site at www.alliedtelesyn.com offers you an easy way to access the most recent documentation, software updates, and technical information for all of our products. The documents provided on our web site are available as PDF files.

Contacting Allied Telesyn

This section provides Allied Telesyn contact information for technical support as well as sales or corporate information.

Online Support

You can request technical support online by accessing the Allied Telesyn Knowledge Base from the following web site at **kb.alliedtelesyn.com**. You can use the Knowledge Base to submit questions to our technical support staff and review answers to previously asked questions.

E-mail and Telephone Support

For Technical Support via e-mail or telephone, refer to the "Support & Services" section of the Allied Telesyn web site at **www.alliedtelesyn.com**.

Returning Products

Products for return or repair must first be assigned a Return Materials Authorization (RMA) number. A product sent to Allied Telesyn without a RMA number will be returned to the sender at the sender's expense.

To obtain a RMA number, contact Allied Telesyn's Technical Support at our web site at **www.alliedtelesyn.com**

For Sales or Corporate Information

You can contact Allied Telesyn for sales or corporate information at our web site at **www.alliedtelesyn.com**. To find the contact information for your country, select "Contact Us" then "Worldwide Contacts".

Obtaining Management Software Updates

New releases of management software for our managed products can be downloaded from either of the following Internet sites:

❑ Allied Telesyn web site: **www.alliedtelesyn.com**

❑ Allied Telesyn FTP server: **ftp://ftp.alliedtelesyn.com**

If you would prefer to download new software from the Allied Telesyn FTP server from your workstation's command prompt, you will need FTP client software and you will be asked to log in to the server. Enter 'anonymous' as the user name and your email address for the password.

Tell Us What You Think

If you have any comments or suggestions on how we might improve this or other Allied Telesyn documents, please fill out the General Enquiry Form online. This form can be accessed by selecting "Contact Us" from **www.alliedtelesyn.com**.

Chapter 1
Installing the Network Adapter Card

This chapter contains instructions for installing the following Allied Telesyn network adapter cards:

❑ AT-2400 Series

❑ AT-2450/AT-2451 Series

❑ AT-2500/AT-2501 Series

❑ AT-2700/AT-2701 Series

❑ AT-2745/AT-2746 Series

❑ AT-2801FX Series

❑ AT-2915 Series

❑ AT-2916T Series

❑ AT-2930 Series

❑ AT-2970/AT-2971 Series

Verifying Package Contents

Make sure the following items are included in your package. If any item is missing or damaged, contact your Allied Telesyn sales representative for assistance.

❑ Allied Telesyn Network Adapter Card

❑ CardAssistant CD

❑ Wake-on-LAN cable (AT-2450, AT-2451, AT-2500, AT-2501, AT-2700, and AT-2701 Series only)

❑ Low Profile Bracket (AT-2451FTXv2, AT-2701FTXv2, AT-2701FXv2, AT-2916T Series only)

Reviewing Safety Precautions

Please review the following safety precautions before you install the network adapter card.

⚠ **Warning**
This is a "Class 1 LED product". 6

⚠ **Warning**
Do not stare into the laser beam. (AT-2450FT, AT-2450FL, AT-2451FTX, AT-2700FX, AT-2701, AT-2970, AT-2971SX Series only) 7

⚠ **Warning**
Lightning Danger: Do not work on this equipment or cables during periods of lightning activity. 8

⚠ **Caution**
Operating Temperature: This product is designed for a maximum ambient temperature of 40 degrees C. 9

⚠ **Caution**
All Countries: Install this product in accordance with local and National Electric Codes. 10

Installing a Network Adapter Card

This section explains how to install a network adapter card in most PC-compatible computers.

> **Note**
> If you are installing an AT-2801FX CardBus PC Card, refer to <u>Installing an AT-2801FX</u> on page 19.

To install the adapter card, perform the following procedure:

1. Shutdown your PC and disconnect the power cord from the outlet.

2. Remove the PC's cover by removing the screws from the chassis and gently sliding off the cover. See Figure 1.
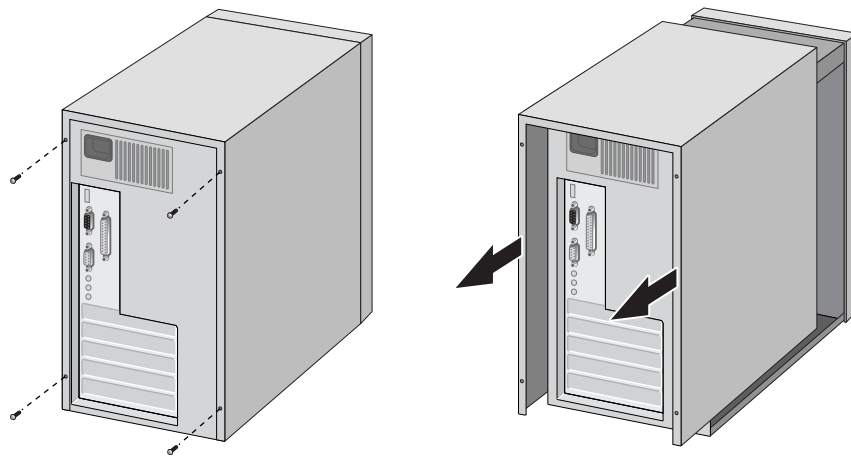
Figure 1 Removing the PC Cover

3. Select an empty, non-shared PCI slot and remove the faceplate. Keep the faceplate in a safe place. You may need it for future use. See Figure 2.
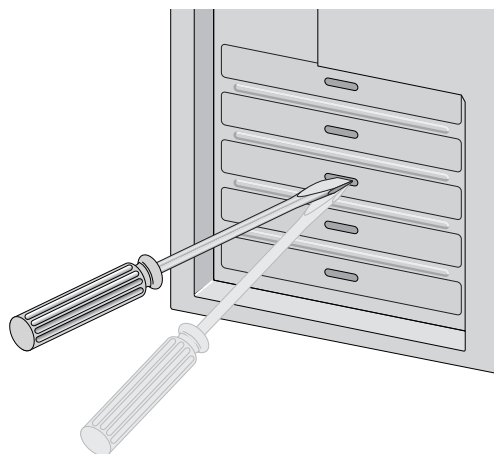
Figure 2 Removing the Faceplate From PCI Slot

Note

If you cannot locate or know how to find an PCI slot, refer to the documentation that came with your PC.

4.   Remove the network adapter card from the shipping package and store the packaging material in a safe location.

⚠ **Caution**

Wear a grounding device and observe electrostatic discharge precautions when installing the network adapter card in a PC. Failure to observe this caution could result in damage to the adapter card.

5.   Gently insert the network adapter card into the PCI slot. Make sure the card is securely seated.
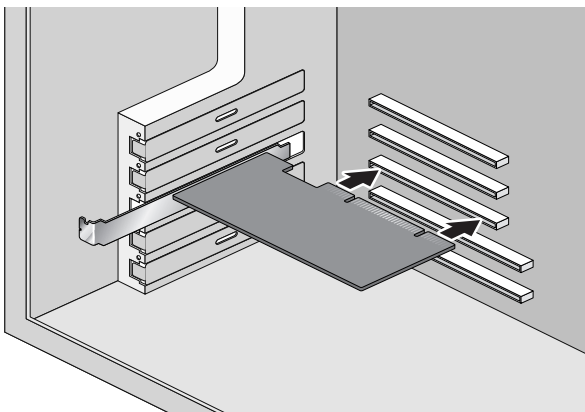
Figure 3 Inserting the Network Adapter Card

6.   Secure the network adapter card to the chassis with a Phillips-head screw, not provided.
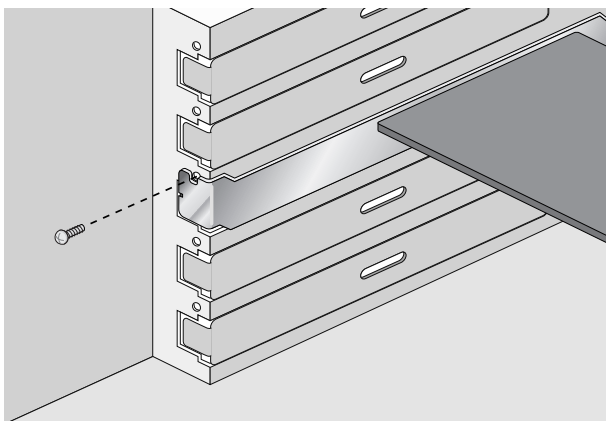
Figure 4 Securing the Adapter Card

7. For the AT-2450, AT-2500, or AT-2700 Series adapters, to use the adapter card's Wake-on-LAN feature in your computer using an Advanced Configuration and Power Interface (ACPI), you must connect the Wake-on-LAN cable to the Wake-on-LAN connector on the adapter card and to the Wake-on-LAN connector on the motherboard of the computer. For the location of the Wake-on-LAN connector on the motherboard, refer to the documentation that came with your computer.

   The AT-2501, AT-2451F, AT-2701, AT-2915, AT-2916T, AT-2930, AT-2970, and AT-2971 do not require the optional external Wake-on-LAN cable. These devices are PCI 2.2 compliant and can use the PCI 2.2 BUS for Wake-on-LAN features.

8. Replace the PC's cover and secure it with the screws removed in [Step 2](#).

9. Connect the adapter card to the network by connecting the appropriate data cable.

10. Power ON the PC.

You are now ready to install the network adapter driver. Refer to the appropriate chapter for your operating system.

Installing an AT-2801FX

The AT-2801FX is a CardBus PC Card that must be inserted into a CardBus slot. If you are unable to insert an AT-2801FX into your PC, it may not support a CardBus device. If you are unsure if your computer will support a CardBus interface, contact your PC manufacturer to determine if your computer supports CardBus Type II devices.

Chapter 2
Diagnostics

This chapter contains the following procedures:

Running Diagnostics

For the AT-24xx Series

Command line option for diag.exe:

-d	Run command-line diagnostics
-e	Enable External Loopback Test when running diagostics
-pme	Enable PME OverWrite mode
-nopxe	Disable boot ROM support
-pxe	Enable boot ROM support
-0	Auto-negotiation
-1	100Mb/half-duplex
-2	100Mb/full-duplex
-3	10Mb/half-duplex
-4	10Mb/full-duplex
-5	Enable copper port as default
-6	Enable fiber port as default

For the AT-24xx, AT-25xx, AT-27xx, AT-2915, and AT-2930 Series

The diagnostics utulity is useful for setting the Speed/Duplex and BootROM. You can also insure proper operation of the network adapter card. This utility is located on the CardAssistant CD or the driver installation disk.

Speed/Duplex

This option allows the user to configure speed and duplex to one of the available options. The options for speed and duplex vary depending on adapter model

BootROM Port

The BootROM port setting is only for multi-port AT-2450, AT-2700, and AT-2745 Series PCI Ethernet Adapter Cards without integrated Manage BootROM, specifically the AT-2450FTX, AT-2700FTX, and AT-2745FX. When using one of these three adapters in a BootROM configuration, it may be necessary to change these settings. For any other AT-2450 or AT-2700 Series PCI Ethernet Adapter Card the BootROM Port setting should not be changed.

BootROM

This feature is only available for the AT-2500 and AT-2501TX Series Adapters. Using the Diagnostics program (diag25.exe) set BootROM to enable.

Diagnostics

There are two diagnostic utilities, Card Test and Network Test.

❑ Card Test

This test checks several parts and functions of the adapter card to ensure proper operation of the adapter card.

❑ Network test

This test allows the user to send and receive raw packets without a driver loaded to check the card functionality.

For the AT-2801FX Series

The AT-2801FX is a CardBus PC Card that must be inserted into a CardBus slot. If you are unable to insert an AT-2801FX into your PC, it may not support a CardBus device. If you are unsure if your computer will support a CardBus interface, contact your PC manufacturer to determine if your computer supports CardBus Type II devices.

To run diagnostics, perform the following procedure:

> **Note**
> Diagnostics is a DOS based program and must be run in true DOS, not in a DOS shell within Windows.

1. If ON, power OFF your computer and reboot into DOS mode.

2. At the DOS prompt and without the drivers loaded, type **diag.exe**.

   The location of the diagnostic files on the CardAssistant CD are:

Adapter Card	Diagnostic Location
AT-2400 Series	\drivers\at2400\diag\diag24.exe
AT-2500, AT-2501 Series	\drivers\at2500\diag\diag25.exe
AT-2450, AT-2700, AT-2701, AT-2745, AT-2746 Series	\drivers\at24_27\diag\diag.exe
AT-2915, AT-2930 Series	\drivers\at29xx\diag\diag29.exe

   For example, if you want to run diagnostics for an AT-2500 Series adapater card and the CD is mapped to drive D, you would enter:

   D:\drivers\at2500\diag\diag25.exe

   If you are using a driver installation disk, the diagnostic files are stored in the root directory on the disk.

For the AT-2916T, AT-2970, and AT-2971 Series

Diagnostics Program

The network adapter can be tested with the supplied diagnostics program (running DOS). The diagnostics program run offline, for example, normal operation of the network adapter can not be maintained. During testing the link of the tested port will be down, for examle, no data can be transferred. The following test are available:

❑ Simple test without loopback

   This test covers all components but not the port (socket including components for transmitting/receiving the data signals).

❑ Comprehensive port test with loopback

   All components are tested, including the port.

Note
The tests do not run in a Windows DOS box.

The location of the diagnostic file on the CardAssistant CD is:

Adapter Card	Driver Location
AT-2916T, AT-2970, AT-2971 Series	\drivers\at2971_16\diag\diagGE.exe

Loopback Test for Fiber Adapters

To perform the loopback test on fiber adapters, you will need a loopback connector. Refer to Figure 5 below.
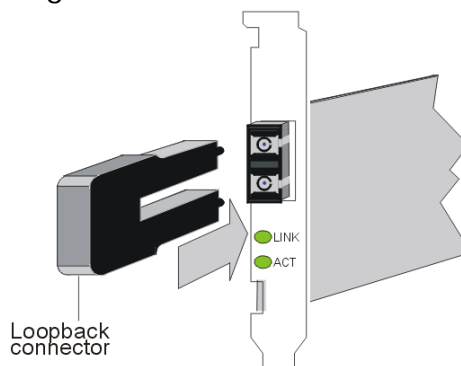
Figure 5 Setup for Loopback Testing

Be sure to observe the Translated Safety and Emission Information on page 121.

To test the adapter, perform the following procedure:

1. Power OFF your computer.

2. If the computer is still connected to the network, unplug the data cable from the network adapter's port.

3. Connect the network adapter as follows:

    ❑   For the simple test, insert the protective plugs into the ports.

    ❑   For the loopback test, insert the loopback connector into the port.

4. Boot to DOS. Wait until the operating system is loaded and the DOS prompt is displayed.

5. Insert the CardAssistant CD into the CD-ROM drive.

6. Go to the product directory and type **diagGE**.

7. Press **<Enter>**.

8. From the Main Menu of the diagnostics program, select one of the following:

    ❏ **DIAGNOSTICS** for the simple test (no loopback)

    ❏ **LOOPB. WRAP PLUG** for the loopback test

    The various components will now be tested. This will take between one and two minutes. If the test was successful, a window similar to Figure 6 will be displayed.
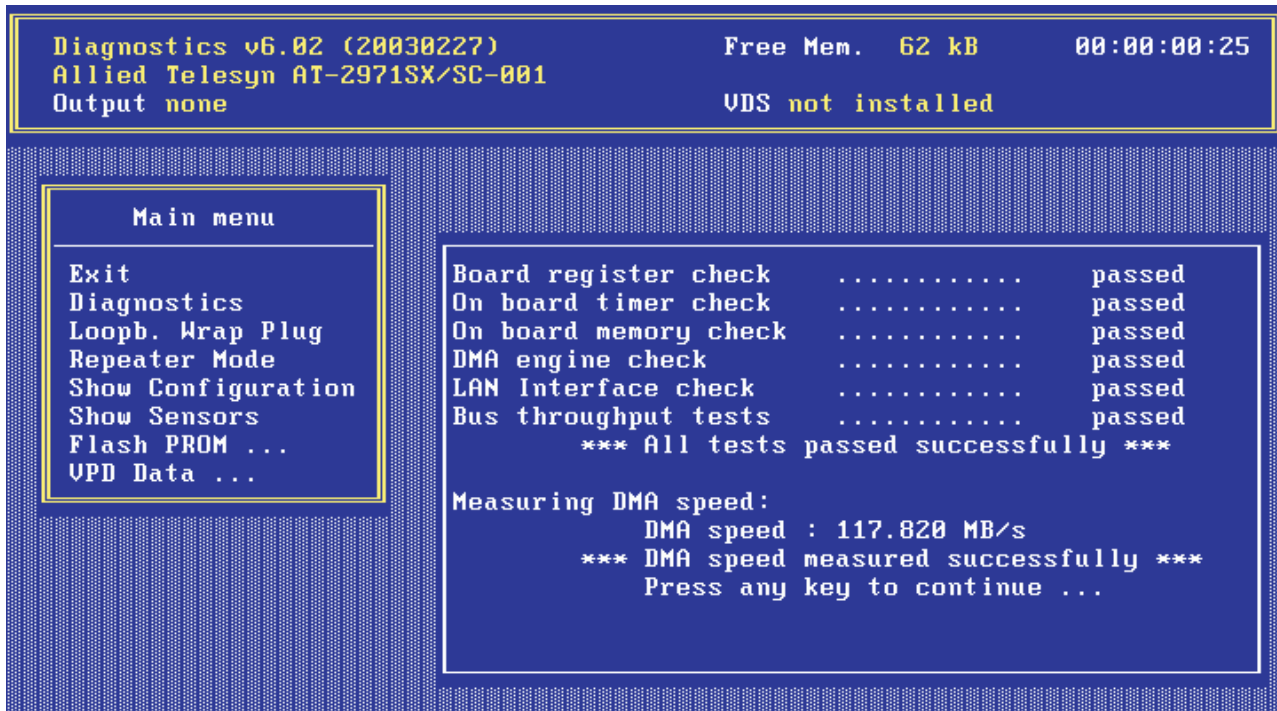
Figure 6 Diagnostic Window (1 of 5)

You can follow the progress of the test in the right-hand window. Each test is displayed as it is being performed (e.g. Board Register Check).

If the test is successful, the word **PASSED** is displayed at the end of the line and the next test is started. If there is a problem, the word **Failed** is displayed.

If errors are reported, follow the instructions that are provided.

9. Check the configuration and if necessary, repeat the test (see Failure of a Test).

10. To continue testing, press any key.

11. To quit the diagnostics program, select **Exit** from the Main Menu.

12. Remove the loopback connector from the port.

13. Re-connect the data cables to the network port.

> ⚠ **Caution**
> For safety reasons, if the adapter is not connected immediately to the data network, insert the protective plug. Otherwise laser light may be emitted. Inserting the protective plug is also protects the port against dust and dirt.

Repeater Test for Copper Adapters

For the AT-2916T, AT-2970, and AT-2971 Series adapters the test via wrap plug is not available. However, loopback testing may be carried out by connecting the adapter to another adapter installed in a second computer running in repeater mode (further known as the repeater computer). The computer in which the adapter is installed, which is to be tested, is called test computer.

To test the copper adapter, perform the following procedure:

1. Install a copper adapter in the repeater computer.

2. Boot the repeater computer to DOS.

    Wait until the operating system is loaded and the DOS prompt is displayed.

3. Insert the CardAssistant CD into the CD-ROM drive.

4. Go to the product directory and type **diagGE**.

5. Press **<Enter>**.

6. From the Main Menu of the diagnostics program, select **Repeater Mode**.

7. Select the port which is to be tested, for example, **A** (for single link adapters, only A is available).

8. Press **<Enter>**.

    The window Repeater Mode Port A is displayed.

9. Install a copper adapter in the test computer.

10. Connect the adapter in the repeater computer to the adapter in the test computer. Use a category 5 cable with RJ-45 plugs.

11. Boot the test computer to DOS.

    Wait until the operating system is loaded and the DOS prompt is displayed.

12. Insert the CardAssitant CD into the CD-ROM drive.

13. Go to the product directory and type **diagGE**.

14. Press **<Enter>**.

15. From the Main Menu of the diagnostics program, select **LOOPB.WRAP PLUG**.

16. Press **<Enter>**.

    When the test was successful, the message **All tests passed successfully** is dis-played.

    When the test fails, the message **failed** is displayed. The further procedure is described in section **Failure of a Test**.

17. Press any key to continue.

18. On the test computer, select **Exit** to quit the diagnostics program.

19. On the repeater computer, select **Exit** to quit the diagnostics program.

Failure of a Test

```
Diagnostics v6.02 (20030227)        Free Mem.   62 kB     00:00:03:45
Allied Telesyn AT-2971SX/SC-001
Output none                         VDS not installed




                    Board register check    ...........   passed
                    On board timer check    ...........   passed
                    On board memory check   ...........   passed
                    DMA engine check        ...........   passed
                    LAN Interface check     ...........   passed
                    Bus throughput tests              failed


             Please check that a wrap plug is installed
                    Press any key to continue
```

Figure 7 Diagonstic Window (2 of 5)

For a test to be completed successfully, each of the following conditions must be met:

❑ The network adapter operates correctly.

❑ The network adapter is cabled correctly for the test or is equipped with the correct connectors.

❑ The network adapter has been installed correctly in the computer.

The **failed** message does not necessarily imply that the network adapter is faulty.

If a **failed** message is displayed, perform the following procedure:

1. Follow the instructions that are displayed in the window below the list of tests.

2. Make sure that the adapter is inserted correctly and the ports are connected properly (connectors are firmly seated, the correct end of the cable is connected).

29

If it is necessary to install the network adapter again, perform the following procedure:

1. Switch OFF the computer. Be sure to observe the <u>Translated Safety and Emission Information</u> on page 121.

2. Remove the computer cover. Refer to the manual that came with your computer for instructions or refer to <u>Installing a Network Adapter Card</u> on page 17.

3. Make sure the network adapter is properly seated in the PCI bus slot on the motherboard. If not, do not remove the network adapter completely but raise it sufficiently to withdraw it from the PCI bus slot.

4. Carefully realign the bus connector on the network adapter with the PCI bus slot.

5. Press the network adapter until it is firmly seated in the slot.

6. Repeat to <u>Step 6</u> of the <u>Loopback Test for Fiber Adapters</u> on page 25 and to <u>Step 4</u> of the <u>Repeater Test for Copper Adapters</u> on page 27.

7. Repeat the test.

8. To quit the diagnostics program, select **EXIT** in the Main Menu.

9. If necessary, remove the loopback connector from the port.

10. Re-connect the data cables to the network ports.

Additional Functions of the Diagnostics Program

Checking Other Displays and Data

In addition to performing the three network adapter tests, the diagnostics program can also read out network adapter-specific data that may be useful for pinpointing the causes of failure.

You can:

❑ read sensor data

❑ read configuration data

❑ read and write VPD data

❑ read and write Flash EPROM data

Main Program

To start the main program, proceed as follows:

1. Boot to DOS and wait for the prompt.

2. Insert the installation CD-ROM into the CD-ROM drive of the computer in which the network adapter is installed.

3. Type the letter of your CD-ROM drive (for example, **D:**)

4. Go to the appropriate product directory and type **diagGE**.

5. Press **<Enter>**.

The Main Menu as shown in Figure 8 is displayed:

Figure 8 Diagnostic Window (3 of 5)

6.   Select the appropriate item from the menu.

7.   To quit the program, select **EXIT** in the Main Menu.

      This option is automatically offered for selection if you did not select a menu item previously.

Reading Sensor Data

To read sensor data, perform the following procedure:

1.   Start the main program. Refer to Main Program on page 31 for instructions.

2.   Select **Show Sensors** in the Main Menu. A separate window will be displayed for the following sensor data:

      ❏   Temperature of the board

      ❏   Voltage on the PCI card

      ❏   Voltage on the PCI I/O lines

      ❏   Other supply voltages

      In the Main Menu, Show Sensors changes to Hide Sensors.

3. You can close the window by selecting **Hide Sensors** from the Main Menu.

   Other windows may be opened while this window is still open, for example, the window displaying the configuration data.

Reading Configuration Data

To read configuration data, perform the following procedure:

1. Start the main program. Refer to [Main Program](#) on page 31 for instructions.

2. Select SHOW CONFIGURATION in the main menu. A separate window will be displayed showing:

   ❑ Device code (Device)

   ❑ Various vendor codes (Vendor)

   ❑ Interrupt no. (IRQ)

   ❑ Cache Line Size (CLS)

   ❑ Latency (Lat.)

   ❑ RAM size (RAM)

   ❑ PCI slot index and size (Slot and Slot size)

   ❑ PCI bus clock (clk)

   ❑ MAC address (MAC Addr)

   ❑ Port type (PMD-Type)

   ❑ Connector (connector)

   ❑ Hardware revision (HW Rev)

   ❑ Chip ID (Chip Id)

   In the Main Menu, Show Configuration changes to Hide Configuration.

3. You can close the window by selecting **Hide Configuration** from the Main Menu.

   Other windows may be displayed while this window is still open, for example, a window shown in Figure 9 will be displayed.

```
Diagnostics v6.02 (20030227)          Free Mem.  62 kB      00:00:06:33
Allied Telesyn AT-2971SX/SC-001
Output none                           VDS not installed


        Main menu

    Exit
    Diagnostics
    Loopb. Wrap Plug
    Repeater Mode
    Hide Configuration                 DEVICE 4320   VENDOR 1148
    Show Sensors                       SUBSYS 2973   SUBVEN 1259
    Flash PROM ...                     IOP D800      MEM FF8FC000
    VPD Data ...                       IRQ 11  CLS  8  Lat. 32
                                       RAM 128kB   FPROM inact.
                                       Slot 1  Slot Size 32 bit
                                       CLK 33 MHz   Ports 1
                                       MAC-Addr    003084f3ae09
                                       PMD-Type    1000Base-SX
                                       Connector   Duplex-SC
                                       HW-Rev 10   Chip-Id B0
```

Figure 9 Diagnostic Window (4 of 5)

Reading VPD Data

To read VPD data (Vital Product Data), perform the following procedure:

1. Start the main program. Refer to Main Program on page 31 for instructions.

2. Select **VPD Data** from the Main Menu. A submenu with the following options will be displayed:

    ❑   EXIT (return to the Main Menu)

    ❑   DISPLAY VPD DATA

    ❑   CLEAR ERROR LOGS

    ❑   ADD/MODIFY VPD DATA (you can enter user-defined data and keywords here)

    ❑   DELETE VPD KEYWORDS

```
Diagnostics v6.02 (20030227)          Free Mem.  62 kB    00:00:07:52
Allied Telesyn AT-2971SX/SC-001
Output none                           VDS not installed


                  Display VPD Data: <Enter> to exit

 Product Name:
 Allied Telesyn AT-2971SX/SC-001

 VPD Read Only Area:         21 bytes unused
  Board Part Number (PN):  AT-2971SX/SC-001
  Engineering Level (EC):  Rev. 1.0
  Manufacturer ID   (MN):  SysKonnect
  Serial Number     (SN):  CSI10L3F3AE09
  Extended Capabil. (CP):  0x01, 0x10, 0x03cc

 VPD Read/Write Area:       121 bytes available
  Asset Tag ID     (YA):  < Keyword not present >
  First Error Log  (VF):  < Keyword not present >
  Last Error Log   (VL):  < Keyword not present >
```

Figure 10 Diagnostic Window (5 of 5)

3.   Select the desired option or return to the Main Menu by selecting **Exit** (default option).

Chapter 3
Microsoft DOS Client 3.0

This chapter contains the following procedures for the AT-24xx, AT-25xx, and AT-2700 Series adapters:

❑ <u>Installing a Network Adapter Driver</u> on page 38

❑ <u>Removing a Network Adapter Driver</u> on page 40

Installing a Network Adapter Driver

This section contains the procedure for installing a network adapter driver on a Microsoft DOS Client 3.0 system.

Note

Before starting with the installation procedure, make sure that the adapter is properly configured using setup25.EXE provided on the CardAssistant CD. If necessary, match the speed and duplex settings of the network card with the hub with which it is connected.

To install the network adapter driver, perform the following procedure:

1. Shut down Microsoft DOS Client 3.0 and power OFF the computer.

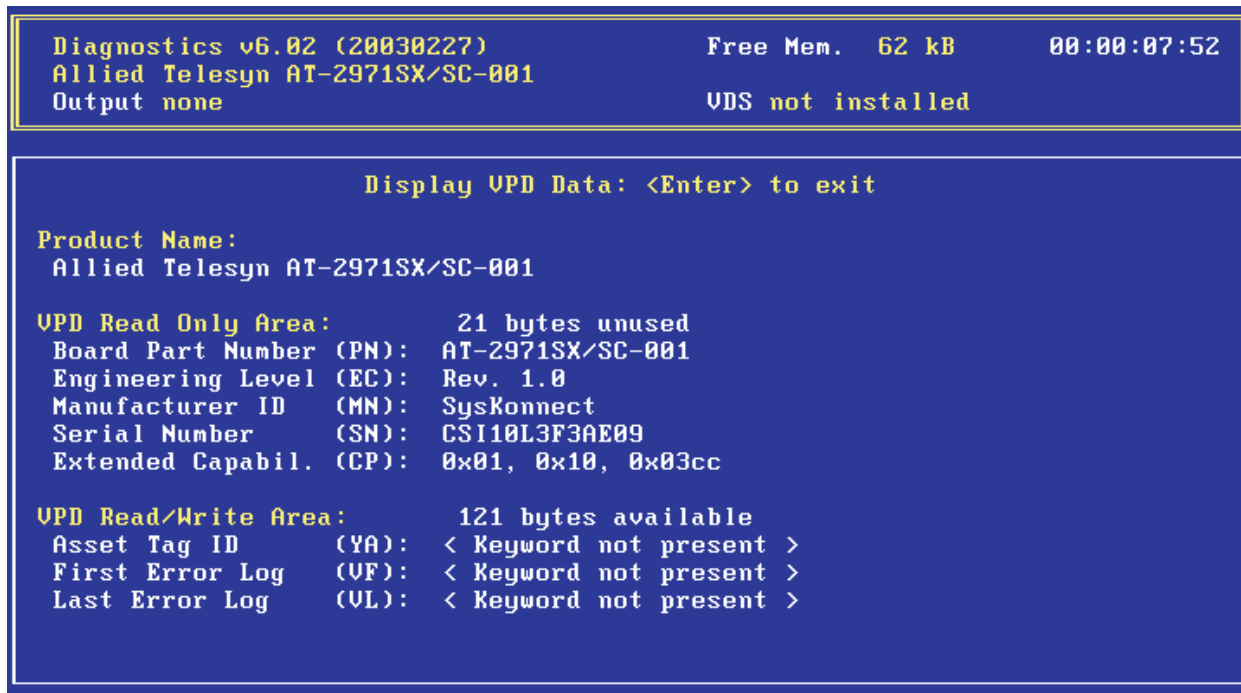2. Install the network adapter card in the compute. Refer to the **Network Adapter Card Installation Guide - Book I** and to your computer's installation manual.

3. Power ON the computer.

4. Start the setup utility provided by Microsoft to install and configure DOS Client v3.0.

5. At the Welcome screen, press **Enter**.

6. Choose the destination directory for the client files and press **Return**.

7. When prompted for the network adapter, choose **Network adapter not shown on list below . . .**

    A prompt is displayed asking you to insert the OEM driver disk.

8. Insert the CardAssistant CD or the driver installation disk into the appropriate drive.

9. Type in the driver letter and path to the NDIS 2.0 driver and press **Return**.

    If you are using the CD, the location of the adapter driver will differ depending on the type of adapter. Below are the driver locations on the CardAssistant CD:

Adapter Card	Driver Location
AT-2400 Series	\drivers\at2400\msclient
AT-2500/AT-2501 Series	\drivers\at2500\msclient

Adapter Card	Driver Location
AT-2450, AT-2700 Series	\drivers\at24_27\msclient

If you are using a driver installation disk, the driver location is: **\msclient**.

For example, if you are using the CardAssistant CD and the CD driver is mapped to drive D and you are installing an AT-2500 Series adapter, you would enter **D:\drivers\at2500\msclient.**

10. Once you have entered the drive letter and path to the adapter driver and pressed **Return**.

    The next screen will display the Allied Telesyn AT-250x PCI Ethernet Adapter.

11. Press **Return** to select the driver and proceed with the installation according to the Microsoft documentation.

Sample Configuration

```
[network.setup25]
version=0x3110
netcard=ATI$a2500,1,ATI$a2500,1
transport=tcpip,TCPIP
lana0=ATI$a2500,1,tcpip
```

Removing a Network Adapter Driver

This section contains the procedure for removing an adapter driver from a system running Microsoft Client 3.0.

To remove an adapter driver, perform the following procedure:

1. Start the Microsoft setup utility.

2. Select **Change Network Configuration**.

3. Select the network adapter whose driver you want removed from the system.

4. Click **Remove**.

Chapter 4
Microsoft Windows for Workgroups

This chapter contains procedures the following procedures for the AT-24xx, AT-25xx, AT-2700 Series adapters:

❑ Installing a Network Adapter Driver on page 42

❑ Removing a Network Adapter Driver on page 48

Installing a Network Adapter Driver

This section contains the instructions for manually installing a network adapter driver on a PC running Windows for Workgroups 3.11.

Installing NDIS2 and ODI Drivers

1. Power OFF the computer.

2. Install the network adapter card. Refer to the **Network Adapter Card Installation Guide - Book I** and the documentation that came with your computer.

3. Power ON the computer.

4. From the Network group under Program Manager, choose **Network Setup**.

5. Select **Networks**.

6. Verify that **Install Microsoft Windows Network** is selected, then select **OK**.

7. Select **Sharing**.

8. Select whether to allow file and/or printer sharing with other users.

9. Select **Drivers**.

10. Select **Add Adapter**.

11. Select **Unlisted or Updated Network Adapter**, then click **OK**.

12. Insert the CardAssistant CD into the CD drive or a Driver Installation Disk into a floppy drive.

13. In the text box of the Install Driver dialog box, enter the drive letter and path to the driver files and click **OK**.

    If you are using the CD, the location of the appropriate driver will differ depending on the type of adapter. Below are the driver locations on the CardAssistant CD:

Adapter Card	Location
AT-2400 Series	\drivers\at2400
AT-2500/AT-2501 Series	\drivers\at2500
AT-245x Series, AT-27xx Series	\drivers\at24_27

If you are using a Driver Installation Disk, the driver location is the root (\) directory.

14. In the Network Adapters list of the Unlisted or Updated Network Adapter dialog box, verify that **Allied Telesyn PCI Ethernet Adapter** is highlighted, then click **OK**.

15. In the Network Drivers dialog box, verify that Allied Telesyn PCI Ethernet Adapter and its default protocols, Microsoft NetBEUI and IPX/SPX Compatible Transport with NetBIOS, appear in the Network Drivers list, then click **Close**.

16. In the Network Setup dialog box, click **OK**.

17. If prompted, insert the required Windows for Workgroups diskette(s) into your floppy drive and click **OK**.

   Note
   Windows for Workgroups occasionally loses its place at this point; if you get a message from Windows that it cannot find a file, try inserting Windows for Workgroups installation diskettes 7 and 8.

18. If prompted, reinsert the CardAssistant CD or Driver Installation Disk into the appropriate drive.

19. In the text box of the Install Driver dialog box, click **OK**.

20. From the Windows Setup dialog box, select **Restart Computer**.

AT-245x, AT-27xx NDIS2 Keywords

The AT-245x and AT-27xx series NDIS2 driver supports the following options:

- ❏ 0 = auto
- ❏ 1 = 100H
- ❏ 2 = 100F
- ❏ 3 = 10H
- ❏ 4 = 10F
- ❏ 5 = hardware

Sample PROTOCOL.INI File

```
[network.setup]
version=0x3110
netcard=ms$a2500,1,MS$a2500,3
transport=ms$nwlinknb,NWLINK
transport=ms$ndishlp,MS$NDISHLP
transport=ms$netbeui,NETBEUI
lana0=ms$a2500,1,ms$netbeui
lana1=ms$a2500,1,ms$nwlinknb
lana2=ms$a2500,1,ms$ndishlp

[protman]
DriverName=PROTMAN$
PRIORITY=MS$NDISHLP

[NWLINK]
BINDINGS=MS$a2500

[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=MS$a2500

[NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=12
BINDINGS=MS$a2500
LANABASE=0

[MS$a2500]
DriverName=a2500$

[a2500]
Adapters=MS$a2500
```

Note
These are the default values for installation. If you are adding any TCP/IP software, this configuration will satisfy the NDIS 2.0 requirements of TCP/IP systems.

NetWareIPXODI Support for NetWare 3.x

1. Create a new directory on your local hard drive (e.g.; C:\ATINET).

2. Copy the contents of the DOSODI directory on the CardAssistant CD or the Driver Installation Disk to the directory you created.

   If you are using the CardAssistant CD, the location of the appropriate driver will differ depending on the type of adapter. Below are the driver locations on the CardAssistant CD:

Adapter Card	Location
AT-2400 Series	\drivers\at2400\Dosodi
AT-2500/AT-2501 Series	\drivers\at2500\Dosodi
AT-2450 Series, AT-2700 Series	\drivers\at24_27\Dosodi

   If you are using a driver installation diskette, the driver location is **\Dosodi**.

3. Verify that the ODI drivers for the AT-2500/AT-2501 Ethernet Adapter Card are NOT loaded before setting up Windows for Workgroups.

4. Start Windows.

5. Choose **Network Setup** from the Network group.

6. Select **Networks**.

7. Select **Install Microsoft Windows Network**, then **Other**.

8. Select **Novell NetWare (Workstation Shell 3.X)**, then **OK**.

9. Select **IPXODI.COM and LSL.COM (recommended)**, then **OK**.

10. Verify that **ATI AT-xxxx[ODI/NDIS2]** and its default protocols, **Microsoft NetBEUI and IPX/SPX Compatible Transport with NetBIOS**, appear in the Network Drivers list, then **OK**.

11. When asked if you want to modify the net.cfg file, you can enter the path to the directory created earlier for your ODI files (for example, C:\ATINET). After you make your changes, or if you do not want to make changes, click **OK**.

12. From the Windows Setup dialog box, select **Continue**.

13. Edit the Autoexec.bat file by inserting the following file references before C:\WINDOWS\odihlp.exe:

```
c:\ net\lsl
c:\net\a2500 (atnic,a2400)

c:\net\ipxodi
c:\net\netx
```

14. Exit Windows and re-boot your PC by powering OFF then ON.

NetWare IPXODI Support For NetWare 4.x

1. Verify that the ODI drivers for the AT-2500/AT-2501 Ethernet Adapter Card are NOT loaded before setting up Windows for Workgroups.

2. From the DOS command line, install the NetWare DOS/Windows Client software. Select **Yes** to install Windows support and then enter the path to your Windows directory, for example, C:\WINDOWS

3. Start Windows.

4. Select **Network Setup** from the Network group.

5. select **Networks**.

6. Select **Install Microsoft Windows Network**, then select **Other**.

7. From the Other drop down list, select **Novell NetWare (Workstation Shell 4.0 and above)** and click **OK**.

8. Select **IPXODI.COM and LSL.COM (recommended)**, then **OK**.

9. In the Network Drivers dialog box, verify that **ATI AT-xxxx [ODI/NDIS2]** and its default protocols, **Microsoft NetBEUI** and **IPX/SPX Compatible Transport with NetBIOS**, appear in the Network Drivers lis and then click **OK**.

10. From the Windows Setup dialog box, select **Restart Computer**.

    Installing Novell NetWare 3.x and 4.x support adds `DEVICE=C:\WINDOWS\IFSHLP.SYS` to your CONFIG.SYS file and `C:\WINDOWS\ODIHLP.EXE` to your AUTOEXEC.BAT file.

    Note
    The sample AUTOEXEC.BAT shows VLM.EXE being used instead of NETX.EXE. VLMs are required for NetWare 4.x but may be an alternative to NETX with NetWare 2.x and 3.x.

Sample NET.CFG and PROTOCOL.INI Files

NET.CFG

Preferred Server = MyServer

Link Driver a2500

LineSpeed 100F (optional)
Frame Ethernet_802.3
Frame Ethernet_II
Frame Ethernet_802.2
Frame Ethernet_SNAP

VLM Support

NETWARE DOS REQUESTER
FIRST NETWORK DRIVE=F

PROTOCOL.INI

[network.setup]
version=0x3110
netcard=ms$a2500,1,MS$a2500,4
transport=ms$netbeui,NETBEUI
transport=ms$nwlinknb,NWLINK
lana0=ms$a2500,1,ms$nwlinknb
lana1=ms$a2500,1,ms$netbeui

[MS$a2500]

[NETBEUI]
BINDINGS=a2500
LANABASE=1

[net.cfg]
PATH=C:\NET\net.cfg

[Link Driver a2500]
data=Frame Ethernet_SNAP
data=Frame Ethernet_802.2
data=Frame Ethernet_II
data=Frame Ethernet_802.3
data=Link Driver a2500

[NWLINK]
BINDINGS=a2500

Removing a Network Adapter Driver

This section contains the procedure for removing a network adapter driver from a system running Microsoft Windows for Workgroups 3.11.

The initial installation copies the OEMSETUP.INF to your WINDOWS\SYSTEM directory. It renames the file to OEM*x*.INF, where *x* is a number starting with 0 for drivers that are not shipped with Windows for Workgroups; this also pertains to video and printer drivers.

1. Click the **Network Icon** in the Network Control panel.

2. Select the **Drivers** button in Network Setup.

3. Select the **Remove** button.

4. Select **Yes** when asked if you want to remove the driver.

Chapter 5
Novell Netware

This chapter contains the following procedures:

Installing a Network Adapter Driver on Novell Netware 4 Server

This section contains the procedure for installing a network adapter driver on a system running Novell NetWare 4 Server.

Files Needed for Installation

The .LDI file and the .LAN file for your adapter must be present to succesfully complete installation. The location for each Allied Telesyn adapter are as follows:

Adapter Card	Location
AT-2400 Series	\drivers\at2400\netware\
AT-2500/AT-2501 Series	\drivers\at2500\netware\
AT-2450/AT-2451 Series, AT-2700/AT-2701 Series, AT-2746 Series	\drivers\at24_27\netware\
AT-2915 Series, AT-2930 Series	\drivers\at29xx\netware\
AT-2916T, AT-2970, AT-2971 Series	\drivers\at2971\netware\[1]

1. For additional AT-2916T, AT-2970, and AT-2971 parameter information, refer to the AT297x.txt file.

New Server Installation

1. Follow the directions provided by Novell to load the network drivers using the INSTALL.NLM program.

2. When the Install program prompts for the LAN driver, select **Insert** to specify a driver not listed.

3. Insert the CardAssistant CD or driver installation disk into the appropriate drive.

4. Press <**F3**> to change the default path to A:\NETWARE. Press <**Enter**> as prompted. The adapter driver and other required files will be copied to the SYS: volume.

5. On the next menu, AT-2*xxx* Protocols and Parameters, specify any parameters where needed. A slot value is required when loading the adapter driver. If slot is unknown, driver will correctly detect slot value when loading.

6. Select Save parameters and load driver. The Netware 4.x driver has a PermaNet parameter that gives the Netware Server a redundancy mechanism where two network adapters are connected to the same

local network. When the primary adapter fails, the secondary adapter then handles the network traffic until the primary adapter is restored. Proceed with the installation as outlined by Novell.

Installing the Drivers

1. At the file server console prompt, issue the load statement(s) in this order:

```
LOAD <DRIVE>:<PATH>\NBI
LOAD <DRIVE>:<PATH>\MSM
LOAD <DRIVE>:<PATH>\ETHERTSM
LOAD <DRIVE>:<PATH>\<DRIVER>
```

where <DRIVE> and <PATH> are the drive and directory where you copied the NLMs and the adapter file. <DRIVER> is the filename of the adapter driver.

Adapter Card	Location
AT-2400 Series	\drivers\at2400\netware\
AT-2500/AT-2501 Series	\drivers\at2500\netware\
AT-2450/AT-2451 Series, AT-2700/AT-2701 Series, AT-2746 Series	\drivers\at24_27\netware\
AT-2915 Series, AT-2930 Series	\drivers\at29xx\netware\
AT-2916T, AT-2970, AT-2971 Series	\drivers\at2971_16\netware\[1]

1. For additional AT-2916T, AT-2970, and AT-2971 parameter information, refer to the AT297x.txt file.

Note
If MSM and ETHERTSM NLMs are not loaded, they'll automatically load before the driver.

You will be prompted if you do not specify a SLOT number.

2. Next you must bind the LAN driver to IPX in order to attach to the server. Type:

```
BIND IPX TO <DRIVER> NET=n
```

Where <DRIVER> is the filename of the adapter driver and *n* is the node address Novell uses for routing IPX packets. This number is arbitrary if there is the only one server on the network, but if there are multiple servers on the same network, it must match the other servers' external network number.

Note

The default frame type for Novell file servers is now Ethernet_802.2. If you require Ethernet_802.3, specify FRAME=ETHERNET_802.3 on the command line when loading the driver.

To load multiple frame types for a single card, enter a LOAD and BIND statement for each frame type. You need to supply a name on each load line in order to avoid being prompted for which board to bind IPX to. If you do not have the name option in the AUTOEXEC.NCF, it will not execute completely without user intervention.

Example:

```
LOAD <DRIVER> FRAME=ETHERNET_802.3 NAME=IEE8023
BIND IPX TO IEE8023 NET=11111
LOAD <DRIVER> FRAME=ETHERNET_802.2 NAME=IEE8022
BIND IPX TO LAN8022 NET=22222
```

Where <DRIVER> is the filename of the adapter driver.

Additionally, if you have a PCI-1 bus in your system, add `BUSTYPE=PCI1` to the command line, for example, `LOAD C:\SERVER.4\<driver> BUSTYPE=PCI1`. Otherwise the driver may not find the card. If you don't know which bus you have, try loading without the option. If it loads, you do not need it.

3. Add the load and bind statements you require to the server's AUTOEXEC.NCF file so that the LAN driver will load automatically each time the server starts up.

    Here's an example of how the commands would look in your AUTOEXEC.NCF file.

    Example:

    ```
    LOAD a2500v3 FRAME=Ethernet_802.3 (overrides
    default frame BIND IPX to a2500v3 net=1 (all servers
    on the LAN segment need the same #)
    ```

4. Proceed with the installation as outlined by Novell.

Multiple Adapters

If a system has multiple Allied Telesyn Ethernet Adapters, you use the keyword SLOT to identify each card to the driver. If you have multiple adapters in a single server, each adapter must have a different network number and SLOT number. Also, you might want to name each adapter. So add the options in LOAD commands to distinguish particular adapters. For example:

```
LOAD <DRIVER> FRAME=Ethernet_802.2 NAME=LAN_A SLOT=1
BIND IPX TO LAN_A NET=11
LOAD <DRIVER> FRAME=Ethernet_802.2 NAME=LAN_B SLOT=2
BIND IPX TO LAN_B NET=22
```

<DRIVER> is the filename of the adapter driver.

Add the load and bind statements you need to the server's AUTOEXEC.NCF file so that the Allied Telesyn adapter drivers load automatically each time the server starts.

In an IPX internal router configuration (a server with two adapters, each connected to a different network), the data transfer rate across the router can be low. This happens if client workstations have CPU speeds equal to or higher than the server. You might be able to increase the data transfer rate by adding the following line to STARTUP.NCF:

```
SET MAXIMUM INTERRUPT EVENTS = 100000
```

The default setting is 10.

If you have problems loading the driver on multiple adapters and the initialization fails due to "Insufficient RCBs," increase the number of buffers allocated to the server. Add the following to STARTUP.NCF:

```
SET MINIMUM PACKET RECEIVE BUFFERS = 100 (or larger)
SET MAXIMUM PACKET RECEIVE BUFFERS = 500 (or larger)
```

The MINIMUM value you specify must be at least 30 times the number of Allied Telesyn PCI adapters in the computer.

Recommended settings:

1-3 adapters: 100
4 adapters: 150

The maximum you can specify depends on the amount of memory in the server, but it must be greater than the minimum.

Removing an Adapter Driver from Novell Netware 4 Server

This section contains the procedure for removing a network adapter driver from a system running Novell Netware 4 Server.

1. Type **LOAD INSTALL** at the server console to bring up the server installation module.

2. Select **Driver Options** and press Return.

3. Select **Deselect a selected driver** from the next menu and press Return. The highlight is moved to the installed adapter(s).

4. Press **Return** again to remove the selected driver.

Installing a Network Adapter Driver on Novell NetWare 5.x/6.x

This section contains the procedure for installing a network adapter driver on a system running Novell NetWare 5.x/6.x.

Files Needed for Installation

The .LDI file and the .LAN file for your adapter must be present to succesfully complete installation. The location for each Allied Telesyn adapter are as follows:

Adapter Card	Location
AT-2400 Series	\drivers\at2400\netware\
AT-2500/AT-2501 Series	\drivers\at2500\netware\
AT-2450/AT-2451 Series, AT-2700/AT-2701 Series, AT-2745/AT-2746 Series,	\drivers\at24_27\netware\
AT-2915 Series, AT-2930 Series	\drivers\at29xx\netware\
AT-2916T, AT-2970, AT-2971 Series	drivers\at2971_16\netware\[1]

1. For additional AT-2916T, AT-2970, and AT-2971 parameter information, refer to the AT297x.txt file.

New Server Installation

The NetWare 5 utility NWCONFIG provides the user with the abitlity to add additional network adapter cards. At the system console, type NWCONFIG.

1. Select **Driver Options** then **Configure Network Driver**.

2. Select an **Additional Driver**.

   The NWCONFIG displays a list of the available drivers.

3. Press <**Insert**> to specify a driver not listed.

4. Insert the CardAssistant CD or the Driver Installation Disk into the appropriate drive.

If you are using the CardAssistant CD, the names and locations of the adapter drivers are as follows:

Adapter Card	Location
AT-2400 Series	\drivers\at2400\netware\
AT-2500/AT-2501 Series	\drivers\at2500\netware\
AT-2450/AT-2451 Series, AT-2700/AT-2701 Series, AT-2745/AT-2746 Series,	\drivers\at24_27\netware\
AT-2915 Series, AT-2930 Series	\drivers\at29xx\netware\
AT-2916T, AT-2970, AT-2971 Series	drivers\at2971_16\netware\[1]

1. For additional AT-2916T, AT-2970 and AT-2971 parameter information, refer to the AT297x.txt
      file.

If you are using a Driver Installation Disk, the adapter driver will be located in the root directory.

5. Press <**F3**> to change the default path.

6. Press **Return**.

    The adapter driver and other required files are copied to the SYS: volume.

7. On the next menu, Protocols and Parameters, specify any parameters where needed. A slot value is required when loading the adapter driver. If the slot is unknown, driver will correctly detect slot value when loading.

8. Select **Save parameters and load driver**.

9. Proceed with the installation as outlined in the Novell documentation.

Manual Installation

1. At the file server console prompt, issue the load statement(s) in this order:

```
LOAD <DRIVE>:<PATH>\NBI
LOAD <DRIVE>:<PATH>\MSM
LOAD <DRIVE>:<PATH>\ETHERTSM
LOAD <DRIVE>:<PATH>\<DRIVER>
```

Where <DRIVE> and <PATH> are the drive and directory where you copied the NLMs and the adapter driver file. <DRIVER> is the filename of the driver.

Note

If MSM and ETHERTSM NLMs are not loaded, they will automatically load before the driver. You will be prompted if you do not specify a SLOT number.

Type the following command to bind the LAN driver to IPX in order to attach to the server.

```
BIND IPX TO <DRIVER> NET=n
```

Where <DRIVER> is the filename of the driver and *n* is the node address Novell uses for routing IPX packets. This number is arbitrary if there is the only one server on the network, but if there are multiple servers on the same network, it must match the other servers' external network number.

Note

The default frame type for Novell file servers is now Ethernet_802.2. If you require Ethernet_802.3, specify `FRAME=ETHERNET_802.3` on the command line when loading the driver.

To load multiple frame types for a single card, enter a LOAD and BIND statement for each frame type. You need to supply a name on each load line in order to avoid being prompted for which board to bind IPX to. If you do not have the name option in the AUTOEXEC.NCF, it will not execute completely without user intervention.

Example:

```
LOAD <DRIVER> FRAME=ETHERNET_802.3 NAME=IEE8023
BIND IPX TO IEE8023 NET=11111
LOAD <DRIVER> FRAME=ETHERNET_802.2 NAME=IEE8022
BIND IPX TO LAN8022 NET=22222
```

<DRIVER> is the filename of the adapter driver.

If you have a PCI-1 bus in your system, add `BUSTYPE=PCI1` to the command line (for example, `LOAD C:\SERVER\A2500v3 BUSTYPE=PCI1`). Otherwise the driver may not find the card. If you don't know which bus you have, try loading without the option. If it loads, you don't need it.

Add the load and bind statements you require to the server's AUTOEXEC.NCF file so that the LAN driver will load automatically each time the server starts up. Here's an example of how the commands would look in your AUTOEXEC.NCF file.

```
("NCF Files Options - Create / Edit Server Startup
Files")
LOAD A2500v3 FRAME=Ethernet_802.3 (overrides
default frame type)
BIND IPX to A2500v3 net=1 (all servers on the LAN
segment need the same #)
```

2. Proceed with the installation as outlined by Novell.

Multiple Adapters

If you have multiple Allied Telesyn adapters installed in the system, use the keyword SLOT to identify each card to the driver. If you have multiple adapters in a single server, each adapter must have a different network number and SLOT number. Also, you might want to name each adapter. So add the options in LOAD commands to distinguish particular cards. For example:

```
LOAD A2500v3 FRAME=Ethernet_802.2 NAME=LAN_A SLOT=1
BIND IPX TO LAN_A NET=11
LOAD A2500v3 FRAME=Ethernet_802.2 NAME=LAN_B SLOT=2
BIND IPX TO LAN_B NET=22
```

Add the load and bind statements you need to the server's AUTOEXEC.NCF file so that the adapter drivers load automatically each time the server starts.

In an IPX internal router configuration (a server with two adapters, each connected to a different network), the data transfer rate across the router can be low. This happens if client workstations have CPU speeds equal to or higher than the server. You might be able to increase the data transfer rate by adding the following line to STARTUP.NCF:

```
SET MAXIMUM INTERRUPT EVENTS = 100000
```

The default setting is 10.

If you have problems loading the driver on multiple adapters and the initialization fails due to "Insufficient RCBs," increase the number of buffers allocated to the server. Add the following to STARTUP.NCF:

```
SET MINIMUM PACKET RECEIVE BUFFERS = 100 (or larger)
SET MAXIMUM PACKET RECEIVE BUFFERS = 500 (or larger)
```

The minimum value you specify must be at least 30 times the number of PCI adapters in the computer.

Recommended settings:

1-3 adapters: 100

4 adapters: 150

The maximum you can specify depends on the amount of memory in the server, but it must be greater than the minimum.

Removing an Adapter Driver from Novell Netware 5/6 Server

This section contains the procedure for removing a network adapter driver from a system running Novell Netware 5 or Netware 6 Server.

To remove a driver, you can either use the NWCONFIG program supplied with NetWare or edit the AUTOEXEC.NCF in the SYS:SYSTEM directory with a text editor. The procedure below explains how to remove a driver using the NWCONFIG program.

1. Type **NWCONFIG** at the server console to bring up the installation module.

2. Select **Driver Options** and press **Return**.

3. Select **Deselect a selected driver** from the next menu and press Return. This moves the highlight to the installed adapter(s).

4. Selct the adapter you wish to remove.

5. Press **Return** again to remove the selected driver.

Chapter 6

Linux

This chapter contains the following procedures:

Installing the ATNIC Driver for AT-2450/AT-2451, AT-2700/AT-2701 Series, and AT-2745/AT-2746 Series PCI Ethernet Adapters

This driver supports dynamic loading and unloading via the KLM support provided by Linux. As a result, you must custom build the driver for the particular version of the kernel installed. The driver is located on CardAssistant at/drivers/at2701/linux.

Limitations   The current version of the driver has been tested as a loadable module on Red Hat 7.0, 7.1, and 7.2 Linux distributions for i386 and ia64. Testing has also been done on other similar Linux distributions using the 2.4.x kernels.

Building the Driver

> **Note**
> You must have the kernel source code and the the full GCC library installed in order to build and load the driver. For RedHat, the kernel source is located on the installation CDs (Disk2), not the source CDs. Look for a file with the name KERNEL-SOURCE-X.X.XX-i386.RPM, where x stands for build number.
>
> To insure that the kernel source code is installed, change to the USR/SRC directory and verify that the linux source tree is present. Look for linux-x.x.x-x, where x stands for the current build numbers. If you only see a linux directory, chances are you've got the wrong source files installed.

1. Copy the Allied Telesyn driver source TAR file to a temporary directory, and type **tar -xvf <filename>** to extract the files.

2. Edit **Makefile** using VI or your favorite text editor, and change the LINUX path variable to the directory name where the kernel source files are installed.

3. Type **make** to compile the driver source code. You should see the atnic32.o file is created if successfull.

4. Continue with driver installation.

Installing the Driver   Run **make install** to install the driver.

The atnic32.o file will be copied to the lib/modules/<build#>/kernel/drivers/net directory and depmod - a will be run to update dependancies.

Dynamic Loading

Type **insmod atnic32.o** to dynamically load the driver without installing it into the operating system.

To configure network protocol and address, refer to Linux documentations.

Changing Configuration Settings

To enable Autonegotiation edit the /etc/conf.modules file to add the line `options atnic options=0` below the `alias eth0 atnic` line. The following indicate the various options for enabling the various interfaces. Only ONE of the following lines can be added. Only one interface is activated based on the keyword it represents. If neither option is selected the driver/device defaults to autonegotiation. Each option is selected by the number it represents.

> **Note**
> Full duplex ooperation on the Am79C970 chipset-based cards is only supported on the 10Base-T interface.

AT-2450F, AT-2450FTX, AT-2700TX, AT-2700FX, AT-2745FX, AT-2700FTX (AMD Am79C972 - Fast+ chipset):

options atnic options=0 #(MII, Autonegotiation)

options atnic options=1 #(MII, 100Mbps, Half duplex)

options atnic options=2 #(MII, 100Mbps, Full duplex)

options atnic options=3 #(MII, 10Mbps, Half duplex)

options atnic options=4 #(MII, 10Mbps, Full duplex)

AT-2450T/BT/AT/FT (AMD Am79C970 chipset):

options atnic options=5#(Auto Port Selection)

options atnic options=6#(Fiber/BNC/AUI)

options atnic options=7#(10baseT, Half duplex)

options atnic options=8#(10baseT, Full duplex)2450FT/T/BT/AT

For example:

alias eth0 atnic
options atnic options=3

Installing a Linux Driver for an AT-2915 and AT-2930 Series Network Adapter

This driver supports dynamic loading and unloading via the KLM support provided by Linux. As a result, you must custom build the driver for the particular version of the kernel installed. The driver is located on CardAssistant at/drivers/at29xx/linux.

Limitations

The current version of the driver has been tested as a loadable module on Red Hat 7.0, 7.1, and 7.2 Linux distributions for i386 and ia64. Testing has also been done on other similar Linux distributions using the 2.4.x

Building the Driver

Note
You must have the kernel source code and the the full GCC library installed in order to build and load the driver. For RedHat, the kernel source is located on the installation CDs (Disk2), not the source CDs. Look for a file with the name KERNEL-SOURCE-X.X.XX-i386.RPM, where x stands for build number.

To insure that the kernel source code is installed, change to the USR/SRC directory and verify that the linux source tree is present. Look for linux-x.x.x-x, where x stands for the current build numbers. If you only see a linux directory, chances are you've got the wrong source files installed.

1. Copy the Allied Telesyn driver source TAR file to a temporary directory, and type **tar -xvf <filename>** to extract the files.

2. Edit **Makefile** using VI or your favorite text editor, and change the LINUX path variable to the directory name where the kernel source files are installed.

3. Type **make** to compile the driver source code. You should see the at29xx.o file is created if successfull.

4. Continue with driver installation.

Installing the Driver

Run **make install** to install the driver.

The at29xx.o file will be copied to the lib/modules/<build#>/kernel/drivers/net directory and depmod - a will be run to update dependancies.

Dynamic Loading

Type **insmod at29xx.o** to dynamically load the driver without installing it into the operating system.

To configure network protocol and address, refer to Linux documentations.

Module Parameters

Optional parameters for the driver can be supplied as command line arguments to the insmod command. Typically, these parameters are set in the file /etc/modules.conf (see the man page for modules.conf). These parameters take the form:

```
<parameter>=value[,value,...]
```

where the multiple values for the same parameter are for multiple NICs installed in the system.

Note

The default values will be used when invalid values are selected.

All the parameters are listed below.

❏ line_speed

Selects the line speed of the link. This parameter is used together with full_duplex to select the speed and duplexity of the link.

The valid values are:

0	Autonegotiate (default)
10	10 Mbps
100	100 Mbps
1000	1000 Mbps

Note

The 1000 Mbps must be negotiated for copper twisted pair links.

❏ full_duplex

Selects the duplexity of the link. This paramter is used together with line_speed to select the speed and duplexity of the link. Note that this parameter is ignored if line_speed is 0.

The valid values are:

0	half duplex
1	full duplex (default)

❑ rx_flow_control

Enables or disables receiving flow control (pause) frames. This parameter is used together with auto_flow_control. The valid values are:

0	pause receive disabled (default)
1	pause receive enabled if auto_flow_control is set to 0, or pause receive advertised if auto_flow_control is set to 1

❑ tx_flow_control

Enables or disables transmitting flow control (pause) frames. This parameter is used together with auto_flow_control.

The valid values are:

0	pause transmit disabled (default)
1	pause transmit enabled if auto_flow_control is set to 0, or pause transmit advertised if auto_flow_control is set to 1

❑ auto_flow_control

Enables or disables autonegotiation of flow control. This parameter is used together with rx_flow_control and tx_flow_control to determine the advertised flow control capability.

The valid values are:

0	flow control autonegotiation disabled (default)
1	flow control autonegotiation enabled with capability specified in rx_flow_control and tx_flow_control (only valid if line_speed is set to 0)

Installing Linux Driver on a AT-2916T, AT-2970, or AT-2971 Series Adapters

Overview The sk98lin driver installation script supports the Allied Telesyn AT-2971 and AT-2916 Series Adapters. It has been tested with Linux on Intel/x86 systems.

Required FIles The Linux kernel source is available in directory '/usr/src/linux' and the compiler tools (for example, gcc, make etc).

Installation Guidelines This script will automatically compile and load the sk98lin driver on your host system. Before performing both compilation and loading, it is necessary to shutdown any device using the sk98lin kernel module and to unload the old sk98lin kernel module. This script will do this automatically per default. If you want to shutdown and unload the old sk98lin kernel module manually, run the script in the EXPERT mode.

Plug a card into your machine. Without a card you are not able to check the full driver functionality.

Be sure to use the same kernel source and kernel version. For instance, it might be that you run kernel version 2.4.20 but the header files the kernel module will be compiled with refer to kernel version 2.4.21. If you do not have the same kernel version, install the sources and compile a new kernel. You cannot mix different kernel versions.

Installing the Driver To install the newest Linux driver, perform the following procedure:

1. Login as **root**.

2. Unpack the driver installation package using the command:

    ```
    # tar xfvj install-???.tar.bz2
    ```

    or

    ```
    # bunzip2 -c install-???.tar.bz2 | tar xfv -
    ```

3. To start the driver build process, go to the directory **DriverInstall** and start the build process with the following command:

    ```
    # cd DriverInstall
    # ./install.sh
    ```

4. Choose your favorite installation method.

5. The driver will be compiled and installed.

Loading the Module Manually

To load the module manually, perform the following procedure:

1. Enter **modprobe sk98lin**.

2. If an AT-2971 or AT-2916 adapter is installed in your computer and you have a /proc file system, execute the command:

   ```
   # ls /proc/net/sk98lin/
   ```

   This should produce an output containing a line with the following format:

   ```
   eth0    eth1  ...
   ```

   which indicates that your adapter has been found and initialized.

Unloading the Module

To stop and unload the driver modules, perform the following procedure:

1. Execute the command **ifconfig YOUR_DEVICE down**.

   ```
   # ifconfig eth0 down
   # ifconfig eth1 down
   ```

2. Execute the command **rmmod sk98lin**.

Driver Parameters

When loading the driver as a kernel module, additional parameters can be passed to the driver for configuration.

Those parameters can be passed in two ways:

❑ You can either state them on the modprobe command line

❑ You can set them in the file /etc/modules.conf (or old name: /etc/conf.modules), in order to force the kernel module loader to pass them to the driver at load-time

Chapter 7
AT-2971 Solaris Sparc

This chapter contains the following sections:

Installing a Solaris Sparc Driver on a AT-297x Series Adapter

Overview   The AT-2971 driver supports the Allied Telesyn AT-2970 and AT-2971 Adapter Series on Solaris 7 or higher.

Required Files   The driver installation files are located in AT2971_sparcv6.08.tar.Z. You can copy this file onto your system, as long as you do not change the files within the package.

Installing the Driver   To install a Solaris Sparc driver for the AT-2970 or AT-2971 Series Adapters, you will need the following files:

❏ pkgadd
This file runs from the command line.

❏ admintool
This file uses from a graphical interface.

Note
If you want to configure an adapter for the use of VLANs, you must to do this after you install the driver. Refer to VLAN Configuration and Parameters on page 90 for further information.

Using pkgadd   There are two possibilities to install the driver using pkgadd:

❏ Manual installation (user input required)

❏ Automatic installation (no user input required)

Manual Installation

To manually install the driver, perform the following procedure:

1. Locate AT2971_sparc6.08.tar.Z files on your system.

2. Unpack the driver installation package using the command:

   ```
   pkgadd -d . SKGEsol
   ```

   A shell window will come up and you will be asked whether you want to configure IP interfaces during installation.

3. If yes, enter name, IP address, and network number for every interface you want to set up (in case you have more than one adapter installed on your system).

   After pkgadd has run, the adapter is fully functional.

4. If no, only the driver will be loaded and you have to configure all the interfaces manually.

5. If successful, you will be prompted to reboot your system.

The driver has been loaded.

Automatic Installation

During automatic installation, you are not required to enter any input. After pkgadd has run, the driver is added to the system, but no IP interfaces have been attached to it. You have to do this manually after installation is complete.

To install the driver automatically, perform the following procedure:

1. Located AT2971_sparc6.08.tar.Z files on your system.

2. To suppress user interaction, create a response file named response in the working directory (or choose any other name and/or location) that is used by pkgadd during installation:

    Execute: touch response

3. The file must exist but remains empty.

4. Check the admin file /var/sadm/install/admin/default for the following entry:

    ```
    action=ask
    ```

5. This entry has to be set to:

    ```
    action=nocheck
    ```

    If not, you will be prompted to allow execution of commands that need root authority during installation.

6. The file /var/sadm/install/admin/default is not writable. To assign the value above, create a new admin file named default in the working directory (or choose any other name and/or location).

7. Execute the pkgadd command with the following options:

    ```
    pkgadd -d . -r ./respone -a ./default SKGEsol
    ```

8. If necessary, exchange `./response` and/or `./default` with the name and/or location you have chosen for the response and/or admin file.

    The package will be installed without any further input needed.

9. (Optional) Reboot your system.

The driver has been loaded.

Procedures During Installation

This is a brief description of what happens during installation. This information is not needed to install and use the driver but it may be useful if any problems occur:

❑ The driver software package is added to the Solaris package database.

❑ The driver binary is copied to /kernel/drv (or /kernel/drv/sparcv9 on 64 bit systems).

❑ The sample configuration file skge.conf is copied to /kernel/drv.

❑ The startup script S50skge for modifying network settings is copied to /etc/rcS.d.

❑ The VLAN configuration script skge_vlan_config is copied to /usr/sbin.

❑ The man page skge.7d is copied to /usr/share/man/man7d.

❑ The driver is added to the system and loaded with the add_drv command.

❑ If you did not choose automatic installation, the following entries are made for each adapter:

— a line with the IP address and interface name is added to /etc/hosts

— a line with the network address and netmask is added to /etc/netmasks

— a file /etc/hostname.skgeX is created, where X is the number to which the adapter is attached. The file contains only one line with the name of the corresponding interface.

❑ If you did not choose automatic installation, the IP interface is started with the **ifconfig** command.

Removing the Driver

> **Note**
> In case you have changed the configuration settings in the
> skge.conf file and you want to keep the settings, make a backup file
> before removing the driver.

To remove the driver, perform the following procedure:

1.   Enter **pkgrm SKGEsol**.

2.   Remove all according lines with the IP addresses in /etc/hosts.

3.   Remove all according lines with the netmasks in /etc/netmasks.

The driver has been removed.

Adding Adapters

There are two ways of adding additional adapters to an existing installation:

❑ Remove the driver with pkgrm, insert the additional adapters, and then reinstall the driver using pkgadd.

❑ Add the necessary adapters manually.

Installing the Adapter using pkgrm and pkgadd

To add additional adapters, perform the following procedure:

1. Enter **pkgrm SKGEsol**.

    You do not need to clean up /etc/hosts, /etc/netmasks, and the configuration file.

2. Insert the additional adapter.

3. Reinstall the driver with pkgadd.

4. Use the same interface name as before.

    The corresponding entries will be found and can be reused.

5. In case the addresses have been swapped after reinstallation, swap the numbers of the corresponding /etc/hostname.skgeX files (or simply swap the cables).

6. (Optional) Reboot your system.

The driver has been installed.

Manual addition

To manually add additional adapters, perform the following procedure:

1. Look in directory /dev for the devices skge* before and after installation of the additional adapter(s) to find out which instance number to use for the hostname.skgeX file.

2. Insert the additional adapter.

3. Enter the necessary entries for each additional adapter (IP address, interface name, network address, netmask) in the corresponding files. Refer to for further information.

4. (Optional) Reboot your system.

5. Look in directory /dev for the devices skge* (Refer to Step 1).

Driver Parameters

Parameters can be set in a file called skge.conf in the directory /kernel/drv. This file is created during installation, but does only contain comments. Edit it to review your settings. The syntax for this file is :

❑ for string parameters:
ParamName="string";

❑ for integer parameters:
ParamName=value;

You can also see: man driver.conf.

> **Note**
> All parameters and values are case sensitive. Write them exactly as shown. Additionally, all parameters must be followed by a semicolon.

Parameters in this file will be used immediately if you create this file before installing the driver. (Installation will then ask to overwrite the file.) If you change the parameters while the driver is already running, you have three possibilities to use the new settings:

❑ Reboot the system. Refer to Dual Net Operation Mode on page 86.

❑ Unload the driver with rem_drv and load it again with add_drv. Refer to Dual Net Operation Mode on page 86.

❑ Unload and reload the driver with modunload/modload.

To use the Unload and Reoad Method

To use unload and reload the driver with modunload/modload, perform the following procedure:

1. Deactivate the IP interfaces of all adapters with the following command executed for each interface:

```
ifconfig <interface_name> unplumb
```

Example: ifconfig skge0 unplumb

2. Make sure that no other application or OS daemon is connected to any of the adapters.

3. First you need the module ID of the skge driver. You can retrieve it by entering the following command:

```
modinfo | grep skge
```

You will see one line like this:

```
69 1026bb64  322bb  67   1  skge ...
```

The module ID is the first value in the row above, in our example "69". This ID is needed to unload the driver with the command modunload.

4.   Remove the driver module from the kernel with the command:

```
modunload -i <module_id>
```

If there are any remaining connections to any of the adapters (refer to Steps 1 and 2), you will see the following error messages:

```
can't unload the module: Device busy
```

5.   Exchange <module_id> with the value from Step 3.

6.   Load the driver again into the kernel with the following command:

```
modload skge
```

For more details about modinfo, modunload or modload, please refer to the manual pages by executing the commands 'man modinfo', 'man modunload' or 'man modload' accordingly.

7.   After loading the driver, set up the IP interfaces manually using the ifconfig command. To start the interfaces, enter the following command for each interface:

```
ifconfig skge<X> plumb <hostname> up
```

8.   Exchange <X> with the interface number.

9.   Exchange <hostname> with the hostname you have chosen in /etc/hosts for the IP address.

Per-port Parameters   These settings are available for each port on the adapter. In the following description, '?' stands for the port for which you set the parameter (A or B), 'X' stands for the instance number of the adapter.

AutoNegotiation_?_InstX

Type: string

Default value: ON

Valid values: ON
                     OFF
                     Sense

The Sense-mode automatically detects whether the link partner supports auto-negotiation or not.

Note
Sense-mode will fail if your link partner is configured to half-duplex with no auto-negotiation enabled. AutoNegotiation_? and DuplexCapabilities_? have to be set manually in this case.

Note
Sense-mode is not possible with 1000Base-T (copper) adapters. If you select **Sense**, it will be mapped to ON automatically.

DuplexCapabilities_?_InstX

Type: string

Default value: Both

Valid values: Half
                                    Full
                                    Both

Both: Port can connect with full-duplex and half-duplex.
Full: Port connects with full-duplex.
Half: Port connects with half-duplex.

This parameter is ignored if 'AutoNegotiation' is set to Sense.

If auto-negotiation is set to ON, all three values are possible. If it is set to OFF, only Full or Half are allowed. This parameter is useful if your link partner does not support all possible combinations.

FlowControl_?_InstX

Type: string

Default value: SymOrRem

Valid values: Sym
                                    SymOrRem
                                    LocSend
                                    None

This parameter can be used to set the flow control capabilities the port reports during auto-negotiation.

The values represent the following configurations:

❑ SymOrRem = SymmetricOrRemote

Both or only the remote link partner are allowed to send PAUSE frames (possible results: symmetrical flow control, asymmetrical flow control towards local station, no flow control).

❑ Sym = Symmetric

Both link partners are allowed to send PAUSE frames (possible results: symmetrical flow control, no flow control).

❑ LocSend = LocalSend

Asymmetrical flow control to other station: only the local link partner is allowed to send PAUSE frames (possible results: flow control to other station, no flow control).

❑ None

No link partner is allowed to send PAUSE frames (possible result: no flow control).

Note
This parameter is ignored if auto-negotiation is set to OFF.

JumboFrames_?_InstX

Type:	string
Default value:	OFF
Valid values:	ON
	OFF

Note
This parameter is valid in Dual Net mode only. For Single Net mode and further details about Jumbo Frames please refer to

---

Role_?_InstX

Type: string

Default value: Auto

Valid values: Auto
                         Master
                         Slave

Note
This parameter is only valid for SK-982x and SK-982x V2.0 adapters.

Note
If auto-negotiation is set to OFF, the correct role must be set
manually.

This parameter defines the role of the port for the physical clock
generation. In order for two 1000Base-T ports to communicate, one
must take the role as master (providing timing information), while the
other must be slave. Usually, this is negotiated between the two ports
during link establishment. If this fails, a port can be forced to a specific
setting with this parameter.

Speed_?_InstX

Type: string

Default value: Auto

Valid values: Auto
                         1000
                         100
                         10

This parameter sets the link speed of the port to the specified value. If
you choose **Auto**, the adapter will negotiate the speed with the link
partner automatically.

Note
This parameter is only valid for SK-982x V2.0 adapters.

Per-adapter Parameters

In the following description, 'X' stands for the instance number of the according adapter.

PreferredPort_InstX

Type:	string
Default value:	A
Valid values:	A
	B

Note
This parameter is only available for dual link adapters.

This parameter determines the preferred port RLMT (Redundant Link Management Technology) will use for all network traffic, if more than one port has an active link to the network.

RlmtMode_InstX

Type:	string
Default value:	CLS
Valid values:	CLS
	CLP
	CLPSS
	DualNet

Note
This parameter is only available for dual link adapters.

Use this parameter to set the operational mode for the Redundant Link Management Technology (RLMT, the driver function that decides which port to use):

❑ CLS (Check Link State): RLMT uses the link state reported by the adapter hardware for each individual port to determine whether a port can be used for all network traffic or not.

❑ CLP (Check Local Port): In this mode, RLMT monitors the network path between the two ports of an adapter by regularly exchanging packets between them. Please configure your network in a way that the link between the ports sends LLC test packets. This mode requires a network configuration in which the two ports "see" each other (i.e. no router between the ports).

❑ CLPSS (Check Local Port and Segmentation Status): This mode supports the same functions as the CLP mode, and additionally checks network segmentation by sending BPDU hello packets. Thus, this mode is only to be used if Gigabit Ethernet switches are installed on the network that have been configured to use the Spanning Tree protocol.

❑ DualNet: In this mode, the two ports on one adapter are treated as separate interfaces, with different IP addresses and independent operation. Please refer to section 5 for details.

Note
RLMT modes "CLP" and "CLPSS" are designed to operate in configurations where a network path between the ports on one adapter exists. Moreover, they are not designed to work where adapters are connected back-to-back or for adapters operated in Dual Net mode.

Note
If the adapter is configured for the use of VLANs, make sure that both switch ports belong to the same VLAN as both adapter ports.

RlmtChgBCPrio_InstX

Type: string

Default value: No

Valid values: Yes
                    No

This parameter specifies whether received broadcast packets have the highest priority for the port switch decision (No) or not (Yes).

JumboFrames_InstX

Type: string

Default value: OFF

Valid values: ON
                    OFF

Note
This parameter is valid in Single Net mode only. For Dual Net mode please refer to Per-port Parameters on page 76.

To enable support for Jumbo Frames (frames with a length of up to 9014 bytes or up to 9018 bytes in case of VLAN frames), set this parameter to ON. Using Jumbo Frames can speed up network throughput, because longer frames reduce the overhead in the operating system.

For full Jumbo Frame support, the MTU (Maximum Transfer Unit) size used by TCP/IP must also be changed. This can be done with the **ifconfig** command.

To change the MTU size, perform the following procedure:

1. The file /etc/rcS.d/S50skge contains a line to set MTU size during system start. Edit this file.

2. Remove the "#" before the ifconfig line.

3. If necessary, change the adapter device number from skge0 to the attached number displayed during driver startup.

4. Set the MTU size to 9000, the 14 bytes of the MAC address header or 18 bytes in case of a VLAN MAC address header are not counted.

> **Note**
> Jumbo Frames can only be used if all the equipment in your subnetwork support Jumbo Frames (many current switches do not). Devices without Jumbo Frame Support will simply drop the longer frames (and possibly report them as error frames). If problems occur, try to connect two SK-98xx adapters (with Jumbo Frames enabled) back-to-back.

RxRingSize_InstX

Type:	integer
Default value:	1280 on SPARC 128 on Intel and for jumbo frames on both platforms
Valid range:	100 - 5000

TxRingSize_InstX

Type:	integer
Default value:	128
Valid range:	50 - 2500

⚠ Warning

If you want to increase the size of the transmit and/or receive descriptor rings, bear in mind that every descriptor needs about 2 KByte of memory for normal ethernet frames and about 10 KByte of memory for jumbo frames. If you choose the maximum ring sizes for transmit and receive descriptor rings and you have one dual link adapter installed, you would need about 300 MByte of memory for the descriptors (a dual link adapter has two transmit and two receive descriptor rings, one for each port respectively) only.

So it is easily possible that you need too much system memory for your installed adapter. Please check the amount of memory you would need for your chosen ring sizes on all installed adapters and compare this value with the memory size of your machine (you can obtain this value with the command 'prtconf | more').

CopyThreshold_InstX

Type:	integer
Default value:	1500
Valid range:	0 - 1500

During transmit, the driver needs the physical memory address of frames to inform the hardware where to find the frame data. Setting the DMA address on Solaris is rather slow, so in many cases it is faster to copy the frame data to a buffer that has been set up in advance during driver load. All frames with a length <= CopyThreshold are copied to such buffers. For longer frames, the real DMA setup is executed. By default (without Jumbo Frame support!), all frames are copied. You can experiment with this parameter to find out if your system performs better with only smaller frames copied.

Ignore_LenErr_InstX

Type:	string
Default value:	OFF
Valid values:	OFF
	ON

Ignore_LenErr_InstX can be used as a workaround for the EDP frame problem. EDP (Extreme Discovery Protocol) is a proprietary protocol that is used by Extreme Gigabit switches to exchange information about connected switches etc. These frames (at least the ones we have seen on a Extreme Summit 1) have a length field indicating 316 bytes, but a real frame length of 338 bytes. Such frames are counted by the MAC in the InRangeLength error counter, which is one of the counters that is summed up to form the counter "input errors". The counter even goes up if the frames are received only in the MAC and dropped immediately. These frames go to a constant MAC address of 00:e0:2b:00:00:00, which is normally not received by the driver, except in promiscuous mode.

In the output of 'netstat -I skgeX', these errors are visible as "input errors", going up two times per second in bigger installations (multiple Extreme switches).

To avoid this, the parameter Ignore_LenErr_InstX has been introduced. If it is set to "On" in the configuration file skge.conf, the InRangeLength errors are not added to the "input errors".

Note that the frames are in fact incorrect and so they must be counted. But if you are puzzled by the error counter going up, you can set this parameter. To verify if you are really have this kind of problem, the InRangeLength error counter can be viewed by using 'netstat -k skgeX'. The error will show up under the label "inrangeerr".

DescrPollTime_InstX

Type: integer

Default value: 250

Valid values: 0 to 250

DescrPollTime_InstX can be used as a workaround for a possible hang-up of the data transmission over one link due to a hardware timing problem. Please do not change the default value without contacting Allied Telesyn support for further advice!

Global Driver Parameters

These parameters will apply to all supported adapters installed on the system.

DisplayMessages

Type:	string
Default value:	Yes
Valid values:	Yes No

Enable or disable extensive messages during driver load and link up.

Dual Net Operation Mode

Starting with version 5.00, the driver supports the Dual Net mode on dual link adapters. In this mode, the two ports on one adapter are treated as separate interfaces, with different IP addresses and independent operation.

To enable Dual Net operation, perform the following procedure:

1. Set the parameter RlmtMode_InstX in skge.conf to **DualNet**.

    X is a placeholder for the instance number of the according adapter. The number in the interface name of a Single Net adapter is the required instance number. skge0 refers to instance number 0, skge1 to instance number 1, etc.

    Example: If you want to configure instance 0 for Dual Net mode, you have to change the RlmtMode_Inst0 paramter to:

    ```
    RlmtMode_Inst0="DualNet";
    ```

Dual Net interface naming:

Due to the naming of VLANs you can configure for each port (see the next section for details), the interface number for port B starts at an offset of 50000 from the number used for port A. The interface of port A always gets the instance number of the according adapter.

Example: You have configured instance 0 for Dual Net mode. After loading the driver, two devices exist in the /dev directory:

```
skge0 and skge50000.
```

skge0 is used to access port A, skge50000 for port B. The interfaces you have to configure with 'ifconfig' will have the same names.

When the configuration is finished, you have two possibilities to activate the changes in skge.conf:

❏ Reboot the system.

❏ Unload the driver with rem_drv and load it again with add_drv.

Note
If you execute all changes in skge.conf after package installation and before you reboot the system, no additional steps as described below have to be executed.

Note
Before you choose one of the above possibilities, you MUST remove the device links to the driver in the /dev directory manually. Otherwise these links and the entries in the /devices directory will not be created properly to show the new configuration of the driver.

Enter the following command to remove the device links:
```
rm /dev/skge*[0-9]
```

⚠ **Warning**
Please be very careful! It is possible to remove other devices and to damage the system!

Now all entries are removed.

Reboot the system

If you want to reboot the system, perform the following procedure:

1. Remove the links to the driver in the /dev directory as described above.

2. Create the file "reconfigure" in the root directory with the following command:

   ```
   touch /reconfigure
   ```

   This informs the system about the nessecitiy to recreate the /dev and /devices directories.

3. Reboot the system.

Unload and reload the driver with rem_drv/add_drv

To use this possibility, perform the following procedure:

1. Deactivate the IP interfaces of all GE adapters with the following command executed for each interface:

   ```
   ifconfig <interface_name> unplumb
   ```

   Example: ifconfig skge0 unplumb

2. Make sure that no other application or OS daemon is connected to any of the GE adapters.

3. Remove the driver from the system with the command:

   ```
   rem_drv skge
   ```

If there are any remaining connections to any of the GE adapters (see Steps 1 and 2), you will see the following error messages:

```
"Device busy
Cannot unload module: skge
Will be unloaded upon reboot."
```

4. Load the driver again into the system with the following command:

```
add_drv -f -c pci -m '* 0660 root sys' -i
'"pci1148,5021" "pci1148,5041" "pci1148,5043"
"pci1148,5051" "pci1148,5061" "pci1148,5071"
"pci1148,5081" "pci1148,9821" "pci1148,9822"
"pci1148,9841" "pci1148,9842" "pci1148,9843"
"pci1148,9844" "pci1148,9861" "pci1148,9862"
"pci1148,9871" "pci1148,9872" "pci1259,2970"
"pci1259,2971" "pci1259,2972" "pci1259,2973"
"pci1259,2974" "pci1259,2975" "pci1259,2976"
"pci1259,2977" "pci1148,9521" "pci1148,0121"
"pci1148,0221" "pci1148,0321" "pci1148,0421"
"pci1148,0621" "pci1148,0721" "pci1148,0821"
"pci1148,0921" "pci1148,1121" "pci1148,1221"'
skge
```

⚠️ **Warning**
Please make sure that the whole add_drv command is on one line.

The easiest way to achive this is to write a script.

For more details about rem_drv or add_drv, please refer to the manual pages by executing the commands 'man rem_drv' or 'man add_drv' accordingly.

5. After loading the driver, set up the IP interfaces manually using the ifconfig command. To start the interfaces, enter the following command for each interface:

```
ifconfig skge<X> plumb <hostname> up
```

6. Exchange <X> with the interface number.

7. Exchange <hostname> with the hostname you have chosen in /etc/hosts for the IP address.

Note
Do not forget to create the /etc/hostname.skgeX file for the interface of port B, otherwise the interface configuration during a reboot will not work.

After the changes have been activated, the adapter will behave as two separate interfaces in Dual Net mode, e.g. skge0 and skge50000. Each of the interfaces in Dual Net mode can be configured as if they were single port adapters.

Note
The RLMT parameters PreferredPort_InstX and RlmtChgBCPrio_InstX (described above) do not work in this mode.

VLAN Configuration and Parameters

> **Note**
> If you want to configure VLANs for an adapter, all traffic on the adapter has to be handled by VLANs. Mixing VLAN interfaces with non VLAN interfaces connected to the same adapter (or one adapter port in case of Dual Net mode) is not allowed! A different adapter can be configured as a non VLAN adapter at the same time.

The complete configuration is executed in the file /kernel/drv/skge.conf. A sample file can be found at this location after the normal driver installation process without VLAN parameters.

There are two possibilites to configure VLANs for an adapter:

❑ Use the script skge_vlan_config.

❑ Edit the configuration file /kernel/drv/skge.conf manually.

> **Note**
> We recommend to use the script! It is much easier than the manual configuration.

VLAN Configuration Using Script skge_vlan_congif

The script skge_vlan_config was copied into the directory /usr/sbin during driver installation.

> **Note**
> You have to be logged in as user 'root' to execute it.

With this script you are able to configure the AT-2971T/SX Gigabit Ethernet Adapter previously installed on the system for VLAN support.

To configure VLANs using skge_vlan_config, perform the following procedure:

1. Before you start the script, you have to find out the instance number(s) of the adapter(s) you want to configure as VLANS.

    List all network interfaces with:

    ```
    ifconfig -a
    ```

2. Search for interfaces named skge0, skge1 and so on. The according IP address will show you the correct adapter. The value of <number> in the interface name skge<number> reflects the instance number of the adapter:

Instance number belonging to skge0: 0
Instance number belonging to skge1: 1

...

After you have determined the adapters you want to configure, configuration with skge_vlan_config can be started.

3. Start the script by entering the following at the command line:

   ```
   skge_vlan_config
   ```

   The script will prompt you to define the following parameters:

4. Instance number: Enter the instance number of the adapter to configure.

5. VLAN ID: Enter a VLAN ID for each VLAN. Allowed values range from 1 to 4094. The IDs distinguish the VLANs in your network topology.

   Note
   Please be careful: switches that are VLAN capable often have a default VLAN configured. Do not choose the same VLAN ID as used in the switch or change the ID of the switch default VLAN.

6. Jumbo Frame Support: Decide whether the VLAN is to support Jumbo frames or not. If not all VLANs for the same adapter need jumbo frame support, this is no problem. The adapter will be configured accordingly.

   Note
   It is not necessary to set the MTU size for jumbo frames in the file /etc/rcS.d/S50skge manually. The script will do this for you.

7. Hostname: Enter the hostname to be used for the VLAN IP interface.

8. IP Address: Enter the IP address for the VLAN IP interface.

9. Netmask: Enter the netmask for the VLAN IP interface.

   When you have finished defining the parameters, the script adds all necessary entries to the file /kernel/drv/skge.conf, adds all entries to the files /etc/hosts and /etc/netmasks and creates all /etc/hostname.<interface> files.

   When the configuration is finished, you have two possibilities to activate the changes in skge.conf:

   — Reboot the system.

   — Unload the driver with rem_drv and load it again with add_drv.

Note

If you execute all changes in skge.conf after package installation and before you reboot the system, no additional steps as described below have to be performed.

Note

Before you choose one of the above possibilities, you MUST remove the device links to the driver in the /dev directory manually. Otherwise these links and the entries in the /devices directory will not be created properly to show the new configuration of the driver.

---

10. Enter the following command to remove the device links:

```
rm /dev/skge*[0-9]
```

⚠ **Warning**

Please be very careful. It is possible to remove other devices and to damage the system.

Now all entries are removed.

Reboot the system

If you want to reboot the system, perform the following procedure:

1. Remove the links to the driver in the /dev directory as described above.

2. Create the file "reconfigure" in the root directory with the following command:

```
touch /reconfigure
```

This informs the system about the nessecitiy to recreate the /dev and /devices directories.

Unload and reload the driver with rem_drv/add_drv

To use the second possibility, perform the following procedure:

1. Deactivate the IP interfaces of all GE adapters with the following command executed for each interface:

```
ifconfig <interface_name> unplumb
```

Example: ifconfig skge0 unplumb

2. Make sure that no other application or OS daemon is connected to any of the GE adapters.

3. Remove the driver from the system with the command:

    ```
    rem_drv skge
    ```

    If there are any remaining connections to any of the GE adapters (see Step 2), you will see the following error messages:

    ```
    "Device busy
    Cannot unload module: skge
    Will be unloaded upon reboot."
    ```

4. Load the driver again into the system with the following command:

    ```
    add_drv -f -c pci -m '* 0660 root sys' -i
    '"pci1148,5021" "pci1148,5041" "pci1148,5043"
    "pci1148,5051" "pci1148,5061" "pci1148,5071"
    "pci1148,5081" "pci1148,9821" "pci1148,9822"
    "pci1148,9841" "pci1148,9842" "pci1148,9843"
    "pci1148,9844" "pci1148,9861" "pci1148,9862"
    "pci1148,9871" "pci1148,9872" "pci1259,2970"
    "pci1259,2971" "pci1259,2972" "pci1259,2973"
    "pci1259,2974" "pci1259,2975" "pci1259,2976"
    "pci1259,2977" "pci1148,9521" "pci1148,0121"
    "pci1148,0221" "pci1148,0321" "pci1148,0421"
    "pci1148,0621" "pci1148,0721" "pci1148,0821"
    "pci1148,0921" "pci1148,1121" "pci1148,1221"'
    skge
    ```

> **⚠ Warning**
> Please make sure that the whole add_drv command is on one line. The easiest way to achive this is to write a script.

For more details about rem_drv or add_drv, please refer to the manual pages by executing the commands 'man rem_drv' or 'man add_drv' accordingly.

5. After loading the driver, set up the IP interfaces manually using the 'ifconfig' command.

    or

6. Reboot the system and the IP interfaces will be set automatically.

VLAN IP interface naming

Example: You have configured two VLANs for instance 0. The values you have chosen might have been the following:

First VLAN:
ID: 2
Jumbo frame support: OFF

Second VLAN:
ID: 4
Jumbo frame support: ON

The entry in /kernel/drv/skge.conf created with the script will look like this:

```
# BEGIN VLAN configuration settings for
instance 0
Vlan_Inst0_Enable="Yes";
Vlan_0_DevNum=0;
Vlan_0_ID=2;
Vlan_0_Jumbo="Off";
Vlan_100_DevNum=100;
Vlan_100_ID=4;
Vlan_100_Jumbo="On";
Vlan_Inst0_Count=2;
# END VLAN configuration settings for instance
0
```

Note
If you want to disable VLAN support at a later time, only switch Vlan_Inst<instance>_Enable to "No". It is not necessary to delete all the settings.

For each VLAN you have to set up one interface. The number of the interface must be the same as the value of the according Vlan_X_DevNum parameter. For our example you need the following two values:

```
Vlan_0_DevNum=0 This value belongs to the VLAN
with ID 2.
Vlan_100_DevNum=100 This value belongs to the
VLAN with ID 4.
```

The interface for the first VLAN will be skge0, for the second skge100.

To start the VLAN interfaces, perform the following procedure:

1. Enter the commands:

    ```
    ifconfig skge0 plumb <hostname> broadcast +
    netmask + up
    ```

    ```
    ifconfig skge100 plumb <hostname> mtu 9000
    broadcast + netmask + up
    ```

2. Exchange <hostname> with the hostname you have chosen for the VLAN.

3. Now enter 'ifconfig -a' again to check if all interfaces are set up correctly.

4. Now you can try to ping to another machine to check whether or not the connection works.

Additionally, you have the possibility to check the VLAN settings for a specific interface by use of the 'ndd' command. If you want to know the settings for skge100 from the example above, enter the command:

```
ndd /dev/skge100 vlan_props
```

If VLAN support is enabled on the according interface, you get a list of four parameters (used in skge.conf):

— VLAN number: This is the number of the VLAN, for skge100 it is 100.

— VLAN ID: This is the VLAN ID you have chosen.

— VLAN Port: Actual port used by the VLAN.

— VLAN Jumbo Frames: Did you choose jumbo frame support?

If VLAN support is disabled, you get the following message: "No VLAN support on skgeX enabled." X is the number of the according interface.

For our example the output will look like the following:

```
VLAN number: 100

VLAN ID: 4

VLAN Port: A

VLAN Jumbo Frames: Yes
```

For more details about 'ndd' refer to

Manual VLAN Configuration

The complete VLAN configuration will be carried out in the driver configuration file /kernel/drv/skge.conf. Please refer to 'man driver.conf' for further information about these files.

An excerpt from skge.conf looks like the following:

```
#

# Configuration file for the skge DualNet/VLAN
driver.

# See skge.txt or skge.htm for a description of
the parameters.

# Uncomment and change the settings you need.

#

# The decimal value in _Inst0 in all parameters
is the instance

# number of the appropriate adapter. Set it to
needed value.

# ..._Inst0 means instance number 0, ..._Inst1
means instance number

# 1 and so on.

#

# WARNING: All parameters and values are case
sensitive. Write them

# exactly as shown here!

# All parameters have to be followed by a
semicolon!

# AutoNegotiation: Values are: On, Off, Sense;
Default = On

# AutoNegotiation_A_Inst0="On";

# AutoNegotiation_B_Inst0="On";

# DuplexCapabilities: Values are: Half, Full,
Both; Default = Both

# DuplexCapabilities_A_Inst0="Both";

# DuplexCapabilities_B_Inst0="Both";
```

If you want to change the default values, you only have to uncomment the appropriate parameter and set it to the desired value.

Here is an example how the VLAN parameters will look like if configured for Single Net mode:

```
Vlan_Inst0_Enable="Yes";
Vlan_0_DevNum=0;
Vlan_0_ID=2;
Vlan_0_Jumbo="Off";
Vlan_100_DevNum=100;
Vlan_100_ID=4;
Vlan_100_Jumbo="On";
Vlan_Inst0_Count=2;
```

VLAN Configuration in Single Net Mode

Note
All parameters and values are case sensitive. Write them exactly as shown here. All parameters have to be followed by a semicolon.

If you want to configure an adapter for the use of VLANs, proceed as follows:

1. The first parameter you have to set is:

    Vlan_Inst<instance>_Enable="Yes";
    <instance> is a placeholder that has to be replaced with the actual instance number of the adapter given by the system. Without this parameter no further VLAN parameters will be read by the driver for this adapter.

    Note
    If you want to disable VLAN support at a later time, only switch Vlan_Inst<instance>_Enable to "No". It is not necessary to delete or uncomment all the settings.

2. For each VLAN you want to create, you MUST set two parameters:

    Vlan_<number>_DevNum;

    Vlan_<number>_ID;

    <number> is a placeholder that has to be exchanged with the real VLAN number. These numbers have to be set in a special manner. For each adapter there is a numbering scheme that MUST be used.

    The first VLAN you create has the same number as the instance number given to the adapter by the system. For every additional VLAN simply add 100 to the instance number.

Example:

Instance number of the adapter: 0

First VLAN to create: Vlan_0_DevNum, Vlan_0_ID
Second VLAN: Vlan_100_DevNum, Vlan_100_ID
Third VLAN: Vlan_200_Dev_num, Vlan_200_ID
...
and so on.

Instance number of the adapter: 1

First VLAN to create: Vlan_1_DevNum, Vlan_1_ID
Second VLAN: Vlan_101_DevNum, Vlan_101_ID
Third VLAN: Vlan_201_Dev_num, Vlan_201_ID
...
and so on.

> **Note**
> This is necessary to create device minor nodes in the driver that have the same numbers as the according interfaces you have to create with 'ifconfig'. More details refer to the next section.

Parameters

Parameter: Vlan_<number>_DevNum

Type: integer

Default value: None! You MUST set this value!

Valid Values: Not limited

Example:

    Vlan_0_DevNum="0";
    Vlan_100_DevNum="100";

This parameter defines the number skge<number> of the interface that belongs to the VLAN with the parameter Vlan_<number>_DevNum. The value for Vlan_<number>_DevNum should be <number>. You are free to choose a different value. We recommend to use <number> because it is very easy to distinguish all interfaces belonging to the same board since the last digit is the same for all interfaces.

Parameter: Vlan_<number>_ID

Type: integer

Default value: None! You MUST set this value!

Valid values: 1 to 4094

Example:

    Vlan_0_ID=2;
    Vlan_100_ID=122;

This parameter defines the VLAN ID as specified in IEEE 802.1Q. It is used to distinguish the VLANs in VLAN capable drivers and switches. For this reason it is not allowed to use a chosen VLAN ID on the same adapter (in Single Net mode) or on the same port (in Dual Net mode) again! The value for Vlan_<number>_ID can be any value in the range from 1 to 4094.

Note
Please be careful: switches that are VLAN capable often have a default VLAN configured. Do not choose the same VLAN ID as used in the switch or change the ID of the switch default VLAN.

Parameter: Vlan_Inst<instance>_Count

Type: integer

Default value: None! You MUST set this value!

Valid values: 1 up to the number of VLANs configured for the appropriate adapter.

<instance> is a placeholder that has to be replaced with the actual instance number of the adapter given by the system. This parameter has to be set to enable the driver to check the completeness of all VLAN parameters you must set during configuration.

Example: We use the sample entry from the beginning of this chapter to show the use of this parameter.

    Vlan_Inst0_Enable="Yes";
    Vlan_0_DevNum=0;
    Vlan_0_ID=2;
    Vlan_0_Jumbo="Off";
    Vlan_100_DevNum=100;
    Vlan_100_ID=4;
    Vlan_100_Jumbo="On";
    Vlan_Inst0_Count=2;

Two VLANs have been configured for this adapter. Therefore Vlan_Inst0_Count is set to 2.

If you, for example, forget to set Vlan_100_ID, the driver will ouput the following message on the console:

```
skgeX: GetConfiguration: Missing VLAN
parameter Vlan_100_ID!
```

X is the instance number of the according adapter.

After the display of this message, the driver will abort the complete configuration of the adapter because it makes no sense to continue. A possible workaround is to look up the configuration file and fill in the missing parameter. In case of two VLANs this might seem overstated, but if you have 10 or 20 VLANs configured for one adapter it can easily happen that you forget to set one parameter.

Additional Parameters

There are additional parameters that can be set, but it is not necessary to use them. If you do not set these parameters, default values will be used by the driver.

Parameter: Vlan_<number>_Jumbo

Type: string

Default value: OFF

Valid values: ON
                             OFF

Example:

Vlan_100_Jumbo=ON;

If you want to use Jumbo frames on one or more VLANs you have configured for an adapter, set the appropriate parameter to ON. The adapter will be configured accordingly.

Note
Do not forget to enable setting the MTU in /etc/rcS.d/S50skge!.

Important: If you have configured your VLANs in skge.conf manually and you want to use the script /usr/sbin/skge_vlan_config the next time you have to change or add existing VLAN entries, please edit the file before using the script and add two extra lines for each instance:

Insert

```
# BEGIN VLAN configuration settings for
instance <instance>
```

in front of the first VLAN entry and

```
# END VLAN configuration settings for instance
<instance>
```

after the last VLAN entry belonging to this instance number. <instance> is a placeholder for the instance number you have chosen. A VLAN entry for instance 0 would look like this:

BEGIN VLAN configuration settings for instance 0

```
Vlan_Inst0_Enable="Yes";
Vlan_0_DevNum=0;
Vlan_0_ID=2;
Vlan_0_Jumbo="Off";
Vlan_100_DevNum=100;
Vlan_100_ID=4;
Vlan_100_Jumbo="On";
Vlan_Inst0_Count=2;
# END VLAN configuration settings for instance
0
```

Note
You have to do this for each VLAN instance.

Important: The /etc/hostname.<interface> files are important. One of these files is needed for each interface to be configured with 'ifconfig' by the system at boot time. You have to create one file for each VLAN interface you want to use. These files contain only one entry; the hostname or IP address associated with the VLAN belonging to the appropriate interface. If you put a hostname into the file you have to make sure that there is an entry with the correct IP address for this hostname in the file /etc/hosts!

Example: For the two VLANs above you have to create two files:

```
/etc/hostname.skge0
/etc/hostname.skge100
```

Note
If you want to use a different netmask as the default for the chosen IP address class for some or all of your interfaces at boot time, do not forget to put the correct value into /etc/netmasks.

Now you should be able to configure your adapters for the use of VLANs in Single Net mode.

When the configuration is finished, you have two possibilities to activate the changes in skge.conf:

❑ Reboot the system.

❑ Unload the driver with rem_drv and load it again with add_drv.

For details refer to the description in

VLAN Configuration in Dual Net Mode

In Dual Net mode, one or both ports can be configured for VLANs.

VLAN configuration on one port

VLAN configuration for each port has to be enabled separately. This is executed in skge.conf with the following parameter:

```
Vlan_?_InstX_Enable="Yes";
```

'?' stands for the port for which you want to configure VLANs (A or B), 'X' stands for the instance number of the adapter.

If you want to enable VLANs on port A of instance 1, you have to add the following entry:

```
Vlan_A_Inst1_Enable="Yes";
```

The configuration and naming of the VLANs for port A is the same as described in section 6.2.1. The only difference for port B is that the VLAN numbers do not start with the instance number of the adapter. An offset of 50000 is added to the instance number instead to create the VLAN and device numbers. The offset of 50000 is added in order to provide enough numbers to configure VLANs for port A.

VLAN configuration on two ports

Assumption: Configuration of a Dual Net adapter for VLANs on both ports. Each port should have two VLANs bound to it.

Thus the entry for instance 1 in skge.conf could look like the following:

```
Vlan_A_Inst1_Enable="Yes";
Vlan_1_DevNum=1;
Vlan_1_ID=2;
Vlan_101_DevNum=101;
Vlan_101_ID=4;
Vlan_A_Inst1_Count=2;
Vlan_B_Inst1_Enable="Yes";
Vlan_50001_DevNum=50001;
Vlan_50001_ID=6;
Vlan_50101_DevNum=50101;
Vlan_50101_ID=8;
Vlan_B_Inst1_Count=2;
```

When the configuration is finished, you have two possibilities to activate the changes in skge.conf:

❑ Reboot the system.

❑ Unload the driver with rem_drv and load it again with add_drv.

For details refer to the description in <u>Dual Net Operation Mode</u> on page 86.

PCI Hot Plug and Power Management

Please refer to the documentation that can with your system to find out whether or not you can use the capabilities of PCI Hot Plug or power management.

PCI Hot Plug   Please refer to the Solaris documentation for further information about the use of PCI Hot Plug.

Power Management   There are two possibilites of power management:

❑ system power management and

❑ device power management

System power management (Suspend/Resume):

This feature of the power management software of Solaris allows you to power cycle the whole machine without losing the state of your current activities. You can do this on SPARC machines by pressing the key in the upper right corner of your keyboard.

This driver can handle the appropriate system calls so you are able to use Suspend/Resume if you need to. This may be useful on a workstation but not on a server machine.

Note
Network connections will not be interrupted until the timeout value for the chosen protocol of the remote machine has expired.

Device power management:

This feature allows the system to power cycle individual pieces of hardware that support device power management. If the hardware is idle for a specified time it will be power cycled by the system. You can configure the value allowed for the idle time in the file /etc/power.conf. If you want to enable device power management for Allied Telesyn adapters you have to edit power.conf.

For each adapter that is to be configured for power management, proceed as follows:

Enter the following line (for each adapter):

```
device_name          threshold
```

Each line must contain both entries in this order.

Device_name is the name of the device associated with your adapter in the /dev directory. For all supported adapters they look like:

```
/dev/skge0

/dev/skge1
```

and so on.

Threshold is the idle time value in seconds after which the adapter will be power managed by the system to save energy.

Example: If you want to power cycle the adapter connected to skge0 after 60 seconds of idle time, enter the following line:

```
/dev/skge0      60
```

If you want to disable power management for this adapter again, set the value of threshold to '-1':

```
/dev/skge0      -1
```

Refer to 'man power.conf' for further details.

Tuning

This section describes settings that affect network performance. Also refer to the description of the CopyThreshold parameter above.

The TCP/IP protocol stack of Solaris can be tuned to better suit high speed network adapters. This tuning is executed with the "ndd" tool.

The startup script /etc/rcS.d/S50skge is created during installation and it sets some of the TCP parameters.

More improvement can be achieved by further increasing e.g. tcp_xmit_hiwat and tcp_recv_hiwat when using Jumbo Frames. But this also increases the memory consumption per TCP stream and the effect depends on the type of application.

If you need this last bit of optimization, please refer to the man page of 'ndd' and find the best settings for your system by experimenting with different settings.

"ndd" Support

Starting with version 3.10, the driver supports the Solaris tool 'ndd' for reading driver parameters and statistics. For details on 'ndd', refer to the man page. The driver supports the following parameters:

- ? : a list of all parameters is displayed. Do not forget to quote the question mark with a backspace: ndd /dev/skgeX \?

  Otherwise the ? will be interpreted by the shell as a metacharacter. X in skgeX is the number of the according interface.

```
- link_status  : Up or Down

- link_mode    : 1=full-duplex, 0=half-duplex

- link_speed   : 10|100|1000 (Mbits per second)

- port_count   : number of ports on adapter

- adapter_id   : adapter identification string

- hw_revision  : hardware revision number

- instance_num : instance number of adapter
```

- ring_sizes : a list of the following parameters is displayed:

```
- RX ring size: # of RX descriptor ring buffers

- TX ring size: # of TX descriptor ring buffers
```

- port_props : a list of the following parameters is displayed:

```
- Port: used port for this device

- Link Status: see link_status above.

- Link Speed: see link_speed above.

- Jumbo Frames: jumbo frames enabled?

- VLAN: VLAN support enabled?

- RX ring size: # of RX descriptor ring buffers

- TX ring size: # of TX descriptor ring buffers

- RLMT Mode: RLMT mode used for this port.
```

— For possible values see parameter RlmtMode_InstX in Per-port Parameters on page 76.

```
- AutoNegotiation: auto-negotiation used?
```

```
- Duplex Mode: half- or full-duplex mode?

- Flow Control: used mode

- Role: this parameter is only valid with
1000Base-T
```

adapters (SK-9821, SK-9822 and SK-9821 V2.0). Please refer to parameter Role_?_InstX in Per-port Parameters on page 76 for details.

- dual_net   : Dual Net mode enabled?

- vlan_props   : if VLAN support is enabled on the according interface, a list of four parameters (used in skge.conf) is displayed:

```
- VLAN Number: used for configuration purposes

- VLAN ID: set by user

- VLAN Port: port used by this VLAN

- VLAN Jumbo Frames: jumbo frames enabled?
```

If VLAN support is disabled, the following message is displayed:
"No VLAN support on skgeX enabled."
X is the number of the corresponding interface.

- vct_start   : Start a VCT cable test on the selected interface.

- vct_status : Get the actual VCT/DSP status of the selected interface.

- vct_result : Get the result of the last VCT/DSP cable test of the selected interface.

Refer to Error Messages on page 113 for details about the VCT parameters.

Example: If you want to know the adapter identification string of the adapter belonging to IP interface skge0, enter the command:

```
ndd /dev/skge0 adapter_id
```

Virtual Cable Tester (TM) (VCI)

The Marvell(R) VCT technology utilizes Time Domain Reflectometry (TDR) technology to remotely diagnose the quality and characteristics of the attached cables. Using this technology it is possible to detect and report potential cabling issues such as cable opens, cable shorts or any impedance mismatches in the cable and accurately report - within one meter - the distance to the fault. The VCT technology enables the IT manager or the end user to quickly identify the failing mechanism and isolate the source of the problem.

If at the selected device a link is up, DSP (Digital Signal Processor) is activated, which reports the length of the cable (only if link is at 1000 Mbps speed).

Note
The VCT feature is available for AT-2916T and AT-2971T Gigabit Ethernet 10/100/1000Base-T Adapters.

VCT can be used with the Solaris tool 'ndd'. It is supported with the following three parameters:

```
- vct_start  : Start a VCT cable test on the
selected device.

- vct_status : Get the actual VCT/DSP status of
the selected device.

- vct_result : Get the result of the last
VCT/DSP cable test of the selected device.
```

Example: If you want to start a VCT test on device skge0, enter the command:

```
ndd /dev/skge0 vct_start
```

If you have started VCT on device skge0, you will get the following message:

```
"VCT test started on device skge0!"
```

VCT needs about three seconds to finish. If you try to get the results before finishing the test, you will get the following message:

```
"VCT test is running on device skge0"
```

VCT can not be started if the link on the selected device is active. If you should do this accidentally, you will get the following message:

```
"VCT test not started on device skge0! Link is
up!"
```

If you have tried to start VCT on a device not supporting it, you will get the following message:

```
"VCT Error: VCT not supported on device skge0!"
```

This message will also appear, if you try to view the VCT status or to get the VCT result on a device not supporting VCT.

You can retrieve the VCT result with the following command:

```
ndd /dev/skge0 vct_result
```

You will see output like the following example in the terminal window:

```
Old DSP result for skge0: Cable length: < 50m
New VCT result for skge0: Pair 1 [1-2] Length:
5m  Status:  Open in cable.
New VCT result for skge0: Pair 2 [3-6] Length:
5m  Status:  Open in cable.
New VCT result for skge0: Pair 3 [4-5] Length:
5m  Status:  Open in cable.
New VCT result for skge0: Pair 4 [7-8] Length:
5m  Status:  Open in cable.
```

The first line belongs to the DSP output. The VCT result lists the cable pairs, the status of the corresponding cable pair, the distance to the fault (length), and the status of the test.

"New" and "old" in the output above (and also in the output of the vct_status command, see below) have the following meaning:

For VCT data, "new" means that the link is down and VCT has been executed during this link down time. "Old" means that the link is or has been up after the test has been executed, so the data is outdated and may be wrong now.

For DSP data, "new" means that the link is up and DSP has calculated the cable length automatically. "Old" means that the link is or has been down after DSP has been run so the data is outdated and may be wrong now.

The following states of a cable pair are possible after VCT has been executed:

- Normal cable.   : The cable pair is connected correctly.

- Short in cable.   : Two or more cable pairs are short-circuited together. VCT reports the distance to the short-circuit in meters.

- Open in cable.   : Lack of continuity between the pins at each end of the twisted-pair cable, i.e. the cable pair is not connected correctly. VCT reports the distance to the open location in meters.

- Impedance mismatch. : The impedance on the cable pair is not correct. Possible reasons for impedance mismatch:
- The cable pair is not connected properly.
- The cable pair is damaged.
- The connector is faulty.
VCT reports the distance to the impedance mismatch in meters.

- Test failed!   : The test of the cable pairs was not successful.

You can also retrieve the current VCT and DSP status with the following command:

```
ndd /dev/skge0 vct_status
```

For the example above you will get the following message:

```
"VCT status for skge0: New VCT and old DSP
data!"
```

If the link was never up and VCT has not been started up to now, you will get the following message:

```
"VCT status for skge0: No VCT or DSP data!"
```

Troubleshooting

This section describes some common problems and their solution.

Problem	Solution
The installation prints the following message: "Driver (skge) successfully added to system but failed to attach"	The driver file could not be executed. Check if you have the correct driver version for your system architecture. In the directory above the "SKGEsol" subdirectory, enter: file SKGEsol/reloc/kernel/drv/skge This will tell you which system type the driver supports. If the skge file is located in: SKGEsol/reloc/kernel/drv/sparcv9 you have the SPARC 64 bit version.
The driver startup fails with the message: "skge<InstanceNumber>: BoardAllocMem: ddi_dma_mem_alloc failed!"	<InstanceNumber> is the instance number assigned to the adapter by the system. You probably have multiple adapters installed. Each one uses an amount of limited DMA memory. If the driver can not get sufficient memory, it will not work.
	You can increase the available DMA memory by tuning a kernel parameter. In the file /etc/system, add the line: set lomempages=<Value>
	The default for <Value> is 36. Increase this value until the above message disappears (recommended increment: 10). You have to reboot your system to activate this change!
After installing additional adapters and reinstalling the driver, the network is up, you see the interfaces with 'netstat -i', but you can not reach other machines.	The order in which instance numbers are assigned depends on the PCI slots the adapters are plugged into.
	This can cause an adapter that was inserted at a later time to have a lower instance number. Since you do not know this order when entering the IP addresses, the address assignment may be swapped.
	You can either swap the names of the corresponding /etc/hostname.skgeX files or you can swap the cables of the adapters. X is the number of the corresponding interface.

Error Messages

This section describes error messages that may be printed by the driver. This list is incomplete! If you get other error messages and you can not solve the problem, contact Allied Telesyn technical support.

Note
In all following error messages, <InstanceNumber> is a placeholder for the instance number assigned to the adapter by the system.

Message	Meaning
"skge<InstanceNumber>: Getconfiguration: Missing VLAN parameter <ParameterName>!"	<ParameterName> can be any name described as 'MUST be set' in Dual Net Operation Mode on page 86. You have configured the adapter skge<InstanceNumber> for the use of VLANs and forgotten to set a parameter that is essential for the correct functionality of a VLAN (Virtual LAN) device. If so, the attachment of the adapter is aborted.
"skge<InstanceNumber>: Getconfiguration: Illegal value for <ParameterName>, using default!"	<ParameterName> can be any parameter name described in Driver Parameters on page 75. You have entered an invalid value for this parameter in the driver configuration file.
"skge<InstanceNumber>: SkGeAttach: ddi_soft_state_zalloc failed!"	Not enough kernel memory is available for the driver.
"skge<InstanceNumber>: Adapter failed."	A serious driver or hardware problem has occurred. This will prevent the adapter from working correctly.
"skge<InstanceNumber>: Port <A|B> failed."	Same as the previous message, but for the port only.
"skge<InstanceNumber>: BoardAllocMem: ddi_dma_mem_alloc failed!"	The driver could not get enough DMA memory. See the section above for a solution.

Chapter 8
BootROM

This chapter contains the procedures for installing and configuring an optional BootROM on an AT-2450, AT-2700, and AT-2745 Series Allied Telesyn Network Adapter Card.

Managed Boot Agent

Managed Boot Agent (MBA) is client-based firmware that allows a client PC to do a "network bootî using the NIC. MBA is fully compliant with the Intel Wired for Management - Preboot Execution Environment (PXE) specification. PXE is the defacto industry standard protocols/APIs for network booting, enabling client PCs to access and boot from boot image files on a server. MBA streamlines networked desktop management, improves network security and cuts client administration costs. Network managers can remotely manage their networks, eliminating costly visits to the desktops

MBA adds extra important features in addition to standard PXE boot agents. To configure these features type ìCRTL ALT Bî when prompted to initialize the MBA configuration screen.

❑ MBA supports additional boot protocols:

— Remote Program Load (RPL)

— Netware NCP/IPX

— Traditional BootP and DHCP

❑ MBA has extra features and options, e.g.:

— The ability to configure speed and duplex without DOS configuration tools.

— Prompt when network boot fails: PXE ñ waits a definable time period before going to next device MBA ñ waits a definable time period before going to next device OR can display message to user and wait for a key press before going to next device

❑ MBA is compatible, robust, and dependable:

— MBA undergoes extensive and thorough testing:

The AT-2451, AT-2701, AT-2746 Series of adapters incorporates Managed Boot Agent (MBA) on the network interface card. MBA is available for the AT-2500, AT-2450, AT-2700, AT-2745 MBA series of adapters as an add-on option.

Installing a BootROM

Note
There are two different variations of AT-2450FTX, AT-2700FTX and AT-2745FX Series cards. One with a BootROM switch and one without. If using the version with a switch see **Step 3**. Also, if using an AT-2700TX or FX, only complete **Step 1**.

Installation
Installing the MBA ROM is a straightforward task, but you must take care to ensure that components are not damaged. Be sure you understand the following instructions *before* installing MBA.

⚠ **Caution**
Risk of equipment damage:
Before removing an adapter card, attach an earth ground to the PC chassis. If an earth ground is unavailable, ensure that the power is switched off and plug in the PC's grounded AC power cord.

⚠ **Caution**
Wear an anti-static wrist strap when handling ROMs. As an additional measure, do not touch the ROM's connectors. Leave the ROM in its anti-static packaging when not in use.

If you are installing MBA on an adapter card that is already in your PC, remove the adapter card from the PC. If you are not familiar with inserting and removing adapter cards in your PC, refer to the **Network Adapter Cards Installation Guide - Book I** for instructions then locate the Boot ROM socket on your adapter card. You may need to refer to the installation guide to locate the correct ROM socket.

MBA Boot ROM Configuration

To configure the MBA Boot ROM options press **Ctrl + Alt+ B** during PXE initialization to enter the MBA Configuration Menu. This message will appear during the Boot ROM initialization. In this menu you can select the boot method and other parameters. Two new features are the Speed/Duplex and Boot ROM Port parameters. The Speed/Duplex parameter allows the user to determine the default speed and duplex configuration without the DOS configuration utility. The Boot ROM Port parameter allows the user to configure the default port on dual-port adapters. Allied Telesyn's dual-port adapter cards are: AT-2450FTX, AT-2700FTX, and AT-2745FX

PLCC Socket Installation

The PLCC socket has three square corners and one angled corner. The angled corner of the ROM must be oriented to match the angled corner of the socket.

Remove the MBA ROM from its anti-static packaging, and align the angled corner of the MBA ROM with the angled corner of the ROM socket on the adapter card. Press down gently and evenly on the ROM to ensure that it is seated correctly in the socket. Figure 11 shows the MBA ROM installation for the AT-BP2700 and AT-BP2501 PC Boot Agent.
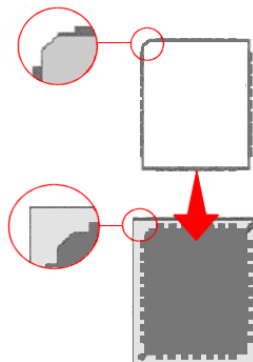
Figure 11 MBA ROM Installation

Figure 12 shows an MBA ROM installation for the AT-BD2700 and AT-BD2500 PC Boot Agent.
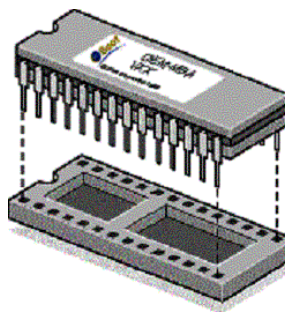
Figure 12 MBA ROM Installed on a AT-BD2700/AT-BD2500

Installing the NIC into the PC and Enabling the ROM Socket

Now that the ROM has been inserted into the adapter card, you can install the card into your PC.

To install the adapter card into the PC, refer to the **Network Adapter Cards Installation Guide, Book II** for instructions. The AT-2450 and AT-2700 Series Adapter Cards will recognize the inserted MBA Boot ROM automatically. However, PXE can be disabled or enabled through the diagnostics program **diag.exe**.

The AT-2500 and AT-2501 adapter cards will require the card to be configured for Boot ROM support, it is disabled by default. To enable Boot ROM support, start the AT-2500 or AT-2501 DOS diagnostics program, **setup25** and enable the Boot ROM from the configuration menu.

BootROM Parameter

1. Run the diagnostics program that came with your Allied Telesyn adapter. (diag.exe, diag25.exe, etc.).

2. If using an AT-2450 and AT-2700 series Combo card, set the BootROM Parameter to the desired port (copper or fiber). If using an AT-2500 series adapter set the BootROM parameter to enable.

For the AT-2450FTX, AT-2700FTX, and AT-2745FX versions with switches you must set your switch to the proper position based on which port you are using (Copper or Fiber).

Table 1 AT-2450FTX

Diag Setting	Switch Position
Copper[1]	Up[1]
Fiber	Down

1. Factory default.

Table 2 AT-2700FTX

Diag Setting	Switch Position
Fiber[1]	Down[1]
Copper	Up

1. Factory default.

Table 3 AT-2745FX

Diag Setting	Switch Position
100 Mb[1]	Up[1]
10 Mb	Down

1. Factory default.

Note
For proper operation when BootROM is **NOT** installed insure the Diagnostics parameter BootRom and switch are set to Factory Default.

Appendix A

Translated Safety and Emission Information

Important: This appendix contains multiple-language translations for the safety statements in this guide.

Wichtig: Dieser Anhang enthält Übersetzungen der in diesem Handbuch enthaltenen Sicherheitshinweise in mehreren Sprachen.

Vigtigt: Dette tillæg indeholder oversættelser i flere sprog af sikkerhedsadvarslerne i denne håndbog.

Belangrijk: Deze appendix bevat vertalingen in meerdere talen van de veiligheidsopmerkingen in deze gids.

Important: Cette annexe contient la traduction en plusieurs langues des instructions de sécurité figurant dans ce guide.

Tärkeää: Tämä liite sisältää tässä oppaassa esiintyvät turvaohjeet usealla kielellä.

Importante: questa appendice contiene traduzioni in più lingue degli avvisi di sicurezza di questa guida.

Viktig: Dette tillegget inneholder oversettelser til flere språk av sikkerhetsinformasjonen i denne veiledningen.

Importante: Este anexo contém traduções em vários idiomas das advertências de segurança neste guia.

Importante: Este apéndice contiene traducciones en múltiples idiomas de los mensajes de seguridad incluidos en esta guía.

Obs! Denna bilaga innehåller flerspråkiga översättningar av säkerhetsmeddelandena i denna handledning.

Standards: This product meets the following standards.

U.S. Federal Communications Commission
Radiated Energy
Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Note: Modifications or changes not expressly approved by the manufacturer or the FCC can void your right to operate this equipment.

Industry Canada
This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Community (EC) Electromagnetic Compatibility Directive
This equipment has been tested and found to comply with the protection requirements of European Emission Standards EN55022 Class B/EN61000-3-2 and the ITE European Immunity Standard EN55024

1 RFI Emission   EN55022 Class B, EN61000-3-2, EN61000-3-3

2 ⚠ **Warning**: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

3 Immunity   EN55024

Safety

4 Electrical Safety   TUV-EN60950, UL1950, CSA 950, EN60825

5 Laser   EN60825

6 ⚠ This is a "CLASS 1 LED PRODUCT"

7 Warning Do not stare into the Laser beam.

8 **Lightning Danger**
   Danger: Do not work on equipment or cables during periods of lightning activity.

9 ⚠ **Operating Temperature:** This product is designed for a maximum ambient temperature of 50 degrees C.

10 **All Countries**: Install product in accordance with local and National Electrical Codes.

Normen: Dieses Produkt erfüllt die Anforderungen der nachfolgenden Sicherheitsnormen.

☞ 1   Hochfrequenzstörung   EN55022 Klasse B

☞ 2   ⚠   **Warnung**: Bei Verwendung zu Hause kann dieses Produkt Funkstörungen hervorrufen. In diesem Fall müßte der Anwender angemessene Gegenmaßnahmen ergreifen.

☞ 3   Störsicherheit   EN55024

Sicherheit

☞ 4   Elektrische Sicherheit   TUV-EN60950, UL1950, CSA 950

☞ 5   Laser   EN60825

☞ 6   ⚠   Das ist ein "LED Produkt der Klasse 1"

☞ 7   **Warnung:** Nicht direkt in den Strahl blicken.

☞ 8   **Gefahr Durch Blitzschlag**
            Gefahr: Keine Arbeiten am Gerät oder an den Kabeln während eines Gewitters ausführen.

☞ 9   ⚠   **Betriebstemperatur:** Dieses Produkt wurde für den Betrieb in einer Umgebungstemperatur von nicht mehr als 50° C entworfen.

☞ 10   **Alle Länder**: Installation muß örtlichen und nationalen elektrischen Vorschriften entsprechen.

Standarder: Dette produkt opfylder følgende sikkerhedsstandarder.

☞ 1   Radiofrekvens forstyrrelsesemission   EN55022 Klasse B

☞ 2   ⚠   **Advarsel**: I et hjemligt miljø kunne dette produkt forårsage radio forstyrrelse. Bliver det tilfældet, påkræves brugeren muligvis at tage tilstrækkelige foranstaltninger.

☞ 3   Immunitet   EN55024

Sikkerhed

☞ 4   Elektrisk sikkerhed   TUV-EN60950, UL1950, CSA 950

☞ 5   Laser   EN60825

☞ 6   ⚠   Dette er et "PRODUKT UNDER KLASSE 1 LED"

☞ 7   **Advarsel:** Stirr ikke på strålen.

☞ 8   **Fare Under Uvejr**
            Fare: UNDLAD at arbejde på udstyr eller KABLER i perioder med LYNAKTIVITET.

☞ 9   ⚠   **Betjeningstemperatur**: Dette apparat er konstrueret til en omgivende temperatur på maksimum 50grader C.

☞ 10   **Alle lande**: Installation af produktet skal ske i overensstemmelse med lokal og national lovgivning for elektriske installationer.

Normen: Dit product voldoet aan de volgende veiligheidsnormen.

☞ 1   RFI Emissie   EN55022 Klasse B

☞ 2   ⚠   **Waarschuwing**: Binnenshuis kan dit product radiostoring veroorzaken, in welk geval de gebruiker verplicht kan worden om gepaste maatregelen te nemen.

☞ 3   Immuniteit   EN55024

Veiligheid

☞ 4   Electrische Veiligheid   TUV-EN60950, UL1950, CSA 950

☞ 5   Laser   EN60825

☞ 6   ⚠   Dit is een "KLASSE 1 LED-PRODUKT"

☞ 7   **Waarchuwing:** Neit in de straal staren.

☞ 8   **Gevaar Voor Blikseminslag**
            Gevaar: NIET aan toestellen of KABELS WERKEN bij BLIKSEM.

☞ 9   ⚠   **Bedrijfstemperatuur**: De omgevingstemperatuur voor dit produkt mag niet meer bedragen dan 50 graden Celsius.

☞ 10   **Alle landen**: het toestel installeren overeenkomstig de lokale en nationale elektrische voorschriften.

Normes: ce produit est conforme aux normes de sécurité suivantes :

☞ 1   Emission d'interférences radioélectriques   EN55022 Classe B

☞ 2   ⚠   **Mise En Garde**: dans un environnement domestique, ce produit peut provoquer des interférences radioélectriques. Auquel cas, l'utilisateur devra prendre les mesures adéquates.

☞ 3   Immunité   EN55024

Sécurité

☞ 4   Sécurité électrique   TUV-EN60950, UL1950, CSA 950

☞ 5   Laser   EN60825

☞ 6   ⚠   Ce matériel est un "PRODUIT À DIODE ÉLECTROLUMINESCENTE DE CLASSE 1"

☞ 7   **Attention:** Ne pas fixer le faisceau des yeux.

☞ 8   **Danger De Foudre**
Danger: Ne pas manier le matériel ou les CÂBLES lors d'activité orageuse.

☞ 9   ⚠   **Température De Fonctionnement**: Ce matériel est capable de tolérer une température ambiante maximum de 50 degrés Celsius.

☞ 10   **Pour Tous Pays**: Installer le matériel conformément aux normes électriques nationales et locales.

Normit: Tämä tuote on seuraavien turvallisuusnormien mukainen.

☞ 1   Radioaaltojen häirintä   EN55022 Luokka B

☞ 2   ⚠   **Varoitus**: Kotiolosuhteissa tämä laite voi aiheuttaa radioaaltojen häiröitä, missä tapauksessa laitteen käyttäjän on mahdollisesti ryhdyttävä tarpeellisiin toimenpiteisiin.

☞ 3   Kestävyys   EN55024

Turvallisuus

☞ 4   Sähköturvallisuus   TUV-EN60950, UL1950, CSA 950

☞ 5   Laser   EN60825

☞ 6   ⚠   Tämä on "ENSIMMÄISEN LUOKAN VALODIODITUOTE"

☞ 7   **Variotus:** Älä katso säteeseen.

☞ 8   **Salamaniskuvaara**
Hengenvaara: Älä työskentele laitteiden tai kaapeleiden kanssa salamoinnin aikanA.

☞ 9   ⚠   **Käyttölämpötila**: Tämä tuote on suunniteltu ympäröivän ilman maksimilämpötilalle 50°C.

☞ 10   **Kaikki Maat**: Asenna tuote paikallisten ja kansallisten sähköturvallisuusmääräysten mukaisesti.

Standard: questo prodotto soddisfa i seguenti standard di sicurezza.

☞ 1   Emissione RFI (interferenza di radiofrequenza)   EN55022 Classe B

☞ 2   ⚠   **Avvertenza**: in ambiente domestico questo prodotto potrebbe causare radio interferenza. In questo caso potrebbe richiedersi all'utente di prendere gli adeguati provvedimenti.

☞ 3   Immunità   EN55024

Norme Di Sicurezza

☞ 4   Sicurezza elettrica   TUV-EN60950, UL1950, CSA 950

☞ 5   Laser   EN60825

☞ 6   ⚠   Questo è un "PRODOTTO CON LED DI CLASSE 1"

☞ 7   **Avertenza:** Non fissare il raggio con gli occhi.

☞ 8   **Pericolo Di Fulmini**
Pericolo: Non lavorare sul dispositivo o sui CAVI durante precipitazioni temporalesche.

☞ 9   ⚠   **Temperatura Di Funzionament**o: Questo prodotto è concepito per una temperatura ambientale massima di 50 gradi centigradi.

☞ 10   **Tutti I Paesi**: installare il prodotto in conformità delle vigenti normative elettriche nazionali.

Sikkerhetskrav: Dette produktet oppfyller følgende sikkerhetskrav:

☞ 1 RFI stråling EN55022 Klasse B

☞ 2 ⚠ **Advarsel**: Hvis dette produktet benyttes til privat bruk, kan produktet forårsake radioforstyrrelse. Hvis dette skjer, må brukeren ta de nødvendige forholdsregler.

☞ 3 Immunitet EN55024

Sikkerhet

☞ 4 Elektrisk sikkerhet TUV-EN60950, UL1950, CSA 950

☞ 5 Laser EN60825

☞ 6 ⚠ Dette er et "KLASSE 1 LED PRODUKT"

☞ 7 **Advarsal**: Stirr ikke på strålen.

☞ 8 **Fare For Lynnedslag**
Fare: Arbeid ikke på utstyr eller kabler i tordenvær.

☞ 9 ⚠ **Driftstemperatur**: Dette produktet er konstruert for bruk i maksimum romtemperatur på 50 grader celsius.

☞ 10 **Alle Land**: Produktet må installeres i samsvar med de lokale og nasjonale elektriske koder.

Padrões: Este produto satisfaz os seguintes padrões de segurança:

☞ 1 Emissão de interferência de radiofrequência EN55022 Classe B

☞ 2 ⚠ **Aviso**: Num ambiente doméstico este produto pode causar interferência na radiorrecepção e, neste caso, pode ser necessário que o utente tome as medidas adequadas.

☞ 3 Imunidade EN55024

Segurança

☞ 4 Segurança Eléctrica TUV-EN60950, UL1950, CSA 950

☞ 5 Laser EN60825

☞ 6 ⚠ Este é um "PRODUTO CLASSE 1 LED"

☞ 7 **Aviso:** Não olhe fixamente para o raio.

☞ 8 **Perigo De Choque Causado Por Raio**
Perigo: Não trabalhe no equipamento ou nos cabos durante períodos suscetíveis a quedas de raio.

☞ 9 ⚠ **Temperatura De Funcionamento**: Este produto foi projetado para uma temperatura ambiente máxima de 50 graus centígrados.

☞ 10 **Todos Os Países**: Instale o produto de acordo com as normas nacionais e locais para instalações elétricas.

Normas: este producto cumple con las siguientes normas de seguridad.

☞ 1 Emisión RFI EN55022 Clase B

☞ 2 ⚠ **Advertencia**: en un entorno doméstico, este producto puede causar radiointerferencias, en cuyo caso, puede requerirse del usuario que tome las medidas que sean convenientes al respecto.

☞ 3 Inmunidad EN55024

Seguridad

☞ 4 Seguridad eléctrica TUV-EN60950, UL1950, CSA 950

☞ 5 Laser EN60825

☞ 6 ⚠ Este es un "PRODUCTO DE DIODO LUMINISCENTE (LED) CLASE 1"

☞ 7 **¡Advertencia!** No mirat fijamente el haz.

☞ 8 **Peligro De Rayos**
Peligro: No realice ningun tipo de trabajo o conexion en los equipos o en los cables durante tormentas electricas.

☞ 9 ⚠ **Temperatura Requerida Para La Operación**: Este producto está diseñado para una temperatura ambiental máxima de 50 grados C.

☞ 10 **Para Todos Los Países**: Monte el producto de acuerdo con los Códigos Eléctricos locales y nacionales.

Normer: Denna produkt uppfyller följande säkerhetsnormer.

&⁓ 1   Radiostörning   EN55022 Klass B

&⁓ 2   ⚠   **Varning**: Denna produkt kan ge upphov till radiostörningar i hemmet, vilket kan tvinga användaren till att vidtaga erforderliga åtgärder.

&⁓ 3   Immunitet   EN55024

         Säkerhet

&⁓ 4   Elsäkerhet   TUV-EN60950, UL1950, CSA 950

&⁓ 5   Laser   EN60825

&⁓ 6   ⚠   Detta är en "KLASS 1 LYSDIODPRODUKT"

&⁓ 7   **Varning!** Laserstrålning när enheten är öppen.

&⁓ 8   **Fara För Blixtnedslag**
         Fara: Arbeta ej på utrustningen eller kablarna vid åskväder.

&⁓ 9   ⚠   **Driftstemperatur**: Denna produkt är konstruerad för rumstemperatur ej överstigande 50 grader Celsius.

&⁓ 10   **Alla Länder**: Installera produkten i enlighet med lokala och statliga bestämmelser för elektrisk utrustning.