Perle 594M

User's Guide

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How To Use This Guide

Read this page if you don't read anything else!

The information in this manual has been presented in the recommended order in which to setup and configure the Perle 594M. More experienced users may wish to refer to chapters out of sequence, depending on their needs and level of expertise.

For those of you that only read manuals as a last resort, the next two pages tell you where to find information when you need it.

Quick Install	Read *Chapter 1: Quick Install*—for those in a rush for a checklist of steps to install, setup, and configure the Perle 594M. Each step is cross-referenced with a page number where you can find detailed descriptions.
Perle 594M Overview	Read *Chapter 2: Introducing the Perle 594M* for an introduction to the Perle 594M, its features, use, and environment.
Preparing the Site	Read *Chapter 3: Site Preperation* for a checklist of items to prepare before installing the 594M. This includes a list of AS/400 configuration parameters.
Installation	Read *Chapter 4: Setting Up and Installing the Perle 594M* for information on installation and setup of the Perle 594M.
594M Utility Program	Read *Chapter 5: Using the 594M Utility Program* for information on the functions and use of the 594M Utility Program.
AS/400 Communications	Read *Chapter 6: Communicating with the AS/400* for information on communication with the AS/400.
Concurrent Host	Read *Chapter 7: Concurrent Host* for information on using the 594M to communicate concurrently with up to four AS/400 systems over a single link.
Problems	Read *Appendix A: Solving Problems* for information on possible error conditions and how to resolve them.
Specifications	Read *Appendix B: Specifications* for specifications on the Perle 594M.
Perle 594M Part Numbers	Read *Appendix C: Identifying Perle 594M Components* for a listing of the part numbers for Perle 594M components.

About this guide

The *Perle 594M User and Reference Guide* provides you with setup, configuration, operational, diagnostic, and reference information for the Perle 594M. More specifically, this manual tells you how to:

- configure the AS/400 to communicate with the Perle 594M
- setup the Perle 594M
- configure the Perle 594M
- connect the communication cable
- establish communication with the AS/400
- isolate and diagnose problems.

For further information about the Perle 594M, please refer to the following in the 594M documentation set:

Perle 594M Getting Started booklet	Provide instructions on how to install the 594M software and to access the on-line documentation.
Perle 594 Reference Guide	Provides reference information that is common to the 594 family of controllers.
Perle 594M Diagnostic Guide	Contains information for diagnosis of error conditions; also includes message code descriptions and System Reference Code (SRC) descriptions.

Conventions used in this guide

Information that you enter by typing on a workstation keyboard, or on the Perle 594M key panel, is shown in **bold Courier** typeface characters.

Buttons that you press on a workstation keyboard, or on the Perle 594M key panel, are shown in **bold** characters.

All titles are shown in italic characters; titles include: *book titles*, *chapter titles,* and *section titles.*

Chapter 1: Quick Install—for those in a rush

This chapter provides a checklist of steps required to install, setup, and configure the Perle 594M. Each step is cross-referenced with a page number where you can find detailed descriptions.

1. Prepare site for Perle 594M.
   a) Plan the placement of 594M Controller (refer to page 11)
   b) Determine your cabling needs for workstations and Host communication (refer to page 12)
   c) Determine the Communication Network requirements, and order equipment and services (refer to page 16)

2. Configure the AS/400.
   a) Define a Network Interface-Frame Relay only (refer to page 19)
   b) Define a Line Description (refer to page 19)
   c) Define the APPC (advanced program-to-program communication) Controller Description (refer to page 19)
   d) Define the RWS (remote workstation) Controller Description (refer to page 19)
   e) Define the Device Descriptions (refer to page 20)
   f) Define the Mode Description (refer to page 20)
   g) Configure TCP/IP services if required (refer to page 20)

3. Setup and Install Perle 594M hardware
   a) Unpack the Perle 594M (refer to page 22).
   b) Set up the Perle 594M.
      i. Connect and plug in the power cord (refer to page 29).
      ii. Power on the Perle 594M (refer to page 30).
      iii. Set date and time (refer to page 43).
   c) Connect the Perle 594M.
      i. Connect workstations (see Connecting workstations on page 31).
      ii. Connect the communication cable (see Connecting the Communication Cable on page 32).

4. Install the 594M PC Utility Program (refer to the *Perle 594M Getting Started* booklet).

5. Download the firmware to the 594M controller (refer to page 44).

6. Configure the Perle 594M (refer to page 43).

7. Establish communication with the AS/400 (refer to page 51).

8. Setup Concurrent Host Attachment (refer to page 59).

Chapter 2: Introducing the Perle 594M

Welcome to the Perle 594M—the Remote Communications Controller that provides powerful solutions for your AS/400 communication needs! The Perle 594M is an advanced workstation and communication remote controller for the IBM AS/400 environment that facilitates connection of display stations, personal computers (PCs), and printers to an AS/400.

Host Attachment methods

- SDLC
- X.21 Switched
- X.21 Leased
- X.25
- SNA Subarea Network
- Ethernet, 10 or 100 Mbps
- Frame Relay
- TCP/IP for Ethernet connections and Frame Relay

Workstation Attachment methods

- Twinaxial
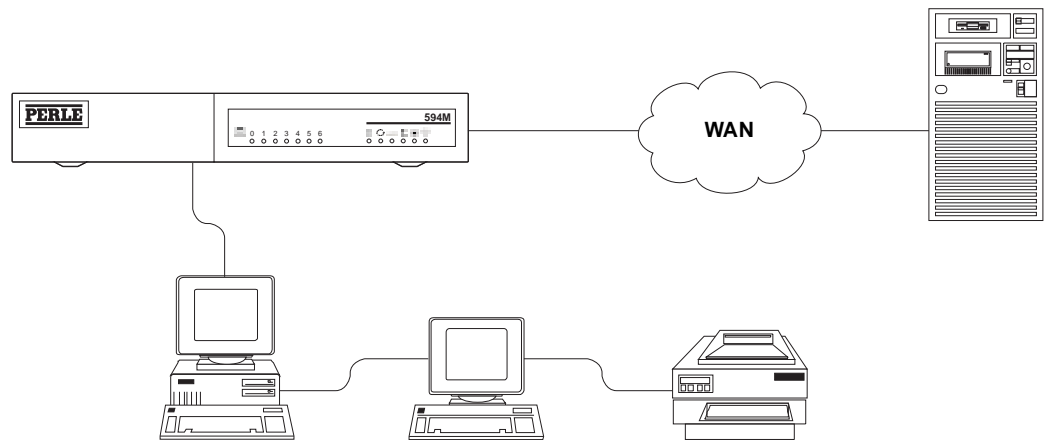
Fig. 1: 594M Controller Attachments

Features of the Perle 594M

Attachment of Remote Workstations

Normally, workstations that are locally attached to the AS/400 must be located near the AS/400. The Perle 594M allows workstations to be located any distance from the AS/400 because it communicates with the AS/400 over a communication network.

Nonprogrammable Workstation Support

Twinaxial displays and devices that emulate Twinaxial displays are called Nonprogrammable Workstations (NWS). With the Perle 594M you can remote attach Twinaxial devices to an AS/400.

Local NWS Editing Control

The Perle 594M handles field editing functions for each NWS.

Programmable Workstation Support

A programmable workstation (PWS) can process information independently of an AS/400 or controller, but can exchange information with these systems. An example of a PWS is a PC running IBM AS/400 PC Support or Client Access/400.

Automatic Configuration

The addition, removal or relocation of a NWS or a PWS is automatically detected by the Perle 594M. On the AS/400, a PWS can be automatically reconfigured, but the device description for a NWS may require modification when a change occurs.

Attachment of Twinaxial Workstations

The Perle 594M's Twinaxial Interface supports up to 7 workstations.A Twinaxial workstation can be an NWS or a PWS. Twinaxial workstations may be attached using twinaxial cabling or twisted pair cabling.

Synchronous Communication Interfaces

The Perle 594M supports the following physical interfaces to synchronous communication equipment:

- EIA 232D (V.24/V.28)
- V.35
- X.21.

Ethernet AS/400 Attachment

The Perle 594M and the AS/400 can be configured to communicate over an Ethernet network. Other devices may share the network with the AS/400 and the Perle 594M.

The Perle 594M supports the Ethernet interface at 10 / 100 Mbps. The physical interfaces supported are:

- 10 BaseT (10 Mbps UTP category 3, 4, or 5 cable)
- 100BaseTX (100 Mbps UTP category 5 cable)

SNA Subarea Network Support

The Perle 594M can access the AS/400 system over an SNA subarea network.

Access to Alternate AS/400 Systems

The Perle 594M can be preconfigured for up to four AS/400 systems. The Perle 594M stores information about all four AS/400 systems so that the operator can end a connection with one AS/400 and easily establish a link with a different AS/400.

Workstation Customization

The Perle 594M supports the AS/400 Workstation Customization feature.

594M Utility Program

The 594M Utility Program is used to enter configuration information, provide network link establishment, extended diagnostics, software download and to access Concurrent Diagnostics.

Standalone PC Configuration

Configuration information can be entered from a PC. The PC runs the 594M Utility Program and the configuration is stored on the PC's hard drive for later download to the a Perle 594M system.

Online PWS Configuration

Configuration information can be entered from a PWS that is attached to the Perle 594M. The PWS may be attached locally through the Twinaxial Interface or Utility Serial Port or remotely through the AS/400 APPN network.

Internal Configuration Storage

Configuration information is saved in non-volatile storage on the Perle 594M whenever configuration is done from an attached PWS.

Using Backup Configuration

The 594 Utility Program can save your configuration as a Backup configuration file. It will be saved in non-volitile storage on the 594M controller. A key-sequence is used on an NWS to select the Backup file.

This enhancement is useful for occasions when your network becomes unavailable and you need to switch to a backup connection. Use an NWS to select the Backup configuration and then restart the 594M. When the original network is restored, select the normal configuration file from the an NWS and restart the 594M. The normal configuration file will now be used.

CD-Based Architecture

Each software upgrade is distributed through new CD releases.

Concurrent Host Attachment

The 594 can be configured to communicate concurrently with up to four AS/400 systems over a single physical link. Concurrent host attachment enables NWSs that do not have the use of AS/400 display station or printer passthrough to communicate with different AS/400 systems in the communication network. Once concurrent host attachment is configured, printer sharing can be enabled or disabled.

European Currency Symbol Support

The 594 EURO symbol support will allow the configuration of new keyboard country codes that contain support for the new European currency symbol.

TCP/IP Host Connection

The Perle 594M supports a TCP/IP host connection that uses full AnyNet functionality to take in SNA traffic and convert it into TCP/IP. At the host, the AS/400 uses AnyNet/400 to convert the TCP/IP back to SNA. This means that any SNA 5250 workstation, printer, or PC client connected to the Perle 594M can communicate with the AS/400 over a TCP/IP enabled network.

A TCP/IP connection can be made over an Ethernet network or Frame Relay network.

Software Download Utilities

Software Download refers to the capability of downloading new controller software to a 594M Controller. The software will replace the existing software in the 594M flash memory. This is accomplished using the 594 Utility program on a PWS that is attached locally or remotely to a controller.

There are two methods of downloading the 594 Controller Software. Interactive mode uses the 594M Utility program menus to select download files and begin download operation. Status and progress will be displayed on screen. Batch mode uses the 594 Utility with the batch mode option. This allows the software to be downloaded to one or more controllers without user attendance. Status is saved in a log file.

Communication Line Types

The Perle 594 supports the following communication protocols:

- **SDLC**

  The following types of lines use the SDLC protocol:
  - SDLC Leased Line
  - SDLC Switched Line
  - X.21 Leased Line
  - X.21 Switched Line
  - SNA Subarea Network

  SDLC protocol is supported over the following physical interfaces:
  - EIA 232D
  - X.21
  - V.35

- **X.25**

  An X.25 line will be one of the following types:

  - Permanent Virtual Circuit (PVC)
  - Switched Virtual Circuit (SVC)

  X.25 protocol is supported over the following physical interfaces:

  - EIA 232D
  - X.21
  - V.35

- **Ethernet, 10 or 100 Mbps**

- **Frame Relay**

  Frame relay protocol is supported over the following physical interfaces:

  - X.21
  - V.35

- **TCP/IP**

  TCP/IP is supported over the following networks:

  - Ethernet
  - Frame Relay

Chapter 3: Site Preparation

Preparing the site for the Perle 594M

Prior to installation, prepare the site for the Perle 594M including the following:

- All workstations, workstation cabling, and communications lines are on hand and have been installed, where applicable.

- Any network facilities, modems, and other equipment that may be required have been installed and are ready for use.

- Locate the controller in an area where:

    - Power cords and cables are out of traffic areas.

    - Front panel LED's are visible

    - Connection to the Utility Serial port is accessible.

- Configure the AS/400

Site Preparation Checklist

The following is a checklist of recommended tasks should be completed before the installation of the Perle 594. Some items on the list may not apply to your installation, and you may wish to add new items.

___ Identify and contact the following individuals:

   ___ Network supplier

   ___ Modem supplier

   ___ Remote installation planner

   ___ Cabling supplier

___ Analyze the site's electrical requirements (see page 10):

___ Analyze the site's environmental requirements (see page 10):

   ___ Temperature and humidity levels

   ___ Electrostatic conditions

   ___ Electromagnetic sources

   ___ Atmospheric contaminants

___ Determine that the future location of the Perle 594M will meet the placement needs of the unit (see page 11).

___ Create a floor plan to show the location of all system components, and the routing of all cables.

___ Determine your cabling needs for:

   ___ Twinaxial workstation cabling (see page 31)

   ___ Ethernet cabling (see page 33)

   ___ Synchronous AS/400 communication cabling (see page 32).

___ Order the required workstations, modems, cabling and other hardware components of your system.

___ Order the communication network facilities.

___ Ensure that the AS/400 communication equipment (Ethernet, or synchronous) is installed.

___ Ensure that electrical outlets have been installed and are properly grounded.

Electrical Requirements

Electrical Specification	Voltage	
Voltage	100 - 125 VAC	200 - 240 VAC
Phases	1	1
Current	4 A (Maximum)	2 A (Maximum)
Power	500 W (Maximum)	500 W (Maximum)

The Perle 594M controller should not share electrical circuits with equipment that can cause electrical noise and interference.

Environmental Requirements

Temperature and Humidity Levels

The Perle 594M controller is designed to operate in a normal office environment. The following conditions must be met and maintained.

Condition	Temperature Range	Relative Humidity
Operating	10 ° - 40° C 50° - 104° F	8% - 80%
Idle	10 ° - 50° C 50° - 125° F	8% - 80%
During Storage	1 ° - 60° C 34° - 140° F	5% - 80%
During Shipment	-40 ° - 60° C -40° - 140° F	5% - 100%

Electrostatic Conditions

Static electricity can cause problems for electronic equipment. To minimize static:

• Avoid high-resistance floor surfaces.

• Use antistatic mats, or install antistatic carpeting.

• Keep humidity levels within the required range.

Electromagnetic Sources

Do not place the Perle 594M in an area of high conducted or radiated electromagnetic interference. This includes areas within 500 meters (1650 feet) of radio frequency sources such as transmitting antennas for AM, FM, TV, two-way radio or radar. This also includes areas within 50 meters (165 feet) of industrial machines such as induction heaters or arc welders, or within 50 meters (165 feet) of high-energy power lines. Also avoid other sources of electromagnetic interference such as transformers, power distribution panels and electrical heating systems.

Atmospheric Contaminants

Do not place the Perle 594M in environments where the atmosphere may be contaminated by liquids, gases or suspended particles. Prolonged exposure to such contaminants can cause failure of the system's hardware components.

Placement

The 594M is designed for either 19" rack mount, wall mount, or table top placement. The rack or wall mount requires an optional Mounting Kit.

Locate the 594M in an area where:

*   Power cord and cables are out of traffic areas.

*   The front panel LEDs is visible.

Cable Planning and Requirements

Twinaxial Workstation Cabling

Twinaxial Cables are used to attach personal computers which are equipped with twinaxial communication cards, twinaxial displays and printers to the 594M.

The 594M comes equipped with either a single twinaxial turret interface or with 7 Twinaxial Telephone Twisted Pair (TTP) interfaces. The cabling used depends on this interface.

Single Turret

Conventional twinaxial cables are used to attach individual workstations directly to the Perle Twinaxial interface port. Some twinaxial devices are equipped with two twinaxial ports, allowing additional twinaxial device to be "daisy-chained" to the first.
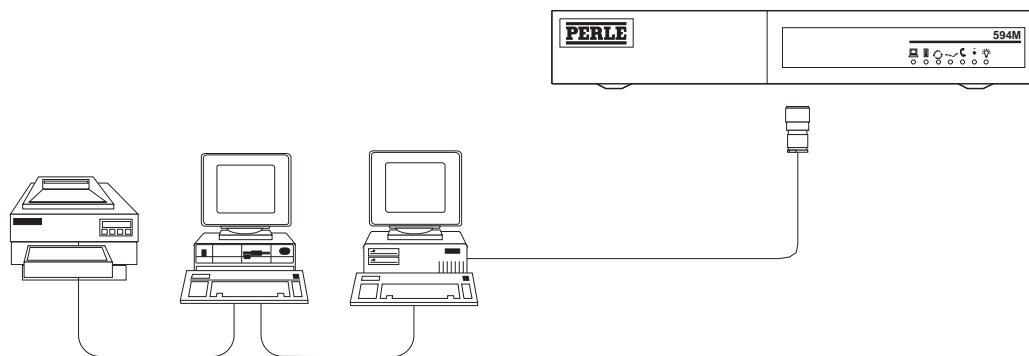
Fig. 2: Twinaxial Work Station Cabling

Up to seven devices can be daisy-chained on the twinaxial port. The total length of the twinaxial cable must be 1025m (5000 ft.) or less. Consult your workstation or cable vendor to ensure that the twinaxial cabling is properly terminated at the last workstation.
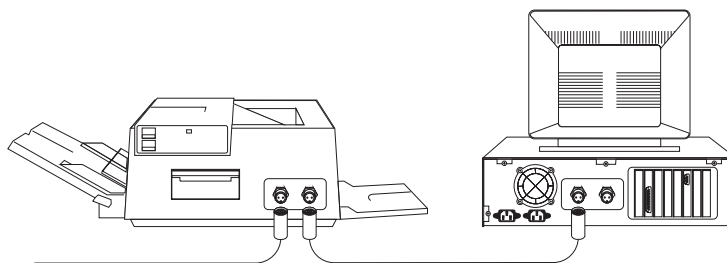
Fig. 3: Daisy-Chained Devices

TTP Interface

Instead of twinaxial cables, you may decide to use Telephone Twisted Pair (TTP) cables. TTP cable is less expensive than twinaxial cable. It is also smaller in diameter and is therefore easier to install. In many buildings, extra TTP cable was included when the telephone wiring was initially installed.

Each workstation will have its own TTP cable connecting to the 594M using RJ-45 connectors. The maximum length of cable between the workstation and the 594M must be 304.8 m (1000 ft.) or less.
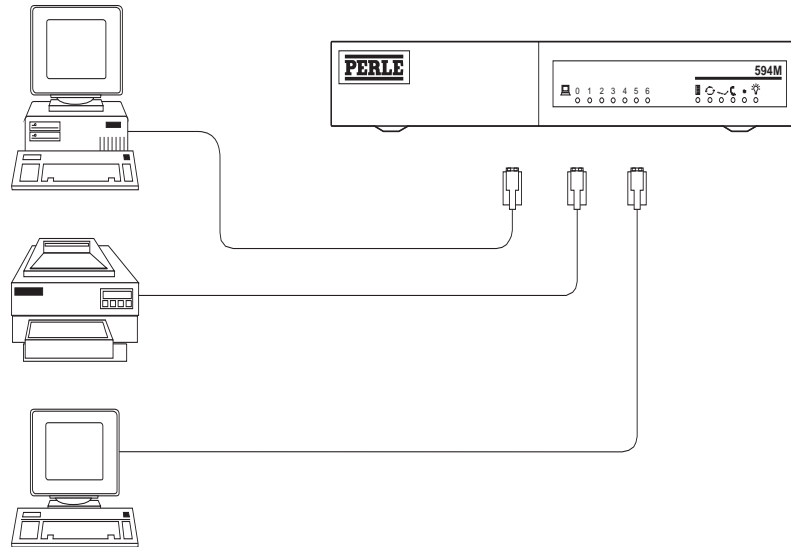
Fig. 4: Twinaxial TTP Cabling

If a workstation is equipped with a twinaxial connector and you wish to connect the workstation to TTP cable, a special adapter called a balun is required. Many types of baluns are available.
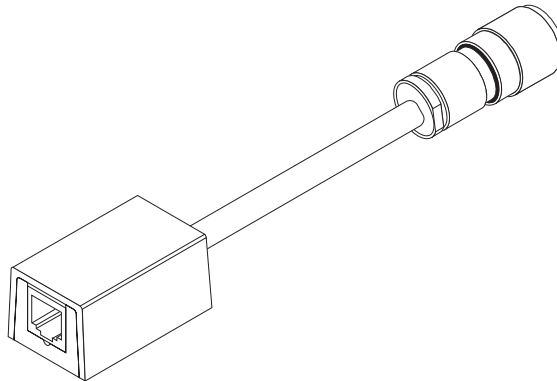
Fig. 5: Balun Example

Once you have decided on the type of cabling you will use, you may begin to plan the details of the installation. It is best to draw up a floor-plan, on which you identify: the location of all workstations; the type of cabling; and the adapters required (if any). The floor plan will assist you in ensuring that the cables are within the allowable lengths.

AS/400 Communication Cabling

AS/400 Communication cabling will be one of the following types:

* **Synchronous Communication Cabling**

  This method is generally used when the Perle 594M and the IBM AS/400 will be located a large distance apart. For example, the systems may be located in different buildings, different cities, or even in different countries.

  With this type of cabling, the Perle 594M is connected to its modem using a Synchronous Communication Cable. A telephone line or a communications network is needed to allow the modem at the Perle 594M to communicate with the modem at the AS/400.

* **Ethernet Cabling**

  This type of cabling is used when the Perle 594M and the AS/400 will communicate over an Ethernet LAN. The two systems can be on the same LAN, but will usually be on different LANs which are attached using bridges. Other devices, such as terminals or printers, may also operate on the same Ethernet LAN.

Synchronous Communication Cabling

The Perle 594M and the AS/400 each require a separate cable to connect to their own modems, as shown in the following diagram
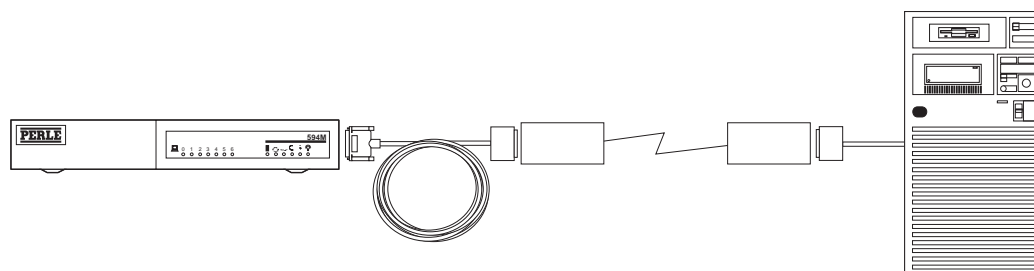
Fig. 6: Synchronous Communication Cabling

The Perle 594M communication cable will be equipped with one of the following physical interfaces:

* EIA 232D

* X.21

* V.35

Both modems are connected to the communications network, as indicated by your network representative. Usually, this will be done using standard telephone jacks and cords.

Ethernet Communication Cabling

The Ethernet models of the 594M are equipped with a 10/100 Mbps Ethernet Lan interface which supports the 10Base T and 100Base-TX physical interface.
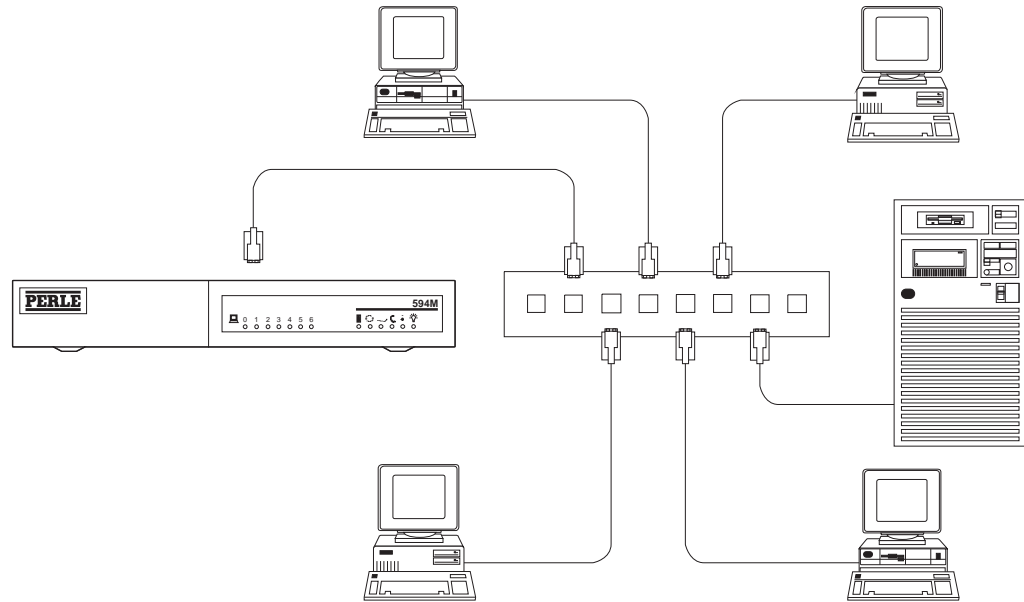
Fig. 7: Ethernet Communication Cabling

 The Perle 594M may be connected to the concentrator hub using the following cable standards:

•	10BaseT Unshielded Twisted Pair cable (category 3,4, and 5)

•	100BaseTX Unshielded Twisted Pair cable (category 5)

Each of these cable types use 8 pin male RJ-45 male connectors.
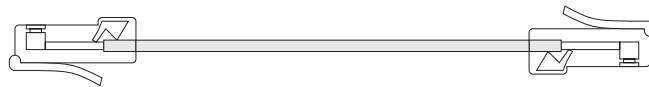
Fig. 8: Ethernet Cable

Planning the Communications Network

Communication Network Transmission Speed

The transmission speed which your network requires will depend of factors such as:

- the number of devices

- the through-put requirements of printers

- the type of applications which will be run on the workstations.

Consult your network representative for assistance in determining the transmission speed you require.

Selecting Network Subscription Options

This section provides basic information about X.21 switched, X.25, and Frame-Relay protocols. It also lists the optional facilities which the Perle 594M supports. This information will be useful in planning the network connection, and in speaking with your network representative.

X.21 Switched Network Support

The basic characteristics of Perle 594M support for X.21 switched networks are:

- 1980, 1984 and 1988 CCITT Recommendation X.21

- Automatic unattended answer

- Operator-controlled address call

- Operator-controller online subscription change

- Short Hold Mode (SHM) for automatically connecting and preserving sessions should the line become inactive, then reconnecting when activity resumes.

X.25 Network Support

The following are the basic characteristics of Perle 594M support for X.25:

- 1980, 1984 and 1988 CCITT Recommendation X.25

- Link level LAP-B

- Data terminal equipment (DTE) role

- Permanent virtual circuit (PVC)

- Switched virtual circuit (SVC)

- Manual (operator-controlled) link establishment

- Modulo 8 or modulo 128 packet sequence numbering

- Packet sizes of 64, 128, 256, 512, or 1024

- Qualified logical link control (QLLC)

- Enhanced logical link control (ELLC)

- No data transfer on logical channel 0

- Transmission of optimal minimum number of packets through automatic adjustment of Request Unit (RU) size for packet size

- Reverse charge acceptance

- Flow control parameter negotiation

- Support for network optional facilities.

Frame-Relay Network Support

The following are the basic characteristics of Perle 594M support for Frame-Relay:

- SNA Direct as described in Request for Comments (RFC) 1490.

- Support for the following link management interface (LMI) options. The first two use DLCI 0 as the virtual circuit for communications with the network:

  - ANSI T1.617 Annex D

  - CCITT Q.933 Annex A

  - No LMI

- A maximum of 64 PVCs (DLCIs) configured on the network link between the Perle 594M and the ALS, as well as a maximum of 64 DLCIs exchanged between the 594M and the frame handler. Only one may be active at a time. Therefore, any additional DLCIs are ignored at the 594M.

TCP/IP

The following are basic characteristics of Perle 594M support for TCP/IP:

- The 594M implements IBM's MPTN (multi-protocol transport network) architecture to transport SNA over TCP/IP

- The AS/400 host must be running OS/400 V3R1 or V3R6 or higher in order to run a TCP/IP configuration with the 594.

- The network between the controller and the host must have proper routing for TCP/IP traffic.

- Physical connections supported are:

  - Ethernet SNAP

  - Ethernet Type II

  - Frame Relay

Ordering Modems

Modems may be required for the following purposes:

- To allow the Perle 594M Controller to communicate with the AS/400.

AS/400 Communication Modems

Your network supplier should provide you with modems, or with information you will require for ordering modems. When ordering a modem, select a transmission speed is greater than the speed your network requires.

The modem you select for the remote site must be compatible with the modem at the AS/400 site (for example, line speed and transmission mode).

When ordering a modem, keep the following in mind:

- The modem must provide the transmit and receive clocking

- A constant Ready-For-Sending (RFS) signal from the modem is not allowed in duplex or half-duplex mode. The modem must be set for Request-To-Send (RTS), and controlled by the Perle 594M

- It is advisable to use a modem with the carrier controlled by RTS (i.e., switched carrier). If the line is point-to-point duplex, the modem can have constant carrier.

- The signal ground should not be connected to the modem's frame ground

- A modem on a switched line must be set as follows:
  - Auto-answer controlled by either Data Terminal Ready (DTR) or Connect Data Set To Line (CDSTL)
  - Pin 22 (calling indicator) must have EIA 232D signal levels
- Contact your network representative to determine whether or not your modem requires an external data coupler.

Configuring the AS/400

Before the Perle 594M operates as a controller you need to configure the following items on the AS/400:

- Network Interface Description (Frame Relay only)
- Line Description(s)
- APPC Controller Description(s)
- RWS Controller Description(s)
- Device Description(s)
- Mode Description(s)
- TCP/IP Interface (TCP/IP or IP Routing only)
- TCP/IP Host Table Entry (TCP/IP only)
- TCP/IP Routes (TCP/IP or IP Routing only)
- APPN Remote Configuration List (TCP/IP only)

Perle recommends you configure the AS/400 prior to setup and configuration of the Perle 594M. You will need to note certain parameters so that they match on both the AS/400 and the Perle 594M. In an APPN network, the host needs information about each network node to which it has a connection; this is done by providing an APPC controller description for each remote controller.

For more information on configuration of the AS/400 refer to Chapter 1: Configuring the AS/400, Chapter 2: Understanding Configuration Parameters in the 594 Reference Guide and your AS/400 documentation.

The following table displays the descriptions to create, and the commands to use, on the AS/400:

Parameter	AS/400 Command	Explanation
Network Interface Description (Frame Relay only)	CRTNWIFR	create a network interface description for Frame Relay
Line Description	CRTLINETH	create line description for Ethernet
	CRTLINSDLC	create line description for SDLC and X.21
	CRTLINX25	create line description for X.25
	CRTLINFR	create line description for Frame Relay
APPC Controller Description	CRTCTLAPPC	create APPC controller description
RWS Controller Description	CRTCTLRWS	create RWS controller description required for NWS devices

Device Descriptions	CRTDEVDSP	create display device description
	CRTDEVPRT	create print device description
Mode Description	CRTMODD	create mode description
TCP/IP Interface	ADDTCPIFC	add a TCP/IP interface
TCP/IP Host Table Entry	ADDTCPHTE	add an entry to the TCP/IP host table
TCP/IP Routes	ADDTCPRTE	add a TCP/IP route
Add APPN Remote Configuration List Entry	ADDCFGLE	add an APPN remote configuration list entry

Note*:   You will need to know the information entered in the descriptions above to configure the Perle 594M.*

Defining a Frame Relay Network Interface

The Frame Relay Network interface description defines the physical attributes of the Frame Relay port. The Frame Relay line descriptions define the logical or virtual connections. Each of these virtual connections is called a permanent virtual circuit (PVC) and is identified by a DLCI number.

In some case, you need not define a Frame Relay network interface description because it might have already been created. To display the current configuration, type: DSPNWIFR

Ensure that the Network Interface Description (NWID) parameter matches the nonswitched NWI (NWI) parameter.

Defining the Line Description

The Line Description defines the communication protocol and related attributes with which the AS/400 communicates to the Perle 594M. This information needs definition in both the AS/400 and the Perle 594M. If you will be attaching the Perle 594M to an existing line, you will not need to create a Line Description. You may view the existing description using the DSPLIND command.

Defining the APPC Controller

The APPC Controller Description defines APPN connections for the Perle 594M controller. On the AS/400 that is the adjacent link station to the Perle 594M, you must define an APPC controller description. This defines the network communication parameters on the AS/400 for the Perle 594M.

The AS/400 defines the APPC controller automatically if:

• The Perle 594M is attached to the host via Ethernet, and

• Autocreation is enabled on the host by setting the system value QAUTOCRTCTL = *YES in the Line Description.

You must define the APPC controller if using another host connection type.

Defining the RWS Controller Description

The RWS Controller Description defines the type of controller and the name of the controller to the AS/400. This description is defined on the host on which users sign on for a session. This may be, but is not necessarily, the adjacent link station to the Perle 594M.

The AS/400 defines the RWS controller automatically if:

• The AS/400 is running OS/400 Version 3.1, or higher, and

- Autocreation is enabled on the host by setting the system value QAUTORMT = 1.

The APPC Controller Description and the RWS Controller Description must be associated with one another on the AS/400. This association takes place automatically when the Remote Control Point Name and the Remote Location Name are the same; when they are not the same, associate them by an entry in the Remote Configuration List.

Defining the Device Description

The Device Description defines the NWS devices for the RWS controller. The AS/400 defines the Device Descriptions automatically if:

- The AS/400 is running OS/400 Version 3.1, or higher, and

- Autocreation is enabled on the host by setting the system value QAUTOCRTDEV = *ALL on the RWS Controller Description.

Defining the Mode Description

The Mode Description defines LU6.2 communication characteristics. An AS/400 predefined mode, named QRMTWSC, is supplied for use with remote controllers. Perle recommends that you use this mode.

Adding a TCP/IP Interface

A TCP/IP interface makes the logical connection between the AS/400 and the TCP/IP protocol stack.

Adding a Host Table Entry

The host table should contain an entry for each network controller that you want to communicate with. Each controller name and IP address must be unique within the network.

Adding a TCP/IP Route

A TCP/IP route entry must be configured if your 594M controller is on a different IP subnet than your AS/400.

Adding an APPN Remote Configuration List Entry

The AS/400 requires a configuration list entry for each 594M TCP/IP controller. The AS/400 uses the information in the remote location list to determine which controller description to use when it activates an NWS session.

Matching Network Attributes

Certain parameters from AS/400 Descriptions need to match parameters in the Perle 594M configuration. Appendix A provides examples of different Perle 594M attachments and shows the relationship between AS/400 parameters and Perle 594M parameters.

You should have the values of the related AS/400 parameters available for the configuration of the Perle 594M.

Chapter 4: Setup and Installing the Perle 594M

Prerequisites

Complete the following before you install the Perle 594M :

• Prepare the site for the Perle 594M as directed in this guide in *Chapter 3: Site Preparation*

• Configure the AS/400 as directed in this guide in *Chapter 3: Site Preparation* .

Installation Overview

Installing the Perle 594M is composed of the following major steps:

1. Unpacking the Perle 594M (refer to page 22).

2. Setting up the Perle 594M (refer to page 27).

3. Connecting the Perle 594M (refer to page 31).

4. Factory Default Mode

Once you install and setup the Perle 594M as described in this chapter, proceed to configuration of the Perle 594M on page 35.

594M Models

The Perle 594M is available in 4 models based on the Twinaxial interface and the host connection interface. The models are:

1 - Single Twinaxial Turret, Synchronous Communication Port.

2 - 7 Twinaxial Telephone Twisted Pair (TTP) connections, Synchronous Communication Port

3 - Single Twinaxial Turrent, Ethernet Host Interface

4 - 7 Twinaxial TTP connections, Ethernet Host Interface.

Unpacking the Perle 594M

Unpacking the Perle 594M is composed of five steps:

1. Open the shipping carton.
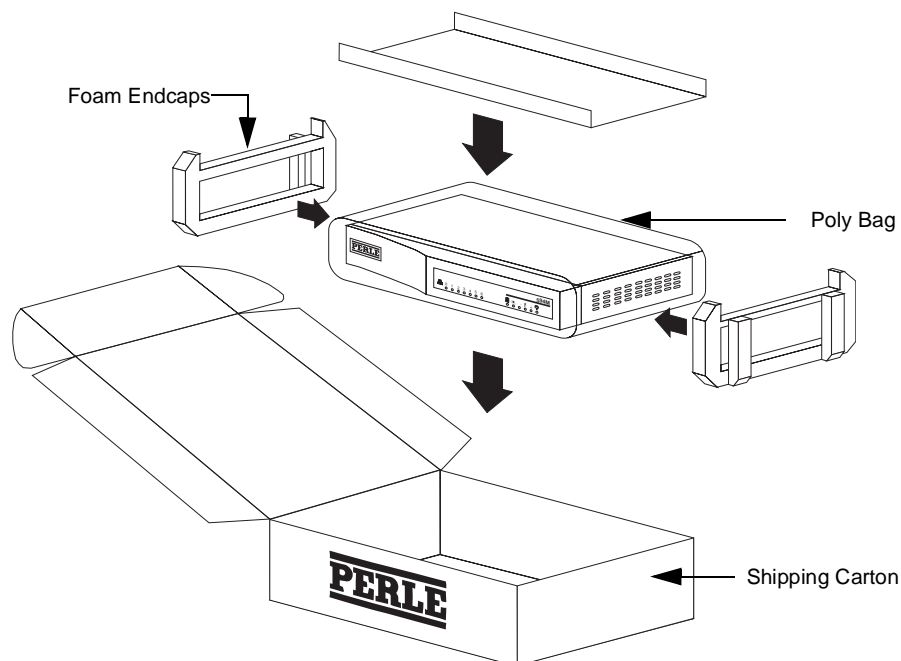
Fig. 9: Opening the Perle 594M shipping carton

2. Remove accessory tray containing cable(s) and power cord(s) from top.

3. Remove documentation packet from side cavity between unit and outer carton.

4. Lift the Perle 594M out of the shipping carton.

5. Remove packing material.

What's in the box?

The Perle 594M shipping carton contains the following:

• Perle 594M Remote Communication Controller

• Cable(s)

• Documentation packet

• CD-ROM

Cables

Part numbers are molded into the power cords and communications cables; refer to *Appendix C: Identifying Perle 594M Components* if you are not sure which power cord or communication cable(s) is appropriate for your site.

The following cables are included in the shipping box:

• power cord

• communications cable (for Synchronous Communication models)

power cord   The appropriate power cord is supplied for your location.
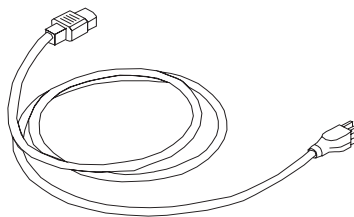
Fig. 10: Power Cord

communications cable   One of the following communcations cables will be supplied with a 594M equipped with a Synchronous Communication interface. Use it to connect the Perle 594M to the communications equipment.

• EIA232 cable (V.24 /V.28), recommended for speeds up to 19,200 bps is identified by the DB 25-pin connector.
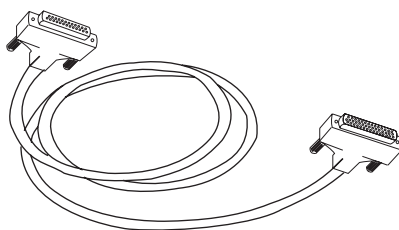
Fig. 11: EIA232 cable

- V.35 cable, recommended for speeds up to 128,000 bps is identified by the box-type connector.
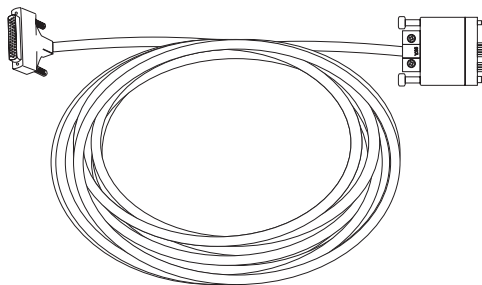
Fig. 12: V.35 cable

- X.21 cable, recommended for high speed communications (up to 128,000 bps), is identified by the DB 15-pin connector.
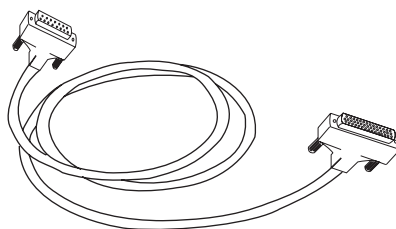
Fig. 13: X.21 cable

Documentation packet

The documentation packet contains the following documents:

- *594M Getting Started Guide*
- Registration Card
- Software License and Warranty Agreement

CD-ROM

594M Base Controller CD ROM contains the following:

- 594M Controller Software
- 594M PC Utility Software
- Online Manuals in PDF and HTML format
  - *594M User's Guide*
  - *594 Reference Guide*
  - *594M Diagnostic Guide*

Perle 594M Views

The diagrams below show the major hardware components of the Perle 594M .
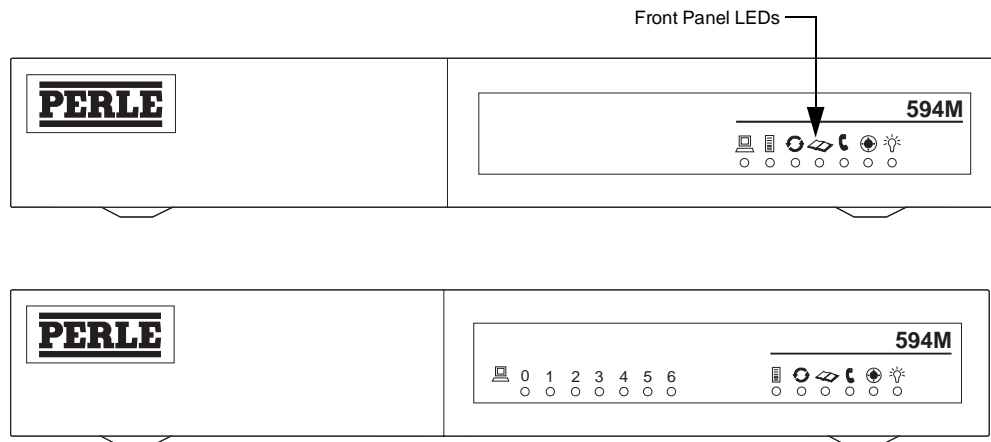
Fig. 14: Perle 594M Front View

The Front View diagram shows the two versions of the 594M front panel. The top model is equipped with a single twinaxial turret interface with the single Twinaxial LED on the front panel. The second model is equipped with 7 twinax TTP interfaces and 7 Twinaxial LEDs on the front panel.
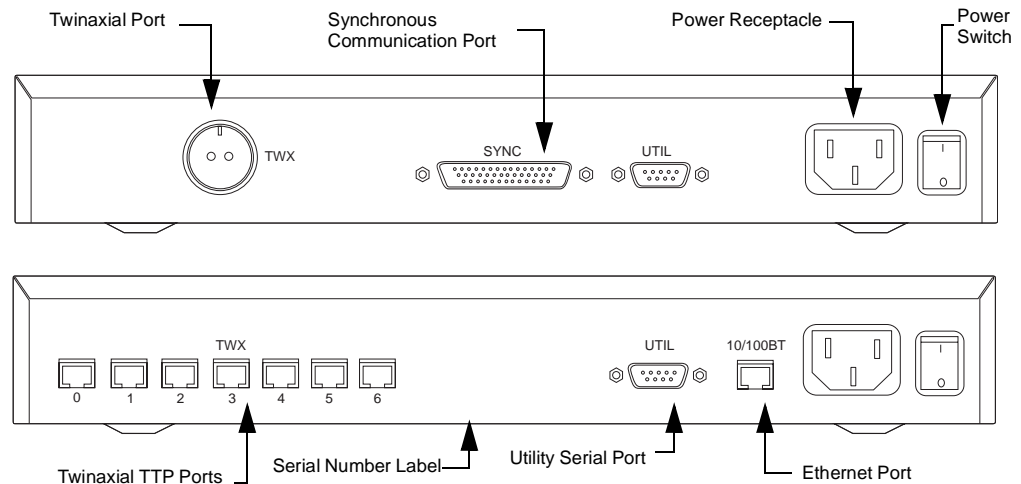
Fig. 15: Perle 594M Rear View

Perle 594M Component Description

Serial Number Label

This label contains such information as the name and model of the unit, the serial number for the unit, power requirement information as well as the various types of approvals registered for the unit. The serial number label can be found on the bottom of the unit.

Operator Panel LEDs

There are 7 operator panel Light Emitting Diodes (LEDs):

	(Power)	This green LED indicates that power is being supplied to the 594M and the power switch is on.
	(Ready)	When lit, this green LED indicates the Perle 594M is ready for operation.
	(Call Perle Service)	When lit, this red LED indicates detection of an error condition that requires you to contact your 594M service representative.
	(SRC)	When lit, this green LED indicates the Perle 594M has detected a problem that requires diagnosis. Refer to *Appendix A: Solving Problems* for problem resolution instructions.
	(Test Mode)	This green LED is lit when the Perle 594M is in power up diagnostics or extended diagnostics.
	(Host)	This green LED inicates activety between the controller and the host computer. It will turn ON when a connection to the host has been made and will blink with traffic activity.
	(Twinax)	This LED or LEDs indicate activity between a twinax terminal and the 594M controller. The LED(s) will be turned on when a twinax terminal is connected and will blink when the terminal is being used. Twinax Turret Model - One green LED Twinax TTP Model - 7 numbered green LEDs.

Power Switch

This switch is used to turn off all power to the unit. When the power is cycled, the unit will restart its power up sequence. The 594M can maintain its program and log information event when no power is applied to the unit.

Synchronous Communication Port (SYNC)

The Synchronous Communication port supports SDLC, X.25, X.21, and Frame Relay host connections.

Ethernet Port (10/100BT)

The Ethernet Port provides a 10/100 Mbps Ethernet interface for host communciation. It supports 10Base-T and 100Base-TX (RJ-45) connections.

Twinaxial Turret Port (TWX)

The Twinaxial Turret port supports conventional twinaxial cable connections to workstations

Twinaxial TTP Ports (TWX n)

The Twinaxial TTP ports each support the connection of a Twinaxial device using Telephone Twisted Pair (TTP) cabling.

Utility Serial Port (UTIL)

The Utility Serial port is an RS-232 DCE communication port. It is used to connect a PC running the Perle 594M Utility program to the 594M controller using a standard RS-232 cable. The 594M Utility program is used to configure and manage the 594M.

Setting up the Perle 594M

Complete the following major steps to set up the Perle 594M :

1. Place the 594M in its planned location

2. Connect and plug in the power cord.

3. Power on the Perle 594M .

Place the 594M

The 594M is designed for either 19" rack mount, wall mount, or table top placement. An optional Mounting kit is required for rack or wall mounting.

Rack Mount

The optional Mounting Kit can be used if you wish to install the 594M in a standard 19" equipment rack. Use the screws included in the Mounting Kit to attach the mounting brackets to the 594M.
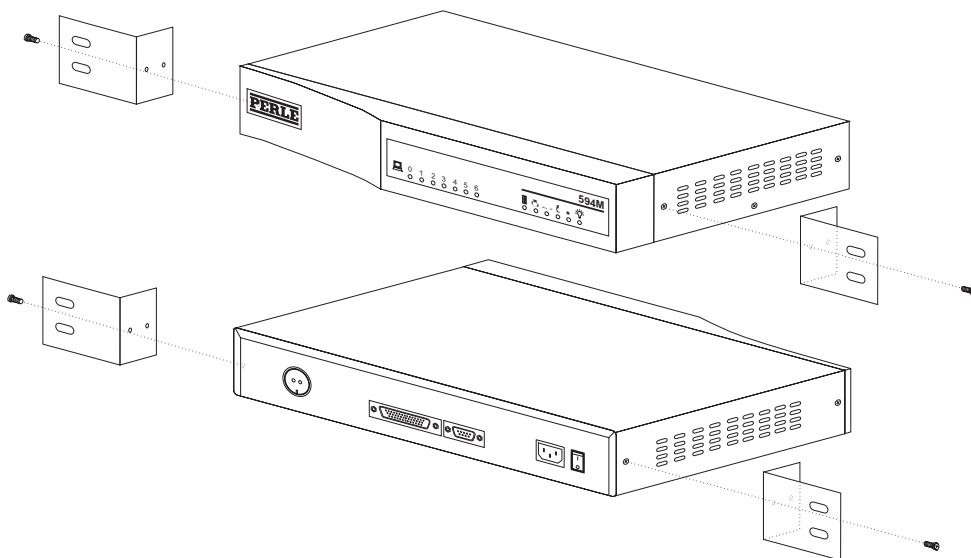
Fig. 16: Rack Mount

You require 4 Rack Mount screws (2 per side) to mount the 594M in the Rack. Do not install the 594M in the Rack with fewer screws. For rack mounting, the 594M requires 1.0 rack mount space (i.e. the 594M height is 1.0U). It is not necessary to leave empty spaces above or below the unit in the rack.

Note*: Sufficient clearances must be maintained at both sides of the unit to allow proper air flow .*

Note*: Mounting of the equipment in the rack shall be such that a hazardous condition does not occur due to uneven mechanical loading. Heavier equipment should be located at the bottom of the rack, and the rack should be loaded such that the bottom slots are used first (fill from the bottom up).*

Circuits supplying power to the rack must be sufficient to safely supply power to all equipment within the rack based on the equipment nameplate rating. Power distribution to all equipment in the rack must have proper grounding. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. power strips).

Wall Mount

The optional Mounting Kit can be used to attach the 594M to a wall. The kit includes mounting brackets, a screw location template, screws to attach the brackets to the wall and screws to attach the 594M to the brackets.
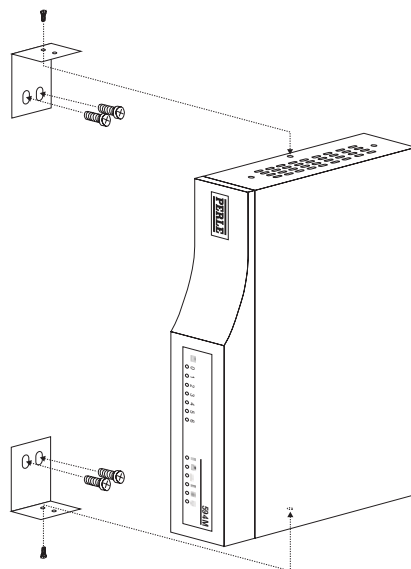
Fig. 17: Wall Mount

1. Use the template to locate and install the wall mounting screws in the required location.

2. Mount the brackets to the wall and tighten the screws.

3. Position the 594M so that the mounting brackets align with the center screw hole on the sides of the 594M cabinet. Fasten with the provided screws.

Connecting the power cord

Using the supplied power cord:

1. Connect the power cord into the power receptacle on the rear of the Perle 594M .

2. Connect the power cord into a properly grounded electrical outlet.

Note*:   The 594M has an auto-sensing voltage power supply which will adjust automatically to 115 V or 230 V.*

Note*:   For safety, this equipment is designed to be electrically grounded. The 594M must be connected to a three wire grounded outlet only. The power cord supplied includes a third (grounding) pin. If you are unable to insert the plug into an outlet, contact an electrician to replace the outlet with a properly grounded outlet.*

Factory Default Mode

A new 594M controller is shipped from the factory without any software or configuration. This state is referred to as **Factory Default** mode. The PC Utiltiy program is used to download the latest software to the 594M and then create a configuration file for the controller.

Once the 594M has software and is fully configured, the unit is in **Normal** mode. The unit can be restored to Factory Default mode from the 594M Utility program (See *Extended Diagnostics* in the *Perle 594M Diagnostics Guide*).

Powering on the Perle 594M

1. Turn on the power switch at the rear of the 594M. All LEDs should come on momentarily. If the Power LED does not come on, check the power cord and the electrical outlet.

2. The 594M will turn off most LEDs, leaving the Power and Test LED on. The system will then perform power-on diagnost tests and system initialization. This should take about 10 seconds.

3. At the end of system initialization, the 594M will set the front panel LEDs to indcate the mode of the controller.

   Factory Default Mode

   The Test LED will remain on and the Ready LED will flash on and off

   No Configuration

   The Test LED will remain on and the Ready LED will be turned on steady. This indicates that the 594M has operating software but has not been configured.

   Normal Mode

   The Test LED is turned off and the Ready LED is turned on.

4. If the LEDs do not indicate one of the modes listed in step 3, then a problem exists. See *Appendix A: Solving Problems* to resolve the problem.

Connecting the Perle 594M

To connect the Perle 594M you need to do the following:

*   connect twinaxial workstations (refer to Connecting Twinaxial workstations on page 31)

*   connect the host communication cable (refer to Connecting the Communication Cable on page 32).

Warning: *Always turn off the power switch before connecting or disconnecting cables.*

Connecting Twinaxial Workstations

1. Set up each Twinaxial workstation according to the vendor's instructions.

2. Ensure that the Perle 594M's power is turned off (i.e., Power LED is off).

3. For a 594M with a Twinaxial Turret port, connect the Twinaxial cable to the port.
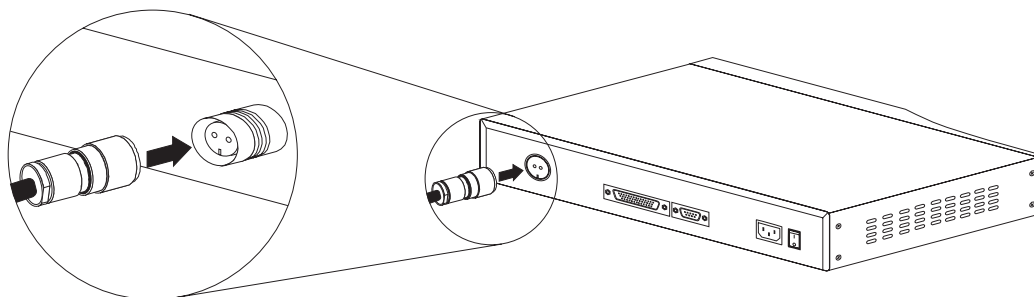
Fig. 18: Twinaxial Port Connection

4. For a 594M with Twinaxial TTP interfaces, connect each workstation to a 594M TTP port using TTP cabling.
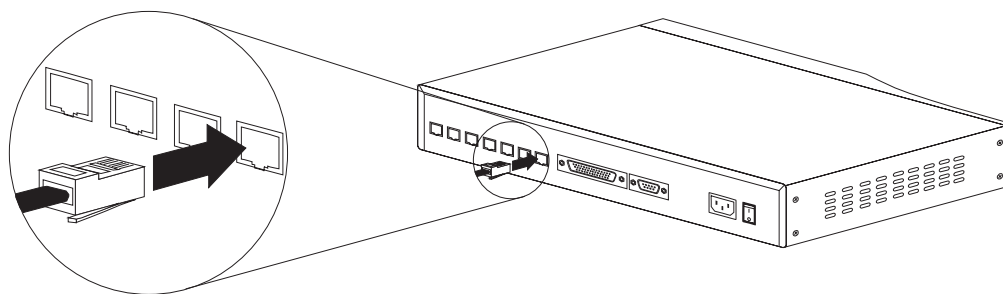
Fig. 19: Twinaxial TTP Connection

Connecting the Host Communication Cable

The 594M will provide either a Synchronous Communication port or Ethernet port for connecting to the Host.

Connecting the Synchronous Communication Cable

1. Ensure that the Perle 594M's power is turned off (i.e., Power LED is off).

2. Connect the appropriate communication cable to the Perle 594M Synchronous Communication Port.
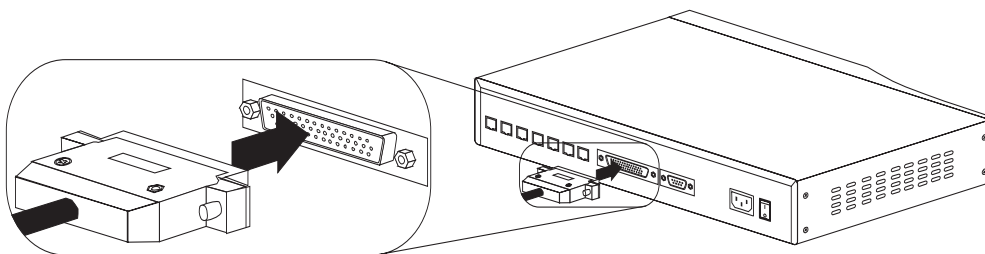
Fig. 20: Synchronous Communication Cable Connection

The communication cable is one of the following, depending on your communication mode:
- EIA232 (V.24/V.28) cable
- V.35 cable
- X.21 cable.

3. Connect the communication cable to the communication equipment.

4. Connect the power cord of the communication equipment to a properly wired, grounded, electrical outlet.

5. The communication cable is now connected to the modem.

6. Power on the 594M.

Connecting the Ethernet Cable

You will need the appropriate cable to attach the 549M to the Ethernet network:

- 10Base-T: UTP, Category 3, 4 or 5

- 100Base-TX: Category 5 UTP or Type 1 STP

For a complete discussion on Ethernet cable requirements, see *Cable Planning and Requirements* on page 12.

To attach the cable:

1. Ensure that the Perle 594M's power is turned off (i.e., Power LED is off).
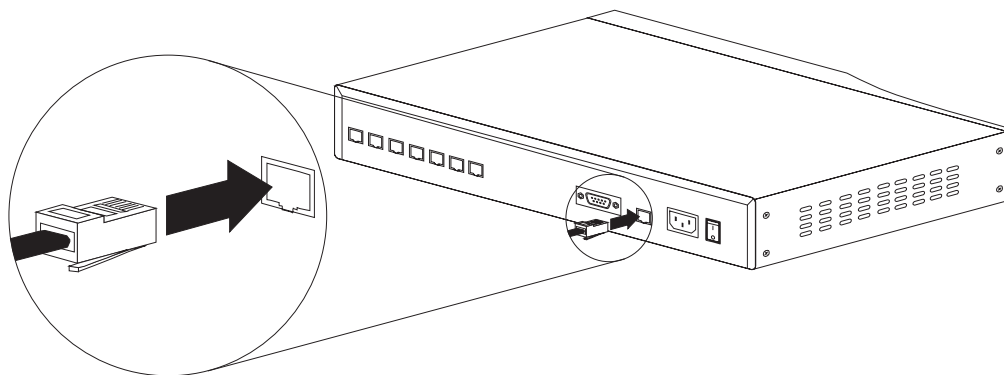
Fig. 21: Ethernet Cable Connection

2. Connect the cable to the 594M as shown.

3. Connect the Ethernet Cable to the proper Ethernet Hub, according to vendor instructions.

4. Power on the 594M.

Chapter 5: Using the 594M Utility Program

Introduction

The 594M Utility Program provides easy-to-use menus that simplify configuration of the Perle 594M. With the 594M Utility Program you can:

- download the 594M software
- configure the Perle 594M
- establish communication between the Perle 594M and an AS/400 system
- request communication and operational status about the Perle 594M (Concurrent Diagnostics feature—for more information refer to the *Perle 594M Diagnostic Guide*).
- perform Extended Diagnostics on the 594M (see *Perle 594M Diagnostics Guide* for details)

In addition, the 594M Utility Program provides the following features:

- A context-sensitive Help system.

  Depending on the current screen and field, the Help system displays topics relating to the parameter(s). Press **F1** to display Help.

- Validation of parameter data.

  The 594M Utility Program ensures that you make valid entries for all required fields. When a required field is blank or contains invalid data, the 594M Utility Program displays an error message and places the cursor in the invalid field. Press **F1** to display Help for the current field and then enter the appropriate data.

Modes of operation

You can use the 594M Utility Program in one of the following modes:

Standalone

When you use the 594M Utility Program in standalone mode, you can create new or modify existing 594M configuration data. Configuration data is saved to a file and later transferred to the non-volatile memory of the Perle 594M. The reasons you may use this method are:

- You wish to create configuration data for distribution.
- Your PC is not connected to the Perle 594M.

On-line

When you use the 594M Utility Program on-line to the Perle 594M, you are working directly on the configuration file contained within the Perle 594M. You communicate with the Perle 594M from a PWS and the configuration file is automatically transferred to the non-volatile memory of the Perle 594M. Use this method if:

- Your PC is connected to the Perle 594M, and you wish to work directly on the configuration file.
- You wish to modify your 594 configuration during normal operation.
- You wish to perform a Network Link Establishment request (only if locally attached to the 594M).
- You wish to access 594M concurrent diagnostic information.
- You wish to reset the 594M controller (594M System Password required).

- You wish to download new system software to the 594M (594M system password required).
- You wish to perform extended diagnostics.

The 594M Utility program can run in on-line mode using the following connection methods:

Local APPC Connection

A PC with a Twinaxial interface card running the 594M Utility program and Client Access/400 for DOS can be attached to the 594M controller to provide a local on-line connection.

Remote APPC Connection

This method allows a PC to be attached remotely to a 594M through an APPN network. A Utility Program performs the same functions on a remotely attached PC as it does on a locally attached PC. In order for the remote Utility Program to work, the 594M must be communicating with the host. For configuration procedures for remote access, see *Configuring the Remote Access Feature (DOS)* on page 37.

Serial Connection

The Serial Connection provides a local connection between a serial port on the Utility PC and the Utility Serial Port on the 594M using a standard RS-232 cable. This connection mode is required to perform initial software download and configuration on a 594M in Factory Default mode. Serial Connection is also the only method that supports the Extended Diagnostic feature.
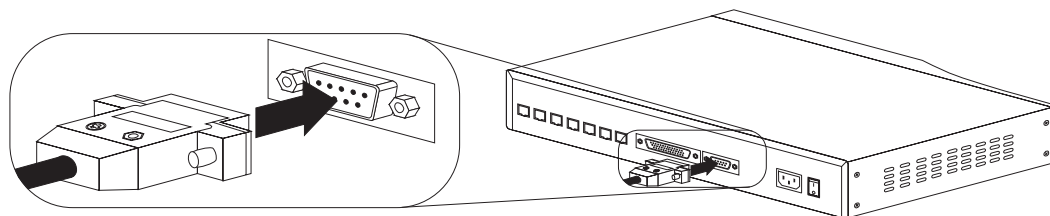
Fig. 22: Utility Serial Port Connection

Prerequisites

Before you begin configuring with the 594M Utility Program, you need the following information from the AS/400:

- Network Interface Description (Frame Relay only)
- Line Description(s)
- APPC Controller Description(s)
- RWS Controller Description(s)
- Device Description(s)
- Mode Name(s)
- TCP/IP Interface (TCP/IP)
- TCP/IP Host Table Entries (TCP/IP only).

For more details on configuration parameters:

- refer to *Chapter 1:Configuring the AS/400* in the *Perle 594 Reference Guide* for configuration examples
- refer to *Chapter 2: Understanding Configuration Parameters* in the *Perle 594 Reference Guide* for detailed descriptions of parameters for the Perle 594M.

Configuring with the 594M Utility Program

Configuring the Perle 594M with the 594M Utility Program is composed of the following major steps:

1. Installing the 594M Utility Program onto the PC. (Refer to *Installing the 594M Utility Program* on page 37)

2. For remote PWSs: Configuring the Remote Access feature.
   a) for a LAN-attached remote PWS, proceed to *Configuring a LAN-Attached Remote PWS* on page 37.
   b) for a Twinaxial-attached remote PWS, proceed to *Configuring a Twinaxial-Attached PWS* on page 38.

3. Starting the 594M Utility Program:
   a) To use the Utility program for an APPC connection on a DOS workstation, proceed to *Starting the 594M Utility Program on a DOS workstation* on page 39.
   b) To use the Utility program for a Serial Connection, proced to *Starting the 594M Utility Program on a Windows workstation* on page 40.

4. Create a configuration file. (refer to *Configuration Overview* on page 43).

5. Saving configuration data (refer to page 47).

Installing the 594M Utility Program

The installation procedure for the Utility program is fully explained in the *Perle 594M Getting Started* booklet.

Configuring the Remote Access Feature (DOS)

If you do not want to configure the remote access feature, proceed to *Starting the 594M Utility Program* on page 39.

The remote access feature for the 594M Utility Program can be used to access one or more 594Ms from a remote PWS. A PWS is considered "remote" only if it communicates to the 594M via an APPN network. To use the DOS remote access feature, the PWS must be running Client Access/400 or PC Support/400 (version 2, release 3), which lets you specify LU names that are fully qualified. For each 594M you want to connect to by remote access, you must create a unique.PCS file and put it in the 594MUP directory.

Configuring a LAN-Attached Remote PWS

To configure a DOS remote PWS with a LAN connection, perform the following steps:

1. Change to the 594MUP sub-directory.

2. Copy the PUP594.PCS file to *new*.PCS, where *new* is the name of the new Client Access configuration file.

3. The content of *new*.PCS is listed below.

```
RTLN APPN.PUP594M
RTYP ITRN
TRLI LOCL594,400059400003,04,PUP594M
```

Using a text editor program, make the following changes:

a) In the first line, change **APPN.PUP594M** to the network name and LU name of your PWS. Use the form: *network_name.LU_name*

b) In the third line:

  •   Replace **LOCL594** with the LU name of the 594M you want to connect with. If the LU name of the 594M must be fully-qualified, use the alias support of Client Access/400.

  •   Replace **400059400003** with the LAN address of the ALS that the PC is using.

  •   Replace **04** with the SAP of the ALS that the PC is using.

  •   Replace **PUP594M** with the LU name of the PWS.

Example:

Suppose a PWS is attached to an AS/400 system through a Token Ring network. The 594M is attached to that AS/400 system via SDLC. The PWS network name is **APPN**; the LU name is **PWS01**. The 594M network name is **ITSCNET**; the LU name is **RCH594M**. The PWS uses Token Ring address **400000000149** and SAP **04** (on the AS/400) to access the AS/400. You could name the.PCS file for this 594M **RCH594M.PCS**. Its contents would be:

```
RTLN APPN.PWS01
RTYP ITRN
TRLI RAL594M=ITSCNET.RCH594M,400000000149,04,PWS01
```

  where: **RAL594M=ITSCNET.RCH594M** defines **RAL594M** as the alias for **ITSCNET.RCH594M**

4. Save all changes.

5. To configure remote access for any additional 594Ms, repeat steps 2 to 4.

6.   Go to *Starting the 594M Utility Program on a DOS workstation* on page 39.

Configuring a Twinaxial-Attached PWS

To configure a DOS remote PWS with a twinaxial connection, perform the following steps:

1. Change to the 594MUP sub-directory.

2. Copy the PUP594.PCS file to *new*.PCS, where *new* is the name of the new Client Access configuration file.

3. The contents of new.PCS is listed below.

```
RTLN APPN.PUP594M
RTYP 5250
EMLI LOCL594,5,PUP594M
```

Using a text editor program, make the following changes:

a) In the first line, change **APPN.PUP594M** to the fully qualified LU name of your PWS. Use the form: *network.LU_name*

b) In the third line:

  •   Replace **LOCL594** with the LU name of the 594M you want to connect with. If the LU name of the 594M must be fully-qualified, use the alias support of Client Access/400.

  •   Replace **5** with the station address of the PWS.

  •   Replace **PUP594M** with the LU name of the PWS.

Example:

Suppose a PWS is attached to an AS/400 system through a twinaxial connection. The 594M is attached to that AS/400 system via Ethernet. The twinax station address of the PWS is **02**. The PWS network name is **APPN**; the LU name is **PWS02**. The network name of the 594M is **NET594M**; the LU name is **LU594M**. You could name the.PCS file **LU594M.PCS**. It contents would be:

```
RTLN APPN.PWS02
RTYP 5250
EMLI RLU594M=NET594M.LU594M,2,PWS02
```

    where: **RLU594M=NET594M.LU594M** defines **RLU594M** as the alias for
            NET594M.LU594M

4. Save all changes.

5. To configure remote access for any additional 594M, repeat steps 2 to 4.

6. Go to *Starting the 594M Utility Program on a DOS workstation* on page 39.

Starting the 594M Utility Program on a DOS workstation

1. Restart the PC in MS-DOS mode.

2. Make sure Client Access/400 for DOS has been installed if you want to run the utility in on-line mode. Client Access must be installed in a directory called **\PCS**

3. Go to the directory in which the 594M Utility Program has been installed.

4. To start the 594M Utility Program in standalone mode, enter:

    594MUP /S

5. To start the 594M Utility Program in online mode:
   a) If the PWS is attached locally to the 594M, enter:

    594MUP

   b) If the PWS is attached remotely to the 594M, enter:

    594MUP new.PCS

   where: *new*.PCS is the file you created in *Configuring the Remote Access Feature*.

   Note: *This automatically starts the router.*

6. The 594M Utility Program startup screen appears.

7. Go to *594M Utility Program Startup Screens* on page 41.

Starting the 594M Utility Program on a Windows workstation

The 594M Utility must be run in a MS-DOS window in Windows 95, 98 or NT 4.0 to use the Serial Connection. The program can also be run stand-alone in the DOS window.

1. To start the 594M Utility Program in standalone mode, select
   `Start|Programs|Perle|594M|594M Utility (Stand-Alone)`.

2. To start the 594M Utility Program in on-line mode,
   `Start|Programs|Perle|594M|594M Utility (On-Line)`.

3. The 594M Utility Program startup screen appears. Press **Enter**

4. If the program is running in Stand-alone mode then the **Configuration and Management** screen will be displayed. Go to *594M Utility Program Startup Screens* on page 41.

5. If the 594M is in Factory Default, then the software download screen will appear. Software must be downloaded to the 594M before the controller can be configured. Follow the instructions on the screen to complete the software download.

6. If the 594M is in Normal Mode, then the Serial Main Screen is displayed. The menu choices are:
   a) **Configuration and Management**. Go to *594M Utility Program Startup Screens* on page 41
   b) **Extended Diagostics**. Refer to the *Perle 594M Diagnostic Guide* for details on how to perform Extended Diagostics

594M Utility Program Startup Screens

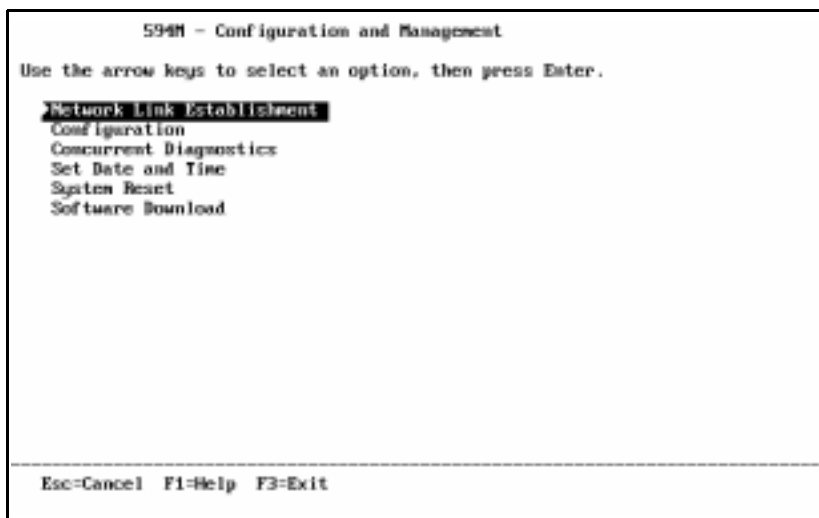This section provides an overview of the Configuration and Management screen with a brief description of each of its functions. For more details on the configuration parameters, please refer to the on-line help for each screen which is accessed using the **F1** key.

When the program is started the following splash screen is displayed. This screen will list the version number of the program.

Fig. 23: 594M Utility Program startup

When **Enter** is pressed the **Configuration and Management** screen is displayed

```
          594M - Configuration and Management

Use the arrow keys to select an option, then press Enter.

        Network Link Establishment
        Configuration
        Concurrent Diagnostics
        Set Date and Time
        System Reset
        Software Download













----------------------------------------------------------------
Esc=Cancel  F1=Help  F3=Exit
```

Fig. 24:   594M - Configuration and Management screen

Navigation

Use the following keys to navigate (move) throughout the 594M Utility Program:

Navigation Key	Description
←↑→↓	Use cursor keys to move from field to field.
Enter	Press Enter to select menu option or to verify data.
F3	Press F3 to exit the program.
F6	Press F6 to verify data and display the next screen.
F7	Press F7 to Page Up the current screen.
F8	Press F8 to Page Down the current screen.
Esc	Press Esc to return to the previous screen without saving data.

Network Link Establishment

The Network Link Establishment option lets you:

• establish a link between the Perle 594M controller and the AS/400

• disconnect a communication link between the Perle 594M and the AS/400

• establish communication with an alternate AS/400.

Configuration Overview

Configuration of the Perle 594M contains the following major steps:

- Configure the AS/400 Connection

- Configure SNA network information

- Configure Keyboard Translation Tables

- Save configuration data.

For detailed descriptions of configuration parameters refer to:

- On-line Help

- refer to *Chapter 1:Configuring the AS/400* in the *Perle 594 Reference Guide* for configuration examples

- refer to *Chapter 2: Understanding Configuration Parameters* in the *Perle 594 Reference Guide* for detailed descriptions of parameters for the Perle 594M.

Concurrent Diagnostics

The 594M Utility Program can provide detailed status and configuration data while the Perle 594M is online. You can request the following:

- Software release level

- Mother board RAM storage size

- 594M Serial number and cable types

- Network and AS/400 Qualified LU and CP names

- Timeout and Retry limits

- Status of Perle 594M connections

- 594M Synchronous Communications and Statistical counters

- AS/400 link status

- AS/400 Logical Unit status

- 594M Dataset signal status

- Status of Twinaxial devices

- LAN error statistics

- System time-stamped error log.

For more information, refer to the *Perle 594M Diagnostic Guide*.

Set Date and Time

Setting the date and time on the 594M controller allows the controller to record an accurate time-stamped error log.

System Reset

You can reset the 594M and cause it to restart in Normal mode. If you reset the 594M, you will have to restart the Utility Program on the PC. This option requires a recognized 594M System Password.

Software Download Utilities

Software Download refers to the capability of downloading new controller software to a 594M Controller. The software will replace the existing software in the 594M flash memory. This is accomplished using the 594 Utility program on a PWS that is attached locally or remotely to a controller. There are two methods:

- Interactive Mode - Use the 594M Utility program menus to select download directories and begin download operation. Status and progress will be displayed on screen.

- Batch mode - Use the 594M Utility with the batch mode option. This allows for software download operations to one or several 594M Controllers without user attendance. Status is saved in a log file.

Note: *The download operation will reset the 594M System. Before beginning the download operation, it is recommended that the user terminate all sessions on the 594M and vary off the RWS Controller on the AS/400 System. Do NOT vary off the APPC Controller on the AS/400.*

Batch download

A special batch facility has been developed to let you download the 594 Controller Software to many 594M controllers. Batch download, which relieves the operator of many repetitive and tedious tasks, is usually done after normal working hours. You can also use the batch facility for retrieving version levels of controller software currently running on 594M controllers.

Note: *The Batch mode will only run when the 594M Utility is running in Interactive mode with the Client Access/400 software.*

The batch download command has the following format:

```
594MUP base.PCS /d=directory /l=luname /p=password
```

where

base.PCS - is the name of a.PCS file that will be used as a base for connection parameters to the 594M Controller. This must be the first option on the command line. See the section *Configuring the Remote Access Feature (DOS)* for instructions on creating the file. Do not replace the **LOCL594 LU** name. This will be done automatically by the batch utility.

directory - is the full path name of the directory containing the 594 Controller Software to download

luname - is the LU name of a controller in the 594M. If the LU name of the 594M controller must be fully qualified, use the alias support of Client Access/400.

password - is the configured password

The batch download command can be invoked from the DOS prompt for download to a single controller. As well, several commands can be placed in a DOS batch file. When the DOS batch file is run, then downloads to several 594M Controllers will be performed.

The following is an example of a batch file which will download V02.00 of the 594 Controller Software to five controllers.

```
download.bat
    call 594Mup local.pcs /d=c:\594Mup\download /l=LOCL594 /p=perle
    call 594Mup remote.pcs /d=c:\www /l=RAL594M1=ITSCNET.CNTR001 /p=perle
    call 594Mup remote.pcs /d=c:\www /l=RAL594M2=ITSCNET.CNTR002 /p=perle
    call 594Mup remote.pcs /d=c:\www /l=RAL594M3=ITSCNET.CNTR003 /p=perle
    call 594Mup remote.pcs /d=c:\www /l=RAL594M4=ITSCNET.CNTR004 /p=perle
```

The batch download command will log the status of each download into a file called logfile.txt. An entry of the log file will have the following format:

```
YY/MM/DD hh:mm - luname
    Downloaded= Vxx.xx, Previous = Vyy.yy
    Directory:
    Status:
```

where

YY/MM/DD - is the date on which the 594 Controller File was downloaded. The date has the format:

year/month/day

hh:mm - is the time at which the 594 Controller Software file was downloaded. The time will use the 24 hour clock format.

luname - is the LU name of the 594M Controller specified in the batch download command.

Vxx.xx - is the version of the 594 Controller Software in the download file.

Vyy.yy - is the version of the 594 Controller Software in the Controller before download.

Directory: is the full path name of the directory containing the 594 Controller Software files that were downloaded

Status: is a status message for the download operation. See section 594M Utility Program Run Time Messages in Appendix C for a description of these message.

Following is an example of a log file produced by the DOS batch file shown above:

```
logfile.txt

    96/11/13 10:10 - LOCL594
        Downloaded = V02.00, Previous = V01.00
        Directory:    C:\594eup\download
        Status:   Download successful

    96/11/13 10:15 - RAL594M1=ITSCNET.CNTRL001
        Downloaded = V02.00, Previous = V01.00
        Directory:    C:\WWW
        Status:   Download successful

    96/11/13 10:20 - RAL594M2=ITSCNET.CNTRL002
        Downloaded = V02.00, Previous = V01.10
        Directory:    C:\WWW
        Status:   File Writing Error
```

```
96/11/13 10:25 - RAL594M3=ITSCNET.CNTRL003
   Downloaded = V03.00, Previous = V02.00
   Directory:    C:\WWW
   Status:   594 Controller Software successfully transferred to 594

96/11/13 10:30 - RAL594M4=ITSCNET.CNTRL004
   Downloaded = V03.00, Previous = V02.00
   Directory:    C:\WWW
   Status:   Download successful
```

The command for retrieving version levels has the following format:

```
594MUP base.PCS /v /l=luname
```

where

base.PCS - is the name of a.PCS file that will be used as a base for connection parameter to the 594M Controller. This must be the first option on the command line.   See the section *Configuring the Remote Access Feature (DOS)* for instructions on creating the file. Do not replace the **LOCL594** LU name. This will be done automatically by the batch utility.

/v - indicates that the version level is being requested

luname - is the LU name of a controller in the 594M. If the LU name of the 594M controller must be fully qualified, use the alias support of Client Access/400

The following is an example of a batch file for retrieving the version levels of five controllers. The content of the log file is also shown.

```
getver.bat
   call 594Mup /v /l=LOCL594
   call 594Mup /v /l=RAL594M1=ITSCNET.CNTRL001
   call 594Mup /v /l=RAL594M2=ITSCNET.CNTRL002
   call 594Mup /v /l=RAL594M3=ITSCNET.CNTRL003
   call 594Mup /v /l=RAL594M4=ITSCNET.CNTRL004

logfile.txt
   96/11/13 10:10 - LOCL594 Version = V01.00
   96/11/13 10:15 - RAL594M1=ITSCNET.CNTRL001 Version = V01.00
   96/11/13 10:20 - RAL594M2=ITSCNET.CNTRL002 Version = V01.10
   96/11/13 10:25 - RAL594M3=ITSCNET.CNTRL003 Version = V02.00
   96/11/13 10:30 - RAL594M4=ITSCNET.CNTRL004 Version = V02.00
```

Saving Configuration

The configuration file created by the 594M Utilty will be saved as follows, depending on the mode in which the Utility was started.

Stand-alone:

- The configuration data is saved in the specified path and file name on the Utility PC.

On-Line

- The 594M Utility Program automatically saves the configuration file to the non-volatile storage of the Perle 594M. In addition, the 594M Utility Program also saves the configuration file to the specified path and file name on the Utility PC.

- The file can be saved on the 594M controller as a normal or backup file. To save the configuration data as a Backup file, select **Backup Configuration** in the **Save Configuration** menu. See *Using a Backup Configuration* on page 48 for details on how to use the Backup Configuration file.

Using Backup Configuration

The 594 Utility Program can save your configuration as a Backup configuration file. It will be saved in non-volatile storage on the 594M controller. A key-sequence is used on an NWS to select the Backup Configuration file.

This enhancement is useful for occasions when your network becomes unavailable and you need to switch to a backup connection. Use an NWS to select the Backup Configuration file and then restart the 594M. When the original network is restored, select the normal configuration file from the an NWS and restart the 594M. The normal configuration file will now be used.

Select Backup Configuration File

The Backup Configuration File is selected by starting a limited Concurrent Diagnostic session on an NWS. For further details on Concurrent Diagnostics see the Perle *594M Diagnostic Guide*. Select the backup file by doing the following:

1. Vary off any current AS/400 communications session on the display you wish to use.

2. Enter the Test Request key sequence that is appropriate to the keyboard you are using:

Keyboard	Test Request key sequence
83-key	CMD Backspace
102/103-key	ALT Test
122-key	ALT Test

3. Type **C**.
   Diagnostic display screen **PW** appears.

4. Key in the 594M System Password specified during configuration and press **Enter**.
   Diagnostic display screen **CL** appears. The cursor appears at the letter **L**.

5. Use the **Up** or **Down** arrow keys until **CR** is displayed. The Configuration File selection screen is displayed.

6. Use the **Right** arrow key to move the cursor to the **BB** field.

7. Use the **Up** or **Down** arrow keys to change field **BB** to 1.

8. Press the **Enter** key. This will reset the 594M and the controller will now use the Backup Configuration file to communicate with your Host.

Select Normal Configuration File

To return to the Normal Configuration File:

1. Repeat steps 1 through 5 of the *Select Backup Configuration File*

2. Use the **Up** or **Down** arrow keys to change field **BB** to 0.

3. Press the **Enter** key. This will reset the 594M and the controller will now use the Normal Configuration file.

Exit Concurrent Diagnostics.

To return the NWS to normal operation without resetting the 594M controller:

1. Press the **Reset** or **Error Reset** key two times.

2. Power off the workstation.

3. Wait 30 seconds, and then power on the workstation. If the 594M is on-line, an AS/400 signon screen appears within a few seconds.

Note*:*   *It may also be necessary to vary on the workstation device at the AS/400 system*

Chapter 6: Communicating with the AS/400

Communication Checklist

Ensure that the following tasks have been completed before attempting to establish communications between the Perle 594M and the AS/400 system:

- Configuration of the following items on the AS/400 system:
    - Network Interface Descriptions (Frame Relay only)
    - The Line Description
    - The APPC Controller Description
    - The RWS Controller Description
    - The NWS Device Descriptions
    - TCP/IP Interfaces (TCP/IP only)
    - TCP/IP Host Table Entries (TCP/IP only)
    - TCP/IP Routes (TCP/IP only)
    - APPN Remote Configuration List (TCP/IP only)
- Download of Controller Software to 594M.
- Configuration of the Perle 594M.
- Start TCP/IP on AS/400 if configured.
- A vary-on by the AS/400 system operator of:
    - Network Interface (Frame Relay only)
    - the Line
    - the APPC Controller
    - the RWS Controller.

Placing the Perle 594M in Operating Mode

1. Press the power switch. All LEDs should come on momentarily. If the LEDs do not come on, check the power cord and the electrical outlet.

2. The Ready LED should come on and the Test LED should turn off within 30 seconds. If the Ready LED does not come on within this time, refer to *Appendix A: Solving Problems*.

3. Proceed to *Establishing Communication*.

Establishing Communication

Use the following chart to locate the procedure for establishing communication between a controller and an AS/400 system. If your Perle 594M emulates more than one controller, you may need to repeat the procedure for each emulated controller.

Communication Method		Procedure
SDLC	Leased	None.
	Switched, Auto Answer	None.
	Switched, Manual Answer	Manual Calls (page).
	Switched, Manual Dial	Manual Calls (page).
	Switched/V.25 bis	Auto Dial from an NWS (page).
X.21	Leased	None.
	Switched, answer call	None.
	Switched, initiate call	PWS Communication Establishment (page) or Auto Dial from an NWS (page).
X.25	PVC, automatic connect	None.
	PVC, manual connect	PWS Communication Establishment (page) or PVC Open Command from an NWS (page).
	SVC, answer only	None.
	SVC, initiate call	PWS Communication Establishment (page) or SVC Call Command from an NWS (page).
Ethernet		None.
Frame Relay		None.
TCP/IP		None

When the above table indicates that the procedure is None, there are no special procedures required to establish communication. Once the Perle 594M is in operating mode and the AS/400 system operator activates the line, the APPC controller, and the remote workstation controller, a sign-on screen should appear on all active workstations.

Note*: If you do not get a sign-on screen after a few minutes, repeat the procedure described in Placing the Perle 594M in Operating Mode on 51, followed by the Establishing Communication procedure. If the problem continues, refer to Appendix A: Solving Problems.*

PWS Communication Establishment

Chapter 5 contains instructions for installing and starting the 594M Utility Program on a PC. Under the 594M Utility Program main menu, select Network Link Establishment and press Enter. The proper network establishment menu is displayed for the type of communication you are using. Select the proper options for the type of communications you wish to establish.

Manual Calls

1. Complete any steps required to establish a modem connection (see your modem documentation).

2. After the connection is completed, a sign-on screen should appear on all active workstations.

   Note*: If you do not get a sign-on screen after a few minutes, repeat the procedure described in Placing the Perle 594M in Operating Mode on page 51. If the problem continues, refer to Appendix A: Solving Problems.*

Auto dial from an NWS

The following procedure must be performed at an NWS which is attached to the controller for which you are attempting to establish communication.

1. Press the **System Request** key.

2. Type a comma (,) and the letter **C**.

   For example, to initiate a call with AS/400 system 1, enter:

       H1,C

3. Press **Enter** to establish communication.

   Note*: If you do not get a sign-on screen after a few minutes, repeat the procedure described in Placing the Perle 594M in Operating Mode on page 51. If the problem continues, refer to Appendix A: Solving Problems.*

PVC Open Command from an NWS

The following procedure must be performed at an NWS which is attached to the controller for which you are attempting to establish communication.

1. Press the **System Request** key.

2. Type an open command on the system request line using the following syntax:

       Hx,O,Lxxx

   where:

x	is the selected host (1—4)
xxx	is a 3-character hexadecimal code to identify the logical channel ID to be used. It is comprised of the logical group number and the logical channel number. This value can range from 001 to FFF.

   Note*: If you do not provide a logical channel ID, the controller defaults to the last value provided on an open command. If this is the first open command issued after a power-on or after a detach command, the controller defaults to the logical channel provided in the configuration procedure.*

3. Press **Enter** to establish communications.

   Note*: If you do not get a sign-on screen after a few minutes, repeat the procedure described in Placing the Perle 594M in Operating Mode on page 51. If the problem continues, refer to Appendix A: Solving Problems.*

SVC Call Command from an NWS

The following procedure must be performed at an NWS which is attached to the controller for which you are attempting to establish communication.

1. Press the **System Request** key.

    To issue an outgoing call to the host, proceed to step 2. To answer an incoming call from the host, go to step 3.

2. To issue an outgoing call to the host, type a call command on the system request line using the following syntax:

    Hx,C,Naaa,Xppp

    where:

x	is the selected host (1—4)
aaa	is the host address (1 to 15 numeric characters)
ppp	is the connection password (1 to 8 alphanumeric characters).

    Note: *If you do not provide a host address or a connection password, the controller will default to the last value provided for the same command. If this is the first command issued after a power-on or after a detach command, the controller will default to values provided in the configuration procedure.*

    Press **Enter**. A sign-on screen should appear on all active workstations.

3. To answer an incoming call from the host, type an answer command on the system request line using the following syntax:

    Hx,A,Naaa,Xppp

    where:

x	is the selected host (1—4)
aaa	is the host address (1 to 15 numeric characters)
ppp	is the connection password (1 to 8 alphanumeric characters).

    Note: *If you do not provide a host address or a connection password, the controller will default to the last value provided for the same command. If this is the first command issued after a power-on or after a detach command, the controller will default to values provided in the configuration procedure.*

Ending Communication

Communication between an emulated controller and an AS/400 system can be ended using this procedure. This is usually done to clear an error condition, or to access an alternate AS/400 system.

To stop communication between a controller and an AS/400 system, use the following procedure.

1. End all sessions between workstations and the AS/400 system.

2. Have the AS/400 system operator vary off the controller.

3. To disconnect using a PWS, proceed to *Disconnecting Communication from a PWS*.
   To disconnect using an NWS, go to *Disconnecting Communication from an NWS*.

Disconnecting Communication from a PWS

Chapter 5 contains instructions for installing and starting the 594M Utility Program on a PC. Under the 594M Utility Program main menu, select **Network Link Establishment** and press **Enter**. The proper network establishment menu is displayed for the type of communication you are using. Select the proper options to disconnect communications.

Disconnecting Communication from an NWS

1. Go to one of the attached display stations and press the **System Request** key.

2. The host identifier (H1—H4) is displayed on the screen.

3. Type a comma (,) and the letter **D**.

   For example, to disconnect from AS/400 system 1, enter:

   ```
   H1,D
   ```

4. Press **Enter** to disconnect communication.

Re-establishing Communication

If the logical link has been lost due to an AS/400 action, but the physical link is still active, you may re-establish communication with the following procedures:

- To re-establish communication using a PWS, proceed to *Re-establishing Communication from a PWS*.

- To re-establish communication using an NWS, go to *Re-establishing Communication from an NWS*.

- To re-establish a lost physical link, go to Establishing Communication on page 52.

Re-establishing Communication from a PWS

Chapter 5 contains instructions for installing and starting the 594M Utility Program on a PC. Under the 594M Utility Program main menu, select Network Link Establishment and press Enter. The proper network establishment menu is displayed for the type of communication you are using. Select the proper options to re-establish communications.

Re-establishing Communication from an NWS

1. Go to one of the attached display stations and press the **System Request** key.

2. The host identifier (H1—H4) is displayed on the screen.

3. Press **Enter** to establish communication.

   Note: *If you do not get a sign-on screen after a few minutes, repeat the procedure described in Placing the Perle 594M in Operating Mode on page 51. If the problem continues, refer to Appendix A: Solving Problems.*

Changing Your AS/400 System Attachment

1. End all sessions between workstations and the AS/400 system.

2. Have the AS/400 system operator vary off the current controller.

3. If an error has occurred, or if you are using Ethernet AS/400 Attachment, you must end communication with the AS/400 system using the procedure on page 54. Once this procedure is complete, continue with step 4.

4. Ensure that the AS/400 system operator has varied on the:

   • line

   • APPC controller

   • RWS controller.

5. Use the following chart to locate the procedure for establishing communication with a new AS/400 system.

Communication Method		Procedure
SDLC	Switched/V.25 bis	Auto Dial from an NWS (page 53).
	Other	Changing Your AS/400 System from an NWS (page 57).
X.21	Leased	Changing Your AS/400 System from an NWS (page 57).
	Switched, answer call	Changing Your AS/400 System from an NWS (page 57).
	Switched, initiate call	PWS Communication Establishment (page52) or Auto Dial from an NWS (page 53).
X.25	PVC, automatic connect	Changing Your AS/400 System from an NWS (page 57).
	PVC, manual connect	PWS Communication Establishment (page 52) or PVC Open Command from an NWS (page 53).
	SVC, answer only	Not applicable.
	SVC, initiate call	PWS Communication Establishment (page 52) or SVC Call Command from an NWS (page 54).
Ethernet		Changing Your AS/400 System from an NWS (page 57).
Frame Relay		Changing Your AS/400 System from an NWS (page 57).
TCP/IP		Changing Your AS/400 System from an NWS (page 57).

Changing Your AS/400 System from an NWS

Go to one of the attached display stations and press the **System Request** key.

1. Ensure that the proper host identifier (H1—H4) is displayed on the screen. If not, enter the host identifier you desire.

2. Press **Enter** to change the AS/400 system.

    Use the following chart to locate the procedure for establishing communication between a controller and the new AS/400 system.

Communication Method		Procedure
SDLC	Leased	None.
	Switched, Auto Answer	None.
	Switched, Manual Answer	Manual Calls (page 53).
	Switched,Manual Dial	Manual Calls (page 53).
X.21	Leased	None.
	Switched, answer call	None.
X.25	PVC, automatic connect	None.
Ethernet		None.
Frame Relay		None.
TCP/IP		None

Registering Online Facilities (X.21 Switched)

PWS

1. Start the 594M Utility Program. See page 39.

2. Select **Network Link Establishment** and press **Enter**.

3. Select **Change Subscription Parameters**. Type in the facility code and parameters.

4. Press F6. When the subscription request completes, check the SRC. See the *Perle 594 Reference Guide* for a list of all SRCs.

NWS

1. Ask the AS/400 system operator to vary off the 594M.

2. Key in the **System Request** key sequence.

3. Key in a comma (,) and the letter **S**, followed by the X.21 switched facility code and parameters in the exact way your network expects them. Obtain these parameters from your network supplier.

   For example, to activate the redirection of call facility, enter:

   ```
   H1,S63/1-+
   ```

4. Press **Enter**.

   The network displays an acknowledgment of the request in the form of an SRC. See the *Perle 594 Reference Guide* for a list of all SRCs.

Chapter 7: Concurrent Host

Introduction

The Perle 594M controller can be configured to allow its nonprogrammable workstations (NWS) to communicate concurrently with up to four AS/400 hosts over a single physical link. This capability is referred to as Concurrent Host. Nonprogrammable workstation (NWS) displays and printers that do not have the use of AS/400 display station or printer passthrough can now communicate with other AS/400s in the communication network. To reach multiple AS/400 systems in the network, concurrent host attachment uses the SNA session-level routing capabilities of an APPN network or an SNA subarea network.

AS/400 System Requirements

Once the configured AS/400 systems are interconnected with an appropriate communication network, whether it be an APPN network or an SNA subarea network, the 594M can provide concurrent host attachment. A route through the network must be established for the flow of LU6.2 session traffic between a 594M controller with which it is intended to communicate and each AS/400 system. Each controller in the 594M must be configured on each AS/400 system. This configuration will be the same with or without concurrent host attachment.

594M Configuration Requirements

Every AS/400 host that a 594M controller contacts must be configured in the 594M (H1-H4), and one of those hosts must be declared the primary host.

A 594M controller and the primary host interact in the following manner:

- Error log data is sent from a 594M controller to the primary host. A 594M controller does not send error log data to any other host.

- A 594M controller sends alerts to the primary host. However, if the controller session with the primary host becomes inactive, an active session with an alternate host will be used for sending alerts until the primary host controller session becomes active again.

- A 594M controller attempts to keep the controller session active as long as there is a device active for a particular host.

- A 594M controller attempts to keep the primary host controller session active whenever any alternate host controller session is active. This way alerts and error log information can be sent to the primary host.

Display Options

Concurrent Host capability affects NWS display options and introduces the concept of "default host."

Default host simply refers to the AS/400 that provides the NWS with its sign-on screen. Unless you change it, the default host is the primary host. The first time you use the 594 Controller Software, all NWS sign-on screens will be taken from the primary host.

However, you can enter a System Request command to change the default host for a particular NWS to any AS/400 that has been configured for that 594M controller. By doing this, you cause that NWS display to take its sign-on screen from a non-primary AS/400. You can also enter another System Request command to temporarily switch to a different host without changing the default host for that display.

Whenever a display session switches hosts, it will appear to the current host as a display power-off and to the new host as a display power-on.

Note: *Return to the sign-on screen for the current host before switching a display session to another host.*

Single, shared, and multiple address displays have different capabilities when communicating with the host:

Single-address displays: able to communicate with only one host at a time.

Shared addressing displays: as long as the AS/400 system supports shared addressing displays (Version 3, Release 1 or later), the displays are able to communicate with a different host on each shared session. If the AS/400 system does not support shared address displays, only the base session of a shared address display will be able to communicate with the AS/400 system.

Multiple address displays: a display that uses multiple addresses for additional sessions can also communicate with a different host on each session. For each session on a shared or multiple address display, the default host can be set independently.

Switching to other AS/400 Systems

Your display session can be switched to any other AS/400 system that is configured in a 594M controller. To do this, follow the steps below:

1. Make sure you are signed off your AS/400 system.

2. Press the **System Request** key on the display that you wish to switch to another AS/400.

    If you are *not* currently in session with an AS/400, a line with the AS/400 system identifier (Hx) will appear at the top of the screen. This identifier indicates the host with which your display is currently set to communicate.

    If you are currently in session with an AS/400, a blank line will appear at the bottom of the screen.

3. To switch the display session to another host *without* changing the power-on default host, type the AS/400 system identifier of the new host in the first two characters of the line, as in the following example:

        H3

    To switch the display session to another host *and also* change the power-on default host, type the AS/400 system identifier of the new host in the first two characters of the line, a comma, and then a P, as in the following example:

        H3,P

4. For the final step, simply press **Enter**.

    As long as the System Request command is a valid host switching command, the 594M will process the command. Otherwise, in the event that the System Request command is *not* valid, the 594M will forward the command to the AS/400 for processing or, if a controller session with an AS/400 is not active, report an error.

    Whenever a controller session for the new AS/400 is not currently active, the controller session for the new AS/400 will be brought up before the display session.

AS/400 Application Considerations

The following considerations should be kept in mind when using these AS/400 applications:

Performance Tools/400:

- only one AS/400 at a time can run Performance Tools/400 for the 594M emulated controller.

- response time data will only be collected and reported for display sessions with the AS/400 running Performance Tools/400.

Workstation Customization:

- For each session of a single, multiple, or shared address display, a 594M controller will accept the download of a keyboard translation table (KTT), to a maximum of five.

- For each single address display, a 594M controller will accept the download of a printer definition (PDT). For multiple and shared address displays, only the display base session will download a PDT. For all displays on a 594M controller, a maximum of five PDTs can be downloaded.

Printers and Concurrent Host Attachment

Once a 594M controller has been configured for concurrent host attachment, printer sharing can be enabled or disabled.

Printer Sharing Enabled

The following is a list of functions that apply once printer sharing is enabled.

- any printer attached to a 594M controller can be shared by up to four AS/400 systems.

- whenever a shared printer is powered on, the 594M controller will activate the controller session with the primary host and report to the primary host that the printer is available.

- if a controller session becomes active with any alternate hosts, the 594M controller will report to the alternate host that the printer is available.

- the 594M controller will not activate a controller session with an alternate host just for a shared printer.

- there are two ways a controller session with an alternate host can be activated:

- by setting the **Controller Session Initiation** to "yes" for the alternate host.

- if a display becomes active for this alternate host.

Printer Timeout

A printer can have only one AS/400 system printer writer active at a time. Therefore, once the writer for a particular AS/400 system has started, a 594M controller will report to the other AS/400 systems that the printer is unavailable. When the writer has ended for the printer, the 594M controller will start the printer sharing timeout. After the timeout expires, the 594M controller will report to the other AS/400 systems that the printer has powered on and that a writer on one of the other AS/400 systems

can be started and can begin printing.

Printer Sharing Disabled

Printers can be dedicated to any AS/400 system if printer sharing is disabled. When the printer connected to a 594M controller is turned on, the 594M controller will activate the controller session with the appropriate primary or alternate host and report to that host that the printer is available.

By default, each printer is initially set to a 594M controller's primary host. To change the host, do the following steps:

1. Turn the printer on.

2. From any display that is attached to the same 594M controller as the printer, press the **System Request** key.

3. Select the new host system for the printer by typing on the System Request input line as follows:

    Hx,P,ps,

    where:

    Hx – Host ID

    P – Power-on default host

    p – Printer port

    s – Printer station address

4. Press **Enter**.

    The 594M controller will now change the power-on default host for the printer at the specified port and station address.

    If the System Request command is not valid, the 594M will, if a host session is active for this display, forward the System Request command to the AS/400 for processing. But if the host session is not active, the 594M will report an error.

5. To complete the change, turn the printer off and then back on.

The printer will then be ready to communicate with the new AS/400 system.

Appendix A: Solving Problems

This appendix contains a procedure to diagnose problems and resolve error conditions.

Problem Determination

To diagnose and resolve problems, do the following:

1. Is a system reference code (SRC) displayed on any workstation?

   Yes   Look up the SRC in the *Perle 594 Reference Guide*.

   No   Proceed to step 2.

2. Is the Ready LED flashing?

   Yes   The 594M is in Factory Default mode. Refer to *Chapter 5: Using the 594M Utility Program* for details on how to download the controller software to the 594M

   No   Proceed to step 3.

3. Is the Test LED and Ready LED on?

   Yes   The controller could be in Extended Diagnostics or the controller has not been configured.

   - Power off the 594M and then power back on.

   - Proceed to step 4.

   No   Proceed to step 5.

4. Is the Test LED and Ready LED still on?

   Yes   The controller has not been configured. Refer to *Chapter 5: Using the 594M Utility Program* for details on how to configure the 594M.

   No   The controller was in Extended Diagnostics.

5. Is the SRC LED on?

   Yes   Use Concurrent Diagnostics to view the time-stamped error log to view the SRC. Look up the SRC in the *Perle 594 Reference Guide*.

   No   Proceed to step 6.

6. Is the Power LED on?

   Yes   Go to step 10.

   No   Proceed to step 7.

7. Is electrical power reaching the Perle 594M?

   Yes   Call your 594M service representative.

   No   Go to step 8.

8. Is the Perle 594M properly connected to the electrical outlet?

   No Turn off the power on the Perle 594M and connect the power cord. The problem is resolved.

   Yes Go to step 9.

9. Test the outlet with another electrical device.
   Is electrical power available?

   No The problem has been located. Take the necessary steps to restore electrical power to the outlet.

   Yes Call your 594M service representative.

10. Are any twinaxial workstations not communicating?

   Yes Proceed to step 11.

   No Call your 594M service representative. Use Concurrent Diagnostics to view the time-stamped error log and be prepared to provide this information to the service representative.

11. Locate the Twinaxial Feature Port to which the non functioning workstation(s) are attached. Are any workstations communicating with this Twinaxial Feature Port?

   No Go to step 15.

   Yes Proceed to step 12.

12. Are all non communicating twinaxial workstations attached to the same port?

   No Go to step 16

   Yes Proceed to step 13.

13. Do the following:
   a) Turn off the power on the Perle 594M.
   b) Remove the cable from the failing port. Replace it with the cable from a functioning port.
   c) Turn on power on the Perle 594M.

14. Do the workstations communicate with the port?

   Yes The problem is with the twinaxial cable or the workstations attached to it. Take the necessary steps to correct the problem.

   No Call your 594M service representative.

15. Do the following:
   a) Ensure that the twinaxial cables are properly connected to the 594M.
   b) Ensure that the twinaxial cables are properly connected to the workstations.

16. Do these steps correct the problem?

   Yes The problem is resolved.

   No Call your 594Mservice representative.

Operator Panel LEDs

	(Power)	This green LED indicates that power is being supplied to the 594M and the power switch is on.
	(Ready)	This green LED comes on when the power-on diagnostics have been successfully completed, indicating the Perle 594M is ready for operation
	(Call Perle Service)	This red LED comes on when an error condition is detected which requires you to contact your 594M service representative. View the error log files and be prepared to provide this information to the service representative
	(SRC)	This green LED comes on when the Perle 594M detects a problem which must be diagnosed. View the error log files and look up the SRC numbers in the *Perle 594 Reference Guide*.
	(Test Mode)	This green LED is lit when the Perle 594M is in power up diagnostics or extended diagnostics. When tests are running, the Ready LED is off. When the Perle 594M is in extended diagnostics or the controller has no configuration, the Ready LED is on.
	(Host)	This green LED indicates activity between the controller and the host computer. It will turn ON when a connection to the host has been made and will blink with traffic activity.
	(Twinax)	This LED or LEDs indicate activity between a twinax terminal and the 594M controller. The LED(s) will be turned on when a twinax terminal is connected and will blink when the terminal is being used. Twinax Turret Model - One green LED Twinax TTP Model - 7 numbered green LEDs.

NWS Workstation Display Format

When the NWS is first set to ON, the cursor will be displayed in the upper right-hand corner of the screen.

When the NWS makes connection with the 594M, the cursor moves to the upper left-hand corner of the screen and the System Available indicator, consisting of four digits, is displayed on the screen. The position of the System Indicator depends on the type of workstation you have. It could be displayed in either the upper right, upper left, or lower left portions of your screen.

Concurrent Diagnostics

Concurrent Diagnostics provides detailed link configuration and status data, device status and system error logs while the 594M is on-line. Refer to the *Perle 594M Diagnostics Guide* for details on how to perform Concurrent Diagnostics.

Extended Diagnostics

Extended Diagnostics are used for Perle 594M hardware diagnostics. It provides a more extensive test that the power-on diagnostics. Unlike concurrent diagnostics, extended diagnostics can be used only when the 594M is off-line.

Refer to the *Perle 594M Diagnostics Guide* for details on how to perform Extended Diagnostics.

Appendix B: Specifications

This appendix provides specifications on the Perle 594M and its feature cards.

Perle 594M Specifications

Table E-1

Dimensions	Height x Width x Depth	45 x 305 x 202 mm 1.75 x 12 x 8 inches
	Weight	1.45 kg/3.2 lbs maximum
Physical/Electric Specifications	Ambient Temperature	10°—30° C (50°—85°F)
	Relative humidity	20—80%, non-condensing
	Power	100—125VAC, 50—60Hz, 200—240VAC, 50—60Hz,
	Btu output	200 Btu/hour maximum
	MTTR	30 minutes
	MTBF	100,000 hours (11.4 years)
Configuration Utilities	Languages	594M software is available in the following languages: English, French, German, Italian, Spanish, and Japanese.

Table E-2

Memory	Two megabytes (Mb) RAM. Four Mb flash memory
Approvals	FCC, UL listed, CSA, DOC, TUV, BZT and CNS Fully compliant for IBM Information Network (IIN) and Advantis networks
Communications Speeds	• Up to 128 Kbps using V.35 (digital circuits) or X.21 host interface • Up to 19.2 Kbps supported with synchronous modems and analog lines • Up to 100 Mbps using Ethernet.
Host Interface	• V.35, EIA 232D (V.24/V.28), X.21 standard • Uses a PU Type 2.1 connection for AS/400 communication • RU size up to 1033 bytes • IP Frame size up to 1500 bytes
Status LEDs	• Ready • Call Perle Service • SRC • Test Mode • Power • Host • Twinaxial
Communications Protocols	• SDLC • X.25 • Frame Relay • Ethernet • circuit switched X.21 (SHM)
Network Interface	• SDLC • SNA subarea network (SDLC) • X.25 • X.21 circuit switched • Multihost support uses Ethernet, X.25, or SDLC links
Software Supported	• OS/400 V2R1.1, or higher • PC Support/400 V2R.1, or higher • Client Access/400 • PC Support-compatible software, such as Rumba, ShowCase VISTA, etc. • DOS V3.3, or higher • Windows 95, 98, NT 4.0

Port	Interface	Workstations	Sessions
Twinaxial	*Cable length* Twinaxial Turret • 1235 m (5000') maximum. Telephone Twisted Pair • (TTP)304.8 m (1000') maximum *Compatibility* • Most baluns/patch panels are supported, with maximum distances dependent on equipment used.	All Twinaxial workstations, IBM PCs and compatibles supported by the IBM 5494.	The Twinaxial Port(s) supports up to 7 physical terminal sessions.
Ethernet	*Ethernet LAN wiring supported* • 10BaseT UTP Category 3, 4 or 5 • 100 BaseTX UTP Category 5 *LAN speed* • 10 Mbps • 100 Mbps *Compatibility* • Compatible with all Ethernet products		

Appendix C: Identifying Perle 594M Components

This appendix provides identification for Perle 594M Components.

Part #	Component
Communications cables	
59-2341	EIA-232D (V.24/V.28) Communication Cable, 4—40 UNC
59-2342	EIA-232D (V.24/V.28) Communication Cable, M3
59-2343	EIA-232D (V.24/V.28) Communication Cable, M2.6
59-2344	X.21 Communication Cable, 4—40 UNC
59-2339	V.35 Communication Cable, 1.6mm Pins, Thumbscrews
59-2340	V.35 Communication Cable, 1.0mm Pins, Clips
Power cables	
60-0578	North American / Japan
60-0743	United Kingdom
60-0744	European
60-0745	Australian
60-1031	Switzerland

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