

# Vanguard Managed Solutions

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## Vanguard 340 and 340 Enhanced Installation Manual

# Notice

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## Notice (continued)

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### Radio Frequency Interference Regulations

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules, CISPR22 and EN55022. These limits are designed to provide reasonable protection against interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Changes or modifications not expressly approved by VanguardMS could void the user's authority to operate the equipment.

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

This is a Class B product. Operation of this equipment in a residential environment may cause radio interference, in which case the user may be required to take adequate measures to correct the interference at his/her own expense.

This product was verified under test conditions that included the use of shielded DTE cable(s). A cable equipped with a ferrite bead may also have been used. Use of different cables will invalidate verification and increase the risk of causing interference to radio and TV reception.

You can obtain the proper cables from Vanguard Managed Solutions.

### Telecommunications Regulations

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Equipment that complies with Part 68 of the FCC rules includes a label or permanent marking on the printed circuit board that connects to the network that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (*e.g.*, 03 is a REN of 0.3).

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information. If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult a trained technician.

Equipment that meets the applicable Industry Canada Terminal Equipment Technical Specifications is conformed by the registration number. Equipment that complies with Industry rules includes a label or permanent marking on the printed circuit board that connects to the network. The abbreviation, IC, before the registration number signifies that the registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

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To comment on this manual, please send e-mail to [LGEN031@vanguardms.com](mailto:LGEN031@vanguardms.com)

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## Overview

### Introduction

This installation describes features, hardware, specifications, and applications for the Vanguard 340 and Vanguard 340 Enhanced.

■ **Note**

For information on operating system software and configuration, see the *Vanguard Basic Configuration Manual* (Part Number T0113).

### Audience

This manual is intended for people who install and operate the Vanguard 340 and 340 Enhanced.

### How to Use This Manual

The following table describes the contents of this manual:

<i><b>This Chapter</b></i>	<i><b>Description</b></i>
Chapter 1	Vanguard hardware and software features.
Chapter 2	Description of the hardware features and components.
Chapter 3	Installing and replacing hardware including daughtercards and motherboard.
Chapter 4	Powerup procedures and software installation.
Appendix A	Product specifications.
Appendix B	FCC and Telephone Company procedures and requirements.

## About This Manual (continued)

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### Related Documentation

#### Introduction

This section describes related documentation and where to obtain documentation.

#### Other Documentation

All documentation is provided on the Vanguard CD-ROM and the VanguardMS web site. <http://www.vanguardms.com/support/documentation>

<b>Documentation Kit</b>	<b>Includes:</b>
Vanguard Applications Ware Documentation Set	<ul style="list-style-type: none"><li>• <i>Vanguard Applications Ware Basic Protocols</i> (Part Number T0106)</li><li>• <i>IP and LAN Feature Protocols</i> (Part Number T0100)</li><li>• <i>SNA Feature Protocols</i> (Part Number T0101)</li><li>• <i>Serial Feature Protocols</i> (Part Number T0102)</li><li>• <i>Multi-Service Feature Protocols</i> (Part Number T0103)</li><li>• <i>Multimedia Feature Protocols</i> (Part Number T0104)</li><li>• <i>Alarms and Reports Manual</i> (Part Number T0005)</li><li>• <i>Software Installation and Coldloading Manual</i> (Part Number T0028)</li></ul>
IP and LAN Feature Documentation Set	<ul style="list-style-type: none"><li>• <i>IP and LAN Feature Protocols</i> (Part Number T0100)</li></ul>
SNA Feature Documentation Set	<ul style="list-style-type: none"><li>• <i>SNA Feature Protocols</i> (Part Number T0101)</li></ul>
Serial Feature Documentation Set	<ul style="list-style-type: none"><li>• <i>Serial Feature Protocols</i> (Part Number T0102)</li></ul>
Multi-Service Feature Documentation Set	<ul style="list-style-type: none"><li>• <i>Multi-Service Feature Protocols</i> (Part Number T0103)</li></ul>
Multimedia Feature Documentation Set	<ul style="list-style-type: none"><li>• <i>Multimedia Feature Protocols</i> (Part Number T0104)</li></ul>
Vanguard Applications Ware Basic Protocols Documentation Set	<ul style="list-style-type: none"><li>• <i>Vanguard Basic Protocols</i> (Part Number T0106)</li></ul>

## About This Manual (continued)

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**Vanguide CD-ROM** The Vanguide CD-ROM contains all Vanguard documentation available at the time of release. The Vanguide CD-ROM is shipped with each Vanguard product. To order an additional copy of the Vanguide CD-ROM, please contact a VanguardMS Representative.

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**VanguardMS Web Site** Check the VanguardMS web site for the latest documentation:  
**<http://www.vanguardms.com/support/documentation/>**

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## Special Notices and Translations

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### Special Notices

The following notices emphasize certain information in the guide. Each serves a special purpose and is displayed in the format shown:

#### ■Nota

Note is used to emphasize any significant information.



#### Advertencia

Caution provides you with information that, if not followed, can result in damage to software, hardware, or data.



#### Warning

Warning is the most serious notice, indicating that you can be physically hurt.

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### Simplified Chinese

#### 特别通告

以下通告强调指南中的某些信息。  
每条信息均有一个特殊的目的并以如下格式显示:

#### ■注解

注解用于强调任何重要的信息。



#### 切记

切记提供您这类信息，如果不遵照信息的要求，可能导致软件、硬件或数据的损坏。



#### 警告

警告是最严重的通告，表明您的身体可能被伤害。

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### Danish

#### Særlige overskrifter

Følgende overskrifter fremhæver nogle af oplysningerne i vejledningen. De tjener hvert et specifikt formål og vises i følgende format:

#### ■Bemærk

Bemærk anvendes til at fremhæve vigtig information.



#### Forsigtig

Forsigtig understreger oplysninger, som, hvis de ikke bliver fulgt, kan føre til beskadigelse af software, hardware eller data.



#### Advarsel

Advarsel er den mest alvorlige overskrift, og tilkendegiver mulig personskaade.

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## Dutch

### Bijzondere vermeldingen

De volgende vermeldingen besteden extra aandacht aan bepaalde informatie in de handleiding. Elke vermelding heeft een eigen nut en wordt in de volgende opmaak weergegeven:

#### ■Opmerking

Een opmerking wordt gebruikt om belangrijke informatie te benadrukken.



#### Let op

Dit kopje geeft aan dat u de beschreven instructies moet volgen om schade aan de software, hardware of gegevens te vermijden.



#### Waarschuwing

Een waarschuwing is de belangrijkste vermelding. Indien u deze niet volgt, kan dit tot lichamelijke verwondingen leiden.

---

## Finnish

### Eritysilmoitukset

Seuraavat ilmoitukset korostavat tiettyjä oppaan tietoja. Kullakin on oma erikoistarkoituksensa ja ne esitetään seuraavassa muodossa:

#### ■Huomaa

Huomautusta käytetään korostamaan tärkeitä tietoja.



#### Vaara

Vaarailmoitus antaa tietoa, jonka huomiotta jättäminen voi johtaa ohjelmiston, laitteiston tai tietojen vahingoittumiseen.



#### Varoitus

Varoitus on kaikkein vakavin ilmoitus ja se kertoo mahdollisesta loukkaantumisriskistä.

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## French

### Messages spéciaux

Les messages suivants mettent en valeur certaines informations dans le guide. Chacun d'eux remplit une fonction spéciale et est affiché dans le format indiqué :

#### ■Important

Important est utilisé pour souligner des informations critiques au sujet d'une procédure.



#### Mise en Garde

Une mise en garde vous fournit des informations qui, si elles ne sont pas observées, peuvent se traduire par des dommages pour le logiciel, le matériel ou les données.



## Avertissement

Un avertissement constitue le message le plus sérieux, indiquant que vous pouvez subir des blessures corporelles.

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### German

#### Besondere Hinweise

Durch die folgenden Hinweise werden bestimmte Informationen in diesem Handbuch hervorgehoben. Jeder Hinweis dient einem bestimmten Zweck und wird im dargestellten Format angezeigt:

##### ■Wichtig

WICHTIG wird zur Betonung signifikanter Angaben zu Vorgehensweisen verwendet.



## Vorsicht

Ein Vorsichtshinweis macht Sie darauf aufmerksam, daß Nichtbefolgung zu Software-, Hardware- oder Datenschäden führen kann.



## Warnung

Eine Warnung weist Sie darauf hin, daß ernsthafte Körperverletzungsgefahr besteht.

---

### Italian

#### Simboli speciali

I seguenti simboli, ciascuno con una speciale funzione, evidenziano determinate informazioni all'interno del manuale. Il formato è quello riportato qui di seguito.

##### ■Nota

Questo tipo di avvertimento viene utilizzato per evidenziare tutte le informazioni significative relative ad una procedura.



## Attenzione

Questo tipo di avvertimento fornisce informazioni che, se non vengono seguite, possono provocare danni al software, all'hardware o ai dati.



## Avvertenza

Questo tipo di avvertimento indica la presenza di condizioni di rischio che possono causare lesioni fisiche. Si tratta del simbolo più importante al quale prestare attenzione.

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## Japanese

### 特別表記

ガイド内では、以下の表記を使って特に注意する必要がある情報が提供されます。各表記にはそれぞれ目的があり、次の形式で表示されます。

#### ■重要

重要な情報が記述されています。



#### 注意

記述されている内容に従わない場合、ソフトウェア、ハードウェア、またはデータが壊れる可能性があります。

#### 警告

最も重要な情報が記述されています。身体的な障害を被る可能性があります。

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## Korean

### 일러두기

이 설명서에는 사용자에게 특정한 내용을 강조하기 위해서 다음 내용이 포함되어 있습니다.

#### ■참고

중요한 정보를 강조하는데 사용합니다.



#### 주의

소프트웨어나 하드웨어, 또는 데이터를 손상시킬 수 있으므로 주의가 필요한 상황을 알립니다.



#### 경고

사용자의 안전에 위험을 알리는 가장 심각한 수준의 경고입니다.

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## Norwegian

### Spesielle merknader

Merknadstypene nedenfor representerer en bestemt type informasjon i håndboken. Hver merknadstype har en spesiell hensikt og vises på følgende format:

#### ■Merk

Merk brukes for å fremheve viktig informasjon.



#### Forsiktig

Forsiktig gir deg informasjon om situasjoner som kan føre til skade på programvare, datamaskin eller data dersom den blir fulgt.



#### Advarsel

Advarsel er den mest alvorlige merknaden og indikerer at du kan bli fysisk skadet.

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## Portuguese/ Portugal

### Avisos Especiais

Os avisos que se seguem realçam certas informações neste guia. Cada um deles serve um objectivo especial e é visualizado no formato apresentado:

#### ■Nota

Nota é utilizado para realçar qualquer informação importante.



### Atenção

Atenção facultalhe informações que, se não forem cumpridas, poderão provocar danos no software, hardware ou nos dados.



### Cuidado

Cuidado constitui o aviso mais grave, o qual indica que poderá ficar fisicamente ferido.

---

## Spanish/Spain

### Notificaciones especiales

Las siguientes notificaciones ponen énfasis sobre determinada información de la guía. Todas tienen un propósito especial y se muestran con el formato siguiente:

#### ■Nota

Las notas se utilizan para destacar determinada información de importancia.



### Advertencia

Las advertencias le proporcionan información que debe seguirse, si no desea que el software, el hardware o los datos puedan verse dañados.



### Aviso

Los avisos son las notificaciones de carácter más importante e indican la posibilidad de daños físicos para el usuario.

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## Swedish

### Speciella beteckningar

Följande beteckningar betonar viss information i handboken. Var och en har ett speciellt syfte och visas i formatet nedan:

#### ■OBS!

OBS! används för att betona viktig information.



### Viktigt

Viktigt ger dig information som, om den inte följs, kan resultera i skada i programvara, maskinvara eller data.



## **Varning**

Varning är den mest allvarliga beteckningen och den indikerar att du kan skadas fysiskt.

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## Customer Information

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### **Customer Questions**

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Customers who have questions about Vanguard Managed Solutions products or services should contact your VanguardMS representative or visit this website for product, sales, support, documentation, or training information:

**<http://www.vanguardms.com/>**

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### **Comments About This Manual**

To help us improve our product documentation, please complete the comment card included with this manual and return it by fax to (508) 339-9592. If you prefer, provide your name, company, and telephone number, and someone in the documentation group will contact you to discuss your comments.

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# Customer Response Card

Vanguard Managed Solutions would like your help in improving its product documentation. Please complete and return this card by fax to (508) 339-9592; Attention: Product Documentation, to provide your feedback.

To discuss comments with a member of the documentation group, provide telephone information at the bottom of this page. **Thank you** for your help.

Name \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_

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Document Title: Vanguard 340 and 340 Enhanced Installation Manual

Part Number: **T0178 Revision G**

Please rate this document for usability:

Excellent     Good     Average     Below Average     Poor

What did you like about the document? \_\_\_\_\_

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What information, if any, is missing from the document? \_\_\_\_\_

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Please identify any sections/concepts that are unclear or explained inadequately.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Additional comments/suggestions. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone \_\_\_\_\_ Ext. \_\_\_\_\_ Best time to call \_\_\_\_\_





# Chapter 1

## About the Vanguard 340 and 340 Enhanced

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### Overview

#### Introduction

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This chapter describes the hardware and software functions, and the target applications for Vanguard 340 products.

These topics are discussed:

- Vanguard 340 and 340 Enhanced Descriptions
  - Features and Functionality
  - Target Applications
-

## Vanguard 340 and 340 Enhanced Descriptions

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### Introduction

This section describes the Vanguard 340 and 340 Enhanced.

#### ■ Note

The Vanguard 340 Enhanced requires release 6.4 or greater software.

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### Vanguard 340 Description

The Vanguard 340 is a flexible, high performance RISC based multiservice router designed for small branch, and home offices that depend on efficiently consolidating serial protocols such as, SNA/SDLC, BSC with LAN traffic over dedicated or switched services.

The Vanguard 340 offers cost-effective integrated solutions that simultaneously support:

- Data
  - Fax
  - RemoteVU<sup>®</sup> video
  - Voice over Frame Relay and Voice over IP
  - Virtual Private Network (VPN)
  - Broadband access
  - 10/100BT LAN
  - G.SHDSL
  - DCC 3 DES SIMM Interface
  - External Power supply 62945-01 (APS Model APS61ES-30)
- 

### 340 G.SHDSL Limitation

There is a limitation on available memory in the 340 that does not allow you to run G.SHDSL and Voice at the same time. This is caused by the 4M flash limit in 340. This limitation does not apply to the Vanguard 340 Enhanced.

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### Vanguard 340 Enhanced Description

The Vanguard 340 Enhanced (VG 340E) offers cost-effective integrated solutions that support:

- Full voice and data IP Multi-service networking capabilities
- Support for IP VPN's
- Enhanced forwarding performance in throughput (for delivering converged IP voice and data services)
  - High speed LAN-to-WAN
- Data
- Fax
- RemoteVU<sup>®</sup> video
- Voice over Frame Relay and Voice over IP
- Virtual Private Network (VPN)
- Broadband access
- 10/100BT LAN
- G.SHDSL

- ECC DIMM - Supports DES, Triple-DES (168-bit) AES.
- External Power Supply 62749-03 (APS Model AD-748U-3125A)

The Vanguard 340 and 340 Enhanced are SNMP-manageable and are available with a variety of LAN, SNA, and IP networking features. The Vanguard 340 and 340 Enhanced support two Vanguard Daughtercard slots for video, voice, fax and mixed protocol data traffic such as, IP, Frame Relay, X.25, ISDN, or NX64 T1/E1 services.

■ **Note**

For descriptions of the daughtercards and other hardware components, refer to the appropriate sections in Chapter 2, Hardware Description.

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## Features and Functionality

### Introduction

This section describes the features available with your Vanguard 340 and 340 Enhanced device. For descriptions of the software running on your Vanguard, refer to the appropriate protocol document. These documents can be found on the VanguardMS Web site: <http://www.vanguardms/support/documentation/>

### Vanguard 340 and 340 Enhanced Comparison Chart

The table below lists the different features for each product.

<i>Product Name</i>	<i>LAN Ports</i>	<i>Voice Ports</i>	<i>Processor</i>	<i>SDRAM (MB)</i>	<i>FLASH (MB)</i>	<i>Encryption</i>	<i>Compression</i>	<i>Power Supply</i>
340	1	1 to 8	MPC860T 9kpps	16	4/4	DCC	DCC	50 Watts
340 Enhanced	1	1 to 6	MPC860P 13.5kpps	32	8/8	ECC	Software	35 Watts

### Standard Features on the 340

The standard Vanguard 340 provides these features:

- Low Profile enclosure with rear accessible motherboard, and support for two Vanguard Daughtercards
- 50 Mhz MPC860T PowerPC processor
- 4 Megabytes of Non-Volatile FLASH on board
- 4 to 8 Megabytes FLASH SIMM (optional)
- 16 Megabytes of SDRAM DIMM (expandable to 32 Megabytes - optional)
- Standard rear panel ports include:
  - Two daughtercard ports
  - One serial interface DB25 port supporting V.24, V.35, V.36, V.11/X.21 interfaces
  - One Async (RJ-45 connector) Control Terminal Port (CTP) for local and remote configuration, and management
  - One 10/100BaseT Ethernet port with auto-sensing
  - Up to Eight Voice Ports
- Data Compression and Encryption SIMM slot (optional)
- External power supply 62945-01 (APS Model APS61ES-30)

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**Standard Features on the 340 Enhanced**

The standard Vanguard 340 Enhanced features are:

- Low Profile enclosure with rear accessible motherboard, and support for two Vanguard Daughtercards
- 50 Mhz MPC860P PowerPC processor
- 8 Megabytes of Non-Volatile FLASH on board
- 8 Megabytes FLASH SIMM (can be expanded to 16 Megabytes with option SIMMs)
- 32 Megabytes of SDRAM DIMM (October 2004 and later)16 Megabytes of SDRAM DIMM (expandable to 32 Megabytes - optional) before 10/2004.
- Standard rear panel ports include:
  - Two daughtercard ports
  - One serial interface DB25 port supporting V.24, V.35, V.36, V.11/X.21 interfaces
  - One Async (RJ-45 connector) Control Terminal Port (CTP) for local and remote configuration, and management
  - One 10/100BaseT Ethernet port with auto-sensing
  - Up to Six Voice Ports
- ECC DIMM - Supports DES, Triple-DES (168-bit) AES.
- External Power Supply 62749-03 (APS Model AD-748U-3125A)

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**External Power Supply**

The Vanguard 340 and 340 Enhanced use a different external power supply. The external power supply for 340 Enhanced (62749-03) cannot be used on the Vanguard 340 or 342. The Vanguard 340 External Power Supply (62945-01) can be used on the 340 Enhanced.

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**10/100BaseT Ethernet Cable**

Port 5 is a 10/100BaseT Ethernet Port that conforms to the Fast Ethernet specification (IEE 802.3u) known as 100BaseT. This LAN standard has raised the Ethernet speed limit from 10 Megabits to 100 Megabits per second. This Ethernet port has an auto-sensing feature that allows it to determine if the connection is 10BaseT or 100BaseT and adjust its speed as required.

---

**Control Terminal Port (CTP)**

Port 4 can be used as a Control Terminal Port (CTP) for configuration, reporting, and troubleshooting the Vanguard 340 and 340 Enhanced.

To access the CTP you must also configure your terminal or terminal emulation software, to VT100, 9600 bps, 8 bit, no parity, 1 stop bit.

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**Dual Daughtercard Slots**

The Vanguard 340 and 340 Enhanced ship with two slots to support optional daughtercards. This permits easy future expansion of the product.

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**340 Daughtercard Functionality**

The Vanguard 340 is available with the optional components listed below as factory-installed or as separate add-in daughtercards:

- FXS/FXO Voice
- Voice FXS
- 4-Port FXS
- 4-Port FXO
- FT1/FE1
- Dual E&M
- RemoteVU (Video)
- ISDN BRI-U Data
- ISDN & enhanced ISDN BRI-S/T Data
- ISDN BRI Voice
- DSU
- DIM
- V.34
- V.90
- G.SHDSL

---

**340 Enhanced Daughtercard Functionality**

The Vanguard 340 Enhanced is available with the optional components listed below as factory-installed or as separate add-in daughtercards:

- FXS/FXO Voice
- Voice FXS
- 4-Port FXS
- 4-Port FXO
- FT1/FE1
- Dual E&M
- RemoteVU (Video)
- ISDN BRI-U Data
- ISDN & enhanced ISDN BRI-S/T Data
- ISDN BRI Voice
- DSU
- ECC DIM
- V.90
- G.SHDSL

**■Note**

Release 6.2 or greater software is required for the V.90. Release 6.3 and greater supports the enhanced ISDN BRI ST Data Daughtercard. Release 6.4 or greater software is required for the Vanguard 340 Enhanced.

For additional information about these cards, refer to the “Vanguard Daughtercards” section in Chapter 2.

For detailed information about installing the Vanguard Daughtercards, refer to the “Modifying Your Vanguard 340 and 340 Enhanced” section in Chapter 3.

---

**Operating Software** The Vanguard Applications Ware software is compressed in FLASH memory and loaded into the SDRAM DIMM for operation. The Vanguard 340 and 340 Enhanced support the following Applications Ware packages:

- IP<sup>+</sup> Applications Ware Package (includes IP, and IPX)
- SNA<sup>+</sup> Applications Ware Package (includes IP, and SNA)
- Multi-Service Applications Ware Package.

See the *Software Release Notice* accompanying your Vanguard unit for more information on the software license upgrades available for the Vanguard 340 and 340 Enhanced.

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## Target Applications

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### **Introduction**

This section describes the various target applications for the Vanguard 340 and 340 Enhanced.

These examples are shown are for the 340 and 340 Enhanced:

- Virtual Private Network
  - IP and Serial Protocols over Frame Relay
  - Video and Serial Protocols over Public or Private Networks
  - Branch Office to Central Office over Public or Private Networks
  - SOHO and Branch Office to Central Office over ISDN
  - DSL, G.SHDSL
-

## Virtual Private Network

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### Introduction

This section provides a general description of features and applications within the Vanguard Virtual Private Network (VPN).

These topics are discussed:

- Cost-effective VPN Solutions
- Hardware-based Encryption and Compression
- Standard-based Tunneling and Encryption for IP Traffic
- Multi-protocol Tunneling and Encryption
- Frame Relay and X.25 Encryption

For detailed information about a VPN, refer to your *Virtual Private Network Manual (VPN)* (Part Number T0103-10).

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### What is a VPN?

A Virtual Private Network (VPN) is a network that has the appearance and many of the advantages of a dedicated link but occurs over a shared network. Using a technique called “tunneling,” packets are transmitted across a public routed network, such as the Internet or other commercially available network, in a private “tunnel” that simulates a point-to-point connection.

This approach enables network traffic from many sources to travel through separate tunnels across the same infrastructure. A VPN allows network protocols to traverse incompatible infrastructures. A VPN also enables traffic from many sources to be differentiated, so that it can be directed to specific destinations and receive specific levels of service.

---

### Advantages of a VPN

A VPN provides following advantages:

- Cost Effectiveness
    - *Infrastructure Cost* - By using a VPN, a company need not invest money on connectivity equipment like leased lines, WAN switches etcetera. The connectivity is provided by the service provider.
    - *Operational Cost* - Costs involved with maintaining leased lines or a private WAN along with the money spent on people to maintain them can be avoided.
  - Manageability
    - A VPN is more easily managed when compared to a fully private network.
- 

### Requirements of a VPN

Below are some of the requirements of a VPN:

- Connectivity
  - There needs to be network connectivity among the various corporate sites. This connectivity is typically used through the Internet.
- Security
  - Data exchanged between the various corporate sites is confidential. When data is sent over a public network it is usually encrypted. The encryption algorithm must be robust enough to withstand any type of snooping.

- Address Management
  - The Addresses of the clients on each of the private sites should not be the ones used in the public domain, however, packets sent out onto the public network must have public source/destination addresses.
- Multiprotocol Support
  - The solution must be able to handle common protocols used in the corporate network.

## Cost-effective VPN Solutions

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<b>Small to Medium Enterprise (SME)</b>	The Vanguard VPN solution is ideal for SMEs that are looking to take advantage of the flexibility, global reach, security, and cost savings of Internet-based VPNs. The current Vanguard installed-base can be easily upgraded to support VPN site-to-site applications at a very competitive price point.
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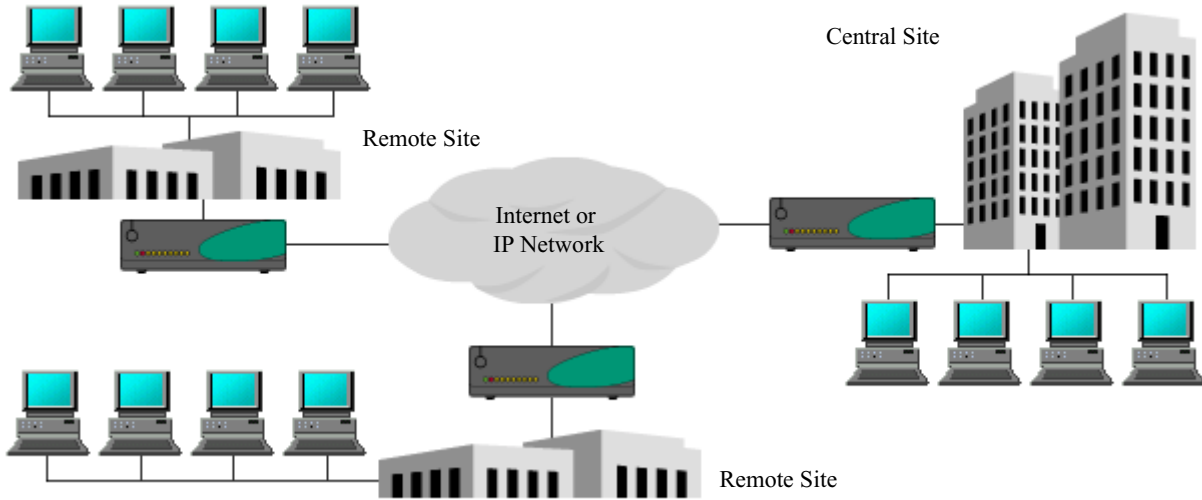
## Hardware-based Encryption and Compression

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<b>Data Encryption and Compression</b>	Data encryption is a very CPU intensive process and is therefore best implemented on hardware. The VanguardMS solution provides a secure hardware-based encryption and compression on a single module. Figure 1-1 shows an example of a secure hardware-based VPN solution for a site-to-site application.
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<b>Hardware Options Vanguard 340</b>	The Vanguard 340 supports the DES (56-bit) and Triple-DES (112-bit) Encryption and Compression SIMMs. Vanguard Triple-DES encryption uses 2 pre-shared keys with throughputs of up to 3 Megabytes per second (Mbps).
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<b>Hardware Options Vanguard 340 Enhanced</b>	The Vanguard 340 Enhanced uses an ECC DIMM which supports DES, Triple-DES (168-bit) and AES Encryption. For detailed information regarding Encryption, refer to your <i>Encryption Manual</i> (Part Number T0103-09).
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**Figure 1-1. Hardware-based VPN Solution for Site-to-Site Applications.**

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## Standard-based Tunneling and Encryption for IP Traffic

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### IPSec

IPSec is the predominant tunneling and security standard for IP Networks. It defines protocols required for site-to-site as well as remote access VPN implementations at layer 3 of the OSI model. Vanguard Applications Ware release 5.5 and greater supports these IPSec features:

- Authentication Header (AH) and Encapsulating Security Payload (ESP) for user authentication and encryption.
- Internet Key Exchange (IKE) using preshared keys for key management.
- Message Digest (MD5) and Secure Hashing Algorithm-1 (SHA-1) for data integrity.

#### 340 Enhanced:

- ISAKMP supports DES, Triple-DES and AES
- ESP support DES, Triple-DES and AES

#### ■ Note

ISAKMP and ESP support is available with the ECC DIMM on the Vanguard 340 Enhanced.

## Multi-protocol Tunneling and Encryption

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### General Router Encryption (GRE)

Whereas IPSec can only tunnel IP traffic over IP Networks, GRE tunneling is a Layer 2 protocol that can tunnel multi-protocol traffic over IP Networks. This enables the Vanguard to tunnel and encrypt IP, IPX, AppleTalk, and other bridge data.

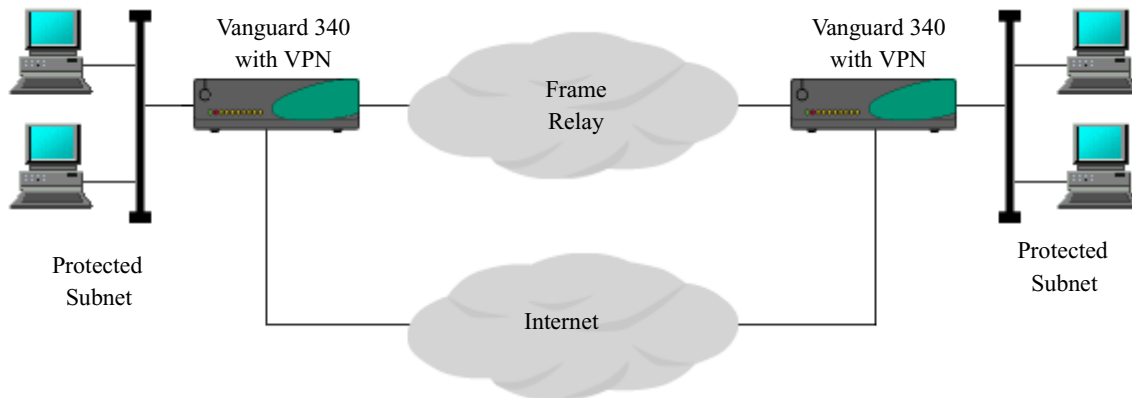
DES and Triple-DES (112-bit) are used as encryption algorithms and the fast and efficient SAM proprietary key exchange protocol is used for key management. Integrity Check Character (ICC) establishes data integrity when the SAM protocol is implemented.

---

## Frame Relay and X.25 Encryption

### Frame Relay and X.25 Networks

Another value-added feature in Vanguard Managed Solutions VPN implementation is the ability to encrypt LAN traffic and serial legacy protocols (SNA, SDLC, SLAC, and TBOP) and tunnel them over Frame Relay and X.25 networks. This is particularly useful in the financial industry where SNA traffic going out into the branches and ATM machines require a high level of security. This implementation also uses DES, Triple-DES (112-bit) for encryption and VanguardMS Proprietary SAM key exchange protocol to negotiate the keys.



**Figure 1-2. Encryption over IP, Frame Relay, and X.25 Networks**

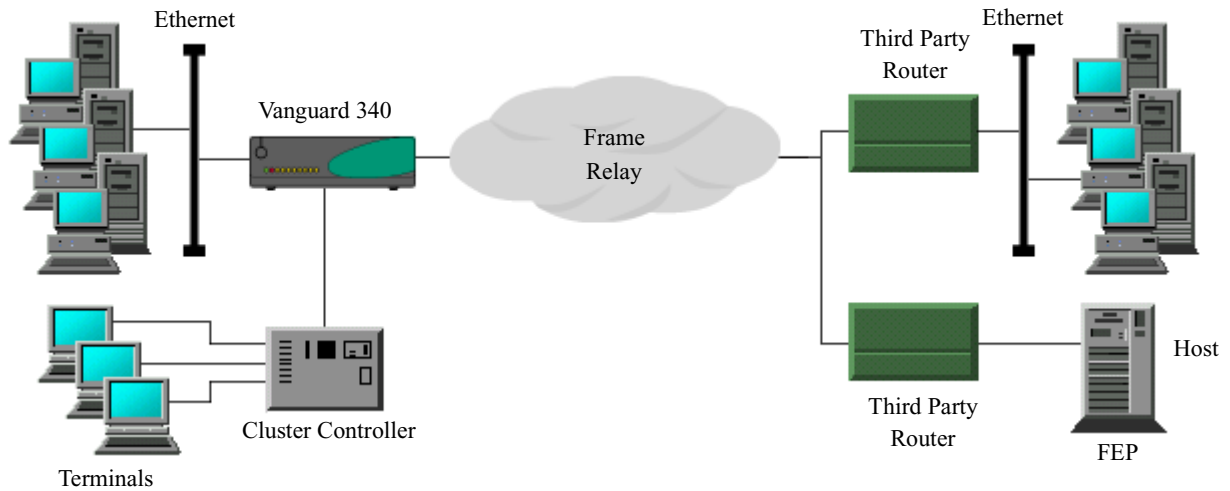
### Security Features

The security features in Vanguard Applications Ware release 5.5 and greater also include Firewall functionality based on IP Packet Filtering. Access Control Lists can be configured based on a combination of source and destination addresses, IP Protocol, TCP/UDP source and destination port numbers/ranges, and interface numbers. A feature called Cypher Block Chaining prevents repeated patterns in Plaintext from appearing as repeated patterns in Cyphertext, thus making it harder for hackers to find traffic patterns.

## IP and Serial Protocols over Frame Relay

### Introduction

The Vanguard 340 and 340 Enhanced support multi protocol encapsulation of IP traffic and serial protocols over frame relay as specified by RFC 1490. As shown in Figure 1-3, a SNA cluster controller connects to a serial port on the Vanguard 340 and the Ethernet LAN connects to the 10/100BaseT Ethernet port. The Vanguard is fully interoperable with third party routers via RFC 1490.

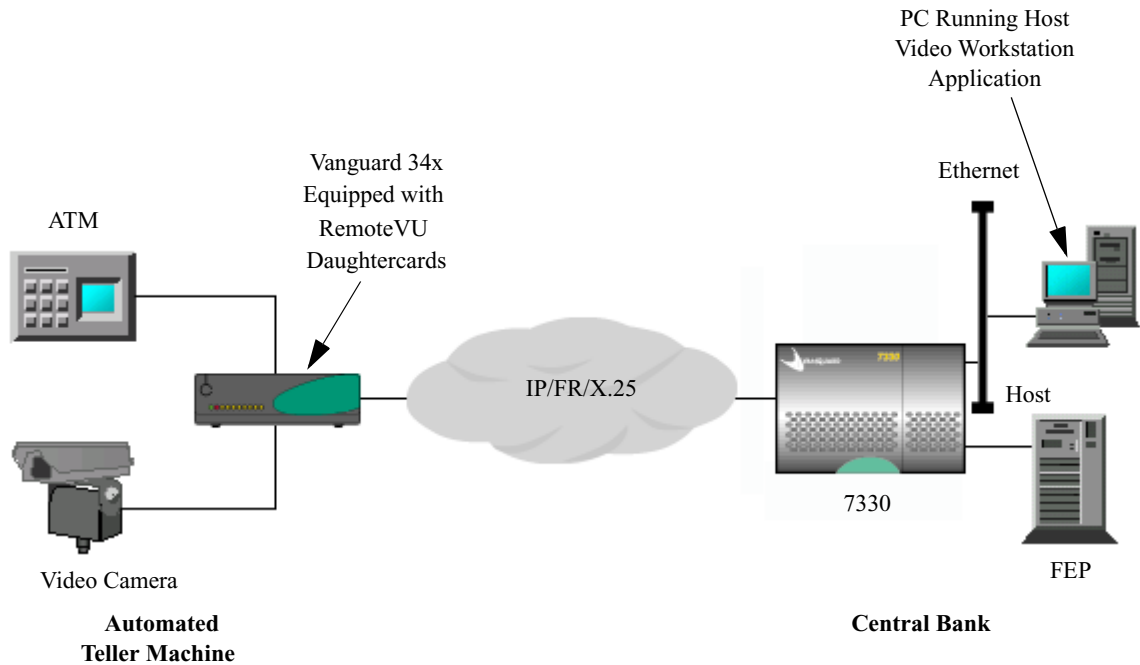


**Figure 1-3. IP and Serial Protocols over Frame Relay**

## Video and Serial Protocols over Public or Private Networks

### Introduction

As shown in Figure 1-4, the Vanguard 340 and 340 Enhanced can support encapsulation of video and serial protocols over public or private networks. This use of Vanguard 34x suits banking applications such as Automated Bank Machines (ABMs). With Dial on Demand software feature enabled, the Vanguard 34x initiates a connection only when there is a data transfer, that is only for the duration of a bank transaction. The RemoteVU Daughtercard can capture video and send video streams to the central bank's security system.

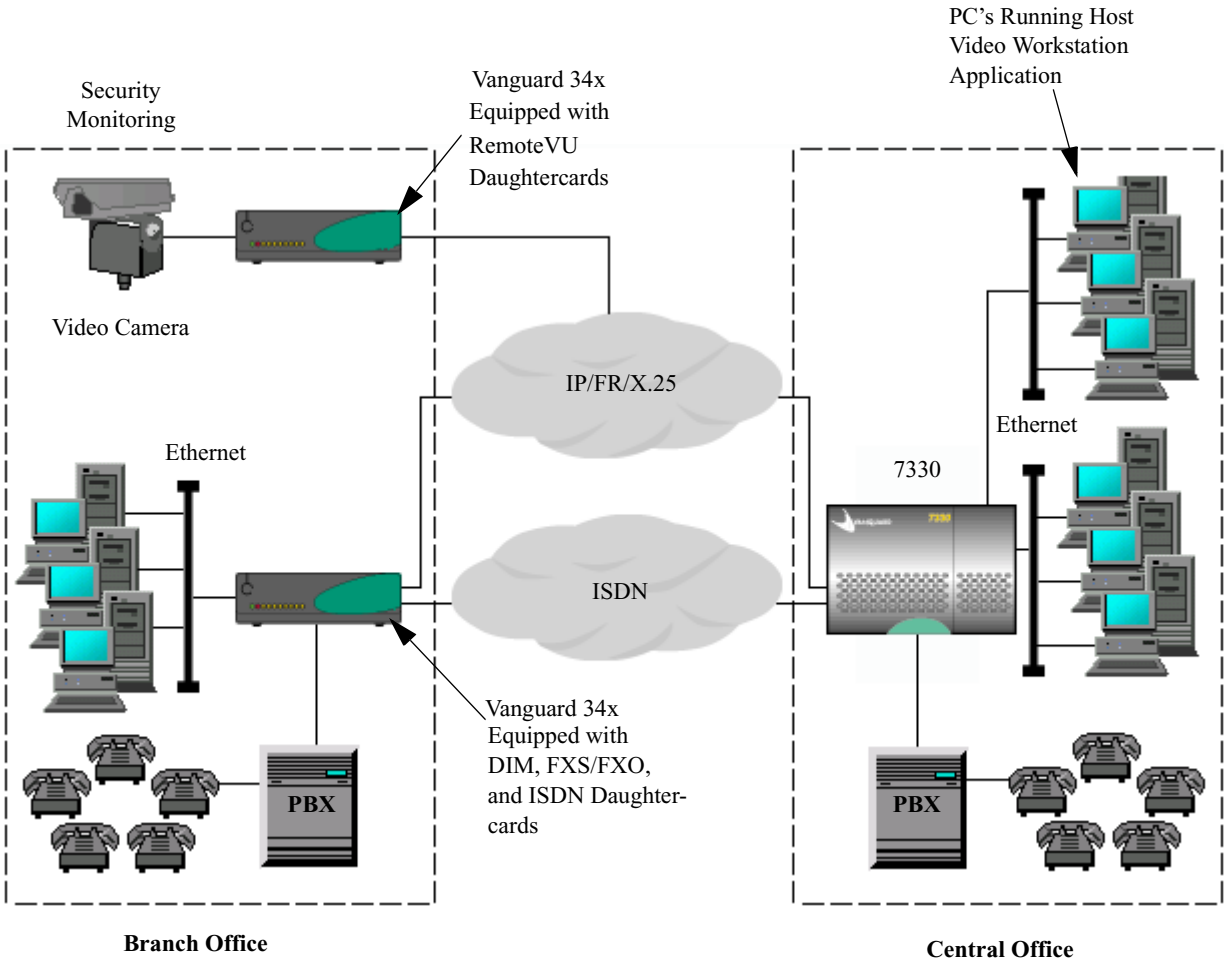


**Figure 1-4. Video and Serial Protocols over Public or Private Networks**

## Branch Office to Central Office over Public or Private Networks

### Introduction

The Vanguard 340 and 340 Enhanced offer an ideal solution for branch office to central office connectivity over a public or private network as shown in Figure 1-5. The Vanguard 34x is equipped with a T1 daughtercard supports connectivity to the network at fractional T1 speeds.



**Figure 1-5. Vanguard 34x supporting Voice, Video, and ISDN over a Public or Private Network**

**Application Matrix** This table describes the application types shown in Figure 1-5 and lists the various daughtercards used for connectivity over a private or public frame relay network:

<b>Application Type</b>	<b>Daughtercard Used</b>	<b>Application Description</b>
Branch access to Central Office	DSU DIM, FXS/FXO and ISDN Daughtercards	The Vanguard 34x supports voice, video and data traffic between the branch and central office over private or public network. The FXS/FXO Daughtercard supports telephones, PBX, and faxes. Connect a telephone or PABX to one FXS port on the FXS/FXO Daughtercard and all branch telephones have access to the central office PBX. This eliminates long distance telephone charges between the branch and central office.
ISDN Backup link between Branch and Central Office	DSU DIM, FXS/FXO and ISDN Daughtercards	To provide an alternative path in case of network failure, you can configure and connect serial ports to an external analog modem or switch 56K DSU. As Figure 1-5 illustrates, you can also configure ISDN for WAN backup.
Security Monitoring at Branch Office	RemoteVU and DSU Daughtercards	The Vanguard 34x equipped with a RemoteVU Daughtercard provides security surveillance and remote monitoring of the branch office location from the central office. The RemoteVU Daughtercard packetizes video stream in IP and sends the data over the network. Security personnel at the central office can control the branch office video camera from a PC running the Host Video Workstation application.

## SOHO and Branch Office to Central Office over ISDN

### Introduction

The Vanguard 34x equipped with optional daughtercards provide a wide range of network solutions for companies with small branch offices or telecommuting employees working from a home office. A dial in or dedicated ISDN link provides network connection for the home and branch as shown in Figure 1-6.

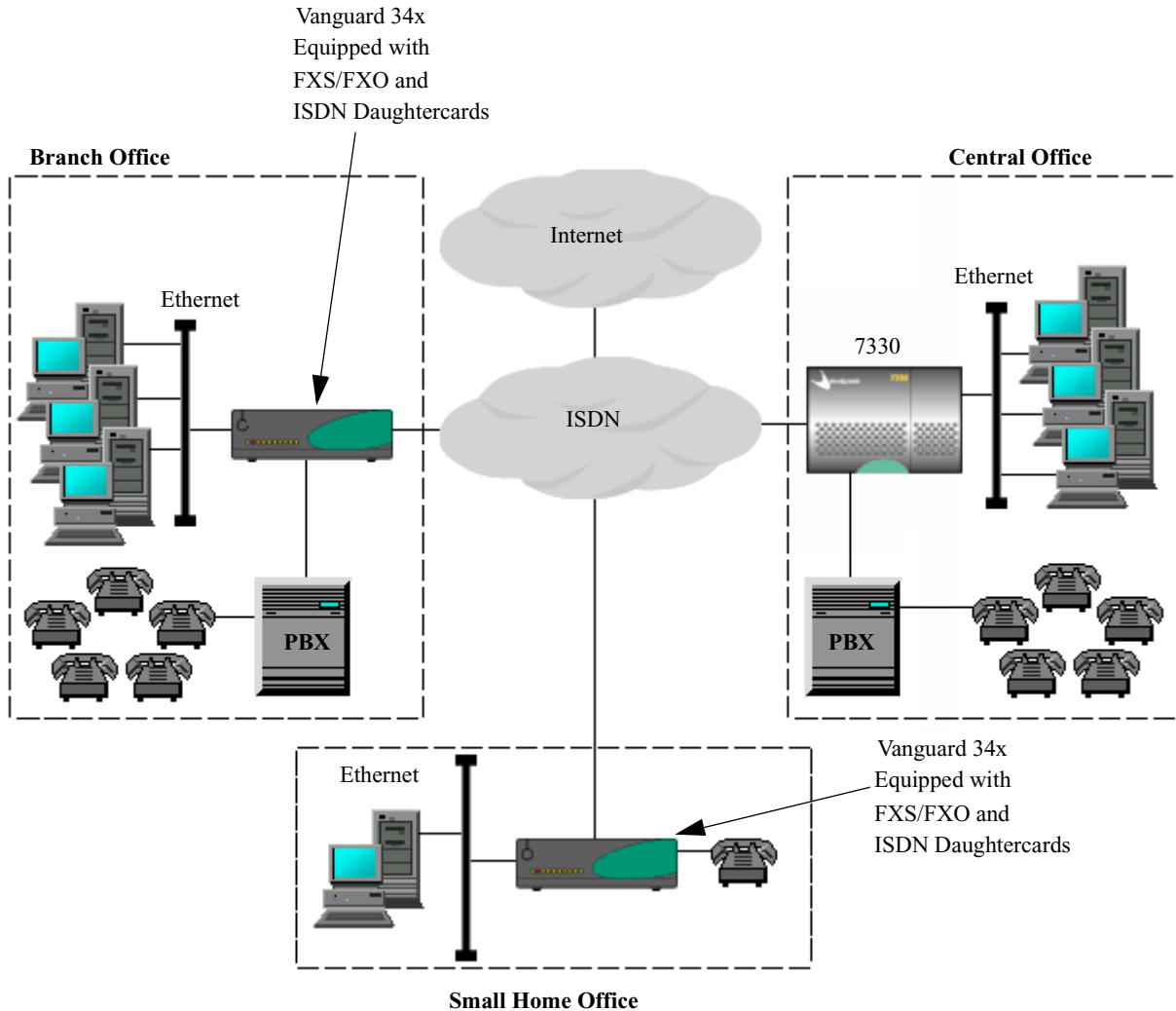


Figure 1-6. Small Home and Branch Office to Central Office Application

<b>Office Type</b>	<b>Daughtercard Used</b>	<b>Description</b>
Small Home Office	FXS/FXO and ISDN Daughtercard	Equipped with a Vanguard supporting the FXS/FXO and ISDN daughtercard, a work-at-home employee can stay fully connected to the corporate backbone and PBX via an ISDN link. A telecommuter can easily access file servers, email servers, voice mail and the Internet from home. The Voice Over IP (VoIP) software feature provides voice support.
Branch Office	FXS/FXO and ISDN Daughtercard	Small branch offices can access the corporate backbone and PBX in the same way as a work-at-home employee. With Dial on Demand software feature enabled, the Vanguard 34x initiates a connection for data transfer and disconnects when data transfer has stopped.

■ **Note**

With release 6.0 and greater, the Vanguard 340 can support the 4-Port Voice FXS and 4-Port Voice FXO Daughtercards. The Vanguard 340 Enhanced requires 6.4 and greater and can support the 4-Port Voice FXS and 4-Port Voice FXO Daughtercards.

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## Vanguard 340 and 340 Enhanced DSL and G.SHDSL

**DSL/Cable Modem** The Vanguard 340, and 340 Enhanced support connectivity to high-speed broadband services such as DSL and Cable by connecting the 10/100BaseT port on the Vanguard 340 Enhanced to the Ethernet port on the DSL or Cable modem.

Cable modem speeds vary in the downstream direction. Network speeds can reach 27 Mbps., but this is an aggregate amount of bandwidth that is shared by users. Few computers will be capable of connecting at such high speeds, so a more realistic number is 1 to 3 Mbps. In the upstream direction speeds can be up to 10 Mbps. Most modem producers have selected a more optimum speed between 500 Kbps and 2.5 Mbps.

### Remote Branches

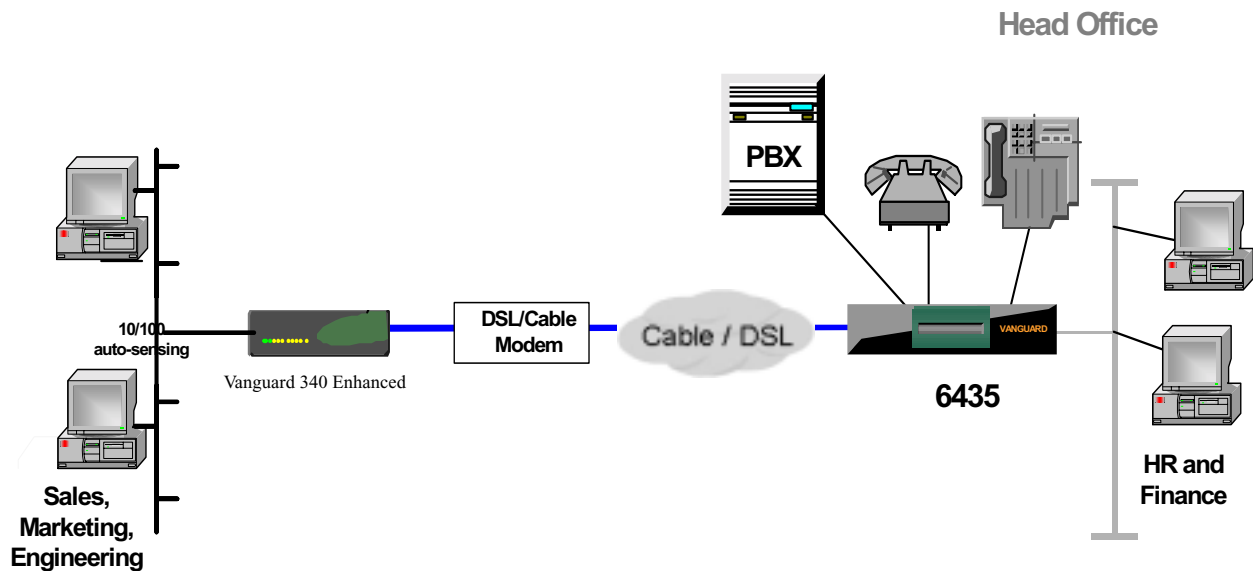


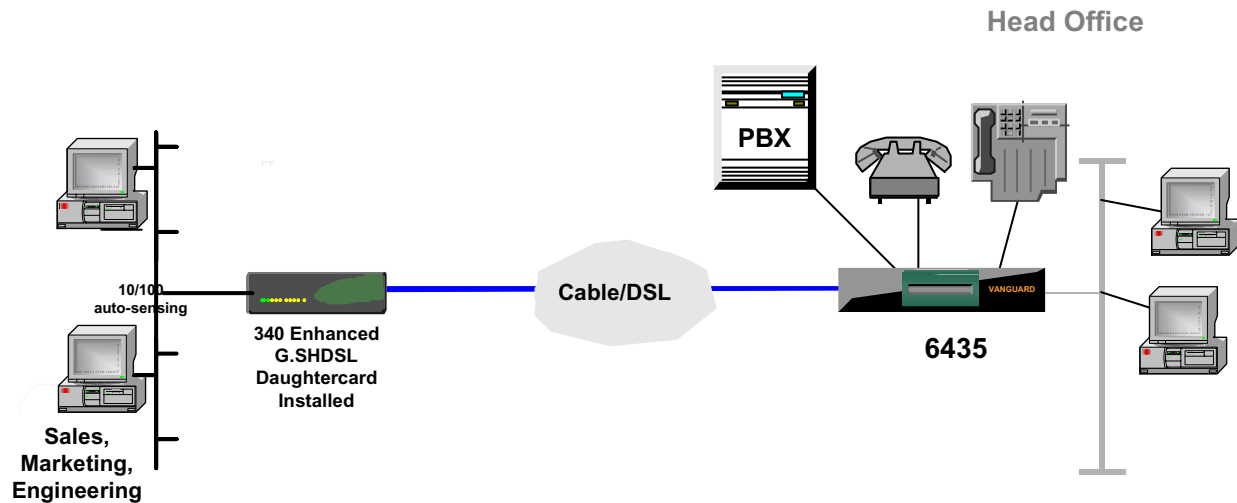
Figure 1-7. LAN Over WAN (DSL/Cable Modem)

## G.SHDSL Daughtercard

### Introduction

The Vanguard 340 and 340 Enhanced support connectivity to high-speed broadband services such as G.SHDSL by installing a Vanguard G.SHDSL daughtercard.

### Remote Branches



**Figure 1-8. LAN Over WAN (G.SHDSL Daughtercard Installed)**

### G.SHDSL Daughtercard

The G.SHDSL Daughtercard is available for the Vanguard 340 and 340 Enhanced with Release 6.4 and greater software. One G.SHDSL Daughtercard is supported in either of the two daughtercard slots. For information on the G.SHDSL Daughtercard reference the *G.SHDSL Manual* (Part Number T0100-14). Installation instructions are available in the *Daughtercard Installation Guide* (Part Number T0020).

### 340 G.SHDSL Limitation

There is a limitation on available memory in the 340 that does not allow you to run G.SHDSL and Voice at the same time. This is caused by the 4M flash limit in 340. This limitation would not be present in the 340 Enhanced.

## Clocking Limitations

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### Clocking Limitations Vanguard 34x

Listed below are the clocking issues relating to Port 3 of the Vanguard 34x:

#### **Vanguard 34x DCE INT --> VG6560/VG320/VG64xx EXT at 1.5 Mbps**

When a Vanguard 34x Port 3 is configured as internally clocked and is connected to a 6560/320/64xx which is configured as EXT clocked, and the Vanguard 34x internal clock is configured at 1.5 Mbps, the link has clock slippage and CRC errors.

*Workaround:* Configure the VG6560/VG320/VG64xx port "Invert TX Clock" to YES.

#### **Vanguard 34x DCE INT --> VG6560 SDB2 EXT**

When a Vanguard 34x Port 3 is configured as internally clocked and is connected to a SDB2 card on a Vanguard 6560 which is configured as EXT clocked, the link will not come up. *Workaround:* Configure the Vanguard 6560 SDB2 port as INT clocked and the Vanguard 34x as EXT clocked. Connect the ports with a crossover cable. The DIM on the Vanguard 6560 SDB2 port should be in the DCE position.

#### **Vanguard 34x DCE EXTLP --> VG6560 SDB2 or SDB INT**

When a Vanguard 34x Port 3 is configured as EXTLP clocked and is connected to a SDB2 or SDB card in a Vanguard 6560, the link will not come up.

*Workaround:* Configure the Vanguard 6560 SDB2 or SDB port as INT clocked and the Vanguard 34x as EXTLP clocked. Connect the ports with crossover cable. The DIM on the Vanguard 6560 SDB2 or SDB port should be in the DCE position.

In general, configuring a DTE device as Internally clocked or a DCE device as externally clocked or EXTLP are not recommended configurations.

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# Chapter 2

## Hardware Description

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### Overview

#### Introduction

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This chapter describes the Vanguard 340 and 340 Enhanced:

- Enclosures
  - Motherboards
  - Vanguard Daughtercards
-

## Enclosures

### Introduction

This section describes the components of the enclosures.

### Vanguard 340 and 340 Enhanced Enclosure

The Vanguard 340 and 340 Enhanced fit into a compact, low profile enclosure case that can be:

- used as a desktop standalone device
- seated on a shelf in a standard 19-inch equipment rack
- bracketed to the underside of a desktop or vertical surface

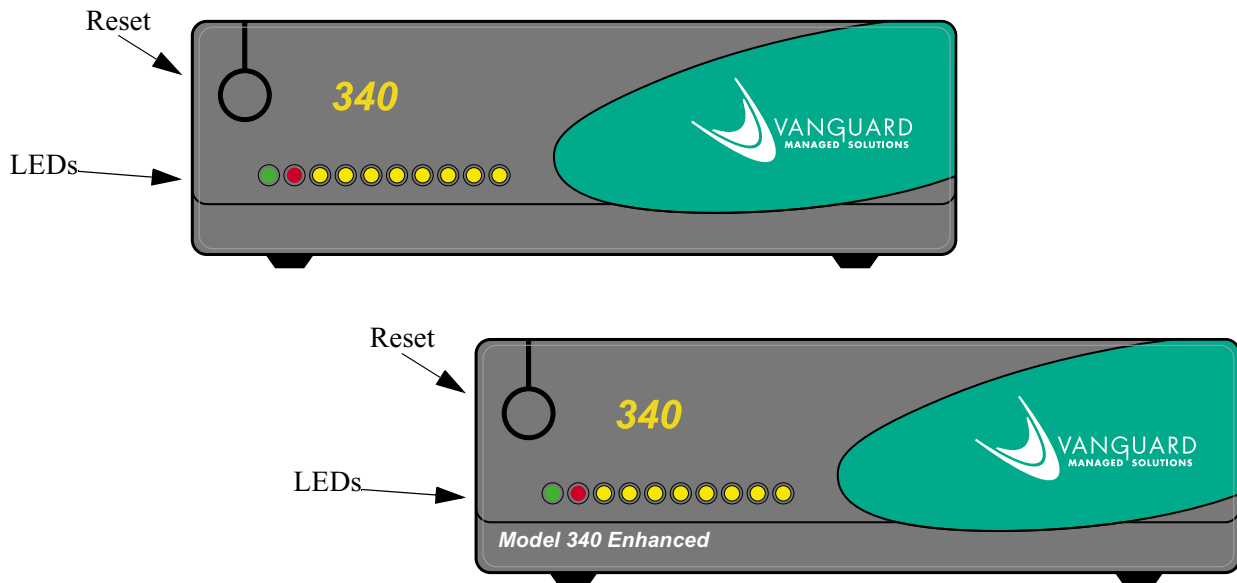
The enclosure contains a motherboard and (two optional) daughtercards.

### Front Panel

The front panel of the Vanguard 340 and 340 Enhanced (see Figure 2-1) includes:

- 10 LEDs that provide node status
- Reset button

For a full description of all Front panel LEDs and reset button, refer to the “Powerup Diagnostics” section in Chapter 4.

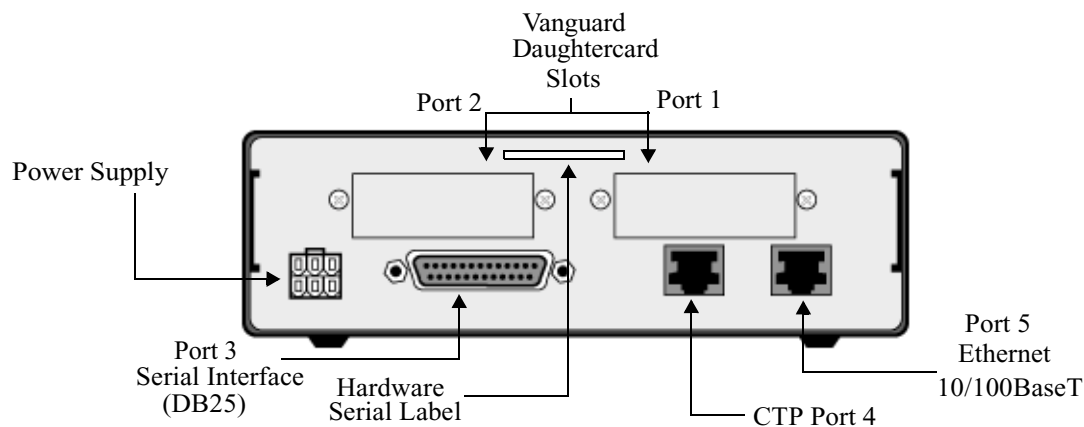


**Figure 2-1. Vanguard 340 and 340 Enhanced Front Panels**

## Rear Panel

Figure 2-2 shows a Vanguard 340 and 340 Enhanced rear panel containing the following:

- One Sync/Async Universal Serial Interface port (DB-25 connector)
- One Async port (RJ-45 connector) as the CTP
- One Ethernet port (with 10/100BaseT connector)
- Power Supply connector
- Two locations for Vanguard Daughtercards



**Figure 2-2. Vanguard 340 and 340 Enhanced Rear Panel**

### ■ Note

For information about port numbering and cabling, refer to the “Port Characteristics and Cabling” section in Chapter 3.



### Caution

Do not connect Ports 4 or 5 to the Public Communications Network.

## Serial Number

The Hardware Serial Number indicates the version of hardware in your unit. This serial number label is located on the rear panel of the Vanguard router.

Refer to this serial number when contacting a Vanguard Managed Solutions Service Representative.

## Motherboards

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### General Description

The Vanguard 340 and 340 Enhanced motherboards contain different components. Figure 2-3 and Figure 2-4 show the two motherboards.

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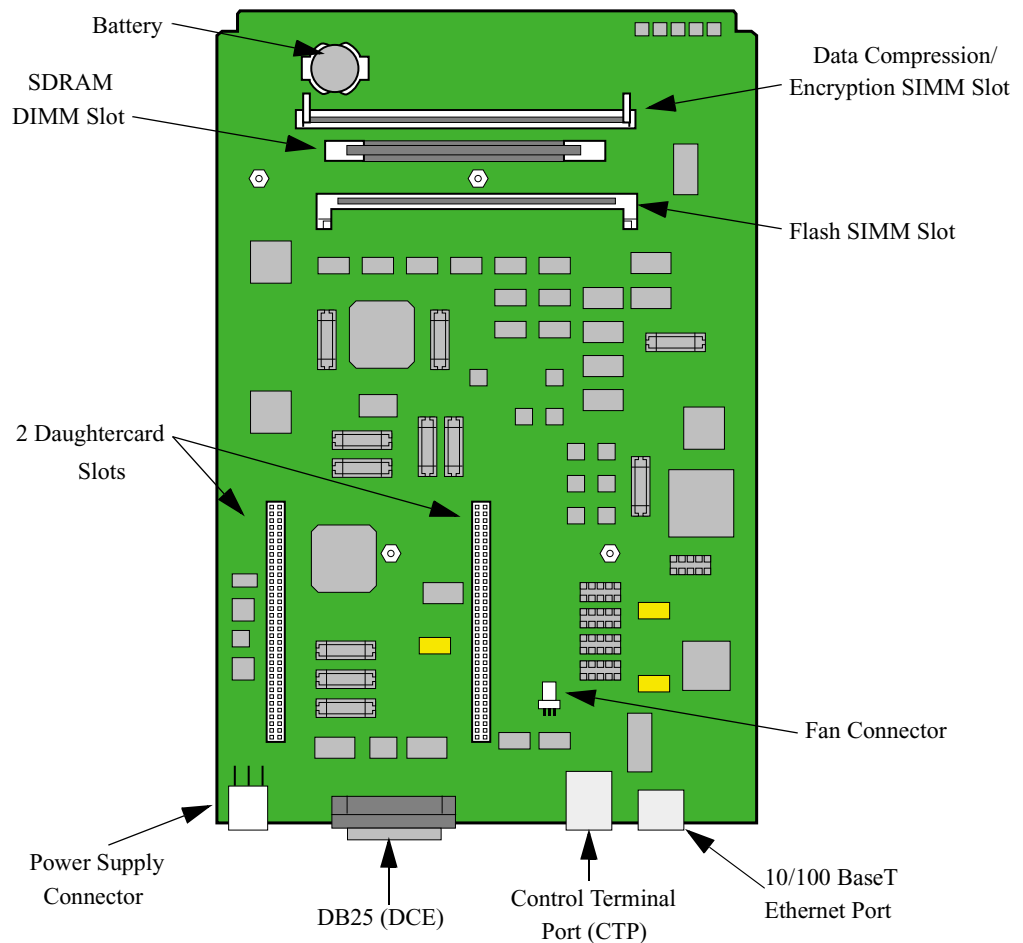
### Vanguard 340 Motherboard

The Vanguard 340 motherboard contains 4 Megabytes of Non-Volatile FLASH on board and has 16 Megabytes of SDRAM (synchronous DRAM) on an attached DIMM.

These components are included on the motherboard:

- Connectors for:
  - FLASH expansion: 4 Megabyte SIMM on board
  - SDRAM Expansion: 16 Megabyte DIMM standard
  - Data Compression/Encryption SIMM (optional)
  - Two Vanguard Daughtercard slots
  - Fan
- A battery that provides power for the unit's real time clock
- 10/100BaseT Ethernet (RJ-45connector)
- Control Terminal Port (RJ-45connector)
- DB-25 Connector

Figure 2-3 shows the location of the motherboard components of the Vanguard 340.



**Figure 2-3. Vanguard 340 Motherboard**

### Vanguard 340 Enhanced Motherboard

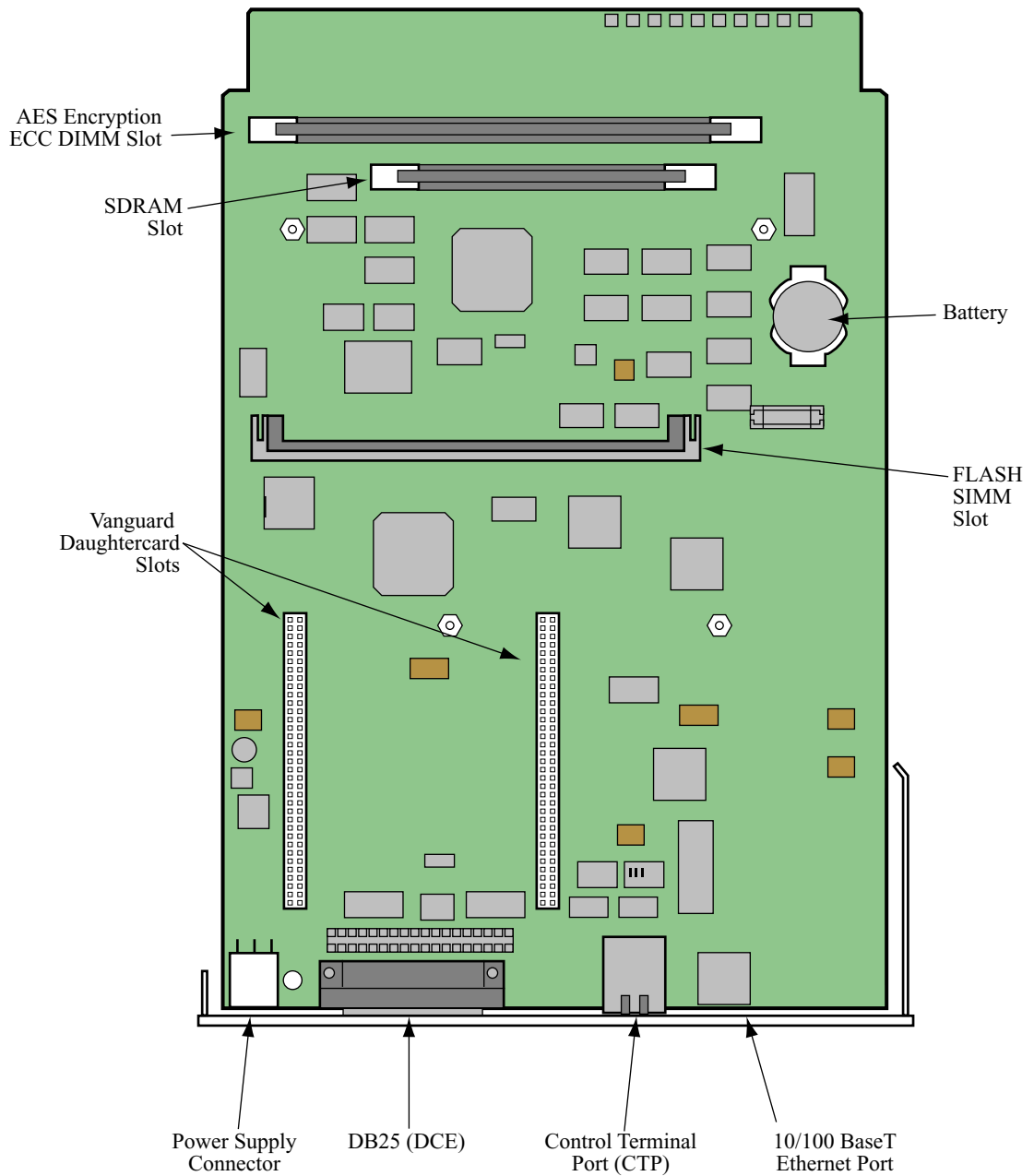
The Vanguard 340 Enhanced motherboard contains 8 Megabytes of Non-Volatile FLASH on board and has 32 Megabytes of SDRAM (October 2004 and later) 16 Megabytes of SDRAM (synchronous DRAM) on an attached DIMM was available before October 2004.

These components are included on the motherboard:

- Connectors for:
  - FLASH expansion: 8 Megabyte SIMM on board
  - AES Encryption Slot - ECC DIM
  - Two Vanguard Daughtercard slots

- A battery that provides power for the unit's real time clock
- 10/100BaseT Ethernet (RJ-45connector)
- Control Terminal Port (RJ-45connector)
- DB-25 Connector

Figure 2-4 shows the location of the 340 Enhanced motherboard components.



**Figure 2-4. Vanguard 340 Enhanced Motherboard**

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**Access the Motherboard**

To access the motherboard components you must remove the motherboard from the enclosure.

For information about removing and installing the motherboard refer to the “Accessing the Motherboard” section in Chapter 3.

For information about removing or installing motherboard components, refer to the “Modifying Your Vanguard 340 and 340 Enhanced” section in Chapter 3.

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**Daughtercards**

The Vanguard 340 and 340 Enhanced can support two optional daughtercards. These daughtercards are described in the “Vanguard Daughtercards” section on page 2-9.

**■ Note**

If you are only using one ISDN or enhanced ISDN BRI daughtercard, the card must be located in the Port 1 position. If you are using Release 6.3 and greater, the enhanced ISDN BRI ST data daughtercard must be located in port 1 and the ISDN BRI voice card would go in port 2. For more information refer to Chapter Five of the *Daughtercard Installation Guide* (Part Number T0020).

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**Serial Interface**

The Vanguard 340 and 340 Enhanced support a serial interface that is installed on the motherboard. The serial interface can be configured to function as a Digital Interface Module allowing the support of these interfaces on Port 3 only:

- V.24
- V.35
- V.36
- V.11/X.21

For information on configuring the serial interface, refer to the “Configuring the Serial Interface” section in Chapter 3. The serial interface supports only DCE. It can accommodate DTE with the use of a crossover adapter cable. For information on cabling for DTE capability, refer to the “V.35/V.36, and X.21/V.11 Interface Types” section in Chapter 3.

---

**SIMMs and DIMM**

The Vanguard 340 motherboard has three slots:

- SDRAM: This connector takes a standard DIMM.
- FLASH: This connector takes a FLASH SIMM to support alternate bank FLASH options.
- Data Compression/Encryption: Set on its side, this connector takes a SIMM to provide data compression and encryption capabilities.

The Vanguard 340 Enhanced motherboard has three slots:

- SDRAM: This connector takes a standard DIMM.
- FLASH: This connector takes a FLASH SIMM to support alternate bank FLASH options.
- ECC DIMM - supports DES, Triple DES (168-bit) and AES Encryption.

**Caution**

To avoid damaging the equipment, be sure to place the SDRAM DIMM, and the FLASH, and Data Compression/Encryption SIMMs in the correct slot.

For information on installing or removing these components, refer to the “Adding and Removing Memory Modules” section in Chapter 3.



### **Warning**

Your Vanguard product was designed and certified for use with specific memory option SIMMs. It is IMPORTANT that you install only the devices that are certified for use with your Vanguard product. Installation of an incorrect FLASH SIMM module could result in damage to the SIMM device or your Vanguard Product. Please see the list below for the memory device that is compatible with your hardware platform.

#### **Vanguard 340 Enhanced and 342 Compatible FLASH SIMM Devices are as follows:**

8-Meg FLASH Devices

PN - "IW-388DL3-R-120"

PN - "CT8M8FJV120.M1M"

#### **Vanguard 340 Compatible FLASH SIMM Devices are as follows:**

4-Meg FLASH Devices

PN - "EDI7F292MC100BNC"

PN - "SM70848XA2JIES2"

The FLASH SIMM Device Part Number (PN) can be found in small print on the face of the SIMM device. For further assistance, please call VanguardMS Service.

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## Vanguard Daughtercards

### Introduction

The Vanguard 340 supports these standard Vanguard Daughtercards:

- 1-Port FXS/FXO Voice
- 2-Port Voice FXS
- 4-Port Voice FXS
- 4-Port Voice FXO
- FT1/FE1
- Dual E&M
- RemoteVU (Video)
- ISDN BRI-U Data
- ISDN and Enhanced ISDN BRI-S/T Data
- ISDN BRI-S/T Voice
- DSU
- DIM
- V.34
- V.90
- G.SHDSL

Vanguard 340 Enhanced supports:

- 1-Port FXS/FXO Voice
- 2-Port Voice FXS
- 4-Port Voice FXS
- 4-Port Voice FXO
- FT1/FE1
- Dual E&M
- ISDN BRI-U Data
- ISDN and Enhanced ISDN BRI-S/T Data
- ISDN BRI-S/T Voice
- DSU
- V.90
- G.SHDSL
- ECC DIMM

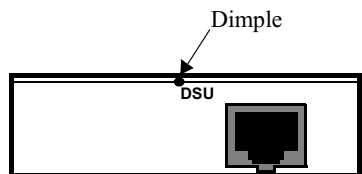
The following section briefly describes these cards.

For instructions for installing these cards, refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020).

### Daughtercard Compatibility

Older Vanguard Daughtercards do not fit into the Vanguard 340 or 340 Enhanced. You can only use the newer daughtercards which are identified by a dimple as shown in Figure 2-5. If the dimple is not present, do not attempt to use the Daughtercard in the Vanguard 34x.

Also, when installing a Vanguard Daughtercard into a Vanguard 34x, you must use the shorter two-sided header. The taller header is used with other Vanguard units.



**Figure 2-5. New Vanguard 34x Daughtercard Example**



**Caution**

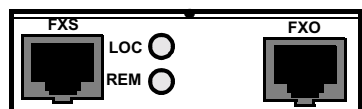
If you attempt to force an older Vanguard Daughtercard into a Vanguard 34x, the equipment will be damaged.

If you have an older Vanguard Daughtercard and would like to use it in a Vanguard 34x, contact your VanguardMS representative about having the card reworked.

**1-Port FXS/FXO Voice**

The Vanguard 34x supports the FXS/FXO Daughtercard. This daughtercard supports voice channel, using either an analog FXS or FXO interface. The 1-Port Voice FXS/FXO Daughtercard provides RJ11 connectors for FXS and FXO Ports. However, only one port can be active at a time.

Figure 2-6 shows the FXS/FXO Voice Daughtercard connectors as they appear on the back panel.

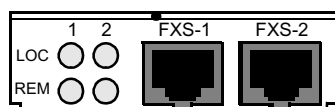


**Figure 2-6. 1-port FXS/FXO Voice Daughtercard Connector**

**2-Port Voice FXS**

The Dual FXS Daughtercard provides two FXS interface ports and support one voice channel each. The 2-Port Voice FXS Daughtercard has two RJ11 connectors for two FXS Ports. The two ports can be used simultaneously and each port supports one voice channel.

Figure 2-7 shows the 2 Port Voice FXS Daughtercard connectors as they appear on the back panel.



**Figure 2-7. 2-port FXS Daughtercard Connector**

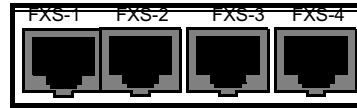
**■Note**

Calls between two FXS ports within the same Vanguard 34x are not supported.

#### 4-Port Voice FXS Daughtercard

The Vanguard Quad FXS Daughter Card is supported on the Vanguard 340. The 4-Port Voice FXS Daughtercard has four RJ11 connectors for four FXS Ports. The new software for this card is in release 6.0 and greater. The Quad cards are supported on the Vanguard 340 Enhanced (which requires release 6.4 and greater software.)

Figure 2-8 shows the 4-Port Voice FXS Daughtercard connectors as they appear on the back panel.



**Figure 2-8. FXS Daughtercard**

#### 4-Port Voice FXO Daughtercard

The Vanguard Quad FXO Daughter Card is supported on the Vanguard 340. The 4-Port Voice FXO Daughtercard has four RJ11 connectors for four FXO Ports. The new software for this card is in release 6.0 and greater. The Quad cards are supported on the Vanguard 340 Enhanced (which requires release 6.4 and greater software.)

Figure 2-9 shows the 4-Port Voice FXO Daughtercard connectors as they appear on the back panel.



**Figure 2-9. FXO Daughtercard**

#### ■ Note

Only one 4-Port card can be installed in the Vanguard 340 Enhanced. Choose either daughtercard slot 1 or slot 2. The Vanguard 340 Enhanced supports six voice ports. Any combinations of the cards below are supported:

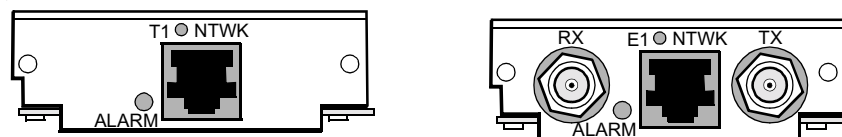
- 1 Quad FXO or FXS plus 1 Dual FXO or FXS or 1 Single FXO or FXS

#### FT1/FE1

The FT1/FE1 Daughtercards allow the Vanguard 34x to transfer data over a T1 or E1 network. The daughtercards support these full and fractional T1 or E1 speeds:

- The FE1 Daughtercard provides line rates 2.048 Mbps and data rates of  $n \times 64$  kbps (where  $n$  is 1 to 31) per channel.
- The FT1 Daughtercard provides line rates 1.544 Mbps and data rates of  $n \times 56$  kbps (where  $n$  is 1 to 24) per channel.

Figure 2-10 shows the FT1 and the FE1 Daughtercard connectors as they appear on the back panels. The FT1 Daughtercard has a single RJ48C connector while the FE1 Daughtercard has two BNC connectors along with one RJ48C connector.



**Figure 2-10. FT1 and FE1 Daughtercard Connectors**

■ **Note**

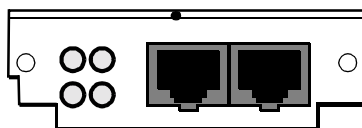
The FE1 Daughtercard comes with a label “!” which means that the user should refer to the Vanguard Daughtercard Installation Guide. The purpose is to point out that the E1 interface complies with the Australian requirements ACA TS-016-1997 for connection to E1 SELV services. The E1 interface meets the IEC 60950 specifications for TNV1.

---

**Dual E&M**

The Dual E&M Daughtercard has two E&M interfaces. The ports use RJ11 connectors.

Figure 2-11 shows the Dual E&M Daughtercard connectors as they appear on the back panel.



**Figure 2-11. Dual E&M Daughtercard Connector**

---

**RemoteVU (Video)**

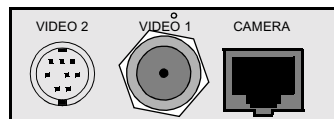
The RemoteVU Daughtercard provides complete end-to-end solution for the transport of video images over low bandwidths (as low as 2.4 kbps). It is ideal for applications such as security surveillance and remote monitoring.

The daughtercard has three ports:

- RJ-45 connector: for camera controls (such as pan-tilt-zoom).
- BNC connector: the primary video input from a single camera.
- 8 Pin Mini-DIN: connects to a custom cable that terminates in three BNC connectors.

When its video ports are connected to a video multiplexor, the RemoteVU Daughtercard can support up to 64 cameras. The daughtercard converts analog video to digital, scales size, and compresses and transports the data. In addition to supporting live video streams, the daughtercard has a one-minute history buffer for capturing video before the connection is established.

Figure 2-12 shows the RemoteVU Daughtercard connectors as they appear on the back panel.



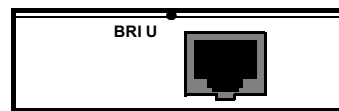
**Figure 2-12. RemoteVU Daughtercard Connector**

**ISDN BRI-U Data**

This card provides 2B+D Channel through an ISDN BRI U interface. It conforms to ANSI T1.601 1992 (2B1Q), is LAPD:ITU Q.921 compliant, and supports the following:

- Integral X.31
- Q.931 dial support
- NI1, 5ESS, DMS-100 switch types
- D Channel Packet Mode
- Leased Circuit Services (I Interface)
- Japan High-Speed Digital

Figure 2-13 shows the ISDN BRI-U Daughtercard connector as it appears on the back panel.



**Figure 2-13. ISDN BRI-U Daughtercard Connector**

**ISDN and Enhanced ISDN BRI-S/T Data**

This card provides 2B+D Channel through a BRI S/T interface. It conforms to ITU I.430, is LAPD:ITU Q.921 compliant, and supports:

- Integral X.31
- Q.931 dial support
- NI1, 5ESS, DMS-100, ETSI, Euro Numeric switch types
- D Channel Packet Mode
- Leased Circuit Services (I Interface)
- Permanent B for German Monopol support or Japan High-Speed Digital

Figure 2-14 shows the ISDN BRI-S/T Daughtercard connectors as they appear on the back panel.



**Figure 2-14. ISDN and Enhanced ISDN BRI-S/T Daughtercard Connector**

**■ Note**

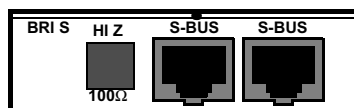
Termination options for the Release 6.3 and greater enhanced ISDN BRI ST data Daughtercards are set in the Configure menu, and are not controlled by switches. For more information, refer to the *Vanguard Integrated Services Digital Network: ISDN Manual* (Part Number T0103-06).

## ISDN BRI Voice

This card provides 2B+D Channel through a BRI S/T interface. It conforms to ITU I.430, is LAPD:ITU Q.921 compliant, and supports:

- Integral X.31
- ITU-T Q.931 (EURO ISDN) - ETSI switch type to connect to PBXs and public networks.
- ECMA 143 - QSIG Basic Service to connect to PBXs over private line.
- ECMA 165 - QSIG Generic Functions for Support of PBX Supplementary Services.
- ITU-T G.711A (A-law) and G.711U ( $\mu$ -law) interface voice encoding.
- ITU-T G.723, G.729, and VanguardMS proprietary CVSELP packet voice compression.

Figure 2-15 shows the ISDN BRI Voice Daughtercard connectors as they appear on the back panel.



**Figure 2-15. ISDN BRI Voice Daughtercard Connectors**

### ■ Note

For more information on supported daughtercard configurations, refer to the *Daughtercard Installation Manual* (Part Number T0020) Chapter Five.

## DSU

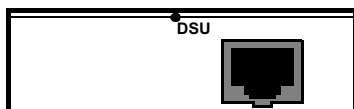
The DSU Daughtercard provides an RJ48S connector and can support speeds of 56 kbps (synchronous). It conforms to AT&T 62310 point-to-point and multipoint, and to ANSI T1/E1.4/91-006 56 kbps. The card supports the following capabilities:

- Internal/external clocking
- Internal/external loop back
- 4-wire line driver operation

The card also supports multidrop DSUs when either of these conditions exist:

- If a MARK Idle protocol is used (such as MX25).
- If the Telco uses an OR'ed or Data Contention is used to mix individual DRU drops.

Figure 2-16 shows the 56K DSU Daughtercard connector as it appears on the back panel.

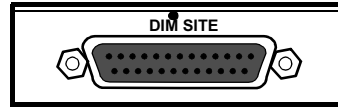


**Figure 2-16. DSU Daughtercard Connector**

**DIM**

This card supports a single V.11, V.24, V.35, or V.36 DIM (Digital Interface Module) and can be set as either a DTE or DCE.

Figure 2-17 shows the DIM Daughtercard connector as it appears on the back panel.

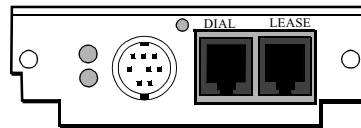


**Figure 2-17. DIM Daughtercard Connector**

**V.34 Modem**

The V.34 modem daughtercard is essentially a 3460 modem that can be installed in the Vanguard 340. Once the card is in your unit, it performs as if it were an external modem. For information about configuring and using the V.34 modem, refer to the *3460 Fast'R User's Guide* (Part Number T0022-01).

Figure 2-18 shows the rear panel connectors on the V.34 modem daughtercard.

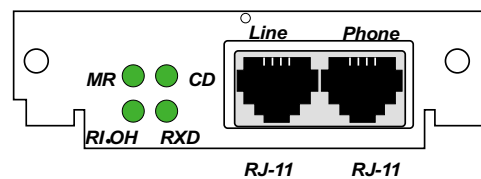


**Figure 2-18. V.34 Daughtercard Connector**

**V.90 Modem**

The V.90 modem daughtercard provides dial back-up for a customers PPP Async applications. The V.90 uses a dual RJ-11 for connection to central offices, PBXs or telephone systems. V.90 is designed for the Vanguard 320 and 34x. The Vanguard V.90 daughtercard requires release 6.2 or greater software.

Figure 2-19 shows the rear panel connectors on the V.90 modem daughtercard. For installation instructions, refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020).

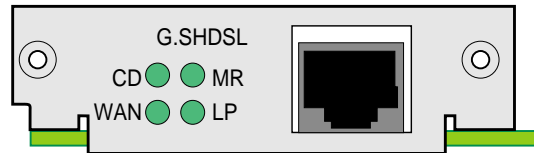


**Figure 2-19. V.90 Daughtercard Connector**

## G.SHDSL

The G.SHDSL Daughtercard is available for the Vanguard 340 and 340 Enhanced with Release 6.4 and greater software. One G.SHDSL Daughtercard is supported in either of the two daughtercard slots.

Figure 2-20 shows the rear panel connector on the G.SHDSL Daughtercard. For information on the G.SHDSL Daughtercard reference the *G.SHDSL Manual* (Part Number T0100-14). Installation instructions are available in the *Daughtercard Installation Guide* (Part Number T0020).



**Figure 2-20. G.SHDSL Daughtercard Connector**

### ■Note

There is a limitation on available memory available in the 340 that does not allow you to run G.SHDSL and Voice at the same time. This is caused by the 4M flash limit in the 340. The Vanguard 340 Enhanced does not have this limitation.

# Chapter 3

## Installation and Replacement

---

### Overview

#### Introduction

---

This chapter describes how to install, cable, and modify your Vanguard 340 and 340 Enhanced device.

Instructions are provided for the following tasks:

- Checking Your Shipment Contents
  - Installing the Vanguard 340 and 340 Enhanced
  - Configuring the Serial Interface
  - Cabling the Vanguard 340 and 340 Enhanced
  - Modifying Your Vanguard 340 and 340 Enhanced
-

## Checking Your Shipment Contents

### List of Contents

The Vanguard 340 and 340 Enhanced are packaged in shock-absorbent packing material. Inside your shipping carton, you should find the contents shown in Figure 3-1.

Before installing the Vanguard hardware, make sure these items are included in your shipment:

- Vanguard Enclosure (four rubber feet on the bottom side)
- Serial interface adapter cable (optional)
- External Power Supply and Cable



### Warning

The Vanguard 340 and 340 Enhanced use a different external power supply. The external power supply for 340 Enhanced (62749-03) cannot be used on the Vanguard 340. The Vanguard 340 External Power Supply (62945-01) can be used on the 340 Enhanced.

### Note

A Rack-Mounting Kit must be purchased separately.

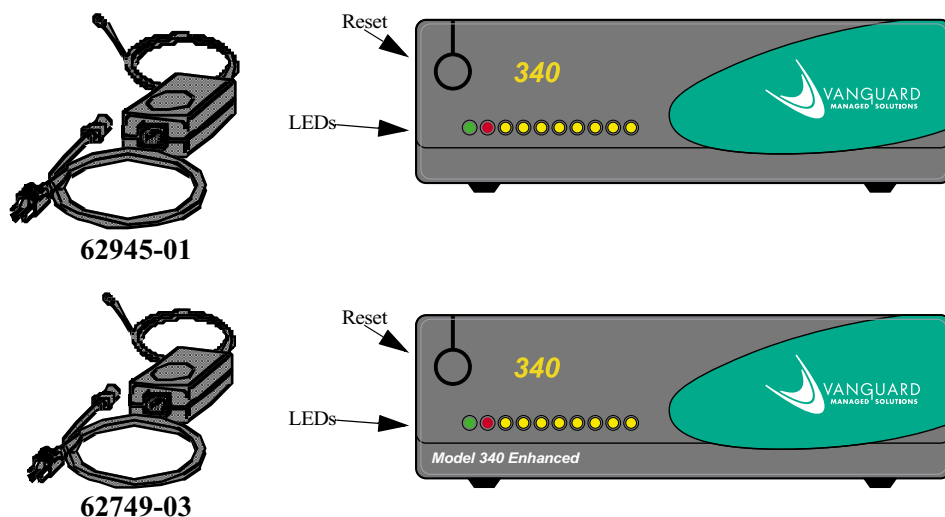


Figure 3-1. Vanguard 340, 340 Enhanced Shipment Contents

### External Power Supply

Vanguard Model	Part Number	APS Model Number
340	62945-01	APS61ES-30
340 Enhanced	62749-03	AD-748U-3125A

## **Installing the Vanguard 340 and 340 Enhanced**

### **Introduction**

---

This section explains how to install the Vanguard 34x and includes these topics:

- Selecting and Preparing the Installation Site
- Installing Your Vanguard 340 and 340 Enhanced
- Thermal Considerations
- Configuring the Serial Interface
- Port Characteristics and Cabling
- Daughtercard Cable Information
- Modifying Your Vanguard 340 and 340 Enhanced

After your Vanguard 34x is installed and cabled, go to the “Powering Up Your Vanguard 340 and 340 Enhanced” section in Chapter 4 for instructions on powering-up the unit.

---

## Selecting and Preparing the Installation Site

---

### How to Choose a Site

Before installing your Vanguard 34x, select a site for the device. Choose a site within an appropriate distance of a power source. The selected site should be free of accumulated dust and environmental extremes.



### Caution

All Vanguard products should be used in environments designed for computers and electronic equipment. In areas susceptible to lightning, take precautions to prevent damage to electronic equipment. Contact your telephone company or an electronic accessories vendor for information on lightning protection equipment. If you experience problems caused by surges from lightning, install appropriately rated surge suppressors on power and data lines connected to your Vanguard.



### Mise en Garde

Tous les produits Vanguard doivent être utilisés dans des environnements conçus pour les ordinateurs et équipements électroniques. Dans les zones sujettes à la foudre, prenez soin de protéger l'équipement électronique contre tout dommage. Contactez votre compagnie de téléphone ou un vendeur d'accessoires électroniques pour de plus amples informations sur les équipements de protection contre la foudre. Si vous avez des problèmes engendrés par des surtensions dues à la foudre, installez des protections contre les surintensités appropriées sur les lignes d'alimentation et de données connectées à votre produit Vanguard.



### Vorsicht

Alle Vanguard-Produkte sollten in für Computer und elektronische Geräte geeigneten Umgebungen verwendet werden. In durch Blitzschlag gefährdeten Gebieten sollten Vorsichtsmaßnahmen zum Schutz von elektronischen Geräten ergriffen werden. Informationen über Schutzeinrichtungen gegen Blitzschlaggefahr erhalten Sie von Ihrer Telefongesellschaft oder vom Einzelhandel für Elektrozubehör. Wenn Sie durch Blitzeinwirkung verursachte Spannungsstörungen feststellen, installieren Sie einen ausreichend abgesicherten Spannungsableiter an den Strom- und Datenleitungen, die mit dem Vanguard-Produkt verbunden sind.

---

### Power Source

Depending on your application and the country in which the Vanguard 340 operates, a power source must be a grounded 100 to 240 VAC outlet.

---

### Cable Clearance/ Air Circulation

Allow at least 12 inches (30.5 cm) in back of the unit for interfacing cable clearance and air circulation, as shown in Figure 3-2.



### Caution

To avoid overheating the unit's circuitry, you should never place anything on either side of the unit, within 1 inch (2.5 cm) of the ventilation slots, or within 12 inches (30.5 cm) of the back of the unit.



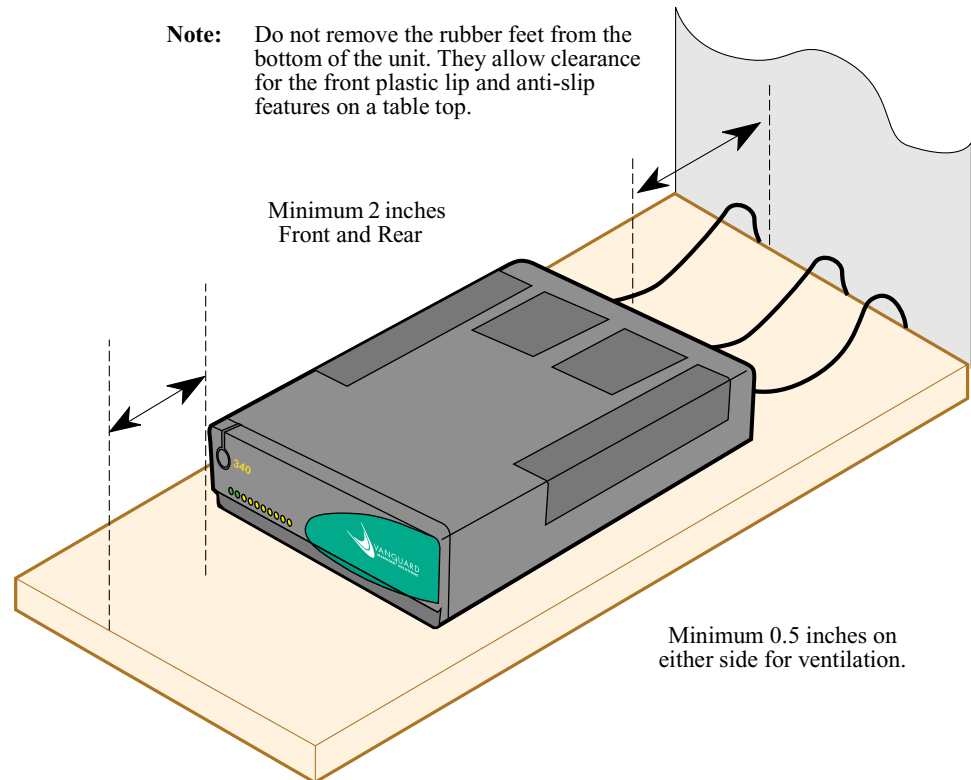
### Mise en Garde

Afin d'éviter toute surchauffe des circuits de l'unité, ne placez aucun objet sur l'unité à moins de 2,5 cm (1 pouce) des conduits de ventilation du panneau avant et à moins de 30,5 cm (12 pouces) de l'arrière de l'unité.



### Vorsicht

Zur Vermeidung einer Überhitzung der Geräteschaltkreise sollten Sie keine Gegenstände auf dem Gerät plazieren. Zu den Entlüftungsöffnungen der Vorderabdeckung sollte ein Abstand von 2,5 cm und zur Rückseite des Gerätes von 30,5 cm eingehalten werden.



**Figure 3-2. Proper Cable and Air Clearance**



### Caution

Do not place items weighing more than 20 pounds (9 kg) on top of a Vanguard 34x enclosure. Do not block the top vents of the unit.

## Installing Your Vanguard 340 and 340 Enhanced

### Installation

Complete these steps to install your Vanguard 340 and 340 Enhanced:

<b>Step</b>	<b>Action</b>
<b>1</b>	Unpack the Vanguard 34x, and inspect the unit to ensure you have all the components.
<b>2</b>	Install any daughtercards, or memory modules that you need to add to the unit, as necessary. Refer to “Modifying Your Vanguard 340 and 340 Enhanced” section on page 3-22.
<b>3</b>	Be sure that the four rubber feet are on the bottom of the enclosure.
<b>4</b>	Attach the power cord and cables to the rear panel.
<b>5</b>	Place the enclosure in the selected site, and power unit on. Do not block the fan inlet or outlet vents. Refer to the “Powering Up Your Vanguard 340 and 340 Enhanced” section in Chapter 4.
<b>6</b>	If you have a Vanguard 340, ensure the fan is operational after powering the unit on by checking to see if air blows out of the unit. <b>■ Note</b> The Vanguard 340 Enhanced does not contain a fan.
<b>7</b>	Ensure that the ambient temperature at the fan inlet for the Vanguard 340 is within the temperature range specified in Appendix A.

## **Thermal Considerations**

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**Introduction** This section explains some of the heat and temperature factors that can affect your Vanguard 34x.

---

**Fan** After the Vanguard 340 is installed, power it up and check that the fan is working properly. The feet must be installed and air should be blowing out of the unit.

**■ Note**

The Vanguard 340 Enhanced does not include a fan in the unit.

---

**Inlet Temperature** After the unit is running, check the ambient air temperature. Make sure it does not exceed the operating temperature limits specified in Appendix A.

---

**Power Supply Shutdown** If the Vanguard 34x power supply is not properly vented, the external power supply overheats and shuts down.

---

# Configuring the Serial Interface

---

## Introduction

This section describes the serial interface and explains how to configure your Vanguard 34x for various communication interface types. These topics are discussed:

- Setting the Interface Type
  - Setting the Interface Options
- 

## The Serial Interface

The Vanguard 34x supports a software-programmable serial interface that is integral to the motherboard. Port 3 supports the serial interface and can be configured to function as a fixed Data Interface Module, providing communication using these interface types:

- V.24
- V.35
- V.36
- X.21/V.11

### ■ Note

The serial interface supports only DCE mode but can accommodate DTE with the use of a crossover adapter cable. For information on DTE capability, refer to the “Setting the Interface Options” section on page 3-10.

---

## The Serial Interface Parameters

The serial interface is supported in the Port Configuration menu and can be configured using the Control Terminal Port (CTP). Included in the Port Configuration menu, are two parameters that allow you to set both the communication and electrical interfaces. These parameters are:

### Interface Type

This parameter allows you to set the communication interface type (physical layer protocol) on Port 3. The interface types include: V.24, V.35, V.36, and X.21/V.11.

### Interface Option

This parameter allows you to specify the traditional hardware strap used in V.24 Vanguard Daughtercards and electrical interface for V.35, V.36, and X.21/V.11 cabling operations.

---

## Setting the Interface Type

### Introduction

This section provides instructions for setting the Interface Type parameter.

### Interface Type Parameter

Use this procedure to set the Interface Type parameter:

<b>Step</b>	<b>Action</b>	<b>Result/Description</b>
<b>1</b>	From the Control Terminal Port Main menu, select <b>Configure -&gt; Port</b> .	The Port record appears.
<b>2</b>	In the Port Number parameter, type <b>3</b> , then press ENTER.	Port 3 is selected.
<b>3</b>	In the Port Type parameter, type <b>FRI</b> , then press ENTER.	This defines Port 3 type as FRI.
<b>4</b>	In the Interfaced Type, type a <b>?</b> , and then press ENTER.	The Range and Default appear: Range = V.24, V.35, V.36, X.21, NONE Default = V.24 Specify the Electrical Interface Type: V.24 - V.24 Electrical Interface Type V.35 - V.35 Electrical Interface Type V.36 - V.36 Electrical Interface Type X.21 - V.11 Electrical Interface Type NONE - Electrically disabled
<b>5</b>	Select an Interface Type from the menu and press ENTER.	The Interface Type is set.

## Setting the Interface Options

**Introduction** This section provides instruction for setting the Interface Options parameter.

**V.24 Interface Type** Use this procedure to set the Interface Options parameter for V.24 interface type:

<b>Step</b>	<b>Action</b>	<b>Result/Description</b>
<b>1</b>	From the Control Terminal Port Main menu, select <b>Configure -&gt; Port</b> .	The Port record appears.
<b>2</b>	In the Port Number parameter, type <b>3</b> , then press ENTER.	Port 3 is selected.
<b>3</b>	In the Port Type parameter, type <b>FRI</b> , then press ENTER	This defines Port 3 type as FRI.
<b>4</b>	In the Interface Type parameter, type <b>V.24</b> , and then press ENTER.	The interface is set to V.24
<b>5</b>	In the Interface Options parameter, type a <b>?</b> , and then press ENTER.	The Range and Default appears: Range = RI, TM Default = RI Specify the Pin 22 option: RI - V.24 uses Pin 22 for Ring Indicator output signal TM - V.24 uses Pin 22 for Test Mode input signal
<b>6</b>	Select either <b>RI</b> or <b>TM</b> for the Interface Option.	When RI is selected, the output signal is Ring Indicator. When TM is selected, the input signal is Test Mode.

**V.35/V.36, and X.21/V.11 Interface Types** Use this procedure to set the Interface Options parameter for V.35, V.36, and X.21/V.11 interface types:

<b>Step</b>	<b>Action</b>	<b>Result/Description</b>
<b>1</b>	From the Control Terminal Port Main menu, select <b>Configure -&gt; Port</b> .	The Port record appears.
<b>2</b>	In the Port Number parameter, type <b>3</b> , then press ENTER.	Port 3 is selected.
<b>3</b>	In the Port Type parameter, type <b>FRI</b> , then press ENTER	This defines Port 3 type as FRI.
<b>4</b>	In the Interface Type parameter, type one of these interfaces: <b>V.35, V.36, X.21</b> and then press ENTER.	The interface is set to the selected type.
<b>5</b>	In the Interface Options parameter, type a <b>?</b> , and then press ENTER.	The Range and Default appears: Range = NONE, XOVER Default = NONE Specify the cable type: NONE - V35/V.36/X.21 DCE with straight through cable XOVER - V35/V.36/X.21 DCE with crossover adapter cable
<b>6</b>	Select either <b>NONE</b> for straight DCE mode, or <b>XOVER</b> when using the DTE crossover adapter cable.	When NONE is selected, the serial interface is in straight DCE mode. When XOVER is selected, the serial interface is in DCE Mode using the adapter cable.

## Cabling the Vanguard 340 and 340 Enhanced

### Introduction

This section provides information to help you cable your Vanguard 340 and 340 Enhanced.

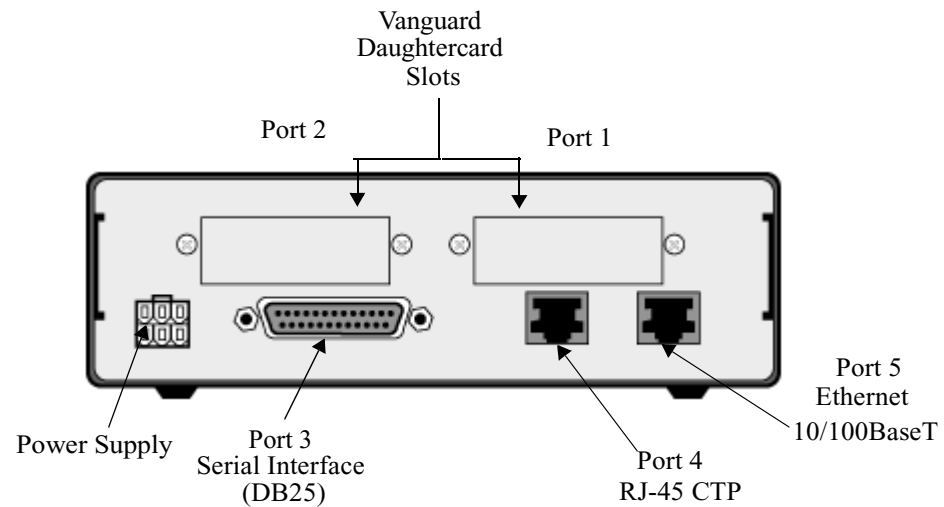


### Caution

Before connecting cables to the motherboard or daughtercard ports, be sure that the screws holding the motherboard in place are tight. If the screws are loose, the motherboard could loosen under the weight of the cables and cause damage to the equipment.

### Vanguard 340 and 340 Enhanced Rear Panel

Figure 3-3 illustrates the rear panel of the Vanguard 340 and 340 Enhanced, optional daughtercards, and the locations of cables that must be connected.



**Figure 3-3. Vanguard 340 and 340 Enhanced Rear Panel and Cable Connections**

## Port Characteristics and Cabling

### Introduction

This section describes the port characteristics and cables required to connect to the Vanguard 340 and 340 Enhanced.

### Port Characteristics and Cable Requirements

This table lists the port characteristics, connector and cable requirements:

<b>Port</b>	<b>Connector</b>	<b>Interface</b>	<b>Cable Required (Application Specific)</b>	<b>Speed</b>	<b>DCE/DTE</b>
1	DB25	DIM Site Daughtercard V.11, V.24, V.35, V.36	DB25-to-DB25 Cable	V.11, V.35 and V.36 - Max. sync speed 2 mpbs V.24 - Max. sync speed 80 kpbs, Max async speed 115.2 kbps	Selectable
		DIM Site Daughtercard	DSU/EIM Cable Assembly and Lease Line Telco Cable (Part Number) shipped with Integral DSU only	DSU - 56 kbps	DTE DSU
	RJ48S	DSU Daughtercard	DSU Telco Cable (Part Number) shipped with DSU Daughtercard	DSU -56 kbps	DTE DSU
	RJ11	FXS/FXO Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A
	RJ45	*ISDN U or S/T Daughtercard	RJ45-to-RJ45 Cable	Either 56 or 64 kbps for each B Channel and 9.6 kbps for the D Channel	N/A
	BNC video connector	RemoteVU Daughtercard	BNC-to-BNC Cable	N/A	N/A
	RJ45 connector	RemoteVU Daughtercard	RJ45-to-RJ45 Cable	N/A	N/A
	RJ11	Dual FXS Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A
	RJ48C	FT1 Daughtercard	RJ48-to-RJ48 Twisted Pair Cable	full or fractional T1 speeds	N/A
	RJ48C	FE1 Daughtercard	RJ48-to-RJ48 Twisted Pair Cable	full or fractional E1 speeds	N/A

**Cabling the Vanguard 340 and 340 Enhanced**

<b>Port (conti</b>	<b>Connector</b>	<b>Interface</b>	<b>Cable Required (Application Specific)</b>	<b>Speed</b>	<b>DCE/DTE (continued)</b>
1 (cont.)	BNC Pair	FE1 Daughtercard	2 BNC-to-BNC 75ohm Coax Cable	Full or fractional E1 speeds	N/A
	RJ45	Dual E&M Daughtercard	RJ45-to-RJ45 Cable	N/A	N/A
	RJ11	V.34 & V.90 Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A
	RJ45	G.SHDSL Daughtercard	RJ45-to-RJ45 Cable	N/A	N/A
2	DB25	DIM Site Daughtercard V.11, V.24, V.35, V.36	DB25-to-DB25 Cable	V.11, V.35 and V.36 - Max. sync speed 2 mpbs V.24 - Max. sync speed 80 kpbs, Max async speed 115.2 kbps	Selectable
		DIM Site Daughtercard DSU DIM	DSU/EIM Cable Assem- bly and Lease Line Telco Cable shipped with Integral DSU only	DSU - 56 kbps	DTE DSU
	RJ48S	DSU Daughtercard	DSU Telco Cable shipped with DSU Daughtercard	DSU -56 kbps	DTE DSU
	RJ11	FXS/FXO Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A
	BNC video connectors	RemoteVU Daughtercard	BNC-to-BNC Cable	N/A	N/A
	RJ45	RemoteVU Daughtercard	RJ45-to-RJ45 Cable	N/A	N/A
	RJ11	Dual FXS Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A
	RJ48C	FT1 Daughtercard	RJ48-to-RJ48 Twisted Pair Cable	full or fractional T1 speeds	N/A
	RJ48C	FE1 Daughtercard	RJ48-to-RJ48 Twisted Pair Cable	full or fractional E1 speeds	N/A
	BNC Pair	FE1 Daughtercard	2 BNC-to-BNC 75ohm Coax Cable	full or fractional E1 speeds	N/A
	RJ45	Dual E&M Daughtercard	RJ45-to-RJ45 Cable	N/A	N/A
	RJ11	V.34 Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A
	RJ11	V.90 Daughtercard	RJ11-to-RJ11 Cable	N/A	N/A

<b>Port (conti</b>	<b>Connector</b>	<b>Interface</b>	<b>Cable Required (Application Specific)</b>	<b>Speed</b>	<b>DCE/DTE (continued)</b>
	RJ45	G.SHDSL Daughtercard	RJ45-to-RJ45 Cable	N/A	N/A
3	DB25	V.11, V.24, V.35, V.36 DIM	DB25-to-DB25 Cable	V.11, V.35 and V.36 - Max. sync speed 2 mpbs V.24 - Max. sync speed 80 kpbs, Max async speed 115.2 kbps	Selectable Adapter Cable required for DTE
4	RJ45	CTP Port	RJ45-to-DB25 CTP Cable shipped with Vanguard unit	Max. async speed 115.2 kbps	DCE
LAN	RJ45	10/100BaseT	10/100BaseT Adapter cable or standard UTP cable (RJ45-to-RJ45)	100Mbps	

\*Enhanced ISDN BRI ST Data information refer to the Daughtercard Guide (Part Number T0020).

**Port Numbering for Physical Ports 1 and 2**

Daughtercards installed in ports 1 and 2 must be configured correctly. For example, if you have installed a Dual E&M daughtercard in port 1 you must configure the port as an E&M port. In addition, use this port numbering scheme when configuring the Vanguard 340:

<b><i>If the daughtercard is installed in...</i></b>	<b><i>...and it has one port connector, configure port</i></b>	<b><i>...or it has two port connectors, configure port</i></b>
Port 1	1	1 or 6
Port 2	2	2 or 7

**■Note**

For more information on daughtercard configuration refer to Chapter Five of the *Daughtercard Installation Guide* (Part Number T0020).

**Daughtercard Cable Information**

Cables for optional daughtercards are shipped with the daughtercards. If your Vanguard 34x is shipped with pre-installed daughtercards you will receive the cables. For daughtercard installation and more cable information, please refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020).

## Control Terminal Port (CTP)

### Port 4 Connector Pinout

Use the supplied RJ45/DB25 cable to connect to the CTP Port and perform CTP operations such as coldloading software images into a Vanguard 34x. The Vanguard 34x defaults this port to 9.6 kbps, 8 bits, no parity, 1 stop bit.

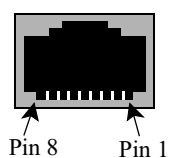
This table identifies the connector pinout for this RJ-45 connector:

<i>RJ45 Pin</i>	<i>Signal</i>	<i>Pin Connection on DB25F Adapter</i>
1 (not connected)	Request To Send (RTS)	4
2	DTE Ready (DTR)	20
3	Received Data (RXD)	3
4 (not connected)	Data Carrier Detect (DCD)	8
5	Signal Ground	7
6	Transmitted Data (TXD)	2
7	Data Set Ready (DSR)	6
8 (not connected)	Clear To Send (CTS)	5

#### ■ Note

If you plan to use a personal computer to configure the Vanguard 34x, you may need to purchase a DB25 (male) to DB9 (female) adapter for the serial port of your personal computer. The serial ports on most personal computers require DB9 connectors.

The connector pins are numbered as indicated in Figure 3-4.



**Figure 3-4. RJ45 Pinout**

## 10/100BaseT Adapter Cable

### Specifications

The 10/100BaseT cable has the following specifications:

- Cable Type: Category 5 or better
- Connectors: RJ45 to RJ45
- Color: Gray
- Part Number: 61798-01

### Port 5 Connector Pinout

The 10/100BaseT Ethernet Port has a single RJ45 connector and is cabled using CAT-5 twisted pair copper cables. This table details the pin for the 10/100Base T RJ45 connector:Cabling Daughtercards:

<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>
1	Transmit Positive	5	Not Used
2	Transmit Negative	6	Receive Data Negative
3	Receive Data Positive	7	Not Used
4	Not Used	8	Not Used

## DB25 V.24 Pinouts

**Connector Pinouts** This table shows the DB25 V.24 connector pinouts for DCE/DTE mode. To use DTE to DTE or DCE to DCE mode, a crossover adapter cable is required. Refer to Figure 3-5 on page 3-21 for crossover cable connections.

These pins are assigned double functions in the V.24 cable:

- Pin 15: Outputs TRANSMIT CLOCK if the port is configured for internal clocks. Otherwise it acts as a V.54 Loop 1 signal when connected to a modem.
- Pin 22: Used as the Ring Indicator output if the port is configured to emulate a dial modem. For this to work properly, the RI/TM port must be configured to RI. When the RI/TM is configured to TM, this pin acts as an input, and the TM output from the attached modem (pin 25 on the modem) comes into the 6500 on this pin.

For more information on configuring the V.24 interface type, refer to the “Setting the Interface Type” section on page 3-9.

Port3 Pin	DCE Signal	Function/Signal Name	Port3 Pin	DTE Signal using Crossover Adapter Cable	Function/Signal Name
1	-----	PROTECTIVE GROUND	1	-----	PROTECTIVE GROUND
2	<-----	TRANSMITTED DATA	2	----->	TRANSMITTED DATA
3	----->	RECEIVED DATA	3	<-----	RECEIVED DATA
4	<-----	REQUEST TO SEND	4	----->	REQUEST TO SEND
5	----->	CLEAR TO SEND	5	<-----	CLEAR TO SEND
6	----->	DATA SET READY	6	<-----	DATA SET READY
7	-----	SIGNAL GROUND	7	-----	SIGNAL GROUND
8	----->	DATA CARRIER DETECT	8	<-----	DATA CARRIER DETECT
14	<-----	DATA RESTRAINT	14	----->	DATA RESTRAINT
15	----->	TRANSMIT CLOCK	15	<-----	TRANSMIT CLOCK
16	----->	STANDBY INDICATOR	16	<-----	STANDBY INDICATOR
17	----->	RECEIVE CLOCK	17	<-----	RECEIVE CLOCK
18	<-----	EXTERNAL RECEIVE CLOCK	18	----->	EXTERNAL RECEIVE CLOCK
20	<-----	DATA TERMINAL READY	20	----->	DATA TERMINAL READY
21	<-----	V.54 Loop 1	21	----->	V.54 Loop 1
22	----->	TEST MODE	22	<-----	TEST MODE
24	<-----	EXTERNAL TRANSMIT CLOCK	24	----->	EXTERNAL TRANSMIT CLOCK
25	<-----	MAKE BUSY	25	----->	MAKE BUSY

## DB25 V.35/V.36 Pinouts

**Connector Pinout** This table shows the DB25 V.35/V.36 connector pinouts for DCE/DTE mode. To use DTE to DTE or DCE to DCE mode, a crossover adapter cable is required. Refer to Figure 3-5 on page 3-21 for crossover cable connections:

<b>Port 3 Pin</b>	<b>DCE Signal</b>	<b>Function/Signal Name</b>	<b>Port 3 Pin</b>	<b>DTE Signal using Crossover Adapter Cable</b>	<b>Function/Signal Name</b>
1	-----	PROTECTIVE GROUND	1	-----	PROTECTIVE GROUND
2	<-----	TRANSMITTED DATA-A	2	----->	TRANSMITTED DATA-A
3	----->	RECEIVED DATA-A	3	<-----	RECEIVED DATA-A
4	<-----	REQUEST TO SEND	4	----->	REQUEST TO SEND
5	----->	CLEAR TO SEND	5	<-----	CLEAR TO SEND
6	----->	DATA SET READY	6	<-----	DATA SET READY
7	-----	SIGNAL GROUND	7	-----	SIGNAL GROUND
8	----->	DATA CARRIER DETECT	8	<-----	DATA CARRIER DETECT
14	<-----	TRANSMITTED DATA-B	14	----->	TRANSMITTED DATA-B
15	----->	TRANSMITTED CLOCK-A	15	(no signal)	TRANSMITTED CLOCK-A
16	----->	RECEIVED DATA-B	16	<-----	RECEIVED DATA-B
17	----->	RECEIVE CLOCK-A	17	<-----	RECEIVE CLOCK-A
18	----->	RECEIVE CLOCK-B	18	<-----	RECEIVE CLOCK-B
20	<-----	DATA TERMINAL READY	20	----->	DATA TERMINAL READY
21	----->	TRANSMITTED CLOCK-B	21	(no signal)	TRANSMITTED CLOCK-B
22	<-----	EXTERNAL TRANSMIT CLOCK-B	22	----->	EXTERNAL TRANSMIT CLOCK-B
24	<-----	EXTERNAL TRANSMIT CLOCK-A	24	----->	EXTERNAL TRANSMIT CLOCK-A
25	-----	(no connection)	25	-----	(no connection)

### ■Note

To use DTE mode, the Interface Options parameter must be set to XOVER. For details on setting the V.35/V.36 Interface Options, see “Setting the Interface Options” section on page 3-10.

## DB25 X.21/V.11 Pinouts

**Connector Pinout** This table shows the DB25 X.21/V.11 connector pinouts for DCE/DTE mode. To use DTE to DTE or DCE to DCE mode, a crossover adapter cable is required. Refer to Figure 3-5 on page 3-21 for crossover cable connections:

<b>Port 3 Pin</b>	<b>DCE Signal</b>	<b>Function/Signal Name</b>	<b>Port 3 Pin</b>	<b>DTE Signal using Crossover Adapter Cable</b>	<b>Function/Signal Name</b>
1	-----	PROTECTIVE GROUND	1	-----	PROTECTIVE GROUND
2	<-----	TRANSMITTED DATA-A	2	----->	TRANSMITTED DATA-A
3	----->	RECEIVED DATA-A	3	<-----	RECEIVED DATA-A
4	<-----	CONTROL-A	4	----->	CONTROL-A
5	-----	(no connection)	5	-----	(no connection)
6	----->	INDICATION-B	6	<-----	INDICATION-B
7	-----	SIGNAL GROUND	7	-----	SIGNAL GROUND
8	----->	INDICATION-A	8	<-----	INDICATION-A
14	<-----	TRANSMITTED DATA-B	14	----->	TRANSMITTED DATA-B
15	----->	SIGNAL ELEMENT TIMING-A	15	-----	(no connection)
16	----->	RECEIVED DATA-B	16	<-----	RECEIVED DATA-B
17	(no signal)	RECEIVE CLOCK-A	17	(no signal)	RECEIVE CLOCK-A
18	(no signal)	RECEIVE CLOCK-B	18	(no signal)	RECEIVE CLOCK-B
20	<-----	CONTROL-B	20	----->	CONTROL-B
21	----->	SIGNAL ELEMENT TIMING-B	21	-----	(no connection)
22	<-----	EXTERNAL TRANSMIT CLOCK B	22	----->	EXTERNAL TRANSMIT CLOCK B
24	<-----	EXTERNAL TRANSMIT CLOCK A	24	----->	EXTERNAL TRANSMIT CLOCK A
25	-----	(no connection)	25	-----	(no connection)

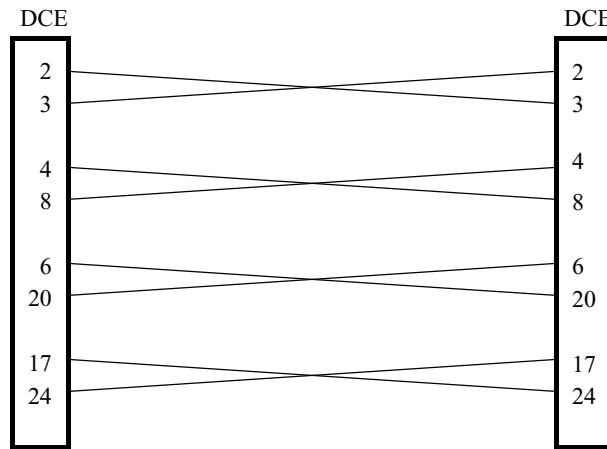
**■Note**

To use DTE mode, the Interface Options parameter must be set to XOVER. For details on setting the X.21/V.11 Interface Options, see “Setting the Interface Options” section on page 3-10.

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**Crossover Cable Connections**

The diagram in Figure 3-5 shows the crossover cable connections for DCE to DCE mode.



**Figure 3-5. Crossover Cable Connections**

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**Ordering Cables**

To order cables please contact a Vanguard Managed Solutions representative. In addition to the crossover adapter cables these cables can also be ordered:

- DB25 Male to M34 Female cable
- DB25 Male to M34 Male cable

## **Modifying Your Vanguard 340 and 340 Enhanced**

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### **Introduction**

You can modify your Vanguard 34x by adding or replacing components on the motherboard. This section explains how to make these modifications and includes the following topics:

- Installing Vanguard Daughtercards
  - Accessing the Motherboard
  - Installing/Removing the Lithium Battery
-

## Installing Vanguard Daughtercards

---

### Vanguard Daughtercards

You can install two Daughtercards in the Vanguard 34x. Vanguard daughtercards can be installed either in the factory or on-site. Refer to the *Vanguard Daughtercard Installation Guide* (Part Number T0020) for complete daughtercard installation instructions.



#### **Caution**

On-site installation of these daughtercards should be undertaken by trained service technicians.



#### **Mise en Garde**

L'installation de ces cartes fille optionnelles doit être effectuée par des techniciens expérimentés.



#### **Vorsicht**

Die Installation vor Ort dieser optionalen Zusatzkarten sollte von geschulten Kundendiensttechnikern durchgeführt werden.

## Accessing the Motherboard

### Introduction

This section explains how to access the motherboard for the Vanguard 340 and 340 Enhanced. It also identifies the location of the key motherboard components.

Before replacing SIMMs, DIMM, batteries, or daughtercards you must access the Vanguard 340 or 340 Enhanced motherboard.

### Accessing the Motherboard

Figure 3-6 shows how to remove and install the Vanguard 340 motherboard.



#### Warning

To prevent injury and damage to the equipment, power down the unit and disconnect the power cord and all network telecommunication cables before you remove or install the motherboard.



#### Avertissement

Pour éviter toute blessure ou endommagement de l'équipement, éteignez l'unité et déconnectez le cordon d'alimentation avant d'enlever ou d'installer la carte mère.



#### Warnung

Um persönliche Verletzungen und Schäden am Gerät zu verhindern, schalten Sie das Gerät ab, und ziehen Sie den Netzstecker aus, bevor Sie die Hauptplatine entfernen oder installieren.



#### Caution

Use care when handling and placing the motherboard on a surface. There are components on the bottom of the motherboard that can be damaged.



#### Mise en Garde

Soyez prudents lorsque vous manipulez la carte mère ou la placez sur une surface. Il y a des composants sur la face inférieure de la carte mère qui pourraient être endommagés.



#### Vorsicht

Auf der Unterseite des Motherboard befinden sich empfindliche Teile. Verfahren Sie entsprechend vorsichtig bei der Handhabung und beim Ablegen des Board.



#### Caution

Some components used in the 340 are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.



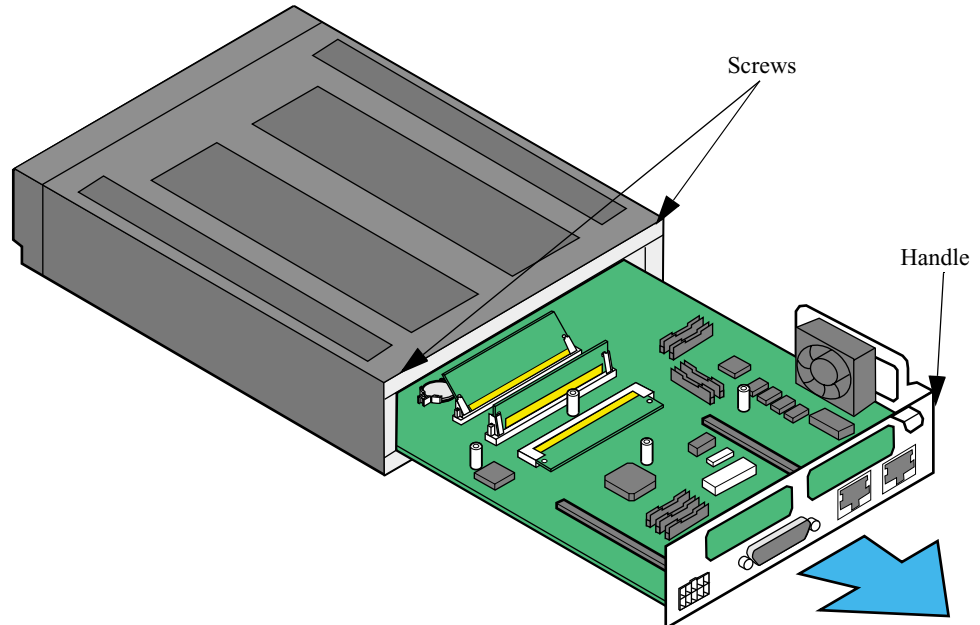
#### Mise en Garde

Certains composants du 340 sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.



### Vorsicht

Einige im 340 verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.



**Figure 3-6. Vanguard 340 Motherboard Removal and Replacement Example**

**Procedure for Removing the Motherboard**

---

Use the steps to remove the Vanguard 340 and 340 Enhanced motherboard:

<b>Step</b>	<b>Action</b>
<b>1</b>	Remove the power cord and cables from the back of the unit.
<b>2</b>	Remove the two screws on either side of the chassis at the rear of the unit.
<b>3</b>	Use the handle on the right side of the front panel to carefully slide out the motherboard.
<b>4</b>	Place the motherboard on a clean flat surface.

**Procedure for Installing the Motherboard**

---

Use the steps to install the Vanguard 340 and 340 Enhanced motherboard:

<b>Step</b>	<b>Action</b>
<b>1</b>	Carefully slide the motherboard into the card guides within the opening.
<b>2</b>	Push the motherboard into the enclosure.
<b>3</b>	Tighten the screws on both sides of the chassis. <i>Be sure the screws are snug.</i>
<b>4</b>	Reconnect the cables and power cord.

---

## Adding and Removing Memory Modules

---

### Introduction

The appropriate memory modules (SIMMs and DIMM) are installed on the motherboard at the factory. If they are not, you can install these components as necessary. This section explains how to add and remove the:

- SDRAM DIMM
- FLASH SIMM
- Data Compression/Encryption SIMM (340)
- ECC DIMM (340 Enhanced)

For instructions on removing the motherboard, refer to the “Accessing the Motherboard” section on page 3-24.



### Caution

Be careful when installing a Data Compression/Encryption SIMM or a FLASH SIMM. These SIMM slots look similar and you may accidentally place a SIMM in the wrong SIMM slot which could damage the equipment.



### Mise en Garde

Soyez prudents lorsque vous installez un SIMM de compression de données/de cryptage ou un SIMM FLASH. Les rainures SIMM ont toutes la même apparence et vous pourriez accidentellement placer un SIMM dans une rainure SIMM erronée, ce qui pourrait endommager l'équipement.



### Vorsicht

Die Steckplätze für die Komprimierungs- und Verschlüsselungs-SIMMs und für die Flash-SIMMs können verwechselt werden. Vergewissern Sie sich, dass Sie die SIMMs in die richtigen Steckplätze einsetzen. Ansonsten können Sie Ihr System beschädigen.



### Caution

Some components used in the 34x are sensitive to static electric discharges; static electric discharges can cause damage to internal components. Use proper handling and grounding precautions whenever handling cards and components.



### Mise en Garde

Certains composants du 34x sont sensibles aux décharges électrostatiques qui peuvent les endommager. Prenez les dispositions et précautions de mise à la terre nécessaires lors de la manipulation de cartes et de composants.



### Vorsicht

Einige im 34x verwendeten Komponenten sollten keinen elektrostatischen Entladungen ausgesetzt werden, durch die interne Bauteile beschädigt werden können. Wenden Sie die entsprechenden Maßnahmen zur Erdung und zum Schutz vor statischen Ladungen bei der Handhabung von Karten und Komponenten an.

■ **Note**

The location of the FLASH SIMM and Data Compression (DCC/DSP)/Encryption SIMM are indicated on the motherboard as shown in Figure 3-8.

---

**Adding/Removing SDRAM DIMM**

Use these steps to add and remove a SDRAM DIMM:

- 1) Insert the DIMM into slot U173 as shown in Figure 3-7.
  - 2) Carefully press the DIMM into the socket.
  - 3) Lock the DIMM into place with the locking levers.
  - 4) To remove the DIMM, disengage the locking levers by pushing them forward, and then lift out the DIMM.
- 

**Adding/Removing FLASH SIMM**

Use these steps to add and remove a FLASH SIMM:

- 1) At a slight angle, insert the SIMM into connector U181 as shown in Figure 3-7.
  - 2) Carefully press the SIMM down, pushing the locking tabs through the holes. The clips click into place.
  - 3) To remove the SIMM, use your fingers to push back the two metal retaining clips and lift out the SIMM.
- 

**Adding/Removing Data Compression/Encryption SIMM**

To add and remove a Data Compression/Encryption SIMM on a Vanguard 340:

- 1) At a slight angle, insert the SIMM into the J39 connector, lining up the holes with the tab as shown in Figure 3-7.
- 2) Carefully press the SIMM down, pushing the locking tabs through the holes. The clips click into place.
- 3) Lock the SIMM into place with the locking levers.
- 4) To remove the SIMM, use your fingers to push back the two metal retaining clips and lift out the SIMM.

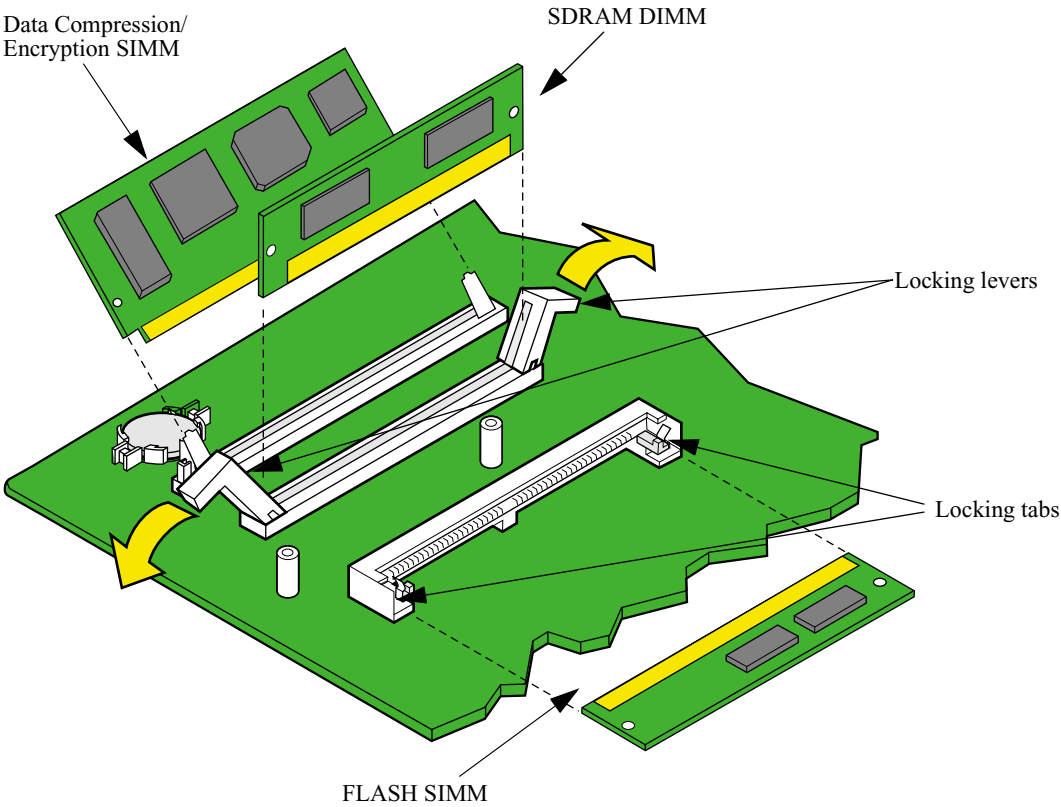
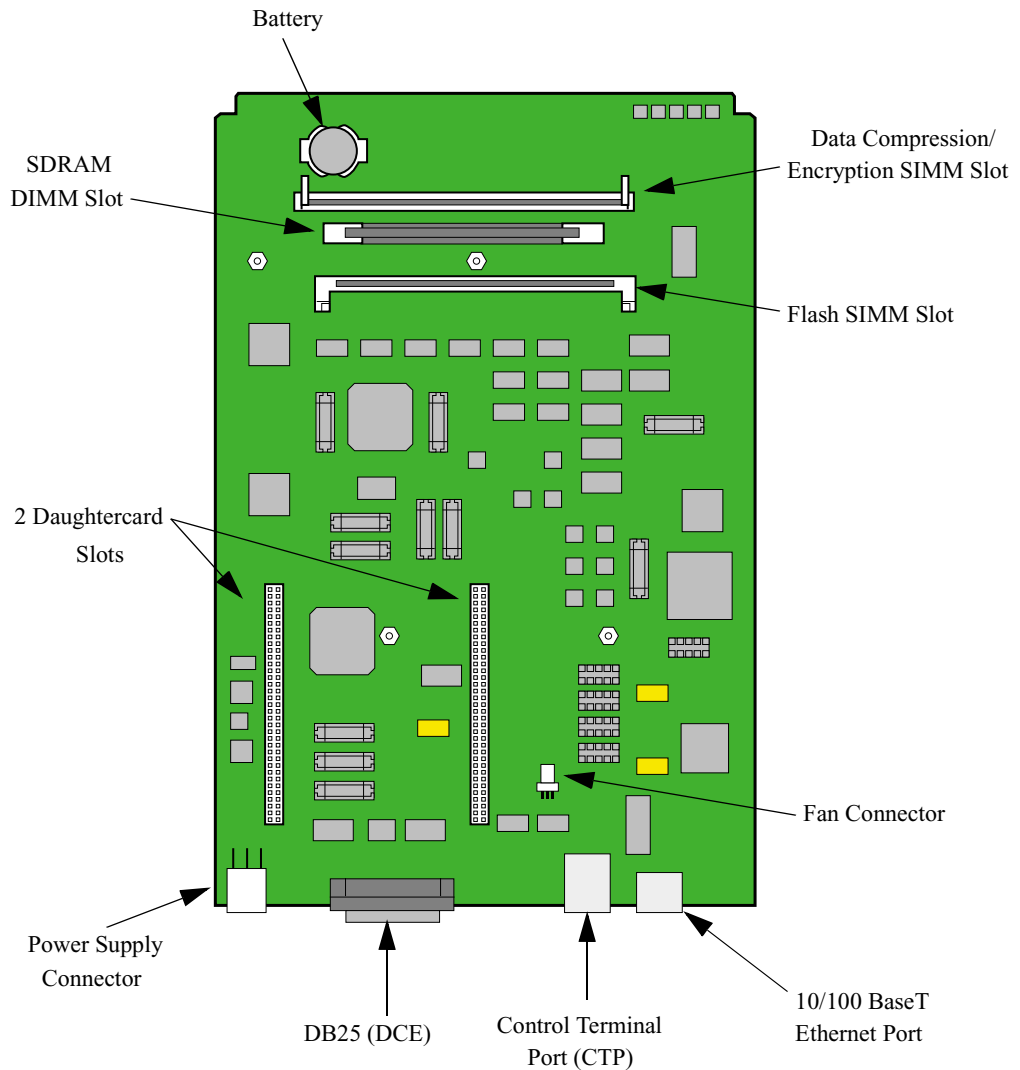


Figure 3-7. SIMM and DIMM Installation/Replacement



**Figure 3-8. Location of Vanguard 340 Motherboard Components**

**SIMM and DIMM Slots**

Figure 3-8 shows the locations of the Vanguard 340 SIMM and DIMM slots:

- SDRAM DIMM: Slot U173
- FLASH SIMM: Slot U181
- Data Compression/Encryption SIMM: Slot J39

## **Vanguard 340 Enhanced ECC DIMM Installation**

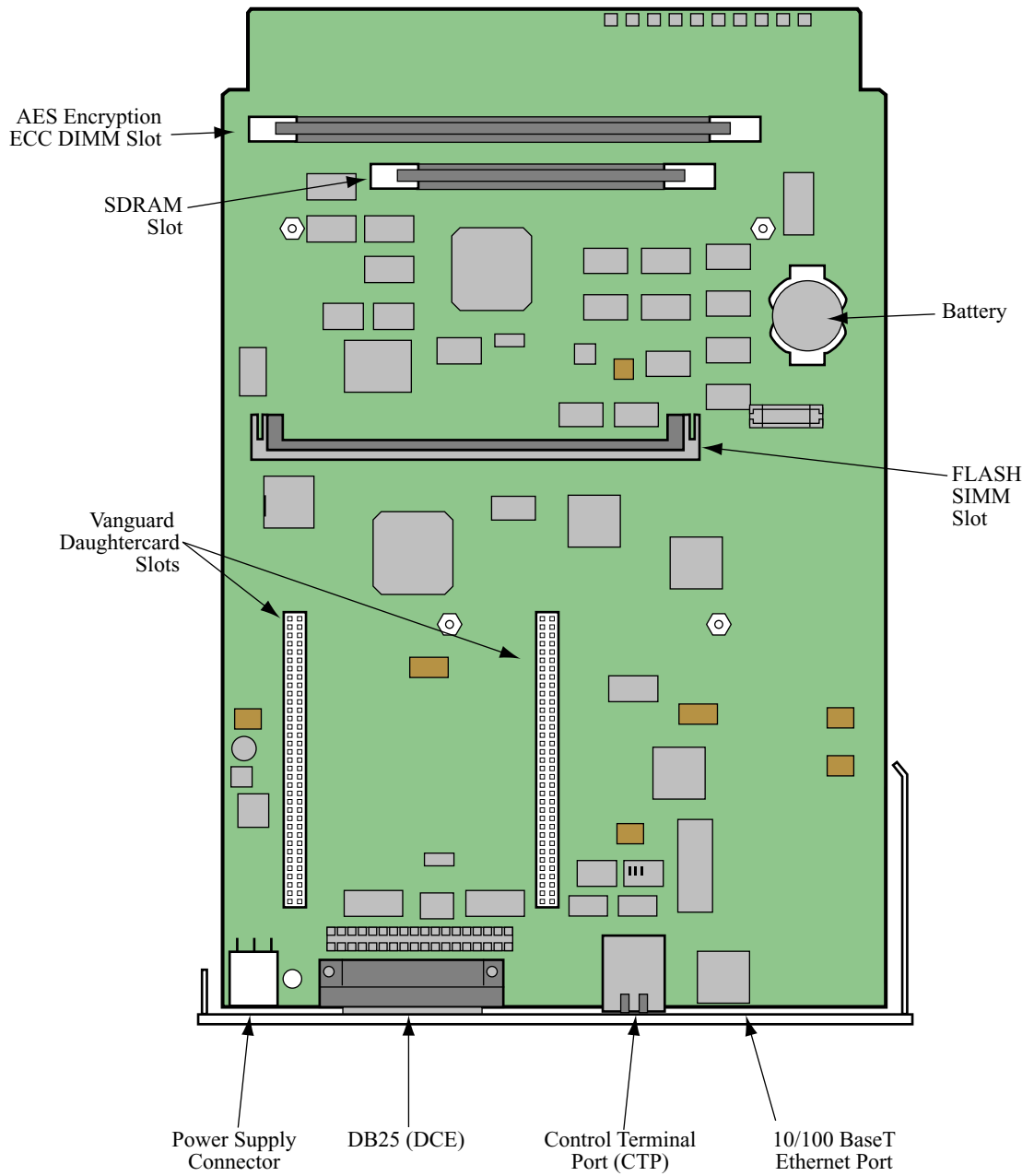
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Figure 3-8 shows the locations of the SIMM and DIMM slots:

- SDRAM DIMM
- FLASH SIMM
- ECC DIMM

Use these steps to add and remove an ECC DIMM:

- 1) At a slight angle, insert the SIMM into the connector, lining up the holes with the AES Encryption slot as shown in Figure 3-9.
- 2) Carefully press the SIMM down, pushing the locking tabs through the holes. The clips click into place.
- 3) Lock the SIMM into place with the locking levers.
- 4) To remove the SIMM, use your fingers to push back the two metal retaining clips and lift out the SIMM.



**Figure 3-9. ECC DIMM Installation**

## Installing/Removing the Lithium Battery

### Introduction

This section explains how to replace the real time battery. Reference Figure 3-8 and Figure 3-9 for the location of the battery. The Vanguard 340 and 340 Enhanced use a lithium battery on the motherboard to maintain the node's real-time clock. The battery is not used to store the configuration memory.



### Warning

Only qualified service personnel should perform the procedure described in this section. If the battery is installed incorrectly, it could explode after the Vanguard product is powered up, damaging the unit.



### Avertissement

Seules des personnes qualifiées peuvent mettre en pratique les procédures décrites dans cette section. Si la batterie n'est pas correctement installée, elle risque d'exploser après la mise en marche du produit Vanguard et d'endommager l'unité.



### Warnung

Die in diesem Abschnitt aufgeführten Vorgänge sollten ausschließlich von qualifiziertem Servicepersonal durchgeführt werden. Wenn die Batterie unsachgemäß installiert wird, kann sie nach dem Einschalten des Vanguard-Produkts explodieren und das Gerät beschädigen.

### ■ Note

After installing the battery, set the Vanguard 34x's date and time. This is done via the CTP in the Update System Parameter menu.

### Battery Type

Replace the lithium battery with lithium coin cell type CR2032 only. These can be obtained where watch batteries are sold.

### Battery Disposal

Dispose of the battery in compliance with applicable local regulations.

### Routine Battery Replacement

The lithium battery should be replaced every six years. Follow the instructions in Figure 3-10 to replace the battery.

### Before Removing/Installing the Battery

Before you remove or install the battery, you must access the Vanguard 34x motherboard as described in the "Accessing the Motherboard" section on page 3-24. Once you can see the motherboard, locate the battery as shown in Figure 3-8 and Figure 3-9. Figure 3-10 shows the battery replacement.

---

## Removing/ Installing the Battery

Figure 3-10 shows how to install and replace the battery.

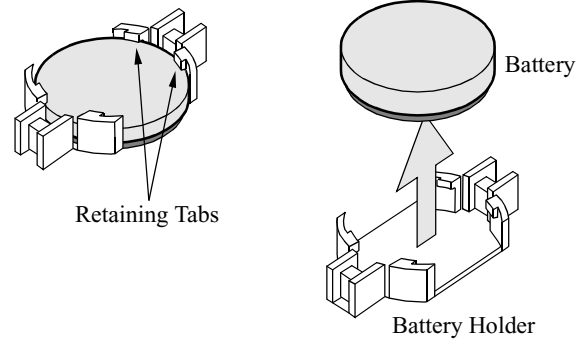
### To remove the battery

Using your fingers, push the retaining tabs aside and pry the battery out of the holder.

### To install the battery

Place the battery in the holder with the positive (+) side up, and press down until the retaining tabs click into place.

**Note:** When done, replace the motherboard as explained in the “Accessing the Motherboard” section on page 3-24.



**Figure 3-10. Replacing the Battery**

---

# Chapter 4

## Powering Up and Loading Software

---

### Overview

#### Introduction

---

This chapter describes:

- Powering Up Your Vanguard 340 and 340 Enhanced
  - Powering Off The Vanguard 340 and 340 Enhanced
  - Powerup Diagnostics
  - Accessing the Control Terminal Port
  - Obtaining and Installing Operating Software
-

## Powering Up Your Vanguard 340 and 340 Enhanced

---

### **Introduction**

This section describes the sequence of events when you power up and power down the Vanguard 34x.

---

### **Powering On the Vanguard 34x**

The Vanguard 34x does not have a power switch on the unit. Use these steps to power on the device:

- 1) Plug the DC output cable of the power supply into the power socket on the Vanguard 34x back panel.
  - 2) Connect the power cord to the power supply outlet.
- 

### **Resetting the 34x**

The RESET button resets the node. Pressing the RESET button is the equivalent of a power-up operation which clears all existing calls and brings down all links.

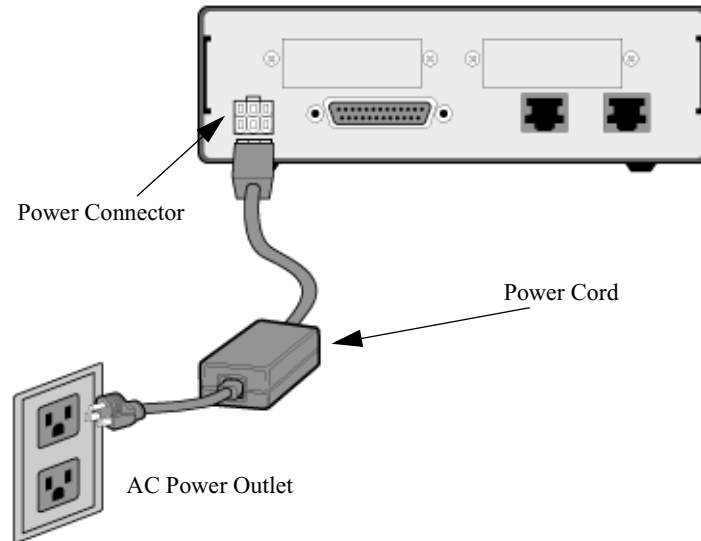
For the location of the RESET button, refer to the “Enclosures” section in Chapter 2.

---

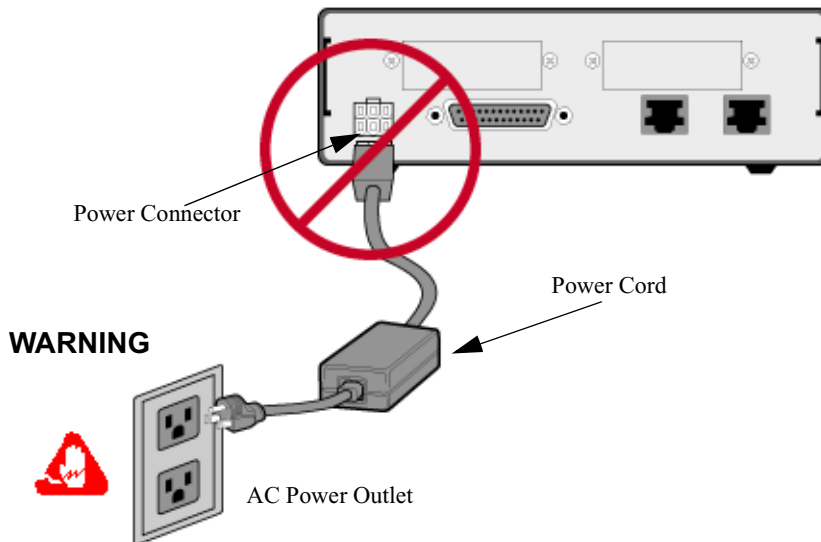
## Powering Off The Vanguard 340 and 340 Enhanced

### Warning

When powering down the unit, always unplug the power cord from the AC power outlet first (Figure 4-1). Never disconnect or reconnect the power connector from the Vanguard back panel if the power supply is still connected to the AC power outlet (Figure 4-2). Doing so can potentially damage the Vanguard unit.



**Figure 4-1. Approved Practice for Powering Down a Vanguard Unit**



**Figure 4-2. Unacceptable Practice for Powering Down or Powering Up a Vanguard Unit**



## **Warning**

Hazardous voltage from the telecommunications network may be accessible on un-earthed units. Disconnect all telecommunications cables before removing the main lead from the power supply.

Des tensions dangereuses provenant des réseaux de télécommunication peuvent être présentes sur des unités qui ne sont pas reliées à la terre. Déconnectez tous les câbles de télécommunication avant de retirer le câble de secteur du bloc d'alimentation.

An nicht geerdeten Geräten können gefährliche Spannungen vom Telekommunikationsnetz anliegen. Trennen Sie alle Kabelverbindungen zum Telekommunikationsnetz, bevor Sie das Hauptnetz Kabel aus der Steckdose ziehen.

---

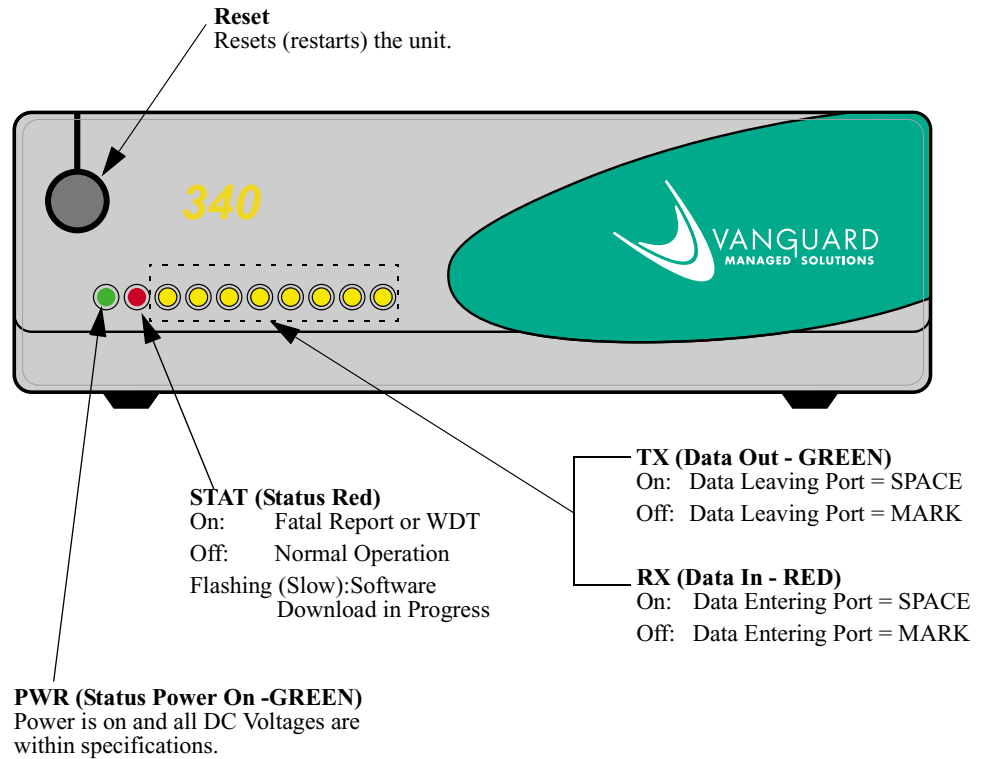
# Powerup Diagnostics

## Introduction

This section describes diagnostics that run automatically when you power up the Vanguard 340 and 340 Enhanced.

## Detailed Front Panel LEDs

Figure 4-3 illustrates the detailed front panel LEDs located behind the front cover.



**Figure 4-3. Detailed Front Panel LEDs**

---

**Power Up Sequence**

When the Vanguard 340 and 340 Enhanced power cord is plugged into the power supply outlet, you will see the following power up sequence:

<b>Stage</b>	<b>when...</b>	<b>...this indicates</b>
<b>1</b>	Power (PWR) LED turns on (GREEN)	Vanguard is receiving power.
<b>2</b>	PWR LED remains on and the Status (STAT) LED blinks (RED).	Diagnostics are starting.
<b>3</b>	PWR LED blinks.	Diagnostics are executed.
<b>4</b>	PWR LED remains on and the STAT LED blinks.	Indicates software is being downloaded from FLASH.
<b>5</b>	PWR LED blinks.	Software is initializing your system configuration.
<b>6</b>	PWR LED remains on.	Your system is running.

---

**Detailed FT1/FE1 LED**

The FT1/FE1 daughtercards have one LED located on the rear panel. Software controls the LED and indicates the following when ON or OFF:

- ON - Alarm condition data path is disrupted, refer to the FT1/FE1 interface statistics for more information on the problem.
  - OFF - Normal operation exists.
-

## Accessing the Control Terminal Port

### Introduction

Once you have powered on the Vanguard 34x, you can access the Control Terminal Port from the PC or terminal attached to the CTP port.

This section does not provide all information about accessing the CTP. For more information on accessing and using the CTP refer to the *Vanguard Basic Configuration Manual* (Part Number T0113).

### Procedure

Follow these steps to access the Vanguard 34x CTP Main menu:

#### ■ Note

This procedure assumes that a PC or terminal is connected to the Vanguard 34x using the CTP access cable.

Step	Action
1	Set your terminal, or terminal emulation software, to VT100, 9600 bps, 8 bit, no parity, 1 stop bit.
2	Type <CR> until either an asterisk (*) or the OK prompt appears.
3	When you see OK, type <b>atds0 &lt;CR&gt;</b> . When you see the asterisk (*) type <b>.ctp</b> . The CTP banner will appear. If this banner does not appear, verify that these steps have been followed correctly.
4	Type <CR> at the password prompt, if no password has been set.

### CTP Access Using Remote Telnet

Another way to connect to the CTP, after the node is configured and operational, is to access remotely via your established IP network by telnetting into the node from an IP network-based personal computer or workstation. You can create a telnet session from your PC to the target node using an IP address configured in that node.

Connect to the CTP by entering **atds0 <CR>** after the Vanguard 34x outputs the OK prompt on your Telnet terminal window.

### CTP Access Using Remote X.25 or Frame Relay Network

If the Vanguard 34x is operating in an X.25 network, or if Frame Relay Annex-G is used to connect with other VanguardMS Network Access Product nodes, you can access the Vanguard CTP remotely by making a Switched Virtual Circuit (SVC) call to the node and specifying subaddress 98.

For example:

- If you are using ASYNC PAD, type **10198** at the asterisk (\*) prompt, and then press **Enter**.
- If you are using AT PAD, type **atds010198**, and then press **Enter**.

## Alternative Methods for Accessing the CTP

---

### Introduction

This section describes alternative methods for accessing the CTP over a Frame Relay Bypass connection when:

- the terminal of the local Vanguard device does not have IP connectivity or
  - cannot connect to the target device over the LAN (serial port only)
  - the WAN is not using X.25 or Annex G
- 

### Using Remote Telnet

VanguardMS Vanguard devices have a built-in Telnet feature that allows to you access the CTP of other Vanguard devices. To use this feature, both the local and target devices must be configured using an IP network connection. Use these steps to access the CTP of another Vanguard device from your local node:

- 1) Access the local Vanguard's CTP.
  - 2) Select the Diagnostics Menu, and then select Telnet.
  - 3) Type any IP address that is configured in the target Vanguard.
- 

### Using SoTCP

If the target Vanguard device has been previously configured for a particular network connection using SoTCP and AT PAD, you can access the CTP using Frame Relay Bypass. Use these steps to establish an SoTCP connection to the target Vanguard's CTP using Frame Relay Bypass:

- 1) From the (\*) prompt, type **10198** and press **Enter**.
  - 2) At the OK prompt, type **atds0<target node>** (example: atds010198) and press **Enter**.
- 

### Startup CTP Screen 340 Enhanced

Figure 4-4 shows an example of the Vanguard 340 Enhanced Startup Screen.

**OK->atds->CONNECT**

```
Connected to the Control Port on Node "Nodename", at 14-NOV-2003 13:32:59
VANGUARD 340 Enhanced, Version V6.4.P02B_@404HP_340v3
Copyright (C) 1989-2001 VanguardMS LLC
Copyright (c) 1995 by AGE Logic Inc., San Diego, CA
All rights reserved

Enter Password:
```

**Figure 4-4. Startup Screen for the Vanguard 340 Enhanced**

---

## Obtaining and Installing Operating Software

### Introduction

This section briefly describes how to obtain and install the software into your Vanguard 34x device.

#### ■ Note

After the software has been loaded, refer to the appropriate user documentation to configure and use the different software options.

### Where to Get Operating Software

You can obtain Vanguard Applications Ware Packages that can be tailored to your specific needs.

You can obtain operating software for your Vanguard 34x from:

1) the Vanguard CD-ROM, using the following path:

**\\VanguardMS\Sfw\_imgs\V340**

2) the WWW, using the following URL:

**<https://secure.vanguardms.com>**

#### ■ Note

All software must be unlocked using the Software Unlocking Utility. Be sure that you have serial numbers for each Applications Ware package before using the unlocking utility. If you do not have serial numbers for the Applications Ware package contact your distributor, VanguardMS sales or service.

### Operating Software

The operating software is compressed in FLASH and loaded into the SDRAM for execution. There are a variety of operating software feature sets available for the Vanguard 34x.

- For feature information on the operating software available for your device, refer to the Software Release Notice included on the CD-ROM.
- For information on installing the operating software, refer to the *Vanguard Software Installation and Coldloading Manual* (Part Number T0028) included on the CD-ROM.

### Optional Software

The Applications Ware packages are divided into licenses available for Vanguard products. These licenses include:

- IP<sup>+</sup> Package
- SNA<sup>+</sup> Package
- Multi-Service Package

For details about the contents of the Applications Ware License Upgrade packages and how they can be obtained, refer to the latest Software Release Notice.

#### ■ Note

A license refers to both a legal document that allows you to use features and to the software that contains those features.

**Operating Software  
File Formats**

Operating software files located on the Vanguide CD-ROM, and on the World Wide Web, adhere to the following file naming formats:

<b>Filename:</b>	<b>Description</b>
<b>XXp01.xrc</b>	<b>where:</b> <ul style="list-style-type: none"><li>• <b>XX</b> identifies the software release number applicable to that image</li><li>• <b>p</b> identifies the Vanguard V340 product equipped with 8MB SDRAM. Units that have 4MB SDRAM are identified by the letter <b>k</b></li><li>• <b>01</b> identifies the number of the image created for any specific software release</li><li>• <b>xrc</b> identifies the file as a software image</li></ul> <b>XXp01.zip</b> is a compressed version of the file.

## Specifications

---

### Introduction

This section describes the physical and environmental specifications and power requirements for the Vanguard 340 and 340 Enhanced products.

---

### 340 Hardware

The Vanguard 340 product features the following:

- 50 Mhz MPC860T PowerPC processor
  - 10/100 Base T Ethernet
  - Async (RJ-45 connector) Control Terminal Port (CTP)
  - 4 Megabyte of Non-Volatile FLASH on board
  - 4 Megabyte FLASH SIMM (can be expanded to 8 Megabytes with option SIMMs)
  - 16 Megabyte SDRAM DIMM (expandable to 32 Megabytes - optional)
  - Data Compression and Encryption SIMM (optional)
  - 2 optional daughtercard ports
  - 1 configurable Universal Serial Interface port
- 

### 340 Enhanced Hardware

The Vanguard 340 Enhanced product features the following:

- 50 Mhz MPC860P PowerPC processor
- 10/100 Base T Ethernet
- Async (RJ-45 connector) Control Terminal Port (CTP)
- 8 Megabyte of Non-Volatile FLASH on board
- 8 Megabyte FLASH SIMM (can be expanded to 16 Megabytes with option SIMMs)
- 32 Megabytes of SDRAM DIMM (October 2004 and later)16 Megabytes of SDRAM DIMM (expandable to 32 Megabytes - optional) before 10/2004.
- ECC DIMM slot
- 2 optional daughtercard ports
- 1 configurable Universal Serial Interface port

---

**Software**

The Vanguard 340 and 340 Enhanced support these software applications ware:

- IP<sup>+</sup> Package
- SNA<sup>+</sup> Package
- Multi-Service Package

See the *Software Release Notice* accompanying your Vanguard unit for more information on the software license upgrades available for the Vanguard 340 and 340 Enhanced.

---

**Environmental**

The following environmental conditions are required:

- Operating temperature: 32° to 104°F maximum (0° to 40°C maximum)
  - Storage temperature: -40° to +158°F (-40° to +70°C)
  - Relative humidity: 5% to 90% (non-condensing)
-

---

**Electromagnetic Compatibility**

Vanguard 340 and 340 Enhanced products adhere to the following:

- FCC Part 15, Class A
  - CISPR 22 and EN 55022, Class A
  - AS 3548, Class A
  - EN 50082-1
- 

**Power Requirements**

Vanguard 340 power requirements:

- 100 to 240 VAC nominal at 50/60Hz
- 50 watts input power (64 VA)
- maximum input current 1.1 to 0.6 amps

Vanguard 340 Enhanced power requirements:

- 100 to 240 VAC nominal at 50/60Hz
  - 25 watts input power (32 VA)
  - maximum input current 0.6 to 0.3 amps
- 

**Power Supply Description**

The Vanguard 340 and 340 Enhanced use a different external power supply. The external power supply for the Vanguard 340 Enhanced cannot be used on a Vanguard 340.

- Vanguard 340 is powered by a switch mode power supply with 50 watts maximum output power.
  - Vanguard 340 Enhanced is powered by a switch mode power supply with 35 watts maximum output power.
- 

**Safety**

Vanguard 340 and 340 Enhanced meet the following safety standards:

- EN60950
  - IEC60960
  - CSA C22.2 No. 950
  - UL 1950
- 

**Physical**

Vanguard 340 and 340 Enhanced have the following measurements:

- Height: 2.6 in. (6.6 cm)
  - Length: 7.7 in. (19.6 cm)
  - Width: 12.2 in. (31.3 cm)
  - Weight (not configured): 7.05 lb.
  - Weight (fully configured) 7.65 lb.
-



# Appendix B

## Software License and Regulatory Information

---

### Overview

#### Introduction

---

This appendix provides information about the following:

- FCC Part 68 and Telephone Company Procedures and Requirements
  - Product Declarations and Regulatory Information
-

# FCC Part 68 and Telephone Company Procedures and Requirements for DSU, T1, and ISDN Interfaces

## Introduction

The equipment referenced in this section is compliant with FCC Part 68 rules.

## Before You Begin

Before connecting a Vanguard 34x to a network, you should:

- Provide the local telephone company with the equipment’s registration number.
- Order the proper connections.

## How to Order Connections

To order the proper connections, provide the telephone company with:

- Interface type
- Required USOC jack connector number
- Service code
- Facility interface codes

<i>Interface Type</i>	<i>USOC Jack Connector</i>	<i>Service Code</i>	<i>Facility Interface Code</i>
56-kbps digital interface	RJ48S	6.0F	04DU5-56
ISDN U Interface	RJ49C	6.0Y	02IS5
ISDN S/T Interface	-----	6.0F	02IS5
Fractional T1 Interface	RJ48C	6.0F	04DU9-BN 04DU9-2SN
V.34 Modem Interface	RJ11C	-----	-----

## Troubleshooting Your Connection

If any of your equipment is not operating correctly, immediately remove it from the telephone line before damaging the network. If the telephone company is aware of the problem, they may temporarily disconnect your service. Whenever possible, the telephone company notifies you in advance of the disconnection.

If advance notice is not feasible, you are notified as soon as possible. Once notified, you can correct the problem. If necessary, it is your right to file a complaint with the FCC.

**Customer-Provided  
Telephone  
Equipment**

FCC regulations and telephone company procedures prohibit connection of customer-provided equipment to telephone company-provided coin service (central office-implemented systems). Connection to party lines is subject to state tariffs.

Occasionally, the telephone company may make changes in their equipment, operations, or procedures. If these changes affect your equipment or service, the telephone company will provide written notice so you can make the necessary changes to maintain uninterrupted service.

Contact your telephone company if you have any questions about your telephone line.

In some circumstances, the telephone company may ask you for information about your equipment that is connected to the telephone line. Within the United States (at the request of the telephone company), you should provide your equipment's FCC registration number. This number is located on the unit's label.

---

## Product Declarations and Regulatory Information

The following sections provide information about standards compliance, safety statements, and ISDN Type Approvals.

### Warnings And Cautions

The following special notices apply to all equipment handling procedures in this installation guide.



#### Warning

Ports capable of connecting to ports on other apparatus are defined as Safety Extra Low Voltage (SELV). To conform with EN60950, ensure that these ports are only connected to ports of the same type on other apparatus.

Les ports qui sont susceptibles d'être connectés à des équipements sont désignés comme TBTS. Pour garantir la conformité à la norme EN 60950, n'interconnecte ces ports qu'avec des ports du même type sur des autres matériels.

Anschlüsse, die mit anderen Geräten verbindet werden können, sind als SELV beschrieben. Um Konformität mit EN 60950 zu versichern, sichern Sie es, daß diese Anschlüsse nur mit den des selben Type auf anderen Geräten verbindet werden.

### CE Marking

The mark in the following diagram appears on each Vanguard Series product, and the statement that follows explains its significance.



**Figure B-1. CE Mark**

This product is CE marked to indicate compliance with the following European Directives:

- 1999/5/EC Radio & Telecom Terminal Equipment (R&TTE)
- 73/23/EEC Low Voltage Directive (Safety)
- 89/336/EEC EMC Directive

Copies of the full Declaration of Conformity are available at the following URL:

**<http://www.vanguardms.com/>**

## Declarations of Conformity

### English

#### Declaration of Conformity:

Hereby, VanguardMS declares that this Vanguard Router is in compliance with the requirement and other relevant provisions of Directive 1999/5/EC.

### Danish

#### Konformitetserklæring:

Hermed erklærer VanguardMS, at indestående Vanguard Router er i overensstemmelse med de grundlæggende krav og de relevante punkter i direktiv 1999/5/EF.

### Dutch

#### Verklaring van overeenstemming:

Hierbij verklaart VanguardMS dat diens Vanguard Router voldoet aan de basisvereisten en andere relevante voorwaarden van EG-richtlijn 1999/5/EG.

### Finnish

#### Vaativustenmukaisuusvakuutus:

VanguardMS vakuuttaa täten, että Vanguard Router on direktiivin 1999/5/EC keskeisten vaatimusten ja sen muiden tätä koskevien säännösten mukainen

### French

#### Déclaration de conformité :

Par la présente, VanguardMS déclare que ce routeur Vanguard est conforme aux conditions essentielles et à toute autre modalité pertinente de la Directive 1999/5/CE.

### German

#### Konformitätserklärung:

Hiermit erklärt VanguardMS, dass der Vanguard Router die grundlegenden Anforderungen und sonstige maßgebliche Bestimmungen der Richtlinie 1999/5/EG erfüllt.

### Greek

#### ήλωση Συμμόρφωσης:

ια του παρόντος, η εταιρεία VanguardMS δηλώνει ότι η παρούσα συσκευή (δρομολογητής) Vanguard Router πληροί τις βασικές απαιτήσεις και άλλες βασικές προϋποθέσεις της Οδηγίας 1999/5/ΕΚ.

**Italian**

**Dichiarazione di conformità:**

Con la presente VanguardMS dichiara che il router Vanguard soddisfa i requisiti essenziali e le altre disposizioni pertinenti della direttiva 1999/5/CE.

**Portuguese**

**Declaração de Conformidade:**

Através da presente, a VanguardMS declara que este encaminhador Vanguard se encontra em conformidade com os requisitos essenciais e outras disposições relevantes da Directiva 1999/5/CE.

**Spanish**

**Declaración de conformidad:**

Por la presente declaración, VanguardMS declara que este encaminhador Vanguard cumple los requisitos esenciales y otras cláusulas importantes de la directiva 1999/5/CE.

**Swedish**

**Överensstämmelseförklaring:**

VanguardMS förklarar härmed att denna Vanguardrouter överensstämmer med de väsentliga kraven och övriga relevanta stadganden i direktiv 1999/5/EG.

---

**Industry Canada**

The following information includes the Industry Canada statement regarding ISDN and T1 equipment use.

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service might be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, could give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution can be particularly important in rural areas.



**Caution**

Users must not attempt to make such connection themselves, but must contact the appropriate electric inspection authority, or electrician, as appropriate.

Les utilisateurs ne doivent pas établir de telles connexions eux-mêmes. Ils doivent contacter une personne compétente ou un électricien.

Benutzer sollten nicht versuchen, diese Verbindung selbst herzustellen, sondern dazu die zuständige Aufsichtsbehörde für Elektroinstallationen bzw. einen Elektroinstallateur kontaktieren.

---

**Notification of  
Canadian  
Requirements**

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

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## Limited Warranty

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VanguardMS, LLC., warrants that the Product will conform to its then-current published specifications and will be free from defects in materials and workmanship under normal use and service for a period of **(ONE) 1 YEAR** from the date of purchase by the original end user.

During the warranty period, Vanguard Managed Solutions will at its option and at no charge either repair a defective Product (using either new or reconditioned parts) or replace it (with a new or reconditioned Product) if you return it freight prepaid to the factory or service center VanguardMS designates. If VanguardMS is unable within a reasonable time to repair or replace your item, VanguardMS may instead elect to accept return of the unit and refund to you the purchase price you paid for it. VanguardMS will pay freight costs to ship any repaired or replacement unit to you.

**VANGUARDMS MAKES NO REPRESENTATION OR OTHER WARRANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED. WITHOUT LIMITING THIS PROVISION, VANGUARDMS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

**THE REMEDIES PROVIDED HEREIN ARE EXCLUSIVE. UNDER NO CIRCUMSTANCES WILL VANGUARD MANAGED SOLUTIONS BE LIABLE FOR LOSS OF DATA, REPROCUREMENT COSTS, LOST REVENUE OR PROFITS, OR FOR ANY OTHER SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF THEY WERE FORESEEABLE OR YOU HAVE INFORMED VANGUARD MANAGED SOLUTIONS OF THEIR POTENTIAL.**

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

This warranty does not apply to any Product which has been subjected by you or a third party to (a) operating or environmental conditions in excess of VanguardMS written specifications or recommendations; (b) damage, misuse or neglect; or (c) improper installation, repair or alteration. This warranty also excludes expendable items, such as lamps, fuses, or other parts which fail from normal use. VanguardMS does not guarantee the integrity of data or warrant that the equipment will operate uninterrupted or error free.

To take advantage of this warranty, you must provide proof of purchase which indicates the date of your purchase in order to obtain warranty service.

This warranty applies only to hardware manufactured by or for VanguardMS and identified by the VanguardMS trademark, trade name or product identification logo affixed to them. For the warranty applicable to software, please refer to the Software License which accompanies the software.

---



## Introduction

The following sections apply to U.S.A. customers only. Non-U.S.A. customers with questions or concerns regarding return procedures should contact their VanguardMS subsidiary or distributor.

---

### Equipment Return Procedures

If you have questions about equipment return procedures, on-site service or unit exchange service call the VanguardMS Technical Support Center at (800) 544-0062 for advice and assistance.

---

### In Case of Damage

If the equipment is damaged in transit, contact the shipper.

If you have additional concerns in case of failure, about missing parts, or to return equipment, contact your nearest VanguardMS representative.

<b><i>For Locations</i></b>	<b><i>Contact...</i></b>
Inside the United States	Vanguard Managed Solutions 575 West Street Mansfield, MA 02048-1193 Phone (800) 544-0062.
Outside the United States	the nearest VanguardMS distributor. For a listing of our Sales and Service Offices, visit our Web site at: <b><a href="http://www.vanguardms.com/">http://www.vanguardms.com/</a></b>

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### Expiration of Lease

To return equipment upon expiration of a lease agreement, contact the VanguardMS Customer Operations Center at (800) 544-0062 for return authorization and instructions. You will be asked to provide the following information:

- Product name and description
- Serial number
- Customer order number
- Reason for return

---

**Factory Repair**

To return equipment for factory repair, call the VanguardMS Technical Support Center at (800) 544-0062, for return authorization and instructions. When you call, you will be given a Return Material Authorization (RMA) control number. Mark this number clearly on the shipping container for ease of identification and faster service. The RMA control number provides a convenient tracking reference for both parties. Please have the following information available for each piece of equipment you return:

- Product name and description
- Serial number
- Failure symptoms

---

**Packaging  
Guidelines for  
Equipment Return**

Data communications equipment or parts that are to be returned to VanguardMS for any reason must be properly packaged to prevent damage in shipment and handling.

If the original packing material and shipping container are available, reuse these items to return equipment. If these items are not available, it is your responsibility to package the contents in a manner that protects the equipment from damage during normal shipping and handling. Responsibility for damage to equipment during transit must be resolved between you and the carrier. VanguardMS can provide you with specific packaging instructions upon request.

---

**Numerics**

- 1 Port Voice FXS/FXO Daughtercard [2-10](#)
- 10/100BaseT
  - Ethernet cable [1-5](#)
- 2 Port Voice FXS Daughtercard [2-10](#), [2-11](#)
- 4 Port Voice FXO Daughtercard [2-11](#)
- 4 Port Voice FXS Daughtercard [2-11](#)
- 56 K DSU/CSU Daughtercard [2-14](#)

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