

**ENGINEERING
HANDBOOK
Update Package**

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Meridian 1

Engineering Handbook

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Chapter 1: Introduction

Meridian 1

Meridian 1 Communication Systems are a family of digital multiplex voice and data switching systems, built upon a foundation of state-of-the-art digital switching equipment and advanced software program control. Meridian 1 Communication Systems have a range of System Options available, providing sophisticated voice and data services for PBX and private CO applications for up to 60,000 users.

The Meridian 1 is the single source solution to the complexities of today's business environment and represents the merger of the functionality of existing Meridian SL-1, Meridian SL-100, and Meridian SuperNode systems into a single, modular communications product portfolio. It offers various system options that are tailored to meet the application requirements of small, medium, and large sized business organizations.

The Purpose of this handbook is two-fold:

1. To focus on capabilities and services that have evolved from the Meridian SL-1 architecture (Meridian 1 System Options 21, 21A, 51, 61, and 71).
2. To provide a consolidated source of selective reference material to assist sales engineers and product support personnel in their everyday work tasks.

The Engineering Handbook is *NOT* a replacement for existing documentation such as Northern Telecom Practices (NTP's) and feature Documents, which have their own specific use. Instead it is structured specifically to address the business applications of the Meridian 1. Modular organization of the Engineering Handbook has been selected for ease of use.

Chapter 1: INTRODUCTION

discusses the purpose and organization of the handbook

Chapter 2: SYSTEM OVERVIEW

provides a general overview of the foundation upon which Meridian 1 SL-1 is built

Chapter 3: PRODUCT EVOLUTION

chronicles the timetable of events that have evolved for over a decade to the introduction of Meridian 1

Chapter 4: SYSTEM ARCHITECTURE

details the various elements that make up the system architecture

Chapter 5: PRODUCT DESCRIPTION

describes the capabilities of the Meridian 1 System Options 21, 21 A, 51, 61, and 71 and various members of the Meridian product family

Chapter 6: MERIDIAN DATA SERVICES

outlines the data products and services that are currently available on Meridian 1

Chapter 7: SYSTEM CONFIGURATION

provides configuration and compatibility parameters for both hardware and software, along with capacity guidelines

Chapter 8: ORDERING INFORMATION

details ordering and packaging information of Meridian 1 SL-1

Chapter 9: TRAFFIC

discusses various aspects of traffic engineering for consideration in system configuration

Chapter 10: TECHNICAL SPECIFICATIONS

consolidates the technical specifications that support Meridian 1 SL-1

Chapter 11: LIST OF TERMS

provides a glossary of terms widely used in the digital communications environment

The Meridian 1 Engineering Handbook was developed to provide useful and usable information. Your suggestions are solicited so that the most effective use can be derived from this handbook. Please direct all correspondence to:

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Chapter 2: System overview .

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Meridian 1 Communication Systems consolidate the functionality of the Meridian SL-1, Meridian SL-100, and Meridian **SuperNode** PBX portfolios into a single product line.

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The design approach to the Meridian 1 architecture, combined with modular components, has produced extremely flexible system options that are adaptable to many applications in the business environment.

The Meridian 1 system options 21, 51, 61, and 71, based on the Meridian SL-1 architecture, provide advanced voice features, data connectivity and local area network communications, and sophisticated information services for PBX applications ranging in size from 30 to 10,000 users,

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The foundation for each Meridian 1 **SL-1** system option is a voice and data circuit-switched digital sub-system under software control. It is comprised of a Central Processing Unit (CPU), memory store, and a digital switching network that uses time division multiplexing and pulse code modulation techniques. Peripheral interfaces are used to connect a wide array of telephones, trunks, and terminals.

Modular packaging

System hardware provisioning is based upon a highly modular packaging scheme that uses an advanced aluminum die-casting process. The basic unit of packaging is called the **Universal Equipment Module, or UEM**. Each module contains all hardware required (such as backplane, card cage, power supply, cabling) to support a specific system function, such as CPU, Network, or Peripheral Equipment (**PE**). The UEM has removeable front and rear covers with locking latches for easy access to its contents. In addition, the UEM is designed to provide universal support for a wide variety of card cages and structures to allow the integration of special applications and features, such as **Meridian Mail**, into the system. The **Universal Equipment Modules** are both mechanically superior and aesthetically attractive, and provide an advanced packaging platform for the future.

The **UEMs** are stacked one on top of another to form a column. Each column may contain up to four **UEMs**. An expansion kit is provided to interconnect the columns in a multi-column system to ensure compliance to **FCC EMI/RFI** regulations. At the base of each column of **UEMs** is the pedestal. The pedestal houses cooling fans, air filters, a power distribution assembly (including the circuit breakers and power switches) and a System Monitor circuit. At the top of each column is a top cap assembly which consists of two air exhaust grills and a thermal sensor assembly.

System expansion simply requires adding one or more **UEMs**. The modular packaging scheme also provides for low cost, easy expansion from one system type to another. For example, the card cage assembly of a UEM containing common equipment for a small system may be removed and replaced with the card cage assembly designed for larger systems. In addition, **Peripheral Equipment**, which is the bulk of the system investment, is common to all systems and may be retained when expanding from one system option to another.

The power distribution arrangement follows the modular design concept of the UEM packaging. Each module is truly universal in terms of power and cooling, and contains its own multi-output power converter to supply all necessary voltages. The system is designed so that there are no restrictions as a result of power or thermal constraints. Any circuit card can go in any slot, and all modules can be filled to capacity with any (logically) valid combination of cards, with virtually no engineering requirements. Both AC-powered and traditional DC-powered system options are available, providing flexibility to meet a wide variety of customer needs. Part of the power architecture includes a System Monitor designed to provide enhanced power, cooling, and general system monitoring capabilities. The System Monitor interfaces to the CPU through a Serial Data Interface (SDI), for intelligent error and status reporting.

System enhancements

The comprehensive open architecture ensures continual growth in capacity and capability to address ongoing demands imposed by business communication and information management needs. Building on the strength of the original SL-1 architecture, this approach has enabled a smooth evolution to occur that takes full advantage of new technology as it becomes available, allowing customers to protect their installed investment while at the same time benefiting from these new technologies and features.

The development of Meridian 1 introduces major enhancements to the network and peripheral areas of the system. The implementation of microprocessor technology to the peripheral circuit cards and their associated support interfaces creates a new set of Intelligent Peripheral Equipment. The on-board microprocessors off-load processing functions previously performed by the CPU, resulting in an increase in system real time capacity. In addition, they provide increased system diagnostic capabilities for an improvement in maintainability. Where possible, hardware switch selection is replaced with software-controlled selection of circuit card options. The on-board microprocessors also allow for circuit card parameters to be changed without requiring hardware revisions. Parameters are stored on the system disk drive unit, and are downloaded to the circuit card at system reload or upon user command. The new cards also make use of on-board intelligence by reporting their product code, serial number, release number, and manufacture location, assisting maintenance and inventory control.

The Intelligent Peripheral Equipment (IPE) provides an increase in density on associated peripheral circuit cards. For example, the digital line card provides 16 voice and 16 data ports, for a total of 32 ports, and the analog line card provides 16 ports. Since the IPE Module holds 16 cards, the maximum number of peripheral ports (or terminal numbers) per module is 512. The overall impact is a 300 percent increase in peripheral density.

Network capacity is enhanced through the introduction of the Superloop Network card, which interfaces to four regular network loops to extend 120 timeslots per superloop to the IPE. This increased bandwidth and larger pool of timeslots improves the network traffic capacity by 25 percent for each 120 timeslot bundle. For high traffic or non-blocking applications, up to four superloops may be assigned to each IPE Module. Alternatively, since the PE address range has been increased such that up to 1024 TNs may be assigned to each superloop, low traffic applications may have one superloop serving up to two IPE Modules.

Other enhancements include a migration to the DS-30 signaling method used by other Northern Telecom switching products, providing a commonality of signaling schemes throughout the Meridian 1 Communication Systems family so that growth beyond 10,000 ports is possible without a change in PE type. Together, the new signaling scheme, the additional processing capabilities, and the increased addressing and termination capacity, provide a ready platform for the integration of ISDN Basic Rate Access (BRA).

System organization

Each system option is organized around three functional partitions: Common Equipment (which includes the system software), circuit-switched Network, and Peripheral Equipment.

Common Equipment

The Common Equipment is comprised of the following components:

- Central Processing Unit (CPU) which, under software control, provides the computing power for system operation.
- Read/Write (R/W) random access memory stores all operating software programs and data unique to the particular SL- 1 system option including switching sequences, features, class-of-service information, and quantity and type of peripheral devices.
- Serial Data Interface (SDI) provides an **RS232C** communications link for administration and maintenance on either a local or remote basis.
- Mass Storage Unit (MSU) provides for high speed loading of the system operating software and data into the R/W memory.

Network

The Network consists of:

- digital switching matrix for circuit-switched connections to associated peripheral devices
- two types of Network cards:
 - Existing Meridian SL-1 Network cards, each supporting a dual-loop configuration where each network loop consists of thirty-two 64 Kbps timeslots (30 traffic, 1 signaling, and 1 spare).
 - Meridian 1 Superloop Network cards, providing 120 timeslots of 64 Kbps each, supporting from one to eight segments over one or two IPE modules.
- Digital service circuits which provide functions such as tones and cadences and conferencing capabilities.
- Arrangement whereby the network loops are provisioned to suit the following configurations:
 - half network group (up to 16 network loops)
 - full network group (up to 32 network loops)
 - multi-network groups (up to 160 network loops)

Peripheral Equipment

Peripheral Equipment (PE) performs the interface function for the telephones, terminals, and trunks that utilize the 64Kbps clear channel bandwidth capability of the circuit-switched network. Where necessary, analog to digital conversion (and vice versa) is accomplished on a per port basis by means of a single channel **codec** (coder-decoder) located on the appropriate interface cards. An exception to this is the Meridian family of digital telephones, which reside on the PE, but include individual codecs built into the set for cost-effective data capabilities.

The Peripheral Equipment falls into two categories:

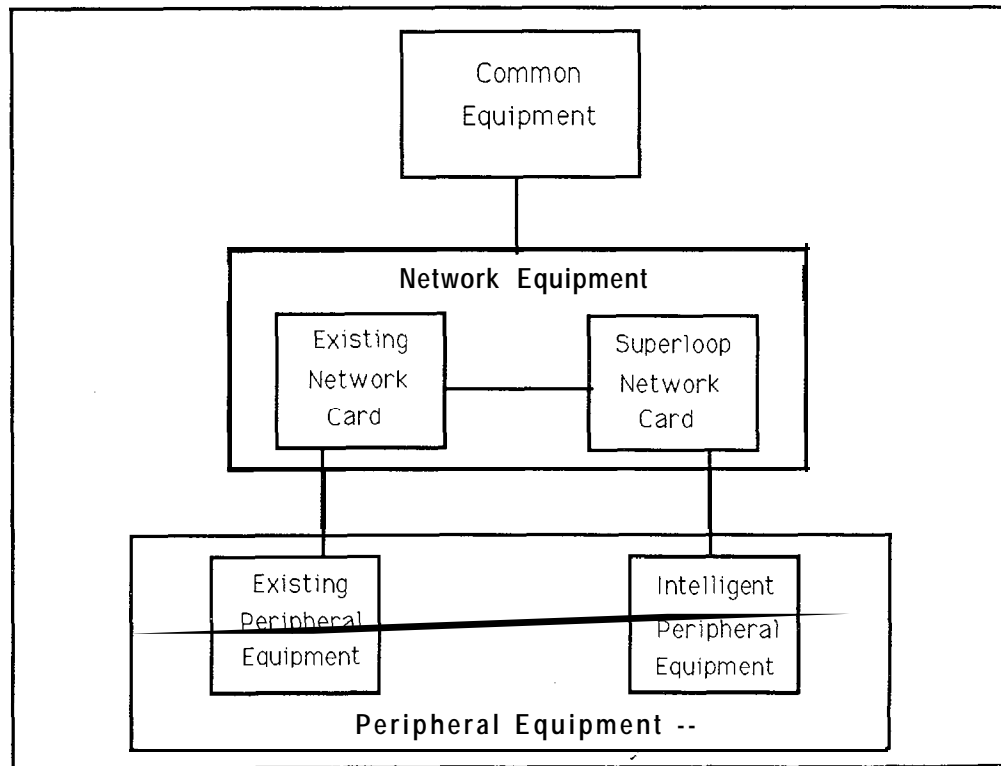
- Existing Meridian SL-1 Peripheral Equipment
- Meridian 1 Intelligent Peripheral Equipment

There are two types of Network-to-PE arrangements:

- Existing Meridian SL-1 Network cards interface to a peripheral buffer associated with existing Meridian SL-1 PE cards.
- Meridian 1 Superloop Network cards interface to a controller associated with Meridian 1 IPE cards.

Both types of network cards can be housed in the same Network Module. However, IPE cards and existing PE cards reside in their own respective modules and cannot be intermixed.

Figure2-1
System organization



System options

Four Meridian 1 system options, based on the Meridian SL-1 architecture, may be selected to meet various applications.

System option 21

System option 21 consists of a single CPU with error correcting memory and up to 28 loops (service circuits reduce this to a maximum of 24 voice/data loops). Also contained within the module are ten IPE slots and an interface, the **Network/Digitone** Receiver (DTR) card, which provides 120 timeslots to those **IPE** cards and eight DTR circuits. **Growth** up to 800 ports is achieved through the addition of Superloop Network cards and IPE Modules/cards. Existing dual loop network cards continue to be supported and a module designed to support Meridian SL- 1 Peripheral Equipment connects to these cards.

Another version, system option **21A**, using AC power and supporting 160 ports in a **single-module-only** configuration, is also available to address small system applications. A field upgrade kit can be utilized should growth beyond the single module be required.

System option 51

System Option 51 consists of a module containing CPU and half network group functions, as well as the number of **IPE** or PE Modules required to support up to 1000 ports. CPU functions are supported using the Omega processor and the eight network slots which are configurable with either dual loop network cards or Superloop Network cards, to support a maximum of 16 loops (service circuits reduce this to 14 voice/data loops).

System option 61

System option 61 adds a CPU/Network Module to the system option 51 configuration to produce a fully redundant configuration, capable of supporting up to 2000 ports. This system option provides a full network group with up to 28 loops (assuming duplicated service circuits) to support voice/data requirements and the ability to process up to 32,000 busy-hour call completions.

System option 71

System option 71 is a fully redundant CPU/memory configuration capable of supporting up to 10,000 ports connected to (up to) five network groups. Again, both Meridian SL-1 dual loop networks and associated peripherals are supported along with the Superloop Network card. Assuming duplicated service circuits on each network group, 140 of the available 160 loops may be equipped to support voice/data requirements.

With the exception of system option **21A**, all system options listed above are available **with** either AC or DC power arrangement.

Features and services

Meridian 1 capabilities range from voice and data communications for a single site, to sophisticated multi-site networking, to high capacity tandem switching applications. The Meridian 1 portfolio offers a complete family of desktop products, a full complement of voice and data communications options, easy to use system administration capabilities, and an extensive array of call processing features. Networking capabilities range from simple off-premise extensions to local area networks, to sophisticated corporate networks deploying ISDN Primary Rate Access (PRA). Call management applications range from simple call distribution to sophisticated call center management and reporting tools.

Meridian 1 Communication Systems extend the high performance and reliability of fully digital communications across the business spectrum, to manufacturers, the financial community, educational institutions, government, hospitals, emergency services, the entertainment and hospitality industries, and any other organization that relies on fast, efficient communications.

The versatility and flexibility of the Meridian 1 provide optional configurations to meet the application requirements of various business organizations. Application driven technology helps reduce, control, and forecast operating costs, enhance and increase service levels to customers, increase new business opportunities, introduce new products, and help streamline business processes to run more efficiently.

Meridian software

Meridian software offers the same features and functions on all SL- 1 system options ranging from small 30 port systems to systems accommodating 10,000 ports.

A comprehensive selection of features addresses the needs of all business organizations. Virtually every industry application (such as lodging, hospitals, finance, education, manufacturing, multi-tenant) benefits from the many time- and money-saving specialized features of the Meridian 1 Communication Systems.

Some of these features are:

- Basic Automatic Route Selection (BARS) — lowers long distance charges by automatically placing calls over the most economical route available.
- Call Detail Recording (CDR) — provides cost accounting information for billing back to departments or individuals. Call records are available for both internal and external calls. In addition, CDR provides information that can assist in the management of network efficiencies.
- Call Party Name Display (CPND) — provides users equipped with display telephones with the source of a call, the reason for its redirection (such as no-answer, busy), and even the identification of the party who forwarded the call.
- Multi-Tenant — allows the resale of Meridian services and features to tenants at the same facility, with either shared or dedicated access to facilities.
- Flexible Dialing Plans — allow selection of up to 7-digit extensions and permit enormous flexibility in designing network dialing plans for multiple sites.

Many other time and money saving applications can be deployed with auxiliary processors for sophisticated system management and administration, for inbound call center management and reporting, for conference bridges and specialized network functions.

Northern Telecom's commitment to ongoing software feature development keeps system capabilities current with state of the art functionality to address ongoing market requirements. A single software development stream ensures that all features are exercised on all installations, small or large, single site or multi-site:

Desktop products

Today's advanced Meridian 1 line of products includes a telephone or terminal for every business communications need. The Meridian Digital Telephone portfolio brings the powerful value-added features and services of Meridian 1 to every desktop. Simple access to voice messaging, data communications, least cost routing, and other call processing features ensures a full return on the communications investment .

The modular design of the telephone portfolio delivers the ultimate flexibility to configure a set for every user in the business organization. The modular units can be factory or field installed to meet initial or later needs. Optional 2 x 24 LCD displays deliver enhanced functionality such as identification of incoming call information. Key expansion modules enable the portfolio to cover user applications from a single line to 60 lines. In addition, all Meridian Digital Telephones support asynchronous data adapters. The Meridian product portfolio enables feature key configurations to suit specific application requirements. The software commands (such as add, move, and change) are simplified because all sets use identical line cards, whether they are equipped for voice only or voice and data.

Data can be added to the Meridian Digital Telephone simply by installing the RS232-C data option into the base of the set. Voice and data signals are transmitted over a single twisted pair to a single voice/data port on the digital telephone line card.

Meridian 1 SL-1 digital sets

The Meridian 1 SL-1 digital set portfolio includes:

- The M2006 single line telephone which has one line key and five programmable feature keys.
- The M2008 standard business telephone which has eight programmable line/feature keys and can connect with the optional data module.
- The M26 16 performance-plus telephone which has 16 programmable keys as well as fixed feature keys. The M2616 can be software-assigned with hands-free communications. Optional key expansion modules can extend this set to provide 38 to 60 line/feature keys.
- The M2216 ACD telephone which comes with dual headset jacks that enable high-volume call handling capability of telemarketing group needs. Model 1

has two RJ-32 ports for modular **electret** headsets; Model 2 has one RJ-32 port for an **electret** supervisor headset and one PJ-327 port for a carbon agent headset.

- **M2016S** secure telephone which prevents the telephone from being used as a passive listening device in any environment in which confidential information is discussed.
- **M2317** intelligent telephone which has a built-in liquid crystal display, 11 programmable line/feature keys, and five soft keys to provide easy access to numerous features, including step-by-step prompts for optional Meridian Mail voice messaging.
- The **M3000** touchphone which has a unique touch-sensitive liquid crystal display that provides access to many features, including a customized directory of more than 250 dial-by-name entries.

Meridian attendant console

One of the key benefits of Meridian 1 is the efficiency and speed of call processing combined with ease of use at the central answering position(s). The Meridian attendant console is the optimum attendant interface for efficient high volume call processing. Large, easy-to-read indicators and a 4 x 40 liquid crystal display provide essential information required for processing calls and personalizing call answering. The alphanumeric display provides for immediate viewing of call source and destination information. Loop keys and Incoming Call Indicator keys allow the attendant the option to handle calls in sequence or to prioritize answering for specific trunk groups. An optional Busy Lamp Field provides the attendant with user status at a glance.

The Meridian attendant console also supports attendant Message Center options. The attendant console can be connected to an IBM PC (80286, 80386, or PS2) or compatible to provide electronic Directory, Dial by Name, and Text Messaging functions to further enhance communications efficiency. All call processing features can be accessed using the computer keyboard. Multiple PC adjuncts can be networked in a multiple-console environment along with the ability to print messages and directories locally or at departmental printers. The central answering position can become a streamlined and efficient message center with all the tools needed to provide a consistently accurate and timely exchange of information.

System administration

System Management is a vital link in ensuring the continuing effectiveness of the Meridian 1 Communication Systems. Meridian Manager-provides a user-friendly, PC-based management system to address operations and administrative functions.

Meridian Manager includes three optional modules:

- Station Administration allows easy implementation of all telephone set software commands (such as add, move, and change).
- Traffic Reporting provides easy to understand reports on Meridian 1 system performance. Specific analysis of processor, operator, loop, and trunk traffic

are automated, assuring the ability to easily and efficiently optimize Meridian 1 resources.

- Work Order System provides planning management and control of telephones inventory, as well as related financial statements, and a master telephone directory.

Meridian 1 data services

The Meridian 1 data product line is the most comprehensive one available with any communications system today. It allows terminals, workstations, and personal computers to easily communicate with a wide range of hosts, local area networks (LANs), printers, modems and other devices via cost-effective standard telephone wiring. Meridian data services provide broad connectivity which allows users to access multiple networks, applications, and computers from a single terminal.

Data switching on the Meridian 1 platform is **simple and cost effective**. Host computer resources can be shared and therefore more efficiently utilized, with fewer requirements for expensive and inflexible nailed up connections. Existing data terminals and intelligent workstations, regardless of type, connect via industry standard interfaces such as RS232, RS422, and V.35. Meridian 1 supports both asynchronous and synchronous data switching. Most models of terminals and PCs can be directly connected to the Meridian 1 without a requirement for data modules. Where the user application also calls for voice communications, these terminals can interface through a Meridian Digital Telephone Data Adapter.

Meridian networking solutions

Network solutions can be simple off-premise extensions, or very sophisticated to accommodate complex networking requirements for a large corporation. Meridian 1 networking solutions can be implemented for initial requirements and upgraded later to accommodate future growth.

Northern Telecom's Electronic Switched Network (**ESN**) is a comprehensive private networking solution that ties separate corporate communications systems into one unified private network with features such as consistent dialing plans and advanced call routing to reduce communication costs and optimize network performance.

With the implementation of ISDN on the Meridian 1, corporations have even more powerful tools to substantially improve networking with even more flexibility to integrate voice and data communications that best fit their organizational needs. ISDN introduces powerful new features and services to further enhance network performance to achieve even greater system flexibility.

Meridian Customer Defined Networking (**MCDN**) further extends Northern Telecom's network solutions portfolio by offering customers greater control and flexibility in hybrid networks. An unprecedented level of network service interworking is provided with MCDN, allowing corporations to customize network design to ensure the best application of advanced technology and service options for complex networking applications.

The link that connects corporate users to the many ISDN network services is ISDN Primary Rate Access (**PRA**). Meridian 1 and ISDN PRA provide access to local exchange carriers through Northern Telecom DMS-100 switch and AT&T **#5** ESS. It provides access to inter-exchange carriers like **MCI** and U.S. Sprint using Northern Telecom DMS-250 switch and to-AT&T on the **#4** ESS switch, and to private network nodes such as Meridian 1 systems.

Meridian 1 offers multi-national customers the ability to access other public exchanges internationally. International PRA provides connectivity to public exchanges, such as **Ericsson AXE-10**, ITT System 12, Alcatel **E10**, and Siemens EWSD.

ISDN Signaling Link (ISL) is a highly versatile 64 Kbps link between Meridian 1 systems to cost-effectively integrate small remote locations more closely with headquarters so any Meridian 1 can enjoy advanced ISDN services.

Meridian Link allows the Meridian 1 and the host computer to communicate with each other in order to provide integration of voice and data communications to support sophisticated applications. For example, users can pop-up a screen of customer history simultaneously upon presentation of that incoming call to the customer service agent. Meridian Link supports defacto industry standards, such as X.25,3270 SNA and LAPB for connectivity to IBM, Digital Equipment Corporation, and Hewlett-Packard computers.

Meridian Networked ACD

Businesses with just two locations, or multi-national organizations with multiple sites can reap the benefits and advantages of Meridian Networked ACD. The system manages the call traffic as specified by the guidelines, allowing the maximization of all resources and control of operating expenses. Automatic load balancing optimizes and prioritizes calls across the network so that callers who have been waiting the longest will get answered first. If business requirements demand 24-hour operation, advantage can be taken of resources in different time zones, thus improving customer service and increasing productivity.

The powerful Meridian features and benefits can be applied to the entire Meridian ACD network. Network Overflow Routing provides peak period service across the network, and network-wide information becomes available to agents and supervisors.

Meridian Mail

The unique integration of Meridian Mail to the Meridian 1 Communication Systems gives it powerful voice messaging and voice processing capabilities.

Meridian Mail delivers numerous functions with flexibility and integration between them to provide a powerful office automation and marketing tool. Voice messaging allows for non-simultaneous verbal communication. The telephone-answering function forwards incoming calls to the messaging system under no-answer

situations. Callers still receive personal attention by hearing a personalized greeting whereupon they can simply leave a message with the Voice Mail function, or at the press of a button, be transferred to an attendant, or another designated answering position. Optionally, callers can route themselves to any another person by inputting the proper extension.

Message Waiting notification advises users to collect their messages. The automated attendant answers calls with a recorded announcement. Call routing enables the callers to route themselves to an extension number or an information mailbox to listen to prerecorded information. Interactive voice response allows callers to retrieve or leave information on a host computer via the telephone keypad.

The Meridian Mail networking option supports from 2 to 500 Meridian Mail systems in remote locations. It enables users at remote sites to reply to voice messages and utilize distribution lists that contain users on other systems across the network. All features are presented and operate transparently to the user.

The Meridian Mail system is installed within the Meridian 1 Communication Systems module. Its multi-module design can expand to meet growth requirements. Meridian Mail can expand from 4 ports, 5 hours, to 48 ports, 240 hours of storage and can support up to 3,700 users, depending upon the application. Integration to the Meridian 1 system is through the Meridian Link for superior integration and digital connectivity for voice quality. Connectivity to a network loop on a network card eliminates the need for additional hardware such as line cards. Meridian Mail can share the battery back-up and power supply of the Meridian 1 for cost efficiency.

Meridian LANSTAR

Meridian LANSTAR provides a most effective data network transport and topology for creating an establishment-wide local **area** network. It connects large numbers of users that may be spread over long distances to create a manageable and **cost-effective** LAN. With LANSTAR bridged via the Meridian **1**, customers can implement LAN to WAN networking (local area networking to wide area networking).

Based on a star topology, LANSTAR uses inexpensive standard unshielded **twisted-pair** telephone wiring to provide a high speed 2.5 Megabit communications link between the transport hub and network users.

The modular design allows even small networks to take advantage of **LANSTAR** superior distance and **performance** capabilities.

LANSTAR 40 Megabit data transport supports up to 1,344 users connected to the hub in a true physical and logical star topology. Users can be widely dispersed up to 609.6 m (2,000 ft) away from the LANSTAR hub for a network span of 1219.2 m (**4,000 ft**).

With the newly announced fiber optic interface, multiple LANSTAR hubs can be interconnected to provide even greater distance capabilities for very large, geographically dispersed networks. The LANSTAR FDDI Interface allows access to a **100-Megabit** fiber backbone, providing very high-speed communications between each LANSTAR hub.

Users have dedicated access between the workstation and the hub, and there is no connection for network access as there is with Ethernet or Token Ring. The star topology minimizes wiring problems and complexities. Fault isolation is easy, and a problem at one connection cannot affect anything else on the network; therefore, network reliability is very high.

Chapter 3: Product evolution

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In the early seventies Northern Telecom recognized the need for a versatile **state-of-the-art** product that could adapt readily and quickly to changing conditions, a product that would give it an edge in a very competitive marketplace. The SL-1 PABX (Private Automatic Branch Exchange) emerged, featuring a digital switching matrix under computer control.

The foresight of the original development team continues to pay dividends. The challenge was to design a system that would meet current needs while retaining the ability to evolve without obsolescence. The key aspect of the system design is a modular, highly flexible architecture in which the primary system elements can be independently changed in whole or in part to address changing market requirements.

The system met an immediate demand for a full range of voice and data processing features in a cost-effective package. Besides functioning as a Private Branch Exchange (**PBX**), it also included key telephone and custom calling features. These advances were achieved by incorporating several notable industry firsts. A high level software language (HLL) provided significant advantages over assembler language in terms of simplicity and implementation. It also permitted improved, simpler ways for users to communicate **with the** system.

To complement the advanced PBX features, a custom LSI chip was incorporated into a proprietary electronic telephone and its associated peripheral interface. From a human factors point of view, replacing the conventional telephone with a new electronic set was a prerequisite for more effective business communications services. The SL-1 electronic telephone provided simple, direct selection of features, and unambiguous system responses to indicate the progress of calls.

The main objective to reduce the size of interconnecting cable as compared to those used for existing key telephone sets, was achieved by using a form of distributed control in the SL-1 set. The six-conductor line cord in the latter permitted systems to be pre-cabled irrespective of the eventual use of either SL-1 or conventional **500/2500** type single line telephones at a terminal location.

Another industry first was the utilization of the **codec** on a per port basis to take full advantage of digital technology. Ongoing silicon enhancements could be introduced without affecting more centralized equipment in the system. Peripheral equipment was packaged in increments of four line circuits and two **trunk** circuits on associated individual cards.

The first system shipment was in 1975, and the product has continued to evolve, incorporating new technologies as they became available. As a result, a continuous stream of enhancements has introduced a series of system models, each building upon its predecessor with improvements in performance and capabilities.

All models in the product family share similar technology and hardware, as well as software. They differ only in hardware packaging and the number of peripheral terminations that they support. The wide variety of available models ensures that users can select the system and features best suited to meet their specific needs.

The Digital World

In 1976, Northern Telecom became the first corporation to commit publicly, with the Digital World announcement, to producing a complete line of digital switching, business communications and transmission systems. Every major telecommunications manufacturer has since followed this lead. Today, Northern Telecom is the principal supplier of fully digital systems in the world. Its family of digital business communications systems is among the world's most advanced multi-function integrated voice and data switching systems.

The Intelligent Universe

In 1979, Northern Telecom unfolded the Intelligent Universe to announce the threshold of a new era for its product capabilities. Envisioned were new applications of digital technology to create efficient, harmonious global networks of simultaneous voice and data transmission that allow major office communication functions to be undertaken in a single integrated system. In addition, the formation of sophisticated networks would evolve to provide comprehensive communications through intelligent terminals in which information can be organized, stored, accessed, and received from any source in the world.

OPEN World

In 1982, Northern Telecom announced the OPEN World for information management systems. The OPEN (Open Protocol Enhanced Networks) World was an extension of Northern Telecom's proven expertise in the key areas of digital technology, semiconductors, software, and integrated communications capability. It presented a commitment to providing a planning framework, new products, features and services for the OPEN World.

Northern Telecom's announcement of OPEN World promised to create integrated communication networks that open the technological barriers to user-controlled systems. The SL-1 would act as the hub for such systems, giving the user the opportunity to install whatever equipment is most cost-effective for the application. The OPEN World concept encompasses the following five key criteria: continuity, compatibility, congeniality, control, and cost-effectiveness.

Meridian

On February 14, 1985, Northern Telecom, in keeping with the OPEN World promise, announced major enhancement capabilities to its SL family of digital switching systems. Under the banner of Meridian SL-1 Integrated Services Network, a new range of sophisticated information management services would evolve including:

- a local area network (LAN) capability called LANSTAR
- a unique, high speed 2.56 Mbps pipeline to the desktop using conventional twisted pair wiring distribution
- a range of fully digital telephones to increase the existing terminal portfolio using a new 512 Kbps digital distribution scheme

The foregoing enhancements were accomplished through architectural extensions that built upon the existing system foundation. As such, they reemphasized Northern Telecom's commitment to a continuity program that guards against product obsolescence.

Meridian 1

On January 30, 1990, Northern Telecom unveiled Meridian 1, a modular communication system encompassing the industry's first truly global private branch exchange (PBX) product line.

Meridian 1 represents a merger of the functionality of Meridian SL-1 and Meridian SL-100, and Meridian **SuperNode**, Northern Telecom's current PBX products, into a single, modular communications product portfolio. Meridian 1 capabilities extend from voice and data features for very small organizations to high capacity advanced tandem networking, very large Automatic Call Distribution (ACD) centers, (up to 4,000 agents), multi-function military agency support, campus communication systems, intelligent network node capabilities, and the bridge to the **FiberWorld** of the future.

The new Meridian 1 provides common hardware and adaptive software for existing systems. This means that **customers** can upgrade to the latest voice features, data connectivity, and sophisticated information services for PBX applications ranging in size from 30 to 60,000 ports, the widest range in the industry, while retaining 80 to 90 percent of their equipment.

Noteworthy for multi-national corporations, Meridian 1 uses globally adaptive technology that enables it to be sold and used in virtually any country without major hardware modifications. Meridian 1 software is compatible with recognized international communications transmission standards. Additionally, Meridian 1 digital telephone sets can be programmed to give instructions in six languages.

Meridian 1 provides a platform for future growth and will be compatible with communications networks of the next century. Underscoring Northern Telecom's leadership in ISDN, Meridian 1 delivers ISDN primary rate access (**PRA**) now. It supports Basic Rate Access (BRA) on large systems and will deliver BRA across the entire product line by the end of 1991. In the future, the new system will use fiber optic technology to provide broadband capability, bandwidth on demand and services such as high speed data and full motion video.

Northern Telecom Meridian 1 introduces a product design consisting of new stackable modules that contain the various system elements. Peripheral Equipment Modules contain line and **trunk** cards that connect a wide variety of telephone and central office interface circuits.

The new modular design offers the ability to grow from a single module through a column of up to four modules into an array of columns that connect with existing equipment to extend and serve applications with up to 60,000 ports. The modular

packaging takes up to 50 percent less floor space than existing systems in cabinets and lets customers add lines and features in a simpler, more cost effective manner than ever before.

The core of the product line is an **Intelligent** Peripheral Equipment Module that works with both the Meridian SL-1 and SL-100 and has distributed processing, high density line cards, universal trunks, improved self-diagnostics, and an enhanced network architecture. System options provide the ability to select the configuration best suited to meet **the** required business communication application within the 30 to 60,000 port range. For applications up to 10,000 ports, system options 21, 51, 61, and 71, based on the Meridian SL-1 architecture, are available for use.

System evolution

SL-1L In 1975, Northern Telecom introduced the SL-1L as its first member. The system was configured in a single network group arrangement with a choice of one or two Central Processing Units (CPUs). Memory was packaged in modules of 4K words and structured in an N + 1 concept such that a spare module was available in the event of a memory failure.

SL-1VL The SL-1VL was introduced in 1976 to address requirements beyond the capacity of the SL-1L. It consisted of a multi-group arrangement for up to **five** network groups, each group capable of accommodating the 16 multiplexed loops provided by the SL-1L. A similar design philosophy and many of the same components were used, the major differences between the two systems being in the area of common equipment. The SL-1VL system utilized a more powerful and duplicated CPU, a repackaged memory in modules of **8K** words, and a centralized powering concept. It was supported by Software Generic 202 which added a number of feature enhancements over the initial system capability. The software was also adapted to the SL-1L as Generic 102.

SL-1LE and SL-1VLE In 1978, common equipment enhancements capitalized on technological advances to effect cost reductions and increased system reliability.

The result was the introduction of two new systems:

- SL-1LE for single network group applications
- SL-1VLE for multi-network group applications

An increased density memory module storing 64K words of data or program information was introduced, drastically reducing the number of circuit cards required by each system. The enhancement also **increased** the memory addressing capability to accommodate ongoing feature incorporation. A redundant (2N) memory bank was introduced to complement the duplicate processor capability already available. Each processor was able to access both memory banks, with the flow of information to the active processor controlled by an arbitrator, a significant improvement over the conventional use of a single memory bank with duplicate spares. In addition, the concept of segmented busses was incorporated to allow

recovery of call processing functions by reconfiguring the system hardware to isolate faults.

SL-1A A significant breakthrough in equipment packaging was made in 1978. Although expandable to some 400 lines, the **SL-1A** emerged to address the 100 line and below market. Spare mounting space in the equipment cabinet was utilized to accommodate a mini-network shelf and a magnetic tape transport. Shelf positions were thereby freed for peripheral equipment, enabling a single CPU to service 200 PE terminations in a single cabinet configuration.

SL-1XL Out of the SL- 1 technology, the SL- 10 packet switching system emerged. Of significance is that the powerful processor utilized for data transmission in the SL-10 was adapted to the SL-1 to form a new family member, **SL-1XL**. The latter was introduced in 1980, expanding the call processing capability through an increase in CPU real time capacity. The SL- **1XL** also provided more memory storage to allow further penetration into the 2000-5000 line range.

SL-1M This system was introduced in 1982 and with it the concept of front and rear cabinet access to take advantage of hardware repackaging and a subsequent reduction in footprint. A single cabinet supports a typical configuration 250 lines/40 trunks with expansion to a 400 line marketing limit by means of an additional peripheral cabinet.

SL-1S, SL-1MS, SL-1N, and SL-1XN Major changes to the SL-1 product line also occurred in 1984 with the introduction of these four new family members.

Model	Application	Configuration
SL-1s	32 to 120 lines	Single CPU-single memory sub-system
SL-1 MS	80 to 400 lines	Single CPU-single memory sub-system
SL-1 N	100 to 1500 lines	Single or dual CPU, single network group, duplicated memory sub-system
SL-1 XN	up to 5000 lines	Dual CPU, multi-network group, duplicated memory sub-system

The systems were the result of an extensive development program that enhanced the major elements of the architecture.

Common Equipment enhancements

The Common Equipment (CE) enhancements consisted of redesigning the Central Processing Unit (CPU) and Memory sub-systems.

A new type of central processor, based upon the **SL-1XL** microprocessor technology but with a much simpler architecture, was introduced for single network group applications. Elimination of much of the discrete logic previously employed in separate Arithmetic Logic Unit (ALU) and Sequencer (SEQ) cards plus utilization of 64K EPROMS to store the firmware resulted in the **CPU being** housed on a single card. Thus the benefits of fewer components, less power requirements, along with a reduction in footprint were achieved without sacrificing performance. Indeed the reverse since the new microprocessor increased processing speed by as much as 55 percent over the equivalent earlier CPU models.

The introduction of 64 **Kilobit** Random Access Memory (RAM) chips permitted memory packaging in 192K modules as opposed to the previously available 64K modules. Additionally, the functions of the Memory Controller, formerly a separate card, were incorporated in the new memory module design. Two design types were developed, one incorporating automatic error correction and detection capability for systems using single memory subsystems (S and MS), and the other using conventional 17 bit per word formatting (16 data plus 1 parity) for the duplicated memory subsystems (N and **XN**). Further, two versions of each type in **128K** and 192K modules were made available to facilitate memory addressing through efficient hardware provisioning for each SL-1 family member.

Network enhancement

Enhancements to the switching network were made primarily to address the requirements imposed by data communications on the SL-1 system. The existing network architecture was designed for applications in what was then a predominantly analog world. As such, to simplify the path search algorithm, available time slots or channels through the network were selected on a **matched-pair** basis. Thus a call originating on **timeslot 4**, for example, always terminated on **timeslot 5** to complete the connection. This arrangement is certainly adequate for voice switching requirements. However, the recognition of the PBX as a viable hub to control the switching of integrated voice and data demanded improvements over the original design.

Network enhancement achieved the following: --

- Removed the time slot matching pair constraint by selecting available channels on an individual basis. Thus the varying traffic requirements imposed by switching voice and data can be readily addressed by allocating network resources accordingly to meet the specific needs of each.
- Doubled the number of links on the network backplane so that the associated equipment shelf could accommodate twice as many network loops. This was accomplished by the design of a new network card containing two loops as opposed to the single loop per card employed previously. Thus the number of network loops was doubled (16 to 32) within a network group. To complement

this increase in traffic handling capability, the junctures, which are merely extensions of the originating and terminating loops between network groups, were also doubled (from 4 to 8 one-way junctures from one network group to each other).

Peripheral Equipment enhancements

Introduction of Very Large Scale Integration (VLSI) components was instrumental in providing significant benefits from the PE enhancement program. In particular, a new custom filter **codec** chip, allocated on a per port basis, enabled peripheral card density to be doubled. Initial application of the chip, designated **W05**, to the most widely used PE cards, the SL-1 and **500/2500** line types, resulted in footprint savings and a reduction in per line power consumption. The next phase of the program introduced the **W05** to the CO Trunk, DID Trunk and Message Waiting Line Cards respectively • again doubling the number of ports per card compared to their previous counterparts. The **W05** met the transmission standards for digital PBX mat are recommended by the U. S. Electronics Industries Association (**EIA**). These standards cover return loss, longitudinal balance, gain variation, idle channel noise, and other transmission characteristics.

Compliance to U.S. Federal Communications Commission (FCC) Part 15 regulations was mandatory for the continued marketing of the SL- 1, which is classified as a Class A computing device. These regulations cover Electromagnetic Interference (**EMI**) and Radio Frequency Interference (**RFI**) requirements and were addressed at both the circuit card and system levels under the PE enhancement program. At the circuit card level, **EMI** and **RFI** were minimized through design practices that tackled the problem at the source. Use of CMOS (Complementary Metal Oxide Semiconductor) components, isolated circuit traces, and multilayer backplanes were contributing factors. From the system point of view, a new equipment cabinet was designed utilizing elaborate shielding techniques to prevent **EMI** and **RFI** being emitted from the SL- 1 equipment contained therein.

Not all facets of the enhancements were applicable to all systems. Instead, portions of the program were adapted as appropriate to benefit product application, a further indication of the modularity and flexibility of the SL- 1 design.

Meridian SL-1NT, Meridian SL-1XT Major system enhancements were incorporated in 1986 as signified by the introduction of Meridian **SL-1NT** and Meridian **SL-1XT**. A Common Equipment enhancement program, supported by Software Generic X 11 Release 8, provided new key operating elements which resulted in significant improvements to system operating parameters. The following new components were identical for use **inboth** NT and XT systems:

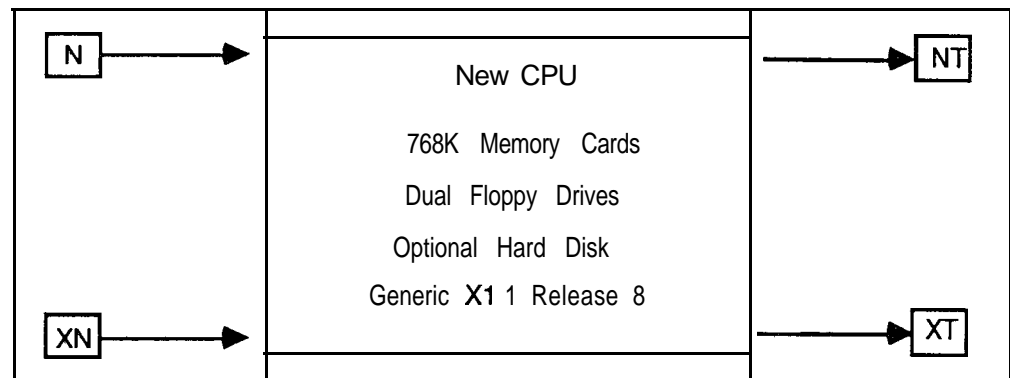
- **Central Processing Unit**
a new CPU, contained on two printed circuit cards, provided in excess of fifty percent more real time capacity compared to that previously available on Meridian **SL-1XN**.
- **Random Access Memory**
A new memory design increased significantly the software address range and eliminated the 64 K word page address partitions incorporated on earlier models

of SL-1. The memory utilized 256K dynamic random access memory chips to permit as much as 768K words of storage on a single circuit card.

— **Mass storage sub-system**

A new mass storage system, designed to replace the previous magnetic tape transport, provided 75 percent more storage capability through the provision of a pair of floppy disks as a standard product offering. An optional 10 Mbyte Winchester hard disk was also made available to further expand storage capacity. Since the mass storage subsystem design was independent of the new CPU design, it could be incorporated on other system models supported by X1 1 Release 8 software. Besides additional storage capability, implementation significantly reduced the time associated with administration and maintenance routines.

Figure3-1
Components common to systems



Meridian SL-1ST In 1987, Meridian **SL-1ST** was introduced to address the requirements of the small PBX market. Packaged in a small, attractive, modular cabinet, the system provides the functionality and feature capability of the much larger members of the Meridian SL-1 portfolio. In addition to a tiered arrangement of equipment shelves for flexible expansion, Meridian SL-1 ST also introduced peripheral enhancements that were later adapted to the larger systems. These enhancements included the introduction of a 16-port 500/2500 line card and a split PE shelf accommodating a dual-loop buffer which in turn housed a dual-port digitone receiver.

Expansion beyond the capabilities of the initial **CE/PE** cabinet was accomplished by means of an **ST** expansion cabinet utilizing similar packaging techniques. These same packaging concepts were also adapted for Remote Peripheral Equipment (**RPE**) applications through the introduction of a new **RPE** cabinet that provides existing feature capabilities in a much smaller hardware configuration.

Meridian SL-1RT The Meridian **SL-1RT** was introduced in 1988 to address the needs of smaller sized organizations requiring the added reliability of control redundancy. Packaged in a small modular cabinet similar to the Meridian **SL-1ST**,

..

redundancy. Packaged in a small modular cabinet similar to the Meridian SL-1ST, the RT utilized the dual CPU and memory duplicate configuration of the NT system. The Meridian SL-1RT could be expanded by adding the same tiers designed for Meridian SL-1ST expansions.

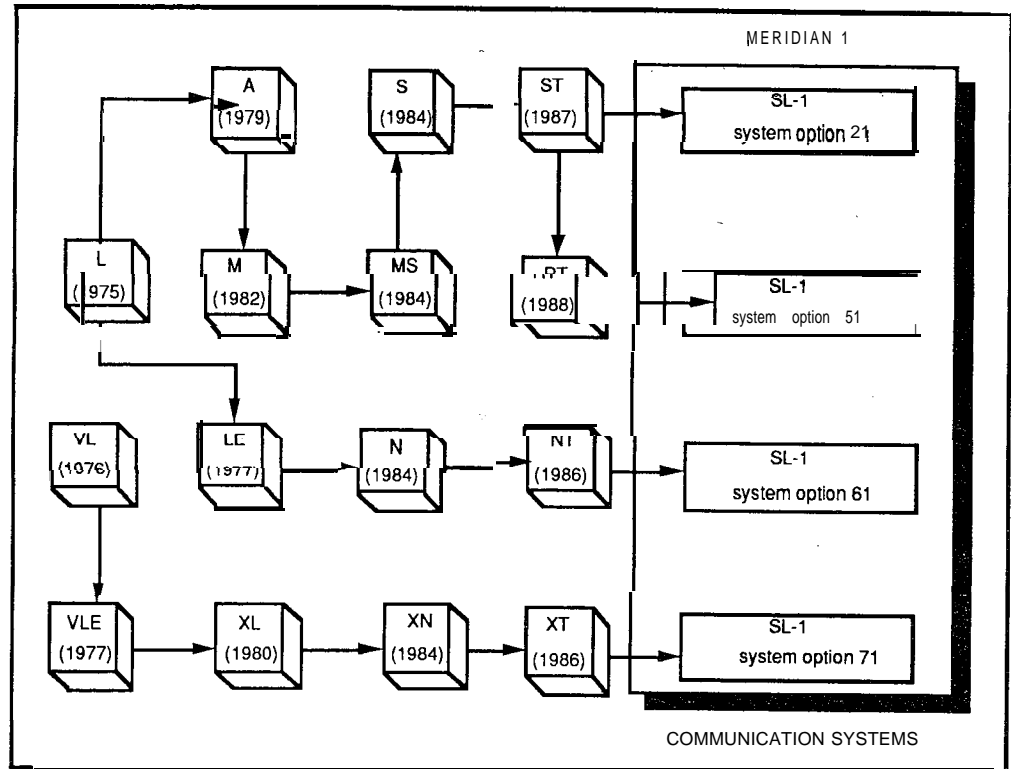
Meridian 1 Communication Systems — system options 21, 51, 61, and 71

Unveiled at global launch events on January 30, 1990, these systems combine the functionality of the Meridian SL-1, Meridian SL-100, and Meridian SuperNode into a single, modular product line to address system applications ranging from 30 to 60,000 ports. Based upon the Meridian SL-1 architecture for applications up to 10,000 ports, Meridian 1 system options 21, 51, 61, and 71 introduce the following enhancements and features:

- Modular equipment packaging
- Superloop
- Intelligent Peripheral Equipment
- 300 percent increase in peripheral display
- 25 percent increase in network traffic capacity
- Seamless growth from 30 to 10,000 ports
- ISDN-ready for Basic Rate Access, in addition to present Primary Rate capabilities
- Increased self-diagnostic capabilities
- Extensive system and power monitoring, with intelligent reporting
- Reduction of system engineering rules and constraints
- Simplified installation and maintenance
- Flexible power system architecture
- Effective total platform for continued growth and evolution, in keeping with Northern Telecom Evergreen philosophy

System evolution since product introduction is shown in Figure 3-2.

Figure 3-2
System evolution



Software evolution

Several software generics were introduced throughout the years to support the various features.

Software Generic 101

From a software point of view, Generic 101 was introduced to support the **SL-1L** systems. In addition to many standard features and services inherent in the system, optional software packages provided multi-customer and advanced SL-1 set features. Multi-customer was unique in that it allowed a single SL-1 system to serve up to 32 different customers, each with independent feature complements, numbering plans, and peripheral equipment. The advanced feature package provided Auto Dial, Call Forward, Override, Ring Again, Speed Call, and Voice Call capability to the SL-1 telephone user. The typical application of the **SL-1L** system was in the 100 - 1000 line range.

Software Generic X02

Generic 202 was introduced in 1976 to form the base for the SL-1 VL system. The software added a number of feature enhancements over the initial system capability and was adapted to the SL-1 L as Generic 102.

Software Generic **X03**

Significant changes were made to the software in 1977. The following major feature complements were made available under Generic **X03**.

Call Detail Recording (CDR)

Allows the recording, on a per call basis, of details related to incoming and outgoing calls such as the calling and called parties, time, and duration. The information is assembled by the software and stored as call records on either a g-track magnetic tape mounted in a CDR cabinet, hard-copy device such as a teletypewriter, or external unit conforming to RS-232-C interface. Downstream processing of the collected data permits usage reports to be generated.

Recorded Announcement (RAN)

Provides an interface to a Recorded Announcement machine and the capability of flexibly defining the intercept treatment for various call situations.

Time and Date

Provides the capability of displaying and modifying the system time and date from the attendant console.

Do-Not-Disturb

Provides the capability for the attendant to make any individual directory number appear busy to incoming calls while maintaining it free for originating calls.

End-to-End Signaling

Allows the use of the SL- 1 electronic telephone on an established outgoing connection to utilize the pushbutton dial pad to effect **Digitone** end-to-end signaling.

Software Generic **X04**

Generic **X04** was also introduced in 1978 with the addition of further optional feature groups.

Automatic Number Identification (**ANI**)

Provides the facility to automatically identify a station originating an outgoing toll call and to send this information by Multi-Frequency (**MF**) signaling to a central office toll-ticketing system. The feature is implemented by a combination of software and hardware, the latter consisting of an MF sender, **located** on the switching network bus, interfacing to an associated **ANI** trunk group.

Route Selection — **ANI (RS-ANI)**

Works in conjunction with the **ANI** feature to route toll calls automatically over predetermined trunks.

Automatic Route Selection (ARS)

Provides automatic selection of least expensive and efficient trunk routes under software control for outgoing calls. The ARS mechanism is accessed by dialing a special access code and arranged to route advance a call over up to eight trunk routes under two different time schedules.

Remote Peripheral Equipment (RPE)

Increases the range of the multiplex loop between the CE and PE by using T1 type carrier facilities. The 2.048 Mbps local network loop is converted to a 1.544 Mbps format for transmission to a remote location and then reconverted back to 2.048 Mbps to interface to the RPE.

Do-Not-Disturb: Group

Allows the attendant to place a group of directory numbers into a Do-Not-Disturb mode so that they appear busy to all incoming calls, but free to originate calls.

Make Set Busy (MSB)

Allows an SL-1 telephone user to busy out the set for incoming calls to all DN appearances but free to originate calls.

The demand for additional system features was so great that in 1979, a split in the Software Generic occurred to address specific market segments. Business Generic X04 formed the foundation for the separate generic streams to evolve.

Software Generic XI 4

Generic XI4 was introduced for SL-1 interface to the Autovon (Automatic Voice Network) to present Northern Telecom with a key marketing strength in supplying the military and government market with a proven cost-effective system. The SL-1 Autovon system provides full-featured PABX capabilities combined with requirements of the Defense Communications Agency (DCA) Circular 370-V175-6 specifications, such as precedence and pre-emption of calls.

Software Generic X07

Generic X07 was aimed specifically at the Hotel/Motel communications management market. The full business features of X04 were incorporated with new features designed to provide additional hotel administration and management functions such as:

- Room Number Correlation
- Single Digit Access to Special Services
- Message Waiting
- Vacant Room Restriction
- Supervisory Attendant Console
- Toll Terminal Access

- Music-On-Hold
- System Call Park
- Room Status
- Control Class-of-Service
- Recorded Overflow Announcement

Software Generic **X05**

Additionally, Generic **X05** was introduced as the premium Business Generic, adding the following major capabilities.

Automatic Call Distribution (ACD)

Provides a means of sharing service among a group of answering positions such that calls are served in the order of their arrival. A number of administration capabilities are available for effective agent/supervisor communication. The flexibility of providing stand-alone ACD, combined PABX service, or a split among the two can be configured utilizing a single SL- 1 system.

ARS - Priority Queuing

Provides an improvement to the ARS feature by introducing a flexible **class-of-service** assignment of one of four priority levels for the access of least cost routes by each user.

Authorization Code

Allows selected users to temporarily override the access restriction assigned to any station or trunk by entering an authorization code.

CDR Charge Account Code

Allows a charge account code to be entered before dialing or during an established call to allow billing of calls to other than station directory numbers.

Centralized Attendant Service (CAS)

Allows customers with multiple locations to centralize their attendant services at a single facility. Operation is compatible with AT&T Technical Advisory Manual 10 (TA-10), with the SL-1 system serving as either a main or remote CAS installation.

Digit Display

Provides for the display of information relative to normal call processing and feature activation on any SL- 1 telephone equipped with a digit display.

Dial Intercom

Allows stations to be accessed by abbreviated dialing and be arranged into separate intercom groups within the SL-1 network.

Direct Inward System Access (DISA)

Allows selected users to access the SL-1 from the external public network by dialing a special directory number from **any Digitone** type telephone.

Message Center

Allows an incoming call to be automatically routed to a message center if not answered at the original destination. A message waiting indication alerts the station user, who can then access the center for message retrieval.

2500 Set Features

Provides a subset of features, formerly available only to SL-1 telephones, to be utilized on **2500-type** single line sets. A **Special Prefix Code (SPRE)** is used in conjunction with the **octothorpe key (#)** to activate the following features:

- Call Forward (All Calls)
- Speed Call (User and/or Controller)
- Permanent Hold

Software Generic X09

Software Generic **X09** was introduced in 1980 to support the **SL-1XL** and additionally provide enhancements to the ACD feature by adding load management administration and report capabilities.

Software Generic X1 1

A new business Generic stream **X1 1** was utilized to support **SL-1M** under 711, Release 1, which provided all the feature capabilities of its predecessors and added new capabilities aimed towards the small system user. These new capabilities were:

- Attendant Overflow Position
- Mini-CDR
- History File
- System Memory Automatic Recovery Technique (SMART)
- Attendant Administration
- Automatic Set Relocation

These feature **enhancements**, with the exception of mini-CDR and SMART, were later made available to the LE, VLE, and XL systems. - -

Generic X11 Release 2

X1 1 Release 2 was introduced in early 1983 to add the following feature enhancements to the M, LE, VLE and XL systems.

Call Park

Provides the capability for attendant or station user to place a call in a held state (park) where it can be retrieved by dial access from any console or telephone set in the system.

System Speed Call

Allows the creation of a System Speed Call list (or lists) for access by any assigned station set irrespective of any class-of-service restrictions.

Recorded Overflow Announcement

Allows incoming calls that are delayed in answering by the attendant to be routed to a recorded message notifying the caller accordingly.

Flexible Code Restriction

Allows the customer to specify whether stations with toll-denied class of service will be allowed or denied access to outgoing trunk routes based on specific number patterns and/or the number of digits dialed.

Extensions to the ACD capabilities were announced in 1983 with the formation of an additional feature group • Package D. The latter is utilized for large ACD operations that require sophisticated management reports and flexible dynamic resource allocation capabilities. ACD-D uses an auxiliary data system (Digital Equipment Corporation PDP-11 minicomputer) attached to the SL- 1 to provide a comprehensive administration capability that includes status displays, reports, and load management functions.

Generic X1 1 Release 4

In 1984, X1 1 Release 4 became the business software standard and incorporated the Autovon capability previously only available on X14. The following additional option groups became available.

Flexible Hotline

Provides the capability to assign any single pre-determined destination to be automatically rung from an associated 500/2500 telephone when the latter goes off-hook.

Deluxe Hold

Adds two capabilities for calls placed on hold in multiple appearance (single call arrangement) directory number environments:

- Individual Hold — held condition is indicated at the normal 120 ipm on the SL- 1 telephone that placed the call on hold only. All other appearances of the DN receive a slow flicker (50 ms off every 2 seconds).
- Exclusive Hold — allowed users with multiple appearance DNs to place calls on hold under the control only of their particular telephone. All other appearances of the DN do not indicate the held call and are excluded from entering it.

Automatic Line Selection

Allows the SL-1 telephone to automatically select a line in a prioritized order when the handset is lifted.

500 Set Features

Provides rotary dial access to the Speed Call, Call Forward, and Permanent Hold features.

Distinctive Ring

Allows calls over specified trunk routes to distinctively ring stations as opposed to the standard audible signaling arrangement.

Integrated Voice Messaging System (IVMS)

Expanded previous SL-1 capabilities to include voice store and forward (VSF) messaging.

Generic X11 Release 5

XI 1 Release 5 was introduced during the second quarter of 1985. It consists of all the capabilities of Release 4 plus the following feature enhancements.

Business features

- Interface to EPSCS (Enhanced Private Switched Communications Service) — a Private Network of AT&T which uses the No. 1 ESS as a switching host
- Departmental LDN feature — allows up to four different departments to be identified by their own specific listed directory number
- Data Port Hunting — allows up to 128 data access modules to be assigned in a trunk group
- Privacy Override — allows multiple-appearance, single-call-arrangement directory numbers assigned to SL-1 telephones to have class-of-service control of privacy
- Enhanced End-to-End Signaling — allows this capability to be invoked on all calls to and from the SL-1 telephone
- Call Register Enhancement — allows a separate logical memory page to be assigned to both call registers and trunk timing blocks, thereby increasing the number of call registers from 1200 to approximately 1500
- Double Density Trunks (CO and DID) and Message Waiting Line Cards — allows twice as many circuits to be packaged on a single card compared to their single density counterparts
- Memory Enhancement — increases the amount of memory available on the SL-1XN in the areas of Program Store and Protected Data Store

ESN features

- Offnet Number Recognition for **BARS/NARS** feature — removes the need to use two additional CO trunks to terminate a call at a company owned location
- Incoming Trunk Group Exclusion — associated with the **BARS/NARS** feature, provides the capability to deny the routing of incoming trunk calls to specific prefix codes
- Multiple DID Office Code Screening for NARS — supports on-net to off-net conversion for sites having varying numbering schemes

Generic X1 1 Release 7

X1 1 Release 7 was introduced to support the following feature capabilities:

- Controlled Class of Service (CCOS), formally introduced for the Hotel/Motel industry, was applied to the business environment to allow a station's level of access to the external network to be changed. to a predetermined system level using a controlling SL-1 telephone.
- Multi-Tenant Service allows each of the 32 customer groups within the Meridian SL-1 to be partitioned into 5 12 tenants to facilitate resale of services.
- Automatic Trunk Maintenance provides a means of periodically testing network resources by measuring facility loss and noise parameters to prevent under-utilization due to poor performance or service outage. Associated hardware to provide tone detection capabilities was also introduced.
- Station Category Indication (SCI) allows the attendant to selectively answer internal calls in accordance with a predetermined priority status.

Generic X1 1 Release 8

X1 1 Release 8 provided additional system capabilities as follows:

- Digital Trunk Interface (DTI), formerly introduced on Meridian **SL-1N** and XN, was extended to include the smaller sized MS system and also NT and XT models.
- Last Number Redial (**LNR**) allows users to simply redial the last number dialed without having to key in the digits again.
- Pretranslation provides a means of utilizing Speed Call lists to implement a flexible dialing plan.
- Supervisory Console allows one attendant in each customer group to function in a supervisory capacity when the associated console is placed in a position-busy mode.
- Eleven-Digit Translation extends the previous three- or four-digit translation mechanism to eliminate potential routing conflicts when utilizing the **BARS/NARS** feature.
- Sixty-three Attendant Consoles are allowed for each customer group compared to the previous fifteen.
- Station-to-Station Call Waiting allows internal calls to enter the call waiting state via a new station class of service.

Generic XI 1 Release 10

Another major announcement was the availability of XI 1 Release 10 for the first quarter of 1988. This software release introduced new business opportunities in key vertical markets such as lodging, health care, telemarketing, and the federal government. In addition, Generic XI 1 Release 10 culminated the development program, embarked upon in 1984, to recombine the Hotel/Motel Generic (X37) into a single stream business offering. Thus users in the lodging environment utilized features formerly only available to the business segment, and vice versa. Generic XI 1 Release 10 introduced a total of 16 new feature options, partitioned typically for vertical markets, but additionally available to all users of this software base.

Hospitality/health care

- Automatic Wakeup
- Room Status
- Message Registration
- Property Management System Interface
- Background Terminal

Federal systems telemarketing

- Station Loop Pre-emption- ACD Enhancements
- Line Load Control • Call Overflow by Time in Queue
- Dialed Number Identification Service

General business

- Call Party Name Display
- Call Forward No Answer/Hunt by Call Type
- Second Level Call Forward No Answer
- Six Party 2500 Set Conference
- Enhanced Hotline
- Station-to-Station Call Detail Recording
- Malicious Call Trace

Generic X11 Release 11

The introduction of ISDN Primary Rate Access (PRA) capability was made available in 1988 with the revision of XI 1Release 11 as the supporting software.

Another enhancement to the system features was the ability to perform digit manipulation on incoming direct-in dial calls.

Generic XI 1 Release 12

Generic XI 1 Release 12 was introduced in November, 1988, to offer another subset of powerful features to Meridian SL-1. The delivery of ISDN services, console and ACD enhancements, further data networking flexibility, specific features for Health Care and Hotel markets, additional business feature offerings and memory expansion for the Meridian SL-1 ST all combined to bring new services. The following features were provided with this release:

- Automatic Call Distribution Auxiliary Security (ACD-D)
- Automatic Call Distribution Priority Agent
- Enhanced Music (EMUS)
- Directed Call Pick-up (DCP)
- Call-by-Call Service (CBC)
- ISDN Signaling Link (ISL)
- ISDN Advanced Features (IAF)
- ISDN Core Signaling (ICS)

Generic X1 1 Release 13

The availability of XI 1 Release 13 in March, 1989, added numerous additional business features and system enhancements. The existing four-digit numbering scheme was expanded to accommodate up to a seven-digit dialing plan to alleviate potential conflicts with directory number assignments. The expanded numbering plan also met the needs of large single system applications which may otherwise exhaust their numbering capacity.

Expanded software parameters addressed the requirements for additional networking routing capabilities with the BARS, NARS, Autovon, and Coordinated Plan features. Other feature parameters expanded included additional Call Pickup Groups, Speed Call lists, Group Call members, and Multiple Appearance Directory Numbers.

In addition, other enhancements to existing features included Distinctive Ring for Dial Intercom, Speed Call/Auto Dial with Authorization Code using one key stroke, and an enhancement to the Call Party Name Display.

ISDN features supported by X 11 Release 13 include:

- Network Call Party Name Display (NCPND) which provides network-wide visual display of name and number over PRA facilities.
- Display of Non-PRA Calls which uses the trunk route access code and member number instead of CLID on the terminating telephone set display when network calls are routed over non-ISDN facilities.
- Call Redirection/Call Forward All Calls enhancements which provide information updates for both the calling and called telephones display for CLID and NCPND under those calling conditions.

- Back-up D-Channel provides redundancy for the D-Channel Handler Interface (DCHI) circuit card with automatic switchover, if necessary, to the back-up unit in the event of failure.
- ISDN Applications Protocol interworking with DEC VAX and **MicroVax** to facilitate message exchange between Meridian SL-1 and the DEC computer to support applications such as telemarketing, message desk, and support center operations.

Generic X1 1 Release 14

Announced in December, 1989, X1 1 Release 14 provides the base software necessary to support further members of the Meridian Digital Telephone portfolio, which are:

- M2006 single-line digital set
- M2008 multi-line set with eight programmable feature keys and optional display
- M2616 with 16 programmable keys, software controlled hands-free capability, and the flexibility to add on a display and two 22-button key modules
- M2016 Secure telephone for government applications

In addition, the software capacity expansion, introduced with Release 13, is extended to change the upper limit parameters on the following features:

- Private Line Routes
- Dial Intercom Group
- Trunk Routes
- Customer Groups
- Network Authorization Codes
- Pretranslation Groups

New features added to the system include:

- **Centrex** Switchhook Flash facilitates the emulation of the SL-1 as a key system behind a **Centrex** switching office to permit call transfer.
- No-Hold Conference allows a station user to set up a conference call without losing voice contact with the original party such as in an emergency call.
- Telemarketing enhancements in the ACD environment namely Audible Tone for Agent Observe and Data Agent Log-in features.
- Flexible Incoming Tones to be applied under varying call conditions.
- Audible Reminder of Held Calls extends to proprietary telephones. The Permanent Hold capability on 500/2500 telephones of alerting users periodically of the held call situation.
- Night Key for DID Digital Manipulation permits different call treatments to be implemented either after hours or during specific times during normal business hours.

- ISDN enhancements provide additional capabilities including Network Call Redirection, Network Ring Again for 500/2500 sets, and the ability to maintain trunk service in the event of a signaling channel failure using the ISL.

Generic X1 1 Release 15

Introduced in January, 1990, to support Meridian 1 system options 21, 51, 61, and 71, XI 1 Release 15 additionally provides the following new features and enhancements.

Business features

- Busy Lamp Field enhancement for the M2250 attendant console displays, in addition to the busy/idle status of system users, the reason for user absence and an alternate extension number to utilize.
- CDP Routing enhancement provides more flexibility to network dialing plans and alternate routings by allowing incoming DID calls to be routed over CO, WATS, and Tie trunks when a distant steering code is used.
- Flexible Feature Codes provide customers the ability to define their own access codes for system features.
- Remote Call Forward allows all incoming calls to a station to be automatically forwarded to a preselected number that may be remotely defined.
- Time Forced Disconnect permits a customer to specify the maximum duration of a call permitted on a trunk route basis.
- Two-step Call Forward No Answer allows the dialed extension to have a Message Waiting class of service assigned for forwarding the call to a Message Center.
- Recorded Announcement enhancements provide compatibility with associated RAN equipment that permit message lengths of 512 seconds.
- Console Presentation Groups provides greater flexibility to the Multi-Tenant feature by allowing attendant consoles to be defined at the tenant level rather than the customer level.
- Attendant Alternative Answering allows any call presented to a console loop key to be forwarded to a customer-defined directory number when the attendant is not available to answer.
- Hotel feature enhancements include additional levels of restriction to be applied to the Controlled Class-of-Service feature and an extension of the number of Automatic Wake-up calls from 100 to 500 in a five-minute period.

Telemarketing enhancements

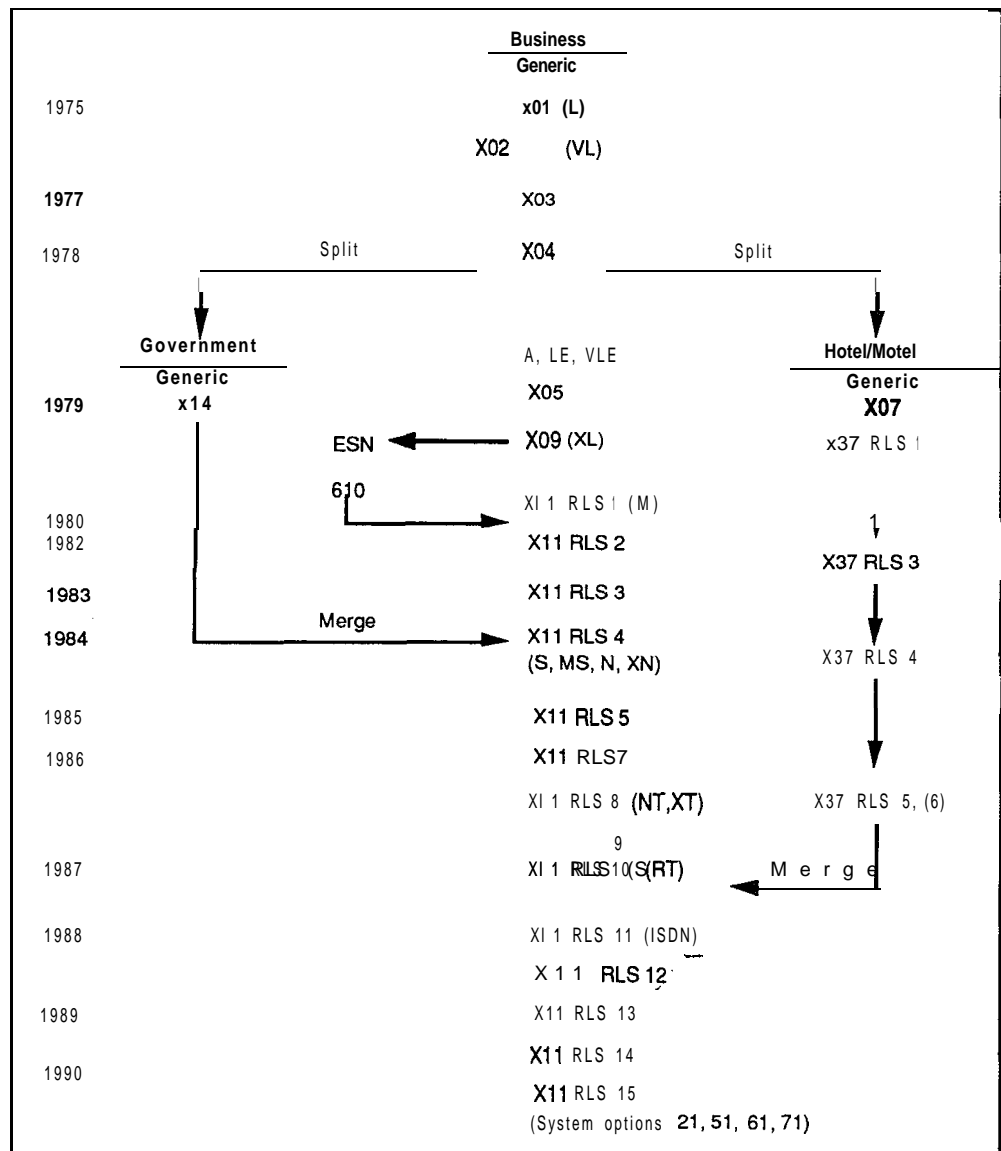
- Network ACD (NACD) uses ISDN PRA or ISL hardware to quickly and efficiently route calls to available agents within a network of SL-1 systems.
- Enhanced Overflow allows customers to optimize resources and service level by adding more flexibility in defining call overflow patterns within the system.
- ACD Screen enhancements provide new display messages on associated M22 16 ACD digital telephones that give agents and supervisors clear and simple instructions for feature activation.

ISDN enhancements

Network Message Center capabilities are enhanced by the ability to serve multiple remote locations with centralized messaging facilities over associated PRA or ISL paths.

Software evolution since product introduction is shown in Figure 3-3. A summary of product evolution is depicted in Table 3-1.

Figure 3-3
Software evolution



**Table 3-1
Product evolution summary**

Year	Model/Event	Hardware	Software
1975	SL-1 L	Front access cabinet Single density PE 4-port line 2-port trunk 4K Memory card	Generic X01 <ul style="list-style-type: none"> ▪ Multi-customer ▪ Autodial ▪ Call Forward ▪ Override Again ▪ Speed Call, Voice Call
1976	SL-1 VL Digital World	Centralized power cabinet Digit display console 8K Memory card	Generic X02 <ul style="list-style-type: none"> ▪ Feature enhancements
1977		CDR cabinet RAN trunk	Generic X03 <ul style="list-style-type: none"> ▪ Call Detail Recording ▪ Recorded Announcement ▪ Do Not Disturb (individual) ▪ End-to-End Signaling ▪ Time and Date
1978	SL-1 LE SL-1VLE	64K Memory card Local/remote RPE Interface MF sender	Generic X04 <ul style="list-style-type: none"> ▪ Remote Peripheral Equipment (RPE) <ul style="list-style-type: none"> ▪ Automatic Number Identification (ANI) ▪ Do Not Disturb (group) ▪ Make Set Busy ▪ Automatic Route Selection
1979	SL-1A Intelligent Universe	4W E & M trunk	Generic X05 <ul style="list-style-type: none"> ▪ Dial Intercom ▪ 2500 Set Features ▪ Digit Display ▪ Direct Inward System Access (DISA) <ul style="list-style-type: none"> ▪ CDR Charge Account ▪ Authorization Code ▪ Message Center ▪ Automatic Call Distribution ▪ ARS Cueing Generic X07 -- <ul style="list-style-type: none"> ▪ Hotel/Motel Generic XI4 <ul style="list-style-type: none"> ▪ Autovon
—continued—			

Table 3-1 continued
Product evolution summary

Year	Model/Event	Hardware	Software
1980	SL-1 XL	SL-10 Processor Add-on Data Module (ADM) Data Line Card	Generic X09 <ul style="list-style-type: none"> • ACD Package B, C1, C2 Generic 610 <ul style="list-style-type: none"> • Electronic Switched Network
1981	SL-1 LE/single CPU		Hospital/Clinic . Automatic Wake-up Room Status
1982	SL-1 M Open World	Displayphone Front & rear access cabinet	Generic XI 1 Release 1 <ul style="list-style-type: none"> • Attendant Administration • Automatic Set Relocation • History File XI 1 Release 2 <ul style="list-style-type: none"> • Call Park • System Speed Call • Recorded Overflow Announcement <ul style="list-style-type: none"> • Flexible Code Restriction • ESN enhancements
1983		Multi-Channel Data (MCDS) SL-1 displayphone PC Interface card Asynch I/F Module (AIM) ACD Auxiliary Processor	XI 1 Release 3 <ul style="list-style-type: none"> - ACD-D - Stored Number Redial - Network Call Transfer - Integrated Messaging System (IMS) - ESN enhancements
1984	SL-1s SL-1 MS SL-1 N SL-1 XN	Double density PE <ul style="list-style-type: none"> - 8-port line card - 4-port trunk card Coax Elimination & SWG (CESS) 3270 protocol converter Asynch/Synch Module (ASIM) 192K Memory card	XI 1 Release 4 <ul style="list-style-type: none"> • Autovon enhancements • Integrated Voice Messaging System • Flexible Hot Line • 500 Set Features • Distinctive Ring • Hold enhancements • Auto Line_Select
-continued-			

Table 3-1 continued
Product evolution summary

Year	Model/Event	Hardware	Software
1985	Meridian	System 36 gateway Computer to PBX interface (CPI) Digital Trunk Interface (DTI) Packet Transport Equipment Digital telephones X.25 gateway pad Integrated Services Digital Line Card (ISDLIC)	XI 1 Release 5 <ul style="list-style-type: none"> ▪ EPSCS interface ▪ ESN enhancements ▪ Department LDN ▪ Privacy Override ▪ Enhanced EES XI 1 Release 7 <ul style="list-style-type: none"> ▪ Multi-Tenant Service ▪ Automatic Trunk Maintenance ▪ Controlled COS ▪ Station Category Indication
1986	Meridian SL-1 NT Meridian SL-1 XT	CE enhancements <ul style="list-style-type: none"> ▪ new processor ▪ 768K Memory card ▪ disk storage Asynch I/F Line Unit (AILU) BALUNS Fast TDS	XI 1 Release 8 <ul style="list-style-type: none"> ▪ Last Number Redial ▪ Supervisory Console ▪ Pretranslation ▪ 11 -Digit Translation ▪ 63-console capability ▪ Station-to-Station Call Waiting
1987	Meridian SL-1 ST Meridian Mail Meridian LANSTAR	PE enhancements 16-port 500/2500 card Dual Loop Buffer Split PE shelf Daughterboard DTR New 50A Rectifier RS232C Interface (RILC) PTE cabinet ST expansion cabinet M2317 digital telephone Macintosh II interface RPE cabinet ISDN PRA interface card	XI 1 Release 9 <ul style="list-style-type: none"> ▪ ACD enhancements ▪ Trunk verification from STN XI 1 Release 10 <ul style="list-style-type: none"> ▪ Call Party Name Display ▪ Dialed No. ID Service (DNIS) ▪ Call Forward by Call Type ▪ Line Load Control ▪ Malicious Call Trace ▪ Optional Output Delay ▪ Internal CDR ▪ Conference 6 ▪ Hotel/Motel features
—continued—			

Table 3-1 continued
Product evolution summary

Year	Model/Event	Hardware	Software
1988	Meridian SL-1 RT	CE enhancements 16-port 500/2500 Message Waiting card New dual processor 766K Memory card M2018S Secure Telephone Meridian Mail M P,SP option M3000 Plus Touchphone Asynch I/F Line Unit (AILU) Meridian Mail ST/RT option 4port SDI card ST memory expansion SL-1 console line card High Speed Data Module (HSDM)	XI 1 Release 11 <ul style="list-style-type: none"> ▪ Incoming Digit Conversion ▪ ACD-D security - Directed Call Pick-up XI 1 Release 12 <ul style="list-style-type: none"> ▪ ACD Priority Agent - ISDN enhancement - Enhanced Music option ▪ CDR Calling Line ID ▪ Night Service by Time of Day Meridian Mail <ul style="list-style-type: none"> - Voice menus ACD MAX <ul style="list-style-type: none"> - Release 1
1989		MI 250 attendant console Meridian Mail option S cabinet Meridian Mail option X cabinet Meridian modular terminals	XI 1 Release 13 <ul style="list-style-type: none"> - Capacity Expansion (phase 1) - ISDN Applications Protocol XI 1 Release 14 <ul style="list-style-type: none"> - Capacity Expansion (phase 2) - Audible Reminder of Held Call ▪ Centrex Switchhook Flash ▪ Flexible Incoming Tones ▪ Night Key for DID ▪ No Hold Conference ▪ Telemarketing features -ISDN Network Ring Again ACD MAX <ul style="list-style-type: none"> - Release 2 Meridian Mail PC
1990	Meridian 1 Communication Systems	System options <ul style="list-style-type: none"> ▪ 21, 51, 61, 71 M2250 attendant console Universal equipment packaging	XI 1 Release 15 <ul style="list-style-type: none"> ▪ Flexible Feature Codes - Network ACD ▪ ISDN enhancements ▪ Shared Tenant Services - Hospitality features

Chapter 4: System architecture

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Meridian 1 modular architecture

An important characteristic of Meridian 1 systems is a modular system architecture. It utilizes an efficient and flexible approach, employing modular construction in all areas of hardware and software, and state-of-the-art commercial and custom components. The result is a system which is highly flexible in terms of operational, maintenance, and administrative characteristics. As demands dictate, any module may be enhanced, singularly or in combination with other modules. Each system is organized around three functional areas: Control, Switching, and Peripherals.

Control

The Control complex provides the sequences required by the system to process voice and data call connections, monitor call activity, and perform system administration, maintenance, and testing. It is composed of two elements: the Central Processing Unit (CPU) which directs lower level subsystems in the hierarchy, and the system memory which stores the operating programs.

Switching

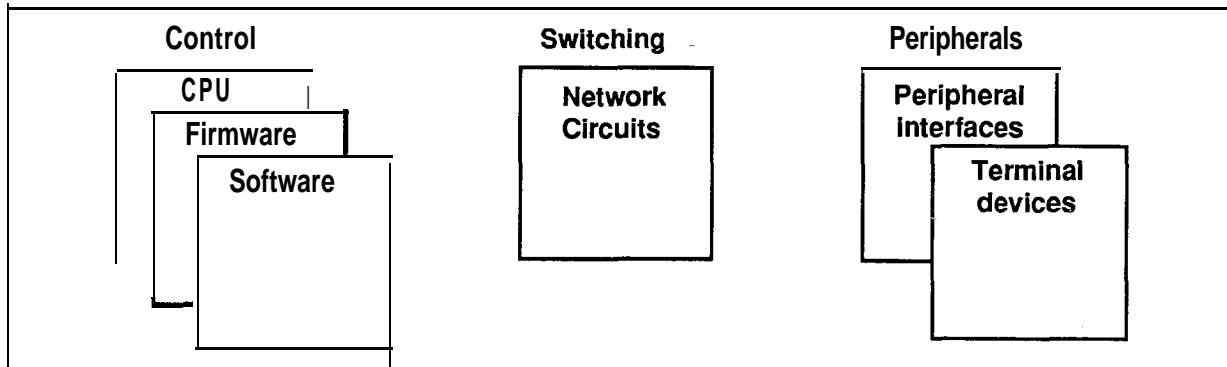
The switching function is performed by the network equipment, which interconnects terminal devices for communication with each other. The network architecture is based on the concept of a digital multiplexed loop. A loop is a bidirectional path between Network and terminal device which transmits voice, data and signalling information.

Peripherals

Peripheral equipment provides the analog and digital interfaces for all peripheral devices, and performs analog to digital conversion of all input signals before switching is performed by the Network. Additionally, peripheral equipment circuits provide the supervisory and transmission functions needed for trunks connected to the external telecommunications network.

Meridian 1 systems use a star topology for connecting peripheral devices to the switching equipment, an approach which permits uniform distributed wiring methods. This approach provides significant benefits in the area of administration, installation, maintenance, and reliability.

Figure4-1
Meridian 1 modular architecture



Software architecture

The adaptability of software control provides a complete array of services and features tailored to meet changing requirements.

Call processing, maintenance, and administration of Meridian 1 systems are controlled by software programs stored either as firmware programs, as software programs resident in system memory, or as non-resident programs on disk. The information which describes system configuration and associated peripheral equipment is termed office data. This data resides in the system memory and on disk.

Firmware

These are fundamental programs consisting of hard-wired logic instructions stored in Programmable Read Only Memory (PROM) which manipulate data in the central processor and control input/output operations, error diagnostic and recovery routines.

Software

Software programs consist of instruction sequences that control call processing, peripheral equipment, administration and maintenance functions. These sequences are interpreted by the firmware programs into machine instructions. Several generic software programs with optional feature packages are **available** to satisfy varying requirements.

Office data

The office data describes the characteristics of the system in terms of configuration and call dependent information such as features and services. Office data is arranged into blocks defining peripheral equipment, system configuration and transient data. These data blocks permit configuration of Meridian 1 systems to specific customer needs.

Resident programs

Resident programs are programs always available in memory during system operation. Firmware programs control other resident programs and provide all CPU arithmetic operations. The other resident programs are those which are automatically loaded into the system memory from the disk drive at system power-up. Once loaded, these programs remain in memory.

Non-resident programs

Non-resident programs are the overlay programs stored on disk which are loaded into the “overlay area” of system memory when required to perform specific tasks. Only one overlay program may be loaded at a time and is removed from the overlay area when no longer required. Overlay programs can be loaded automatically, under program control, or manually, via an administrative terminal.

Once the user has logged into the system, commands for specific overlay programs are processed by the overlay loader program. When loaded, the overlay program assumes control. Only one administrative terminal can input into the overlay area at a time. More than one device, however, can receive output simultaneously. A terminal may be configured as an input only or output only device.

Overlay programs provide the system interface for maintenance, service change, and traffic measurement. Each overlay program is independent and has its own specific set of commands and formats. Overlay programs may be run concurrently with normal call processing without interfering with system traffic. There are five main categories of overlay programs:

- Service change and print routines
- Maintenance diagnostics
- Traffic
 - Equipment data dump
- Software audit

Service change and print routines

Service changes do not generally require hardware intervention. Instead, the service administration programs are used to create or modify all aspects of the system from individual feature key assignments to complete system configurations. There are also programs and print routines for retrieving the data from the system to check the status of office data assignments.

Maintenance diagnostics

These programs are the primary instruments for maintenance purposes. Individual programs are used for automatically or manually testing the Common Equipment (CE) and Peripheral Equipment (PE). The programs may be loaded into the overlay area at the request of maintenance personnel, or as part of a daily maintenance routine automatically initiated by the system at a specified time. In addition,

background and signaling diagnostic routines can occupy the overlay area when it is not in use.

Traffic

All systems are equipped with traffic data accumulation programs. There is also a resident traffic print program which examines the schedules, transfers data from accumulating to holding registers in accordance with schedules, and prints the traffic data. In addition, there is a traffic overlay program which is used to query and modify schedules, options, and thresholds.

Equipment data dump

After making service changes, the changes must be transferred to disk in order to save them. When the equipment data dump program is invoked, all the office data in the read/write memory is written to the system disk. The data dump program is also used to install a new generic version or issue and capture protected data store information which may be changed by the user, such as speed call lists. The program may be invoked automatically during a midnight routine or on a conditional basis (i.e., data dump only occurs if a software service change has been made). It may also be invoked manually via the input/output (I/O) interface to the system.

Software audit

This program monitors system operation and gives an indication of the general state of the system operation. The program is concerned mainly with the system software. When a software problem is encountered, the program attempts to clear the problem automatically.

Hardware architecture

Each Meridian 1 system is composed of the following hardware subsystems:

- Common equipment (CE) — provides the device control, software execution, and memory functions of the system
- Network equipment (NET) — performs the switching function under CPU control
- Peripheral equipment (PE) — provides the interface for line and trunk circuits
- Terminal equipment — telephone sets and attendant consoles
- Power equipment — provides the electrical voltages required to operate equipment

Common equipment

Common Equipment (CE) consists of one or more Central Processing Units (CPUs), memory circuits, and mass storage devices which control the operation of the system. The CE communicates over a common control bus which carries a constant flow of program instructions and data under direct control of the CPU. The digitized speech signals follow a separate path on a network switching bus which allows communications links to be established between any of the peripheral devices.

The Central Processing Unit (CPU) provides the computing power essential for the entire system operation. The system memory stores all operating software programs and data unique to a particular Meridian 1 system, including switching sequences, features, class of service information, and quantity and types of terminals. The Mass Storage Unit provides high speed loading of the operating programs and data into memory. The digital service circuits provide functions such as dial and ringing tones, and call conferencing capabilities. The Serial Data Interface (SDI) provides an RS232C communications link for administration and maintenance on either a local or remote basis. The network circuit cards provide a digital matrix for circuit-switched connections to associated peripheral devices.

Central Processing Unit (CPU)

The CPU performs the control and switching sequences required by the system. The software that directs these functions is loaded into the system memory from the mass storage unit by the CPU. Information flows between the CPU, I/O devices, and the system memory over the CPU bus.

The data required by the CPU to perform its control and switching functions is held during system operation in Random Access Memory (RAM) and fed to the CPU via the CPU bus. The operating data is loaded into the RAM from floppy diskettes on system power-up.

The CPU function is performed by circuit cards which include Read-Only-Memory firmware that contains fault clearing programs and instructions to control the loading of system memory from the mass storage unit.

Meridian 1 system options 5 1, 6 1, and 71 incorporate the following CPU design:

- 24-bit data words plus 1-bit parity
- 24-bit linear addressing that permits memory allocation to be assigned on a contiguous basis
- 16M words - subdivided for up to 12M words of physical memory space and a remainder of 4M words for I/O spaces
- asynchronous (handshake) bus operation
- 16 file registers used to hold address and data for all operations
- a sense (interrupt) input line to indicate that a particular device (tape, TTY, PE, etc.) requires action by the CPU
- a trap facility which, when activated by an external signal, causes the CPU to immediately begin executing instructions starting at a particular address; this facility is used to enter a recovery routine when a fault is detected.

Meridian 1 system option 21 uses a 16-bit processor for small sized business applications.

Mass Storage Unit

A Floppy Disk Unit (FDU) equipped with two 3.5-inch disks and a Multi-Disk Unit (MDU) with additional hard disk is used for high speed loading of the resident operating programs and office data into system memory. The loading process is controlled by instructions held in the Read-Only-Memory (ROM) firmware. When loading is complete, the diskettes remain in the mass storage unit to provide a non-volatile store for automatic loading purposes in the event of software being erased from memory during a power failure. Non-resident software is loaded from the disk automatically or by manual request when required.

The Mass Storage Interface (MSI) card is designed to interface with external devices that are compatible with the Small Computer System Interface (SCSI). This storage capability is provided by the following hardware configurations:

- NT8D68AA Floppy Disk Unit — two 3.5" 1.2 Mbyte floppy disk drives (providing 2.4 Mbytes of formatted capacity) as a standard system offering
- NT8D69 AA Multi Disk Unit — a hard disk drive with 20 Mbytes of formatted capacity. When this option is equipped, the floppy disks are used for backup and system loading.

Input / Output (I/O) interfaces

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There are various methods of communicating with Meridian 1 systems. A family of Serial Data Interface (SDI) circuit cards provides from one to four communication channels which conform to EIA Data Interchange Standard RS-232-C. I/O addressing is under switch control of the SDI card and allows up to 16 RS-232-C compatible devices, such as terminals, to communicate with the system. The devices are used to input commands and/or receive responses from the system during administration and maintenance procedures.

Memory

Firmware, software, and data **are** stored in a read/write Random Access Memory (RAM). The memory is a critical part of the stored program control system. It contains the memory stores of all of the basic operating instructions for the system, plus data on the configuration of the particular application being served. Memory utilization is dependent upon what features are programmed into the system and the number of peripheral terminations being served. The memory is split into four segments to facilitate processor address purposes and permit a functional separation of programs .

Unprotected Data Store (UDS)

These pages hold the transient or unprotected data that is required during call processing. Included are the timing queues and call registers.

Protected Data Store (PDS)

This protected data store holds the office data blocks that are particular to specific installations.

Program Store (PS)

Allocations within the Program Store are as follows:

Firmware — This portion of the memory is a non-volatile Read Only Memory (ROM) used for storage of all system firmware. The ROM is programmed during manufacture and the instructions are permanent and indestructible. It stores the basic rules of operation necessary to initialize the system and bring it into a working state. A recovery or “trap sequence” is included in firmware which is automatically invoked in response to power-on, system reset, or when certain faults are detected.

Overlay -This portion of the memory may be loaded with various non-resident programs as required during automatic diagnostics, service order change, traffic measurement, or maintenance.

Software — The remainder of this memory page is reserved for all of the system software such as the call processing and optional programs. Additional software storage capability is provided by the incremental addition of more memory pages within this category.

Input / Output addresses — There are no RAM modules utilized for this page. Instead the address range is reserved for Input/Output (I/O) device addresses. These devices include signaling for peripheral equipment along with magnetic tape and terminal assignments.

Network equipment

Network equipment consists of network circuit cards which perform the digital switching of voice and data signals, peripheral signalling cards which perform scanning and signal distribution, and service circuit cards, such as tone and digit switches, which provide call progress tones and outpulsing as instructed by the CPU. Network circuits employ Pulse Code Modulation (PCM) and Time Division Multiplexing (TDM) to perform the switching function.

Loops and Superloops

Network equipment interfaces with peripheral equipment via digital multiplexed loops. A loop is a bidirectional path between Network equipment (NET) and Peripheral equipment (PE) for voice, data and signalling information. Upon commands from the CE, the network establishes a path, linking a specific input to a specific output.

Meridian 1 systems provide two network circuit cards, the QPC414 Network card which provides 2 loops per card, and the NT8D04AA Super-loop Network card which provides 4 loops per card, grouped together in an entity called a Superloop. The Superloop permits all 120 timeslots provided by the network card to be shared among the peripheral devices served by the superloop, providing higher traffic capacity and simplified traffic engineering.

The flexibility of the network loop plays an important role in the Meridian 1 architecture. Besides the ability to increase circuit-switched bandwidth on an incremental card basis for cost-effective growth, application may be varied for value added services. The network structure allows for the full connectivity of all devices irrespective of how they connect to the system.

The network loop is a key element in the implementation of Primary Rate Access (PRA) and Digital Trunk Interface (DTI). The PRA offers twenty-three 64-Kbps B channels and one D channel; it connects PBXs to ISDN nodes (such as interexchange carriers, local exchange carriers) or private network facilities (such as PBXs or host computers). The DTI provides a digital link of 24 channels each of which may be flexibly allocated for both voice and data communications. The DTI uses the North American T-1 standard (DS-1 format); each equipped link is assigned an associated network loop.

Network organization

Network loops are organized into groups. Systems are configured as half, full, or multiple group machines. A half network group machine provides up to 16 loops, a full group system provides up to 32 loops, while a multiple group system provides up to 160 loops.

For applications beyond the traffic handling capability of the single network group, additional switching stages are introduced to form a multi-group arrangement. These connecting paths, provided by the **InterGroup** Module, are merely an extension of the originating and terminating network loop involved in a call. There are eight one way junctors from each group to all others. Since each path provides thirty connecting channels, a total of 480 connection paths exist from one group to another, 240 in each direction. Five network groups may be interconnected to constitute a fully configured digital switching matrix.

Peripheral equipment

Peripheral Equipment (PE) consists of peripheral controller cards which provide the timing and control sequences for peripheral circuits, analog and digital line and trunk cards, which provide the interfaces for terminal devices, and circuit cards which provide Digital Trunk Interface (DTI) and Primary Rate Access (PRA) services.

The peripheral controller performs the first stage of multiplexing signals from the terminals, which are then passed on to the network for digital switching. The peripheral controller also transmits timing signals, and carries out other functions associated with the control of the peripheral circuits.

The analog line card converts incoming analog signals into digital signals which are then passed on to the peripheral controller. This conversion is accomplished by an integrated encoder/decoder (codec) chip. There is a codec for each port on the line card. Conversion from digital back to analog is also performed by the codec for outgoing signals. For digital telephones, the codec is located within the telephone set itself.

PCM

Pulse Code Modulation (**PCM**) is used to convert analog signals to digital signals. The PCM method converts the analog signal to digital by sampling the amplitude of the analog signal at a rate of twice the highest signal frequency and converting the amplitude of each sample into a series of coded pulses. The PCM sampling frequency standard for telecommunications is 8 KHz.

Companding (compressing • expanding) PCM is a standard technique for using **8-bit** words to efficiently represent the wide dynamic range of voice and data signals. Two standards for **companding** are internationally recognized:

- Mu-255 law for North American applications
- A-law for international service

Meridian 1 codecs conform to both standards and are software selectable (in Intelligent Peripheral Equipment Modules) for use in North America and internationally. The codecs are also designed to pass signals up to 3.4 KHz with minimum time delay and low phase distortion, a requirement for the proper transmission of data signals.

Remote Peripheral Equipment (RPE)

In a local operating environment, the peripheral equipment may be housed up to 15.2 m (50 ft) from the common equipment. The RPE feature extends this range to approximately 112.6 km (70 miles) between local and remote facilities. This extension is made possible by converting the multiplexed loop signals to a form compatible with the commonly used T-1 type digital transmission system.

Any medium conforming to DS-1 format (1.544 Mbps) may be used to link local and remote sites, including digital microwave radio and fiber optic transmission systems.

DTI/PRI

Allocation of circuit-switched bandwidth may also be made on a network loop basis to Primary Rate Access (PRA) or Digital Trunk Interface (DTI) circuits. These optional services are based on the standard T-1 format (DS-1 24 channel) used in digital transmission networks.

The PRA offers twenty-three 64-Kbps B channels and one D channel; it connects PBXs to ISDN nodes (such as interexchange carriers, local exchange carriers) or private network facilities (such as PBXs or host computers)

The DTI allows for the replacement of 24 conventional analog trunks by a single T-1 digital link. Each of 24 channels provides up to 56 Kbps for voice and synchronous data transmission, or up to 19.2 Kbps for asynchronous data.

Network/peripheral configuration

The allocation of peripheral equipment to the network loop determines the traffic handling capability of the switching network. The lower the number of terminations, the higher the loop traffic capacity. The quantity and type of terminal assignments are allocated to optimize the traffic handling capabilities of the switching network.

A universal PE bus structure permits any mix of PE card types to be located in a PE module. Provisioning of PE cards and their associated density (number of ports) determines the network loop to PE module configuration. Complete modularity permits voice and data modules to be segregated so that the specific traffic patterns of one may be met without impeding the other.

Figure 4-2 shows the arrangement between the network and peripheral equipment.

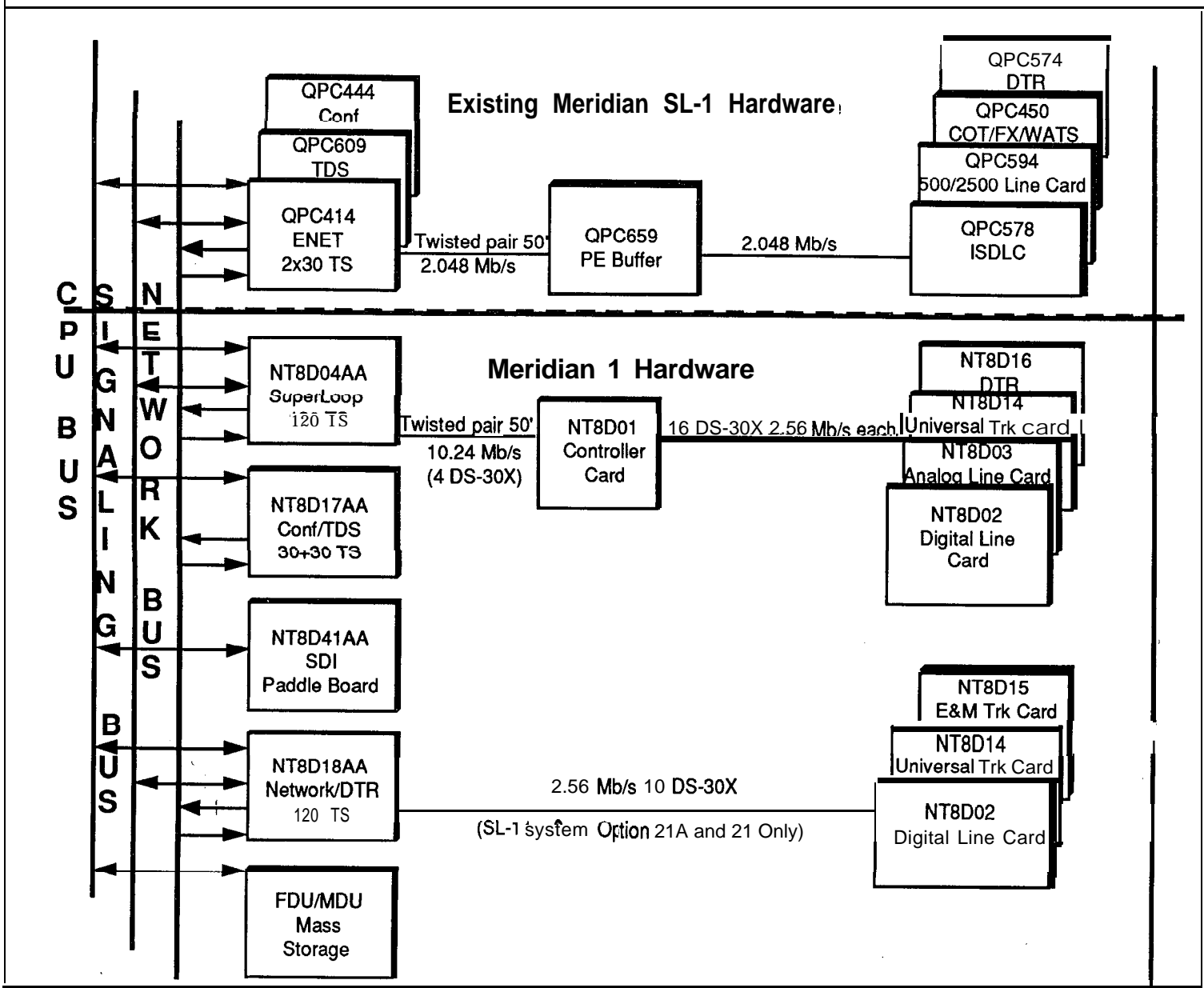
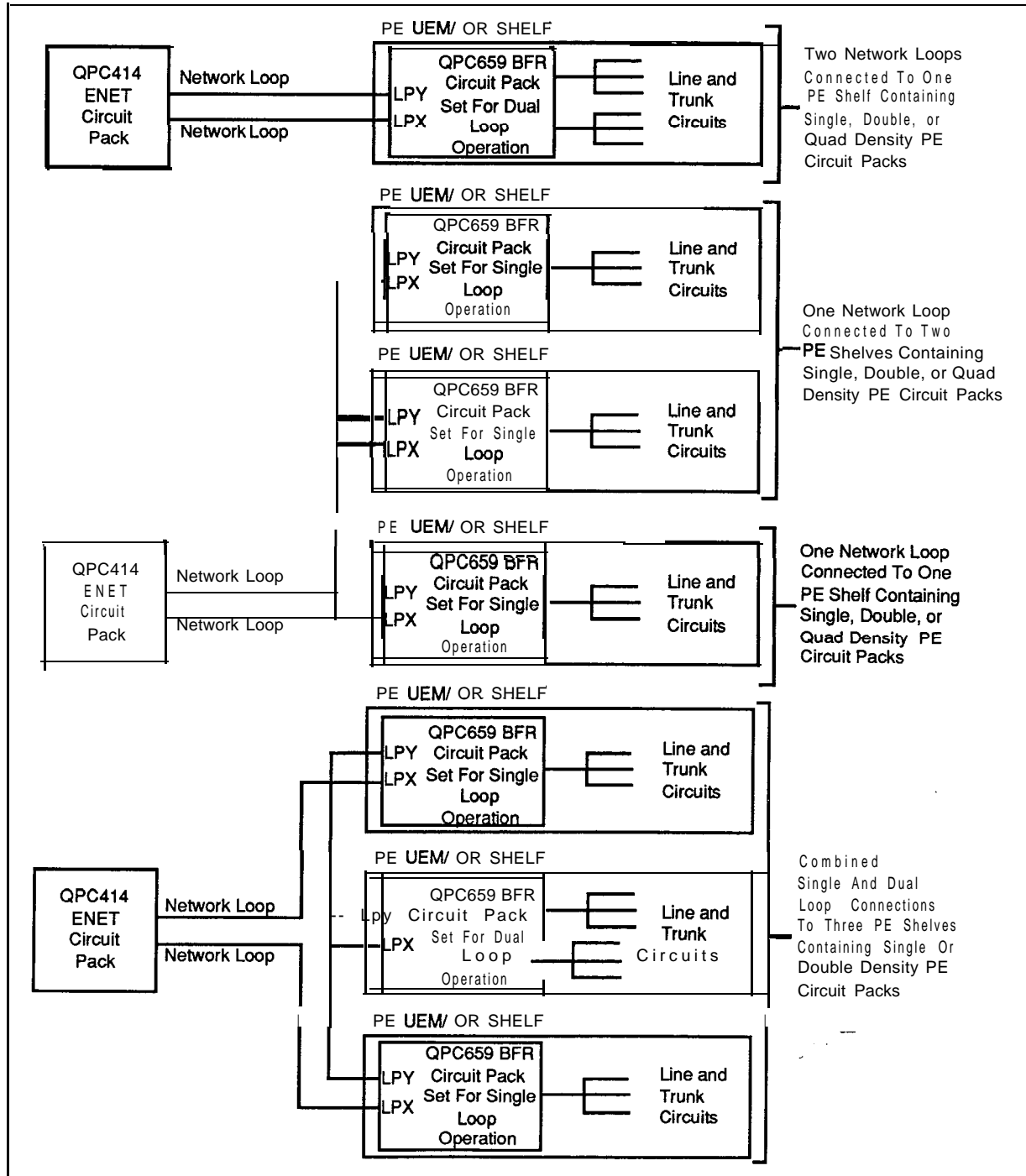


Figure 4-2
Meridian 1 architecture

Enhanced network configurations

For peripheral equipment housed in **NT8D13 PE** modules, network capacity may be allocated in single loop mode and dual loop mode. In single loop mode, one peripheral equipment module is connected to one network loop, yielding a maximum concentration of 160 terminations to 30 time slots. In dual loop mode, half of the PE cards in a module use one loop, and the other half use another loop, yielding two maximum concentrations of 80 terminations to 30 time slots.

Figure 4-3
Single and dual loop configurations

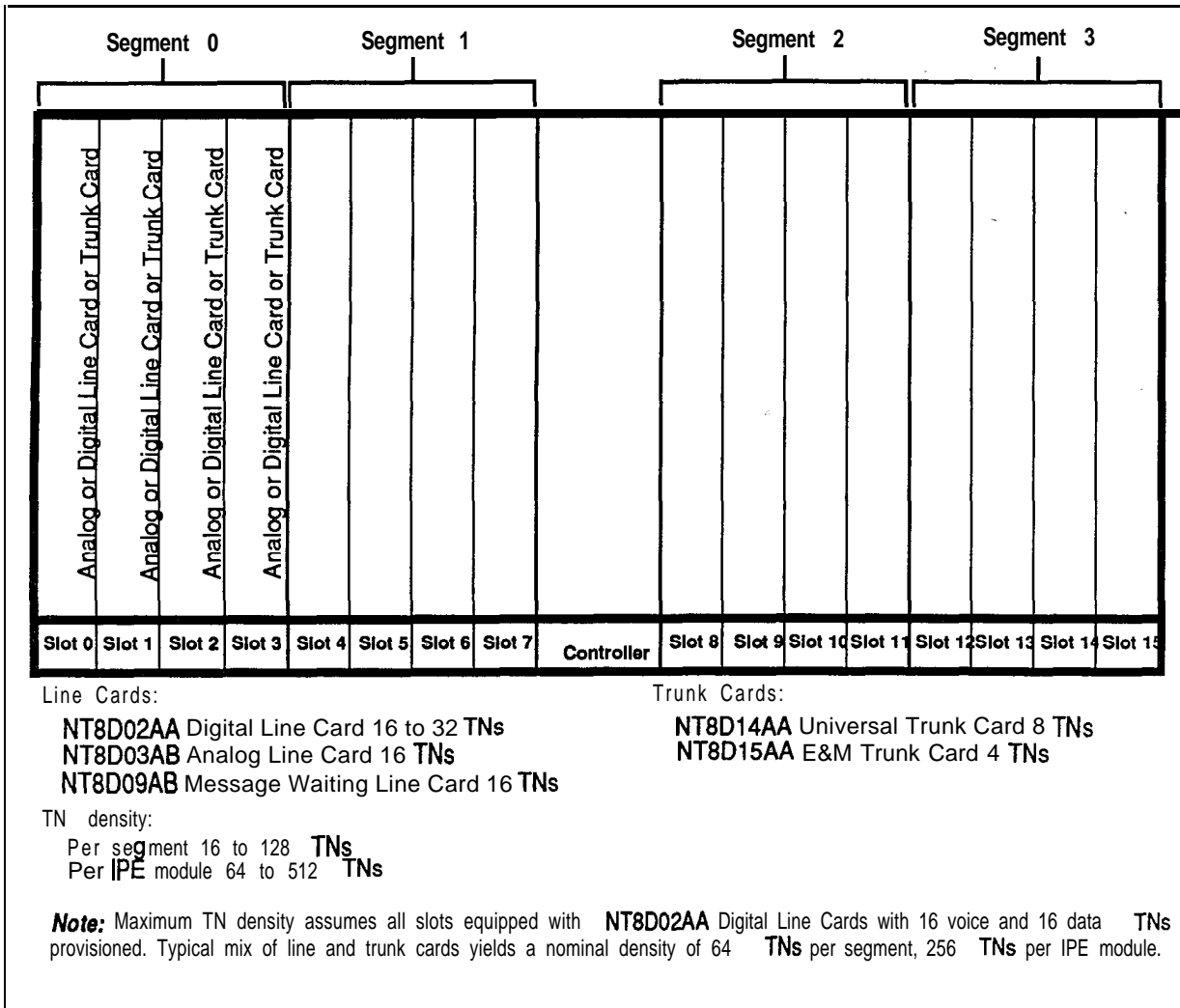


Superloop network configurations

The Superloop Network card combines four regular network loops to make 120 timeslots available to PE cards housed in Intelligent Peripheral Equipment Modules. This increased bandwidth and larger pool of timeslots increases the network traffic capacity by 25% for each 120 **timeslot** bundle. The **NT8D37** Intelligent PE Module is divided into segments of 4 card slots. These segments are numbered 0-3. Segment 0 consists of PE slots 0-3, segment 1 consists of card slots 4-7, segment 2 consists of card slots 8-11, and segment 3 consists of card slots 12-15.

A superloop may be assigned from one to eight Intelligent PE segments. A number of different superloop to segment configurations are possible. The configuration chosen depends upon system traffic requirements and the specific PE cards used. Figures 4-4 through 4-9 illustrate different superloop-to-segment configurations. Note that the TN-to-timeslot concentration figures provided are nominal, and may vary from segment to segment (see Figure 4-4).

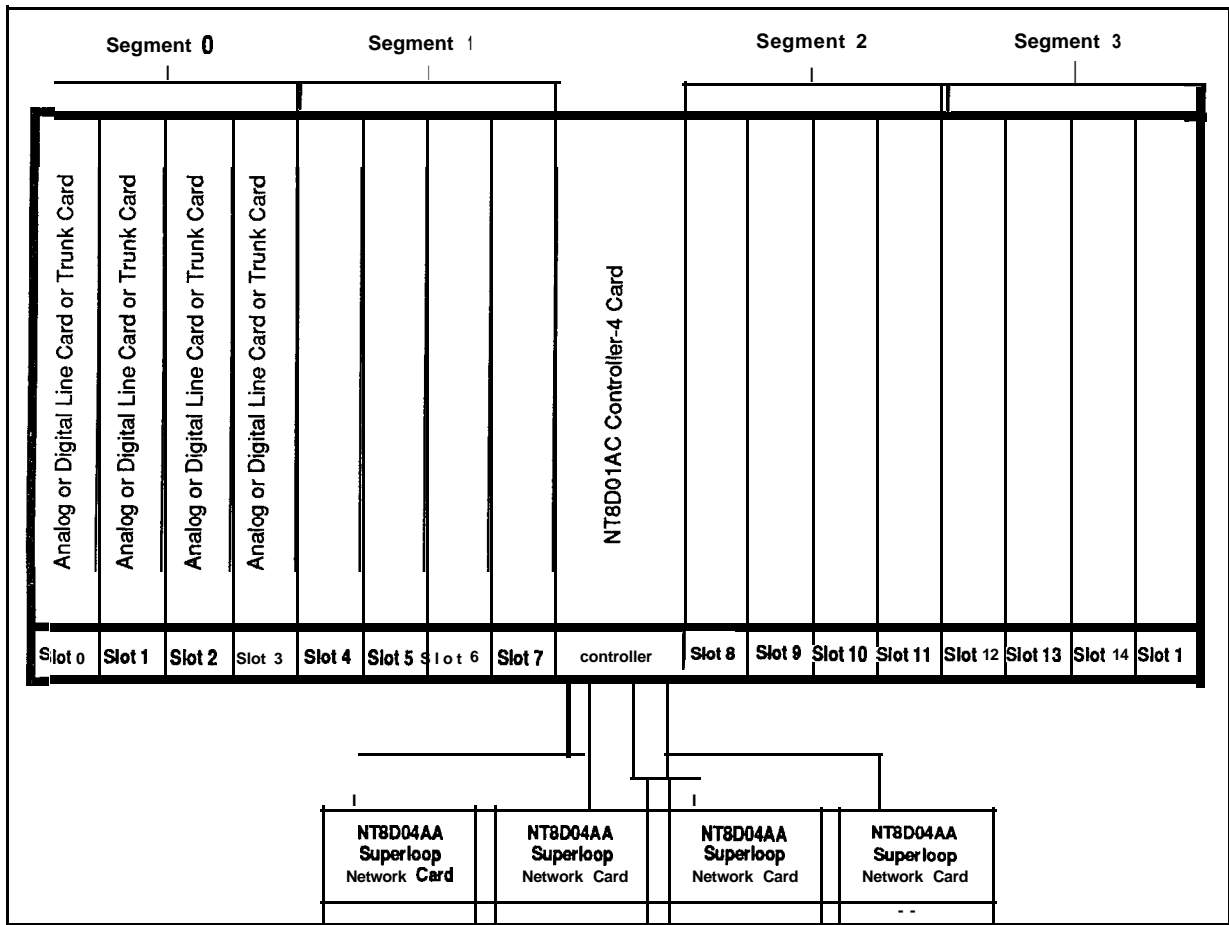
Figure 4-4
NT8D37 Intelligent Peripheral Module segmentation



One segment per superloop

In this configuration, 1 segment is assigned to one superloop (see Figure 4-5). In instances where the segment is populated with NT8D02AA Digital Line Cards with all 16 voice and all 16 data TNs provisioned, the one segment per superloop configuration provides a virtual non-blocking (120 timeslots to 128 TNs) environment (see Figure 4-4). Four NT8D04AA Superloop Network cards and one NT8D01AC Controller-4 card are used to implement a one segment per superloop configuration.

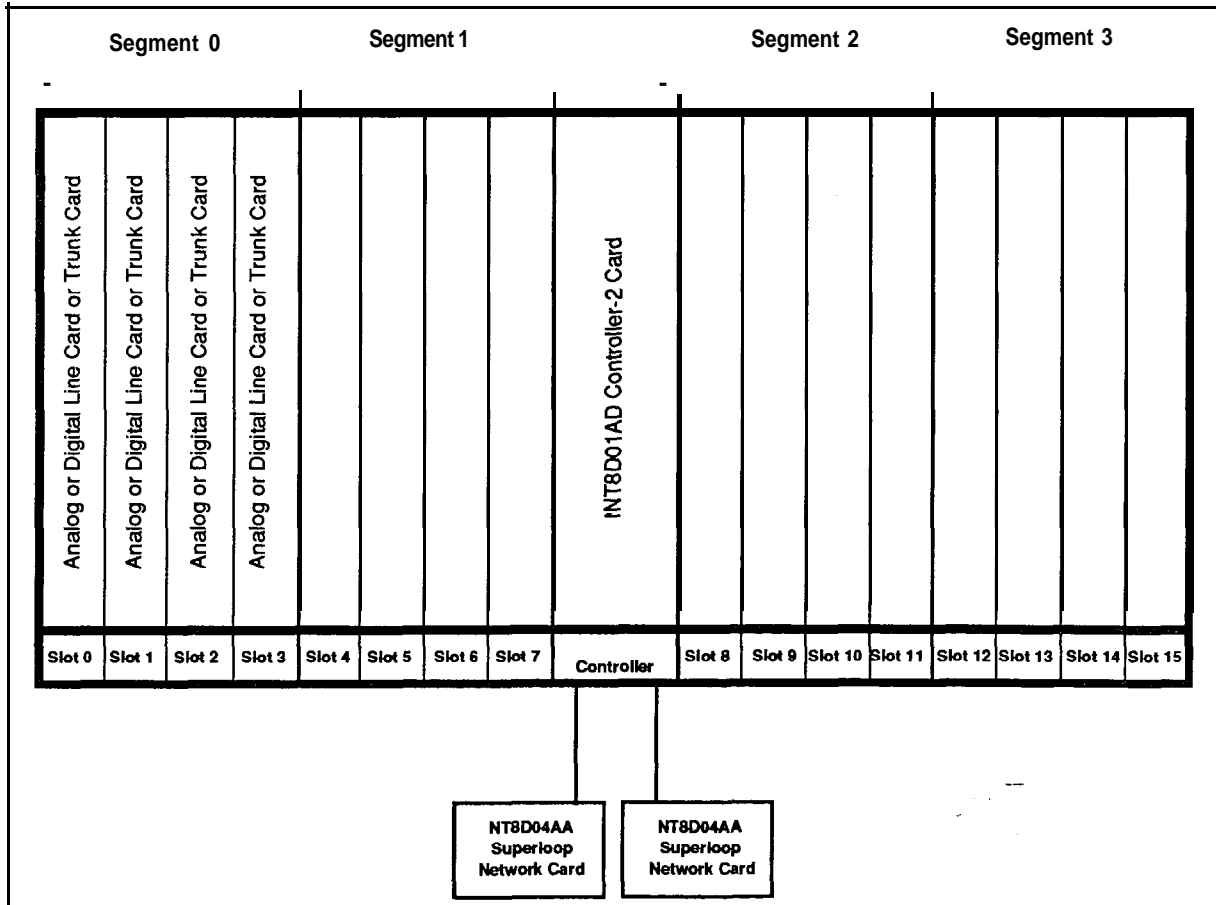
Figure 4-5
One segment per superloop configuration



Two segments per superloop

In this configuration, 2 segments are assigned to one superloop (see Figure 4-6). In instances where the segment is populated with NT8D02AA Digital Line Cards with no data TNs enabled, NT8D03 Analog Line Cards, NT8D09AA Message Waiting Line Cards, or NT8D14AA or NT8D15AA Trunk cards, the two segment per superloop configuration will provide a virtual non-blocking (120 timeslots to 32-128 TNs) environment (see Figure 4-4). For instances where half of the data TNs on NT8D02AA Digital Line Cards are enabled, this configuration still provides a low concentration of TNs to timeslots (120 timeslots to 196 TNs) and a very low probability of blocking. Two NT8D04AA Superloop Network cards and one NT8D01AD Controller-2 card are used to implement a two segment per superloop configuration.

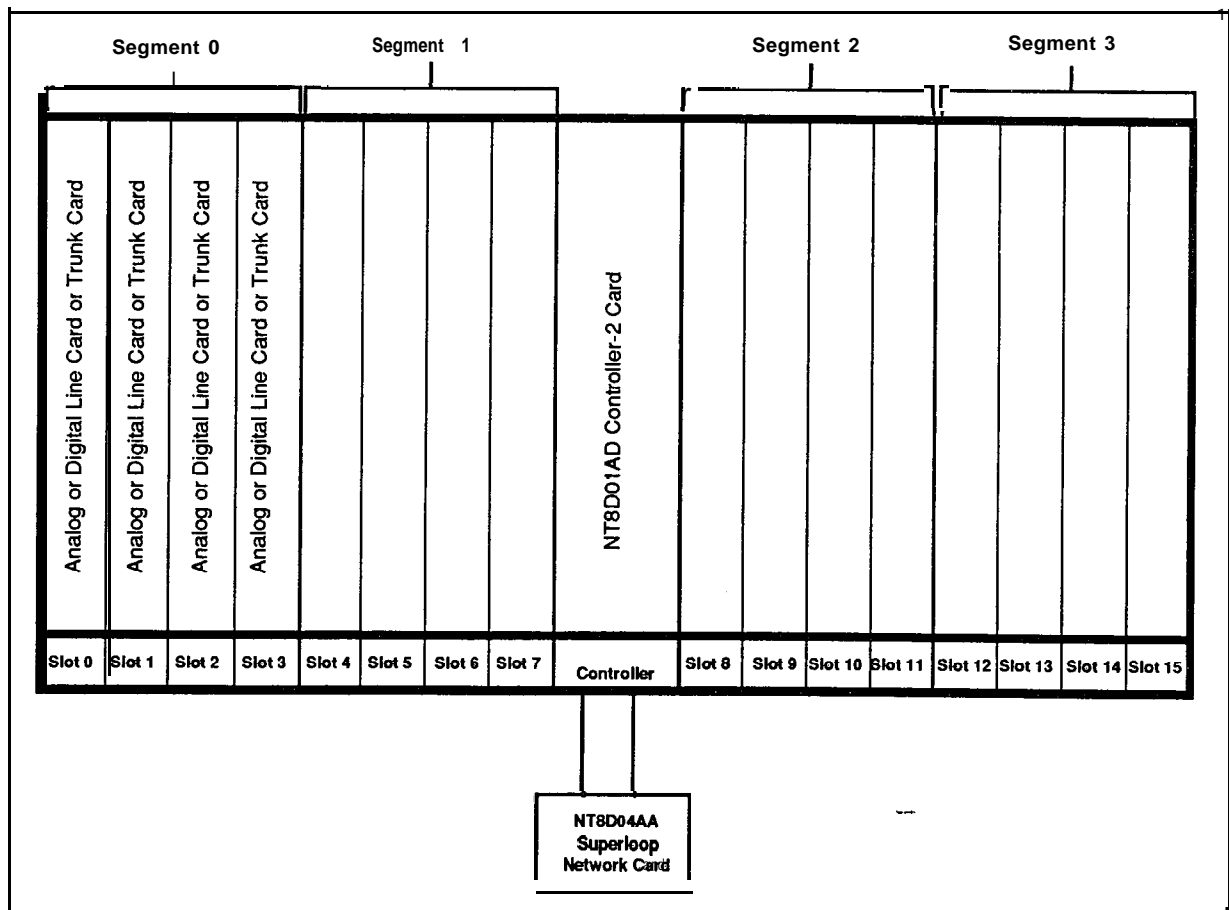
Figure 4-6
Two segments per superloop configuration



Four segments per superloop

In this configuration, 4 segments are assigned to one superloop (see Figure 4-7). In instances where the segment is populated with **NT8D02AA Digital** Line Cards, **NT8D03** Analog Line Cards, **NT8D09AA** Message Waiting Line Cards, or **NT8D14AA** or **NT8D15AA** Trunk cards, the 4 segment per superloop configuration will provide a medium concentration (120 timeslots to 64-256 **TNs**) environment (see Figure 4-4). In instances where half of the data **TNs** on **NT8D02AA** Digital Line Cards are enabled, this configuration provides a concentration of 120 timeslots to 384 **TNs**. One **NT8D04AA** Superloop Network card and one **NT8D01AD** Controller-2 card are used to implement a four segment per superloop configuration.

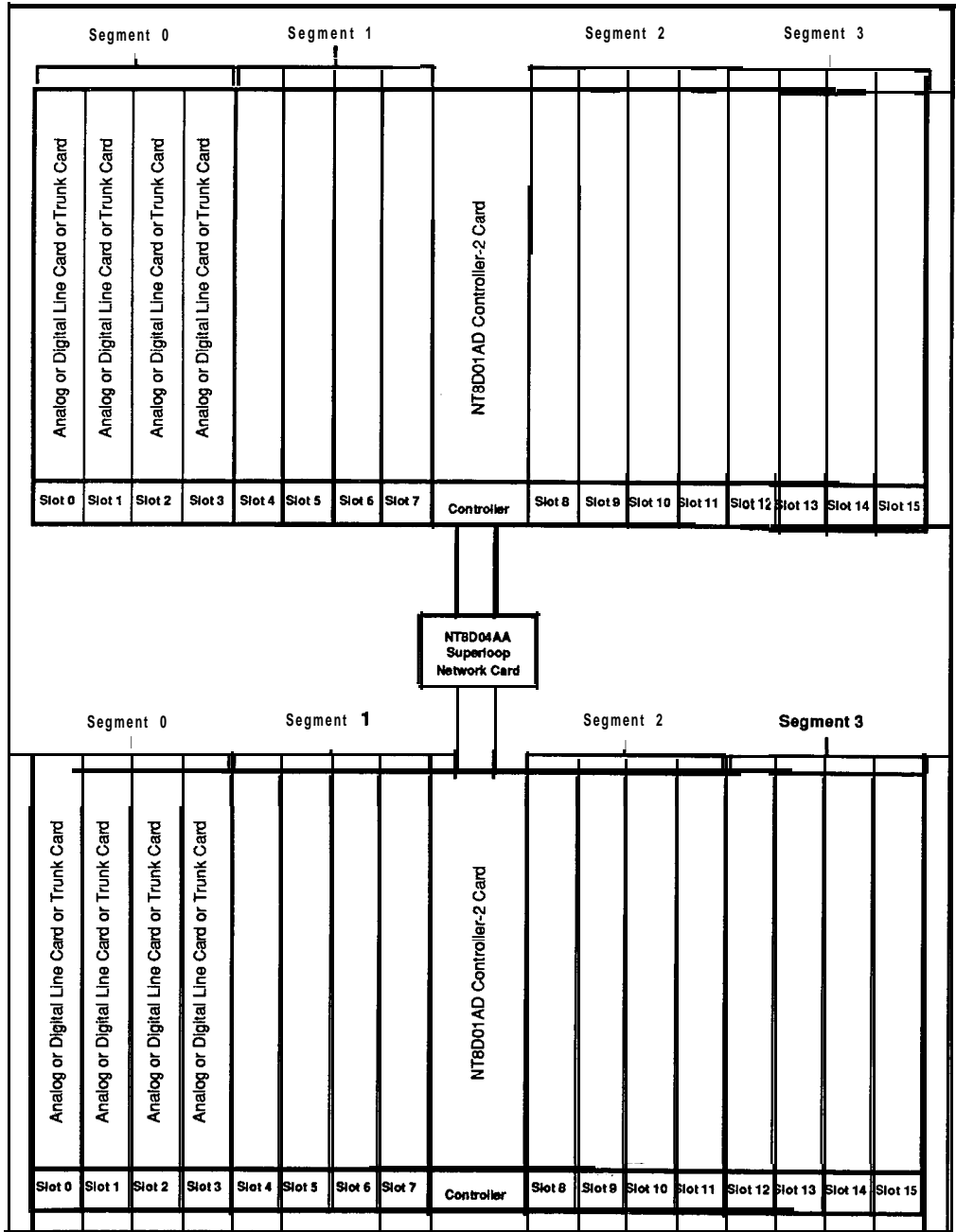
Figure 4-7
Four segments per superloop configuration



Eight segments per superloop

In this configuration, 8 segments are assigned to one superloop (see Figure 4-8). In instances where the segment is populated with **NT8D02AA** Digital Line Cards, **NT8D03** Analog Line Cards, **NT8D09AA** Message Waiting Line Cards, or **NT8D14AA** or **NT8D15AA** Trunk cards, the 8 segment per superloop configuration will provide a high concentration (120 timeslots to 128-512 **TNs**) environment (see Figure 4-4). In instances where half of the data **TNs** on **NT8D02AA** Digital Line Cards are enabled, this configuration provides a concentration of 120 timeslots to 768 **TNs**. One **NT8D04AA** Superloop Network card and two **NT8D01AD** Controller-2 cards are used to implement an eight segment per superloop configuration.

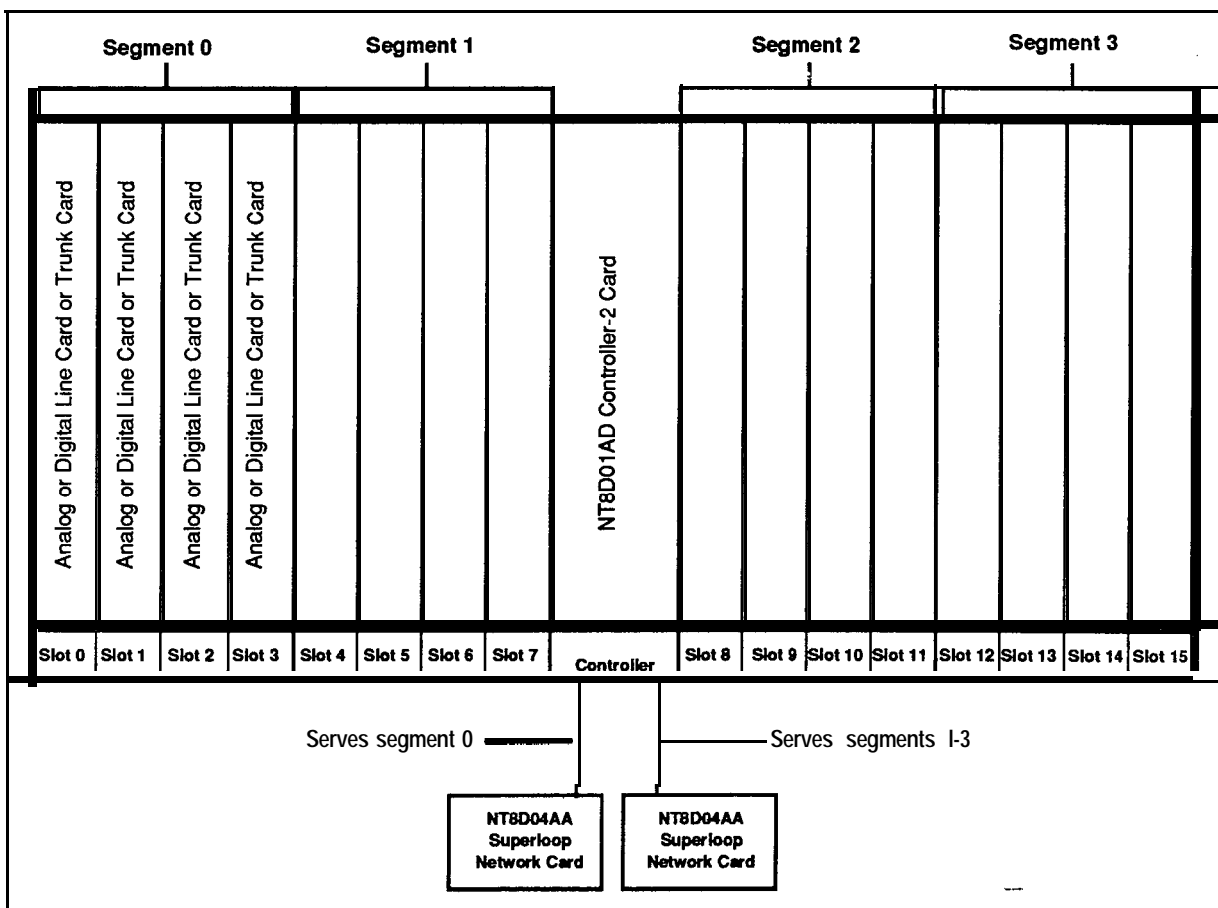
Figure 4-8
Eight segments per superloop configuration



One segment per **superloop**/three segments per superloop

In this configuration, one segment is assigned to one superloop and an additional three segments are assigned to another superloop (see Figure 4-9). This configuration provides a virtual non blocking environment for the single segment served by the first superloop and a medium concentration of **TNs** to timeslots for the three segments assigned to the additional superloop, as described in the preceding examples. Two **NT8D04AA** Superloop Network cards and one **NT8D01AD** Controller-2 card are used to implement a one and three segment per superloop configuration.

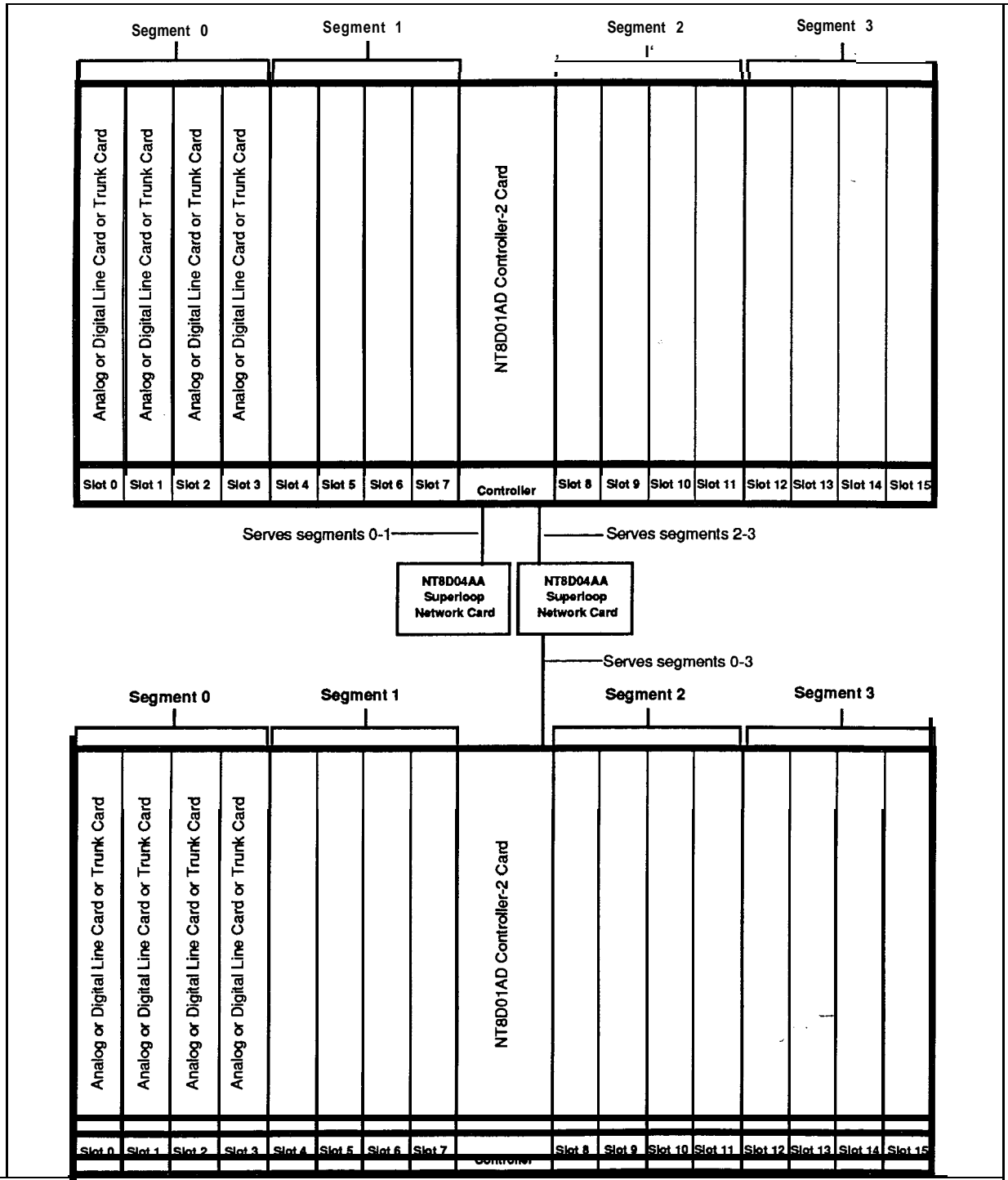
Figure 4-9
One segment per **superloop**/three segments per superloop configuration



Two segments per superloop/six segments per superloop

In this configuration, 2 segments are assigned to one superloop and an additional 6 segments are assigned to another **superloop** (see Figure 4-10). This configuration provides a virtual non blocking environment for the two segments served by the first superloop (or a very low concentration of **TNs** to timeslots when some data **TNs** are enabled) and a medium concentration of **TNs** to timeslots for the three segments assigned to the additional superloop, as described in the preceding examples. Two **NT8D04AA** Superloop Network cards and two **NT8D01AD** Controller-2 cards are used to implement a one and three segment per superloop configuration.

Figure 4-10
Two segments per superloop/six segments per superloop configuration



Power equipment

Meridian 1 systems feature a modular power distribution architecture which parallels the modular design concept of the Universal Equipment Module. Meridian 1 power systems provide the following features:

- AC-powered and DC-powered System Options, providing flexibility to meet a wide range of customer requirements
- A distributed, modular power architecture, with power supplies located in each Module, rather than in separate, centralized power shelves
- All DC systems are available as complete systems, with rectifiers provided by Northern Telecom, or can be equipped for customer-provided external power
- A new System Monitor has been designed to provide enhanced power, cooling, and general system monitoring capabilities. This new System Monitor interfaces to the CPU via a Serial Data Interface card, for intelligent error and status reporting
- Maintenance messages that indicate the location of power faults and status down to the specific column and module
- Equipment modules that are truly universal, in terms of power and cooling. Meridian 1 systems are designed to eliminate power and thermal limitations; any card can go in any slot, and all modules can be filled to capacity with any logically valid combination of cards, with virtually no engineering rules
- A universal quick-connect power wiring harness is used to distribute input voltages and monitor signals to power supplies located in each Module
- An advanced cooling system which employs forced air impellers. The velocity of the impellers is automatically adjusted to meet the cooling requirements of the system
- Fuses are eliminated, as the system exclusively uses circuit breakers for input power protection
- Modular backup capabilities

Though the AC and DC systems have, within the modules, different internal power components, the internal architecture and distribution methods are very similar. AC and DC systems differ primarily in the power components external to the UEM. See Figures 4-10 and 4-11 for block diagrams of the AC and DC powering schemes.

As shown in Figure 4-11, AC-powered systems require absolutely no external power components or rectifiers at all, and can plug directly into the commercial AC (utility) power. If reserve power is required with an AC system, an Uninterruptible Power Supply (UPS), along with its associated batteries (either internal or external to the unit), is installed in series with the main commercial **AC power** feed.

Thus while AC systems **are** especially well-suited for applications that do not require reserve power, they are also recommended for small to medium sized systems (Option 21 through 61) that do require reserve power, with backup times ranging from 15 minutes up to 8 hours. In addition even AC systems **w/o** long-term backup requirements can benefit from a UPS with short-term backup, as the UPS

typically provides power conditioning during normal operation, as well as reserve power during short outages or blowouts.

As shown in figure 4-12, AC-powered systems always require external rectifiers to convert the commercial AC power into the standard -48v DC for distribution within the system. Batteries are generally present-in DC systems, as the traditional telecommunications powering method is for the rectifiers to continuously charge a bank of batteries, while the system power rails “float” in parallel on the battery voltage. However, batteries are only required if reserve power is needed.

Also shown in Figure 4- 12 is a junction box, which is sometimes used if the distance from the rectifiers to the system is greater than approximately 50’. See NTP 553-3001-152, Power Engineering, for detailed guidelines.

In summary, all System Options, in all sizes, are available in both AC-powered and DC-powered versions. The choice of which powering scheme to use is determined primarily by reserve power requirements and preferences, and by existing power equipment at the installation site.

Figure 4-11
AC Power external components

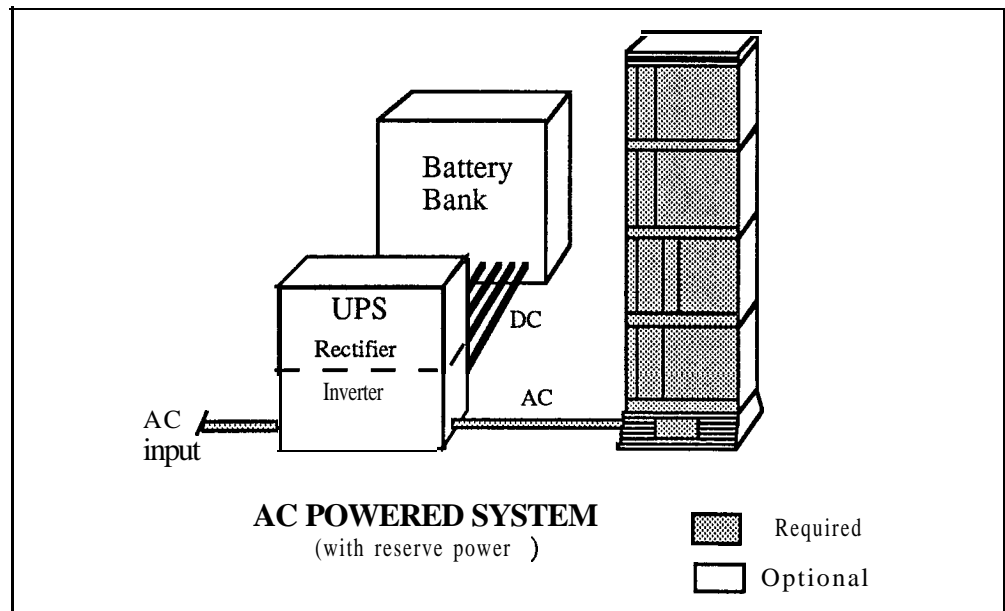
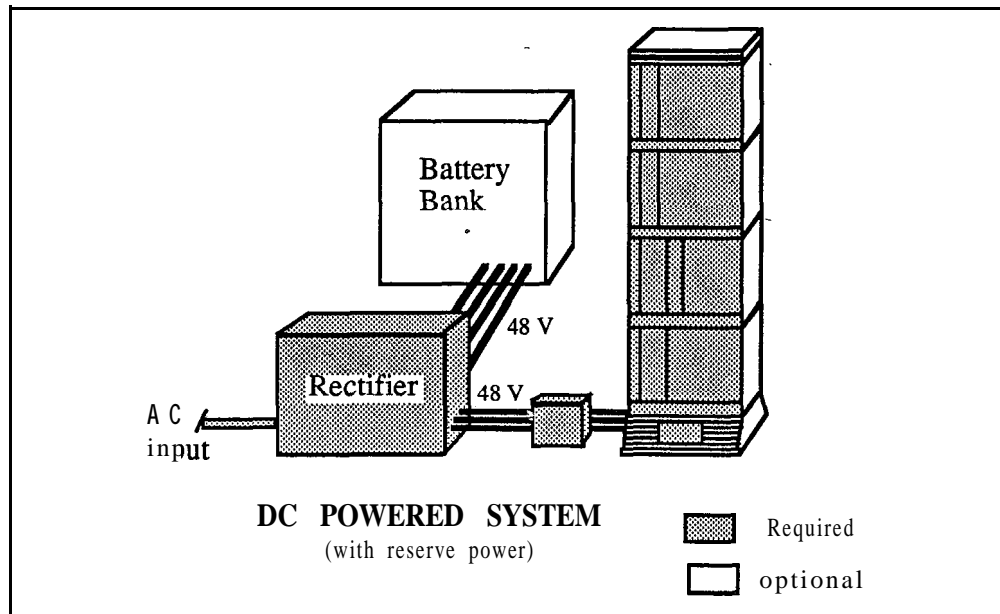


Figure 4-12
DC Power external components



Chapter 5: Product description

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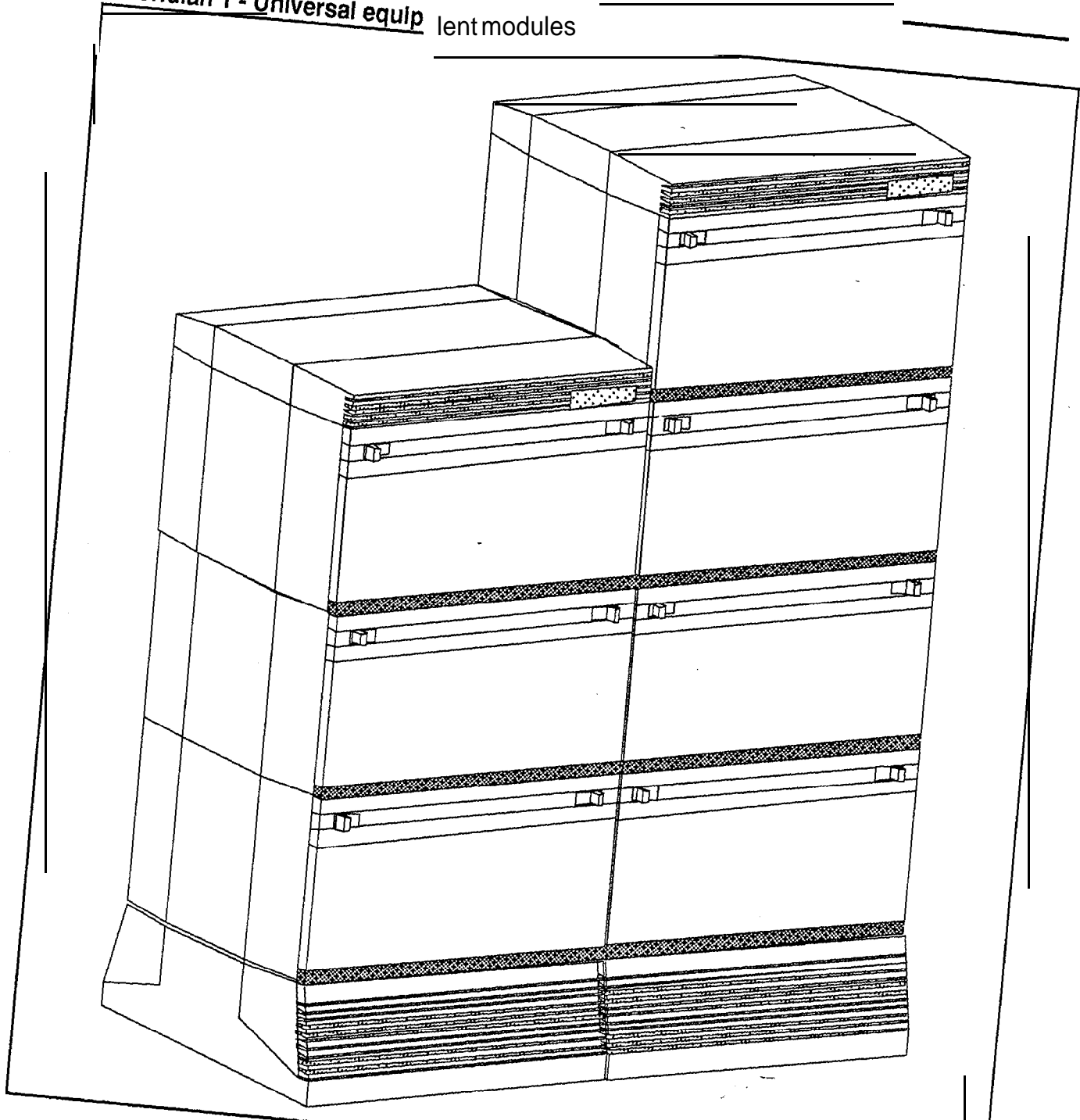
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Introduction

The purpose of this section is to provide a description of the Meridian 1 product line. This information does not replace the Northern Telecom Publications (NTPs). For a list of the available NTPs, please refer to the *Master* index (553-3001-000).

5-2 Product description

Figure 5-1
Meridian 1 - Universal equip lent modules



Universal Equipment Modules

The Meridian 1 System is comprised of Universal Equipment Modules (**UEMs**), each containing everything needed (card cage assembly, power supply, I/O cabling, etc) to support a specific system function. These **UEMs** are assembled up to four high on a pedestal, to form a column. The pedestal contains a central Power Distribution Unit (**PDU**), cooling fans, air filters, and a System Monitor circuit. At the top of each column is a Top Cap, which consists of two air exhaust grilles and a thermal sensor assembly that works in conjunction with the System Monitor. Systems are comprised of one or more columns.

Each module is available in both AC and DC versions, to support the AC- and **DC**-powered System Options. All functional cards and cardcages are identical, however; the only difference in the modules is the power distribution and the type of power supply or converter used.

The different modules and their base product codes are listed below:

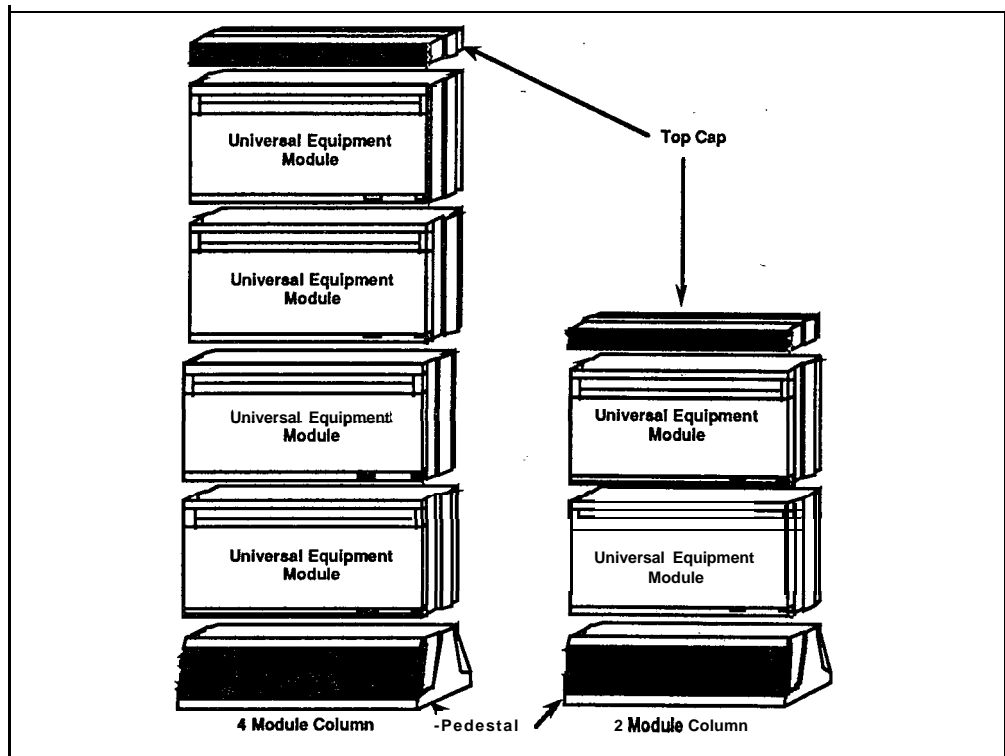
- . CPU module (**NT8D34**)
- . CPU/Network module (**NT6D39**)
- . Network Equipment module (**NT8D35**)
- . Common/Peripheral Equipment module (**NT8D11**)
- . Intelligent Peripheral Equipment module (**NT8D37**)
- . Peripheral Equipment module (**NT8D13**)
- . Remote Peripheral Equipment Carrier module (**NT8D47**)
- . **InterGroup** module (**NT8D36AA**)
- . Meridian Mail module (**NT6D44**)

The Universal Equipment Modules are constructed of die cast aluminum, providing strength and durability. For ease of access these new modules feature removable front and rear panels . All cable routing between the module and the Main Distribution Frame (**MDF**) is handled through the rear of the module. Cable exit can occur at the top, to access overhead cable racks, or at the bottom to take advantage of raised floors.

Universal Equipment Modules are assembled on a pedestal, that provides a central **Power Distribution Unit**, cooling units and system monitoring functions. The pedestal can be equipped with either leveling feet or casters. Modules are shipped three high on a pedestal. Modules are assembled in columns to maximize floor space; Adjacent modules require **NT8D49AAExpansion Kits** to maintain EMI integrity.

Each of these Universal Equipment Modules is available in AC or DC power versions, except for the **InterGroup** module which does not require a power card. Having two power options gives customersthe flexibility to choose the optimal configuration to meet their business needs.

Figure 5-2
Meridian 1 Packaging Elements



Meridian 1 System Options

The Meridian 1 is available in several options. The use of the Universal Equipment Modules allows for seamless growth from one option to another option by adding or replacing Universal Equipment Modules or card cages. The options are selected depending upon the application, line size, or other customer requirements. The options are listed below with a brief description of each:

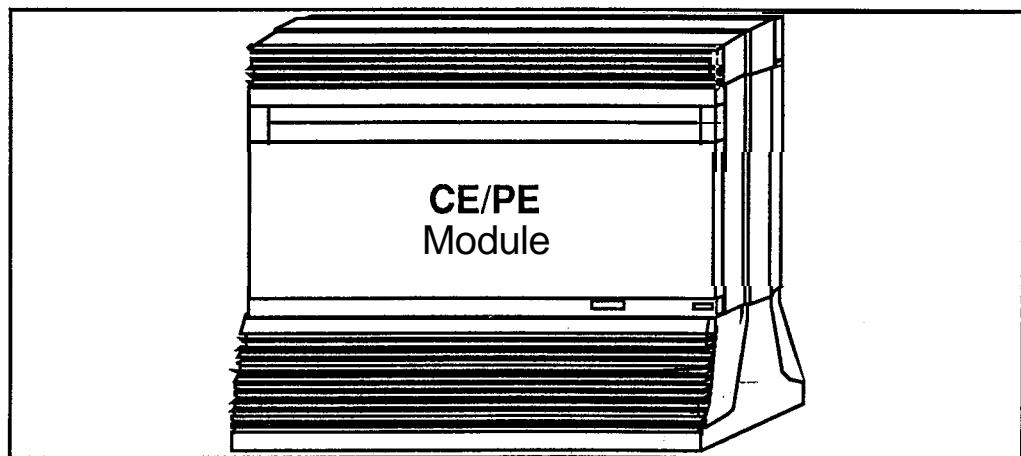
- Meridian 1 System Option 21A (Single CPU-1 module only)
- Meridian 1 System Option 21 (Single CPU)
- Meridian 1 System Option 51 (Single CPU, Half Network Group)
- Meridian 1 System Option 61 (Dual CPU, Full Network Group)
- Meridian 1 System Option 71 (Dual CPU, Multiple Network Groups)

Meridian 1 System Option 21A

The Meridian 1 System Option 21A is a special version of the Sysytem Option 21, with its power distribution, monitoring and cooling optimized for single-module operation. the option 21A utilizes the standard Common/Peripheral Equipment Module, but with a different System Monitor, Pedestal, and Top Cap.

Figure 5-3 shows a typical system configuration.

Figure 5-3
System **Option 21A**



The following specifications apply to System Option 21A:

Power	AC only
Typical Number of Ports	160
Maximum Number of Ports	320
Maximum Number of Modules	1
AC Input Voltage	208 V ac
Number of CPUs	1
Number of Network Loops *	6 SuperLoops or 10 ENET Loops plus two service loops (Conf/TDS)
Number of DTRs	Eight DTMF channels
Cooling	Fan in Top Cap
Memory	768K
Data Storage	Floppy Disk Unit
Software Generic	1011 Rls.15
Hardware Features	No Power Distribution Unit Contains System Monitor (NT7D15AA)

* Note: To expand Option 21A to Option 21, it is necessary to replace several of the power distribution and cooling elements in the pedestal and top cap, as well as upgrading the system monitor.

Meridian 1 System Option 21

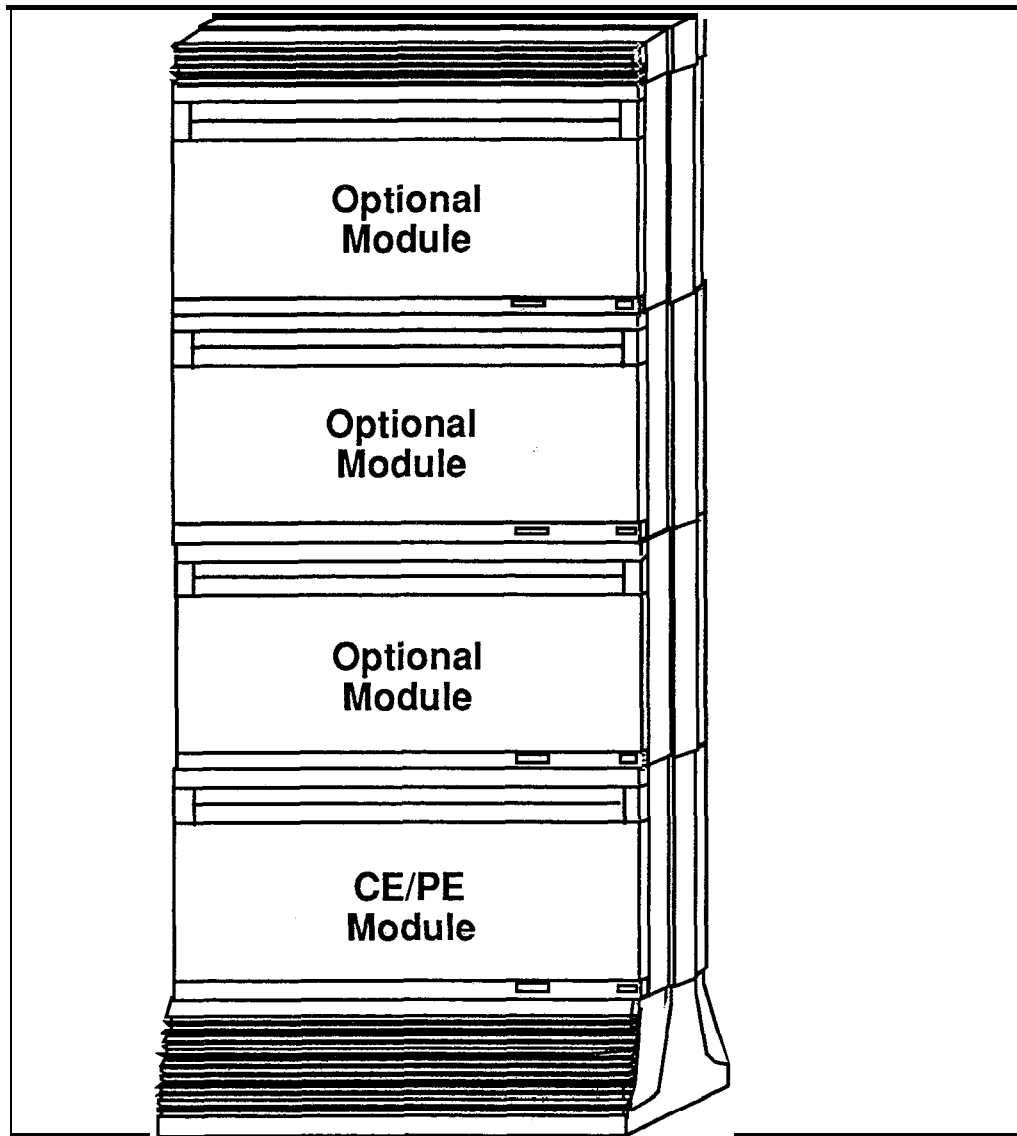
The Meridian 1 System Option 21 is a single CPU system, with error **correction** memory, based on the Common/Peripheral Equipment (**CE/PE**) Module. This module contains: 3 CPU-type slots for CPU, Memory/Peripheral **Signalling**, and Floppy Disk Interface Cards; 6 Superloop Network slots plus a combination Superloop **Network/DTR** card serving the resident Intelligent Peripheral Equipment slots; and 10 resident IPE card slots.

A **conference/TDS** card is generally equipped in one of the Superloop Network slots, using 2 of the 4 loops available, so the total network capacity for voice/data traffic is 1 Superloop for the 10 resident IPE slots plus **5** additional standard ENET loops for PE expansion (or any suitable combination of **loops and** superloops).

The System Option 21 can use the standard Pedestal, with power distribution and cooling for up to 4 modules per column, or a 2-module pedestal with cooling fans optimized for 1 or 2 module system operation.

Figure 5-4 shows a typical system configuration.

Figure 5-4
System Option 21



5-8 Product description

The following specifications apply to System Option 21:

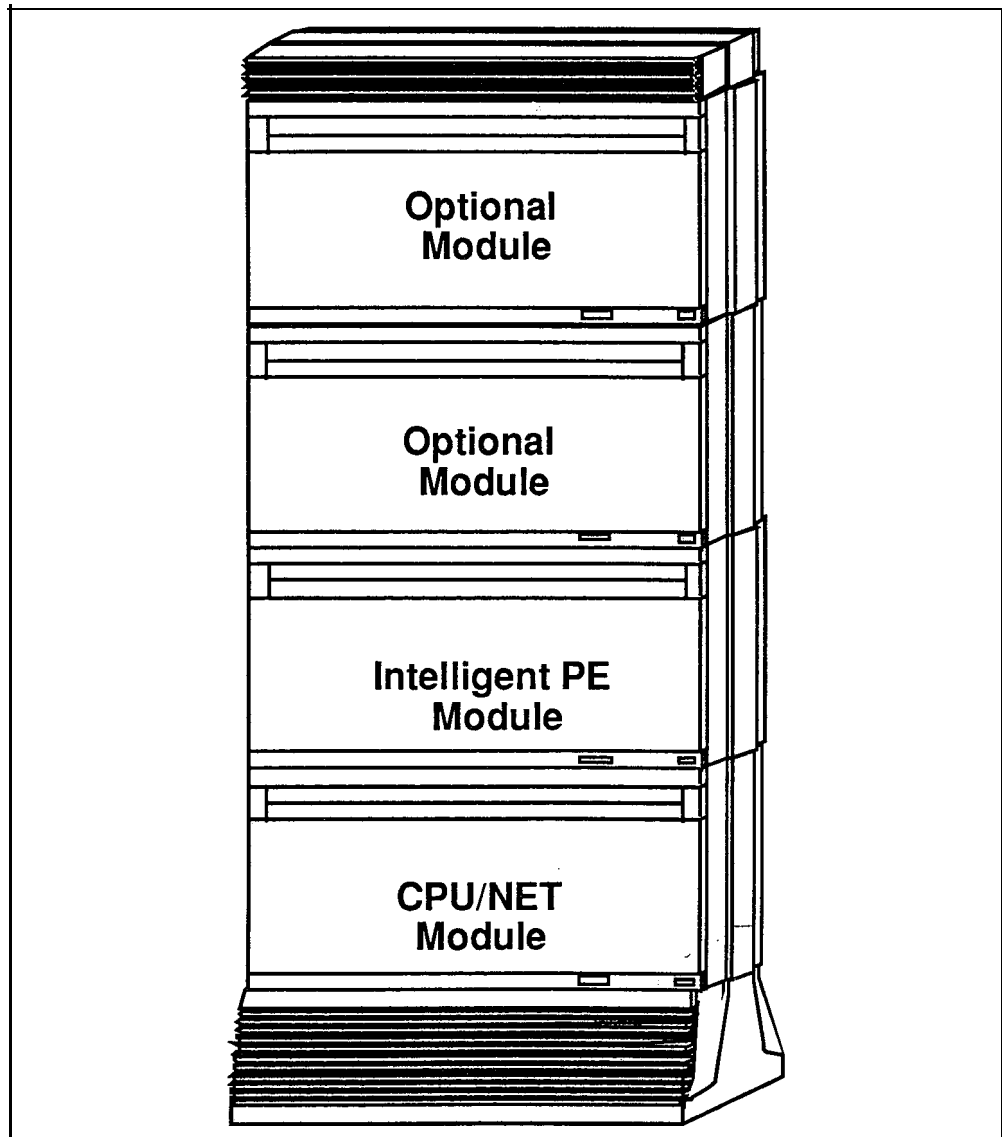
Power	AC or DC
Maximum Number of Ports	800
Input Voltage	208 V ac or -48 V dc
Number of CPUs	1
Number of Network Loops	6 Superloops or 10 ENET Loops plus two service loops (Conf/TDS)
Cooling	Fan Impellers in pedestal
Memory	768K
Storage Media	Floppy Disk Unit
Software Generic	1011 Rls.15
Hardware Features	Standard Power Distribution Unit Contains System Monitor (NT8D22AB)

Meridian 1 System Option 51

The Meridian 1 System Option 51 is a single CPU system with parity-protected memory, plus a half network group of switching capacity, and is based on a single CPU/Network Module.

Figure 5-5 shows a typical system configuration.

Figure 5-5
System Option 51



The following specifications apply to System Option 5 1:

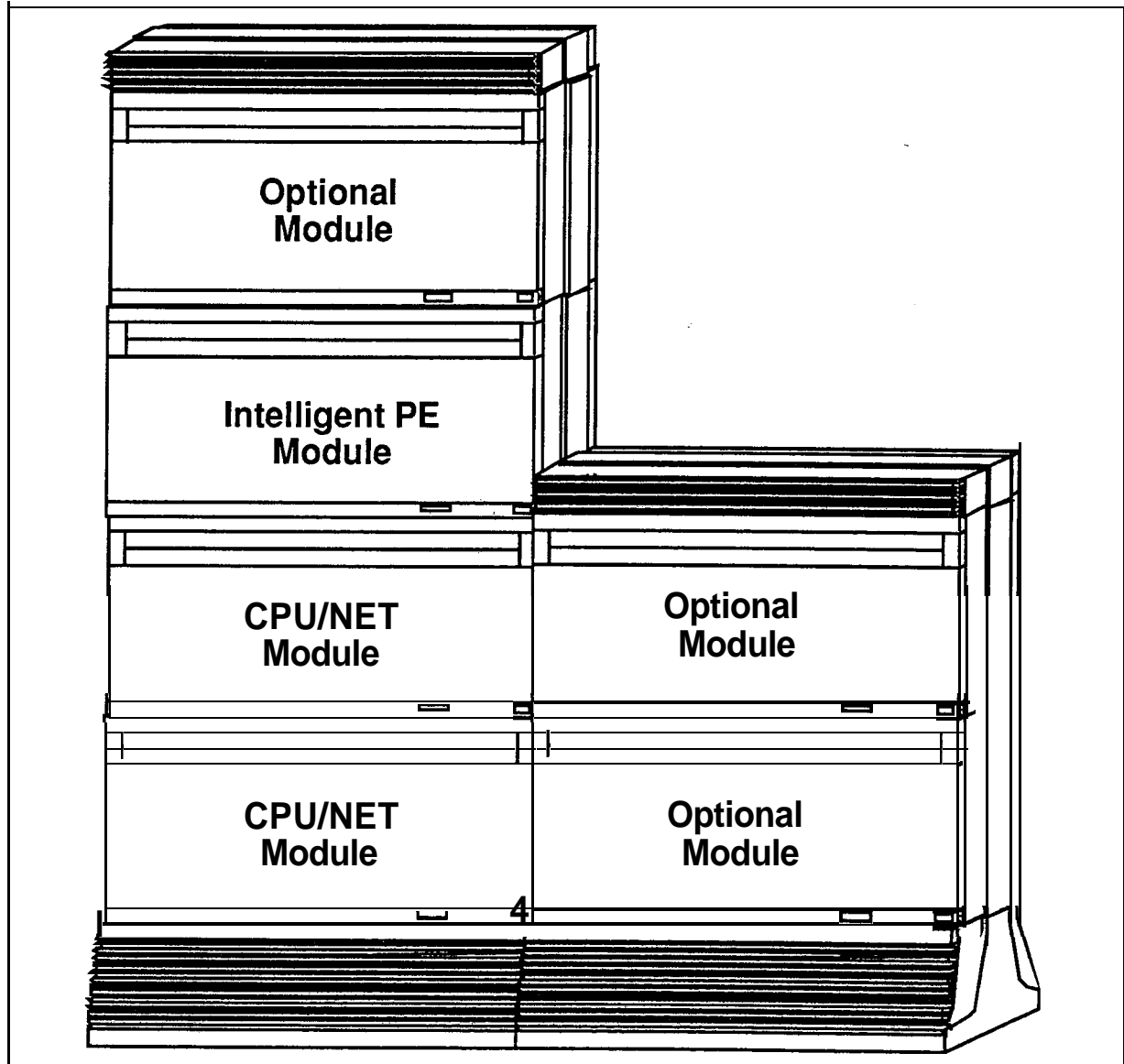
Power	AC or DC
Maximum Number of Ports	1000.
Input Voltage	208 V ac or -48 V dc
Number of CPUs	1
Number of Network Loops	16
Cooling	Fan Impellers in pedestal
Memory	768K
Storage Media	Floppy Disk Unit or Multi Disk Unit
Software Generic	1111 Rls.15
Hardware Features	One Half Network Group, Standard Power Distribution Unit Contains System Monitor (NT8D22AB)

Meridian 1 System Option 61

The Meridian 1 System Option 61 is a dual CPU system with “hot standby” processing capability and fully redundant memory, plus a full network group of switching capacity. The System Option 61 uses two CPU/Network Modules as its common equipment base.

Figure 5-6 shows a typical configuration.

Figure 5-6
System Option 61



5-12 Product description

Specifications for System Option 61:

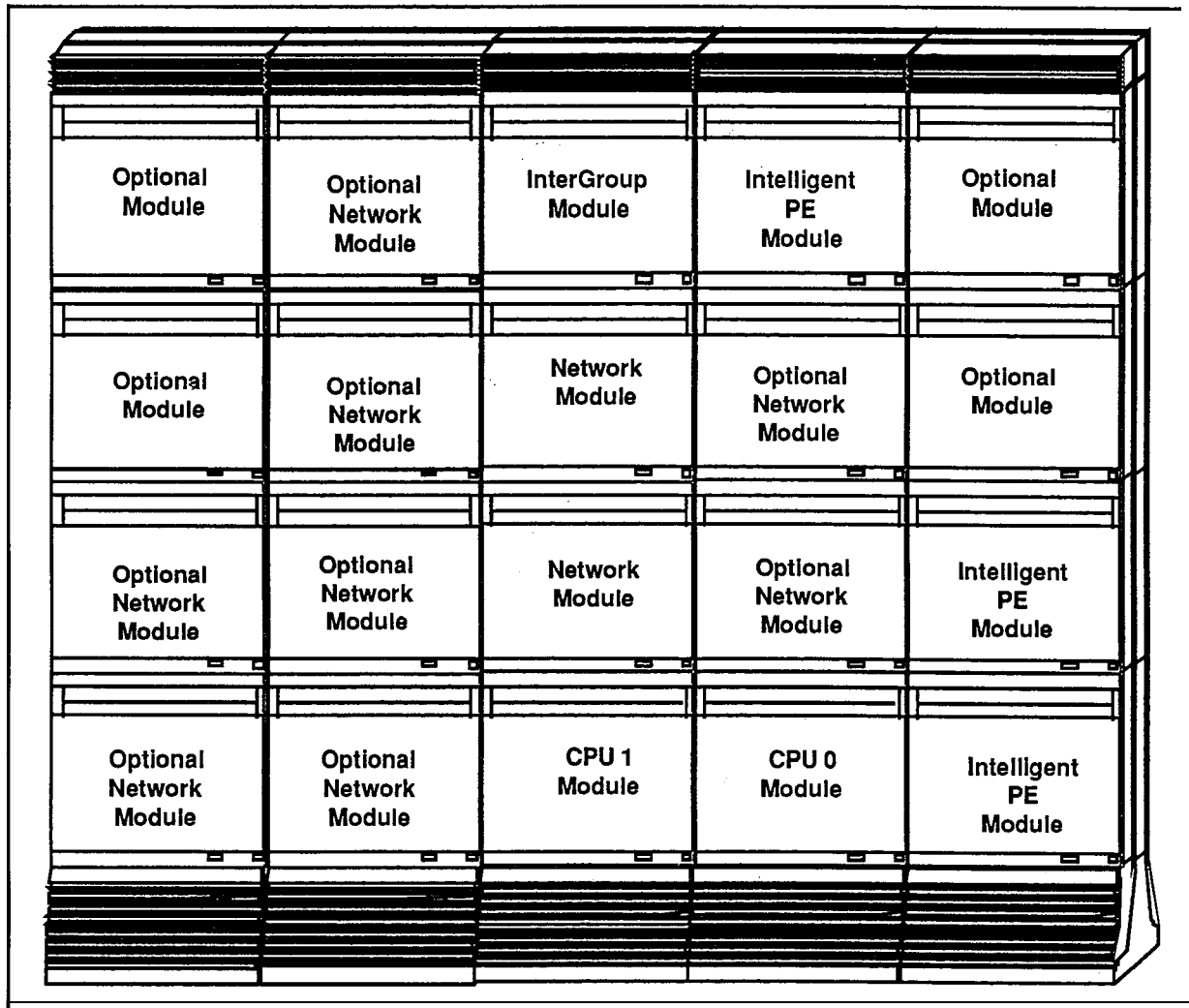
Power	AC or DC
Maximum Number of Ports	2000
Input Voltage	208 V ac or -48 V dc
Number of CPUs	2
Number of Network Loops	32
Cooling	Fan Impellers in pedestal
Memory	768K
Storage Media	Floppy Disk Unit or Multi Disk Unit
Software Generic	1111 Rls.15
Hardware Features	One Network Group, Standard Power Distribution Unit and Contains System Monitor (NT8D22AB)

Meridian 1 System Option 71

The Meridian 1 System Option 71 is a dual CPU system with “hot standby” processing capabilities and fully redundant memory, plus up to 5 full network groups of switching capacity. The System Option 71 uses for its common equipment base two CPU Modules (in separate columns), two or more Network Modules, and an Intergroup Module for space switching between network groups.

Figure 5-7 shows a typical system configuration.

Figure 5-7
System Option 71



Specifications for System Option 71:

Power	AC or DC
Maximum Number of Ports	10,000
Input Voltage	208 V ac or -48 V dc
Number of CPUs	2
Number of Network Loops	160
Cooling	Fan Impellers in pedestal
Memory	1.5 Mbyte
Storage Media	Floppy Disk Unit or Multi Disk Unit
Software Generic	1211 Rls.15
Hardware Features	Up to five Network Groups, Standard Power Distribution Unit and Contains System Monitor (NT8D22AB)

Module descriptions**CPU module (NT8D34)**

The **NT8D34** CPU module uses the CPU and Memory cards currently housed in the Meridian SL-1 XT **CPU/MEM** shelf to provide system control and storage of data and programs for the Meridian 1 System Option 71. Each **NT8D34** CPU module houses one CPU; two are required for the Meridian 1 System Option 71.

For configuration flexibility the **NT8D34** CPU module is available with an AC power supply option or a DC power supply option. These power supplies provide the voltages to operate the circuit cards located in the Modules.

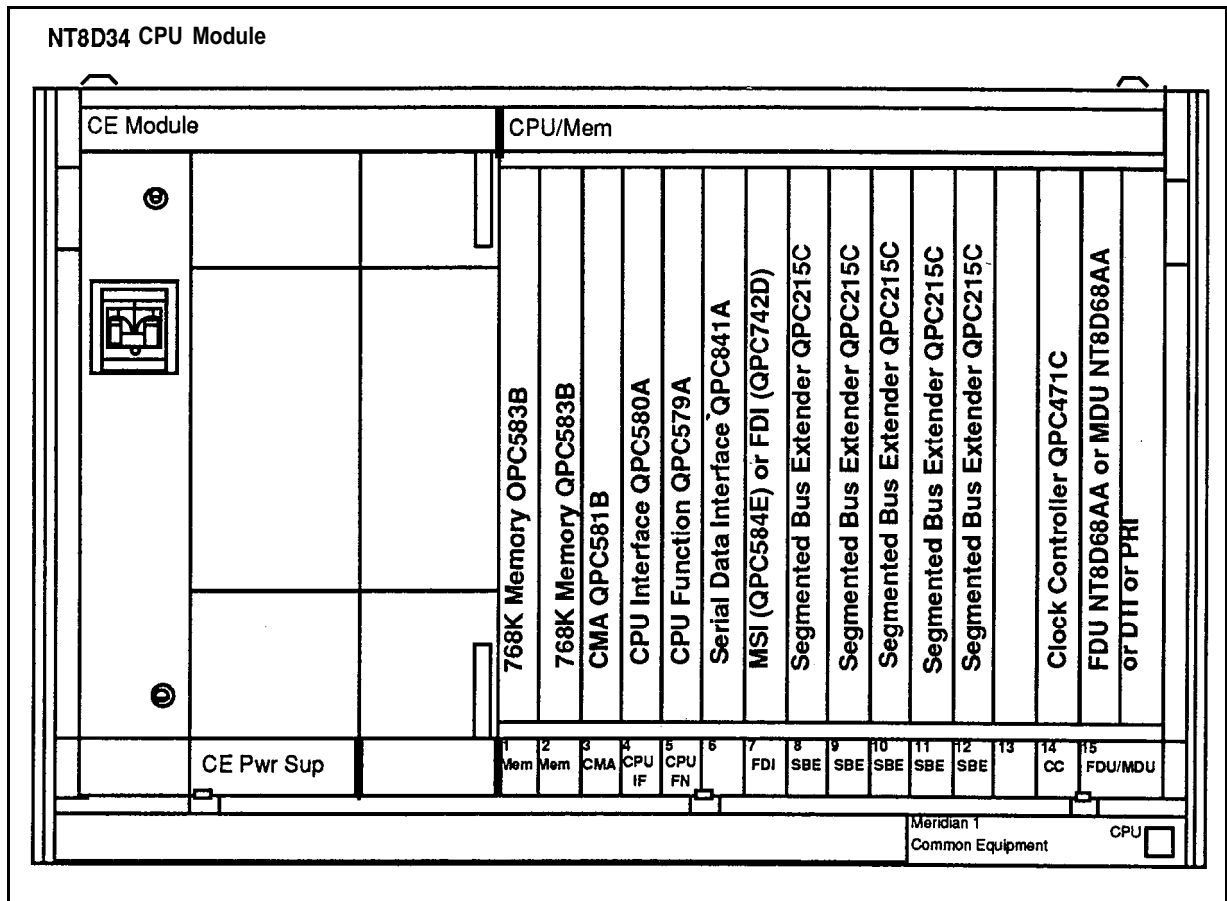
The **NT8D34AA** module is designed to accommodate AC power supplies. One Common Equipment Power Supply AC (**NT8D29AB**) is required for the **NT8D34AA** module.

The **NT8D34DC** module is designed to accommodate DC power supplies. One Common Equipment Power Supply DC (**NT6D4 1AB**) is required for the **NT8D34DC** module.

Configuration guidelines:

- **NT8D34** CPU Modules are located side by side on the **first** level of adjacent columns.
-

Figure 5-8
CPU module (**NT8D34**) with circuit cards



- The **NT8D34** CPU module contains 17 card slots which support the following:
 - slots 1-2 : Memory
 - slot 3: CMA
 - slot 4: CPU Interface
 - slot 5: CPU Function
 - slot 6: **SDI**
 - slot 7: **MSI** or FDI
 - slots 8-12: Segmented Bus Extender (SBE)
 - slot 14: Clock Controller
 - slot 15-17: **FDU/MDU** or Digital Trunk Interface (**DTI**)/Primary Rate Interface (**PRI**)

CPU/Network module (NT6D39)

The **NT6D39** CPU/Network module uses the CPU and Memory circuit cards housed in the Meridian SL-1 NT and RT **CPU/MEM** shelves to provide system control and storage of data and programs for Meridian 1 System Option 5 1 and 61. Each **NT6D39** module houses one CPU and up to 16 network loops, with one **NT6D39** CPU/Net module used in System Options 51 and two used in System Option 6 1.

For configuration flexibility the **NT6D39** CPU/Network module is available with an AC power supply option or a DC power supply option. These power supplies provide the voltages to operate the circuit cards located in the Modules.

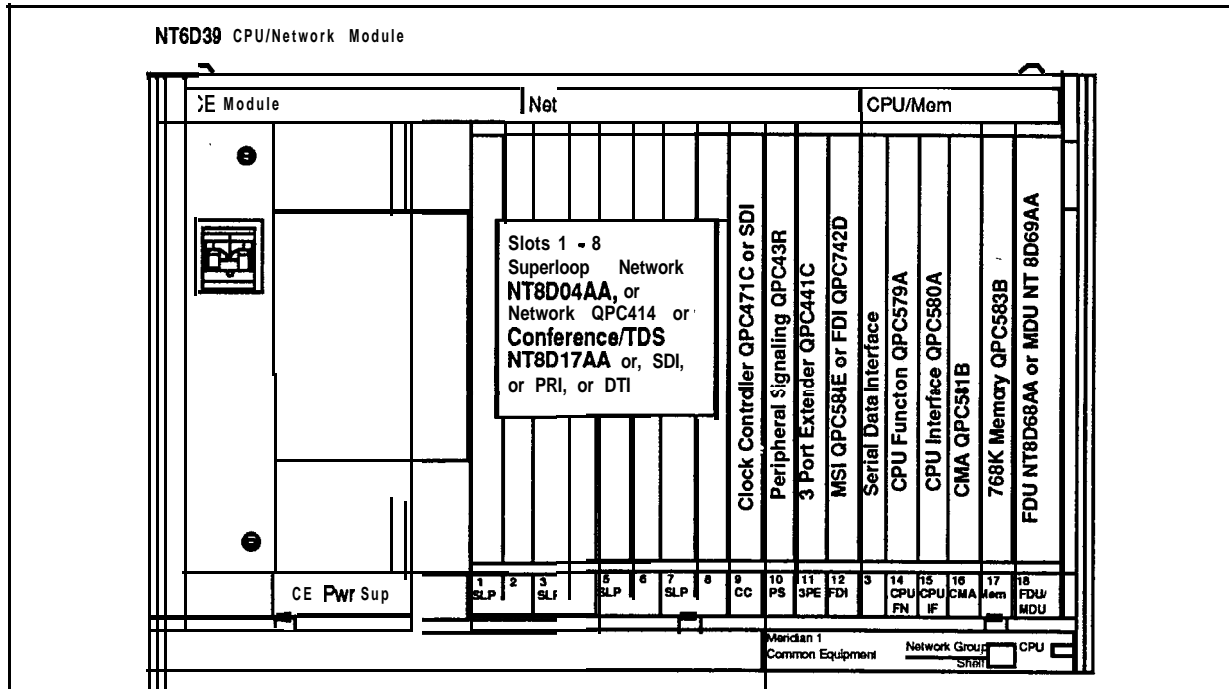
The **NT6D39AA** module is designed to accommodate one Common Equipment Power Supply AC (**NT8D29AB**).

The **NT6D39DC** module is designed to accommodate one Common Equipment Power Supply DC (**NT6D4 1 AB**).

Configuration guidelines:

- For a half group, single CPU system, one **NT6D39** module is required (Meridian 1 System Option 51).
- For a full group, dual CPU system, two **NT6D39** Modules are required (Meridian 1 System Option 61).
- These **NT8D39** Modules must be located on top of each other in the same column.

Figure 5-9
CPU/Network module (**NT6D39**) with circuit cards



- The **NT6D39** contains 17 card slots which support the following:
 - slots 1 - 8: network cards*
 - slot 9 : Clock Controller or Serial Data Interface (SDI)
 - slot 10: Peripheral Signaling
 - slot 11: 3-Port Extender (3PE)
 - slot 12: Mass Storage Interface (**MSI**)/Floppy Disk Interface (**FDI**)
 - slot 13: **SDI**
 - slot 14: CPU Function
 - slot 15: CPU Interface
 - slot 16: Changeover Memory Arbitrator (CMA) --
 - slot 17: Memory
 - slot 18: **FDU/MDU**

* Network-type include the **NT8D04** Superloop Network Card, the QPC 414 Network Card, and conference/TDS, SDI, and PRI/ATI cards.

Network module (**NT8D35**)

The **NT8D35** Network module contains the network shelf backplane from the Meridian SL-1 Network Enhanced systems but is housed in a module configuration. This module will support the current Meridian SL- 1 network circuit cards along with two new network circuit cards:

- **SuperLoop** Network card (**NT8D04**)
- Conference/Tone and Digit Switch card (**NT8D17**)

The new **SuperLoop** Network card (**NT8D04**) will interface to four network loops (120 time slots) and may also be used in the existing Meridian SL-1 Enhanced Network shelves.

The Conference (QPC444) and the Tone and Digit Switch (**QPC609**) circuit cards may be replaced by the **Conference/TDS** card (**NT8D17**) which will require two loops (one card slot), instead of the four loops (two card slots) currently required with the Meridian SL- 1 systems.

For configuration flexibility the **NT8D35** Network module is available with an AC power option or a DC power option. These power supplies provide the voltages to operate the circuit cards located in the modules.

The **NT8D35AA** Network module is designed to accommodate the one Common Equipment Power Supply AC (**NT8D29AA**).

The **NT8D35DC** module is designed to accommodate one Common Equipment Power Supply DC (**NT6D41AB**).

The **NT8D35** Network module will permit eight QPC414 (**ENET**) cards or four **NT8D04AA SuperLoop** Network cards, or any combination for a total of 16 network loops per **NT8D35** module. Usually 14 voice/data loops are available when one Conference/Tone and Digit Switch card is configured in the **NT8D35** module.

Card slots 5 - 12 are used for the network cards. The **SuperLoop** Network card will always use four loops (120 time slots) and will always begin with an even numbered loop that is a multiple of four (Example • 4, 8, 12, 16, 20, 24, 28 etc...). See configuration guidelines for **SuperLoop** Network and ENET card placement rules.

Each **NT8D35** module will provide 16 ENET loops or four Superloops, one half a network group. Two **NT8D35** modules are required for a complete network group of 32 loops.

The **NT8D35** Network modules are designated as:

*Group 0 module 0 , Group 0 module 1

*Group 1 module 0 , Group 1 module 1

(continued)

*Group 2 module 0 , Group 2 module 1

*Group 3 module 0 , Group 3 module 1

*Group 4 module 0 , Group 4 module 1

The Group and module numbers are determined by the switch settings on the Three Port Extender (3PE) card.

The **NT8D35** module may be utilized to support Digital Trunk Interface (DTI) and/or a Primary Rate Interface (**PRI**) card. In this configuration one common equipment power supply is required to power up to six **DTI/PRI** cards.

Configuration guidelines:

- The **NT8D35** Modules do not have a left and right hand version as with the Meridian SL-1 network shelves. In a full network group configuration, the Modules must always be one on top of the other.
 - The terminal number O-O-O-O is software reserved and may not be used for any PE terminal numbers. To avoid using this TN it is recommended you assign loop 0 as a Conference loop and loop 1 for a TDS loop (card slot 5).
 - A maximum of 10 **NT8D35** Modules (5 network groups) (System Option 71 only).
 - A maximum of 6 **DTI/PRI** cards per **NT8D35**.
 - When the Superloop Network card is used, the card slot to the left or right may not be used for other network cards (**ENET** or Superloop Network). The empty card slots may house **DTI/PRI** cards, if two card slots are adjacent to each other, or other type cards that do not require network addressing (**SDI** etc...).
 - All cabling will exit the module from the rear, via I/O panels.
 - All faceplate cables must go to the right of every module and terminate on I/O panels, when exiting module.
 - The **NT8D35** contains 15 card slots which support the following:
 - slots 1: 3PE
 - slots 2-3: **InterGroup** Switch (IGS) 1, **DTI/PRI**, or **SDI**
 - slot 4: Peripheral Signaling
 - slots 5-12: Network Cards
 - slot 13: **DTI/PRI** or **SDI/QSDI/ESDI/DCHI**
-

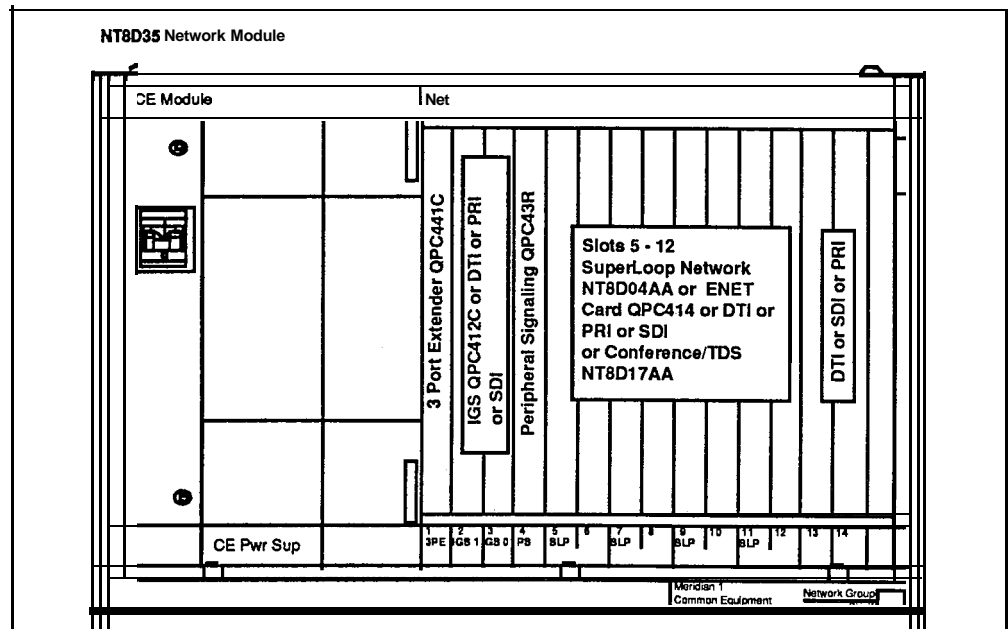
(continued)

- slot 14: DTI/PRI
- slot 15: not used

• The NT8D35 module I/O Panels J1 - J28 have several functions:

- 24 pin J slot connectors are for Network to Peripheral Equipment connections when the Network and PE are not in a contiguous row.
- D25 connector J slots are SDI connections.
- D9 connector J slots are for DTI/PRI connections.

Figure 5-1 0
Network module (NT8D35) with circuit cards



Common/Peripheral Equipment module (**NT8D11**)

The **NT8D11** module is utilized to house common, network and peripheral equipment circuit cards for the Meridian 1 System Options 21A and 21.

The **NT8D11 CE/PE** module is available in two versions, AC or DC power. These power supplies provide the voltages to operate the circuit cards located in the modules.

- . The **N8D11AA CE/PE** module requires one Common Equipment Power Supply AC (**NT7D14AA**).
- . The **N8D11DC CE/PE** module requires one Common Equipment Power Supply DC (**NT7D04AA**).

This module is divided into two sections:

- Common Equipment (CE)
- . Peripheral Equipment (PE)

There are 10 Common Equipment (CE) and 10 Peripheral Equipment (**PE**) card slots. The CPU functions are provided by card slots 1-3. The Network Equipment functions are provided by card slots 3-10.

The CPU circuit card (**QPC687**), used in the Meridian **SL-1ST** system, is installed in CE card slot 2.

The **NT8D11** module uses two specially designed circuit cards for Meridian 1 System Options 21A and 21 only.

- . Memory/Signaling card (**NT8D19AA**)
- . Network/DTR card (**NT8D18AA**)

The **Memory/Signalling** circuit card installed in CE card slot 3 provides the peripheral signaling functions in addition to providing the memory and miscellaneous CPU equipment functions.

The **Network/DTR** circuit card will provide the Controller card (**NT8D01**) functions for the Intelligent PE cards installed in the **NT8D11** module, along with a Superloop Network and **Digitone** Receiver functions, for Meridian 1 System Options **21, 21A**. The **Network/DTR** card is installed in CE card slot 10. This card also provides a Superloop for all ten Intelligent PE cards, and eight DTR circuits. Superloop networks (**NT8D04**) and/or **ENETs** (**QPC414**) are used when expansion is required by adding more PE Modules.

For uniformity, it is recommended that the **Floppy** Disk Interface circuit card be installed in CE card slot 1. This card provides the CPU interface to the Mass Storage Device. A Floppy Disk Unit may replace the **MSI** and Mass storage device in some systems. This FDU may be installed in CE card slots 7-9 or in PE card slots 7-10.

5-22 Product description

CE card slots 4-9 provide an interface to twelve loops when ENET circuit cards are used, and 24 loops if Superloop Network circuit cards are used.

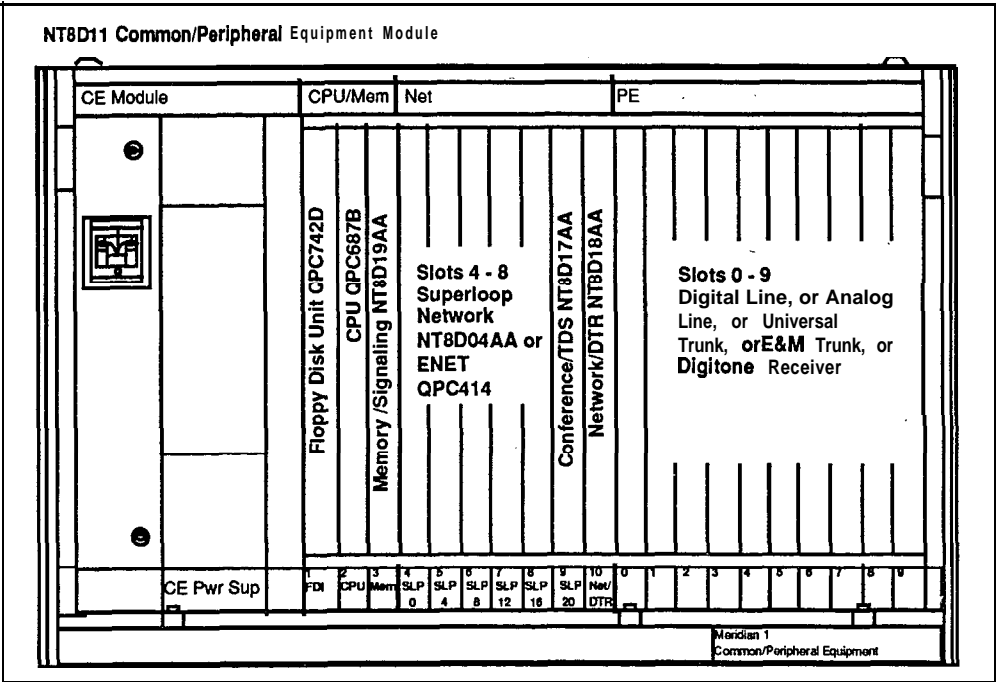
A new Conference/Tone and Digit Switch circuit card (**NT8D17**) is used to provide conference/tone and digit switch functions. The Conference/Tone and Digit Switch circuit card may be installed in CE card slots 4-9 (preferably, use slot 4 for XCT). This circuit card interfaces to two ENET loops on the backplane.

The **NT8D11** module uses the new Intelligent Peripheral Equipment cards only, to provide trunk and station interface in Meridian 1 System **Option 21A** and 21. Meridian 1 Intelligent Peripheral Equipment circuit cards may be installed in (**PE**) card slots 0-9.

Configuration guidelines:

- The **Digitone** Receiver card is always assigned as virtual card slot 10.
-

Figure 5-11
CE/PE module (NT8D11) with circuit cards



Intelligent Peripheral Equipment module (NT8D37)

The Intelligent Peripheral Equipment module uses the new Meridian 1 Intelligent Peripheral Equipment cards only and may be used with Meridian 1 System Options **21, 51, 61, 71**. With an upgrade assembly the Intelligent Peripheral Equipment modules may be used with all existing Meridian SL-1 systems.

The **NT8D37** Intelligent PE module is available in two versions, AC or DC power. These power supplies provide the voltages to operate the circuit cards located in the modules.

The **NT8D37AA** module is designed to accommodate AC power supplies. One Peripheral Equipment Power Supply AC (**NT8D06AA**) is required for the **NT8D37AA** module along with one Ringing Generator AC (**NT8D21 AA**) when 500 or 2500 sets are to be supported by the module.

The **NT8D37DC** module is designed to accommodate DC power supplies. One Peripheral Equipment Power Supply DC (**NT6D40AA**) is required for the **NT8D37DC** module along with one Ringing Generator DC (**NT7D03AA**) when 500 or 2500 sets are to be supported by the module.

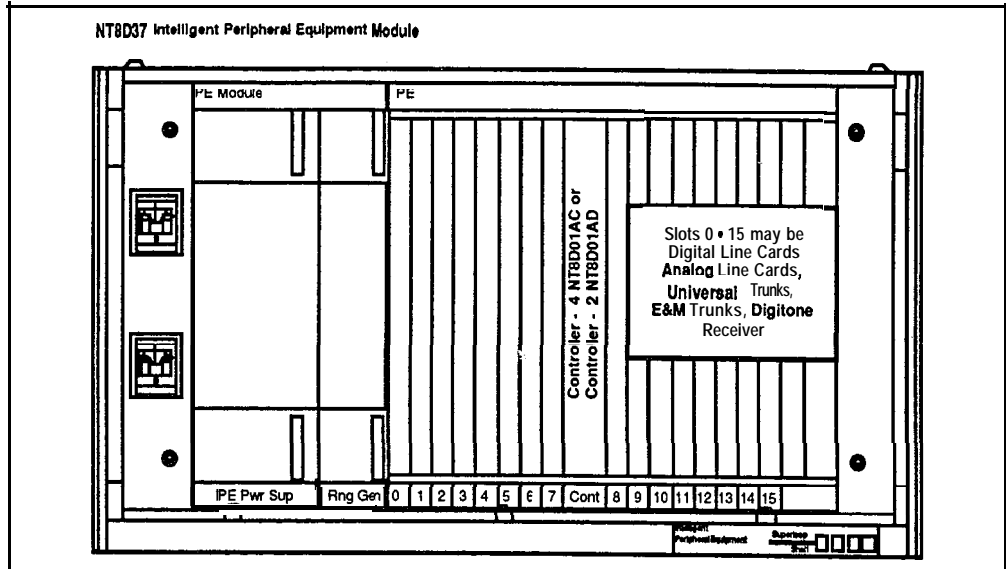
The **NT8D37** module may only be connected to a Superloop Network (**NT8D04AA**) circuit card. It houses one Controller card (**NT8D01**) and up to 16 Intelligent Peripheral Equipment circuit cards. The card slots are numbered from 0 to 15, for a total of 16 PE card slots. The **NT8D37** Intelligent PE module supports 16 PE circuit cards, giving a capacity of 256 Integrated Voice/Data (IVD) lines (512 **TNs**), although a typical configuration includes a mixture of Digital lines, Analog lines, Trunks and **Digitone** Receiver (DTR) circuit cards.

All cable connections to the MDF are made in the rear of the module through an I/O panel. To serve all 16 PE card slots, 12 PE cables are required to the MDF (three per segment).

Configuration guidelines:

- . Only Intelligent Peripheral Equipment cards may be installed in the **NT8D37** Intelligent PE module.
 - . The card slots are universal card slots.
 - . The **NT8D37** Intelligent PE module does not have any limitations or restrictions on card placement.
-

Figure 5-1 2
Intelligent PE module (NT8D37) with circuit cards



Peripheral Equipment module (NT8D13)

The Peripheral Equipment module uses the PE circuit cards currently housed in PE shelves for the Meridian SL-1 systems. It provides the interface to the system for trunks and stations. The **NT8D13** module may only be connected to an ENET (QPC414) circuit card and may be used in Meridian 1 System Options **21A, 21, 51, 61, 71** and the Meridian **SL-1XT, NT, RT, ST, N, and XN** systems. It houses one Peripheral Buffer circuit card (QPC659) and up to ten existing peripheral equipment circuit cards.

For configuration flexibility the **NT8D13** Peripheral Equipment module is available with an AC power supply option or a DC power supply option. These power supplies provide the voltages to operate the circuit cards located in the Modules.

The **NT8D13AA** module is designed to accommodate AC power supplies. One Peripheral Equipment Power Supply AC (**NT8D06AA**) is required for the **NT8D13AA** module along with one Ringing Generator AC (**NT8D21AA**) when 500 or 2500 sets are to be supported by the module.

The **NT8D13DC** module is designed to accommodate DC power supplies. One Peripheral Equipment Power Supply DC (**NT6D40AA**) is required for the **NT8D13DC** module along with one Ringing Generator DC (**NT7D03AA**) when 500 or 2500 sets are to be supported by the module.

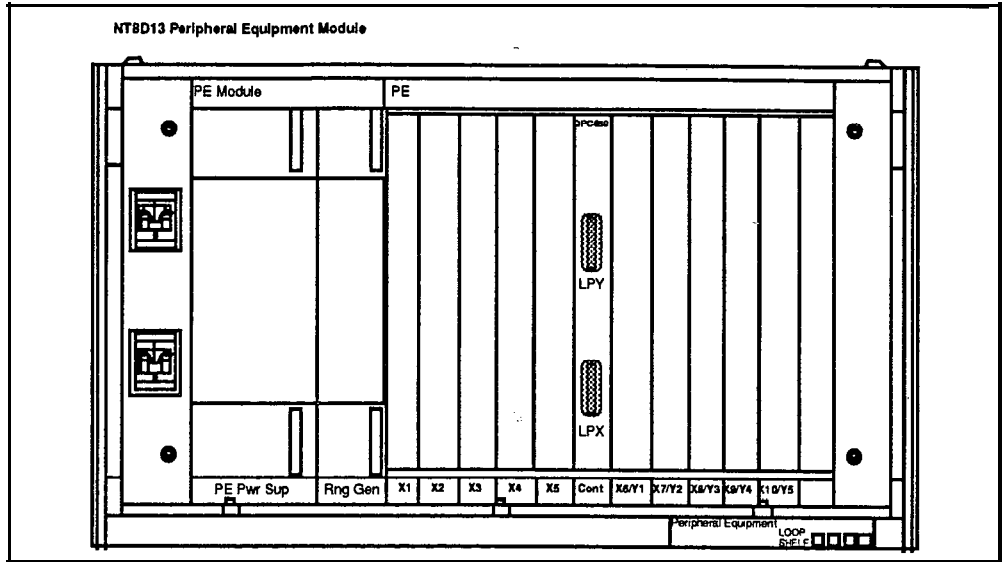
All cable connections to the MDF are made in the rear of the module through an I/O panel. Seven PE cables are required to the MDF for all 10 card slots.

Configuration guidelines:

- . For cabling restraints and ease of expansion the **NT8D13** PE module should always be located as the top module in a column.
- . Only QPC414 Enhanced Network circuit cards may be connected to the **NT8D13** PE module.
- . The **NT8D13** PE module is the only module that may be used to house PE cards when used with the **NT8D47** RPE Carrier module at the remote location.
- . When the Meridian Data Service ADM, ASIM RILC, or AILC are required, the **NT8D13** PE module must be used.
- System Option 21A must be upgraded to Option 21 if an **NT8D13** module is added.

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Figure 5-13
PE module (NT8D13) with circuit cards



Remote Peripheral Equipment Carrier module (NT8D47)

The **NT8D47AA/DC** RPE Carrier module is used to extend the Network to PE interconnection distance between local and remote sites. It accommodates two network loops.

For configuration flexibility the Remote Peripheral Equipment Carrier module is available with an AC power option or a DC power option. These power supplies provide the voltages to operate the circuit cards located in the modules

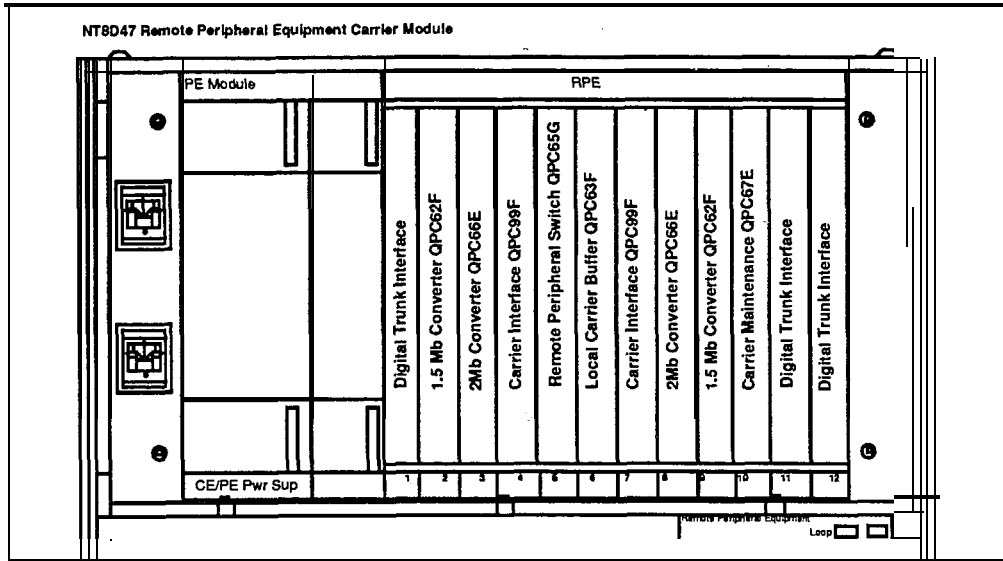
The **NT8D47AA** RPE Carrier module is designed to accommodate AC power supplies. One Common Equipment Power Supply AC (**NT8D29AA**) is required for the **N8D47AA** module.

The **NT8D47DC** RPE Carrier module is designed to accommodate DC power supplies. One Common Equipment Power Supply DC (**NT6D41AB**) is required for the **NT8D47DC** module.

Configuration guidelines:

- Since each RPE Carrier module serves two network loops, the number of modules required per system depends on the number of peripheral devices and traffic requirements at the remote site.
- The RPE backplane contains 12 card slots which support the following:
 - slot 1: DTI
 - slot 2: 1.5 Mb Converter
 - slot 3: 2 Mb Converter
 - slot 4: Carrier Interface
 - slot 5: Remote Peripheral
 - slot 6: Local Carrier Buffer
 - slot 7: Carrier Interface
 - slot 8: 2 Mb Converter
 - slot 9: 1.5 Mb Converter
 - slot 10: Carrier Maintenance
 - slots 11-12: DTI

Figure 5-I 4
RPE Carrier module (NT8D47) with circuit cards

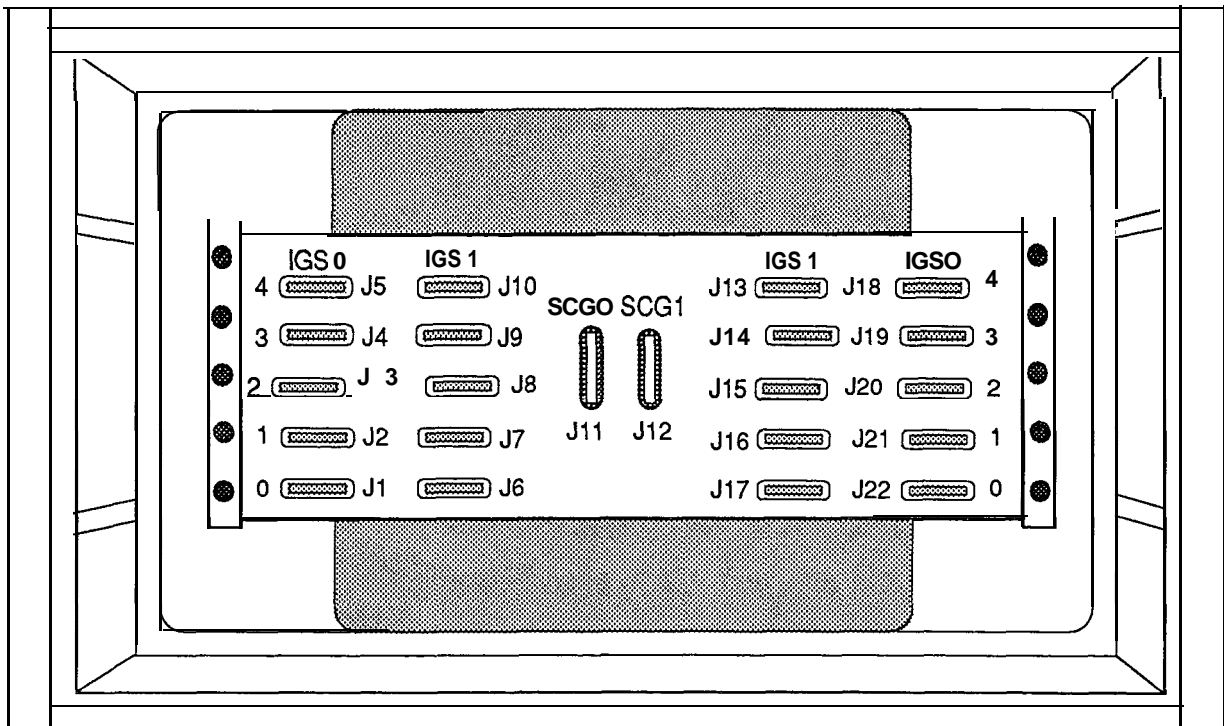


InterGroup module (NT8D36AA)

The **InterGroup** module provides a path for the switching of traffic between the network groups in Meridian 1 System Option 7 i. Faceplate cables from Segmented Bus Extender (SBE), System Clock (SCG) and Inter-Group Switch (IGS) circuit cards are connected to the **InterGroup** module. These faceplate cables are accessed from the front of the module, not the rear.

The **InterGroup** module does not require any power card for operation. Therefore it **InterGroup** module (NT8D36AA)

Figure 5-15

InterGroup module (NT8D36AA)**Configuration guidelines:**

- The **InterGroup** module is always located as the top module of the column containing CPU 1 for the Meridian 1 System Option 71.
- The QPF36A Terminating Plug should be installed in the unused J slot connectors.

Meridian Mail module (NT6D44)

The **NT6D44** Meridian Mail module uses the circuit cards housed in the Meridian Mail Option for the Meridian SL- 1 systems. The **NT6D44** Meridian Mail module may only be connected to an ENET (**QPC414**) circuit card, and may be used in Meridian 1 System Options **21, 51, 61, 71** and the Meridian **SL-1XT, NT, RT, ST, N,** and **XN** systems.

For configuration flexibility the **NT6D44** Meridian Mail module **is** available with an AC power supply option or a DC power supply option. These power supplies provide the voltages to operate the circuit cards located in the Modules.

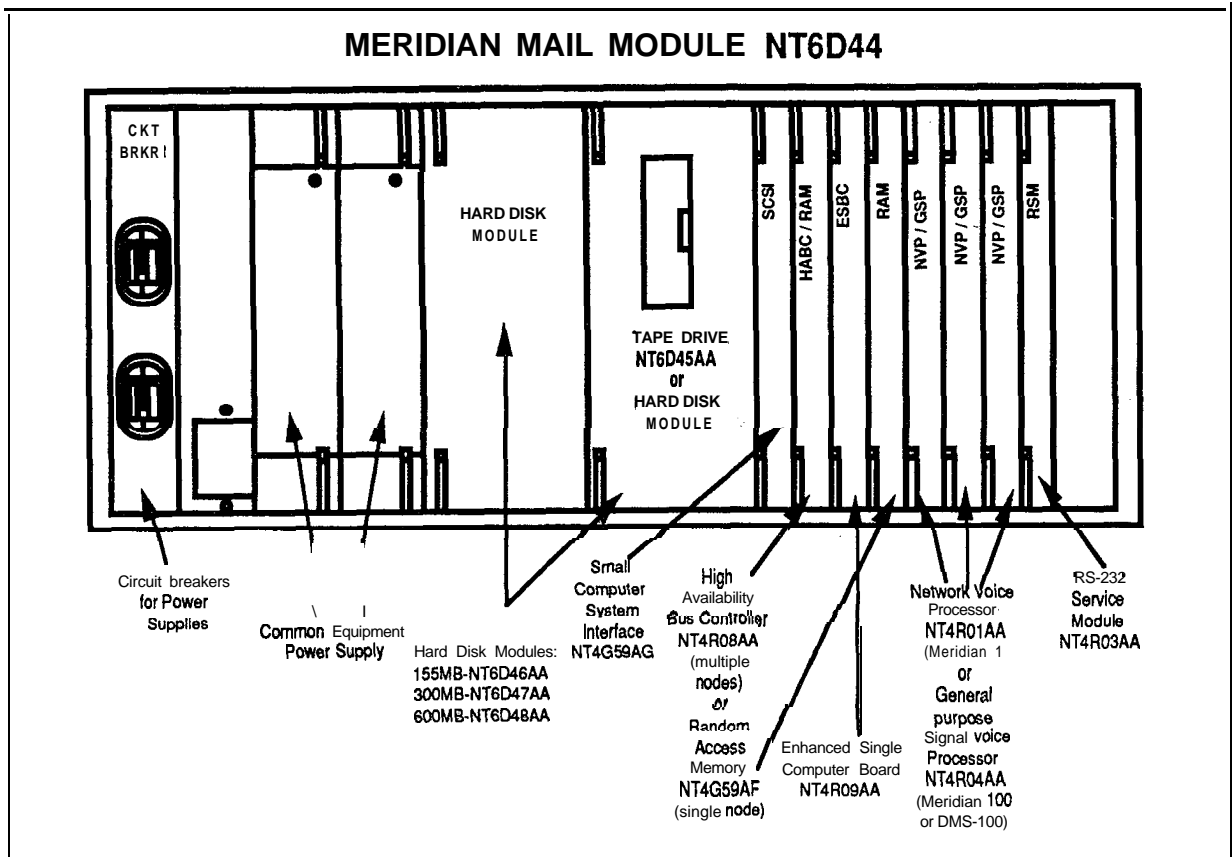
The **NT6D44AA** Meridian Mail module is designed to accommodate AC power supplies. Two Common Equipment Power Supplies AC (**NT8D29AB**) are required for the **NT6D44AA** Meridian Mail module.

The **NT6D44DC** Meridian Mail module is designed to accommodate DC power supplies. Two Common Equipment Power Supplies AC (**NT6D41AB**) are required for the **NT6D44DC** Meridian Mail module.

Configuration guidelines:

- Meridian 1 System Option 21A must be upgraded to Meridian 1 System Option 21 when the **NT6D44** Meridian Mail module is equipped.

Figure 5-16
Meridian Mail module (NT6D44) with circuit cards



Miscellaneous equipment

Pedestal (NT8D27AB)

The **NT8D27AB** pedestal is a base unit made of die-cast construction and houses the power distribution unit, system monitor, blower unit, and fan unit connector.

The pedestal is approximately 3 1.5 inches wide by 25.50 inches deep by 10 inches high and weighs 30 lbs empty. Leveling feet are provided for up to four tiers, while a caster option is provided for up to two tiers. Input power for the system is brought into and distributed by the pedestal. A Power Distribution Unit located in the pedestal contains an **EMI** filter and one 30 amp circuit breaker.

One pedestal distributes the input power for one column. Also located in the pedestal are two forced air impellers and a reusable dust filter. The impellers are protected by two 1 amp circuit breakers.

Configuration guidelines:

- . One pedestal required per column.

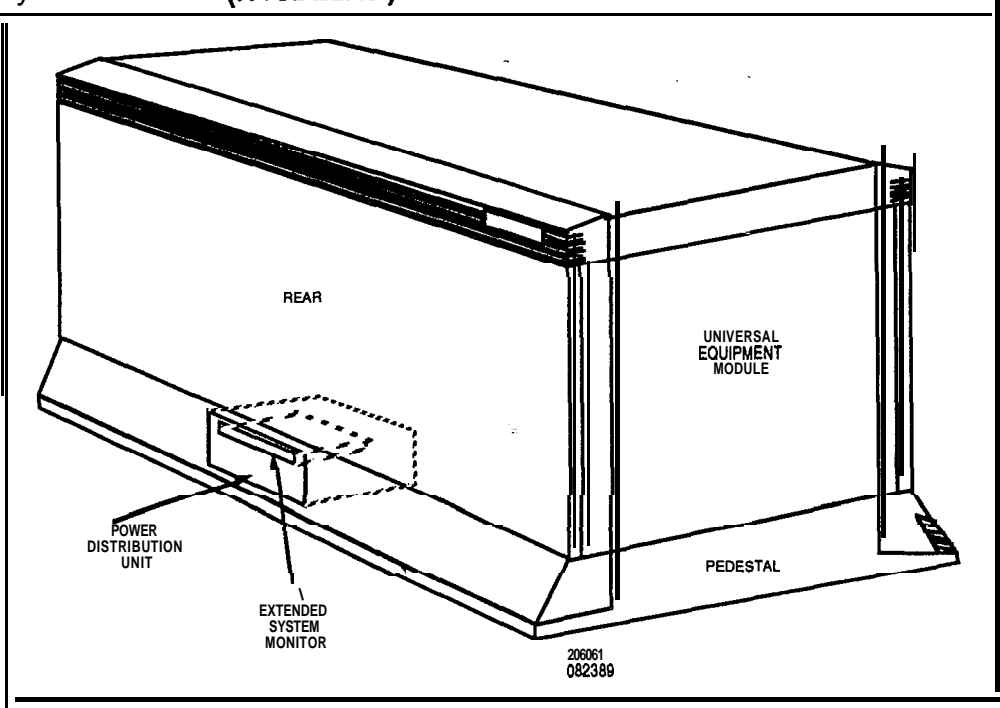
System Monitor (NT8D22AB)

The **NT8D22AB** System Monitor card controls and monitors the status of all power-related hardware and functions, such as column thermal status, power supply operation, blower operation, power fail transfer, circuit breakers, external rectifiers, batteries, and Uninterruptable Power Supply (UPS) systems. The same system monitor is used in both AC and DC systems.

One System Monitor is installed in the pedestal of each column. The System Monitor located in the column containing the **CPU0** Module, acts as the master system monitor while the monitors located in other columns act as slaves. The master will poll the slaves and report their status to the CPU. The master System Monitor is connected to the CPU by means of an **RS232C** port located on an **SDI** card. The slave System Monitors are connected in a daisy chain fashion to the master by means of an 8-conductor RI type connector and are numbered O-63.

Any power message reported to the CPU by the System Monitor is output to the maintenance TTY. All power messages include the following information: status or fault indication, hardware type, column number, Module number, and Power Supply unit number.

Figure 5-17
System Monitor (NT8D22AB) location



Blankfaceplates

Blank faceplates may be inserted into any unoccupied shelf slot position, though, except for power slots, they are not required for cooling. Three different sizes are available:

- 0.875 in. **NT8D31AA** for **IPE** card slots.
- 1 in. **NT8D3 1AB** for common equipment card slots.
- 2 in. **NT8D31AD** for dual common equipment card slots, and for the Ringing Generator slot in the **IPE** and PE modules if the Ringing Generator is not equipped.

Top cap

The top cap is mounted on the top module of each column. It provides additional EMI shielding, air exits, and I/O cable exits.

The top cap is approximately 31.5 inches wide by 22 inches deep by 3 inches high and weighs 8 lbs. It consists of a front and a rear air exhaust grills, each secured by two clips underneath the edge of the grill.

Three versions of the top cap are available:

- **NT7D00AA** AC systems
- **NT7D00BA** DC systems

NT7D00AB Meridian 1 System Option 21A only

Expansion kit (NT8D49)

The Expansion kit bolts modules together for side-by-side expansion when in a contiguous row. The Expansion kits maintain shielding against EMI/RFI, as well as provide additional cable routing space in multi-column systems. See Figures 5-18 and 5-19 below.

Figure 5-1 8
Expansion kit (NT8D49)

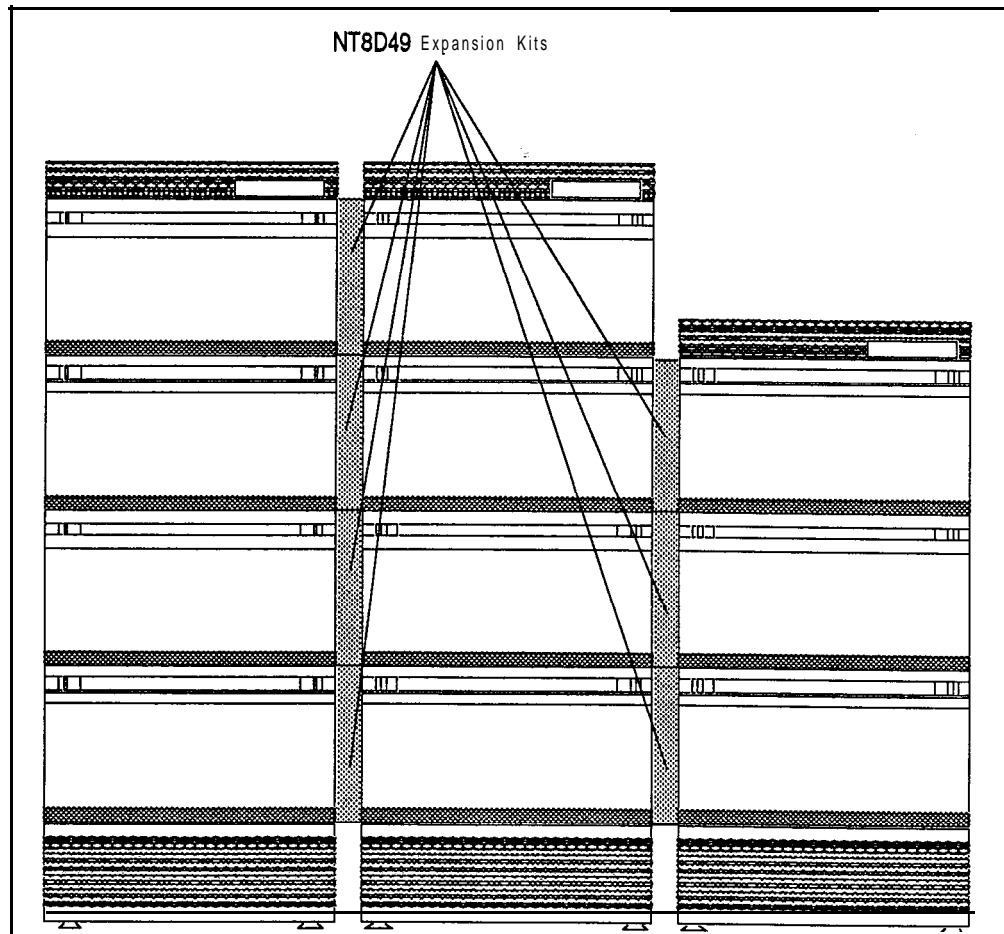
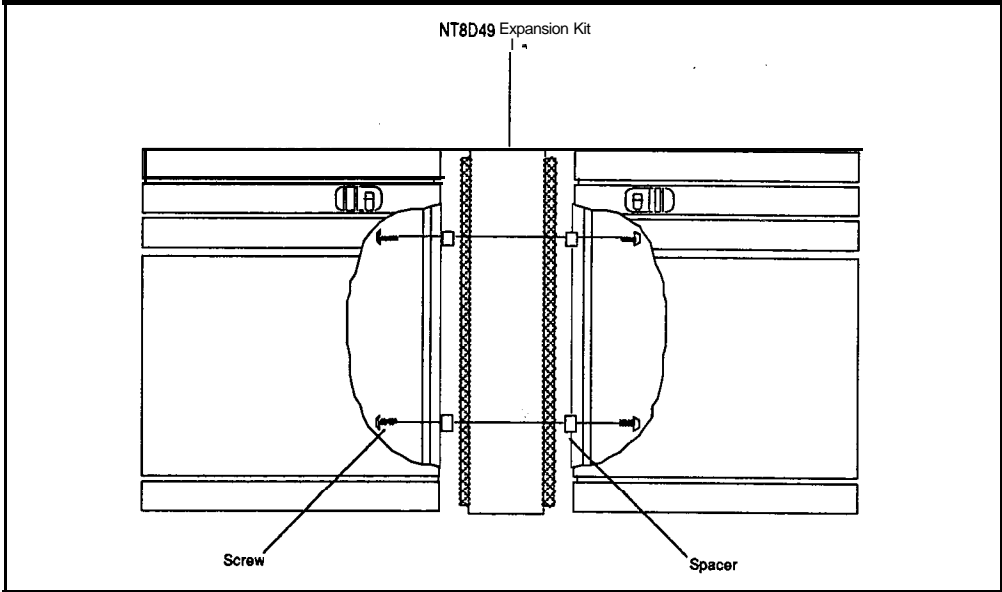


Figure 5-I 9
Expansion kit (NT8D49) internal view



Circuit cards

System functions in the Meridian 1 are performed by components mounted on circuit cards. These circuit cards are specific as to their function but do share some common features. Circuit cards are 12.5 inches by 10 inches and are marked with the part number on each faceplate. Some circuit cards have optional switches located on the card itself, and if this is the case, the faceplate will be marked with a graphic symbol to indicate their presence. Other faceplate features may include status **LEDs**, Enable/Disable switches and cable connectors. All circuit cards include two locking devices, one at the top and one at the bottom to hold the circuit card in the module.

Meridian 1 includes the addition of several new circuit cards which may be installed in the Universal Equipment Modules. These circuit cards are able to transmit their status, identity, and vintage to the CPU. This greatly improves remote maintenance capabilities and inventory control. The Meridian 1 also supports several existing circuit cards. The following is a list of some of the most commonly used existing circuit cards and the new circuitcards supported by Meridian 1:

Table 5-1
Meridian 1 circuit cards

PEC code	Description	PEC code	Description
QPC215C	Segmented Bus Extender	QPC65G	Remote Peripheral Switch
QPC720B	Primary Rate Interface	QPC66E	2M Baud Converter
QPC742D	Fbppy Disk interface	QPC67E	Carrier Maintenance
QPC757C	D-Channel Handler	QPC71 F	DX Signaling
QPC62F	1.5M Baud Converter	QPC99F	Carrier Interface
QPC583B	Memory	QPC192B	OPX Line Card
QPC581B	Changeover and Memory Arbitrator	QPC250B	Release Link Trunk Card
QPC414B	Enhanced Network	QPC297A	Console Monitor (supervisory)
QPC471 C	Clbck Controller	QPC422A	Tone Detector
QPC579A	CPU Function	QPC430E	Asynchronous Interface
QPC841 A	4 Port Serial Data Interface	QPC432C	4 Port Data Line Card
QPC584E	Mass Storage Interface	QPC449D	Loop Signaling Trunk Card

—continued—

Table 5-1
Meridian 1 circuit cards (continued)

PEC code	Description	PEC code	Description
NT8D01	AC Controller-4	NT8D01AD	Controller-2
NT8D02AA	Digital Line Card		
NT8D04AA	Superloop Network Card	NT8D09AA	Analog Message Waiting Line Card
NT8D14AA	Universal Trunk Card	NT8D15AA	E&M Trunk Card
NT8D16AA	Digitone Receiver Card	NT8D17AA	Conference/Tone and Digit Switch
NT8D18AA	Network/DTR	NT8D19AA	Memory/Signaling
NT8D22AB	System Monitor	NT8D41AA	SDI Paddle Board
NT7D15AA	Mini System Monitor		
NT8D68AA	Fbppy Disk Unit	NT8D69AA	Multi Disk Unit
QPC580A	CPU Interface	QPC450E	CO/FX/WATS Trunk Card
QPC43R	Peripheral Signaling	QPC477-A9/A10/A20/A21/A22	Bus Terminating Unit
QPC412C	InterGroup Switch	QPC578D	Integrated Services Digital Line Card
QPC513F	Enhanced Serial Data Interface	QPC594D	16 Port 500/2500 Line Card
QPC687B	CPU with SDI/RTC/ROM	QPC659C	Dual Loop Buffer
QPC441C	3 Port Extender	QPC723A	RS-232 4 Port Interface Line Card
QPC63F	Local Carrier Buffer	QPC789A	16 Port 500/2500 Message Waking Line Card

Meridian 1 new common equipment circuit cards

Floppy Disk Unit (**NT8D68AA**)

The Floppy Disk Unit (**FDU**) is used to load the programs and office data into the system memory. The FDU contains two **3.5-inch** floppy drives **and** is controlled by the QPC742 Floppy Disk Interface (**FDI**). Each floppy drive has a formatted capacity of 1.44 MB.

The FDU occupies two adjacent card slots in the CPU, Network, or PE Module. It is powered through the cable connecting it to the Floppy Disk Interface (**FDI**).

Configuration guidelines:

- . One per system.
- . The FDU can be connected to a maximum of two **FDIs**.

Multi Disk Unit (**NT8D69AA**)

The Multi Disk Unit (**MDU**) is used to load the programs and office data into the system memory. The MDU contains the following:

- . Two 3.5inch floppy drives which are connected to the SCSI interface through the SCSI/floppy controller; each drive has a formatted capacity of 1.44 MB
- . A 3.5inch hard disk drive which has a built-in SCSI interface and requires a minimum capacity of 20 MB
- . An SCSI/Floppy Controller

The MDU occupies three adjacent card slots in the CPU or Network Module and requires **5V** and 12V from the module. The MDU is controlled by the QPC584 Mass Storage Interface. The MDU can be connected to a maximum of two **MSIs**.

Configuration guidelines:

- . One per system.

Serial Data Interface Paddle Board Z-Port (**NT8D41AA**)

The **NT8D41** card is a paddle board that may be installed in the rear of a **NT6D39** and **NT8D11** Module. The **NT8D41** card is approximately 12 inches by 4.5 inches and is similar in appearance to a BTU card. It provides an interface to the CPU for up to two I/O devices.

The addressing, (0 - 15) is backwards compatible with the QPC841 **SDI** card. The addressing is set by address switches and the data rates are; 300,600, **1200, 2400**, 4800 or 9600 bps. The data is transmitted and received as 8-bit serial data with no parity.

The number of Serial Data Interface ports required in a system depends on the software options selected by the customer. The following software options require **NT8D41** or QPC841 **SDI** ports:

- . ACD package D (ACD-D)
- . Auxiliary Processor Link (APL)
- . Call Detail Recording (CDR) List
- . Call Detail Recording (CDR) Tape
- Property Management System Interface (PMSI)
- . System Monitor

Configuration guidelines:

- . The **NT8D41** card does not support the TELETYPE (20 ma current loop) interface, or 110 baud rate.
- . It may only be installed in the rear of a **NT6D39** or **NT8D11** module.
- . The address of the **NT8D41** cannot conflict with existing **SDI** addresses.
- . The valid **NT8D41** or QPC841 ports are; 0 - 15.
- . Two maximum per **NT6D39** module.
- . Three maximum per **NT8D11** module. If more than seven ports are required use the QPC841 card.

Superloop Network card (NT8D04AA)

The Superloop Network card employs a new DS30 interface which reduces the number of wires required to interface to the **NT8D37** Intelligent PE Modules. This new interface is a proprietary DS-30 based format known as DS-30Y and allows the connection of four 2.56 Mbps loops. The Superloop Network card is connected by a cable to the new Controller card (**NT8D01**), located in the **NT8D37** Intelligent PE Modules, and may be connected to one or two **NT8D01** Controller cards over separate cables.

Provided on the card is a Motorola 68010 microprocessor which is used to control the card, and in addition provides new maintenance **functions not** available on the ENET card. It receives signaling messages directly from the CPU but will send signaling messages to the CPU by means of the Peripheral Signaling card.

The Superloop Network card may be used in conjunction with the ENET card to provide equivalent network switching functions in existing Meridian SL-1 ST, NT, XT, or RT systems. It provides an interface to four loops on the network bus instead of the two loop interface provided by the ENET card. The number of loops served by a network shelf or Module remains the same (**16**), however the Superloop Network frees up additional network card slots which may be used for circuit cards

(continued)

that do not require access to the network bus (for example, Serial Data Interface [SDI] or Digital Trunk Interface [DTI] cards). For example: When upgrading a Meridian SL-1 to the new Intelligent Peripheral Equipment a Serial Data Interface (SDI) card may occupy the card slot to the left or the right of the Superloop Network card installed in a Meridian SL-1 enhanced network shelf.

A new overlay program (97) is added to allow the definition **and** configuration of the Superloop. New commands are added to existing maintenance diagnostics to allow access to and control of the new maintenance functions provided by the Superloop Network card.

Configuration guidelines:

- Superloop Network cards may be used in existing Meridian SL-1 ST, RT, NT and XT systems.
- 16 networks per enhanced network shelf or module.
- When installed in an **NT8D35** Network Module, the loop number will always be an even number (for example **0, 4, 8, 12, 16**) and it does not matter if it is the left or right hand card slot.
- In the **NT8D35** Network Module, the odd-numbered network card slots are considered left hand and the even-numbered network card slots are right hand.

Conference/Tone and Digit Switch (**NT8D17AA**)

The new **Conf/TDS** card provides the functionality of the **QPC609** Tone and Digit Switch (**TDS**) and **QPC444** Conference cards on one circuit card and occupies one card slot on the network shelf backplane or module. One loop is assigned to the conference function and one is assigned to the Tone and Digit and Switch functions. This circuit card interfaces to two ENET loops on the backplane.

The **Conf/TDS** card contains PROM s that provide 256 tones thus eliminating the need for special international cards. These new tones may be defined by means of a new overlay program (56) if the **FTC** software package is equipped. The tone choices are downloaded to the card upon initialization. If the **FTC** software package is not equipped, then the system will automatically assign normal defaults.

Configuration guidelines:

- The **Conf/TDS** card may be installed in the following existing systems: Meridian SL-1 ST, RT, NT, XT and Meridian 1 System Options **21A, 21, 51, 61** and **71**.

Memory/Signaling card (NT8D19AA)

The Memory/Signaling card may only be used in the Meridian 1 System Option 21A and 21. This card combines the functions of the memory, miscellaneous, and peripheral signaling cards. These cards that were separate functions for the Meridian SL-1 have been combined to reduce the footprint of the Meridian 1 System Option 21A and 21.

The memory features include 768K of RAM with error detection and correction. The miscellaneous portion of the card provides the CPU interrupt function and fault monitoring. The peripheral signaling features include: the signaling interface between the CPU and the peripheral equipment, generation and distribution of timing signals used by the networks for speech path switching.

Configuration guidelines:

- . Used only with the **NT8D11 CE/PE** Module.
- . One Memory/Signaling card is required per **NT8D11 CE/PE** Module and it occupies card slot 3.

Network/DTR card (NT8D18AA)

The **Network/DTR** card may only be used in the Meridian 1 System Option 21A and 21. This card combines the functions of the Superloop Network, Controller card and the **Digitone** Receiver cards to reduce the footprint of the Meridian 1 System Option 21A and 21.

The function of this card is the same as the **NT8D01** Controller card, **NT8D16** **Digitone** Receiver card, and **NT8D04** Superloop network card which were described previously. The maintenance display function of the **NT8D01** Controller card is not provided.

Configuration guidelines:

- . The **NT8D11 Net/DTR** card is always assigned as **SuperLoop 28**.
 - . One **Network/DTR** card is required per **NT8D11 CE/PE** Module.
 - . Use only with the **NT8D11 CE/PE** Module in card slot 10.
 - 8 DTR circuits assigned to virtual card slot 10 of IPE.
-

System Monitor (**NT8D22AB**)

The System Monitor monitors the status of power-related hardware such as column thermal status, power supplies, fan operation, power fail transfer, circuit breakers, and **LEDs**. One System Monitor is installed in the pedestal of each column. The System Monitor, located in the column containing the **CPU0** Module, acts as the master system monitor while the system monitors located in other columns act as slaves. The master System Monitor will poll the slave System **Monitors** and report their status to the CPU. The master System Monitor is connected to the CPU by means of an RS-232C port located on an **SDI** card. The slave System Monitors are connected in a daisy chain fashion to the master System Monitor by means of an **8-conductor** RJ type connector and are numbered O-63.

Any power message reported to the CPU by the System Monitor is output to the maintenance **TTY**, and power messages include the following information: hardware type, System Monitor number, Module number and Power Supply **unit** number. A system alarm LED is located in the Top Cap (**NT8D62**) of the column affected.

Configuration guidelines:

- .. The **NT8D22AB** System Monitor is used in all systems except for the Meridian 1 System Option 21A.

System Monitor • Option 21 A (**NT7D15AA**)

The **NT7D15AA** System Monitor - Option 21A provides an interface to communicate and monitor the **CE/PE** Power Supply, the CPU, and the thermal switches. In the event of failure, the System Monitor • Option 21A is notified and the appropriate alarm is set. A system alarm LED located below the top cap lights to indicate CPU failure.

Configuration Guidelines:

- The **NT7D15AA** is used only in the Meridian 1 System Option 21A.

Intelligent Peripheral Equipment circuit cards

The Meridian 1 Intelligent Peripheral Equipment circuit cards have been reduced in width to only 7/8 inch. These new PE cards have the capability to send specific card information to the CPU. When asked through a maintenance program, the information may contain the PE card (PEC) code and the vintage of that card. This will greatly aid in the inventory and maintenance of a Meridian 1 system.

The Meridian 1 Peripheral Equipment is connected to the Network equipment through the Controller card (NT8D01) for Intelligent Peripheral Equipment Modules (NT8D37), or the Peripheral Buffer (BUF), for the Peripheral Equipment Modules (NT8D13). Controller circuit cards (NT8D01) are used with Superloop Network circuit cards, while Peripheral Buffer cards are used with ENET circuit cards. The two circuit cards serve basically the same function, that is the connection point for shelf/module to network communications. The NT8D01 however does have some additional maintenance capabilities that the Peripheral Buffer does not have, such as a maintenance status display on the faceplate.

Controller Card (NT8D01)

The Controller card provides the primary interface and control functions between the **SuperLoop** Network and up to 16 Meridian 1 Intelligent PE cards. It will switch PCM voice and data from the DS-30X loops of the **SuperLoop** Network to the DS-30Y loops of the PE cards.

The card is installed in the NT8D37 IPE Module and interfaces to the **SuperLoop** network card by means of a cable. The NT8D01 circuit card consists of a mother/daughter assembly which is installed in a dedicated card slot marked "CONT" in the center of the NT8D37 IPE Module.

Located on the NT8D01 card is a Motorola 68010 microprocessor which is used for control functions, message format conversions (DS-30X loop to DS-30Y loop), and to perform new maintenance functions. A maintenance display located on the faceplate of the NT8D01 card will indicate the status of the card. One NT8D01 card is required per NT8D37 IPE Module. The NT8D01 may only be connected to a **SuperLoop** Network card and cannot be installed in the NT8D13 IPE Module.

The NT8D01 is available in two configurations: Controller-2 (Cont-2) and Controller-4 (Cont-4).

The Cont-2 allows the connection of up to two **SuperLoop** Network cards to a single module, while the Cont-4 allows the connection of up to four Superloop Network cards to a single module.

(Continued)

Once connected to the **NT8D01**, the Intelligent PE Module is divided into logical segments. Each segment consists of four PE circuit card slots. These segments are numbered 0-3. Segment 0 consists of PE slots 0-3, segment 1 consists of card slots 4-7, segment 2 consists of card slots 8-11, and segment 3 consists of card slots 12-15.

One Superloop Network card maybe assigned from one to eight segments on one or two **NT8D37** Intelligent PE Modules. Several different **SuperLoop** to segment arrangements are possible. The following figure shows **the** possible Superloop Network to Controller card configurations. The Superloop Network to Controller card configuration chosen will depend upon system traffic requirements and hardware usage.

Controller card configuration information is entered in Overlay 97. This program allows for the assignment of Controller card numbers (1-95) and the Controller card location codes. Both of these parameters are used to identify the location of the Controller card.

Configuration guidelines:

- . The Controller-4 card is used when you assign more than two Superloops per module. (**For** high traffic conditions or Non-blocking requirements).
- . The Controller-2 card is used in all other configurations.

Digital Line Card (NT8D02AA)

The Digital Line card may be installed in an **NT8D37 IPE** or **NT8D11 CE/PE** module only and interface up to 16 M2000 series or M3000 digital telephones. It provides 16 voice and 16 data ports which allows any set connected to transmit voice and data simultaneously over one pair of wires.

Configuration guidelines:

- . One per 16 digital terminals.
- . Used only with the **NT8D37** Intelligent PE Module or **NT8D11 CE/PE Module**.

Analog Line Cards (**NT8D03AA / NT8D09AA**)

- . Analog Line **NT8D03AA**
- . Analog Message Waiting Line Cards **NT8D09AA**

The Analog Line Card and the Analog Message Waiting Line Cards may be installed in **NT8D37** and **NT8D11** Modules only. Both the Analog Line Card and the Analog Message Waiting Line Card interfaces up to sixteen 500 or 2500 type sets and performs analog-to-digital and digital-to-analog conversion.

The Analog Message Waiting Line Card will additionally provide the interface to the -150 V supply to light Message Waiting lamps located on the sets connected to the card.

Configuration guidelines:

- . Used only with the **NT8D37** Intelligent PE Module or **NT8D11 CE/PE** Module.

Universal Trunk Card (**NT8D14AA**)

The Universal Trunk card may be installed in a **NT8D37** or **NT8D11** Module only and provides the interface to the following types of trunk circuits:

- . Central Office (CO, FAX, WATS, Japan CO) • loop or ground start
- 2-way TIE trunk • loop dial repeating or automatic incoming dial
- . Direct Inward Dial (DID)
- . Paging Equipment
- . Recorded Announcement equipment
- . Music Equipment

The **Universal Trunk** card interfaces up to eight of the previously mentioned trunk circuits. It will also support A-law and **μ-law** operations as defined in the system's configuration record. New prompts have been added to Overlay Programs 14 and 16 to allow the configuration of the Universal Trunk card.

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(Continued)

Configuration guidelines:

- . One required for every eight of the above listed trunk types.
- . Used only with the **NT8D37** Intelligent PE Module or **NT8D11 CE/PE** Module.

E&M Trunk Card (NT8D15AA)

The E&M Trunk card interfaces up to four trunk circuits. It will also support A-law and p-law operations as defined in the system's configuration record. New prompts are added to Overlay Programs 14 and 16 which will allow the configuration of the Universal Trunk card.

The E&M Trunk card may only be installed in the **NT8D37** Intelligent Peripheral Equipment Module or the **NT8D11** Common/Peripheral Equipment Module and provides the interface to the following types of **trunk** circuits:

- . 2-wire E & M
- . 4-wire E & M
- . 4-wire DX
- . Paging Equipment
- . Dictation Equipment

Configuration guidelines:

- . Used only with the **NT8D37** Intelligent PE Module or **NT8D11 CE/PE** Module.

Digitone™ Receiver (NT8D16AA)

The **Digitone** Receiver card provides a total of eight channels of Dual Tone Multi Frequency (DTMF) or Multi Frequency (**MF**) detection and it may be installed in any card slot in an **NT8D37** or **NT8D11** Module. An overlay program is used to determine the function of the card.

Configuration guidelines:

- . Required when 2500 sets, **Digitone** DID trunks, Digitone-Tie trunks or DISA used.
 - . Used only with the **NT8D37** Intelligent PE Module or **NT8D11 CE/PE** Module.
-

Cabling

The cables are differentiated by the cabling method used. Two types of cables are available Intra-module and Inter-module.

Intra-module cables are cables that connect to different cards within a module, or cables that go to the I/O connector panels at the rear of the module. Intra-module cables are not shielded. These cables are typically round and use bail locks or screws to prevent accidental removal.

Inter-module cables are cables that are routed internally between modules. These cables are used primarily for interconnecting the following subsystems together:

- CPU to CPU
- CPU to Network
- Network to Network
- Network to Peripheral Equipment

See Table 5-2 for a list of some of the most commonly-used cables and their associated PEC codes. Product codes shown w/o the 2 digit alpha suffix have several lengths available.

Table 5-2
PEC codes for cables

PEC Code	Description	PEC Code	Description
NT8D46AA	System Monitor column cable	NT8D83	PRI/DTI to I/O cable
NT8D46AB	System Monitor jumper cable	NT8D84AA	SDI paddle board to I/O cable
NT8D46AC	Thermostat Harness	NT8D85	Network to PE cable
NT8D46AD	System Monitor 4-port SDI cable	NT8D86	Network to I/O cable
NT8D46AG	System Monitor SDI paddle board cable	NT8D87	Conference/TDS to music trunk cable
NT8D46AH	System Monitor to MDF cable	NT8D88	Network to I/O cable
NT8D46AJ	System Monitor to UPS (Best) cable	NT8D90AF	Extension cable
NT8D46AL	System Monitor Serial Link cable	NT8D91	Network to Controller cable
NT8D46AP	System Monitor Serial Link cable	NT8D92AB	Controller to I/O cable
NT8D46AQ	System Monitor to UPS (Exide) cable	NT8D93	SDI paddle board I/O to DTE/DCE cable
NT8D46AS	System Monitor inter-CPU cable	NT8D95	SDI I/O to DTE/DCE cable
NT8D73	Inter-cabinet Network cable	NT8D96	SDI multiple-port cable
NT8D74	Clock Controller to InterGroup cable	NT8D97AX	PRI/DTI I/O to MDF cable
NT8D75	Clock Controller to Clock Controller cable	NT8D98	Inter-cabinet Network cable
NT8D76	InterGroup Switch to InterGroup cable	NT8D99	CPU to Network cable
NT8D77	FDI to FDU cable	NT9J93AD	PRI/DTI Echo Canceler to I/O cable
NT8D78AA	CPU cable	NT9J94AB	RPE to I/O cable
NT8D79	PRI/DTI to Clock Controller cable	NT9J96	Intra-cabinet Network cable
NT8D80	CPU interface cable	NT9J97	Intra-cabinet Network cable
NT8D81AA	Tip and Ring cable	NT9J98	Intra-cabinet Network cable
NT8D82	SDI to I/O cable	NT9J99	Intra-cabinet Network cable

Software description

The Meridian 1 Superloop and Intelligent Peripheral Equipment is supported on X11 release 15 and future X1 1 Releases. The Meridian 1 System Option 21A and 21 is supported by software generic "1011"; System Options 5 1 and 6 1 by software generic "1111" and System Option 71 by software generic "1211". In addition, three new software options are introduced to provide the extended configuration capabilities required by the new hardware.

These options are:

- Software Option 203 (see Note 1)

Allows the configuration of Superloops and Intelligent Peripheral Equipment. This option is applicable to all System Options and to Meridian SL-1 systems extended to use Superloops and Intelligent Peripheral Equipment.

- Software Option 204 (See Note 2)

Allows the configuration of the combined Conference/Tone and Digit card, NT8D17AA. Applies to all System Options and Meridian SL-1 systems using this card.

- Software Option 205 (See Notes 1 and 2)

Provides the configuration overlay LD97. Required for Software Options 203 and 204.

Note 1: Any system using Superloops and Intelligent Peripheral Equipment requires Software Options 203 and 205.

Note 2: Any system using the new Conference/Tone & Digit card (NT8D17AA) requires Software Options 204 and 205.

Software download

The new circuit cards introduced with the Meridian 1 System Options take advantage of the benefits offered by distributed processing, enabling significant savings in CPU real time to be realized while maintaining compatibility with existing Meridian SL-1 Systems (the real time savings do not apply to existing Meridian SL-1 Systems unless Superloops and Intelligent Peripheral Equipment are used).

The new Superloop network card, the Controller-2 and Controller-4 cards, and Intelligent Peripheral cards contain microprocessors to provide the off-loading of work that was previously done by the CPU and the flexibility to change parameters without hardware revisions. The opportunity has also been taken to significantly increase the self diagnostic and system diagnostic capabilities through use of the on-board microprocessors, resulting in improvements in maintainability.

(Continued)

This flexibility is achieved through software downloading. The program store for the processors contained on the new cards is stored on the new 3.5inch floppy diskettes or on the hard disk drive and is downloaded to the pack (in broadcast mode) following a system reload (sysload) or optionally by means of an overlay program command. Thus, downloadable software upgrades are possible without the need to reload the system and, in the event that similar Intelligent Peripherals have different requirements, selective upgrades are possible.

Typical CPU functions relieved by this capability are the handling of telephone set ringing, which takes place on the Controller card and Dial pulse digit collection, handled by the Intelligent Peripheral cards. The Peripheral Signaling Card is bypassed, since all CPU output signaling messages are handled directly by the Superloop network card, avoiding a potential bottleneck, significantly enhancing message handling. Whenever possible, hardware switch selection on these cards has been removed and the on-board microprocessors allow the soft selection of options.

These new cards make further use of this intelligence by being capable of reporting, following a command from Overlay 32, their pack Product Code, serial number, release number, and manufacture location, greatly assisting inventory control and maintenance. Another capability, that of reporting the presence of a card and function following insertion in the Module, is achieved through the Controller-2 and Controller-4 card continually scanning the module for such events (also applies if card is removed; its absence is reported).

Configuration extensions

Since the new Intelligent Peripheral Equipment extends the number of Peripheral circuit cards per shelf from 10 to 16 (card slots 0-15) and the number of **TNs** per card has increased from 16 to 32, all overlay programs relating to the provisioning of peripheral equipment have been modified to allow for these expanded parameters (within the constraints of currently available circuit card densities).

In addition, a new overlay (LD97) is introduced which provides for the definition of Intelligent Peripheral Equipment system parameters (such as **companding** law for **codecs**, maintenance threshold levels, peripheral software download options or switchhook flash timers), and the configuration of the new Superloop network cards, Intelligent Peripheral Equipment controller cards, the **combined Conference/Tone** and Digit Switch card and the combined Superloop and **Digitone** receiver card.

Maintenance enhancements

Maintenance diagnostic Overlays **30, 32,** and 45 have undergone significant revision and extension to exploit the capabilities of the Superloop network card, Controller card and Intelligent Peripheral Equipment cards. In addition to ~~the~~ greatly enhanced self diagnostic abilities (due to the on-board microprocessors), expanded commands within these overlays provide improved, easy to use manual testing and trouble shooting tools to the craftsman, enabling rapid identification of trouble areas and faulty hardware.

Test capabilities include:

- Testing the timeswitch memory on the Superloop network card
- Generation of test patterns to test different segments of the system:
 - Superloop Network to Controller
 - Superloop Network to Superloop Network
 - Controller to Superloop Network
 - Controller to Controller
 - Superloop Network to self through backplane, Controller **terminal** or **Controller and terminal**
 - Controller to self through terminal
 - Controller or Superloop Network to self through special test channel
- Interrogation of cards to reveal function, release, serial number and manufacture location code
- Interrogation of digital telephone sets to reveal type, code, color and release

Overlay 45 (The background signalling diagnostic program) now provides improved test progress information to the craftsman and is able to identify and report the card requiring replacement following the detection of a fault. Also, if the program is interrupted, it will restart where it was interrupted.

Conversion

Automatic in-line conversion allows upgrading to release 15 from release 12 and beyond. Reconfiguration of the data structures occurs during the SYSLOAD sequence to take account of changes made to accommodate new features. To assist with the reconfiguration of terminal equipment to the new **Superloops**, overlay 25 has been modified to allow **TNs** on single, double, and quad density peripheral equipment to be moved to Superloops.

Terminal equipment

To the user, the telephone is the most visible part of the business communications system. Meridian1 systems support a wide range of telephones, including multiline and single line telephones, as well as digital sets with key and display functions and data transmission capabilities. A range of options for attendant call processing and message center applications is also available. In addition, a number of other add-on devices are available to extend and enhance the features of telephones and consoles. Add-on devices include key/lamp modules, lamp field arrays, handsets, and handsfree units.

Digital Telephones

Analog-to-digital conversion takes place in the set itself rather than in the associated peripheral line card. This eliminates attenuation, distortion, and noise generated over telephone lines, and results in a voice quality that is exceptionally clear and crisp. Signaling and control functions are also handled digitally. An eight-bit microprocessor in the telephone set monitors all keypad and hookswitch operations and sends messages to communicate to the system any change in status. Lamp indications, ringing, and handsfree operation are controlled by messages sent from the system to the telephone set.

Time Compression Multiplexing (TCM) is used to integrate the voice, data, and signaling information over a single pair of telephone wires. TCM compresses the continuous bit stream between the system and digital set into bursts and leaves sufficient space between bursts for data to be received without interference from the far end: the system sends one burst of 20 data bits to the digital set; the set processes the bits and sends a similar burst back to the system. This cycle is repeated 8000 times per second. Every transmitted burst is compressed into two 64 Kbps traffic channels plus two 16 Kbps signalling channels. This technique, often referred to as "**ping-pong**" transmission, provides a total bandwidth of 5 12 Kbps.

For applications where data communications is required, Meridian 1 digital telephones offer an integrated data option that can be field installed to provide simultaneous voice and data communications over single pair wiring to a port on a digital line card. The Asynchronous Data Option provides data communications at speeds up to 19,200 bits per second from an ASCII terminal or desktop computer. Data calls are performed entirely from the data terminal keyboard. Other features such as Speed Calling and King Again (which notifies the user when a busy computer port is free) are selected from a menu displayed **on the** terminal screen. The data option hardware is placed inside the telephone and uses the same pair of wires used for voice calls.

Meridian Digital Telephones

M2006 — Single Line Telephone

The Meridian 1 M2006 digital telephone provides six programmable keys. Key zero ('0') functions as the directory number key, and the five remaining keys are programmable for software feature access. The M2006 comes standard with on-hook dialing, message waiting LED, Hold/Release Keys, and independent volume/tone controls. The set also accepts the new Programmable Data Adapter and External Alerter Interface options. Both of these options require an external power source.

M2008 Multi-line Telephone

The Meridian M2008 digital set is equipped with eight keys which can be programmed for any combination of directory numbers or software features. The set comes standard with on-hook dialing, Message waiting LED, Hold/Release keys, and independent volume/tone control. The M2008 can also be equipped with an optional 2x24 alphanumeric LCD display, and it accepts the new Programmable Data Adapter and External Alerter Interface options. All add-on options require an external power source.

M2616 Multi-Line Telephone

The M2616 digital set has 16 programmable keys for any combination of directory number and software feature assignments. It also comes standard with on-hook dialing, message waiting LED, Hold/Release keys, independent volume control, and two-way handsfree capability. (Note that the handsfree function on the M2616 is unique in that it is software assignable.) Also, the M2616 accepts the new 2x24 alphanumeric LCD display module, accommodates up to two 22-key Meridian Key Expansion Modules, and can be configured with Programmable Data Adapter and External Alerter Interface.

M2016S Secure Telephone

The M2016S is a secure digital telephone, meeting the security requirement for Class-2 as described by TSG (Telephone Security Group) standards. The set has 16 keys which can be programmed for any combination of directory numbers or software features. It comes standard with on-hook dialing, message waiting/secure status LED, Hold/Release keys, and independent volume/tone control. The M2016S can also be equipped with an optional 2x24 alphanumeric LCD display, key expansion module, and it accepts the Programmable Data Adapter option. This set requires an external power source.

M2216ACD Telephones

There are two versions of the M22 16ACD set: M22 16ACD-1 and M2216ACD-2. Optimized for ACD environments, these 16-key programmable multi-line sets come standard with a 2x24 alphanumeric display, on-hook dialing, message waiting LED, Hold/Release keys, independent volume control, and dual headset jacks, one of which can be user optioned at the set level for 'talk/listen' only supervisor monitoring, and one PJ-327 jack to accommodate standard carbon headsets. For those applications requiring handset operation, the TELADAPT jacks on Model -1 have an interface option which provides the electrical properties required to use a DKS handset. The PJ-327 jack on Model-2 can accommodate a carbon handset.

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The **M2216ACD** sets also accommodate up to two, 22-key Meridian Key expansion Modules, and can be equipped with the Programmable Data Adapter and External **Alerter** Interface options. The Model-1 set is loop powered for the Display option only. The Model-2 set requires an external power source for all options.

M2317 — provides 11 programmable keys for any combination of features and directory numbers, 5 context sensitive softkeys, handsfree conversation capability and a 2 **line-by-40-character** alphanumeric display. Release and Hold keys are color coded as are changeable key caps to distinguish lines from features. Large **LCDs** for each key provide a distinctive indication of call status and feature activation. A built-in speaker permits the user to leave the handset in place until the called party is on the line.

Meridian M3000 Touchphone

The M3000 Touchphone is a digital telephone which provides complete communications control by means of a unique touch-sensitive liquid crystal display. It provides access to the full complement of calling features to meet the demanding requirements of business decision-makers. The LCD screen indicates which features can be used at any given time and a feature **labelled “Explain”** provides access to a built-in user guide.

The Meridian Touchphone is equipped with a full list of standard features. Six lines can be configured as directory numbers, private lines, and intercoms. Handsfree with automatic answerback is built-in. A private Directory of over 100 names and numbers permits the dialing of voice, data, and intercom calls by simply touching a name on the LCD screen.

Display Module

The Display Module available as an option with the M2008, M2616 and **M2016S** is a 2 line by 24 character liquid crystal display by which can display the name and extension of callers from within the system or network. It simplifies feature use with interactive prompts and messages in either English or French.

A second version of the 2x24 LCD display presents ACD screen information. The ACD Display Module can be added to the M2008, M2616, or **M2016S** sets for use in an ACD environment. (Note that this display comes standard on the **M2216ACD**.) Also, the ACD Display Module is available in six languages: English, French-European, French-Canadian, Dutch, Spanish, and German.

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Meridian Key Expansion Module

The Meridian Key Expansion Module is a modular 22-key unit which connects to the M2216, **M2016S** and **M2216ACD** sets, providing access to 22 additional key/lamp pairs for access to directory numbers and/or software features. Each key has an associated LCD indicator for call status and feature activation information. A maximum of two Key Expansion Modules can be added per set. The module is connected electrically to the set via a ribbon connector, and mounts physically on the set's footstand base. The footstand must be ordered separately and is available in two versions:

- . Footstand-one accommodates a **38-key** configuration (16 button set plus one key module)
- . Footstand-two accommodates a 60-key configuration (16 button set plus two key modules)

Programmable Data Adapter

The Meridian Programmable Data Adapter (MPDA) is a new asynchronous data card which fits into a slot in the base of the **M2006**, **M2008**, M2616, **M2016S**, and **M2216ACD** sets. Any ASCII terminal, PC, or Macintosh can then be directly connected to the telephone via the built-in RS232 interface. Data capability is provided by the MPDA, working in conjunction with the digital interface chip residing in the telephone.

Data calls can be placed from the telephone keypad, via keyboard dialing, or using the 'AT command' dialing feature. Two primary enhancements of the new data adapter are the addition of Script file capability and enhanced **HAYESTM** 'AT command' support.

Additional data features supported are:

- . asynchronous transmission at 19,200 bps
- . data call origination and termination via keyboard dialing, AT dialing, and keypad dialing.
- . Speed call capability
- . Modem Pool calling

External Alerter Interface

The External Alerter Interface module provides a connection interface to standard remote alerting devices.

Power Supply Board

The Power Supply Board is a printed circuit board (**PCB**) which mounts inside the telephone and receives its power from either a 1 **10/220** volt wall-mount transformer or closet power supply. **the plug-in transformer is single winding**, and is equipped with a 10 foot cord of 22AWG two-conductor stranded and twisted wire with a modular duplex adapter.

Other Digital Telephones

M2009 — provides the benefits of multiple lines and feature flexibility with nine programmable keys.

M2112 — has a built-in handsfree capability and provides eleven feature keys which can be assigned in any combination of lines and features. The 12th key is the **Handsfree/Mute** key.

M2018 — offers 18 keys for the additional lines and features required in typical secretarial environments.

Attendant Consoles

The M1250 and M2250 attendant consoles incorporate design improvements based on the **QCW4E** Attendant Console, and are functionally compatible with the QCW4. The M1250 is driven and powered by SL-1 line cards and is compatible with QCW4 console cabling schemes. The **M2250**, a digital version of the M1250 with additional features and display options, is driven and powered by a digital line card and has a modified cabling scheme.

Figure 5-20
M2008 Modular Telephone

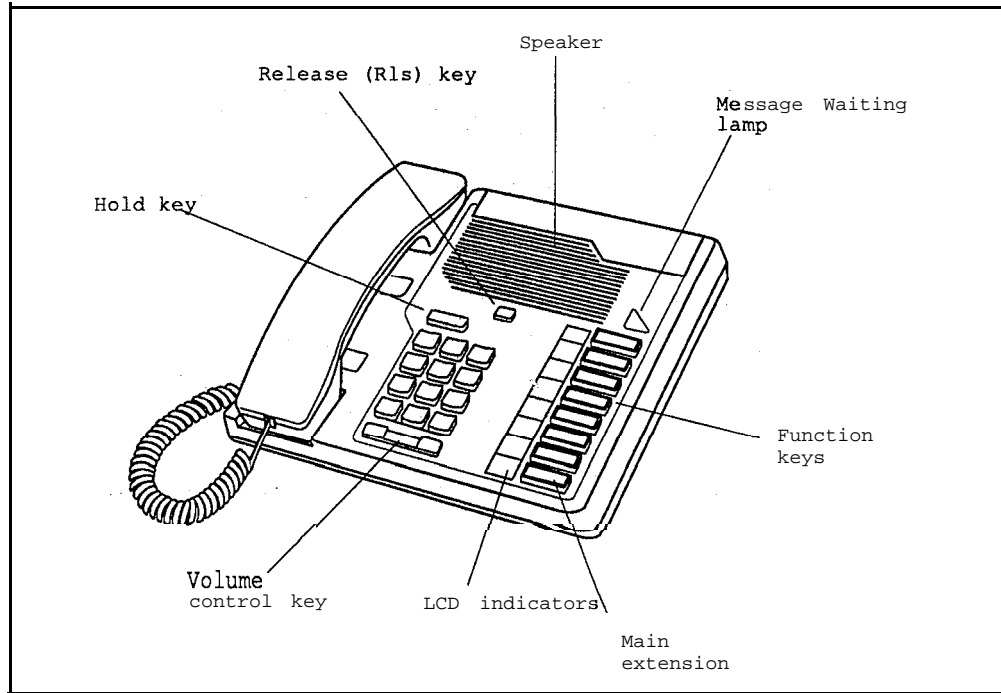


Figure 5-21
M2616 Modular Telephone

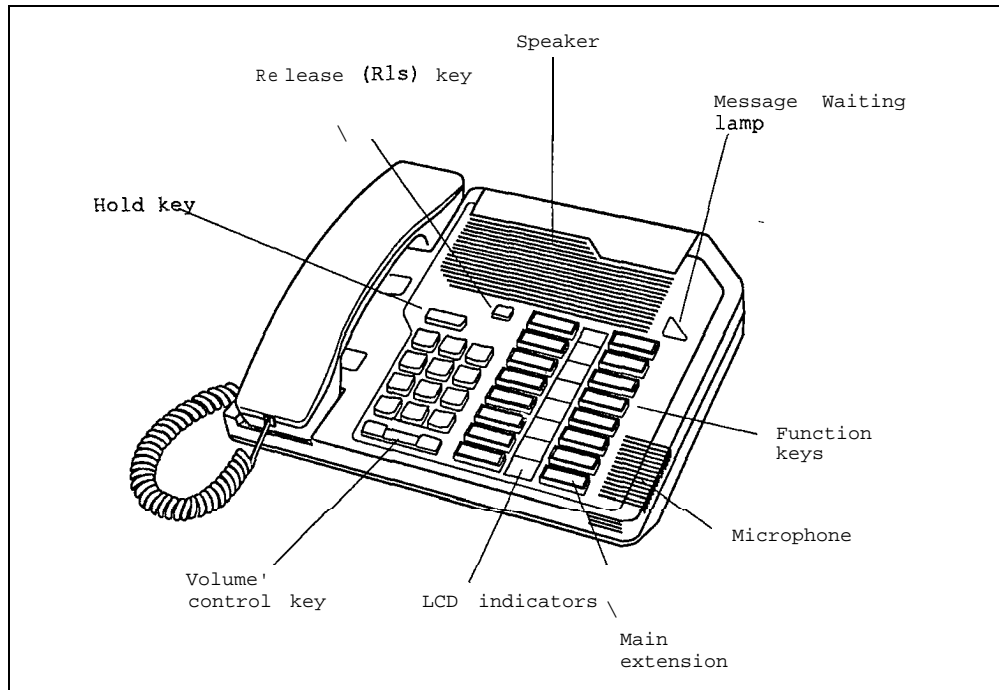
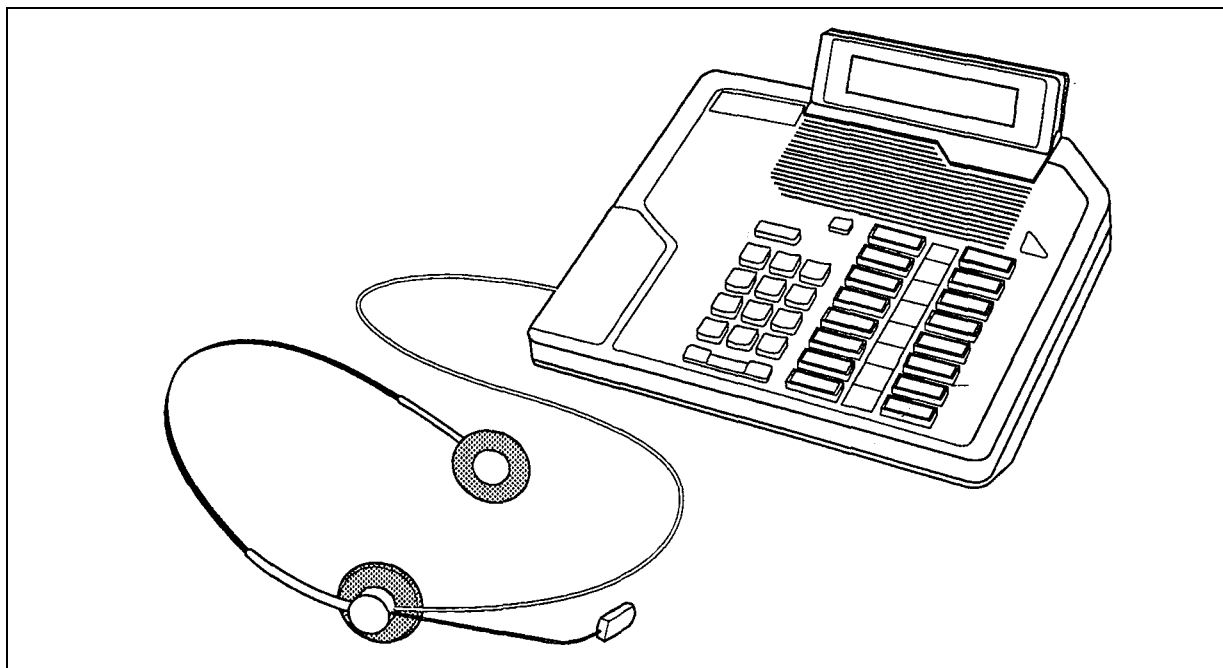


Figure 5-22
M2216ACD Modular Telephone



Power equipment

AC power distribution

The internal AC power system consists of the following main elements:

- . Pedestal Power Distribution Unit (PDU)
- . Module to Module Power Harness
- . Module Power Distribution Unit (MPDU)
- AC Power Supplies

The AC line cord enters the Pedestal and connects to a terminal block located in the PDU. From the terminal block, the AC voltage passes through a line filter and a main Column circuit breaker, which provides power to the four modules and the Blower Unit. The System Monitor runs off a small AC power supply in the PDU. The module to module harnesses distribute AC power to each module by means of the **MPDUs**, which contain circuit breakers for safe operation and easy maintenance.

There are three different AC power supplies that provide power to the common equipment, peripheral equipment, and combined common/peripheral equipment modules. In addition, there is a ringing generator that provides AC ringing (and message waiting lamp voltages) when required for the peripheral equipment modules.

There are no additional external power components required for AC-powered systems. Reserve power, if needed, is accomplished through the use of an external Uninterruptible Power Supply (UPS).

DC power distribution

The internal DC power system consists of the following main elements:

- . Pedestal Power Distribution Unit (PDU)
- . Module to Module Power Harness
- . DC Power Converters

The power cables enter the Pedestal and connect to an internal terminal block located beneath the PDU. From there, the DC voltage enters the PDU, which has five circuit breakers - one for each module and one for the Blower Unit. The System Monitor runs off a small DC-DC converter in the PDU. The module to module harnesses distribute DC power directly to the **DC power** converters in each module, which contain on/off switches for easy maintenance. Circuit breaker protection is provided in the Pedestal.

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There are three different DC power converters that provide power to all of the common equipment, peripheral equipment, and combined common/peripheral equipment modules, as well as a ringing generator that provides AC ringing (and message waiting lamp voltages) when required for the peripheral equipment modules.

AC Rectifiers

The external portion of DC-powered systems is generally referred to as the “power plant”, and consists of the rectifiers and distribution equipment, as well as reserve batteries if required.

For Meridian 1 System Options 2 1, 5 1, and 6 1, Northern Telecom offers a power plant based on the **NT6D52AA** Rectifier, with an output capacity of 30A per rectifier. For systems with power requirements of up to **90A**, up to 3 rectifiers are contained in a 4'6" open relay rack and are joined together with a wall-mount rectifier/battery connection and distribution box (**QBL15**). This configuration is generally adequate to power 2 full columns of 8 modules. For expansion, a second **QBL15** may be added, with up to 3 additional rectifiers in a 2nd rack.

For System Option 71, as well as larger System Option 61 configurations, Northern offers the QCA 13 power plant based on the **NT5C03B J** Rectifier, with an output capacity of 50A per rectifier. Up to 4 **rectifiers** are contained in the prime cabinet for a total of 200A. A supplemental power cabinet holds 4 additional rectifiers, and a 2nd supplemental cabinet holds 2 rectifiers, for a total of 10 rectifiers and a total QCA13 system capacity 500 A.

Customer-provided power is an option for all Meridian 1 systems. The QBL12 Battery Distribution Box is **used to** connect a wide variety of power equipment to the system. In addition to serving as an interface point between the NT-supplied Meridian 1 and the customer-supplied power equipment, the wall-mounted QBL12 provides positive and negative **busbars** for input rectifier connections and up to 24 fused 30A outputs to feed up to 12 columns of equipment, as well as monitoring and reporting capabilities.

For more detailed information on the Meridian 1 power equipment and provisioning, see NTP 553-3001-152, Power Engineering. --



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Chapter 6: Meridian Data Services

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Applications and connectivity

The architecture of the Meridian 1 **SL-1** Private Branch Exchange (**PBX**) was specifically developed to accommodate the rapidly expanding requirements for data as well as voice communications. Since its introduction, the SL-1 product line has evolved and improved to include a wide portfolio of data communications capabilities.

Northern Telecom is serving today's demands for data connectivity without causing its huge installed base of PBX systems to become obsolete. Old and new, all systems are able to take advantage of the full family of data product offerings.

Flexibility

Northern Telecom's commitment to OPEN World (Open Protocol Enhanced Networks) ensures that customers will always be able to achieve maximum functionality and compatibility in data processing and data communications, especially in multi-vendor environments. A single terminal can access multiple hosts, networks, and applications.

Meridian Data Services is a family of hardware and software products that attach personal computers, terminals, host computers, and other data communications devices to Northern Telecom's Meridian **1digital PBX**. Data Services products enable a PC or terminal device to communicate, through the Meridian 1, to computers, Local Area Networks (**LANs**), printers, host computers and other resources via standard telephone wiring.

Included in this Chapter are all of the products from **Meridian Data Services** products that can help efficiently manage resources and allow for easier, faster and more convenient access to information.

Components and benefits

Meridian Data Services provides a comprehensive group of products that connect your data devices to the same telephone wiring you have installed for your Meridian Digital Telephones. In this manner, Meridian Data Services provides you with

multiple host access, direct connectivity, efficient resource management, port contention, increased distance, easier moves and changes, and improved data call handling. Meridian Data Services provide the following advantages.

Multiple host access

Meridian Data Services provides broad connectivity which allows users to access multiple networks, applications, and hosts from a single terminal. This eliminates the need for multiple terminals on a desk and redundant networks.

Direct connectivity

Meridian Data Services has the unique advantage of providing direct connections without the use of data modules for ASCII terminals, PCs, Macintosh computers, protocol converters, modems, X.25 **PADs** and many different computers. The result is reduced costs.

Efficient resource management

There are tremendous advantages in using a single unified system for both voice and data communications.

Perhaps the most obvious benefit is the inherent efficiency of managing resources as part of one system. Resources such as cabling, transmission lines, host computer ports, terminals, personal computers, and peripherals may be administered more intelligently within a single network and a single cabling arrangement. Meridian 1 call accounting functions can be used to optimize system performance and network management.

Port contention

Port contention means that many users may share scarce computer resources on an as-needed basis. This is especially important where many users do not need a dedicated computer connection.

Port contention can be successfully implemented due to Meridian 1 convenience features such as port hunting, auto dial, and ring again. A single number can provide access to a hunt group of host ports. Traffic management functions of the Meridian 1 allow a precise allocation of resources, so that users can have the level of service they need, without having ports and connections which are idle most of the day.

--

Increased distance

Terminal and PC users can be located almost 2438.4 m (8000 f) (2.4 km (1 1/2 miles) end-to-end) from a host computer, eliminating RS-232 distance restrictions.

Easier moves and changes

As all Meridian 1 SL-1 data devices use standard telephone wiring, which is often already in place, installation and on-going moves and changes are less costly and are quickly accomplished.

Improved data call handling

Many Meridian 1 voice calling features are applicable to data. For instance, port hunting, call forwarding, ring again and traffic statistics provide easier data calling and measurement.

Data Services — terminal connectivity

Meridian 1 Data Services provides a comprehensive set of data connectivity options for terminal users. The customer may achieve the complete integration of voice and data communications with Meridian Digital Telephones. The **data connectivity** options available are:

- Meridian Programmable Data Adapter (MPDA)
- Asynchronous Data Option (ADO)
- Enhanced Asynchronous Interface Line Unit (EAILU)
- Asynchronous/Synchronous Interface Module (ASIM)
- High-Speed Data Module (HSDM)
- EasyLAN with Meridian Extension — (A0345240)

Each of these products provides a simple, economical connection to the Meridian 1, the standard RJ-11 jack. Installing a data interface can be as simple as plugging in a telephone.

Features

For the terminal user, establishing a data connection through the Meridian 1 is analogous to making a voice call. Data calling allows many convenience features normally associated with voice calling, as well as other features which are unique to the Meridian 1.

Keyboard dialing may be used to make data calls from asynchronous terminals, where the user enters the destination number from the terminal keyboard instead of using a telephone keypad. The Meridian 1 provides prompts and menu choices to simplify the call setup.

Auto Dial allows one-step data calling to a frequently called destination. The user hits a single key and the predetermined number is automatically dialed.

Speed Call provides abbreviated dialing (1-3 digits) to any of several destinations.

Hot Line is similar to auto dial, except that the terminal connects to the host computer automatically when the terminal is turned on.

This feature is especially useful for synchronous terminal users who desire a **nailed-up** connection. Hot Line may be configured with the High-Speed Data Module and the Asynchronous/Synchronous Interface Module.



Autobaud is automatic speed adjustment between the terminal or host port and the Meridian 1. The carriage return sent by a user to the system to request access to Meridian Data Services is used by the Meridian 1 to determine speed and parity of the terminal.

Important data call processing features are also provided by the Meridian 1 software.

Ring Again allows the user to queue for a busy port or service. As soon as a port is available, the user is alerted and the data call completed after a one-key confirmation by the user.

Data Port Hunting allows a Directory Number to be assigned to a group of data ports, so a data call will hunt to the first available port.

Meridian Programmable Data Adapter (MPDA)

The Meridian Modular Telephones provide a simple solution for voice and data communications. The MPDA is installed inside the digital telephone (at the factory or as a field upgrade). Digitized voice and asynchronous data are multiplexed at the telephone set and transmitted over a single twisted pair of wires to the Meridian 1.

Asynchronous RS-232

The MPDA supports asynchronous terminals and all types of personal computers. It supports transmission speeds up to 19.2 Kbps; transmission speeds are automatically matched in the Meridian 1 by the **Autobaud** feature.

Integral to the digital set

Residing in the base of the Meridian Modular Telephones, the MPDA takes up no additional space on the desktop. The MPDA may be installed into the digital set in the field, with no changes to wiring or to the line card. Supports M2006, M2008, M2016S, M2616, and M2216ACD.

Operation

The user may place data calls directly from the terminal keyboard. The Meridian 1 provides prompts and menu choices to simplify data calling, as well as the features of autodialing, speed calling and ring again.

Personal computer users with the appropriate communications software can simplify data calling by creating automatic log-on script files. In its Hayes compatible mode, the MPDA obeys the AT commands for dialing.

Wiring

The Meridian Modular Telephone requires only one twisted pair of wires to connect to the SL-1 (for both voice and data support). The Meridian Modular Telephone may be located up to 1066.8 m (3,500 ft) from the Peripheral Equipment (PE) module of the Meridian 1.

An RS-232 cable is required to connect the asynchronous terminal or MS-DOS PC to the MPDA; in order to connect a Macintosh, an RS-232 to DIN8 or DB9 cable is required depending on the type of Macintosh computer. (See “Macintosh Connectivity” in this Chapter).

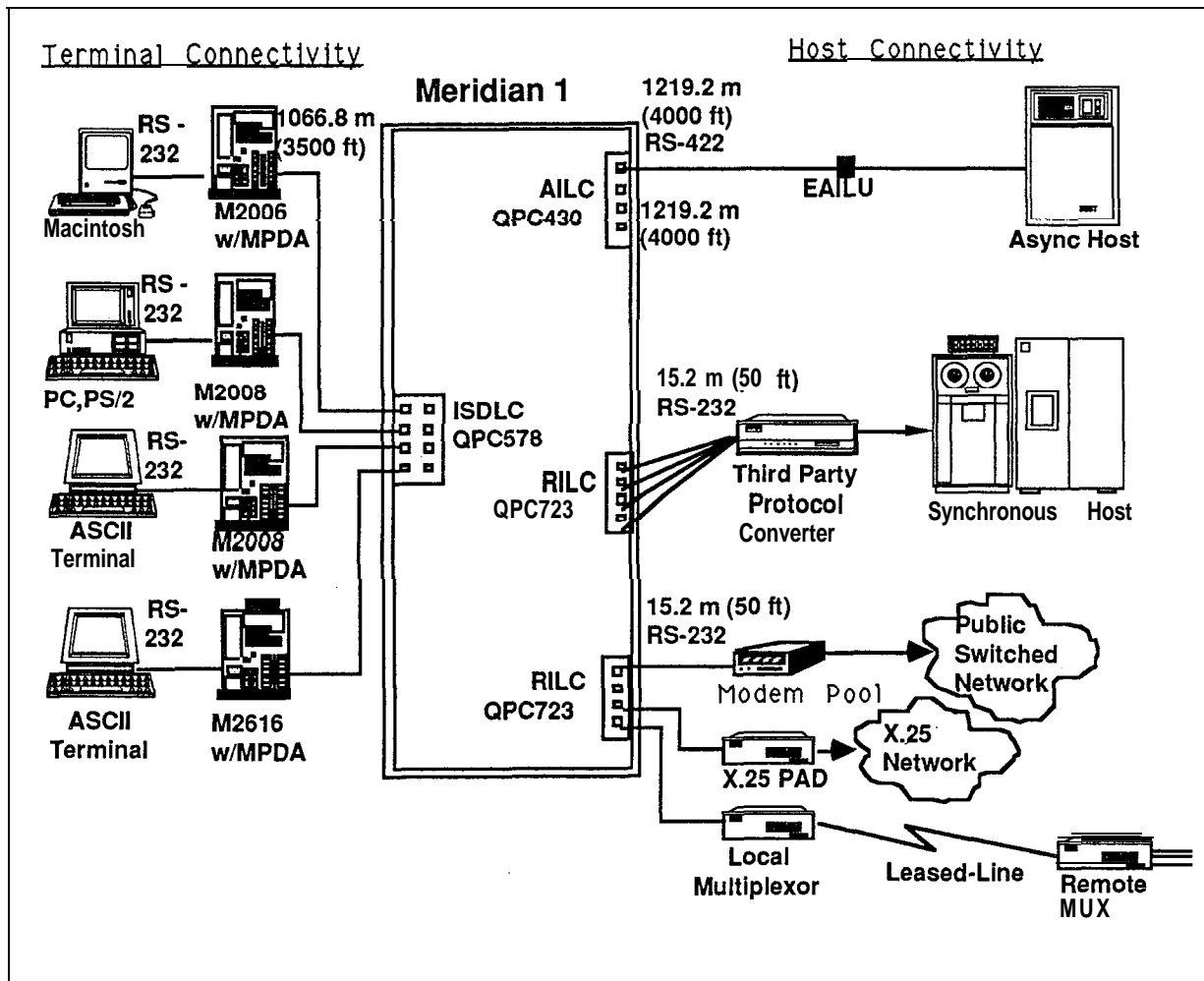
Interface cards

The Meridian Modular Telephone interfaces to the Integrated Services Digital Line Card (ISDLC/QPC578). The ISDLC supports 8 digital sets and resides in a PE Module of the Meridian 1. The Meridian Modular Telephone also interfaces to the Digital Line Card NT8D02AA which resides in the Intelligent Peripheral Equipment Module.

Power

Power is provided by a wall mount power supply.

Figure 6-1
Meridian Programmable Data Adapter (MPDA)



Asynchronous Data Option for Meridian Digital Telephones (ADO)

The Meridian M3000 Touchphone and Meridian M2000 Digital Telephones provide a simple solution for voice and data communications. The Asynchronous Data Option (ADO) is installed inside the digital telephone (at the factory or as a field upgrade). Digitized voice and asynchronous data are multiplexed at the telephone set and transmitted over a single twisted pair of wires to the Meridian 1. The ADO Supports the M2009, M2112, M2008, M2317, and M3000 telephones.

Asynchronous RS-232

The Asynchronous Data Option supports asynchronous terminals and all types of personal computers. It supports transmission speeds up to 19.2 Kbps; transmission speeds are automatically matched in the Meridian 1 by the **Autobaud** feature.

Integral to the digital set

Residing in the base of the M2000 or M3000 Series Digital Telephone Sets, the ADO takes up no additional space on the desktop. The Data Option may be installed into the digital set in the field, with no changes to wiring or to the line card.

Operation

The user may place data calls directly from the terminal keyboard. The Meridian 1 provides prompts and menu choices to simplify data calling, as well as the features of autodialing, speed calling and ring again. The M3000 Touchphone additionally has a touch sensitive LCD display, with a built-in directory which may be used to place data calls.

Personal computer users with the appropriate communications software can simplify data calling by creating automatic log-on script files. In its Hayes compatible mode, the Asynchronous Data Option obeys the AT commands for dialing.

Wiring

The Digital Telephone requires only one twisted pair of wires to connect to the Meridian 1 (for both voice and data support). The Digital Telephone may be located up 1066.8 m (3,500 ft) from the Peripheral Equipment (PE) module of the Meridian 1.

An RS-232 cable is required to connect the asynchronous terminal or MS-DOS PC to the ADO; in order to connect a Macintosh, an RS-232 to DIN8 or DB9 cable is required depending on the type of Macintosh computer. (See "Macintosh Connectivity" in this Chapter).

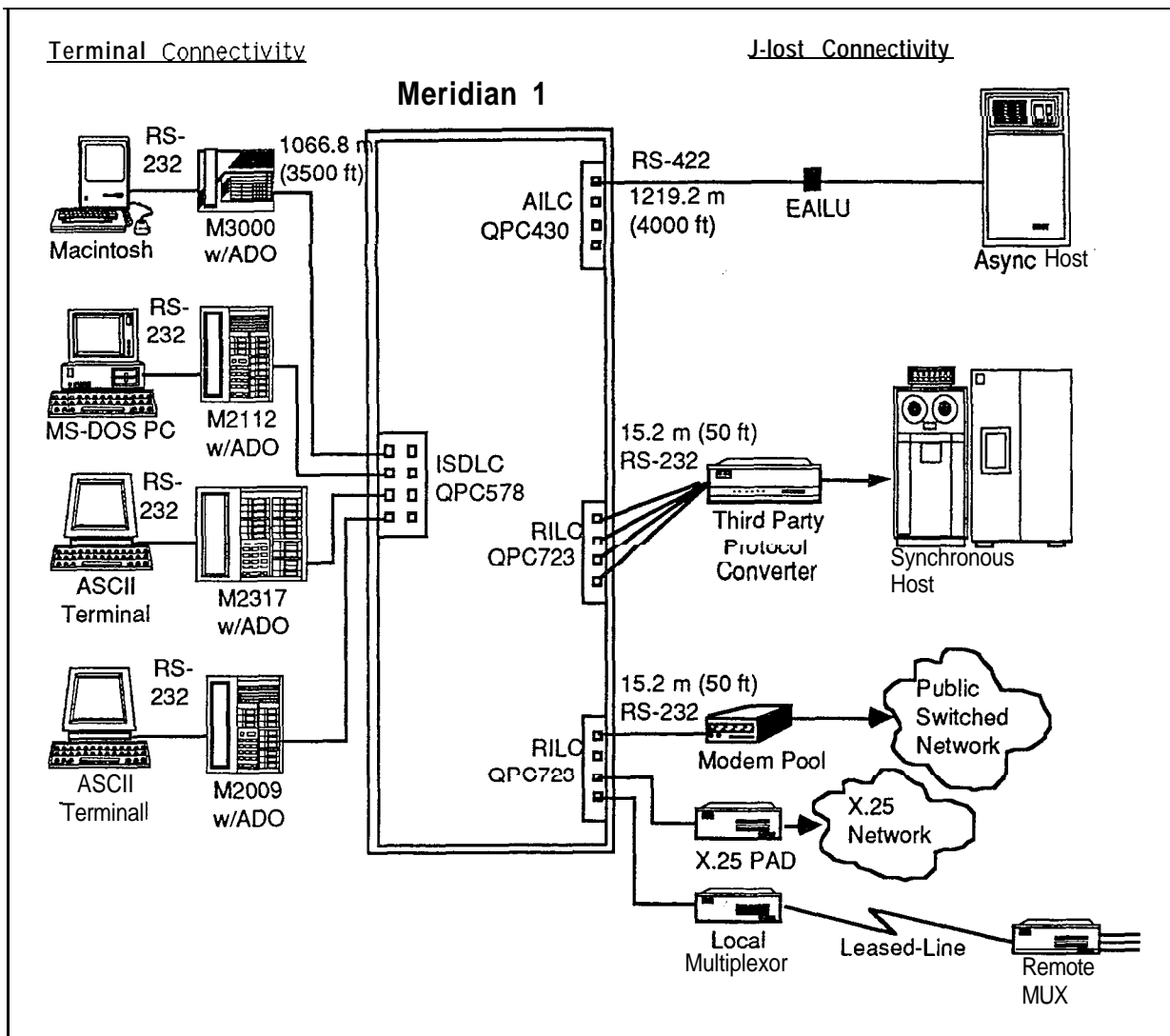
Interface cards

The Digital Telephone Set interfaces to the Integrated Services Digital Line Card (ISDLC/QPC578). The ISDLC supports 8 digital sets and resides in a PE module.

Power

Power is provided by a wall mount power supply (the M3000 already has the required power supply).

Figure 6-2
Asynchronous Data Option (ADO)



Enhanced Asynchronous Interface Line Unit (EAILU)

The Enhanced Asynchronous Interface Line Unit (EAILU) is a simple, low-cost means of connecting ASCII data terminals, teleprinters, word processors, or personal computers to the Meridian 1.

The EAILU is available in two versions:

- Male version (A0344336)
- Female version (A0344337)

A single cable connects your asynchronous ASCII data terminal directly to a telephone jack. The EAILU provides a fully digital connection with no boxes, no bulky cables, and no electrical plugs since the EAILU obtains the necessary power from the terminal unit on pin 4 or 20. Simply plug one end of the EAILU into the standard RS-232 connector of an asynchronous terminal or MS-DOS PC. Then plug the other end into your telephone jack.

Operation

With your data terminal connected to the Meridian 1, your data calls now have convenience features like speed calling, auto dialing, even the option of queueing on busy facilities such as computer ports and modem pools. All are accessed directly from your terminal keyboard by responding to simple menus and prompts.

In addition to data terminals, the EAILU also provides an inexpensive means of bringing teleprinters, word processors, and personal computers into a Meridian 1 network.

Asynchronous host connectivity

The EAILU can also be used to achieve direct connections to host computers located up to 1219.2 m (4000 ft) from the switch. (Otherwise the RILC (QPC723) can be used for a direct RS-232 connection to asynchronous ports). When used for asynchronous host computer connections, the EAILU must be the enhanced version and must interface to E vintage (or higher) of the Asynchronous Interface Line Card (AILC, QPC430).

Wiring

The EAILU is a compact EIA RS-232 to RS-422 cable line driver. Since the EAILU communicates with the Meridian 1 through an RS-422 interface, your data **terminal** can be located up to 1219.2 m (4,000 ft) away **from the** switch. The EAILU allows communication at speeds up to 19.2 Kbps.

Direct connectivity

The EAILU connects directly to the DTE RS-232 connector (DB-25) without the need for an extra data module. The **EAILU/AILC** are interconnected with two-pair wires (4 wires), and reside in the EPE Module. There is no need to use an RS-232 cable for the interconnection.

Interface cards

The EAILU connects to the Asynchronous Interface Line Card (AIRC/QPC430E) on the Meridian 1. Four ports reside on the AIRC. The EAILU enables users of RS-232 Data Terminal Equipment (DTE) to operate in a full duplex mode through the AIRC. The EAILU resides in (only) the EPE module of the Meridian 1.

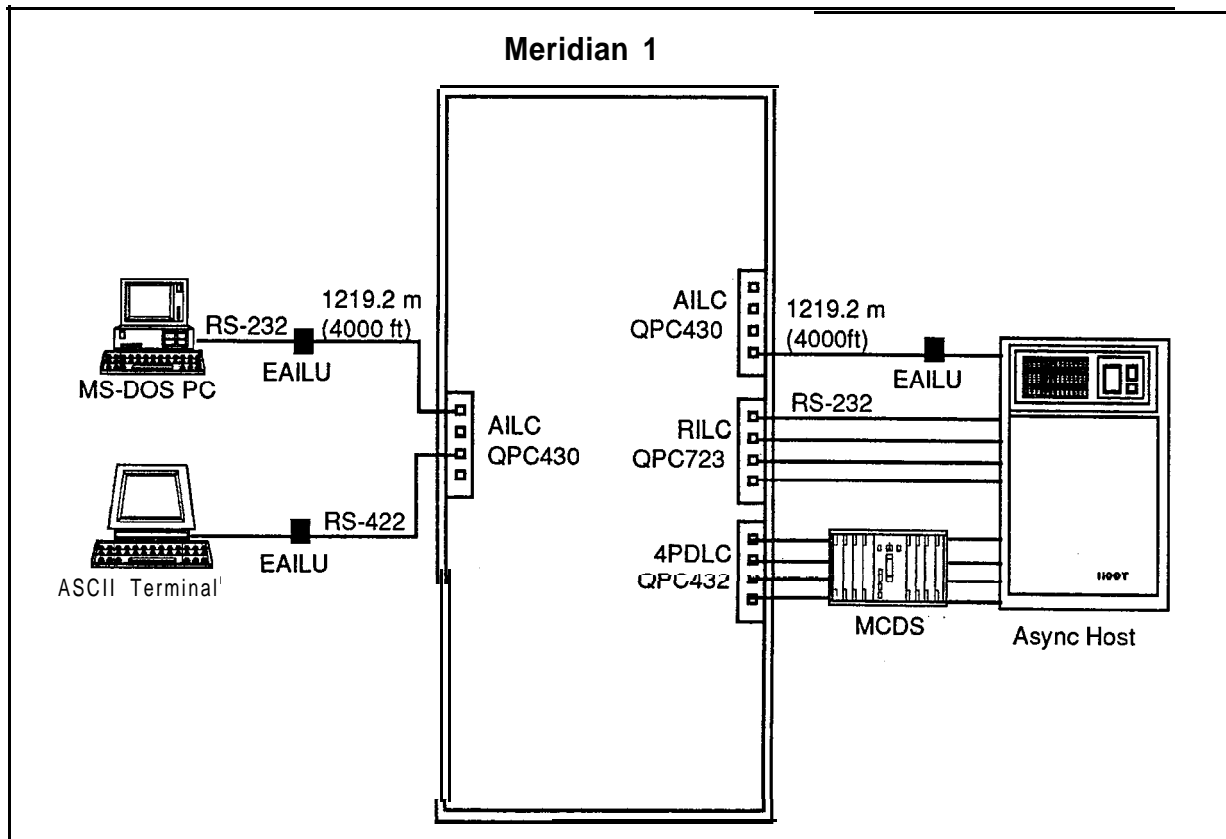
Power and connections

The EAILU requires no local power supply.

Connections:

- EAILU (A0344336 - male version, A0344337 - female version) for terminal and host connectivity up to 1219.2 m (4000 ft) from the Peripheral Equipment (PE) module
- RILC for direct RS-232 asynchronous host connectivity
- Multi Channel Data System (MCDS) for high - density asynchronous host connectivity

Figure 6-3
Enhanced Asynchronous Interface Line Unit



Asynchronous/Synchronous Interface Module (ASIM) — QMT1 1

The Asynchronous/Synchronous Interface Module is a stand-alone data module for RS-232 terminals which operate in either the asynchronous and synchronous modes. The ASIM may also be used to interface with a host computer which has RS-232 ports.

Asynchronous or synchronous

The ASIM supports asynchronous speeds up to 19.2 Kbps and synchronous speeds up to 56 Kbps.

Asynchronous /synchronous switch

The unit has an easily accessible switch which allows the user to choose either asynchronous or synchronous operation.

Physical

The ASIM is a desk top unit with a dial keypad and feature keys.

Operation

The Meridian 1 data call processing features such as Auto Dial, Speed Call, Ring Again are supported by keyboard dialing in asynchronous mode and by feature keys on the ASIM in synchronous mode. The ASIM may only interface to Data Terminal Equipment; it may not be used to interface to Data Communications Equipment (e.g. modems).

Wiring

The ASIM requires one twisted pair of wires and may be located up to 1219.2 m (4000 ft) from the Peripheral Equipment (PE) cabinet of the Meridian 1. A 500/2500 type telephone may also be attached to the ASIM's voice jack. An RS-232 cable is required to connect the ASIM to the terminal.

Virtual leased line capability

The ASIM works with the Digital Trunk Interface (DTI) to provide Virtual leased line capability. Virtual leased line uses existing T-1 facilities to provide the availability of leased data lines at a lower overall cost. When configured for virtual leased line mode (via two switches on the unit), the ASIM will, on detection of a drop in the connection, hotline continuously to re-establish the connection. For virtual leased line capability, use ASIM (QMT1 1) vintage D or greater and DTI (QPC472) vintage C or later.

Asynchronous host mode capability

The ASIM has been enhanced to provide asynchronous host mode capability. This feature suppresses the sending of prompts and responses to an asynchronous host computer which is accessing the ASIM to place a data call. In effect, asynchronous host mode permits blind dialing by suppressing the prompts and responses normally

associated with keyboard dialing. This setting can be used when the host computer dialing software is not expecting any response until the far end answers.

This feature is not applicable to dialing by synchronous host computers, since these computers require the use of the hotline feature or keypad dialing to place data calls. For asynchronous host mode capability, use ASIM vintage D or greater.

Interface cards

The ASIM interfaces to the **4-Port** Data Line Card (**4PDLC/QPC432**) which resides in a PE module.

Power

The ASIM is equipped with a **110V** AC input power supply. 220V AC and **100V** AC power supplies **are** also available .

Figure 6-4
ASIM asynchronous applications

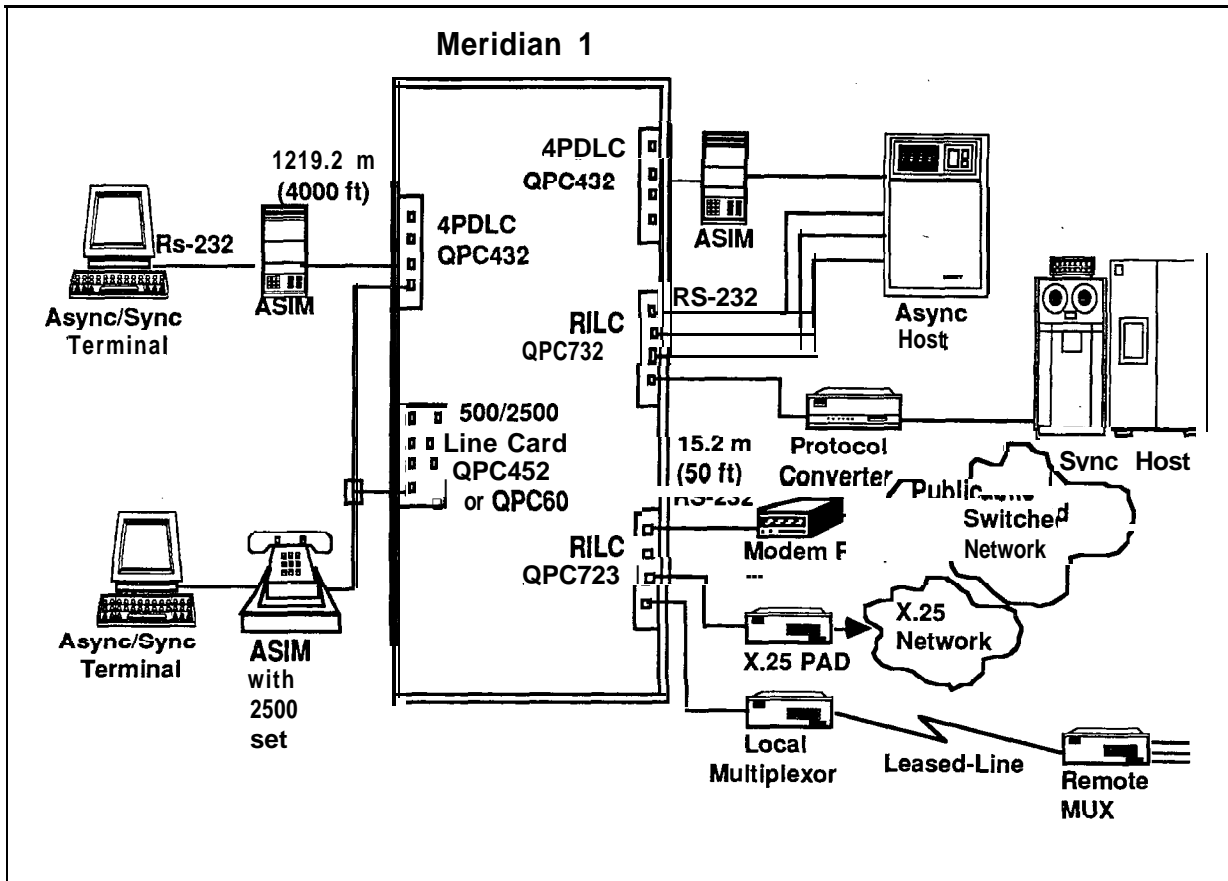
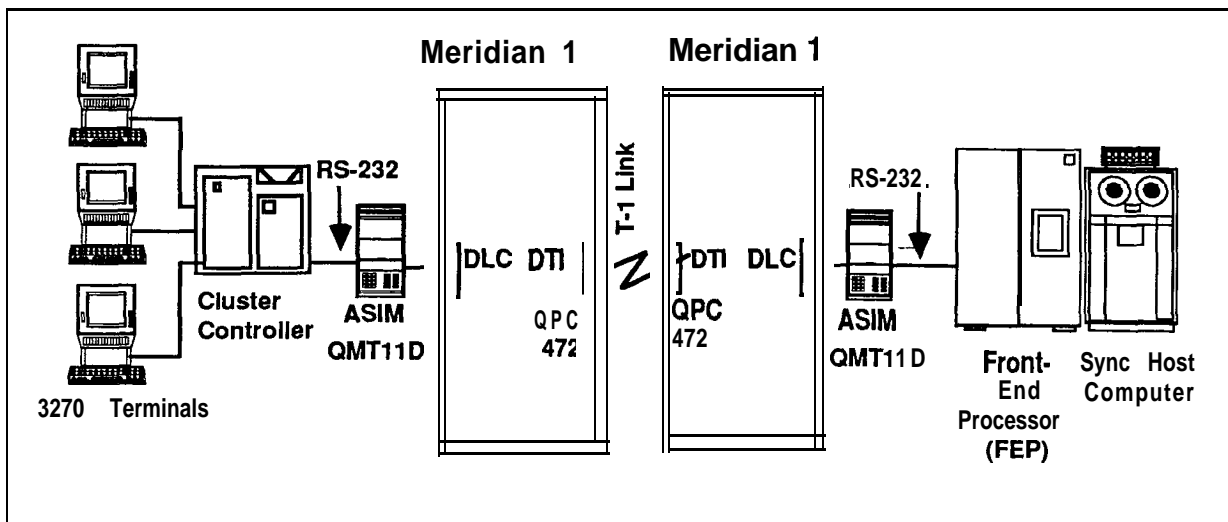


Figure 6-5
ASIM synchronous virtual leased line applications





High-Speed Data Module (HSDM) — (QMT21)

The High-Speed Data Module (HSDM) is a data module to be used with data terminal equipment (DTE) in a Northern Telecom High Speed (up to 56 Kbps) or ISDN (up to 64 Kbps) environment. The HSDM provides connectivity to the Meridian 1 for local communications, as well as for wide-area communications over Primary Rate Interface (PRI) or T-1 links to other NT switches. The HSDM is capable of operating with other data modules using the Data Module to Data Module (DM-DM) protocol as well as with data units for the 100/DMS-100 using the T-Link Version 2 protocol.

High-speed ISDN transmission

The High-Speed Data Module will support speeds up to 64 Kbps clear channel data transmission, giving a customer access to ISDN services. Since an ASIM can only communicate at speeds up to 56 Kbps using RS-232C, a customer needing ASIM functionality today but wanting V.35 capability or easy migration to an ISDN environment in the future would be interested in the High-Speed Data Module.

RS-232 /V.35 and virtual leased line capability

The High-Speed Data Module supports both RS-232 and V.35 interfaces. The virtual leased line capability allows customers to gain the benefits of private line service (dedicated access and high availability) while avoiding private line charges. For more information on virtual leased line capability, see HSDM Host Access in this Chapter.

SL-1/SL-100 setting

The HSDM includes a switch to indicate connection to a Meridian 1 Data Module or to a Meridian 1 SL-100/DMS-100 Data Unit. This switch is used to insure interworking in applications involving synchronous, half-duplex data transmission at speeds less than 56 Kbps.

Physical

The High-Speed Data Module is a desk top unit with a dial keypad and feature keys. The appearance of the HSDM to the 1 is similar to the Asynchronous/Synchronous Interface Module.

Wiring

A single twisted pair wire is needed for data applications. Additionally, an extra jack is provided for connection to a 2500 set.

Interface cards

The High-Speed Data Module connects to a port on the 4-Port Data Line Card (4PDLC/QPC432) which resides in a Peripheral Equipment module.

Power

The HSDM is equipped with a 110V AC input power supply. 220V AC and 100V AC power supplies are also available .

High-Speed Data Card/High Speed Data System — (QPC918)

The High Speed Data Card (HSDC) is the circuit board equivalent of two (2) High Speed Data Modules conveniently mounted together in a compact rack (the existing MCDS cabinet) with a common power supply which is referred to as a High Speed Data System (HSDS). This will save space and energy compared to individual enclosures.

The High Speed Data System (HSDS) is aimed at providing high density connectivity to synchronous hosts but can also be used for asynchronous host connections. The HSDS consists of the following components:

- MCDS Shelf QSD27
- MCDS Power QSY27-110v
- MCDS Power QSY32-220v
- HSDC-2port QPC918
- 4portlinecard QPC432
- MCDS Desk Cab QCA77 (optional)
- MCDS Rack Cab QCA76 (optional)

Features

The High Speed Data Card will provide identical features/functions as the High Speed Data Module. The essentials include:

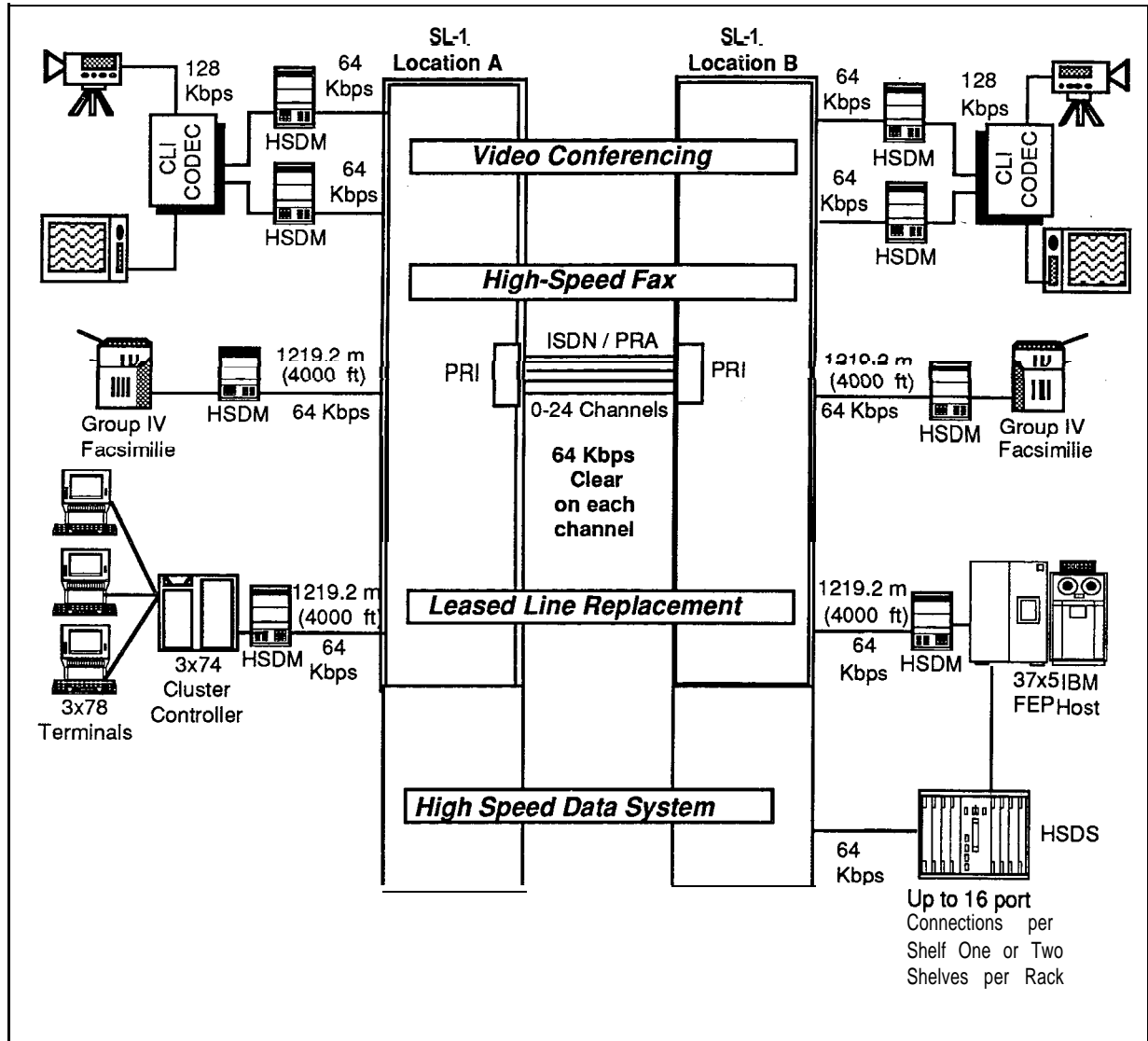
- synchronous connectivity up to 64 Kbps
- asynchronous connectivity up to 19.2 Kbps
- RS232 or V.35 interface
- virtual leased line capability, which allows the HSDC to emulate lease-line operation

Interface cards

The High Speed Data System connects to a 4 port data line card (QPC432) which resides in the Peripheral Equipment.

For technical specifications on the MCDS • Multi Channel Data System, refer to the “Host Connectivity “ in this Chapter.

Figure 6-6
High-Speed Data Module ISDN applications



Add-on Data Module (ADM)

The QMT12 (V.35 interface) Add-on Data Module (ADM) may be co-located with the SL-1 set to provide integrated voice and data communications for synchronous or asynchronous terminals. It can also be used as a stand-alone interface to host computers, printers and modems.

The QMT12 provides the V.35 interface and supports speeds up to 56 Kbps in the synchronous mode only.

DTE or DCE

The ADM is flexible in that it can interface to data terminal equipment (DTE) such as computers or terminals, and data communications equipment (DCE) such as modems and some host computer ports. A switch setting determines the DTE/DCE functionality of the ADM. (The ASIM is recommended for DTE-only requirements).

The ADM is recommended as the primary choice where a customer requires a synchronous V.35, 56 Kbps, DCE link.

Physical

The Add-on Data Module is a desktop unit similar in style to the SL-1 set and other add-on units (such as the handsfree unit). The ADM includes a Data Speed Selector, a Data Option Switch (for choosing other parameters), and several indicator lamps.

Operation

The ADM can be set to the desired transmission rate by the user. In the ADM asynchronous mode, the terminal keyboard may be used for placing data calls, with the features of Auto Dialing, Speed Calling, and Ring Again. In the co-located or synchronous mode, the SL-1 telephone keypad is used to place data calls.

Wiring

In the co-located mode, the ADM requires only the existing two pair wiring of the SL-1 set to provide simultaneous voice and data communications. In the stand-alone mode, the ADM requires one pair. A V.35 cable is used to connect to the terminal, printer, host port, or modem (a switch must be set for use with a modem). The ADM may be located up to 1219.2 m (4000 ft) from the PE Module of the Meridian 1.

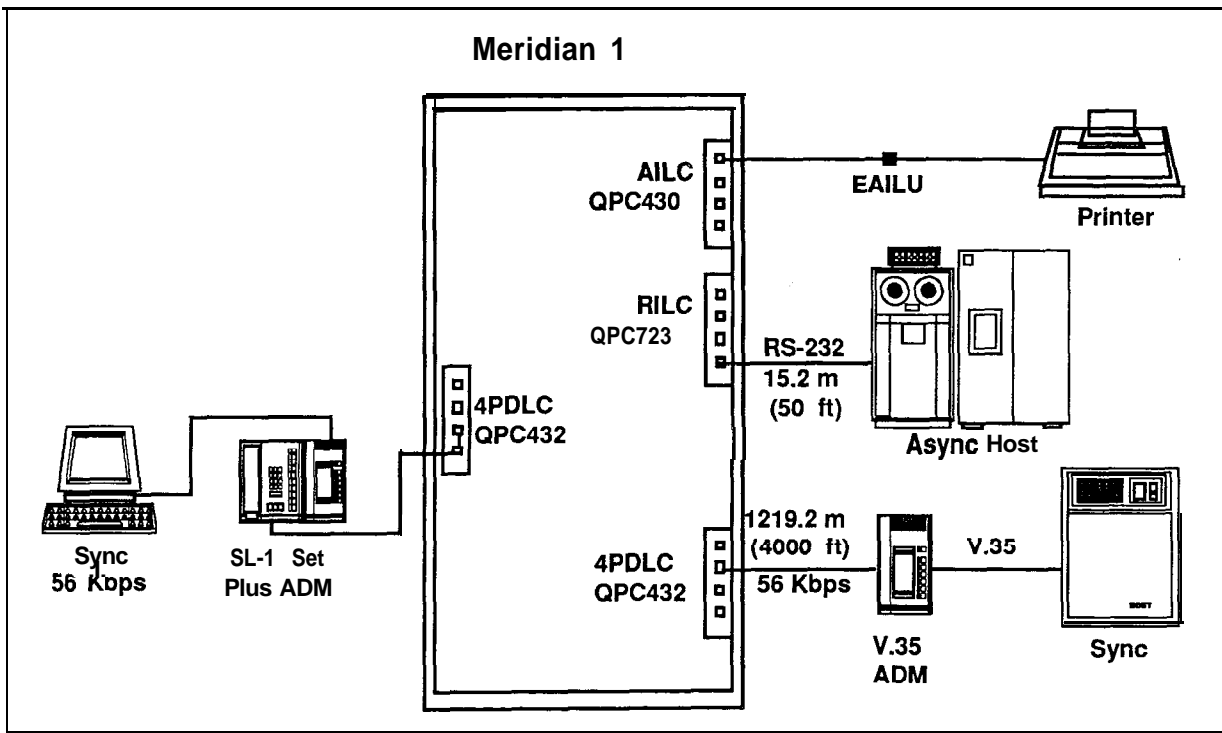
Power

The ADM has an internal power supply, which monitors the local AC power input derived through the 24 volt transformer (PO593922 or PO610756 - ordered separately) from commercial 110 volts AC.

Interface cards

A stand-alone ADM interfaces to the 4-port Data Line Card (4PDLC) which is located in a PE module.

Figure 6-7
Add-on Data Module (ADM)



EasyLAN with Meridian Extension — (A0345240)

EasyLAN with Meridian Extension is a low-cost local area network product for MS-DOS PCs in the office. EasyLAN with Meridian Extension allows users to share expensive peripherals such as laser printers, plotters, high-capacity hard disks and tape backup units by using twisted pair wiring and the Meridian 1. EasyLAN with Meridian Extension is a cost-effective solution for companies of any size wishing to share printers distributed among work groups or wishing to support file sharing within a work group.

Set-up

Any MS-DOS PC connected to the Meridian 1 can access the benefits of EasyLAN with Meridian Extension.

Once the data connection is in place and EasyLAN with Meridian Extension software is installed, the end-user needs only to configure the software with the data extension numbers of the other PC users in the group and the port number of the remote PC's physically attached printer.

Key benefits

A pop-up dialing menu works with most third-party application software packages to make remote file access and printing transparent to the user.

Mnemonic dialing from the user's directory simplifies access to computer resources.

Users can assign names to computer resources (e.g., "bill") so that they can more easily remember those resources. Users can then simply place a call to the named resource ("bill" for the PC with a laser printer attached) without knowing the data extension of that resource.

EasyLAN with Meridian Extension requires only 20 Kbytes of Random Access Memory (RAM) per configured communications port. Since the program runs in background mode, EasyLAN with Meridian Extension can be running while the PC user is working with another application (e.g., spreadsheet).

One or more print/disk servers can be configured and shared. These servers need not be dedicated; that is, they can be used for normal PC applications while acting as print/disk servers.

Key points

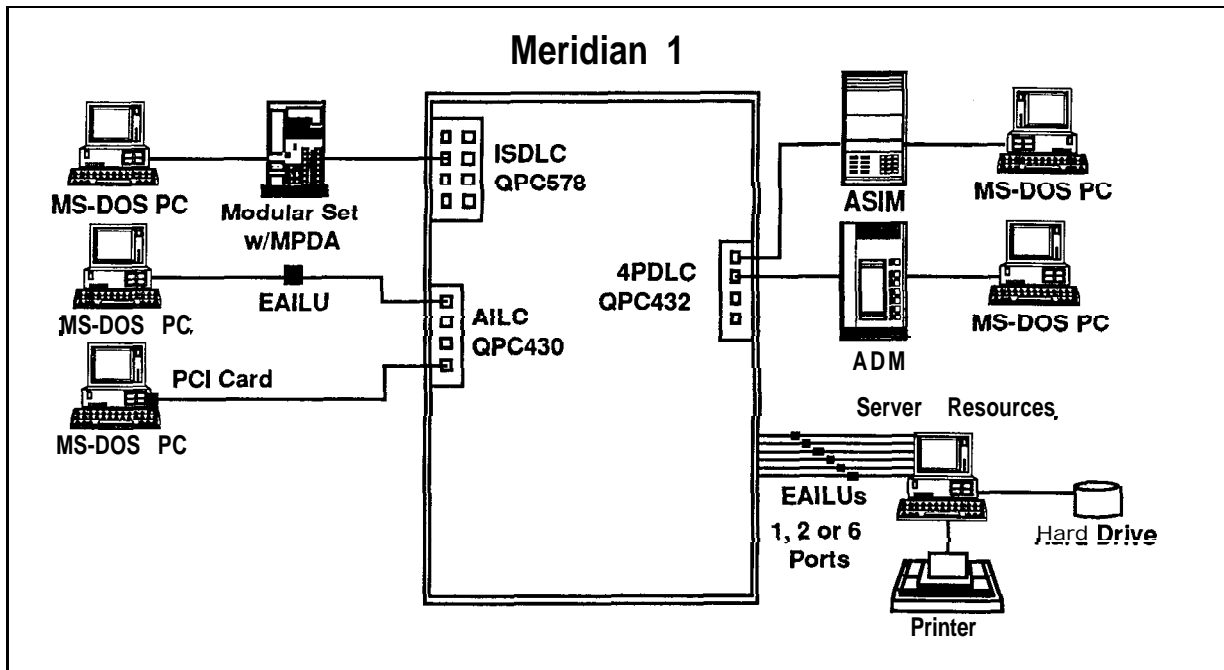
Each PC in the network needs its own numbered copy of EasyLAN with Meridian Extension software. The software is not copy-protected, so backup disks can be made, but a code-checking routine in the software prevents duplicate use of the same software diskettes on a network.

An EasyLAN with Meridian Extension network can practically include up to 32 users, as that many names and associated data extensions can be configured. Theoretically, an EasyLAN with Meridian Extension network is limited only by the

number of data ports available on the Meridian 1. If the practical limit of 32 users seems small, bear in mind that the average number of users on a local area network in 1988 was six to ten.

EasyLAN with Meridian Extension supports communications at speeds up to 19.2 Kbps to each PC.

Figure 6-8
EasyLAN with Meridian Extension



Data Services — host connectivity

Data Services provides a variety of connection options for host computer ports. Host ports may be synchronous or asynchronous, and may utilize RS-232 (V.24), RS-422, or V.35 standard connections. The data modules used for host connectivity are:

- Add-on Data Module (ADM)
- Enhanced Asynchronous Interface Line Unit (EAILU)
- Asynchronous/Synchronous Interface Module (ASIM)
- High-Speed Data Module (HSDM)
- Multi-Channel Data System (MCDS)
- RS-232 Interface Line Card (See SL-1 Data Line Card section)

Port contention is an inherent feature of the Meridian 1, allowing scarce host ports to be shared by a much larger number of terminal users. Host ports may be configured in hunt groups under a single Directory Number, and terminal users may use the Auto Dial, Hotline, and Speed Call features to quickly access the host. When all host ports are in use, the terminal user may use the Ring Again feature to queue for the next available port. Host computers may be located up to 1219.2 m (4000 ft) from the Meridian 1 and up to 2438.4 m (8000 ft) away from Data Services connected terminals.

Since many of the Data Modules discussed previously can be used for both host and terminal connections, only a brief explanation of their capabilities will be given here. For more information of these Data Modules, see "Data Services Terminal Connectivity" in this Chapter.

Add-on Data Module (ADM)

The stand-alone ADM may answer data calls. Synchronous transmission speeds supported are from 110 bps to 56 Kbps. Speed selection is manual for call origination, but automatic for call answering.

The ADM may be connected to either DTE (Data Terminal Equipment) or DCE (Data Communications Equipment) type host ports, that is, terminal-type ports or modem-type ports (a switch option is set for DTE or DCE).

The ADM is recommended for connection to DCE devices. The ASIM or HSDM is recommended when connection to DTE devices is required. For more information, see also "Data Services Terminal Connectivity" in this Chapter.

Asynchronous/Synchronous Interface Module (ASIM) — QMT11

The ASIM is used for RS-232 interface only. It may be used for asynchronous and synchronous host ports. The ASIM may originate and answer data calls. Speeds supported are up to 19.2 Kbps asynchronous, and 56 Kbps synchronous.

The ASIM may be conveniently switched between asynchronous and synchronous operation. The ASIM also supports Hotline and Auto-answer features using the telephone keypad.

The Asynchronous/Synchronous Interface Module may only interface to a Data Terminal Equipment (DTE) port. If connection to Data Communication Equipment (DCE) (e.g. synchronous modem) is required, the stand-alone ADM should be used. For more information, see also "Data Services Terminal Connectivity" in this Chapter.

Using an ASIM as well as the Digital Trunk Interface (DTI), customers can now set up virtual leased lines between Meridian 1 locations. This arrangement allows customers to gain the benefits of private line service (dedicated access and high availability) while avoiding private line charges.

High-Speed Data Module (HSDM) — QMT21

The High-Speed Data Module (HSDM) is used for both RS-232 and V.35 interface. It provides all of the functionality of the ASIM but adds the ability to run at speeds of 64 Kbps and to interface to V.35 ports. For more information, see also "Data Services Terminal Connectivity" in this Chapter.

The High-Speed Data Module operates in a Northern Telecom ISDN environment at speeds up to 64 Kbps. Combined with the Primary Rate Interface (PRI), the HSDM provides access to wide-area communications over T-1 links to other Northern Telecom switches. The HSDM is compatible with **Datapath** units used within 100 and DMS-100, DMS-250, **DPN-50**, and DPN-100 environments.

Along with the ASIM, the HSDM also provides virtual leased line capability. With the Digital Trunk Interface (DTI) or Primary Rate Interface (PRI), the High-Speed Data Module automatically recovers when the line goes down by hotlining until the connection is re-established. Virtual leased line capability provides dedicated access and high data availability at line charges lower than private lines.

Enhanced Asynchronous Interface Line Unit (EAILU)

The Enhanced Asynchronous Interface Line Unit (EAILU) is a simple, low-cost means of connecting ASCII data terminals or PCs to the Meridian 1. The EAILU is available in two versions:

— Male version (A0344336)

— Female version (A0344337)

A single cable connects your asynchronous terminal directly to a modular phone jack. There are no boxes, bulky cables and no electrical plugs since the EAILU obtains its power from the terminal unit's EIA pin 4 or 20. The EAILU allows speeds up to 19.2 Kbps.

The EAILU can also be used to provide direct asynchronous host connectivity up to 1219.2 m (4000 ft) from the Meridian 1 Peripheral Equipment (PE) Module, without the use of data modules.

The EAILU connects to the Asynchronous Interface Line Card on the Meridian 1. The AILC accommodates up to 4 ports. For more information, see also "Data Services Terminal Connectivity" in this Chapter.

High-Speed Data Card (HSDC) (QPC918) or High-Speed Data System

The High Speed Data Card (HSDC) provides RS232 / V.35 Interface for high port density. It is the circuit board equivalent of two (2) High Speed Data Modules conveniently mounted together in a compact rack (the existing MCDS cabinet) with a common power supply which is referred to as a High Speed Data System (HSDS). This saves space and energy compared to individual enclosures.

The High Speed Data System (HSDS) is aimed at providing high density connectivity to synchronous hosts but can also be used for asynchronous host connections.

The HSDS consists of the following components:

— MCDS Shelf	QSD27
— MCDS Power	QSY27-110v
— MCDS Power	QSY32-220v
— HSDC 2 port	QPC918
— 4 Port line card	QPC432
— MCDS Desk Cab	QCA77-optional
— MCDS Rack Cab	QCA76-optional

Features

The High Speed Data Card provides identical features/functions as the High Speed Data Module. The essentials include:

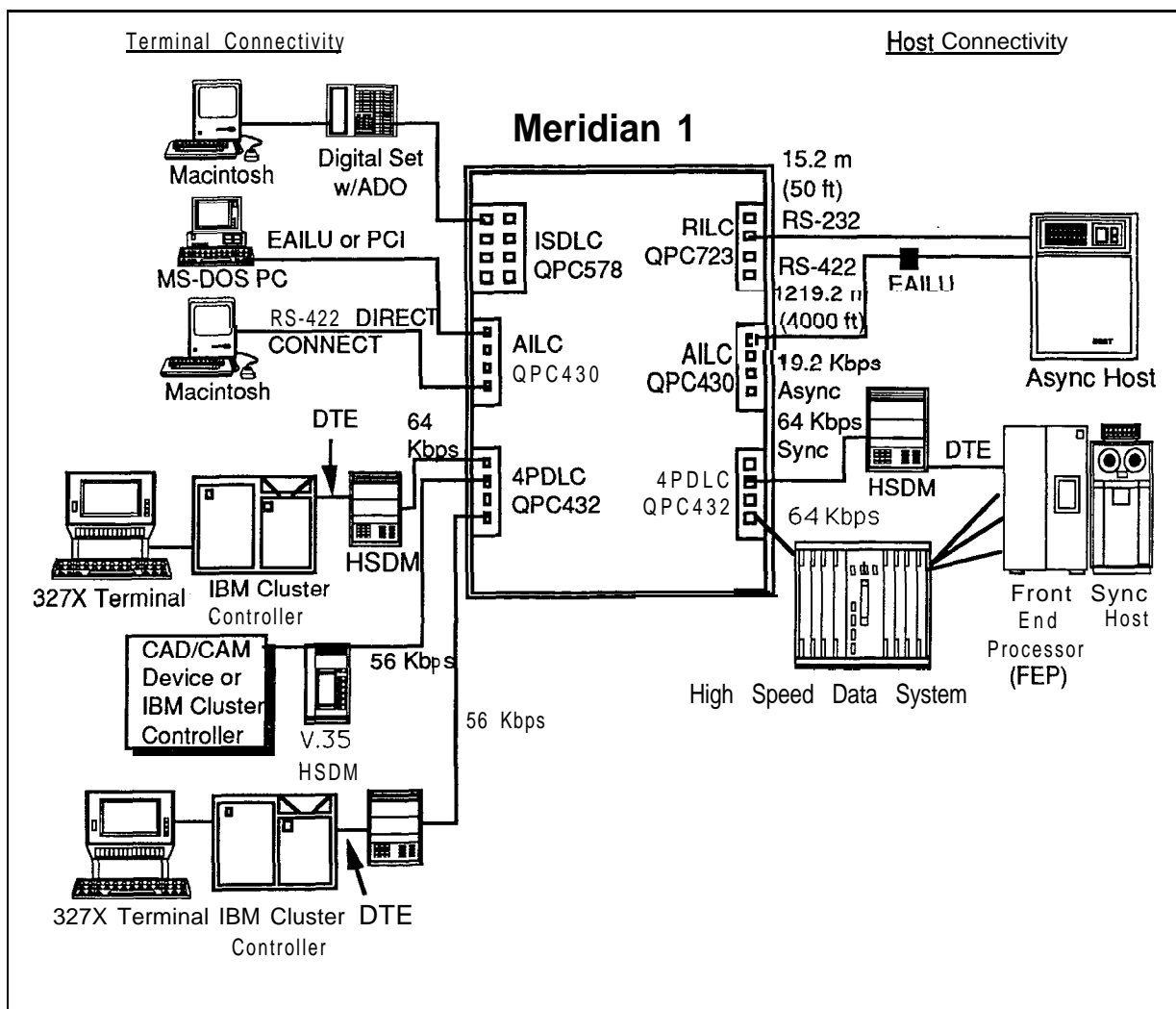
- synchronous connectivity up to 64
- asynchronous connectivity up to 19.2 Kbps
- RS232 or V.35 interface
- virtual leased line capability which allows the HSDC to emulate lease-line operation

Interface cards

The High Speed Data System connects to a 4 Port Data Line Card (QPC432) or the Data Line Card (QPC397). Both cards reside in the Peripheral Equipment Module of the Meridian 1.

For technical specifications on the MCDS - Multi Channel Data System, refer to "Data Services Host Connectivity" in this Chapter.

Figure 6-9
ADM, EAILU, HSDM, & HSDS



Multi-Channel Data System (MCDS)

The MCDS provides high density asynchronous host connections. It is an asynchronous rack mounted Add-on Data Module system that allows the efficient connection of multiple computer ports.- The MCDS consists of multiple Add-on Data Module equivalent circuit cards which are mounted together in a compact rack with a common power supply. This arrangement provides space savings, and a lower power requirement than with individual ADMs.

Asynchronous, Answer-Only

The MCDS provides an asynchronous answer-only interface between multiport computers and the Data Line Cards. The host port cannot originate a data connection using the MCDS .

Physical Configuration

The MCDS consists of:

- Desk mount cabinet (QCA77)
- Rack mount cabinet (QCA76)
- Shelf (QSD27)
- MCDS Asynchronous Card (QPC397)
- Power supply (QSY27)

Acting as an Add-on Data Module, each MCDS Asynchronous Card (MCDS-AC) is capable of connecting to 4 computer ports. Each MCDS shelf can accommodate up to 8 MCDS Asynchronous Cards, for a total of 32 ports.

Each shelf requires one power supply. An MCDS in a rack-mount cabinet consists of a maximum of two shelves offering a total of 64 ports. The rack has additional room for optional diagnostic equipment.

An MCDS in a desktop cabinet comprises one shelf with associated power supply; a total of 32 ports can be configured.

Operation

The MCDS is designed to operate without operator intervention. Each of its ports can operate independently of the other ports. Each of the sixty-four (64) ports can interface to different host computers operating at different speeds and with different data formats. If desired, all the ports can serve a **single host** computer.

Wiring

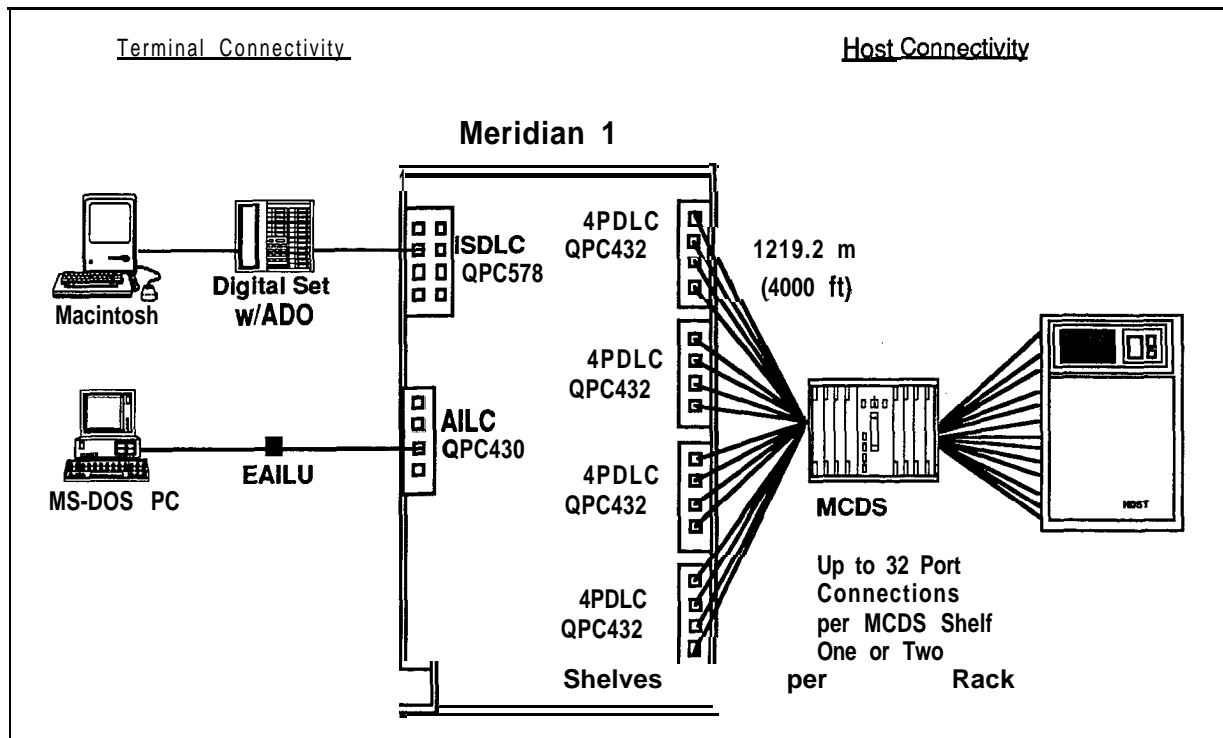
Each port of the MCDS is connected using one twisted pair, and the MCDS equipment can be located up to 12 19.2 m (4000 ft) from the PE Module of the Meridian 1. Industry standard 25-pair telephone cables with **Amphenol** connectors are used to connect the MCDS to the Main Distribution Frame. RS-232 cables are used to connect the host ports to the MCDS.

Interface cards

The MCDS interfaces to the 4-Port Data Line Card (4PDLC) which resides in a Peripheral Equipment Module of the Meridian 1.

Note: If the customer does not require distances up to 1219.2 m (4000 ft) between the Peripheral Equipment (PE) Module and to the host ports (i.e. the PBX is in the same room as the host computer), the RILC may be a more cost effective alternative for asynchronous host connectivity.

Figure 6-10
Multi-Channel Data System



Integrated Services Digital Network-Applications Protocol — (ISDN/AP)

In today's competitive business environment, success is dependent upon the intelligent application of voice and data communication services to meet strategic business objectives.

ISDN Applications Protocol (ISDN/AP) provides integrated host computer and PBX functionality. It is designed to give networks the capability to provide comprehensive solutions to complex business communications problems.

ISDN Applications Protocol is a powerful link that brings together the call processing capability of the versatile Meridian 1 with the host computer ability to process vast amounts of information. Together, they combine to create highly efficient corporate communications networks.

The intelligent link

ISDN/AP allows the Meridian 1 to receive messages from a host computer requesting various call processing functions and allows the Meridian 1 to return status messages to the computer that provide real-time information about the progress and status of requested actions. Consequently, ISDN/AP now allows users, via their application program, to tie previously separate PBX and computer functions into a single, integrated process.

Function

ISDN/AP is an RS-232 or RS-422 synchronous link, presently based on a Northern Telecom proprietary protocol. It operates at speeds up to 64 Kbps. The functions provided by ISDN/AP include the following:

- Call processing
- Call status
- Incoming call notification,
- Directory number update
- Integrated messaging
- System maintenance and administration.

ISDN-AP initial applications

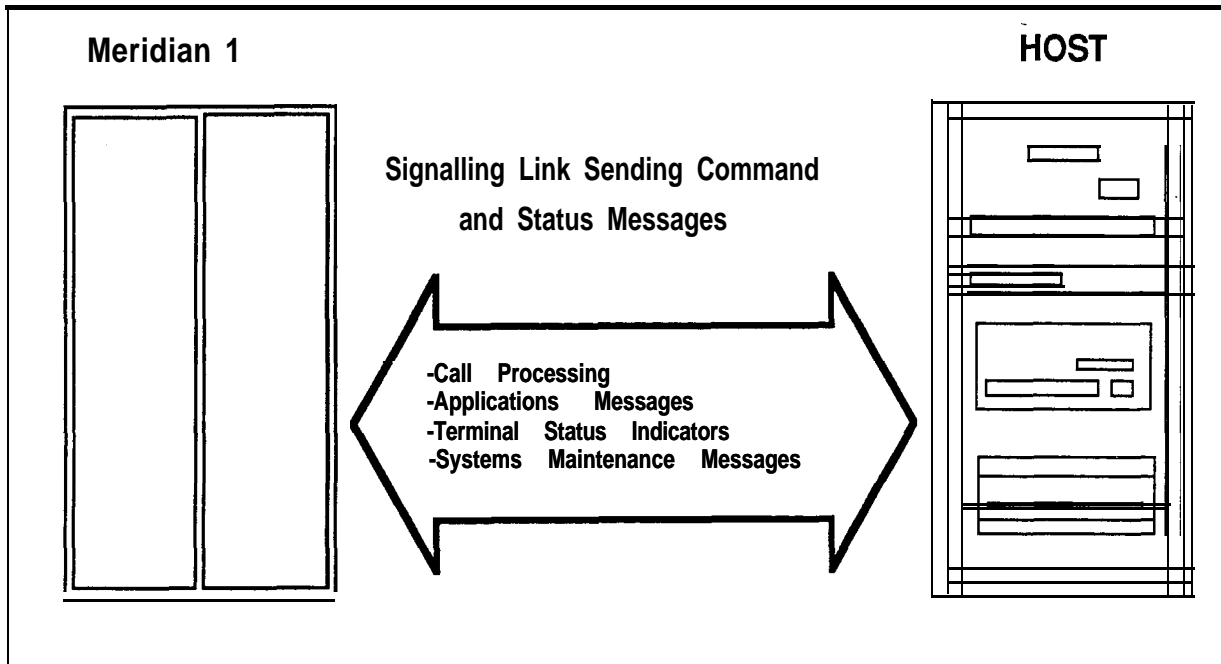
The following are initial applications being developed by Digital Equipment Corporation: --

- Telephone Support Center — allows an incoming or outgoing call to be associated with a database resident on the VAX such as a customer history file or a telemarketing script. This service allows voice and data calls to be simultaneously and repeatedly transferred. Applications include telemarketing, operations and services, repair and dispatch centers.
- Directory Look-up and Automated Directory Dialing — allows a user to scroll through a corporate or personal directory in a VAX database and place a call to anyone via a single keyboard entry.

..

- Automatically Formatted E-Mail Message on Busy or No Answer — automatically formats an Electronic-Mail message (To, From, Brief Message) when a voice call placed through the above application is not completed.
- Message Center — allows users to forward personalized itinerary and message instructions to a centralized Message Center.

Figure6-11
Integrated Services Digital Network/Applications Protocol



IBM connectivity

Northern Telecom continues to lead the way in providing switched and dedicated connectivity in IBM environments. Products available for connecting to IBM devices include the following:

- PC Interface Card (**PCI**) - for MS-DOS Personal Computer direct connection to the Meridian 1
- Coax Elimination and Switching System (**CESS**) - for VT-100 emulation, 3270 host access, and reduction of coaxial cable needs for 3270 terminals
- EasyLAN with Meridian Extension - for cost effective printer and resource sharing among IBM PCs and clones
- **Baluns** - for coax, twinax, and dual coax wiring reduction
- High-Speed Data Module - for networking of cluster controllers and front end processors (See “Data Services Terminal Connectivity” and “Data Services Host Connectivity” in this Chapter)
- RS-232 Interface Line Card (**RILC**) direct connection to third-party protocol converters for PC or asynchronous terminal access to IBM computers. (See “Data Line Cards” in this Chapter)

Meridian Data Services provides flexible and cost-effective solutions to enhance IBM PC, 3270 terminal, and IBM host data communications.

IBM personal computers may be connected to the Meridian 1 by three main methods:

- the Asynchronous Data Option (ADO) in a Northern Telecom M2000 or M3000 digital telephone
- the Enhanced Asynchronous Interface Line Unit (EAILU) if an RS-232 port is provided
- the PC Interface Card (**PCI**) that plugs into an expansion slot on the PC motherboard

One may also use an ASIM which, like the EAILU, connects to the PC via the RS-232 serial port. The ADO, EAILU, and ASIM are discussed in “Data Services

After the IBM PC is connected to the Meridian 1, the user can take advantage of the numerous circuit switched applications that the Meridian Data Network provides. For low-cost local area networking, Northern Telecom provides EasyLAN with Meridian Extension that gives MS-DOS PCs connected to the Meridian 1 the ability to share files and printers - the two most prevalent uses of LANs.

In addition to being able to connect IBM PCs to the Meridian 1, a number of ways exist to connect different IBM terminals (see also "Data Services Terminal Connectivity" in this Chapter). This section focuses on coaxial cable reduction and replacement via twisted pair wiring. Twisted pair wiring is cost-effective and allows for easier moves and changes compared with coaxial cable.

Host computers can be connected to the Meridian 1 in a number of ways including the new High-Speed Data Module that provides 64 Kbps clear channel synchronous transmission (see "Data Services Host Connectivity" section).

Personal Computer Interface Card (PCI) — QPC512

The Personal Computer Interface Card (PCI) is a PC expansion card which installs directly inside an MS-DOS compatible personal computer, using any available expansion slot. The PCI card is used to provide an RS-422 connection to the Meridian 1.

If the PC has no slots available but is equipped with an RS-232 serial port, the EAILU can be used; alternately, the ASIM or ADO may also be used (see also "Data Services Terminal Connectivity" in this Chapter).

Speeds

The PCI Card supports asynchronous speeds up to 19.2 Kbps. The PCI card may be used to access asynchronous host computers, printers and other personal computers.

The personal computer user may access an IBM host by making a data call through a Meridian 1-compatible 3270 Protocol Converter or 3270 Emulator. Northern Telecom has found the Perle and Local Data protocol converters to be compatible with the RILC and AILC. The RILC can also be connected to several other IBM protocol converters. (See "Third Party Compatibility Testing Program" in this Chapter).

Communications software

The PCI requires a communications software package (such as Crosstalk XVI or Smartcom III). Such software allows the personal computer to emulate an ASCII terminal, so that the user can dial from the keyboard to make data calls. This software may also be used to transfer files between personal computers, or between a personal computer and a host computer.

File transfer

File transfer from PC to PC and from PC to Macintosh can be performed with either ASCII file transfer (using X-on/X-off flow control) or binary transfer (using the XModem protocol). Transmission speeds up to 19.2 Kbps are supported by the PCI card (although the PC itself may be limited to 9600 bps).

Operation

Data calls are placed directly from the personal computer keyboard, allowing access to such features as Auto Dialing, Speed Calling, Ring Again, and Modem Pool Calling.

Communications software can simplify data calling by allowing the user to create automatic log-on script files.

Wiring

The PCI requires two twisted pairs, and may be located up to 1219.2 m (4000 ft) from the Meridian 1. One additional pair may be used to connect a Unity series telephone or other 500/2500 type set. The PCI card provides an extra telephone jack for connecting the telephone set.

Interface cards

The PCI interfaces directly to a port on the Asynchronous Interface Line Card (AILC). The AILC resides in a PE module of the Meridian 1. The telephone set connected via the PCI card also requires a port on the appropriate line card.

Table 6-1
IBM PS/2 connectivity to Meridian 1

	PCI	EAILU	ADO	ADM	ASIM	HSDM
PS/2-25	yes	yes (Note 1)	yes (Note 1)	yes (Note 1)	yes (Note 1)	yes (Note 1)
PS/2-30	yes	yes (Note 1)	yes (Note 1)	yes (Note 1)	yes (Note 1)	yes (Note 1)
PS/2-30(286)	no (Note 3)	yes (Note 1)	yes (Note 1)	yes (Note 1)	yes (Note 1)	yes (Note 1)
PS/2-50	no (Note 2)	yes	yes	yes	yes	yes
PS/2-60	no (Note 2)	yes	yes	yes	yes	yes
PS/2-70 n	o (Note 2)	yes	yes	yes	yes	yes
PS/2-80 n	o (Note 2)	yes	yes	yes	yes	yes

Note 1: IBM PS/2 Models 25 and 30 can use listed dataconnection if the PS/2 has a serial (RS-232) communications port installed. The EAILU is recommended for best price-performance.

Note 2: IBM PS/2 Models 50, 60, 70, and 80 come with a serial (W-232) port installed as standard equipment therefore the PCI is not necessary. Either the EAILU or ADO is recommended instead.

Note 3: The PC Interface Card is incompatible with the PS/2 Model 30-206, due to a change-in the UART (Universal Asynchronous Receiver/Transmitter) used by this particular PS/2 computer.

For more information, refer to Sales and Marketing Bulletin 331-G, March 1988.

Coax Elimination and Switching System (CESS)

The Coax Elimination and Switching System access IBM and ASYNC hosts from a single 3270 terminal. It substantially eliminates the need for coaxial cable between IBM 3270 display terminals and IBM cluster controllers, replacing the coax with standard twisted pair wiring. IBM terminal users can have switched access to asynchronous and IBM hosts and to multiple controllers. The controller ports can be shared by many additional users through port contention.

VT1 00 terminal emulation

By using the Coax Elimination and Switching System (CESS), one gains access to the ASCII world from a 3270 terminal. Screen menus assist in the selection of ASCII or IBM mode and any desired call set up parameters. In ASCII mode, the IBM 3270 emulates a DEC VT 100 or VT52 terminal.

Reduction of coaxial cabling

The Coax Elimination and Switching System enhances the value of an IBM 3270 display terminal and minimizes installation and relocation expenses.

By using Coax Interface Modules (CIMs), coaxial cabling can be replaced with standard twisted pair wiring. Standard twisted pair wiring provides flexibility and growth for your data network • moves and changes are easier and less expensive to administer.

Meridian 1 advantages

The Meridian 1 switching capability enhances any data network. Port contention eliminates the requirement to have a dedicated controller port per terminal.

In situations where terminals do not need dedicated access, multiple terminals may use the concentration functions of the Meridian 1 to share a smaller number of controller ports. The reduction in the number of ports required results in cost savings.

Multiple controllers with different protocols

The Multi-Channel Coax System (MCCS) can be connected to multiple cluster controllers using the same or different protocols (e.g., SNA/SDLC, BSC).

Operation

The Coax Interface Module provides the Hotline feature, as well as keyboard dialing and Auto Dial directly from the terminal keyboard. --

System configuration

The Coax Elimination and Switching System consists of individual Coax Interface Modules (CIMs) for connection of terminals to the Meridian 1, and a Multi Channel Coax System (MCCS) for connection of cluster controllers to the Meridian 1. The MCCS consists of up to sixteen (16) Coax Interface Cards (CIC). Each CIC has two (2) ports, which means that the MCCS can accommodate a maximum of 32 ports.

Wiring (switched connection)

The IBM 3270 terminal is connected to the CIM via coaxial cable. The CIM is connected to the Meridian 1 via one twisted pair of wires.

Additional wire pairs may be used to support an SL-1 set or a standard 500/2500 telephone.

The MCCA is connected to the cluster controller via coaxial cable. On the Meridian 1 side, the MCCA connects to the 4PDLC card via twisted pair telephone wiring.

Non-switched connection

The CIM can be directly connected to a cluster controller port to provide a non-switched connection between an IBM 3270 terminal and associated cluster controller. This configuration can be employed where there is a need to eliminate a substantial amount of coaxial cable used by terminals with no requirement for switched access to other computers.

Inactivity timer

The CIM includes an inactivity timer which will drop a terminal user's connection through the SL-1 after a user-defined period of inactivity. This timer can be used to provide improved access to computer ports by disabling connections which are not being actively used.

112.6 km (70 miles) via RPE

Using Remote Peripheral Equipment (RPE), the IBM cluster controller may be located up to 112.6 km (70 miles) from its terminals. Refer to "Data Services Wide-Area Networking" section for more information on RPE.

Interface cards

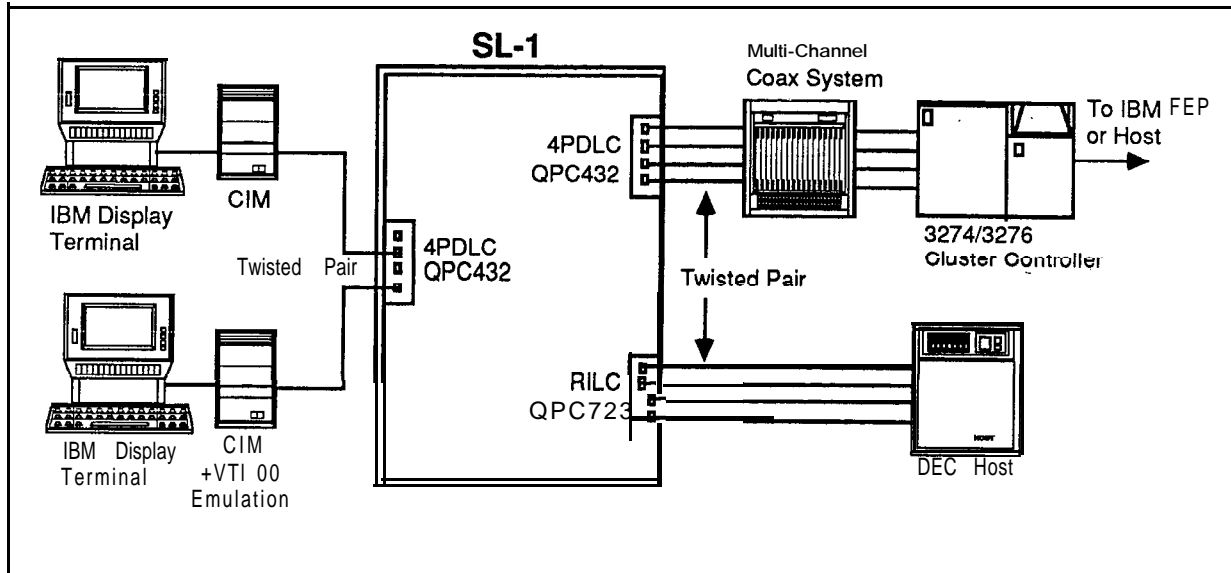
The CIM and CIC connect to the 4-Port Data Line Card or to spare data ports on the Data Line Card. These cards reside on a Peripheral Equipment shelf of the Meridian 1. Note that the AC vintage or later of the Coax Interface Card is required for connection to Model 3174 cluster controllers.

Terminals supported

CESS supports the following IBM terminals and personal computers:

- 3191 (in 3278 emulation mode)
- 3178 ..
- 3278 (Models 2 through 5)
- 3279 (Without Program Symbols and Color Convergence),
- 3 179 (in 3279 emulation mode)
- 3 180 (in 3278 emulation mode)
- **3270-PC** (in CUT mode, without file transfer or program symbols)
- IBM PC with IBM **3278/79** coax cards or with IRMA boards (operating in 3278 emulation mode, without file transfer or program symbols)

Figure 6-12
Coax Elimination and Switching System (CESS)



Baluns

Baluns (which stands for balanced to unbalanced impedance matching devices) provide a connection via standard twisted pair wiring for many different terminals that otherwise need special cable. The Balun products are a non-switched data offering. Baluns let you reduce cable requirements and provide easy terminal installation.

Baluns free you from the burden and expense of installing and maintaining coax, dual coax, or **twinax** cable throughout your facilities. You can use ordinary telephone wiring in your building to connect terminals directly to computers. The three different types of Baluns available are listed below.

CTP-1 for IBM 3270 devices — MVC02031

The CTP-1 Balun is used to connect any IBM 3270 Coax A Device, or any other manufacturer's device that supports the same signal characteristics as the Coax A signal, to 24 AWG twisted pair wire.

The Baluns are used in pairs. One of the pairs is connected to the terminal and the other is connected to the cluster controller.

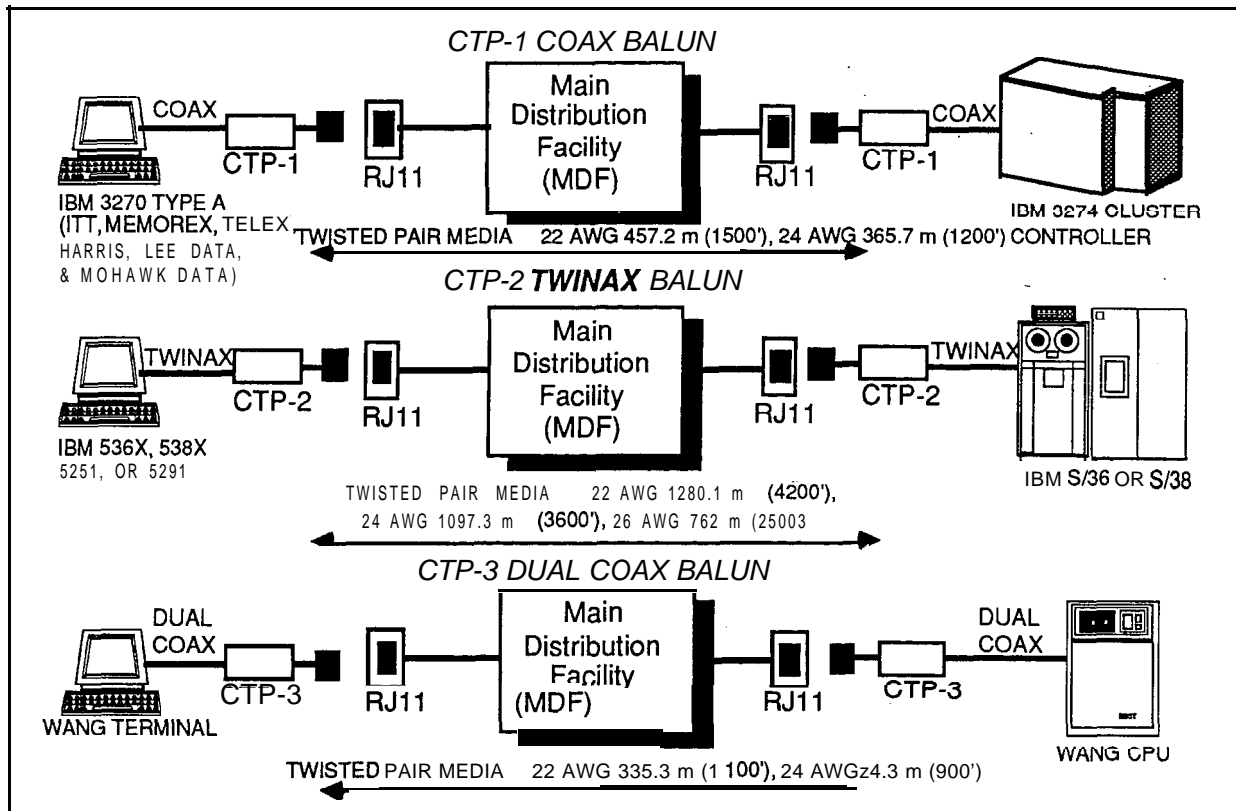
CTP-2 for IBM System 34/36/38 Terminals — (MVC02032)

The **CTP-2** Balun matches the impedance from twinaxial cable to twisted pair cable. This allows signals from any of IBM 536X or 538X System unit and connectable terminals and controllers to be transmitted over one pair of twisted pair cable instead of twinaxial cable.

CTP-3 for Wang Office Products — (MVC02033)

The CTP-3 Balun for Wang systems provide a cost-effective alternative to standard dual coaxial cabling systems.

Figure 6-13
Baluns

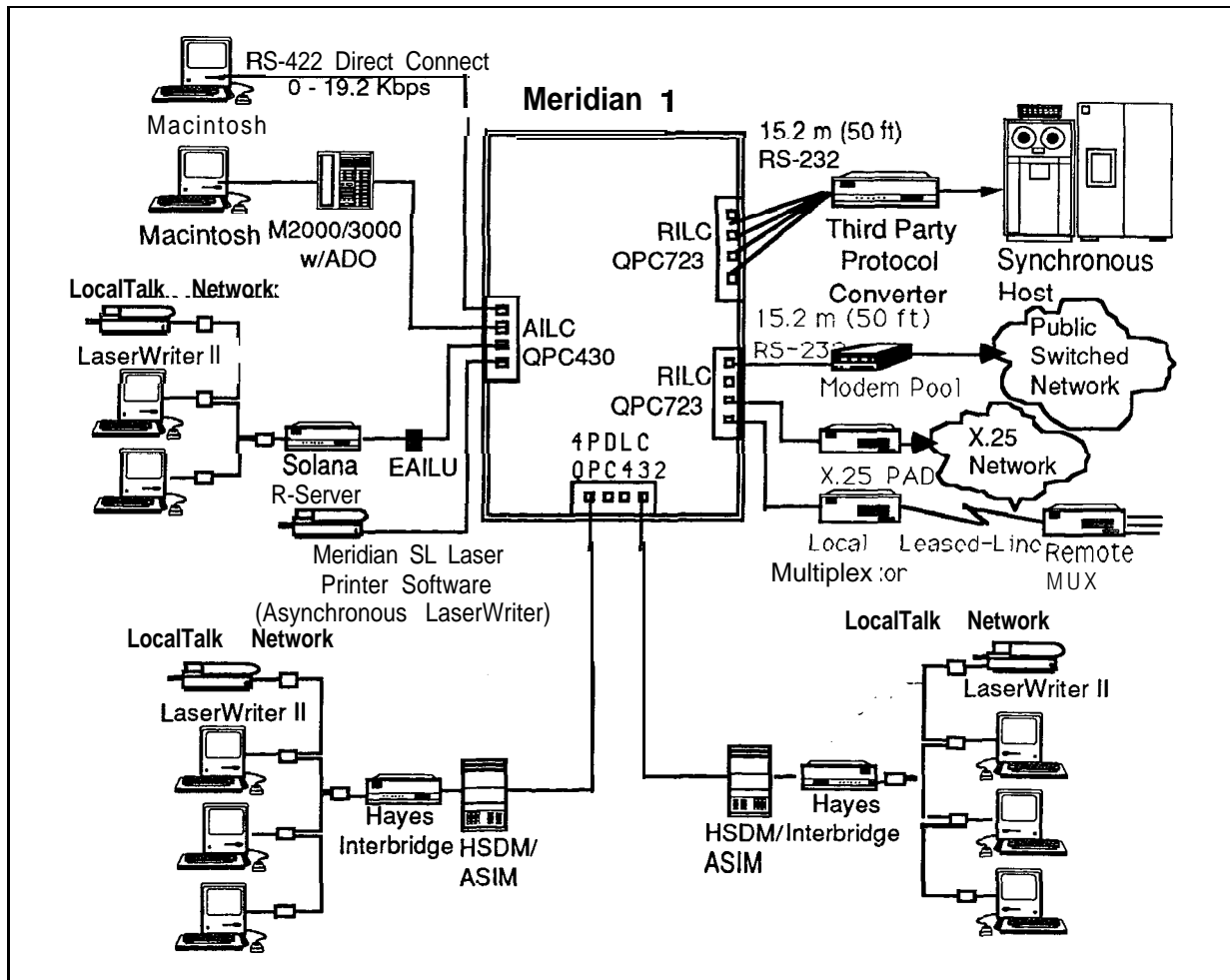


Macintosh Connectivity

Northern Telecom, a leader in Macintosh Connectivity, provides a number of solutions for integrating Apple Macintosh products into the circuit-switched data environment of the Meridian 1. With a Macintosh connected to the Meridian 1, users can gain access to multiple host computers and to a wide area network of services provided via connected X.25 PADS and modem pools.

A number of ways exist to connect Macintoshes to the Meridian 1. Using a Meridian Modular Telephone equipped with an Asynchronous Data Option (ADO), or MPDA, a Macintosh can be connected to a Meridian network via an RS-232 to DB9 or DIN8 cable (See also "Data Services Terminal Connectivity" in this Chapter). In the absence of Northern Telecom digital telephones, a direct RS-422 cable can be used. The cable connects directly to the Meridian 1 Asynchronous Interface Line Card and allows the Macintosh to be 1219.2 m (4000 ft) from the switch.

Figure 6-14
Macintosh connectivity



Direct RS-422 connection

Direct Macintosh connectivity:

- DB9-to-RJ11 - (A0326760)
- DB9-to-DB25 - (A0326761)
- DIN8-to-RJ11 - (A0326762)
- DIN8-to-DB25 - (A0326763)

The Macintosh (and asynchronous terminals which provide the RS-422 interface) can be connected directly to the Meridian 1 without the need for a data module.

Both the Macintosh and LaserWriter printer may be connected directly to a port on the Asynchronous Interface Line Card providing a simple and inexpensive connection to the Meridian 1

Asynchronous transmission up to 19.2 Kbps is supported. The Macintosh may be used to access asynchronous hosts, IBM hosts (through third-party protocol converters), packet switching networks (through an X.25 PAD), modem pools and other personal computers.

Communication software

ASCII terminal emulation software such as MacTerminal must be used. The software used should provide the "long break" function (1.6 seconds) for disconnecting data calls.

File transfer

File transfer from Mac to Mac and from Macintosh to PC can be performed at speeds up to 19.2 Kbps, with either ASCII transfer (using X-on/X-off flow control) or binary transfer (using a protocol common to both computers, such as Xmodem).

Operation

The Macintosh user can take advantage of Meridian 1 data call processing features such as Auto Dial, Speed Calling and Ring Again. Data calls are placed using the Mac keyboard.

Wiring

Direct RS-422 connections require two twisted pair of wires, allowing the Macintosh computer to be located up to 1219.2 m (4000 ft) from the Meridian 1. The Macintosh Plus, SE and II have a DIN8 connector. Macintoshes older than the Macintosh Plus (including the Macintosh 512K) use a DB9 connector.

Simple cable connection

Meridian Data Services offers cables with DIN8 and DB9 connectors and which terminate in RJ11 connectors (for direct RS-422 connection) and DB25 connectors

(for connection to ADO or EAILU). Simply plug the appropriate cable into the Macintosh modem port, and plug the other end of the cable to an ADO or a wall jack to complete the data connection to the Meridian 1 .

Interface card

The Macintosh interfaces directly to the Asynchronous Interface Line Card (AIRC). This card resides on a Peripheral Equipment module of the Meridian 1.

Meridian SL laser printer software package — (NPS50396-16L1)

Macintoshes not connected to an AppleTalk network now have the ability to share a laser printer by using the Meridian SL laser printer software package. This software package provides laser printer sharing without the need for a LAN. Using standard phone wire and the Meridian 1, the installation is simple and cost-effective.

Features and benefits

The Meridian SL laser printer software package provides the following advantages:

- Dial-up access from any Macintosh
- Standard queueing just like AppleTalk for the LaserWriter via Camp-On
- Distances up to 2438.4 m (8000 ft)
- At 19.2 Kbps printing times are nearly equal to AppleTalk. Printing time **slows** when a modem connection is employed
- Uses existing Meridian 1 phone wires
 - Readily adapted for other families of modems and other communications equipment by using the included Asynchronous Connection Language (ACL) facility

Set-up

Any number of Macintoshes connected to the Meridian 1 via Data Services equipment such as the Direct RS-422 cable can access a Meridian 1 -connected LaserWriter. The LaserWriter is connected to an Asynchronous Interface Line Card (AILC) on the SL-1 by an RS-422 Direct Connect cable. Once the software is set-up, there is no appreciable difference between the usual way of printing and the Meridian SL Laser Printer software method, with the exception that the Macintosh does not need to be connected to an Apple talk network. The Macintosh can be located up to 2438.4 m (8000 ft) from the LaserWriter.

Requirements

- One or more Apple Macintosh personal computers with a minimum of 5 12K memory
- Apple LaserWriter, LaserWriter Plus, LaserWriter II
- Meridian SL laser printer software package
- Macintosh Data Services connection
- RS-422 direct connect or
- Asynchronous data option/Meridian Programmable Data Adapter (MPDA) LaserWriter connection
- DB9 - RJ1 1 cable

Hayes Interbridge

AppleTalk is a superb local area network for small centralized groups (up to 32 users and 304.8 m (1000 ft)). To serve the needs of the entire organization, Hayes Interbridge, in conjunction with a Meridian 1, allows for the addition of users to the network at distances up to 2438.4 m (8000 ft), in different buildings, and on different floors.

An integrated network

Networks that can be reached by a Meridian 1 can be linked-together. Macintosh applications such as InBox (an electronic mail package) will be available to all users. File servers such as AppleShare and laser printers such as the LaserWriter can be accessed by all users across the bridge and through the Meridian 1. Each Interbridge can support the connection of two AppleTalk networks via software supplied with the Interbridge, working in conjunction with a connection to the Meridian 1 provided by an Asynchronous/ Synchronous Interface Module (ASIM) and associated line card port.

With AppleTalk local area networks connected to the Meridian 1, each user will have access to multiple host computers and to a wide network of services via X.25 PADs and modem pools also connected to the Meridian 1.

Solana R-Server

Macintosh users can use the Meridian 1 to join an AppleTalk network on a dial-up basis, using the R-Server terminal server product from **Solana** Electronics.

NetAccess software provided with the R-Server allows Macintosh users to dial (manually or automatically) through the Meridian 1 to connect to a local R-Server. Remote access (e.g. dial-up access from Mac at home) is also available via inbound modem pooling.

The R-Server can connect to the Meridian 1 via the RILC or via the EAILU connected to the AILC.

One limitation of R-Server access with the Meridian 1 is that queuing is not supported. For instance, if the R-Server being called is busy, the Mac user would have to re-try the connection at a later time. **Despite this limitation, the R-Server is a powerful device for extending the benefits of AppleTalk LANs to local and remote Mac users.**

Data Services Wide Area Networking

With the Meridian 1, you have access to a wide range of services from X.25 public and private networks to remote host computers and terminals.

The following are the various advantages of Data Services Wide Area Networking,

- High-Speed Data Module (HSDM) with virtual leased line capability offers cost effective data networking
- Modem pools provide access to a wide variety of services over analog telephone lines
- Digital Trunk Interface (DTI) extends the capabilities of the Meridian 1 to allow digital wide area voice and data services over T-1 carrier communication links
- Primary Rate Access (PRA) gives Meridian 1 users ISDN wide area networking features and benefits
- Remote Peripheral Equipment (RPE) provides the capability to connect a peripheral equipment shelf up to 12.6 km (70 miles) away from the Meridian 1 via T-1 carrier facilities

High-Speed Data Module (HSDM) — QMT21

The High-Speed-Data Module (HSDM) provides all the functionality of the ASIM but adds the ability to support 64 Kbps data transmission for ISDN applications. Upgrading an HSDM from 56Kbps to 64 Kbps requires no change to the module or associated line card; a simple speed selector change is all that is required. The HSDM provides versatile functionality for present and future applications.

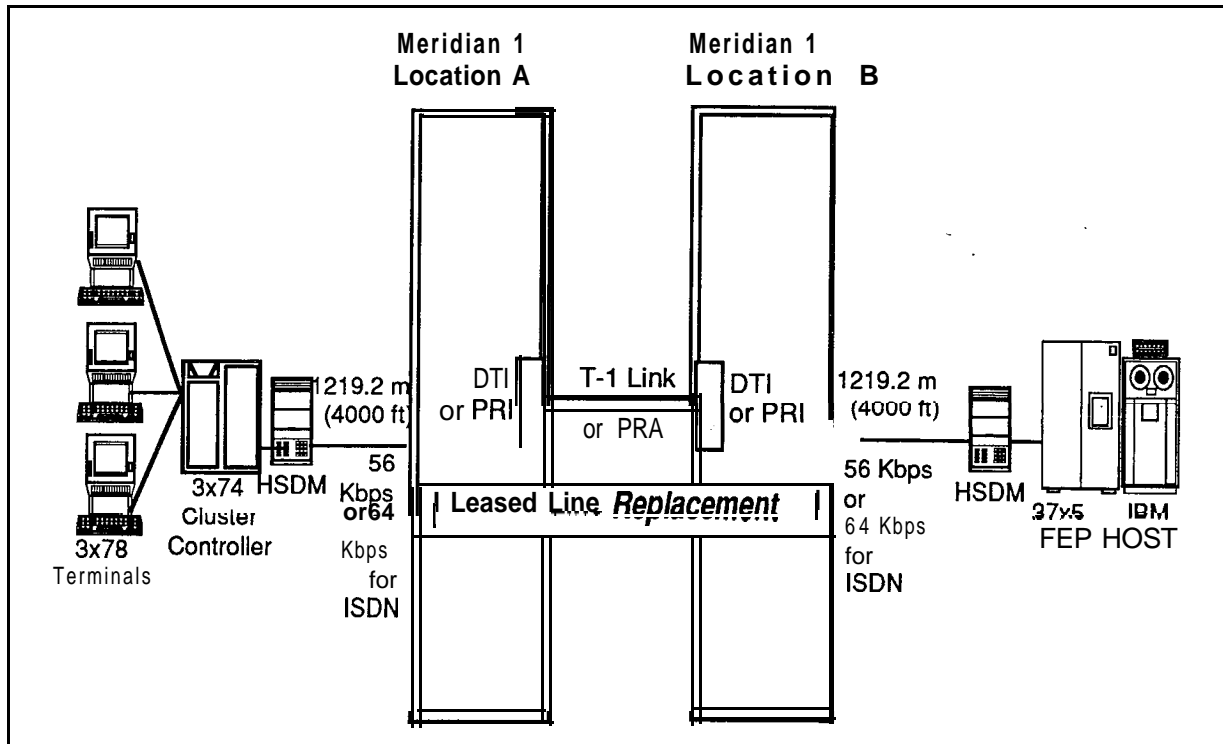
Within a wide area network, the High-Speed Data Module can provide virtual leased line capability. The virtual leased line capability allows customers to gain the benefits of private line service (dedicated access and high availability) while avoiding private line charges.

With the Digital Trunk Interface (DTI) or Primary Rate Interface (PRI), the High-Speed Data Module automatically recovers the line when the line goes down by hotlining until the connection is re-established.

For connection to V.35 DTE, the HSDM provides a more cost-effective solution than V.35 ADM (QMT12).

For more information on HSDM, see also “Data Services Terminal Connectivity” and “Data Services Host Connectivity” in this Chapter.

Figure 6-15
High-Speed Data Module (HSDM) — QMT21



Modem pooling

Modems are required for data communication between remote devices over analog telephone lines. In the Meridian 1, a modem may be used as either a stand-alone modem or as part of a modem pool. Modem Pooling refers to dial-up modems configured in a group for data calling over analog trunks to remote computers (also equipped with modems).

Modem pooling allows modems to be shared across all dial-up trunks (analog) as well as among all users. Since many users do not need a dedicated modem for full-time use, Modem pooling can provide considerable cost savings, while making modem communications available to many more users.

The call accounting functions of the Meridian 1 can be used to monitor data calling activity and to better manage system facilities. Users can also take advantage of Meridian 1 features such as hunting and ring again. Substantial cost savings may be achieved by using Automatic Route Selection for outbound modem calls.

Modem pools organized by modem type

The Modem pools are organized according to modem type, modems of the same speed and transmission mode are placed together in the same pool. Several modem pools may be configured according to the customer's requirements.

Outbound/inbound modem pooling

Outbound modem pools provide shared access to remote data environments for terminal and personal computer users. Inbound modem pools provide shared access to Meridian 1 data services for remote **terminal** and workstation users. Modem pools can be configured in a variety of ways depending on the individual requirements. If “smart” modems are utilized with the RILC, inbound and outbound modem pools can be configured using the same modems, significantly reducing hardware requirements. Modem pools can also be configured separately.

Placing a modem pool call

The user places a remote data call by keyboard dialing to the modem pool DN (Directory Number) through the use of a communications software package. The Meridian 1 reserves a modem for the call, prompts the user for the telephone number of the far-end modem, and instructs the reserved modem to place the call.

Modem pooling hardware, wiring and interface cards

A number of different configurations exist for connecting a modem pool to the Meridian 1. A standard configuration is to set the smart modems up in both an inbound and outbound mode reducing the need for additional hardware. In this configuration, The RILC must be configured as an SL-1 set only. When the RILC is programmed as an SL-1 set, the 1 station hunting for the outbound modem access should be in the opposite direction to the **500/2500** station hunting for the inbound modem access.

A standard way to connect modems to the Meridian -1 would be to connect the PBX to a Main Distribution Frame (**MDF**) from which a patch panel or octopus cable can be **connected**. These wiring schemes provide the high density cabling required for the modem pool configuration. (See diagrams).

Figure 6-16
Outbound/inbound modem pooling configuration

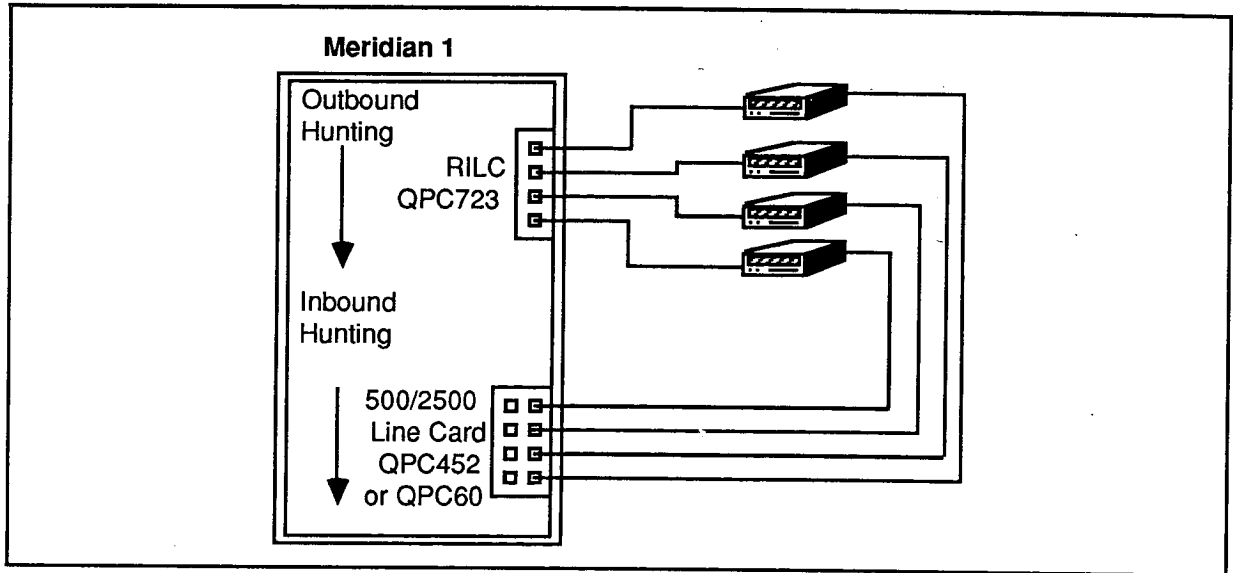
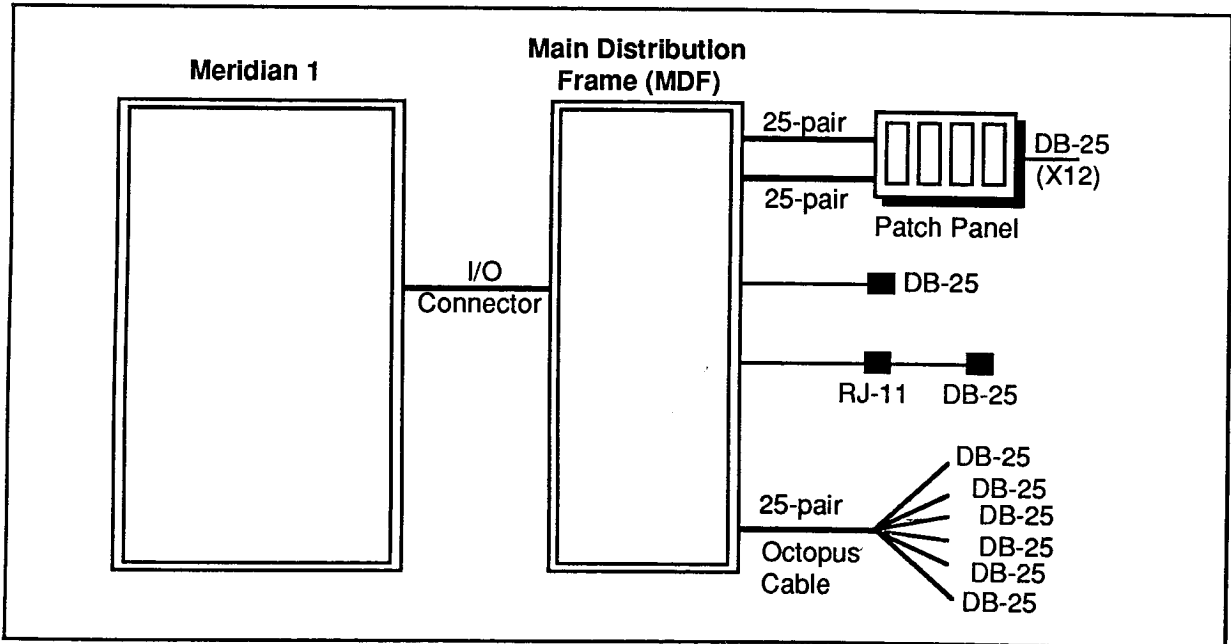


Figure 6-17
Cabling options to data equipment (modems connect to DB-25)



Digital Trunk Interface (DTI) QPC471, QPC472

Digital Trunk Interface (DTI) extends the capabilities of the Meridian 1 to allow digital wide area voice and data service. The user with multiple locations can create a single all-digital network, by utilizing Digital Trunk Interface with T-1 carrier communications links.

Reduced costs with cleaner, faster transmission

The primary benefit of DTI is to substantially reduce costs, but DTI also provides cleaner and much higher speed data transmission than is possible using analog trunks.

North American T-1

In keeping with Northern Telecom commitment to OPEN WORLD, DTI uses the North American industry standard T-1 interface, with the DS-1 signaling format. North American T-1 carrier uses a 1.544 Mbps circuit, subdivided into 24 individual channels which can be used for either digital voice or data communications.

24 channels of 56 Kbps

Each of these 24 channels can support synchronous transmission up to 56 Kbps or asynchronous transmission up to 19.2 Kbps.

Voice or data transmission

Each DTI link can be configured to carry all voice, all data, or a mixture of voice and data. Each channel may also be programmed independently for various digital trunk configurations (CO trunks, FX trunks, etc.).

Systems supported

DTI can be used to communicate voice and data between Meridian 1 systems. DTI can also be used to connect the Meridian 1 to any PBX or Central Office with a suitable T-1 interface.

System requirements

The software associated with DTI must be Generic XI 1 Release 5 or later and must include software option 75 (PBX Interface).

Hardware configuration

DTI consists of two circuit packs:

- QPC471— Clock Controller (maximum 2 per system) . . .
- QPC472/720 — Digital Trunk or Primary Rate Interface (PRI)

Interface

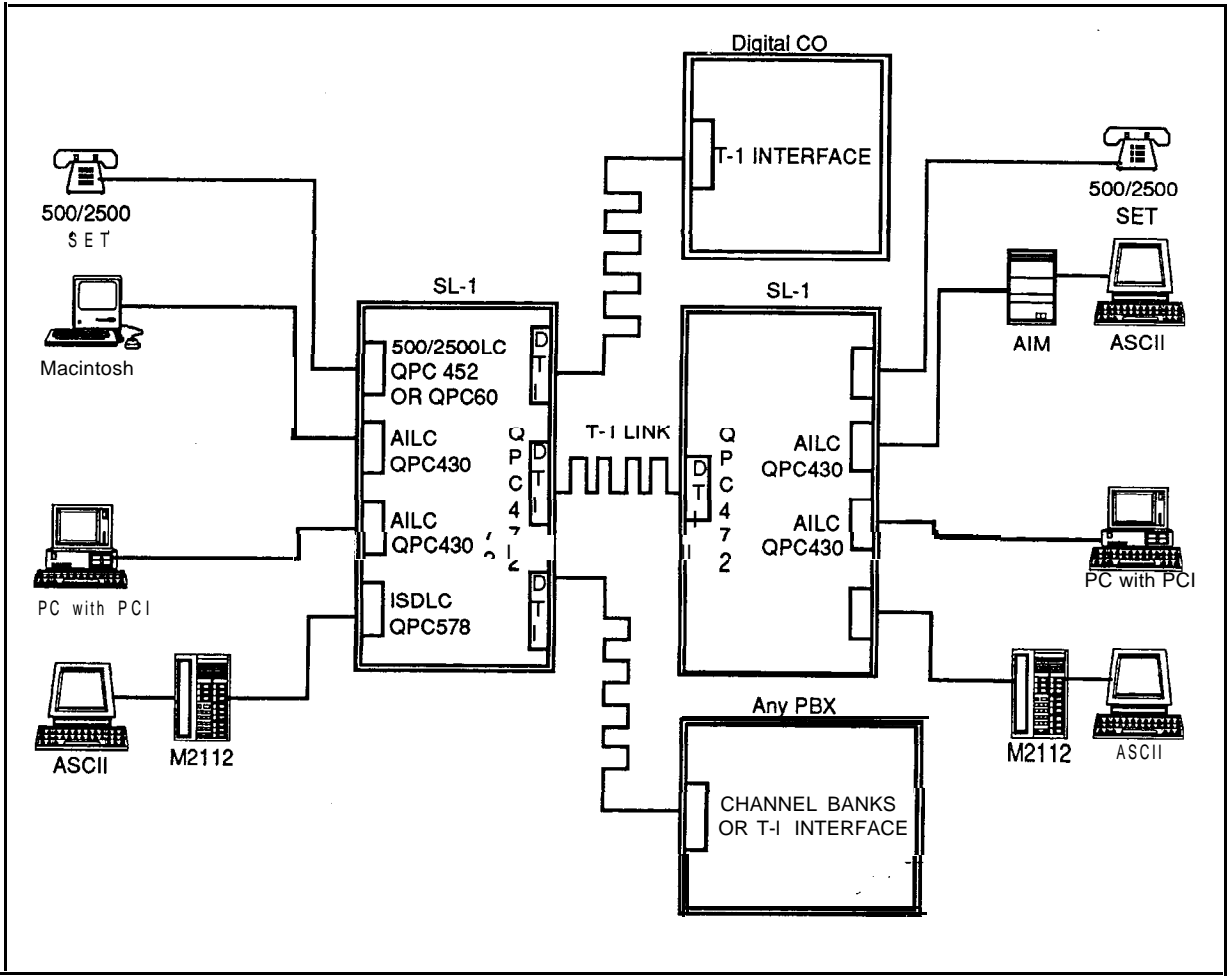
The DTI circuit pack uses 2 card slots and is typically located on a Network Shelf. The clock controller is located on the network module of the Meridian 1 System option 5 1/6 1 and on the CPU module of the Meridian 1 System option 7 1. The

standard configuration with a full network group contains two clock controllers for redundancy. The Meridian 1 System option 5 1 (half network group) requires only one clock controller.

Wiring

Voice and data transmission through DTI circuit pack leaves the Meridian 1 via two twisted pairs of wires. These wires may be directly connected to all available T-1 facilities, including cable, microwave, fiber optics, infrared, or satellite links. If DTI is to be connected to a cable T-1 facility provided by the local telephone company, a 551A-type Channel Service Unit may be required.

Figure 6-18
Digital Trunk Interface



Primary Rate Access (PRA)

Meridian ISDN Primary Rate Access (**PRA**) stimulates development of new applications that fully utilize ISDN networking services. With added capabilities such as integrated voice and data, network-wide feature transparency, and interworking with host computer databases, ISDN PRA provides a platform for innovative networking services.

The following feature rich enhancements enable advanced applications that provide the opportunity to substantially improve worker productivity:

- conducting simultaneous voice and data teleconferencing
- activating Ring Again or Call Forwarding across a network
- notification of a calling party's identity
- improving telemarketing and order entry by automatically linking the calling party's number to a file in a host computer database
- centralizing message services or call detail recording for many locations

ISDN can be added to your Meridian 1 with the simple addition of two circuit packs and selected software options.

Primary Rate Interface (PRI) — (QPC720)

The Primary Rate Interface (**PRI**) circuit pack is a new line card that provides a 1.544 Mbps 24 channel digital link from the Meridian 1 to public and private networks. The PRI allows twenty-four 64 Kbps clear channels, including a 64 Kbps out-of-band signaling channel (**23B+D**). It can also be configured to support T-1 facility access, including Extended Super Frame.

D-Channel Handler Interface (DCHI) — (QPC757)

The D-Channel Handler Interface (**DCHI**) is a new line card that processes ISDN signaling information on the out-of-band signaling channel for basic call connection services such as call set-up, tear down, and feature activation. It implements the **CCITT** defined ISDN LAP-D link layer protocols. The DCHI also provides a single asynchronous Serial Data Interface (**SDI**) port.

XI 1 Release 13 software

XI 1 Release 13 software (and later versions) contains the instructions for interpreting Q.931 signaling on the D-channel. Q.931 is the signaling protocol recommended by the CCITT for ISDN Primary Rate Access. It acts in unison with the DCHI card to switch and route data between devices.

Meridian 1 software features

Meridian 1 software options 117, 118, 145149 are the feature packages which provide user access to enhanced ISDN services (basic call connection features, network calling services, enhanced trunking, and integrated voice and data).

Enhanced data networking

One of the best inherent benefits that ISDN brings to our customers is an all-digital end to end network. Hence, the Meridian 1/ISDN network provides customers with completely digital transmission, high speed private data line replacement, less complex and lower-cost data connectivity, and enhanced wide area networking. Customers will also be able to take advantage of the high speed all digital network for their other data communications requirements, such as coax elimination, 3270 access, X.25 network access, PC to PC networking, and PC to host communication.

**Figure 6-19
Primary Rate Access (PRA)**

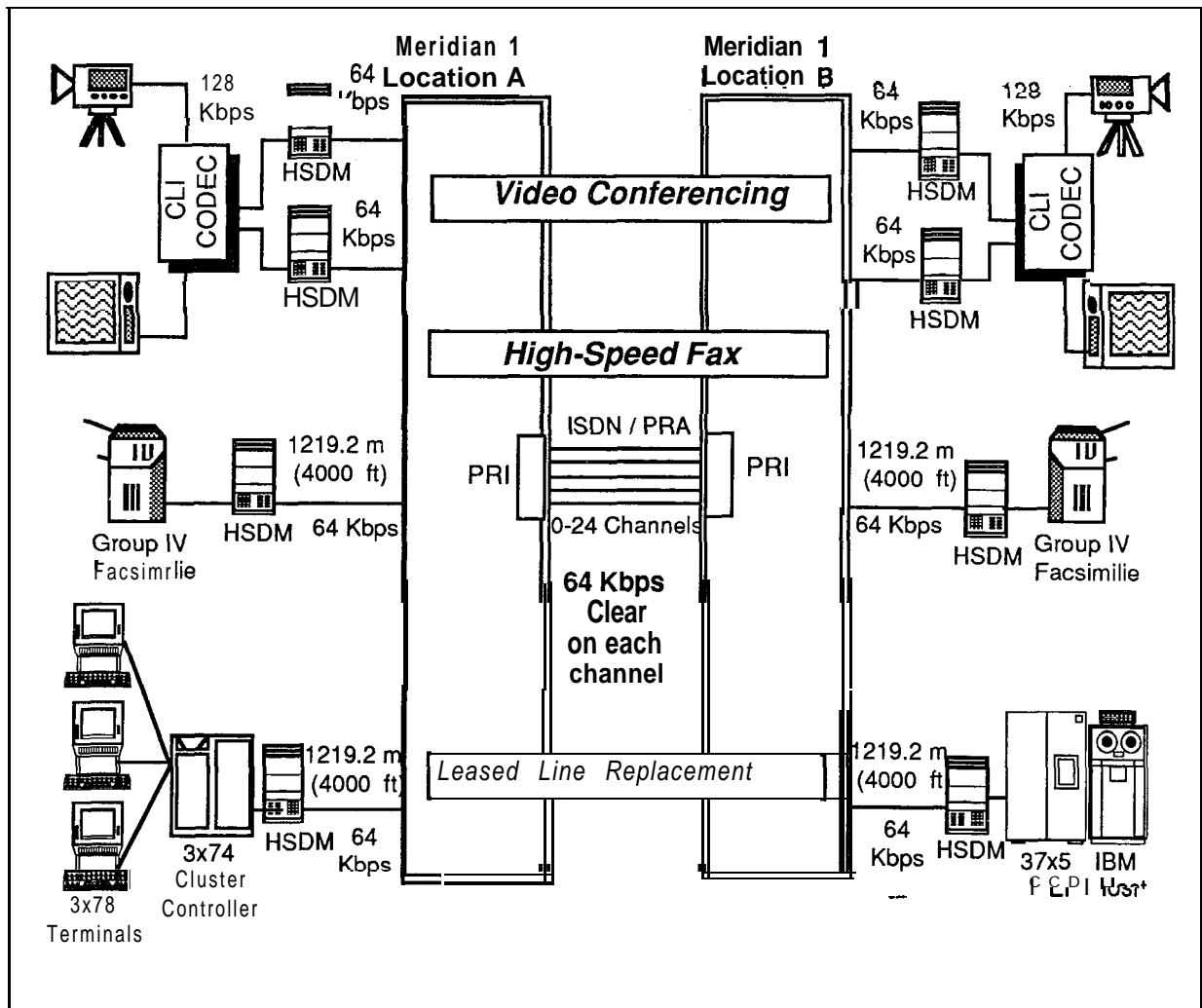
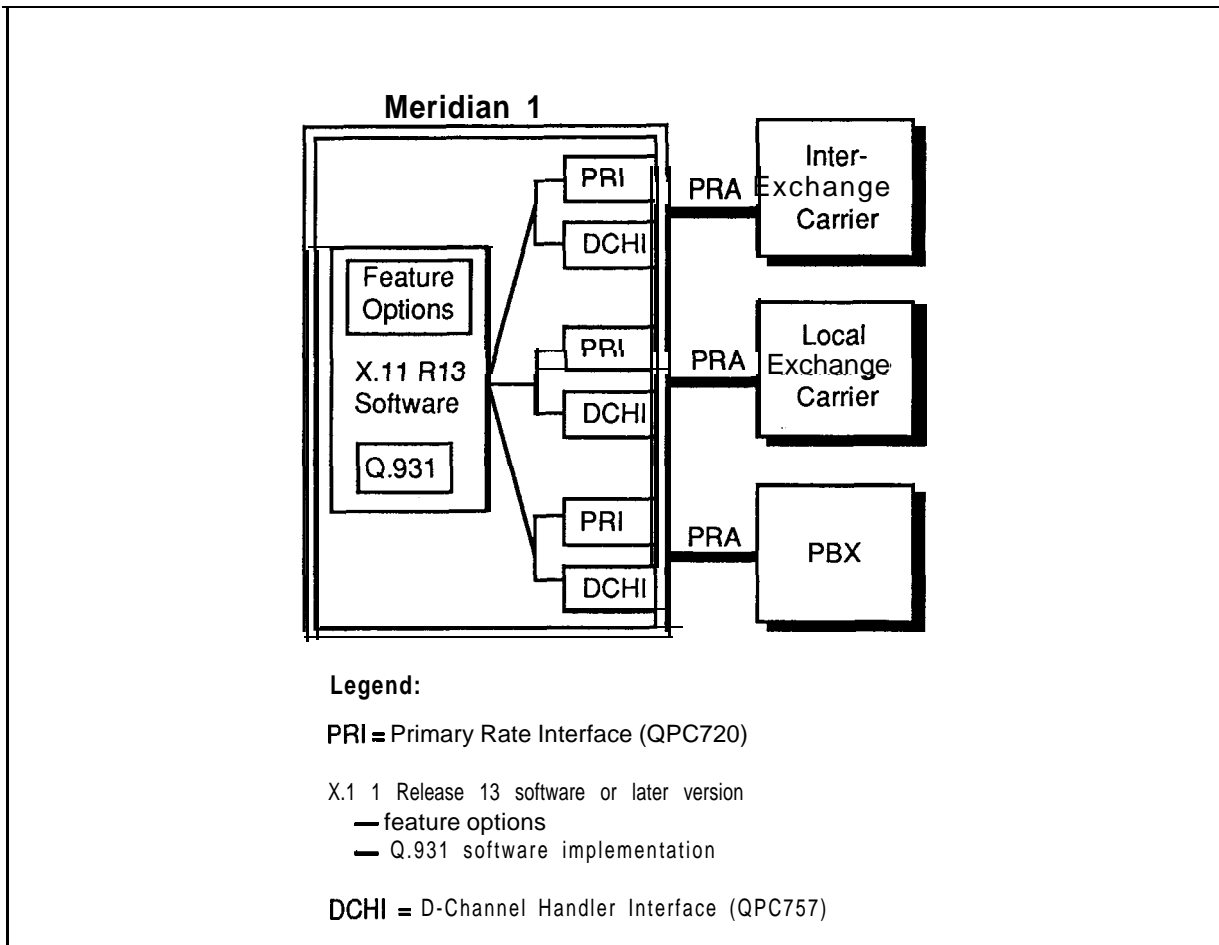


Figure 6-20
Adding ISDN to Meridian 1



Remote Peripheral Equipment (RPE)

Remote Peripheral Equipment provides the capability to connect a module (or modules) up to 12.6 km (70 miles) away from the Meridian 1 via T-1 carrier facilities. To the Meridian 1, the Remote Peripheral Equipment appears as any other PE Module. The data terminals, data modules and telephones connected via the RPE shelf appear to be connected locally to the Meridian 1.

Two T-1 carrier links

Two T-1 carrier links are required to connect each RPE to the assigned network loop of the Meridian 1.

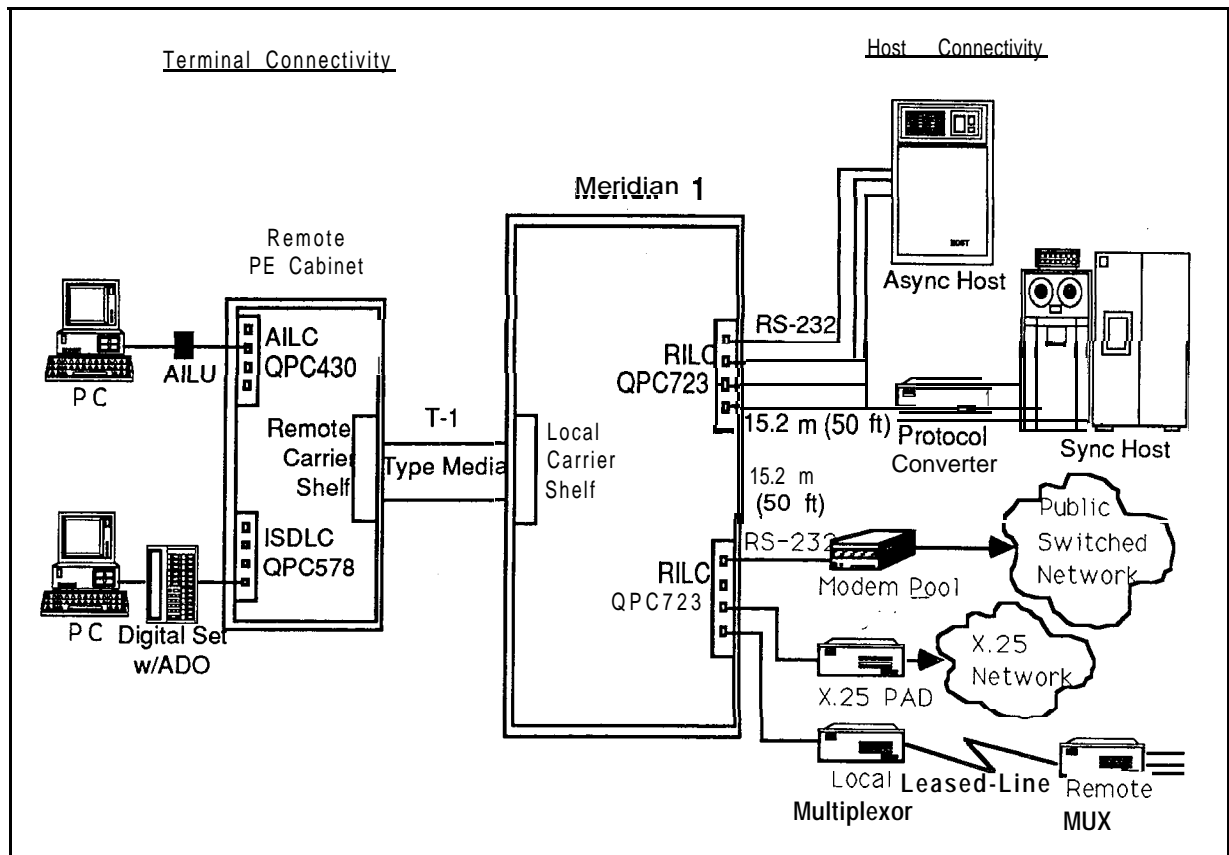
712.6 km (70 miles) maximum

RPE may be located up to 12.6 km (70 miles) from the Meridian 1.

RPE carrier shelves at both ends

Both a local RPE carrier shelf (at the main Meridian 1 location) and a remote RPE carrier shelf (at the remote facility) are required to accomplish RPE connectivity.

Figure6-21
Remote Peripheral Equipment (RPE)



Strategic Alliances Program

Customers demand that the information industry connect equipment from various suppliers to provide applications in a multi-vendor; multi-media environment. Customers want to have the ability to handle any form of information — voice, data, text, graphics and image.

Northern Telecom initiated the Strategic Alliances Program in 1982 to encourage close working relationships with leading computer vendors. Northern has developed and maintained these partnerships to jointly deliver benefits to customers by serving their needs for innovative integrated information systems involving many types of equipment, from multiple vendors.

As a part of its efforts, Northern Telecom Strategic Alliances Program conducts ongoing connectivity testing with its partners. Northern Telecom connectivity testing program is designed to provide customers with a wide range of tested, effective connections for a variety of applications.

By providing compatibility with multiple computer and connectivity products, the Meridian 1 can accommodate new requirements in a cost-effective manner.

Apple Computer, Inc.

Apple Computer is one of the largest manufacturers of personal computer workstations. Featuring a broad range of configurations and applications, and great ease of use, Apple Macintosh family of 32-bit computers has been embraced by business and education. Through a cooperative working agreement, Northern Telecom and Apple Computer are committed to the testing and integration of Macintosh technology with the Meridian 1.

The Macintosh has access to MS-DOS or other Macintosh personal computers (both standalone and networked) for data exchange and file transfer. In addition, the Macintosh connects to asynchronous host computers, modem pools, IBM hosts via protocol converters and to X.25 gateways, all through the Meridian 1. In an asynchronous environment, speeds up to 19.2 Kbps are supported; in a synchronous environment, speeds up to 64 Kbps may be attained.

Northern Telecom Memory Systems Division offers Memorybank, a hard disk subsystem with SCSI interface to Macintosh. With storage capacity up to five Gigabytes, Memorybank is ideal for Local Area Networks. LANs interconnected via the Meridian 1 (see “Macintosh Connectivity” in this Chapter) can use the Memorybank system as a file or disk server.

Meridian 1 SL- 100 and DMS- 100 switches also support Macintosh connectivity via the **Datapath** and Meridian Data Services product lines respectively.

Supported configurations

Macintosh **512K**, Macintosh Plus, Macintosh SE, Macintosh II and any other models which have built-in RS-422 connections are supported.

Apple LaserWriter and Apple LaserWriter II printers may also be connected. Meridian SL Laser Printer Software provides for an unlimited number of Macintosh users connected to the Meridian 1 to dial and print to Apple LaserWriter printers attached to the switch locally, via RPE, or cross-country without the need to use an AppleTalk connection or bridge. The LaserWriter connected to the Meridian 1 is selected via the Macintosh Chooser and is used by executing the standard Macintosh PRINT command from any application program.

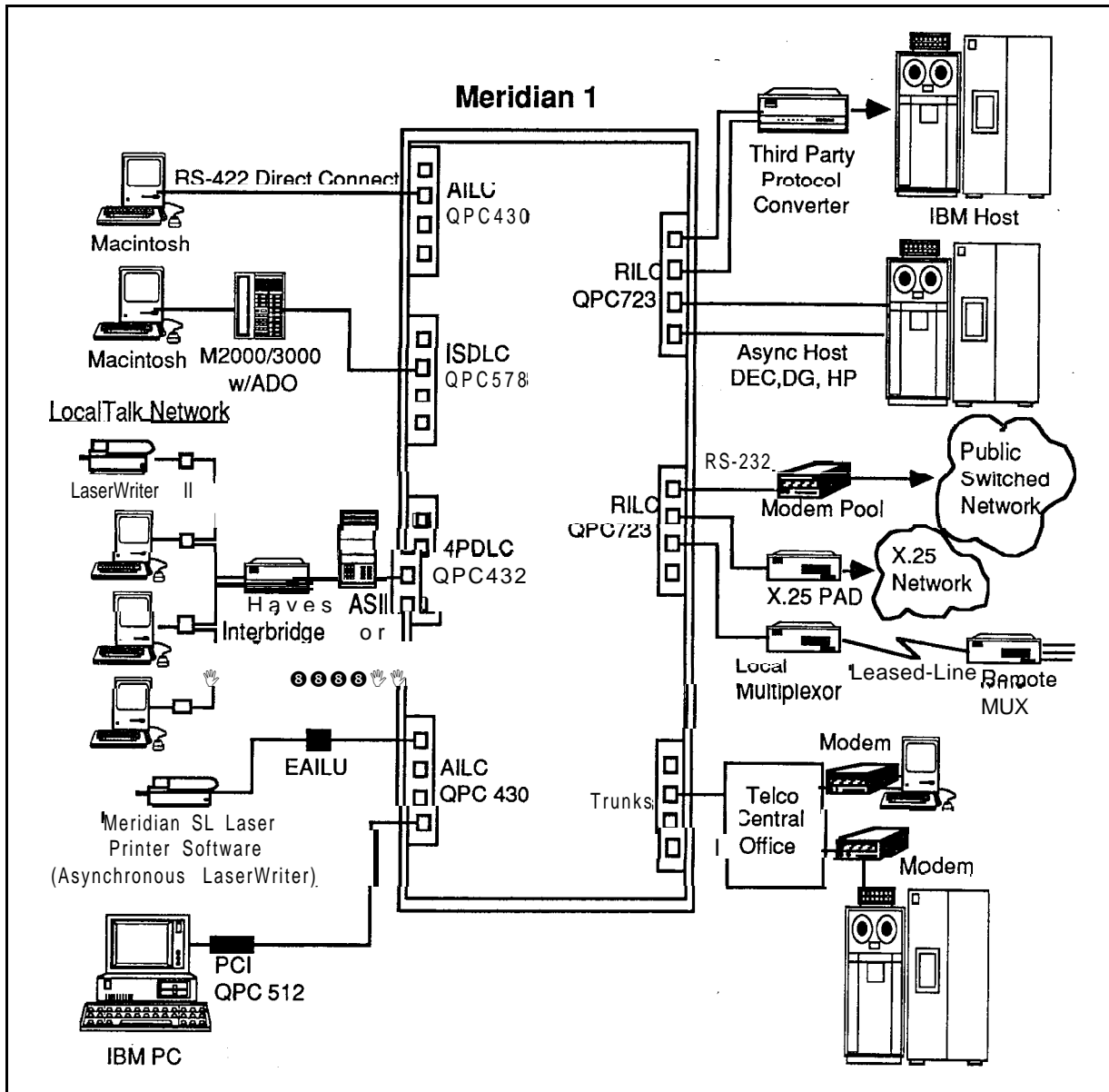
Data modules

Macintosh Computers (RS-422) may be connected directly to the AILC card; through Digital Telephones with an ADO, or Modular Telephones with an MPDA.

AppleTalk **LANs** may be bridged via the Hayes Interbridge and the ASIM or HSDM. Macintoshes can dial into an AppleTalk network via a **Solana** R-Server connected to the RILC.

Apple **LaserWriters** are connected via the EAILU or a direct RS-422 connection.

Figure 6-22
Apple Computer, Inc.



Data General

Northern Telecom and Data General Corporation have completed a program of connectivity and compatibility testing. This program covers Data General major terminal families connected through the Meridian 1 to Data General MV family of processors.

Data General has developed an interface to Northern Telecom Computer to PBX interface (CPI). The 24 channels of CPI each support up to 19.2 Kbps asynchronous communications between Data General Dasher terminals and DG hosts. The **CPI/24** eliminates 24 individual port connections, 6 MCDS Cards (or 24 **ADMs**), as well as the individual cabling that would be required to connect to the Meridian 1.

A direct connection from the DG RS-422 terminal to the Meridian 1 is available, but this configuration requires expensive shielded wire. With **ADOs**, **ASIMs**, or **EAILUs**, unshielded twisted pair may be used to provide more cost-effective connections.

Supported configurations

Data General host models ECLIPSE **MV/7800**, **MV/75000** Models 8, 10, 20, and **MV/20000** and 40000 are supported.

Data General Dasher **RS-232/RS-422** terminal models **D200**, **D211**, **D220**, **D410**, **D411**, **D450**, **D460**, **D461** and **D470** are supported. Data General RS-232 terminals **D210** and **D214** are also supported.

All applications on Data General MV series products including CEO (Data General Comprehensive Electronic Office software) are supported.

Data General **CPI/24** product model number is 4398. Model 4398 is supported under Revision 6.0 or later of Data General's Advanced Operating System/Virtual Storage (**AOS/VS**).

Note: The **MV4000SC** and **MV4000DC** do not support CPI.

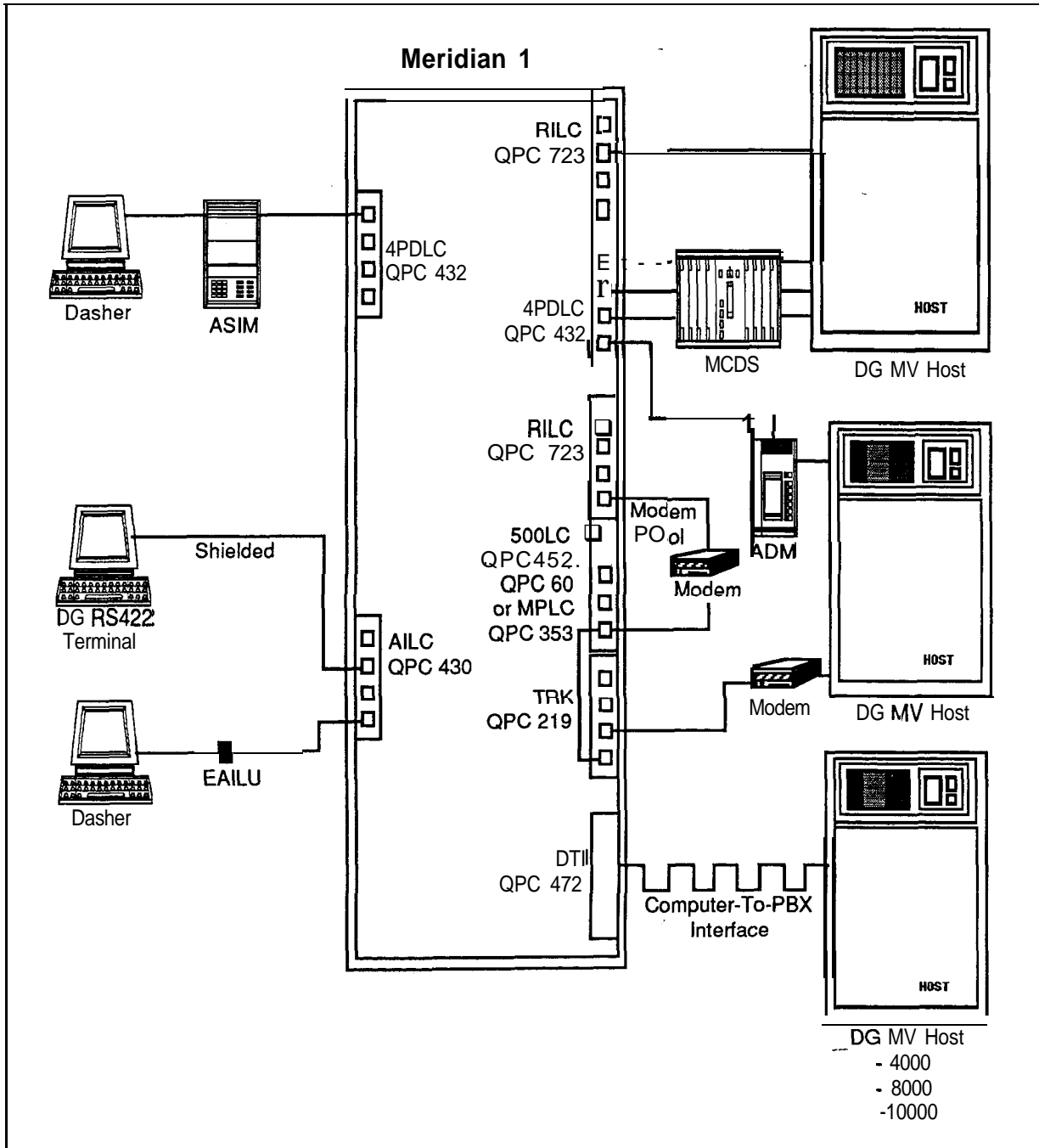
Data modules

Data General Dasher terminals can be connected to the Meridian 1 via the **ADO**, **ASIM**, **HSDM**, or **EAILU**.

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If the customer has too few data connections to require CPI, then the host can also be connected to the Meridian 1 via the **RILC**, **EAILU**, **ASIM**, **HSDM**, or **MCDS**.

Figure 6-23
Data General



Digital Equipment Corporation

Northern Telecom and Digital Equipment Corporation have completed a significant amount of product integration and testing. The result is a cost-effective and simplified terminal to host connectivity through the Meridian 1.

To connect the Meridian 1 to the VAX, Northern Telecom recommends using the RS-232 Interface Line Card (**RILC**). The RILC allows cost-effective connectivity to the VAX by eliminating the need for the ASIM, HSDM and MCDS. The RILC may be connected directly to the VAX Host or may be connected through DEC Ethernet Terminal Servers (**DECServer** 200 or 500).

Although the RILC eliminates the need for the ASIM, HSDM and MCDS, these modules may still be used for Meridian 1/VAX connectivity. The ASIM and HSDM may be required if asynchronous host mode capability is required (see "Data Services Terminal Connectivity" in this Chapter).

Supported configurations

VAX hosts supported: VAX Series **8000, 8600, 8650**, VAX Series 1 **1/730, 1/750** and **1/780, 1/782, 1/785, MicroVAX 2000**

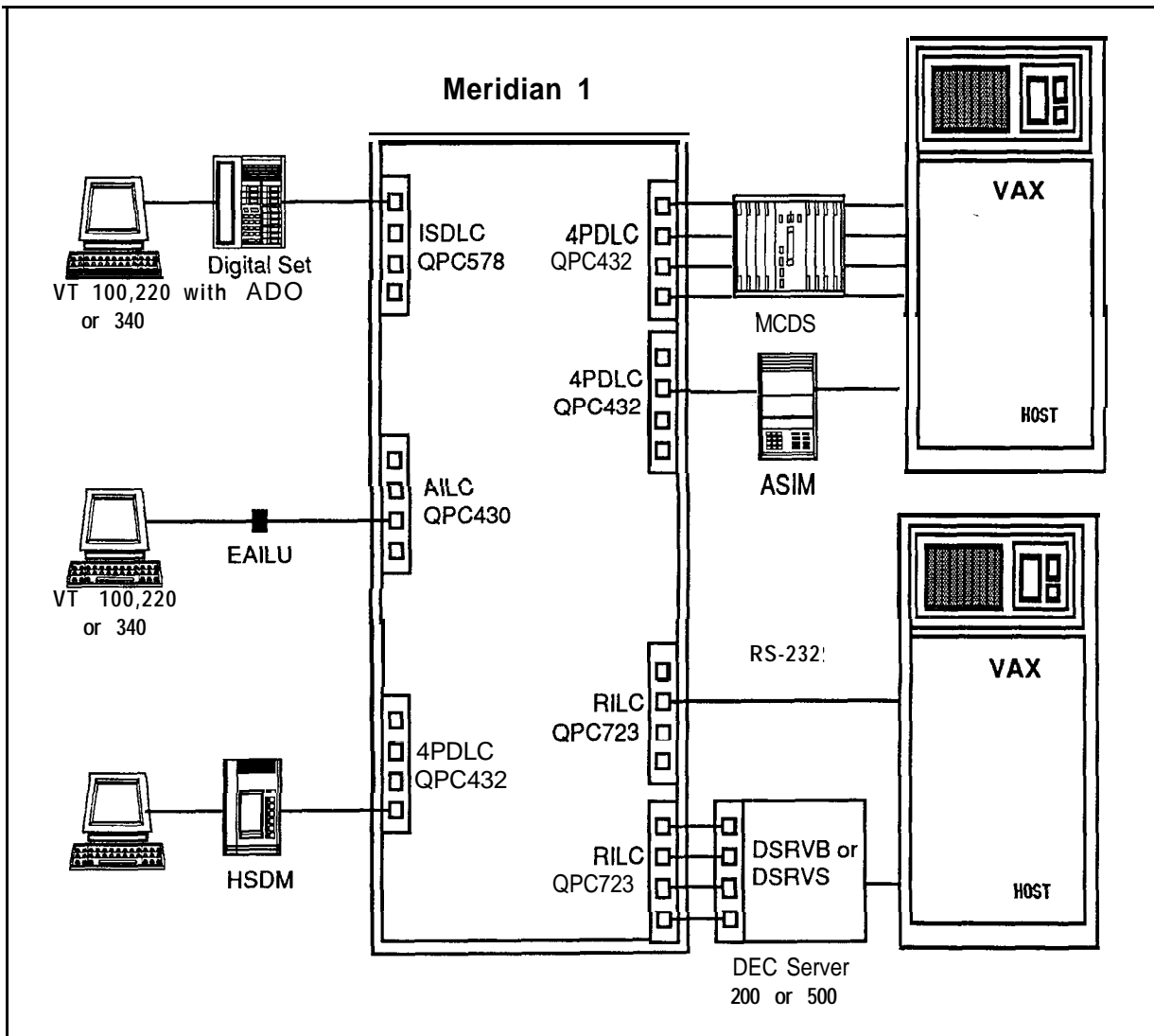
Digital terminals, PCs and terminal servers supported: **VT100**, VT220, VT 340 Series, **DECmate** II and III, Rainbow 100, Professional 300 and **VAXmate**, DECServer 200 and 500

Data modules

DEC terminals may be connected to the Meridian 1 using ASIM, HSDM, EAILU, or ADO.

The DEC hosts may be connected via the RILC, EAILU, ASIM, HSDM, or MCDS.

Figure 6-24
Digital Equipment Corporation



Hewlett-Packard Company

As a part of Northern Telecom Strategic Alliance with Hewlett-Packard (HP), a series of new connectivity tests between the Meridian 1 and HP Series 925 and 950 computers has been successfully conducted. The HP 3000 Series 900 is the latest addition to HP broad family of compatible business computing systems. The HP Series 925 and 950 are based on HP Precision Architecture and are compatible with the entire HP 3000 family. Tested connections between the Meridian 1 and HP Series 925 and 950 computers involve Northern Telecom RS-232 Interface Line Card (RILC) and Enhanced Asynchronous Interface Line Unit (EAILU) and HP new Distributed Terminal Controller (DTC).

The RILC provides direct interface to HP DTC, thereby eliminating the need for additional data modules. This interface reduces connection costs while improving resource sharing. The DTC connects asynchronous terminals and serial printers to the 900 Series systems.

For a direct, low cost connection of an HP 3000 computer to the Meridian 1, HP has developed the Advanced Terminal Processor (ATP) for the Meridian 1. When used with a breakout box, the ATP for the Meridian 1 will allow the HP 3000 to be connected directly to the AILC. HP standard ATP or Asynchronous Data Communications Controller (ADCC) may be used to interface the HP 3000 to the Meridian 1 via the EAILU or MCDS. These connections expand options for joint users of Meridian 1 Systems and HP 3000 systems who wish to lower costs, improve resource sharing and protect their investments in communication systems.

Supported configurations

Host:

- With DTC, HP Series 925 and 950 with operating system 1.1 or higher
- With ATP, HP 3000 Series 39,4X, 58,6X or 70
- Series 37 is not supported
- With ADCC, HP 3000, Series 30, 33, 40 and 44

PCs: HP 150 A, HP 150 B/Touchscreen, HP 150 II/Touchscreen II, Vectra, Vectra CS, Vectra ES, Vectra ES/12, Portable Plus, Vectra Portable CS

Terminals: 239x Series, 2622A, 2624B, 2627A, 700/xx Series

Printers: 2235A, 256x, 293x

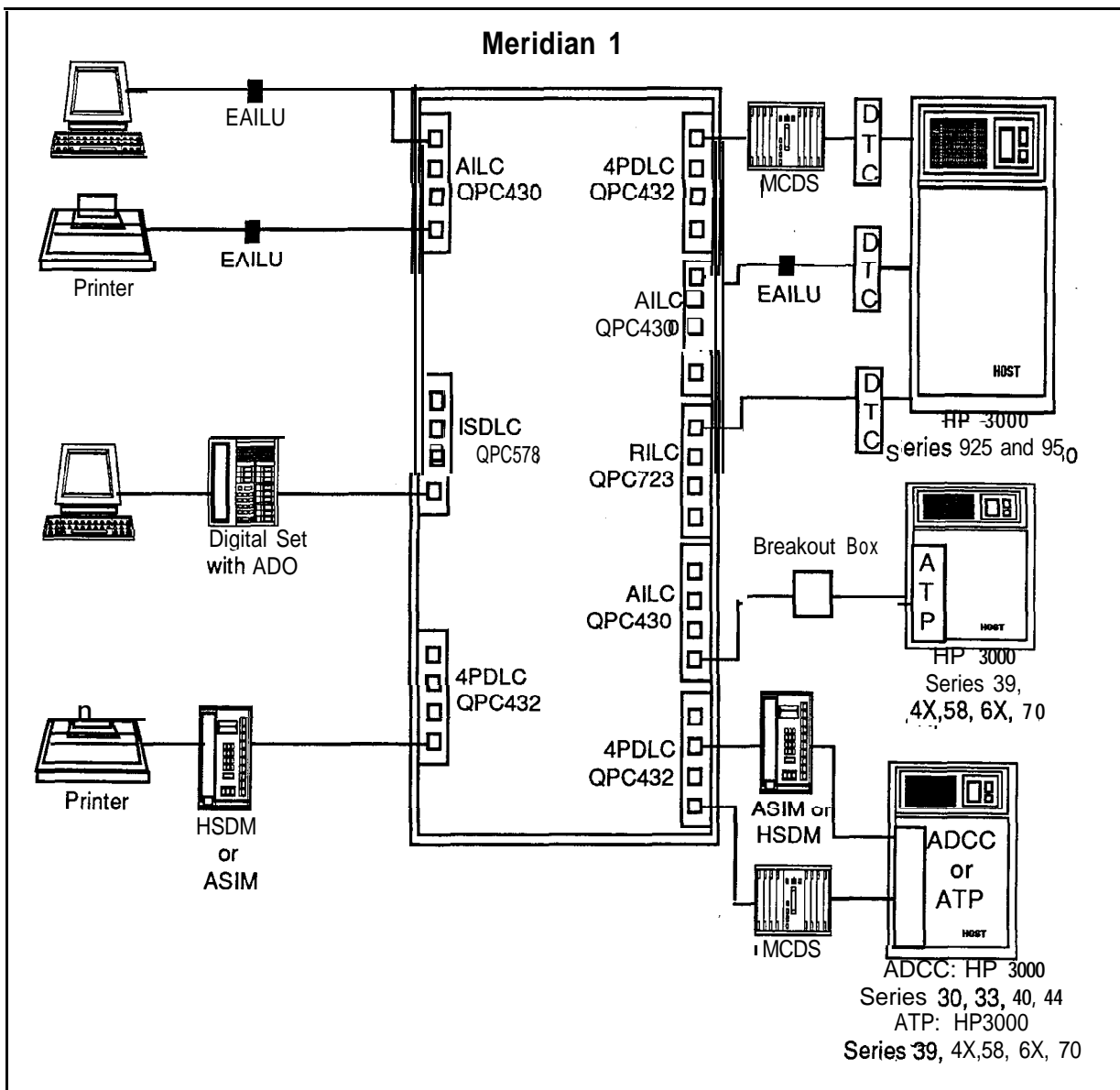
Data modules

HP PCs and terminals may be connected to the Meridian 1 by using the EAILU, ADO, ASIM, or HSDM.

The HP printers may be connected to the Meridian 1 by using the ASIM or HSDM for HP host printing. The HP Laser Jet must be able to recognize Forced Data Terminal Ready (FTDR).

The HP host may be connected to the Meridian 1 by using the RILC, EAILU, ASIM, HSDM, or MCDS.

Figure 6-25
Hewlett Packard Company



NCR

Northern Telecom and NCR have completed joint connectivity testing of the NCR Tower XP and NCR PC with the Meridian 1.

An NCR PC or an IBM PC may be connected to the Meridian 1 via the **PCI** card. VT102 terminals may also be connected via an ADO or EAILU. The NCR Tower XP may be connected to the Meridian 1 via an ASIM, HSDM, or an EAILU.

These connections support access to modem pools, host computers, terminals, and X.25 PADs. File transfer from IBM PC to NCR Tower **XP** and file access to NCR Tower **XP** (both via PC based communication software) are also supported.

Supported configurations

Host: NCR Tower XP

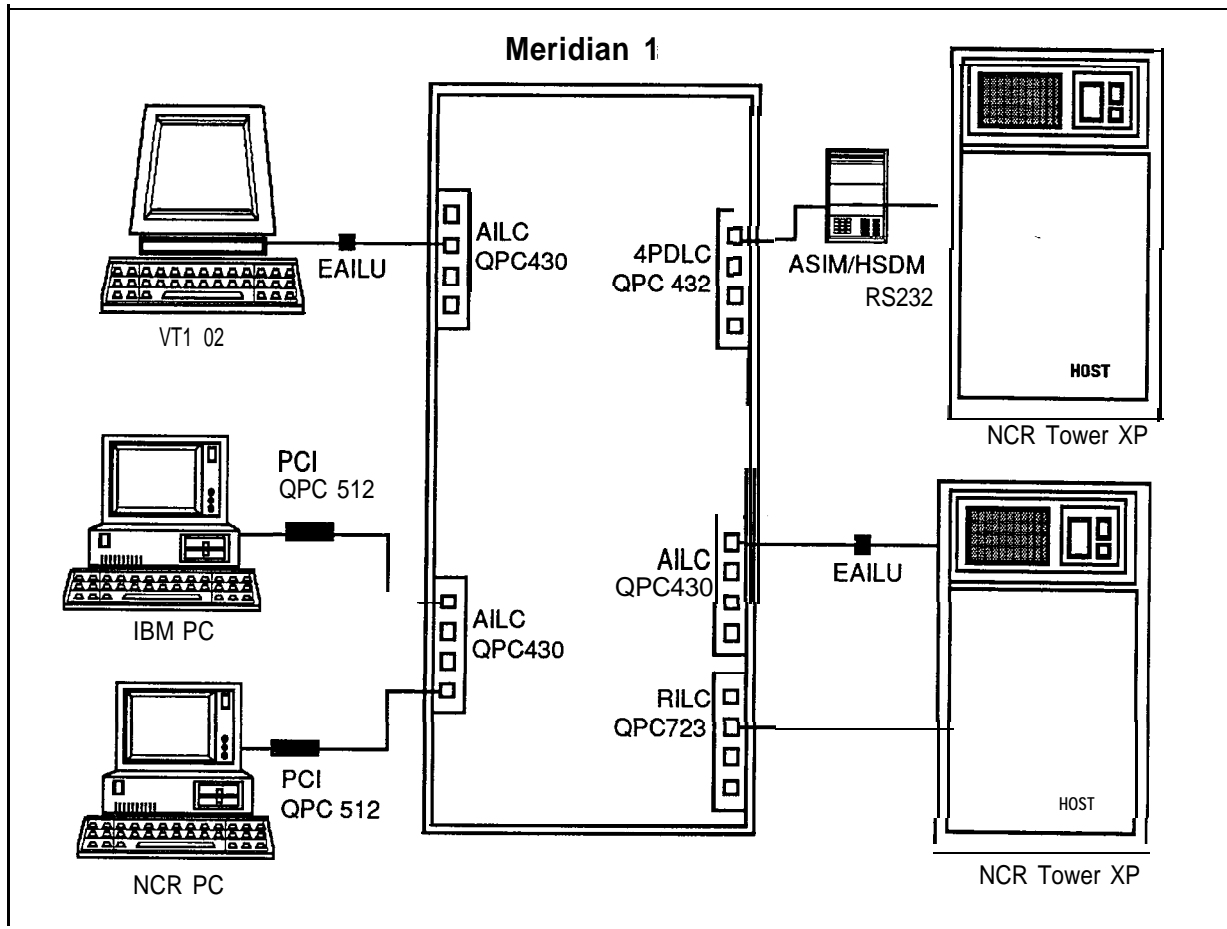
PCs and Terminals: NCR PC, VT102, IBM PC

Data modules

NCR PC and IBM PC may be connected via the **PCI** card, EAILU, or ADO. VT102 Terminals connect via an EAILU.

The NCR Tower may be connected to an RILC, EAILU, ASIM, or HSDM.

Figure 6-26
NCR



Prime Computer, Inc.

Northern Telecom and Prime have completed connectivity and compatibility testing to further expand the data connectivity options available to Meridian 1 customers.

Northern Telecom RILC may be used to connect the Meridian 1 to Prime Series 50 host computers equipped with an appropriate controller without any additional data modules. An MCDS or ASIM (Vintage C or later) may also be used.

Prime **PT250** terminals may be connected to the Meridian 1 via an EAILU, or ASIM. Although speeds of up to 19.2 Kbps may be achieved, 9.6 Kbps is recommended by Prime for error-free transmission. An IBM PC/AT may be connected via the **PCI** card with **PrimeLink** software. Speeds up to 19.2 Kbps are supported in this configuration. 3278 terminals with VT-100 emulation may be connected via the CIM to carry data at 9.6 Kbps. Prime LQP3185 Printer may be connected to the Meridian 1 via an ASIM at speeds up to 9.6 Kbps.

Supported configurations

Host: Prime 50 Series, Models **2350, 2450, 2455, 4050, 4150, 4450, 6150, 6350, 6550** with PRIMOS Operating System 20.2.2 or later. Prime Controllers: 1 CS3, **AMLC, ICSI**.

PCs and terminals: **PT250**, IBM PC/AT, 3278 with VT-100 Emulation

Printers: LQP3 185

Software: PRIMOS, ED, EMACS

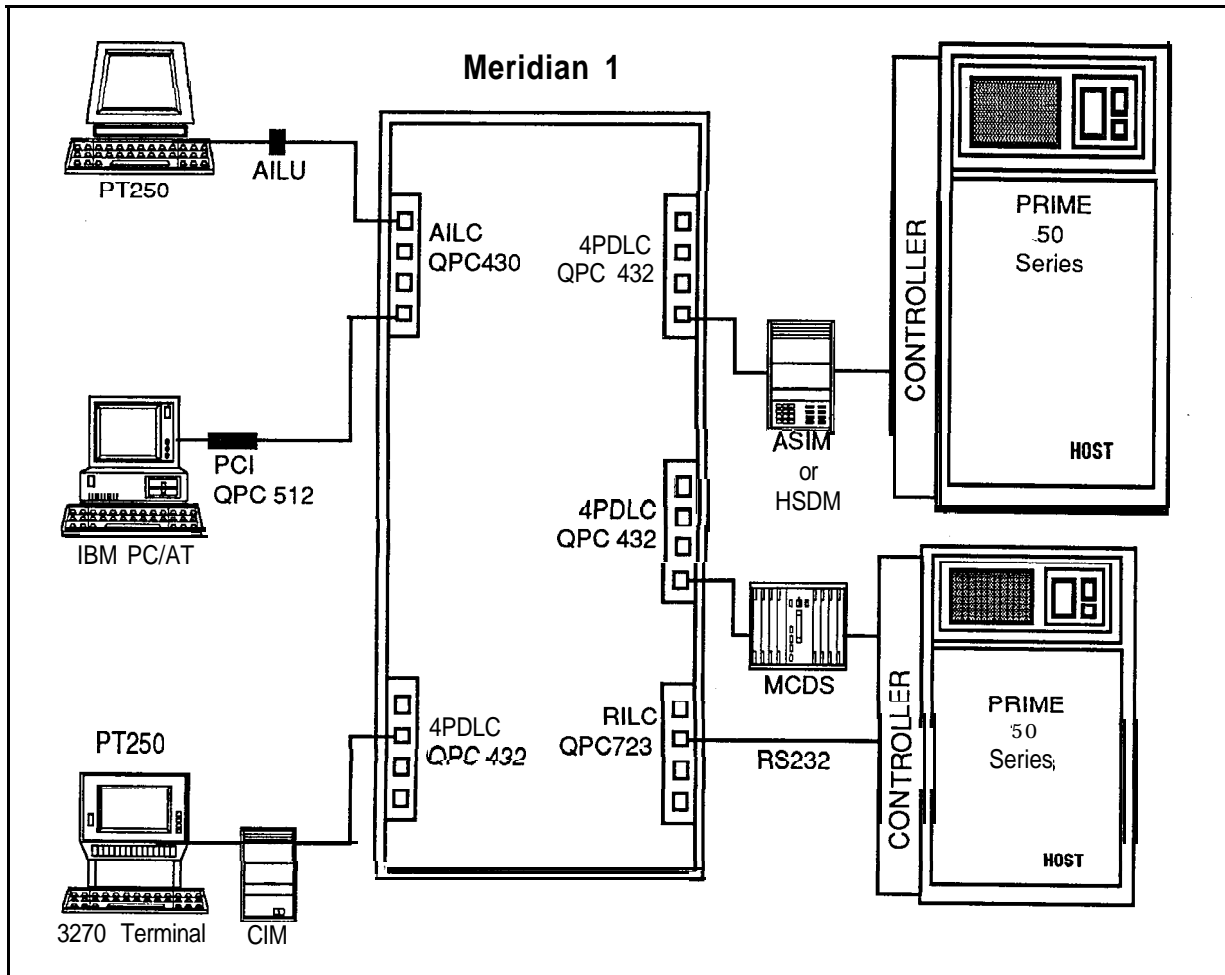
Data modules

Prime 50 Series host computers may be connected to the Meridian 1 using the RILC, ASIM, HSDM, or MCDS.

Prime **PT200** computer may be interfaced to the Meridian 1 via the EAILU, ASIM, or the HSDM. PCs may be connected via the **PCI** card with **PrimeLink** software. 3278 terminal access (via VT-100 emulation) requires the CIM.

Prime LQP3185 printer may be connected using an ASIM.

Figure 6-27
Prime Computer, Inc.



Unisys (Sperry)

Northern Telecom and Unisys have completed connectivity testing which demonstrates the Meridian 1 capability to interconnect Sperry UTS 4000 terminals. This configuration will provide low cost, switched access to Sperry 1100 Series mainframes.

The UTS 4000 product line consists of five terminals: the UTS 10 (asynchronous), UTS 20, 30, 40, and 60 (all synchronous). UTS 10 terminals may be interfaced to the SL- 1 via an EAILU while UTS 20, 30, 40 and 60 may be interfaced, using an ASIM. In addition, a Sperry PC, UTS 30 or Model 30 Desk Station equipped with the Line Interface Circuit (LIC) chip may be connected directly to the Meridian 1. Sperry PCs may also be connected with a PCI card attached directly to the AILC.

Sperry terminals access 1100 Series mainframes by contending for branch ports on the Sperry terminal multiplexer (T-MUX) which is connected to a Distributed Communications Processor (DCP).

Supported configurations

Host: Sperry 1100 Mainframe

Terminals: Sperry UTS 4000 series, Sperry PC

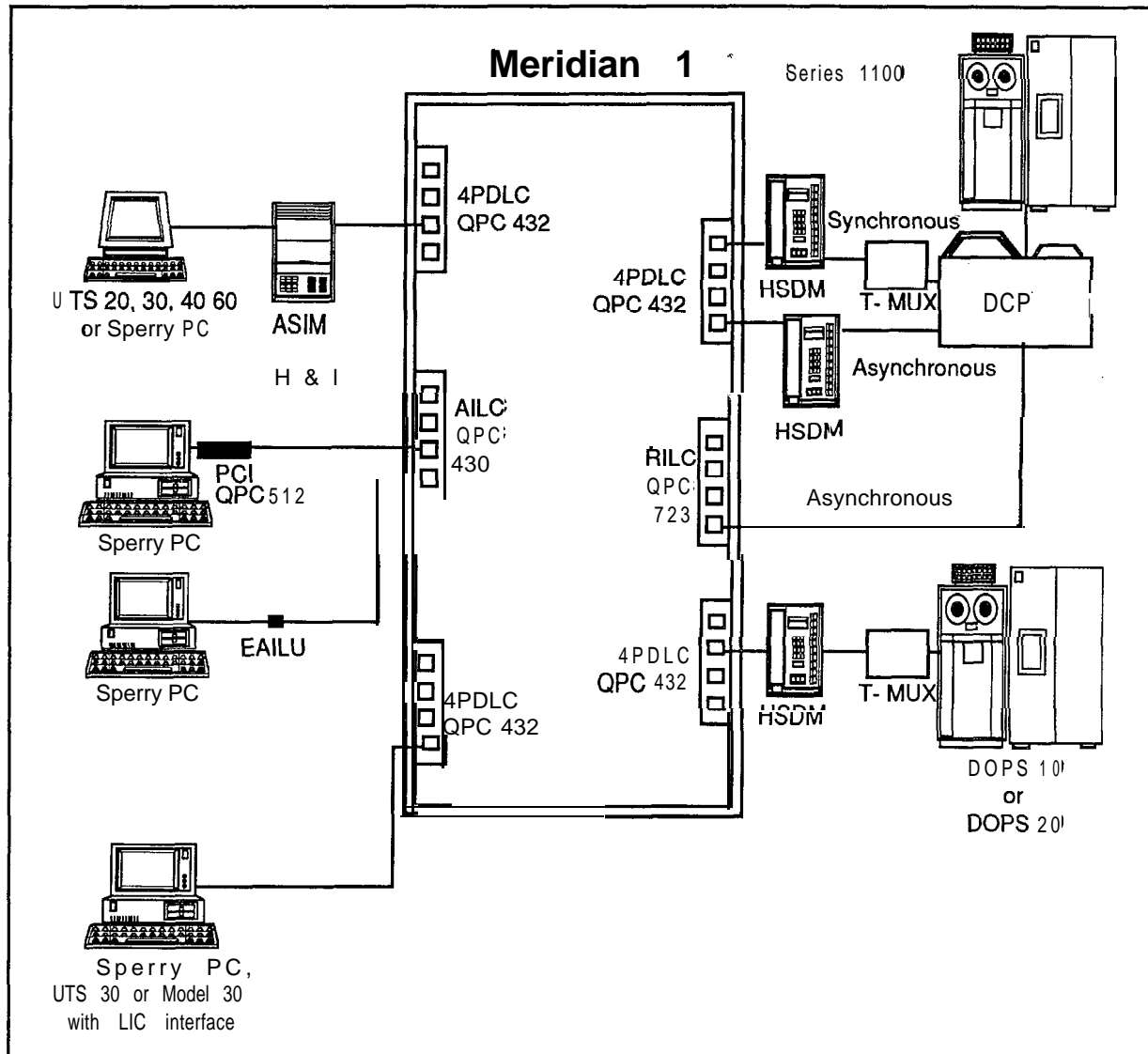
File Servers: DOPS 10 and DOPS 20

Data modules

The 1100 Mainframe may be connected to the Meridian 1 via an ASIM.

The UTS Terminals may be connected to the Meridian 1 by using an ASIM. Sperry PCs may be interfaced with the Meridian 1 using an RILC, ASIM, PCI, or an EAILU.

Figure 6-28
Unisys



Wang Laboratories Inc.

Northern Telecom and Wang Laboratories Inc. have completed joint connectivity testing of Wang equipment with the Meridian 1.

Connections between the Meridian 1 and the Wang VS have been improved by the use of Northern Telecom RILC and Wang Asynchronous Controller products. The Asynchronous Controllers allow Wang and non-Wang asynchronous terminals and printers to use integrated Information Processing, Professional Application Creation Environment (PACE) and Wang OFFICE applications, at speeds of up to 19,200 bits per second. The RILC provides direct connections to these controllers, eliminating the need for additional data modules and reducing connection costs while improving resource sharing.

Wang Asynchronous Communications Sub-system (WACS) was developed by Wang and comes with 16 or 32 ports. A WACS model exists for any VS family. Wang also has an 8 port Enhanced Asynchronous Device Controller (EADC) which provides the same connectivity and speeds to workstations and printers as the WACS units. The EADC is available for the VS 5, 5E, 6, 6E, 15, 65 and 75E systems. There is also a single port version of the EADC which may be used when only a few terminals need a shared connection to the Wang VS. The single port EADC may be directly connected to the RILC; it is connected to the VS via a Wang dual coaxial cable.

Supported configurations

Hosts: VS family including VS 5, 5E, 6, 6E, 15, 65, 75E, 85, 100, 300, and 7000

Terminals: Wang 2110A Asynchronous VS terminal, Wang PC or IBM PC with Wang 2110A or VT-100 emulation, DEC VT-100, VT-102 and VT-220 terminals and most ANSI X3.64 compatible asynchronous terminals

Printers: PM015 40 cps Daisy Printers, PM019 Color Matrix Printers, PM017 400 cps Printers

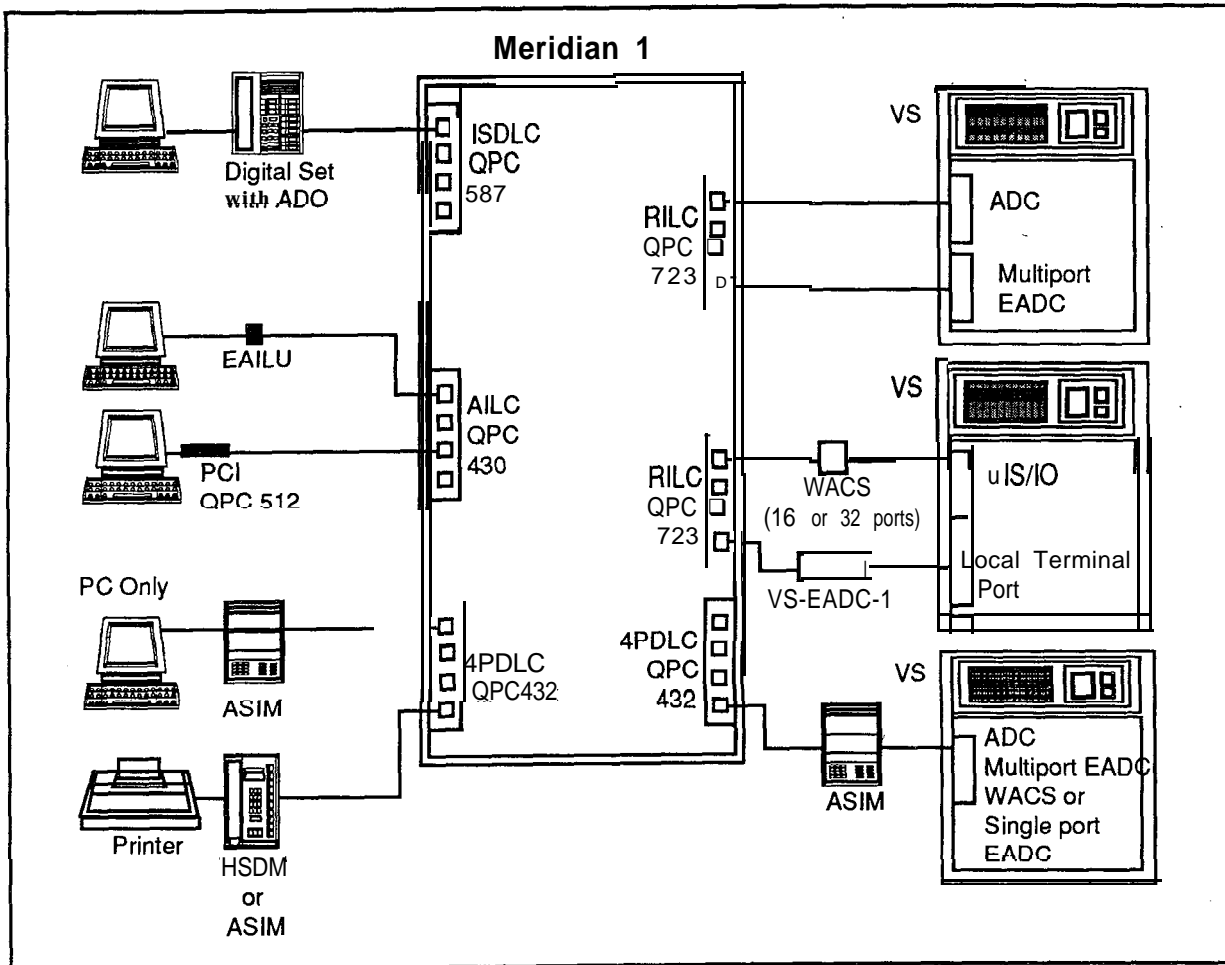
Applications supported: VS DP, OFFICE, PACE, VS Word Processing, Word Processing Plus (WP PLUS)

Data modules

Terminals may be connected to the Meridian 1 via the ASIM or EAILU. PCs may be connected via terminal products such as an EAILU or (if no serial port is available) the PCI card.

Host computers may be connected to the Meridian 1 (via appropriate Wang Controllers) by using an ASIM, HSDM, or the RILC.

Figure 6-29
Wang Laboratories, Inc.



Data Services applications

Meridian Data Services provides connectivity solutions for many industries, from banking to the education market. Using Meridian Data Services, Northern Telecom customers gain direct connectivity, multiple host access, and port contention features that can assist in efficient use and management of a data network. The following examples demonstrate just some of the innovative data applications that are possible using the Meridian 1 and Meridian Data Services.

Banking industry application — Regional Bank Network

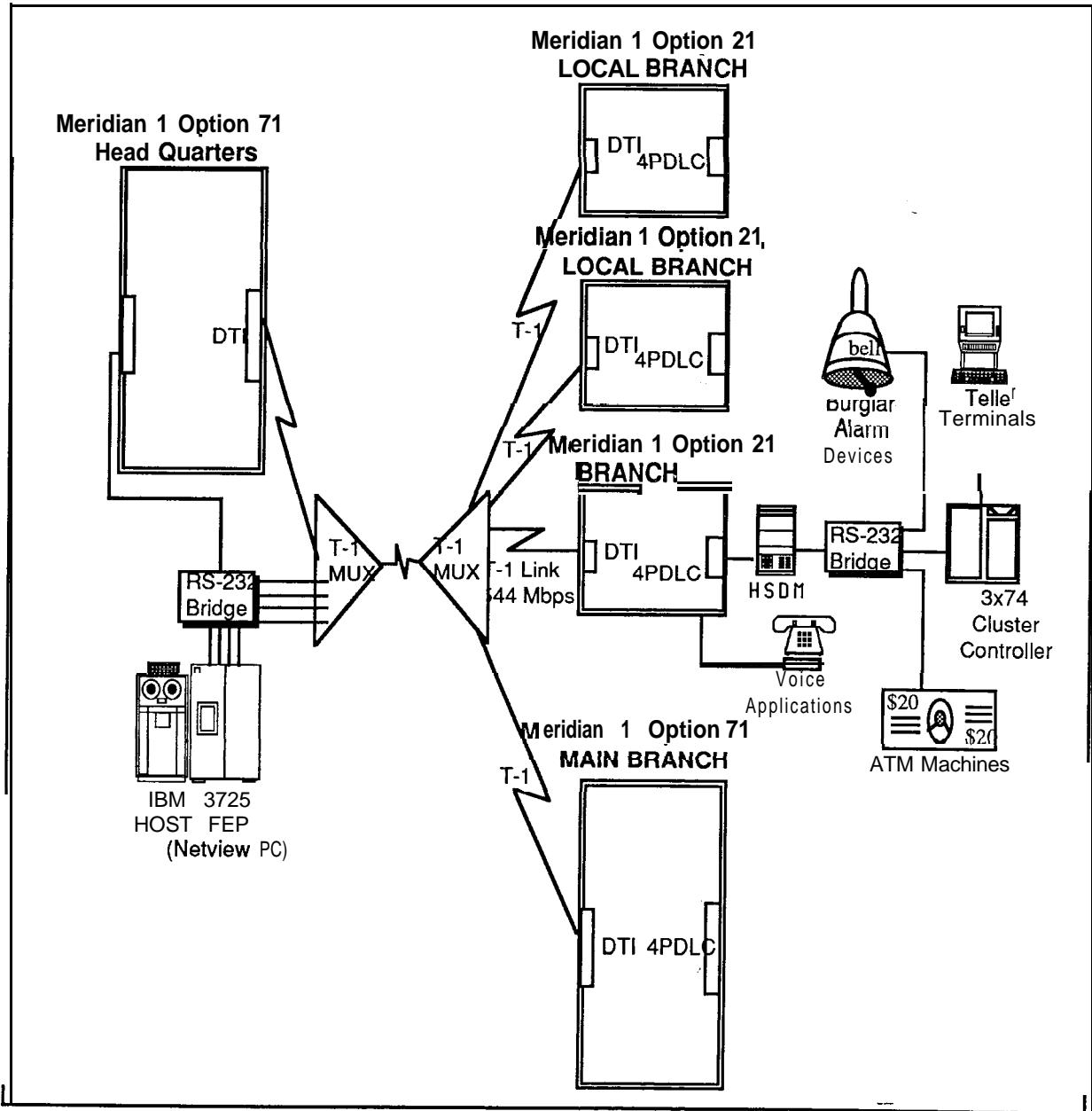
One Northern Telecom customer, a regional bank holding company, is installing an advanced private voice and data network that will use more than 100 Meridian 1 system to interconnect branch offices with the banks data center.

The data network will connect IBM PCs, teller terminals, alarm devices, and Automated Teller Machines (ATMs) at branch locations to an RS-232 bridge. The bridge will connect to the High-Speed Data Module, which will in turn be connected to a Meridian 1 System option 21. Small branches will be connected to a main branch facility in the area using T-1. In turn, these larger branches will be connected to the headquarters location through the use of a T-1 Multiplexor.

The High-Speed Data Module is connected to a line card on a Meridian 1 which is connected to other Meridian 1 Systems via Digital Trunk Interface (DTI) and T-1 links. The High-Speed Data Module and the line card will operate at 56 Kbps and accommodate IBM System Network Architecture (SNA) protocols.

The High-Speed Data Module is also capable of operating at 64 Kbps and when combined with the ISDN Primary Rate Interface (PRI) line card will permit 64Kbps data transmission across the network. The HSDM allows for advanced functionality today with the added capability for upward migration to an ISDN platform in the future.

Figure 6-30
Regional Bank Network



University application — Eastern College Network

At a leading Northeastern college progressive philosophy in preparing young people for contemporary life is evident from the extensive use of a variety of data processing equipment throughout the college.

Voice and data communications are provided by a Northern Telecom SL- 1. Computing power for the college is provided by Digital VAX computers, an IBM 3090, and about 1000 Macintosh and MS-DOS personal computers. Using Meridian Data Services, all of these systems have been tied together in a broad and varied data network allowing almost every course at the college to involve a computer in some way. The SL-1 provides switched access to a variety of computing resources; some examples are provided below.

Business learning lab — Many Macintosh systems are used to access business simulations located on a host computer.. Macintoshes are connected to the host through the SL- 1, eliminating the need for modems and point-to-point dedicated connections through existing wiring and direct RS-422 connections.

Faculty and administrative staff both need to access student records, student work, and business information on computers in several locations. The SL- 1 provides switched access to specific hosts located on campus. Computer workstations anywhere on campus can reach the hosts by simply entering the appropriate phone number.

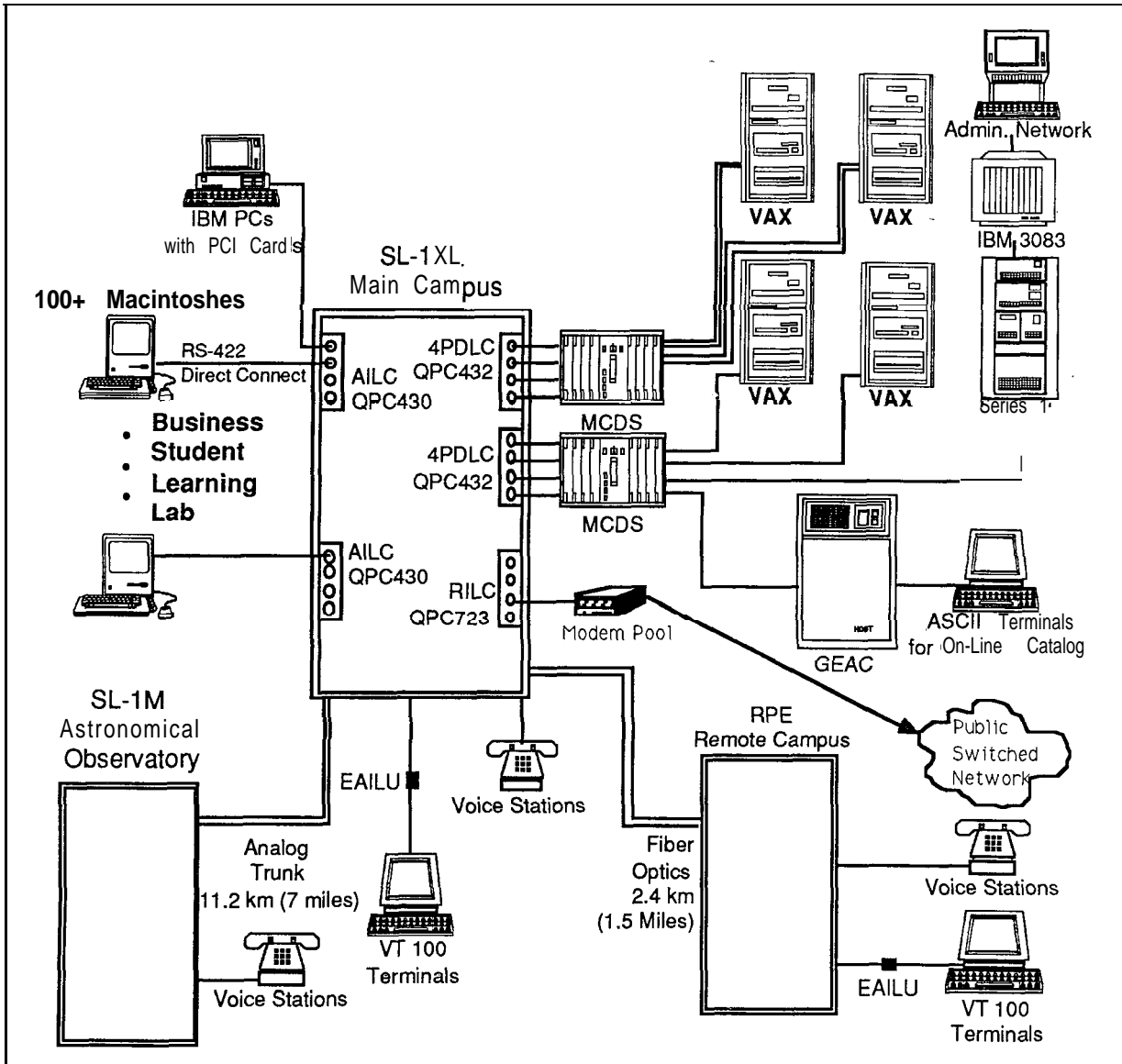
Meridian Data Services reduces the number of DEC VAX host ports and dedicated terminals that are needed through use of the MCDS and port contention and features such as Hotline and Ring Again. For the same reason, a smaller number of protocol converters are needed for access to IBM mainframes.

Meridian SL Laser Printer Software automatically connects a Macintosh to any local or remote LaserWriter selected from the Macintosh Chooser, while using any Macintosh application. Each LaserWriter is connected to the switch, via RS-422 directly or through an EAILU.

This college represents advanced collegiate teaching techniques using the following advanced tools and Northern Telecom communications equipment.

- Host interface applications
- File transfers
- HyperCard simulations

Figure 6-31
Eastern College



Aerospace industry application -defense contractor

Another Northern Telecom customer, a leader in aerospace and advanced government systems including the Space Shuttle and the Strategic Defense Initiative (SDI), needed a reliable data network that would connect a variety of users to a variety of computers. This company chose a Meridian 1 and Meridian Data Services to provide for their diverse data networking needs.

The Meridian 1 connects over two hundred users from different project groups within the Software Center of Excellence (SCOE) Lab to different computers such as DEC VAXs, Data Generals, Sequents, Symbolics, and MS-DOS and Macintosh personal computers. The Northern Telecom Meridian network provides reduced moving and changing costs and improved implementation time of moves. With the Meridian 1 port contention capability, both casual and heavy user can be accommodated efficiently and cost effectively.

An Ethernet LAN using Bridge Communications servers is connected to the Meridian 1 with 32 direct RS-232 port connections per server. The Meridian 1 connection enables terminals and PCs not directly connected to the Ethernet LAN to gain switched access to the network, a much more cost-effective connection for users not requiring dedicated access. The Ethernet LAN provides PCs (both IBM and Macintosh computers) high speed access to scientific systems, including SUN, Sequent and Symbolics computers.

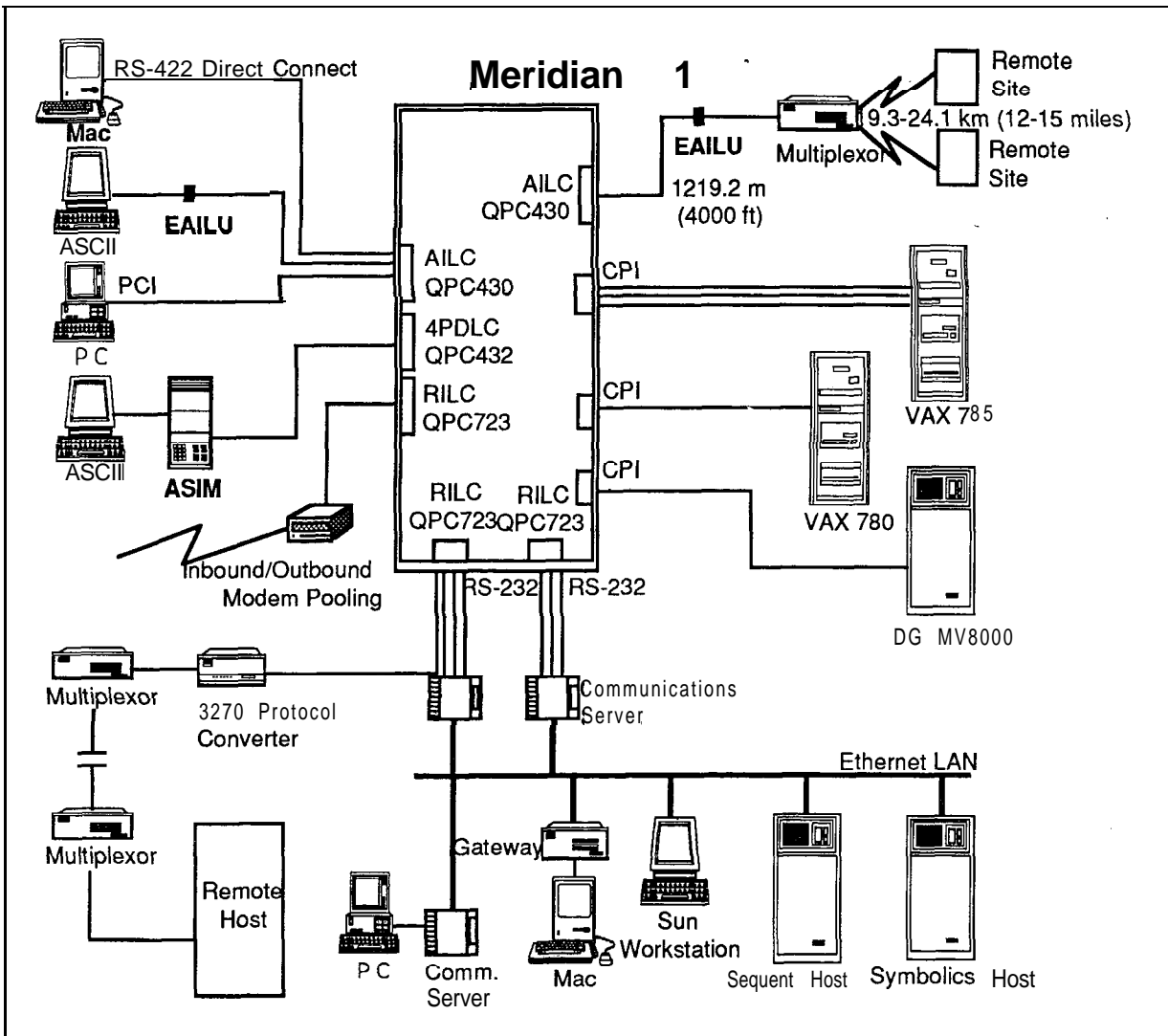
Data access modules designed to support varying transmission requirements for terminal and host connectivity are used at this company.

Asynchronous/Synchronous Interface Modules (ASIMs) are used to connect terminals within the engineering group to the Meridian 1. Those with MS-DOS personal computers use the Personal Computer Interface Card (PCI) to connect. Macintosh users gain access to the Meridian 1 through the use of an RS-422 direct connection. The direct connection further reduces communication costs and simplifies hardware requirements.

The contractor uses an ADM connected to a 3270 protocol converter to provide access to a remote host computer which houses an electronic mail system for executives.

This defense contractor, with the flexibility, the reliability, and the cost savings of advanced technology provided by the Northern Telecom Meridian 1, stands at the threshold of exciting technological innovations.

Figure 6-32
Defense contractor



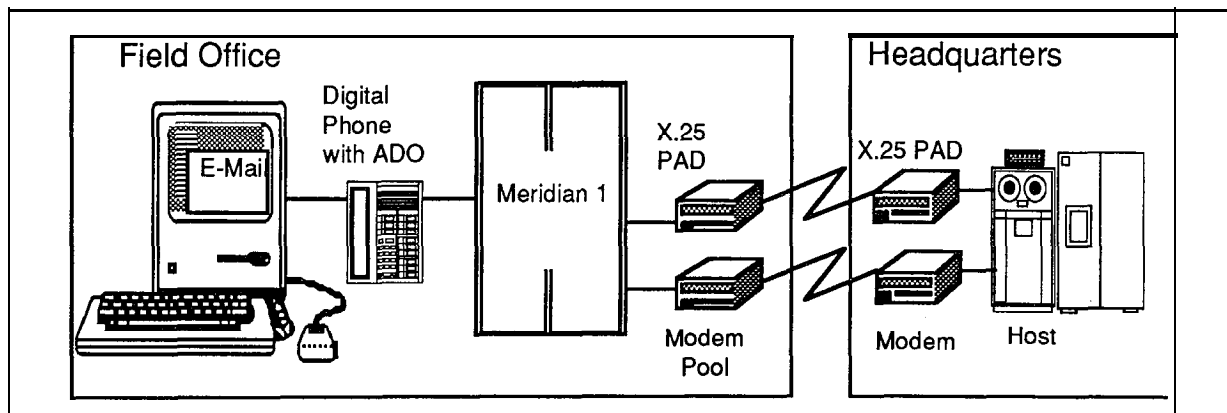
Computer industry application -workstation manufacturer

A major workstation manufacturer has installed Meridian 1 Systems in most of their sales offices, in the US and around the world; to deliver both voice and data communication services to the desktop.

Workstation software automatically places outgoing data calls for access to internal electronic mail, file transfer and on-line product and program information on this company's data network. These calls go through a modem pool on the Meridian 1 to the public switched network or through an X.25 PAD to a packet switching network. The Meridian 1 automatically selects the least costly route for long distance calls.

Users also exchange files using standard communications software at speeds of up to 19.2 Kbps by simply dialing the extension of the receiving workstation and executing appropriate send file/receive file commands at each workstation.

Figure 6-33
Workstation manufacturer



Third party compatibility testing program

Northern Telecom Third Party Compatibility Testing Program provides vendors with an opportunity to test their equipment in Northern Telecom Meridian (PBX) environment. This program provides ever widening solutions for customer data applications with assured compatibility. The following tables list third party products that have been found compatible with the Meridian 1 at the time of this publication.

Table 6-2
T-1 multiplexors

Vendor	Model	Tested With	Bulletin/Date
Technologies	Integrated Data Network Exchange	DTI	194-G/Feb 1987
Stratacom	Integrated Packet Exchange	DTI	208-G/May 1987
Timeplex	Link II	DTI	276-G/Oct 1987
DCA/Cohesive			
Technologies	System 9000	DTI	284-G/Nov 1987

Table 6-3
Protocol converters

Vendor	Model	Host	Tested With	Bulletin/Date
Perle	350/294	Sys/3X	RILC	362-G/May 1988
Local Data	DataLynx/5251	Sys/3X	RILC, EAILU/AILC	465-G/Nov 1988
	InterLynx/52/51	Sys/3X	RILC, EAILU/AILC	465-G/Nov 1988
	DataLynx/3174	SDLC, BSC	RILC, EAILU/AILC	465-G/Nov 1988
IBM	7171	SDLC, BSC	MCDS	57-G/Apr 1986

Table 6-4
Modems

Vendor	Model	Tested With	Notes
Hayes	V Series Smartmodem 9600	RILC	454-G/Nov 1988
Bizcomp	Intellimodem 4124NT (2400)	RILC	474-G/Dec 1988
	Intellimodem 5124NT (Rackmount 2400)	RILC	474-G/Dec 1988
	Intellimodem EXT 4120NT	EAILU/AILC	144-G/Nov 1986
US Robotics	Rackmount 2400/2	RILC	316-G/Mar 1988
Universal Data Systems	UDS 2440	RILC	In preparation
Prometheus Products	ProModem 1200	ADM/QPC60	52-G/Mar 1986

Table 6-5
Other products

Vendor	Model	Tested With	Notes
Raycom	5100 Fiber Optic Multiplexor	RILC	333-G/Mar 1988
Solana Electronics	R-Server	RILC	In preparation

Data products and product codes

The following tables list all Northern Telecom data products and their product codes. Also, Table 6-10 provides the interface matrix between various products and line cards.

Table 6-6
Terminal/host connection

Product description	Code
Add-on Data Module (RS232)	QMT8
Add-on Data Module (V.35)	QMT12
High-Speed Data Module	QMT21
Async/Sync Interface Module	QMT11
Macintosh Cable - DB9/RJ11	A0326760
Macintosh Cable - DB9/DB25	A0326761
Macintosh Cable - DIN8/RJ11	A0326762
Macintosh Cable - DIN8/DB25	A0326763
PC Interface Card	QPC512
Enhanced Async Interface Line Unit (Male)	A0344336
Enhanced Async Interface Line Unit (Female)	A0344337
Coax Interface Module	NT9N20
Coax Interface Card	NT9N02
Async Data Option (M2000 Series)	NT1 FO9
Async Data Option (M3000 Series)	NT1 F10
Meridian Programmable Data Option	NT2K64WA
High Speed Data Card	QPC918

Table 6-7
Data Line Cards

Product description	Code
Modem Pool Line Card	QPC353
Multi-Channel Data System-Async Card	QPC397
Data Line Card (A-law)	QPC341
Data Line Card (Japan)	QPC634
Data Line Card	QPC311
4-Port Data Line Card	QPC432
Async Interface Line Card	QPC430
RS232 Interface Line Card	QPC723
Integrated Services Digital Line Card	QPC578
500 Line Card	QPC60
2500 Line Card	QPC452
Digital Line Card	NT8D02AA

Table 6-8
Shelves/cabinets/cables

Product description	C o d e
Coax Balun	MVC02031
Twinax Balun	MVC02032
Dual Coax Balun	MVC02033
Multi-Channel Coax System (110v)	NT9N01
Multi-Channel Coax System (220v)	NT9N01
Multi-Channel Coax System ▪ Faceplate	NT9N03
Multi-Channel Coax System ▪ Optional Power	NT9N07
BNC Coax Cable ▪ 8FT	NT9N30AA
BNC Coax Cable ▪ 16FT	NT9N30AB
Multi-Channel Data System ▪ Shelf	QSD27
Multi-Channel Data System ▪ 11 Ov Power	QSY27
Multi-Channel Data System ▪ 220v Power	QSY32
Multi-Channel Data System ▪ Rack Cabinet	QCA76
Multi-Channel Data System ▪ Desk Cabinet	QCA77
RILC Octopus Cable ▪ Female	QCAD318
RILC Octopus Cable ▪ Male	QCAD319
RILC Patch Panel	A0336982

Table 6-9
Software

Product description	Code
Meridian SL Laser Printer Software	NPS50396-16L1
EasyLAN with Meridian Extension	A0345240

Table 6-10
Product/interface card matrix

Product	QPC578 ISDL	QPC432 4PDL	QPC430 AIC	QPC723 RIL	QPC60/452 500/2500	NT8D02AA DL
Digital Set/ADO	X					X
ADM w/V.35		X				
ASIM		X				
HSDM		X				
MCDS		X				
CESS		X				
EAILU			X			
PCI			X			
Mac Direct Connect			X			
Modem Pool (Smart)				X	X	
Dumb Modem Pool(Async in, or Sync in/out)					X	
3270 Protocol Converters			X	X		
sys 34/36/38 Protocol Converter			X	X		
Async Host Direct Connect				X		
MPDA	X					X
HSDC		X	X			

Chapter 7 — System configuration

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Introduction

System configuration of the Meridian 1 SL-1 system options involves determining the hardware and software necessary to meet the specific requirements of the installation. This determination is based upon parameters related to quantity and type of terminals, telephones, traffic, features, and services. An assessment of these requirements indicates which particular member of the Meridian 1 system family is best suited to address those particular needs.

Autoquote

The Autoquote mechanism readily provides a system configuration based upon specific input data pertaining to the required parameters. In addition to providing a listing of hardware and software and their associated ordering codes, reports may also be generated to denote traffic, memory, and real time estimations. Engineering rules determine equipment provisioning and the capability exists to specify requirements on an “equipped” and “wired for” basis to address future growth projections. Other services available include the capability to:

- quote all available software generics and associated optional feature groups
 - quote all standard hardware items
 - indicate which hardware and software items are on a controlled release basis
 - configure systems to support non-blocking and RPE applications
 - generate configurations for different options using the same input data requirements
 - save and later retrieve input data from one run and modify it for a subsequent run
 - specify the spare capacity available in terms of memory, real time, traffic, and hardware.
-

Configuration guidelines

The following reference tables provide information which relates to provisioning and compatibility guidelines are provided to assist in the configuration aspects of Meridian 1 system options 21, 51, 61, and 71.

Table 7-1
Meridian 1 system comparison (21, 21A, 51, 61, 71)

System option	21A	21	51	61	71
Software release	15	15	15	15	15
Ports (maximum)	160	800	1000	2000	10,000
CPU calls / hour	1 7300	1 7300	1 32000	2 32000	2 32000
Memory	768K words	768K words	768K words	768K words	1.5M words
- Program	320K words	320K words	flexible	flexible	flexible
- Pdata	64K words	64K words	flexible	flexible	flexible
- Udata	64K words	64K words	flexible	flexible	flexible
- Back-up	error detect	error detect		duplicate	duplicate
- Structure	64K pages	64K pages	contiguous	contiguous	contiguous
- Packaging	MEM/PS card	MEM/PS card	768K card	768K card	768K card
Network					
▪ Traffic Loops	24	24	14	28	140
▪ TDS	1	1	1	2	10
▪ CONF	1	1	1	2	10 --
Storage	disk	disk	disk	disk	disk

Table 7-2
Meridian 1 hardware compatibility — Common Equipment

CODE	DESCRIPTION	21A	21	51	61	71
Modules						
NT6D39AA, CPU/Network Module NT6D39DC				x	x	
NT8D11 AC, Common/Peripheral Equipment Module NT8D11DC		x	x			
NT8D34AA, CPU Module NT8D34DC						x
NT8D35AA, Network Module NT8D35DC			x*	x*	x*	x
NT8D36AA	Inter Group Module					x
-continued —						
* Network Module can be used in these System Options for PRI/DTI cards only, not for network-type cards.						

Table 7-2
Meridian 1 hardware compatibility — Common Equipment (continued)

CODE	DESCRIPTION	21A	21	51	61	71
Cards						
NT8D04AA	Superloop Network	x	x	x	x	x
NT8D17AA	Conference/Tone and Digit Switch	x	x	x	x	x
NT8D18AA	Network/Digitone Receiver	x	x			
NT8D19AA	Memory/Peripheral Signaling	x	x			
NT8D41AA	Serial Data Interface paddle board (dual port)	x	x	x	x	
NT8D68AA	Floppy Disk Unit	x	x	x	x	x
NT8D69AA	Multi Disk Unit			x	x	x
QMM42	Security Data Cartridge	x	x	x	x	x
QPC43	Peripheral Signaling			x	x	x
QPC215	Segmented Bus Extender					x
QPC412	Intergroup Switch					x
QPC414	Network	x	x	x	x	x
--						
-continued --						

Table 7-2
Meridian 1 hardware compatibility — Common Equipment (continued)

CODE	DESCRIPTION	21A	21	51	61	71
QPC757	D-Channel Handler Interface	x	x	x	x	x
QPC841	Four-Port Serial Data Interface	x	x	x	x	x
Q PC939	Read-Only Memory			x	x	x
Q PC940	Read-Only Memory	x	x			

Table 7-3
Meridian 1 hardware compatibility — Peripheral Equipment

CODE	DESCRIPTION	21A	21	51	61	71
Modules						
NT8D13AA, NT8D13DC	Peripheral Equipment Module		x	x	x	x
NT8D37AA, NT8D37DC	Intelligent Peripheral Equipment Module		x	x	x	x
NT8D47AA, NT8D47DC	Remote Peripheral Equipment Module		x	x	x	x
Cards						
NT8D01	AD Controller-2		x	x	x	x
NT8D01AC	Controller-4	x		x	x	x
— continued —						

Table 7-3
Meridian 1 hardware compatibility — Peripheral Equipment (continued)

CODE	DESCRIPTION	21A	21	51	61	71
NT8D02AA	Digital Line card	X	X-	X	X	X
NT8D03AB	Analog Line card	X	X	X	X	X
NT8D09AB	Analog Message Waiting Line card	X	X	X	X	X
NT8D14AA	Universal Trunk	X	X	X	X	X
NT8D15AA	E&M Trunk	X	X	X	X	X
NT8D16AA	Digitone Receiver	X	X	X	X	X
QPC62	1.5 Baud Converter		X	X	X	X
QPC63	Local Carrier Buffer		X	X	X	X
QPC65	Remote Peripheral Switch		X	X	X	X
QPC66	2M Baud Converter		X	X	X	X
QPC67	Carrier Maintenance		X	X	X	X
QPC99	Carrier Interface		X	X	X	X
QPC71	E&M/DX Signaling and Paging Trunk		X	X	X	X
QPC192	Off-Premises Extension Line		X	X	X	X

-continued —

Table 7-3
Meridian 1 hardware compatibility — Peripheral Equipment (continued)

CODE	DESCRIPTION	21A	21	51	61	71
QPC237	4-wire E&M/DX signaling trunk		x	x	x	x
QPC250	Release Link Trunk		x	x	x	x
QPC297	Attendant Console Monitor		x	x	x	x
QPC422	Tone Detector		x	x	x	x
QPC430	Asynchronous Interface Line		x	x	x	x
QPC432	4-Port Data Line		x	x	x	x
QPC449	Loop Signaling Trunk		x	x	x	x
QPC450	CO/FX/WATS Trunk		x	x	x	x
QPC578	Integrated Services Digital line		x	x	x	x
QPC594	16-Port 500/2500 Line		x	x	x	x
QPC659	Dual Loop Peripheral Buffer		x	x	x	x
QPC723	RS-232 4-Port Interface Line		x	x	x	x
QPC789	16-Port 500/2500 Line (Message Waiting)		x	x	x	x
QPC918	High Speed Data Card		x	x	x	x

Note : All of above, from QPC71 to QPC918 are only supported via PE **Module NT8D13**.

Table 7-4
Meridian 1 hardware compatibility — power equipment

CODE	DESCRIPTION	21A	21	51	61	71
NT5C03BJ	Switched Mode Rectifier -48V/50A					x
NT6D40AA	Peripheral Equipment Power Supply DC		x	x	x	x
NT6D41AA	Common Equipment Power Supply DC		x	x	x	x
NT6D52AA	Switched Mode Rectifier -48V/30A		x	x	x	
NT6D53AA	Junction Box		x	x	x	x
NT6D5303	Logic Return Equalizer					x
NT7D0003	Fan and Sensor Panel					
NT7D03AA	Ringing Generator DC		x	x	x	x
NT7D04AA	Common/Peripheral Equipment Power Supply DC (also used on DC RPE)	x	x	x	x	x
NT7D10AA	Power Distribution Unit DC		x	x	x	x
NT7D12AA	Rectifier Rack		x	x	x	
NT7D14AA	Common/Peripheral Equipment Power Supply AC (also used on AC RPE)	x	x	x	x	x
NT7D15AA	System Monitor - System Option 21A	x			--	

— continued —

Table 7-4
Meridian 1 hardware compatibility — power equipment (continued)

CODE	DESCRIPTION	21A	21	51	61	71
NT7D17AC, Fan Unit NT7D17DC			x			
NT7D1201	Rectifier Baffle/Mounting Kit		x	x	x	
NT8D06AA	Peripheral Equipment Power Supply AC		x	x	x	x
NT8D21AA	Ringing Generator AC		x	x	x	x
NT8D22AB	System Monitor		x	x	x	x
NT8D29AA	Common Equipment Power Supply AC			x	x	x
NT8D39AA	Power Failure Transfer Unit		x	x	x	x
NT8D52AA, Blower Unit NT8D52DC			x	x	x	x
NT8D53AB	Power Distribution Unit AC		x	x	x	x
NT8D53AD	Power Distribution Unit • System Option 21A	x				
NT8D56AA	Module Power Distribution Unit		x	x	x	x
NT8D56AB	Module Power Distribution Unit		x	x	x	x
— continued —						

Table 7-4
Meridian 1 hardware compatibility — power equipment (continued)

CODE	DESCRIPTION	21A	21	51	61	71
NT8D57AA	Module Power Distribution Unit		x	x	x	x
NT8D62AA, NT8D62DC	Temperature Sensor Panel		x	x	x	x
QBL12	Battery Distribution Box		x	x	x	x
QBL15	Power/Battery Distribution Box		x	x	x	
QCA13	DC Power Plant					x
QPC188	Battery Monitor (Part of QBL 15)		x	x	x	x

Meridian 1 system options hardware provisioning

Following is a description of all hardware equipment of the Meridian 1 system options 2 1, 5 1, 6 1, 71 that can be ordered individually. The items are described in terms of purpose, quantity required, and system hardware (system option), as appropriate.

Universal Equipment Modules

NT6D39AA, NT6D39DC CPU/Network Module

System hardware-System option 51/61

Purpose—The NT6D39 CPU/Network Module (hereafter referred to as NT6D39 CPU/NET) houses a Central Processor Unit (CPU) and network cards.

This module is available in two versions:

- NT6D39AA for AC systems
- NT6D39DC for DC systems

The NT6D39 CPU/NET card cage contains 18 card slots which support the following cards and functions:

- network cards
- Clock Controller
- Serial Data Interface (SDI)/Enhanced Serial Data Interface (ESDI)
- Peripheral Signaling
- 3-Port Extender (3PE)
- mass storage unit
- CPU Function
- CPU Interface
- Changeover Memory Arbitrator (CMA)
- Memory
- D-Channel Handler Interface (DCHI)
- Primary Rate Interface (PRI)/Digital Trunk Interface (DTI)

The NT6D39 CPU/NET Module is powered by a Common Equipment Power Supply.

Quantity-One per system option 5 1 ; two per system option 6 1

NT6D44AA, NT6D44DC Meridian Mail Module

System hardware--System option 21/51/51/71

Purpose-The NT6D44 Meridian Mail Module is a self-contained unit, complete with power converters and cooling units. It is designed to integrate with **Meridian 1** Communication Systems but is also available as a stand-alone system.

This module is available in two versions:

- NT6D44AA for AC systems
- NT6D44DC for DC systems

The Meridian Mail Module is powered by two Common Equipment Power Supplies.

Refer to the Meridian Mail suite of documents (553-7041-xxx) for detailed information.

Quantity-**Maximum** of five per system

NT8D11AC, NT8D11DC Common/Peripheral Equipment Module

System hardware—System option 21 and 21A

Purpose-The NT8D11 Common/Peripheral Equipment Module (hereafter referred to as NT8D11 CE/PE) supports CPU, network, and Intelligent Peripheral Equipment (IPE) cards in a single module.

This module is available in two versions:

- NT8D11AC for AC systems
- NT8D11DC for DC systems

The NT8D11 CE/PE card cage contains 20 card slots which support the following cards and functions:

- Floppy Disk Interface (FDI)/Floppy Disk Unit (FDU)
- CPU
- Memory
- SDI/ESDI
- network
- network/Digitone Receiver (DTR)
- DCHI
- DTI/PRI
- IPE

The NT8D11 CE/PE Module is powered by a Common/Peripheral Equipment (CE/PE) Power Supply.

Quantity-One per system

NT8D13AA, NT8D13DC Peripheral Equipment Module

System hardware—System option 21/51/61/71

Purpose—The NT8D13 Peripheral Equipment Module (hereafter referred to as NT8D13 PE) supports the Dual Loop Buffer (DLB), and 10 card slots. The PE Buffer is situated near the center of the module, with five cards to the left and five cards to the right.

This module is available in two versions:

- NT8D13AA for AC systems
- NT8D13DC for DC systems

The NT8D13 PE Module is powered by a Peripheral Equipment Power Supply, and a Ringing Generator when 500/2500 sets are supported by the module.

Quantity-As required; refer to *System* engineering (553-3001-151)

NT8D34AA, NT8D34DC CPU Module

System hardware—System option 71

Purpose—The NT8D34 CPU Module (hereafter referred to as NT8D34 CPU) houses the CPU, memory cards, and the mass storage.

This module is available in two versions:

- NT8D34AA for AC systems
- NT8D34DC for DC systems

The NT8D34 CPU card cage contains 15 card slots which support the following cards and functions:

- Memory
 - CMA
 - CPU Interface
 - CPU Function
 - SDI/ESDI
 - MSI
 - Segmented Bus Extender (SBE)
 - DCHI
 - PRI/DTI
 - Clock Controller
 - Mass Storage Unit (MSU) or Floppy Disk Unit (FDU)
-

The NT8D34 CPU Module is powered by a Common Equipment Power Supply.

Quantity-Two per system

NT8D35AA, NT8D35DC Network Module

System hardware—System option 71

Purpose—The NT8D35 Network Module (hereafter referred to as NT8D35 NET) provides the signal interface between the Common Equipment (CE) cards located in the module.

This module is available in two versions:

- NT8D35AA for AC systems
- NT8D35DC for DC systems

The NT8D35 NET card cage contains 15 card slots which support the following cards and functions:

- 3PE
- Intergroup Switch (IGS) (for system option 71 only)
- peripheral signaling
- network cards
- SDI/ESDI
- PRI/DTI

The NT8D35 NET Module is powered by a Common Equipment Power Supply.

Quantity-A maximum of 10 per system (five network groups), excluding additional requirements for PRI/DTI.

NT8D36AA Inter Group Module

System hardware—System option 71

Purpose—The NT8D36AA Inter Group Module provides a path for the switching of traffic between the network groups in the system. Faceplate cables from the Clock Controller (CC) and Intergroup Switch (IGS) circuit cards are connected to the Inter Group Module. This module uses a QPC417 Junctor Board.

This module is used in both AC and DC systems.

Quantity-One per system

NT8D37AA, NT8D37DC Intelligent Peripheral Equipment Module

System hardware—System option 21/5 1/6 1/7 1

Purpose—The NT8D37 Intelligent Peripheral Equipment Module (hereafter referred to as NT8D37 IPE) supports a Controller card and 16 IPE cards. The Controller card is situated near the center of the module, between slot 7 and slot 8.

This module is available in two versions:

- NT8D37AA for AC systems
- NT8D37DC for DC systems

The card slots in the NT8D37 IPE card cage support the following cards:

- Universal Trunk
- E&M Trunk
- Digitone Receiver (DTR)
- Analog Line card (ALC)
- Digital Line card (DLC)
- Analog Message Waiting Line card (MLC)

The NT8D37 IPE Module is powered by a Peripheral Equipment Power Supply, and a Ringing Generator when 500/2500 sets are supported by the module.

Quantity-As required; refer to *System* engineering (553-3001-151)

NT8D47AA, NT8D47DC Remote Peripheral Equipment Module

System hardware—System option 21/51/61/71

Purpose--The NT8D47 Remote Peripheral Equipment Module (hereafter referred to as NT8D47 RPE) is an interface module used to extend the interconnection distance between local and remote sites.

The same module is used for **both** local and remote applications. On the local side, it interfaces to the QPC414 Network card for up to two network loops; on the remote side, it supports the NT8D13 PE Module.

This module is available in two versions:

- NT8D47AA for AC systems
- NT8D47DC for DC systems

The NT8D47 RPE card cage contains 12 card slots which support the following cards and functions:

- 1.5 Mb converter
 - 2 Mb converter
 - carrier interface
 - remote peripheral
 - local carrier buffer
 - carrier interface
 - 2 Mb converter
 - 1.5 Mb converter
 - carrier maintenance
 - PRI/DTI (optional)
-

The NT8D47 RPE Module is powered by a Common Equipment/Peripheral Equipment Power Supply.

Quantity—Since each NT8D47 RPE Module serves two network loops, the number of modules required per system depends on the number of stations in the remote site.

Packaging

NT8D49 Spacer Kit

System Hardware-All

Purpose—Bolts modules together for side-by-side expansion. The Spacer Kit includes:

- expansion spacer
- RF gasketing
- eight bushings

NT8D55AA Universal Equipment Module cover

System Hardware-All

Purpose--This is the front or rear cover that is part of the UEM. Two covers are required for each UEM.

Universal Equipment Module side panel

System Hardware-All

Purpose—This is the side panel (PO699724) that is part of the UEM. A maximum of eight panels are required for multi-column systems.

Card cage assemblies

A card cage assembly consists of a sheet metal case and an associated backplane. The card cage provides the physical framework that houses the circuitry and power supplies within the UEM.

The following is a list of all the card cage assemblies available and their corresponding UEMs:

- NT6D3903 NT6D39AA/DC CPU/Network Module
- NT8D1103 NT8D 11 AC/DC Common/Peripheral Equipment Module
- NT8D1303 NT8D13AA/DC Peripheral Equipment-Module
- NT8D3403 NT8D34AA/DC CPU Module
- NT8D3503 NT8D35AA/DC Network Module
- NT8D3703 NT8D37AA/DC Intelligent Peripheral Equipment Module
- NT8D4703 NT8D47AA/DC Remote Peripheral Equipment Module

Top Cap

System Hardware-AU

Purpose—The top cap is mounted on the highest module of each column. The top cap is approximately 80 cm (31.5 in.) wide by 55.9 cm (22 in.) deep by 7.6 cm (3 in.) high and weighs 3.6 kg (8 lbs). It consists of a front and a rear air exhaust grill and thermal sensors. System option 21A contains a small fan to cool the power supply.

Three versions of the top cap are available:

- NT7D00AA AC systems
- NT7D00BA DC systems
- NT7D00AC system option 21A only

Pedestal

System Hardware-All

Purpose—The Pedestal is a base unit made of die-cast construction. It is approximately 80 cm (31.5 in.) wide by 64.8 cm (25.5 in.) deep by 25.4 cm (10 in.) high and weighs 13.6 kg (30 lbs) empty. Leveling feet are provided for up to four tiers, while a caster option is provided for up to two tiers.

The pedestal is available in three versions:

- NT8D27AB for AC systems
- NT8D27AC for system option 21A only
- NT7D09AA for DC systems

The pedestal for AC and DC systems (except system option 21A) can house any of the following field replaceable assemblies:

- Power Distribution Unit NT8D53AB or NT7D10AA
- Blower Unit NT8D52AA or NT8D52DC
- Fan Unit NT7D17AC or NT7D17DC
- Leveling foot A0318207
- Air grill (molded) PO699797
- Air filter PO699798

The pedestal for system option 21A is basically the same as the one used for other system options except it can only house the following field-replaceable assemblies:

- Power Distribution Unit NT8D53AD
- Leveling foot A03 18207
- Air grill (molded) PO699797

Power and cooling equipment

A0367754 Top Cap Fan

System Hardware-System option 2 1 A

Purpose—The A0367754 Top Cap Fan is located in the Fan and Sensor Panel. It provides cooling for the NT7D14AA CE/PE power Supply AC. There is no speed or temperature control provided with it. Power to the Top Cap Fan is controlled by the circuit breaker located on the back panel of the pedestal.

Quantity—One per system

NT5C03BJ Switched Mode Rectifier -48V/50A

System Hardware-System option 7 1 (DC version)

Purpose—Solid state, switched-mode rectifier. Converts 208/240 VAC (nominal) to -48 VDC (nominal), with a 50A output. Used in the QCA13 power plant, with up to ten rectifiers in parallel.

Quantity—As required by system power consumption

NT6D40AA Peripheral Equipment Power Supply DC

System Hardware-All

Purpose—The Peripheral Equipment Power Supply DC is used to provide power to all peripheral equipment modules in DC systems. It converts -48V DC to +5V, +8.5V, ±10V, ±15V, and -48V DC voltages used to power peripheral equipment logic cards and to supply talk battery to lines and trunks. This power supply is located in the far left hand card slot labeled “PE Pwr Sup”.

Quantity—One Peripheral Equipment Power Supply DC is used in each of the following DC modules:

- Intelligent Peripheral Equipment Module (NT8D37DC)
- Peripheral Equipment Module (NT8D13DC)

NT6D41AA Common Equipment Power Supply DC

System Hardware-All

Purpose—The Common Equipment Power Supply DC is used in the common equipment modules in DC systems. It is located in the first slot on the left in the module labeled “CE Pwr Sup”. It converts -48V DC to +5V and ±12 V DC to provide all required voltages for CE and network circuit cards

Quantity—One Common Equipment Power Supply DC is used in each of the following DC modules:

- CPU Module (NT8D34DC)
 - Network Module (NT8D35DC)
 - CPU/Network Module (NT6D39DC)
-

Two Common Equipment Power Supply DC units are used in the Meridian Mail Module (NT6D44DC).

NT6D52AA Switched Mode Rectifier -48V/30A

System Hardware-System option 21/51/61 (DC versions)

Purpose—The Switched-Mode Rectifier is based on the QRF12 rectifier, with shielding to limit electromagnetic interference. It converts 208/240 VAC (nominal) to -48 VDC (nominal), with a 30A output. It connects to the system through the QBL15 Battery Distribution Box.

Quantity—Generally one rectifier per every three modules. Exact quantity depends on system configuration and power requirements.

NT6D53AA Junction Box

System Hardware-All (DC version)

Purpose—The Junction Box is required when the distance from the rectifier to the pedestal is over 0.74 m (8 ft), which requires wire larger than 10 AWG. It provides a set of connection terminals for the 4-AWG wire that comes from the rectifier, and a set of connection terminals for the 10-AWG wire that goes into the pedestal.

Refer to Power engineering (553-3001-152) for more information.

Quantity—One per DC pedestal

NT6D5303 Logic Return Equalizer

System Hardware-System option 7 1 (DC version)

Purpose—The Logic Return Equalizer (LRE) mounts on top of the QCA13 cabinet. It is used as the single point ground for system option 71.

Quantity—One per system

NT7D0003 Fan and Sensor Panel

System Hardware-System option 2 1 A

Purpose—The NT7D0003 Fan and Sensor Panel contains a 230 VAC tubeaxial fan (A0367754) and a thermal sensor for a high temperature/shutdown alarm to the Option 21A System Monitor. The fan provides cooling for the NT7D14AA Common/Peripheral Equipment Power Supply. It is on continuously and receives power directly from the Power distribution Unit via the module power harness.

The NT7D0003 Fan and Sensor Panel consists of the following:

- a perforated top shield (P0703062)
 - a Top Cap Fan (A0367754)
 - a fan power harness (NT7D0004)
 - a thermostat harness (NT8D46AC)
-

Quantity-One per system

NT7D03AA Ringing Generator DC

System Hardware-All DC system options

Purpose-The Ringing Generator DC operates from a nominal -48V DC input and provides selectable AC ringing voltage outputs superimposed on -48 VDC. The frequency and voltage options are 20/25/50 Hz and 70/80/86 VAC. It also supplies -150V DC Message Waiting lamp 500/2500 set applications. The Ringing Generator DC mounts in the PE modules to the right of the Peripheral Equipment Power Supply DC.

Quantity-One Ringing Generator DC is used in each of the following, when these DC modules support 500- or 2500-type analog sets:

- Intelligent Peripheral Equipment Module (NT8D37DC)
- Peripheral Equipment Module (NT8D13DC)

NT7D04AA Common/Peripheral Equipment Power Supply DC

System Hardware-All (DC options)

Purpose---The Common/Peripheral Equipment Power Supply DC converts -48V DC to +5V, +8.5V, $\pm 15V$, $\pm 12V$, -48V, and -150V DC voltages used to power peripheral and common equipment, supply talk battery, and light Message Waiting lamps on 500/2500 sets. It provides selectable AC ringing voltage outputs superimposed on -48 VDC. The frequency and voltage options are 20/25/50 Hz and 70/80/86 VAC. It is located to the left of the module, in the slot labeled “CE/PE Pwr Sup”.

Quantity-One Common/Peripheral Equipment Power Supply DC is used in each of the following DC Modules:

- Common/Peripheral Equipment Module (NT8D11DC)
- Remote Peripheral Equipment Module (NT8D47DC)

NT7D10AA Power Distribution Unit DC

System Hardware-All except system option 2 1 A

Purpose--The NT7D10AA Power Distribution Unit DC distributes power to the entire column. It is located in the rear of the pedestal. It houses five circuit breakers (one for each Module and one for the Blower Unit) and the System Monitor.

Quantity-One per pedestal/column in DC systems --

NT7D12AA Rectifier Rack

System Hardware—21/5 1/61 (DC versions)

Purpose--This is a 48.3-cm (19-in.) open relay rack which is approximately 1.5 m (5 ft) high. It supports up to three NT6D52AA Rectifiers in a single column.

Quantity-One rack per every three NT6D52AA Rectifiers, up to a maximum of three racks per system

NT7D14AA Common/Peripheral Equipment Power Supply AC

System Hardware-System Options 21/21A And all RPE

Purpose-The Common/Peripheral Equipment Power Supply AC converts 208/240V AC to +5V, +8.5V, $\pm 15V$, $\pm 12V$; -48V, and -150V DC voltages used to power peripheral and common equipment, supply talk battery, and light Message Waiting lamps on 500/2500 sets. It provides selectable AC ringing voltage outputs superimposed on -48 VDC. The frequency and voltage options are 20/25/50 Hz and 70/80/86 VAC. It is located in the left of the module, in the slot labeled "CE/PE Pwr Sup".

Quantity-One Common/Peripheral Equipment Power Supply AC is used in each of the following AC modules:

- Common/Peripheral Equipment Module (NT8D11AC)
- Remote Peripheral Equipment Module (NT8D47AA)

NT7D15AA System Monitor - System Option 21 A

System Hardware-System option 21A

Purpose-The NT7D15AA System Monitor - System Option 21A provides an interface to communicate and monitor the NT7D14AA CE/PE Power Supply AC, the CPU, and the thermal switches. In the event of failure, the System Monitor-System Option 21A is notified and the appropriate alarm is set. A system alarm LED located below the top cap lights to indicate CPU failure.

Quantity-One per system

NT7D17AC Fan Unit AC

System Hardware-System option 21 with up to two tiers

Purpose-The NT7D17AC Fan Unit AC is housed within the pedestal and provides cooling for the entire column. It consists of three fans and a circuit breaker located in the front.

Quantity-One per pedestal

NT7D17DC Fan Unit DC

System Hardware--System option 21 with up to two tiers --

Purpose—The NT7D17DC Fan Unit DC is the same as the NT7D17AC Fan Unit AC except that it is used for DC systems. It has an on/off switch in the front and its own separate circuit breaker located on the Power Distribution Unit.

Quantity-One per pedestal

NT7D1201 Rectifier Baffle/Mounting Kit

System Hardware—System option 21/51/61 (DC versions)

Purpose—The Rectifier Baffle/Mounting Kit consists of a set of support brackets for mounting the NT6D52AA Rectifier to an NT7D12AA Rack, and a heat baffle plate. The baffle directs exhaust air from the lower rectifier away from the inlet to the upper rectifier, thereby allowing cooling by natural convection .

Quantity-One per NT6D52AA Rectifier

NT8D06AA Peripheral Equipment Power Supply AC

System Hardware-All except system option 21A

Purpose—The Peripheral Equipment Power Supply AC is used to provide power to all peripheral equipment modules in AC systems. It converts 208/240V AC to +5V, +8.5V, ±10V, ±15V, and -48V DC voltages used to power peripheral equipment logic cards and to supply talk battery to lines and trunks. This power supply is located in the far left-hand card slot labeled “PE Pwr Sup”.

Quantity-One Peripheral Equipment Power Supply AC is used in each of the following AC modules:

- Intelligent Peripheral Equipment Module (NT8D37AA)
- Peripheral Equipment Module (NT8D13AA)

NT8D21 AA Ringing Generator AC

System Hardware-All except system option 21A

Purpose-The Ringing Generator AC operates from a nominal 208/240 VAC input and provides selectable AC ringing voltage outputs superimposed on -48 VDC. The frequency and voltage options are 20/25/50 Hz and 70/80/86 VAC. It also supplies -150V DC Message Waiting lamp 500/2500 set applications. The Ringing Generator AC mounts in the PE modules to the right of the Peripheral Equipment Power Supply.

Quantity-One Ringing Generator AC is used in each of the following, when these AC Modules support 500- or 2500-type analog sets:

- Intelligent Peripheral Equipment Module (NT8D37AA)
- Peripheral Equipment Module (NT8D13AA)

NT8D22AB System Monitor

System Hardware-All except system option 2 1 A

Purpose—The NT8D22AB System Monitor monitors the status of all internal power and cooling related components, as well as external DC rectifiers, batteries, and Uninterruptable Power Supplies (UPS). The System Monitor is mounted in the Power Distribution Unit, within the Pedestal.

The System Monitor that handles the communication with the system CPU (via SDI port) is the master; all others function as slaves. There is a serial communication link between the master and the slave System Monitors. In addition to CPU status reporting, the System Monitor also controls all external visual status indications.

Quantity-One master and up to 63 slave System Monitors are allowed per system.

NT8D29AA Common Equipment Power Supply AC
System Hardware-System option 5 1/61/71

Purpose—The Common Equipment Power Supply AC is used in the common equipment modules in AC systems. It is located in the first slot on the left in the module labeled “CE Pwr Sup”. It converts 208/240V AC to +5V and ± 12 V DC to provide all required voltages for CE and network circuit cards.

Quantity-One Common Equipment Power Supply AC is used in each of the following AC Modules:

- CPU Module (NT8D34AA)
- Network Module (NT8D35AA)
- CPU/Network Module (NT6D39AA)

Two Common Equipment Power Supply AC is used in the Meridian Mail Module (NT6D44AC).

A0355200 Power Failure Transfer Unit

System Hardware-All except system option 21A

Purpose—Provides an interface between CO lines, PBX, and 500/2500 phones (rotary dial and pushbutton). The Power Failure Transfer Unit allows eight phones to be connected to the CO lines in the event of a PBX power failure or malfunction. The Power Fail Transfer Unit is transparent to the switch and CO lines during normal PBX operations.

The Power Failure Transfer Unit is approximately 22.8 cm (9 in) long by 22.8 cm (9 in) wide by 8.8 cm (3.5 in) deep. It is screw-mounted to the Distribution Frame and connects to the Main Distribution Frame and switch by two 25-pair cables.

Quantity-As required

NT8D52AA Blower Unit

System Hardware-All except system option 21A

Purpose-The Blower Unit is part of the system cooling assembly and provides forced-convection cooling. Housed within the pedestal, it contains two **backward-curved** impellers (rotor blades) which are cylindrically shaped, approximately 22.8 cm (9.in) in diameter, and 6.9 cm (2.75 in) thick. A circuit **breaker** is located on the front of the blower chassis to turn the unit on and off. Each unit weighs about 1.5 kg (3.5 lbs).

The unit communicates with the power distribution section by engaging a connector in the rear of the pedestal.

Quantity-One per pedestal in AC systems

NT8D52DC Blower Unit

System Hardware-AU except system option 21 A

Purpose—This Blower Unit is the same as the **NT8D52AA** Blower Unit except that it is used for DC systems. It has its own separate circuit breaker located on the Power Distribution Unit. Also, for maintainability in the field, a switch is located on the front of the blower chassis to turn the unit on and off.

Quantity-One per pedestal in DC systems

NT8D53AB Power Distribution Unit AC

System Hardware-All except system option 21A

Purpose—The Power Distribution Unit AC distributes power to the entire column. It is located in the rear of the pedestal. It houses a main circuit breaker and the System Monitor.

Quantity-One per pedestal/column in AC systems

NT8D53AD Power Distribution Unit - System Option 21A

System **Hardware**—System option 21A

Purpose—The Power Distribution Unit - System Option 21A is a panel located in the pedestal. It contains a circuit breaker, a terminal block, and an **EMI** filter. The power cable enters the pedestal and connects to the circuit breaker. From the circuit breaker, the AC voltage goes to the terminal block through the EMI filter and back to the terminal block where it is distributed to the **NT7D14AA CE/PE** Power Supply AC and the fan located in the top cap.

Quantity-One per system

NT8D56AA Module Power Distribution Unit

System Hardware-All except system option 21A

Purpose—The **NT8D56AA** Module Power Distribution Unit protects the power supply and distributes power within a module. It houses a single breaker and is used in conjunction with the **NT8D29AA** CE Power Supply AC.

Quantity-One per **NT8D35AA** NET, **NT6D39AA** CPU/NET, or **NT8D34AA** CPU Module

NT8D56AB Module Power Distribution Unit --

System Hardware-All except system option 21A

Purpose-The **NT8D56AB** Module Power Distribution Unit protects the power supply and distributes power within a module. It houses a single breaker and is used in conjunction with the **NT7D14AA CE/PE** Power Supply AC.

Quantity-One per **NT8D47AA** RPE Module

NT8D57AA Module Power Distribution Unit

System Hardware--All except system option 21A

Purpose--The NT8D57AA Module Power Distribution Unit protects the power supply and distributes power within a module. It houses a dual breaker and is used in conjunction with the NT8D06AA PE Power Supply AC and the NT8D21AA Ringing Generator AC.

Quantity-One per NT8D13AA PE or NT8D37AA IPE Module

NT8D62AA, NT8D62DC Temperature Sensor Panel

System Hardware—All except system option 2 1A.

Purpose-The NT8D62 Temperature Sensor Panel communicates with the System Monitor in the event of overheating. It contains two temperature sensors which protect against thermal damage by detecting extreme temperature.

The Temperature Sensor Panel is available in two versions:

- NT8D62AA for AC systems
- NT8D62DC for DC systems

The Temperature Sensor Panel consists of the following:

- a perforated shield panel (P0703062)
- an LED bracket (P0703061)
- a thermostat harness (NT8D46AC)
- an air probe harness (NT8D46AM or NT8D46DC)
- an air probe connector bracket (PO703064 or PO708 186)

Quantity-One per top cap

QBL12 Battery Distribution Box

System Hardware--All (DC versions)

Purpose-Connects customer-provided power supplies to the system. Allows connection of up to 24 modules. Provides connection points, fused outputs, and monitoring of rectifiers and batteries.

Quantity-One per system

QBL15 Power/Battery Distribution Box

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System Hardware---System option 21/51/61 (DC versions)

Purpose-Allows the parallel connection of up to three NT6D52AA Rectifiers, for connection to the system and to reserve batteries. Includes main fuses, diode blocking, test points, QPC188 battery monitor card, and sense lead fusing on connections from each rectifier.

Quantity-One per every three NT6D52AA Rectifiers, up to a maximum of two QBL15s per system

QCA13 DC Power Plant

System Hardware--System option 71 (DC version)

Purpose—Consists of a primary power cabinet with fusing and distribution hardware, monitoring and control, and up to four NT5C03 50A Rectifiers. Up to two supplemental cabinets can be added, with up to four rectifiers in the first supplemental cabinet and up to two rectifiers in the second cabinet, for a total of 10 rectifiers and a total system capacity of 500A. (This power system is also referred to as the 52412 power plant; QCA13 is actually the cabinet designation, but is the more commonly used name.)

Quantity-As required by system power consumption

QPC188 Battery Monitor

System Hardware-All (DC versions)

Purpose—Located in each Battery Distribution Box to monitor rectifier and battery voltages. Generates low float alarm, low voltage trip alarm and sense lead fuse conditions.

Quantity-One circuit card in QBL12 or QBL15

QRF12 -52 V Rectifier

System Hardware-System option 21/5 1/61 (DC version)

Purpose—Converts 115 V AC and 220 V AC to -52 V DC (nominal). QRF12B voltage conversions from 90V to 129V, and 190V to 250V. Connects to the columns through the QBL15 Power/Battery Distribution Box.

Quantity-One for every two, or three modules, depending on load and redundancy requirements.

Common Equipment cards

NT8D04AA Superloop Network

System Hardware-All

Purpose- Provides 120 time slots (one superloop) interface between Network and Intelligent Peripheral Equipment. Utilizes the equivalence of four network loops. May be connected to one or two NT8D01 Controller card(s).

The Superloop Network card is equipped with a Motorola 68000-type microprocessor which performs network diagnostics and signaling control, and communicates with the Intelligent Peripheral Controller.

Quantity-Up to four per Network Module as required. Refer to *System engineering* (553-3001-151) for engineering details.

NT8D17AA Conference/Tone and Digit Switch (TDS)**System Hardware-All**

Purpose--Provides both Conference and TDS functions. This card accesses two network loops, one for each function.

The Conference circuitry has a warning tone **option** and supports broadcast mode. Up to 15 simultaneous conferences can be controlled with the restriction that the total number of conferees in all conferences is not greater than 30.

The TDS circuitry provides tones for different countries (up to 256 tones and cadences).

Quantity-As required. Refer to system engineering (553-3001-151) for engineering details.

NT8D18AA Network/Digitone Receiver**System Hardware-System option 2 1 and 2 1 A**

Purpose—Combines the functionality of the Network Controller and **Digitone** Receiver cards in a mother/daughterboard assembly. The mother board plugs into a dedicated slot on the backplane. The daughter board attaches to the mother board through an **SDI/ESDI** connector and does not connect to the backplane.

Quantity-One per NT8D11 CE/PE Module

NT8D19AA Memory/Peripheral Signaling**System Hardware-System option 2 1 and 2 1 A**

Purpose—Combines the functionality of the Memory and Peripheral Signaling cards, as well as miscellaneous CPU functions.

The CPU functions include interrupt and fault monitoring.

The Peripheral Signaling function provides:

- signaling interface between CPU and Peripheral Equipment for up to 32 network loops
- clock and timing signals for real-time transmission functions

Quantity-One per NT8D11 CE/PE Module

NT8D41 AA Serial Data Interface paddle board (dual-port)**System Hardware-System option 2 1 A/2 1/5 1/6 1**

Purpose--Provides two serial ports between the SL-1 processor and an external device. Each port supports

- RS-232-C interface
 - 8-bit ASCII data with parity and stop bit
 - asynchronous, start-stop operation
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- data rates of 300, 600, 1200, 2400, 4800, and 9600 baud
- Data Terminal Equipment (DTE) mode
- Data Communication Equipment (DCE) mode

Quantity-Three maximum per NT8D11 CE/PE Module; two maximum per NT6D39 CPU/NET Module

NT8D68AA Floppy Disk Unit

System hardware-All

Purpose-The Floppy Disk Unit (FDU) is used to load the programs and office data into the system memory. The FDU contains two 3.5inch floppy drives and is controlled by the QPC742 Floppy Disk Interface (FDI). Each floppy drive has a formatted capacity of 1.44 MB.

The FDU occupies two adjacent card slots in the CPU, Network, or PE Module. It is powered through the cable connecting it to the FDI. The FDU can be connected to one or two FDIs as required by the system.

Quantity-One per system

NT8D69AA Multi Disk Unit

System hardware-System option 51/61/71

Purpose—The Multi Disk Unit (MDU) is used to load the programs and office data into the system memory. The MDU contains the following:

- two 3.5inch floppy1 drives which are connected to the SCSI interface through the SCSI/floppy controller; each drive has a formatted capacity of 1.44 MB
- a 3.5inch hard disk drive which has a built-in SCSI interface and a capacity of 20 MB
- an SCSI/floppy controller

The MDU occupies three adjacent card slots in the CPU, CPU/NET, or Network Module and requires 5V and 12V from the module. The MDU is controlled by the QPC584 Mass Storage Interface (MSI). The MDU can be connected to one or two MSIs as needed.

Quantity-One per system

QMM42 Security Data Cartridge

System Hardware-AU

Purpose--This is a security measure that allows a customer access only to software packages purchased for his system. This security data cartridge is mounted on either the QPC584 Mass Storage Interface or QPC742 Floppy Disk Interface card.

Quantity-One per MSI/FDI card

QPC43 Peripheral Signaling

System Hardware-System option 5 1/6 1/71

Purpose—Provides a signaling interface between the CPU and PE via the Network cards. Provides basic bit rate 2.048 MHz clock and timing signals for real-time functions.

Quantity-One per NT8D35 NET or NT6D39 CPU/NET Module

QPC215 Segmented Bus Extender

System Hardware-System option 71

Purpose--The Segmented Bus Extender (SBE) extends CPU bus signals (address, data, and control) to the Network Module. It also allows recovery of calls by isolating bus faults to a single network group.

Note: QPC215C or later vintage is required.

Quantity-One circuit card in each CPU per network group, with a maximum of five per CPU

QPC412 Intergroup Switch

System Hardware-System option 71

Purpose+Provides space switching between network groups in multigroup systems.

Quantity-Two per Network Module (use vintage C when two or more groups are installed)

QPC414 Network

System Hardware-All

Purpose—Provides 30 time slots interface per each of two network loops. Provides speech path switching, signaling and control circuits for two network loops. Interfaces between network and NT8D13 PE, NT8D47 RPE, and Meridian Mail Modules, and PRI/DTI cards.

Quantity-As required; refer to **System engineering** (553-3001-151)**QPC417 Junctor Board**

System Hardware---System option 71

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Purpose—Provides space switching paths between network groups in multigroup systems for up to five groups.

Quantity-One per system

QPC441 Three-Port Extender

System Hardware-System option 61/71

Purpose-Extends CPU data, address and control signals between one **NT8D35** NET Module and a QPC215 Segmented Bus Extender on a CPU Module in Option 71. In Option 61, interfaces between two **NT6D39** CPU/NET Modules. (Also required in Option 5 1.)

Quantity-One per NT8D35 NET or NT6D39 CPU/NET Module

QPC471/QPC775 Clock Controller

System Hardware-All

Purpose-The Clock Controller (CC) is used in system option 71 to synchronize the Meridian 1 network to an external source clock and to generate and distribute clock to the Meridian 1 system. It is also used with **PRI/DTI** in all system options.

Note: QPC47 1 C or later vintage is required.

Quantity-Two for system option 71, and one per CPU when DTI or PRA is required in other options.

QPC477 Bus Terminating Unit

System Hardware--System option 5 1/61/71

Purpose—Bus Terminating Units (BTUs) are installed in the CE Modules. They provide a logical termination to the CPU and network buses. They are paddle boards installed in dedicated slots, between circuit cards from the front of the module.

Quantity-The following vintages are required for the modules listed:

- **QPC477-A9**
One required for each **NT6D39 CPU/NET** and each **NT8D35 NET**
- **QPC477-A10**
One required for each **NT6D39 CPU/NET** and each **NT8D35 NET**
- **QPC477-A20**
One required for each **NT8D34 CPU**
- **QPC477-A2 1**
One required for each **NT8D34 CPU**
- **QPC477-A22**
One required for each **NT6D39 CPU/NET**

QPC513 Enhanced Serial Data Interface

System Hardware--All

Purpose—Provides two serial data interface circuits that can be configured for either synchronous or asynchronous data communications at rates of up to 64 kbps (synchronous) or 19.2 kbps (asynchronous).

Note: Use **QPC5 13D** with Meridian Mail option and other applications requiring Integrated Services Digital Network (**ISDN**) Application Protocol,

Quantity-As required per application

QPC579 CPU Function

System Hardware-System option 5 1/6 1/7 1

Purpose—The CPU Function card works in conjunction with the CPU Interface card (QPC580). It contains the main CPU logic circuitry. The CPU provides a 24-bit data bus. The CPU Function card contains a QPC939 system ROM.

Quantity-One per CPU Module

QPC580 CPU Interface

System Hardware--System option 5 1/6 1/7 1

Purpose-Contains the logic required to interface the CPU with the external address bus and detects, identifies and isolates bus faults. Works in conjunction with QPC579 CPU Function card.

Quantity-One per CPU Module

QPC581 Changeover and Memory Arbitrator

System Hardware-System option 5 1/6 1/7 1

Purpose-The Changeover and Memory Arbitrator (CMA) card controls CPU access to the duplicated memory in dual CPU systems, automatically disables faulty memory cards and controls CPU changeover. The CMA switches from one CPU to the other in the event of a CPU fault.

Quantity-Two CMA cards are required per system (one per CPU/Memory configuration).

QPC583 Memory

System Hardware--System option 5 1/61/7 1

Purpose-Provides 768K of Random Access Memory (RAM).

Quantity-One per CPU for system option 51/61; two maximum per system option 71

QPC584 Mass Storage Interface

System Hardware-System option 51/61/71

Purpose—Interface between the Multi Disk Unit (MDU) and CPU(s). Provides address matching, disk drive control, data buffering and interrupt control circuits.

The MSI is used with the MDU and contains:

- two high capacity floppy disk drives or
- one Winchester disk drive with two high capacity floppy drives as backup

Note: QPC584D or later vintage is required.

Quantity-One MSI circuit card for each CPU/MDU.

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QPC687 CPU with SDI/RTC

System Hardware-System option 21 and 21A

Purpose-This is a stand-alone CPU card with error correction, real-time clock, and one SDI port.

Note: QPC687B or later vintage is required.

Quantity-One per system

QPC720 Primary Rate Interface

System Hardware--All

Purpose—The ISDN Primary Rate Interface (PRI) card allows twenty three 64 Kbps clear channel operation with a single 64 Kbps common signaling channel. It is used in conjunction with DCHI to provide PRA. The PRI circuit card provides the physical DS-1 interface and is also used for DTI applications.

Quantity-One per Primary Rate Access (PRA) or DTI link

QPC742 Floppy Disk Interface

System Hardware-All

Purpose—Interface between the Floppy Disk Unit (FDU) and one CPU. Provides address matching, disk drive control, data buffering and interrupt control circuits.

Quantity-One per CPU

QPC757 D-Channel Handler Interface

System Hardware-All

Purpose—The D-Channel Handler Interface (DCHI) card processes the LAPD protocol for ISDN primary rate signaling channel and ISDN Signaling Link (ISL). It also provides a single asynchronous Serial Data Interface (SDI) port.

Quantity-One per 16 PRI links to the same location (eight maximum per system)

QPC841 Four-Port Serial Data Interface

System Hardware-All

Purpose—Provides four serial ports between the system processor and an external device. Each port supports

- RS-232-C interface
 - 8-bit ASCII data with parity and stop bit
 - asynchronous, start-stop operation
 - data rates of 300,600, 1200, 2400, 4800, and 9600 baud
 - Data Terminal Equipment (DTE) mode
 - Data Communication Equipment (DCE) mode
-

Quantity-Up to four per system

QPC939 Read-Only Memory

System Hardware-System option 51/61/71

Purpose—Read-Only Memory (ROM) daughterboard on the QPC579 CPU Function card.

Quantity-One per CPU

QPC940 Read-Only Memory

System **Hardware**—System option 21

Purpose--ROM daughterboard on the QPC687 CPU with **SDI/RTC** card.

Quantity-One per CPU

Peripheral Equipment cards

NT8D01 AD Controller-2

System Hardware-All except system option 21A

Purpose-Provides a primary interface and control function between the Superloop Network card and the IPE Module over up to two 10.24Mbs superloops. Each Controller-2 card serves up to 16 IPE cards.

The Controller-2 card interfaces with up to two NT8D04AA Superloop Network cards. It is equipped with a Motorola 68000-type microprocessor which performs some local call processing and maintenance diagnostics, thus off-loading the system CPU.

Quantity-One per NT8D37 IPE Module

NT8D01 AC Controller-4

System Hardware--All except system option 21A

Purpose-Provides a primary interface and control function between the Superloop Network card and the IPE Module over up to four 10.24Mbs superloops. Each Controller-4 card serves up to 16 IPE cards.

The Controller-4 card interfaces with up to four NT8D04AA Superloop Network cards. It is equipped with a Motorola 68000-type microprocessor which performs some local call processing and maintenance diagnostics, thus-off-loading the system CPU.

Quantity-One per NT8D37 IPE Module

NT8D02AA Digital Line card

System Hardware-All

Purpose—Provides interface to up to 16 digital integrated voice and data sets for a total of 32 ports. It is equipped with an Intel **8051-type** microprocessor which performs several functions, some of which are as follows:

- control of card operation
- card identification
- self-test
- status reporting to the Controller
- maintenance diagnostics

Quantity-Up to sixteen cards per NT8D37 IPE Module

NT8D03AB Analog Line card

System Hardware-All

Purpose—Provides interface to up to 16 analog sets (500/2500). It is equipped with an Intel 8051 -type microprocessor which performs several functions, some of which are as follows:

- control of card operation
- card identification
- self-test
- status reporting to the Controller
- maintenance diagnostics

Quantity-Up to sixteen cards per NT8D37 IPE Module

NT8D09AB Analog Message Waiting Line card

System Hardware-All

Purpose—Provides interface to up to 16 analog sets (500/2500) with Message Waiting lamp feature. It is equipped with an Intel 8051 -type microprocessor which performs several functions, some of which are as follows:

- control of card operation
- card identification
- self-test
- status reporting to the Controller
- maintenance diagnostics

Quantity-Up to sixteen cards per NT8D37 IPE Module --

NT8D14AA Universal Trunk

System Hardware-All

Purpose---Provides interface connecting the trunk facility to the NT8D37 IPE Module. It is equipped with an Intel **8052-type** microprocessor which performs several functions, some of which are as follows:



- control of card operation
- card identification
- self-test
- status reporting to the Controller
- maintenance diagnostics

This card interfaces eight 600 or 900 Ω trunks with the system in A-Law or μ -Law application. Each of these eight ports can be **individually configured** to operate as:

- Central Office (CO) trunk
- Direct Inward Dialing (DID) trunk
- 2-way Tie, Dial Repeating (2DR)
- 2-way Tie, Outgoing Automatic Incoming Dial (OAID) trunk
- Outgoing Automatic Number Identification (OANI) trunk
- Recorded Announcement (RAN) trunk
- Music trunk
- Paging trunk

The Universal Trunk card is software selectable and complies with CSA Standard C82.2 No. 0.7 • MI985 and EIA Standard 464A.

Quantity-Up to sixteen cards per NT8D37 IPE Module

NT8D15AA E&M Trunk

System Hardware--All

Purpose—Used in both A-Law and μ -Law applications. Provides interface connecting the trunk facility to the NT8D37 IPE Module. It is equipped with an Intel 8052-type microprocessor which performs several functions, some of which are as follows:

- control of card operation
- card identification
- self-test
- status reporting to the Controller
- maintenance diagnostics

The E&M Trunk provides four analog trunks, each of which can be individually configured to operate as:

- E&M signaling trunk
- two-wire Tie trunk
- four-wire Tie trunk
- Paging trunk

The E&M Trunk card is software selectable and complies with CSA Standard C82.2 No. 0.7 • MI985 and EIA Standard 464A.

Quantity-Up to sixteen cards per NT8D37 IPE Module

NT8D16AA Digitone Receiver

System Hardware-All

Purpose-Provides a total of eight channels of Dual Tone Multi Frequency (DTMF) detection. These channels are assigned on the DS30X loop. There is one 8 Kbps signaling channel provided for maintenance messaging and tone reporting.

The NT8D16AA Digitone Receiver allows access to the filters for parameter alterations in order to service different environments (e.g. international applications).

Quantity-Refer to System engineering (553-3001-151) for engineering details.

QPC62 1.5 Baud Converter

System Hardware-System option 21/51/61/71

Purpose-Used for Remote Peripheral Equipment (RPE) applications. Converts an SI-1 loop into two carrier loops. Used with 1.5 Mb/s Remote Peripheral Equipment (RPE). Contains switch-selectable line equalizers.

Note: QPC62F or later vintage is required.

Quantity-Two for each network loop, one in the local module and one in the remote module

QPC63 Local Carrier Buffer

System Hardware-System option 2 1/5 1/6 1/7 1

Purpose--Used for RPE applications. Performs the following functions:

- Generates from the 2.048 MHz clock a 1.544 MHz clock
- Decodes and provides enables for outgoing and incoming data
- Delays the data incoming from the carrier so that its frame relative to the outgoing data frame is equivalent to that returning from a peripheral buffer
- Relays line status information to the processor
- Decodes line control information from the processor

Note: QPC63F or later vintage is required.

Quantity-One for each network loop connected to the RPE Module at the local equipment location

QPC65 Remote Peripheral Switch

System Hardware-System option 2 1/5 1/6 1/7 1

Purpose--Used for RPE applications. Performs the following functions:

- Module, card, and line enables plus the bypass bit. to the modules it serves at the remote site

- Cyclic scanning of the terminals it serves for incoming signaling messages
- Monitoring of time slot 0 for outgoing messages
- Assembling incoming messages

Note: QPC65G or later vintage is required.

Quantity-One per network loop at the remote location

QPC66 2M Baud Converter

System Hardware--System option 2 1/5 1/6 1/7 1

Purpose—Used for RPE applications. Converts two carrier loops in to an Meridian 1 loop.

Note: QPC66E or later vintage is required.

Quantity-Two required for each network loop, one in the local module and one in the remote module.

QPC67 Carrier Maintenance

System Hardware-System option 2 1/5 1/6 1/7 1

Purpose—Used for RPE applications. Contains an M-type (3017 Hz) fault-locate filter. Provides DC detection circuitry for the fault-locate pair, and carrier loopback relays to facilitate software maintenance testing. Terminates and gives access to the order wire pair via a jack and binding posts on the faceplate.

Note: QPC67E or later vintage is required.

Quantity-One per RPE Module

QPC71 E&M/DX Signaling and Paging Trunk

System Hardware-All except system option 21A

Purpose-Used in μ -Law applications in one of the following ways to interface with appropriate types of trunk facilities):

-E&M signaling, 2-way dial repeating trunk

- 2-wire DX signaling, 2-way dial repeating trunk

- 4-wire DX signaling, 2-way dial repeating trunk (a 24V4 repeater, externally mounted, converts the trunk from 2- to 4-wire)

- paging trunk or externally mounted loudspeaker

Refer to *E&M/DX signaling and paging trunk — Circuit description (553-2001-187)* for more details.

Each card contains two separate, identical trunk circuits. Trunk usage option is selected by switches on the circuit card.

Note: QPC71F or later vintage is required.

Quantity-One per two trunk circuits

QPC99 Carrier Interface

System Hardware--System option 2 1/5 1/6 1/71

Purpose—Used for RPE applications. Contains two carrier line receivers with 7.5 dB pads built-in. Converts bipolar line signals into TTL level signals. Provides facilities for carrier looping. Monitors system and invokes emergency transfer if carrier fails.

Note: QPC99F or later vintage is required.

Quantity-Two per network loop

QPC192 Off-Premises Extension Line

System Hardware-All except system option 21A

Purpose—The Off-Premises Extension (OPX) line circuit interfaces with 500/2500-type sets in μ -Law applications. The loop range from the PE Module to station apparatus is 1400 Ω excluding the set. This trunk may also be used when the line-to-line loss required is less than 5 dB. Refer to **500/2500 line packs — Description and operation** (553-2201-183) for more information.

Quantity-One per two OPX lines

QPC237 4-wire E&M/DX signaling trunk

System Hardware-All except system option 21A

Purpose---Used in μ -Law applications in one of the following modes to interface with appropriate types of trunk facilities:

- E&M Signaling, 2-way dial repeating trunk
- 4-wire DX signaling, 2-way dial repeating trunk (QPC237A/B only)

Each trunk card has two separate, identical trunk circuits with a balanced terminating impedance of 600 Ω . Trunk usage options are selected by option switches on the pack. Refer to **Four-wire E&M/DX trunk circuit description** (553-2001-190).

Note: QPC237D or later vintage is required.

Quantity-Maximum of 10 cards per NT8D13 PE Module; maximum of 16 cards per NT8D37 IPE Module

QPC250 Release Link Trunk

System Hardware-All except system option 21A

Purpose--Used to interface a remote system, arranged for the Centralized Attendant Service (CAS) option, with the main system where CAS attendant is located. Refer to **Centralized Attendant Service (CAS) -Feature description and**



engineering (553-2681-100) and **Release Link Trunk- Description, operation, and installation** (553-2681-180) for more information.

The card contains two separate, identical trunk circuits, with balanced terminating impedance of 900 Ω .

Note: QPC250B or later vintage is required.

Quantity-One per two Release Link Trunks

QPC297 Attendant Console Monitor

System **Hardware**—All except system option 21A

Purpose—**Interfaces** attendant consoles (including add-on modules) when the supervisory console feature is used. Allows the supervisory attendant to monitor calls being handled by attendants within the customer group.

Quantity-One per M1250/QCW4 console in systems using Supervisory Console feature

QPC422 Tone Detector

System Hardware-All except system option 21A

Purpose-Identifies tones and reports to CPU appropriately. Each card contains two tone detector circuits controlled by two microprocessors. Refer to **Tone Detector — Circuit description** (553-2001- 19 1) for more information.

Quantity-One per system

QPC430 Asynchronous Interface Line

System Hardware-All except system option 21 A

Purpose—**Provides** four asynchronous line ports. Used in the SL-1 Data Feature to interface to data equipment conforming to the EIA RS-422 standard. Refer to **SL-1 Data Feature — General description and provisioning** (553-273 1- 100) for more information.

Note: QPC430F or later vintage is required.

Quantity-One per four data lines

QPC432 4-Port Data Line

System Hardware-All except system option 21A - -

Purpose-Provides four data-only ports for the SL- 1 Data Feature. Refer to **SL-1 Data Feature — General description and provisioning** (553-273 1- 100) for more information.

Note: QPC432C or later vintage is required.

Quantity-One per four data ports

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QPC449 Loop Signaling Trunk

System Hardware-All except system option 21A

Purpose—Interfaces the following 600 or 900 Ω trunks in μ -Law applications:

- Direct Inward Dialing (DID)
- 2-way Tie, Dial Repeating (2DR)
- 2-way Tie, Outgoing Automatic Incoming Dial (OAID)
- Outgoing Automatic Number Identification (OANI)

The card contains four separate identical trunk circuits. Trunk usage option is selected by switches on the circuit card. Refer to **Circuitpack option settings (553-3001-211)** for more information.

Quantity-One per four loop signaling trunks

QPC450 **CO/FX/WATS** Trunk

System Hardware-All except system option 2 1A

Purpose-Interfaces four 600 or 900 S2 CO, FX or WATS trunks with the system in μ -Law applications. The card can also detect ringing on either the tip or ring leads and has provision to extend the normal loop range from 1200 Ω to 2600 Ω using balanced battery boost from the Central Office. Refer to **CO/FX/WATS trunk engineering description** (553-2201-185) for more information.

The card contains four separate identical trunk circuits. Trunk usage option is selected by switches on the circuit card.

Note: QPC450E or later vintage is required.

Quantity-One per four CO/FX/WATS trunks

QPC578 Integrated Services Digital Line

System Hardware-All except system option 21A

Purpose—Interfaces the Digital telephone sets and the associated ASCII terminals on Time Compression Multiplexing (TCM) loops to the system. Each card contains 16 separate line circuits, 8 Data circuits and 8 Voice circuits.

Quantity-One per 16 digital lines

QPC594 **16-Port 500/2500** Line

System Hardware-All except system option 21A

Purpose--Allows for 16 circuits per card (quad density) using p-law.

Quantity-One per 16 500/2500 lines

QPC659 Dual Loop Peripheral Buffer

System Hardware-All except system option 2 1 A

Purpose—Interfaces one or two network loops. Also, a Digitone daughterboard can be used to convert multifrequency dialing signals from a DIGITONE station to dc pulses suitable for processing in the system control.

Quantity—One per NT8D13 PE Module

QPC723 FE-232 4-Port Interface Line

System Hardware—All except system option 21A

Purpose—This card provides four direct interfaces to RS-232 asynchronous ASCII computer equipment, such as asynchronous hosts, modems, standard off-the-shelf X.25 Packet Assembler/Disassembler (PAD), data PABXs and multiplexers.

Quantity—One per NT8D13 PE Module

QPC789 1 6-Port 500/2500 Line (Message Waiting)

System Hardware—AI except system option 21A

Purpose—Provides interface to up to 16 analog sets (500/2500) with Message Waiting lamp feature.

Quantity—One per 16 500/2500 Message Waiting lines

QPC918 High-Speed Data Card

System Hardware—All except system option 21A

Purpose—Supports two data ports that operate independently of each other in synchronous/asynchronous mode. Interfaces with any port on the QPC432 4-Port Data Line Card.

The High-Speed Data Card (HSDC) provides an interface to high speed synchronous devices, such as front end processors or video conferencing ports, through the Multi-Channel System (MCDS) and the PBX. In synchronous mode, it supports data speeds of up to 64 kbps. Refer to *QPC918 High-Speed Data Card — Description, installation, and operation* (553-273 1-108) for more information.

Quantity—As required

Station equipment

Meridian Modular Telephones

The Meridian Modular Telephones are designed to provide cost effective integrated voice and data communication capability.

The following Meridian Modular Telephones are available:

- **M2006**—a single line telephone with 6 programmable keys
- **M2008**—a multi-line set with 8 programmable keys
- **M2616**—a high performance multi-line set with 16 programmable keys and integrated Handsfree unit

- **M2016S**—a Telephone Security Group Class II approved telephone designed to provide on-hook security. It is similar to the M2616, with 16 programmable keys, but has no handsfree capability.
- **M2216ACD-1**—a multi-line set for ACD operations. It has 15 programmable function keys, a special ACD Display Module and two RJ-32 jacks for modular electret headsets
- **M2216ACD-2**—a multi-line set for ACD operations. It has 15 programmable function keys, and a special ACD Display. It is similar to model 1, but with one PJ-327 jack for a carbon agent headset and one RJ-32 jack for an electret supervisor headset

The following hardware options can be add on to Meridian Modular Telephones:

- External Alerter Interface Board
- Display Module
- Programmable Data Adapter
- Key Expansion Module

Refer to **Meridian Modular Telephones — Description and specifications (553-2201 -116)** for additional information.

M2000 series digital telephones

The following types of M2000 digital telephones are available for integrated voice and data communications:

- The M2009 (NT1F05) has 9 keys for features and lines
- The M2112 (NT1F07) has 12 keys which are as follows:
 - 11 keys for features and lines
 - one key to control the built-in handsfree feature
- The M2317 has 17 keys which are as follows:
 - 11 programmable keys
 - one key to control the built-in handsfree feature
 - five soft keys which are programmable for software features

An asynchronous data option circuit board (NT1F09) and data option power supply (NPS50220-04L1) are available for the M2000 series digital telephones to provide for connecting data terminals to the sets.

For additional information on these telephones, refer to **M2000 Digital Telephones - description, installation, operation, and maintenance**. --

M3000 Touchphone

The M3000 (NT1F1 1) Touchphone is a digital integrated voice and data telephone with a touch sensitive Liquid Crystal Display (LCD) screen for feature implementation. Refer to **Meridian M3000 Touchphone -Description, installation, operation, and maintenance** (553-2201-115) for additional information.

An asynchronous data option circuit board (**NT1F10**) and data option power supply (TEC 00020) are available to provide for connecting data terminals to the sets.

MI 250 and M2250 attendant consoles

The MI250 and M2250 incorporate design improvements based on the previous Attendant Console **QCW4E** and are functionally, compatible with the QCW4. The MI250 is driven and powered by analog line cards and is compatible with QCW4 console cabling schemes. The M2250 is driven and powered by a digital line card and has a modified cabling scheme. The following list describes the applications for SL- 1 System attendant consoles.

- The MI250 is designed to work in analog mode and functions through an analog line card when connected to a digital switch.
- The M2250 is a digital version of the M1250, offering additional features. A digital link connects the M2250 to the switch.

Refer to ***M1250 and M2250 Attendant Consoles description*** (553-2201- 117) for additional information.

QMT11 asynchronous/ synchronous interface module

The Asynchronous/Synchronous Interface Module (ASIM) is similar to the QMT9 but provides added dialing capabilities and six data feature keys and associated lamps and data control switches. Refer to ***SL-1 Data Feature --- General description and provisioning*** (553-273 1- 100) for more information.

QMT12 add-on data module

The synchronous ADM provides a **CCITT V.35** interface between the Meridian 1 system and customer-supplied data equipment. Refer to ***SL-1 Data Feature --- General description and provisioning*** (553-273 1-100) for more information.

Each ADM requires a local supplementary power supply such as the PO593922 or PO6 10756 transformer.

QMT21 high-speed data module

This module is similar to the QMT1 1 module. It provides **RS-232/V.35** interface and allows synchronous data transmission of up to 64 kbps. It provides connectivity to the Data Terminal Equipment (DTE) for intra-switch communications, as well as wide area communications over **DTI/PRI** links to other Northern Telecom switches. Refer to ***QMT21 High-Speed Data Module --- Description, installation, and operation*** (553-2731-107) for more information.

Asynchronous data options

These microprocessor-controlled devices provide the interface (**RS-232** compatible) through which ASCII Data Terminal Equipment (DTE) may be connected to the Meridian 1 network. Two types of asynchronous data options are available for use with the following digital telephones:

- **NT1F09AA** printed circuit board for use with M2009, M2018 and M2112 digital telephones. Refer to ***Meridian M2000 Digital Telephones -Description, installation, operation, and maintenance*** (553-2201-1 10) for more information.
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- NT1F10AA printed circuit board assembly and housing for M3000 digital touchphone. Refer to *Meridian M3000 Touchphone — Description, installation, operation, and maintenance* (553-2201-1 15) for additional information.

The following features are available:

- Automatic data rate detection at all rates using the ASCII “Carriage Return” character
- Keyboard dialing for originating data calls to local and remote hosts or DTE from the terminal keyboard
- Break detection and generation

Meridian programmable data adapter

This adapter provides the interface (RS-232 compatible) through which ASCII Data Terminal Equipment (DTE) may be connected to the Meridian 1 network. It is available with the M2006, M2008, M2016S, and M2616 Meridian Modular Telephones

Some of the features available are as follows:

- keyboard dialing for originating data calls to local or remote hosts or DTE
- telephone keypad dialing for originating and releasing data calls
- parameter setting from telephone keypad
- voice call origination from terminal keyboard
- script file capabilities to pre-program resource locations via mnemonic address names

Software provisioning

Call processing, maintenance and administration of the Meridian 1 system are controlled by computer programs. These programs and the office data (system characteristics) are stored in the system memory and on disk. A mass storage unit is used to load the system programs and office data into the memory. Table 7-5 lists all the data administration overlay programs.

Every system requires the Basic PBX Features as the base software package. Optional software features may then be added. The basic and optional features are outlined in Tables 7-6 and 7-7. Note that some software packages require other packages as an operating base. These dependencies are also provided in the tables.

Table 7-8 lists a majority of the features with its parameters. Some of the parameters have changed in Releases 13 and 14 due to the introduction of the System Capacity Expansion feature. For a complete list of all-features and associated parameters, refer to XII *features and services* (553-3001-305).

Table 7-9 lists the memory requirements for each feature option. This table indicates the size of the programs (in K's, where 1K equals 1024 words).



Table 7-5
Data administration overlay programs

LD10	Single-line telephone sets
LD11	Multi-line telephone sets
LD12	Attendant Console
LD13	Digitone Receivers and Tone Detectors
LD14	Trunks
LD15	Customer data
LD16	Trunk Routes & Automatic Trunk Maintenance
LD17	Configuration Record
LD18	Speed Call, Group Call, Pretranslation and Hot Line
LD19	Code Restriction
LD20	Print Routine 1
LD21	Print Routine 2
LD22	Print Routine 3
LD23	Automatic Call Distribution (ACD) and Messaging features
LD24	Direct Inward System Access (DISA)
LD25	Move data blocks
LD26	Group Do Not Disturb
LD28	Route Selection for Automatic Number Identification (RS/ANI)
LD29	Memory Management
LD49	New Flexible Code Restriction (NFCR)
LD50	Call Park
LD56	Flexible Tones and Cadences
LD57	Flexible Feature Codes
LD73	Digital Trunk/Primary Rate Interface error thresholds
LD81	Print features and stations
LD82	Print hunt chains & multiple appearance groups
LD83	Print designated (DES) TNs
LD84	Designators (DES) for single-line telephone sets
LD85	Designators (DES) for multi-line telephone sets

-continued —

Table 7-5
Data administration overlay programs (continued)

LD86	Electronic Switched Network (ESN) <ul style="list-style-type: none">— ESN data block— Digit manipulation data (DGT)— Incoming Trunk Group Exclusion (ITGE)— Route list (RLB)— Special common carrier (SCC)
LD87	Electronic Switched Network (ESN) <ul style="list-style-type: none">— Network control (NCTL)— Free calling area screening (FCAS)— Coordinated Dailing Plan (CDP)
LD88	Basic and Network Authorization code
LD90	ESN Network Translation tables
LD93	Multi-Tenant Service and Console Presentation Group
LD95	Call Party Name Display
LD97	Configuration Record 2

Table 7-6
Feature and software options

Feature option name	Number	Mnemonic	Release
ACD Activity Code Entry	155	ACNT	R13
ACD CDR Queue Record	83	CDRQ	R3
ACD Load Management (C2)	43	LMAN	R1
ACD Package A	45	ACDA	R1
ACD Package B	41	ACDB	R1
ACD Package CI	42	ACDC	R1
ACD Package D	50	ACDD	R2
ACD Package D, Auxiliary Link Processor	51	LNK	R2
ACD Priority Agent	116	PAGT	R12
ACD Timed Over flow	111	TOF	R10
ACD-D Auxiliary Security	114	AUXS	R12
Advanced Network Services	148	NTWK	R13
ANI Route Selection	13	ANIR	R1
Attendant Administration	54	AA	R1
Attendant Alternative Answering	174	AAA	R15
Attendant Overflow Position	56	AOP	R1
Automatic Answerback	47	AAB	R1
Automatic Line Selection	72	LSEL	R4
Automatic Number Identification	12	ANI	R1
Automatic Trunk Maintenance	84	ATM	R7
Automatic Wake-Up	102	AWU	R10
AUTOVON Defense Switched Network (DSN)	68	ATVN	R4
AUTOVON Call Detail Recording	69	ACDR	R4
Auxiliary Processor Link	109	APL	R10
Background Terminal	99	BGD	R10
Basic Routing	14	BRTE	R1
Basic Alternate Route Selection	57	BARS	R1
Basic Authorization Code	25	BAUT	R1
Basic Automatic Call Distribution	40	BACD	R1
-continued -			

Table 7-6
Feature and software options (continued)

Feature option name	Number	Mnemonic	Release
Basic Call Processing	0	BASIC	R1
Basic Queuing	28	BQUE	R1
Call Detail Recording	4	CDR	R1
Call Park	33	CPRK	R2
Call Detail Recording Expansion	151	CDRE	R13
Call Party Name Display	95	CPND	R10
Call-by-Call Service Selection	117	CBC	R13
Calling line ID in CDR	118	CCDR	R13
CDR on Data Link	6	CLNK	R1
CDR on Teletype Machine (TTY)	5	CTY	R1
Centralized Attendant Services (Main)	26	CASM	R1
Centralized Attendant Services (Remote)	27	CASR	R1
Centrex Switchhook Flash	157	THF	R14
Charge Account for CDR	23	CHG	R1
Charge Account/Authorization Code	24	CAB	R1
Command Status Link	77	CSL	R8
Console Presentation Group Level Services	172	CPGS	R15
Controlled Class Of Service	81	CCOS	R7
Coordinated Dialing Plan	59	CDP	R1
CSL with Alpha Signaling	85	CSLA	R8
Deluxe Hold	71	DHLD	R4
Departmental Listed Directory Number	76	DLDN	R5
Dial Intercom	21	DI	R1
Dialed Number Identification Service	9	DNIS	R10
Digit Display	19	DDSP	R1
Digital Sets	88	DSET	R7
Direct Inward System Access	22	DISA	R1
Directed Call Pickup	115	DCP	R12
Directory Number Expansion	150	DNXP	R13
-continued -			

Table 7-6
Feature and software options (continued)

Feature option name	Number	Mnemonic	Release
Distinctive Ringing	74	DRNG	R4
Distinctive Ringing, New	74	DRNG.	R9
Do-Not-Disturb, Group	16	DNDG	R1
Do-Not-Disturb, Individual	9	DNDI	R1
End-To-End Signaling	10	EES	R1
Enhanced Conference, TDS and MFS card	204	XCTO	R15
Enhanced Controlled Class of Service	173	ECCS	R15
Enhanced Music	119	EMUS	R12
Extended PBX Features	1	OPTF	R1
Extended Peripheral Equipment (superloop)	203	XPE	R15
Fast Tone and Digit Switch	87	FTDS	R7
Flexible Call Back Queuing	61	FCBQ	R1
Flexible Feature Codes	139	FFC	R15
Forced Charge Account	52	FCA	R1
Group Call	48	GRP	R1
History File	55	HIST	R1
Hot Line Services	70	HOT	R4/10
Incoming DID Digit Conversion	113	IDC	R12
Integrated Messaging System Link	35	IMS	R2
Inter-exchange Carrier	149	IEC	R13
Intercept Treatment	11	INTR	R1
Internal Call Detail Recording (CDR)	108	ICDR	R10
SDN Application Protocol Third Party Vendor	153	IAP3P	R13
SDN Primary Rate Access	146	PRA	R13
ISDN signaling	145	ISDN	R13
ISDN signaling Link	147	ISL	R13
Last Number Redial	90	LNR	R8---
Line Load Control	105	LLC	R10
-continued -			

Table 7-6
Feature and software options (continued)

Feature option name	Number	Mnemonic	Release
M2250 TCM Console	140	DCON	R15
M2317 Digital Display Set	91	DLT2	R9
M3000 Touchphone	89	TSET	R7
Make Set Busy	17	MSB	R1
Malicious Call Trace	107	MCT	R10
Meridian Modular Telephone Sets	170	ARIE	R14
Meridian SL-1 ST	96	SLST	R9
Message Center	46	MWC	R1
Message Registration	101	MR	R10
Multiple-Customer Operation	2	CUST	R1
Multiple-Tenant Service	86	TENS	R7
Music	44	MUS	R1
Network ACD	178	NACD	R15
Network Alternate Route Selection	58	NARS	R1
Network Authorization Code	63	NAUT	R1
Network Call Transfer	67	NXFR	R3
Network Class Of Service	32	NCOS	R1
Network Message Center	175	NMC	R15
Network Queuing - Main	38	MCBQ	R2
Network Signaling	37	NSIG	R2
Network Speed Call	39	NSC	R2
Network Traffic Measurements	29	NTRF	R1
Yew Flexible Code Restriction	49	NFCR	R2
Off-Hook Queuing	62	OHQ	R1
Office Data Administration System	20	ODAS	R1
Optional Outpulsing Delay	79	OOD	R5
PBX Interface for DTI/CPI	75	PBXI	R5
Pretranslation	92	PXLT	R8
Priority Queuing	60	PQUE	R1
Property Management System Interface	103	PMSI	R10
-continued -			

Table 7-6
Feature and software options (continued)

Feature option name	Number	Mnemonic	Release
Recorded Announcement	7	RAN	R1
Recorded Overflow Announcement	36	ROA	R2
Remote Peripheral Equipment	15	RPE	R1
Room Status	100	RMS	R10
Set Relocation	53	SR	R1
Station Category Indication	80	SCI	R7
Station Loop Preemption	106	SLP	R10
Stored Number Redial	64	SNR	R3
Superloop Administration (LD97)	205	XCT1	R15
Supervisory Attendant Console	93	SUPV	R8
System Speed Call	34	ssc	R2
Time and Date	8	TAD	R1
Tone Detector	65	TDET	R7
Trunk Verification from a Station	110	TVS	R9.32
2.0 Mbit/s Primary Rate Interface	154	PRI2	R14
2500 Set Features	18	SS25	R1
500 Set Features	73	ss5	R4

Table 7-7
Feature options and package dependencies

Option number	Feature option name and dependencies	Mnemonic	Release
0	Basic Call Processing includes the following features: -Call Transfer -Conference -Call Forward No Answer -Hunt -Call Pickup	BASIC	R1
1	Extended PBX Features Includes the following features: — Autodial -Call Forward All Calls — Override — Ring Again -Secretarial Filtering -Speed Call -Voice Call	OPTF	R1
2	Multiple-Customer Operation	CUST	R1
4	Call Detail Recording Package dependencies: CTY (5) or CLNK (6) This is the base package for CDR. See also — CDR with Charge Account (CHG-24) — CDR Magnetic Tape (CLNK-6) — CDR TTY (CTY-5) — CDR Queue Record (CDR-83) -Internal CDR (ICDR-108) -AUTOVON (ACDR-69)	CDR	R1 --
-continued —			

Table 7-7

Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
5	CDR on Teletype Machine (TTY) Package dependencies: CDR-4	CTY	R1
6	CDR on Data Link Package dependencies: CDR-4	CLNK	R1
7	Recorded Announcement Package dependencies: INTR-11	RAN	R1
8	Time and Date	TAD	R1
9	Do-Not-Disturb, Individual	DNDI	R1
10	End-To-End Signaling	EES	R1
11	Intercept Treatment	INTR	R1
12	Automatic Number Identification	ANI	R1
13	ANI Route Selection Package dependencies: ANI-12	ANIR	R1
14	Basic Routing Package dependencies: NCOS-32	BRTE	R1
15	Remote Peripheral Equipment	RPE	R1
16	Do-Not-Disturb, Group Package dependencies: DNDI-9	DNDG	R1
17	Make Set Busy	MSB	R1
18	2500 Set Features	SS25	R1
19	Digit Display	DDSP	R1
20	Office Data Administration System	ODAS	R1
21	Dial Intercom	DI	R1
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
22	Direct Inward System Access	DISA	R1
23	Charge Account for CDR Package dependencies: CDR-4 CAB-24	CHG	R1
24	Charge Account/Authorization Code	CAB	R1
25	Basic Authorization Code Package dependencies: CAB-24	BAUT	R1
26	Centralized Attendant Services (Main) CASM cannot be used with AOP-56	CASM	R1
27	Centralized Attendant Services (Remote) CASR cannot be used with AOP-56	CASR	R1
28	Basic Queuing	BQUE	R1
29	Network Traffic Measurements One of the following packages must be equipped: BARS-57 NARS-58 CDP-59 PQUE-60 FCBQ-61 OHQ-62	NTRF	R1
32	Network Class Of Service	NCOS	R1
33	Call Park	CPRK	R2
34	System Speed Call	SSC	R2
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
35	integrated Messaging System Link Package dependencies: BACD-40 AC DA-45 M WC-46 APL-109 is required in Release 10 and later software.	IMS	R2
36	Recorded Overflow Announcement Package dependencies: RAN-7	ROA	R2
37	Network Signaling Package dependencies: NCOS-32	NSIG	R2
38	Network Queuing - Main Package dependencies: NCOS-32 NSIG-37 FCBQ-61	MCBQ	R2
39	Network Speed Call Package dependencies: ssc-34 BARS-56, or NARS-57	NSC	R2
40	Basic Automatic Call Distribution This is the base package for ACD. See also — ACD Basic; package A (ACDA-45) --- ACD Advanced; package B (ACDB-41)	BACD	R1
-continued —			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
	<ul style="list-style-type: none"> — ACD Management Reports; package CI (ACDC-42) -ACD Load Management; package C2 (LMAN-43) -ACD Package D (ACDD-50) — ACD Auxiliary Link Processor (LNK-51) — ACD/CDR Q record (CDRQ-83) — ACD Timed Overflow (CDRQ-111) — Dialed Number Identification Service (DNIS-98) 		
41	ACD Package B Package dependencies: BACD-40 AC DA-45	ACDB	R1
42	ACD Package CI Package dependencies: BACD-40 ACDB-41 AC DA-45	ACDC	R1
43	ACD Load Management (C2) Package dependencies: BACD-40 ACDB-41 AC DC-42 AC DA-45	LMAN	R1
44	Music Package dependencies: RAN-7	MUS	R1 --
-continued —			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
45	ACD Package A Package dependencies: BACD-40	ACDA	R1
46	Message Center	MWC	R1
47	Automatic Answerback	AAB	R1
48	Group Call	GRP	R1
49	New Flexible Code Restriction Package dependencies: NCOS-32	NFCR	R2
50	ACD Package D Package dependencies: BACD-40 ACDB-41 ACDC-42 ACDA-45 LNK-51	ACDD	R2
51	ACD Package D, Auxiliary Link Processor Package dependencies: ACDD-50	LNK	R2
52	Forced Charge Account Package dependencies: CHG-23 CAB-24	FCA	R1
53	Set Relocation	SR	R1
54	Attendant Administration	AA	R1
55	History File	HIST	R1
56	Attendant Overflow Position AOP cannot be used with CASM-26 or CASR-27.	AOP	R1...

— continue —

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
57	Basic Alternate Route Selection Package dependencies: BRTE-14 NCOS-32	BARS	R1
58	Network Alternate Route Selection Package dependencies: BRTE-14 NCOS-32	NARS	R1
59	Coordinated Dialing Plan Package dependencies: BRTE-14 NCOS-32 FCBQ-61	CDP	R1
60	Priority Queuing Package dependencies: NCOS-32	PQUE	R1
61	Flexible Call Back Queuing Package dependencies: BQU E-28 BARS (57) or NARS (58) or CDP (59)	FCBQ	R1
62	Off-Hook Queuing Package dependencies: BQUE-28 BARS-57 or NARS-58	OHQ	R1
83	Network Authorization Code Package dependencies: CAB-24 BAUT-25 BARS (57) or NARS (58) or CDP (59)	NAUT	R1 --
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
64	Stored Number Redial	SNR	R 3
65	Tone Detector	TDET	R7
67	Network Call Transfer Package dependencies: NCOS-32 NSIG-37	NXFR	R3
68	AUTOVON Defense Switched Network (DSN) Package dependencies: NCOS-32	A N N	R 4
69	AUTOVON Call Detail Recording Package dependencies: CDR-4 ATVN-68 CTY-5 or CLNK-6	ACDR	R 4
70	Hot Line Services	HOT	R4
70	Enhanced Hot Line Package dependencies: NCOS (32) SSC (34)	HOT	R10
71	Deluxe Hold	DHLD	R4
72	Automatic Line Selection	LSEL	R4
73	500 Set Features Package dependencies: SS25-18	SS5	R4
74	Distinctive Ringing and New Distinctive Ringing	DRNG	R4
75	PBX Interface for DTI/CPI	PBXI	R5
76	Departmental Listed Directory Number	DLDN	R5

-continued -

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
77	Command Status Link	CSL	R8
79	Optional Outpulsing Delay	OOD	R5
80	Station Category Indication	SCI	R7
81	Controlled Class Of Service	CCOS	R7
83	ACD CDR Queue Record Package dependencies: CDR-4 BACD-40	CDRQ	R3
84	Automatic Trunk Maintenance Package dependencies: TDET-65	ATM	R7
85	CSL with Alpha Signaling Package dependencies: DDSP-19 CSL-77 Meridian Mail MP systems also require PBXI-75.	CSLA	R8
86	Multiple-Tenant Service	TENS	R7
87	Fast Tone and Digit Switch	FTDS	R7
88	Digital Telephone Set	DSET	R7
89	M3000 Touchphone Package dependencies: DS ET-88	TSET	R7
90	Last Number Redial	LNR	R8
91	M2317 Digital Display Telephone Set Package dependencies: DSET-88	DLT2	R9
92	Pretranslation	PXLT	R8...
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
93	Supervisory Attendant Console	SUPV	R8
95	Call Party Name Display Package dependencies: DDSP-19 DSET-88 TSET-89 ODAS-20* BGD-99* The ODAS package is required for DES. The BGD package is required for Hotel/Motel applications.	CPND	R10
96	Meridian SL-1 ST	SLST	R9
98	Dialed Number Identification Service Package dependencies: DDSP-19 AC DA-45 APL-I 09* IDC-113* *The APL package is required for DP link. * The IDC package is required for routing by DNIS.	DNIS	R10
99	Background Terminal Facility Package dependencies: CCOS-81 RMS-100, MR-101 , AWU-102, or PMSI-103	BGD	R10
— continued —			

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Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
100	Room Status Package dependencies: CCOS-81 BGD-99 DNDI-9* MWC-46* Packages DNDI-9 and MWC-46 are required for lamp status.	RMS	R10
101	Message Registration Package dependencies: CCOS-81 BGD-99	MR	R10
102	Automatic Wake-Up Package dependencies: RAN-7 CCOS-81 BGD-99	AWU	R10
103	Property Management System Interface Package dependencies: CCOS-81 BGD-99 RMS-100	PMSI	R10
105	Line Load Control Package dependencies: ATVN-68' . The AUTOVON package is not required in Release 13 and later software.	LLC	R10 --
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
106	Station Loop Preemption Package dependencies: ATVN-68	SLP	R10
107	Malicious Call Trace	MCT	R10
108	Internal Call Detail Recording (CDR) Package dependencies: CDR-4	ICDR	R10
109	Auxiliary Processor Link	APL	R10
110	Trunk Verification from a Station	TVS	R9.32
111	ACD Timed Overflow Package dependencies: ACDB-41	TOF	R10
113	Incoming DID Digit Conversion Package dependencies: NFCR-49	IDC	R12
114	ACD-D Auxiliary Security Package dependencies: ACDD-50 LNK-51	AUXS	R12
115	Directed Call Pickup	DCP	R12
116	ACD Priority Agent Package dependencies: AC DA-45	PAGT	R12
117	Call-by-Call Service Selection Package dependencies: NARS-58 ISDN-145 IEC-149* *The IEC package is required for Inter-exchange carrier.	CBC	R13
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
118	Calling line ID in CDR Package dependencies: CDR-4 ISDN-145	CCDR	R13
119	Enhanced Music Package dependencies: MUS-44	EMUS	R12
139	Flexible Feature Codes Package dependencies: CCOS - 81	FFC	R15
140	M2250 TCM Console Package dependencies: DSET-88	DCON	R15
145	ISDN signaling	ISDN	R13
146	ISDN Primary Rate Access Package dependencies: PBXI-75 ISDN-145 The DDSP (19) package is required for CLID	PRA	R13
147	ISDN Signaling Link Package dependencies: ISDN-145	ISL	R13
148	Advanced Network Services Package dependencies: NCOS-32 ISDN-145 INARS-58 or CDP-59 IPRA-146 or ISL-147 The NSIG (37) package is required for Tandem Node.	NTWK	R13
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
149	Inter-exchange Carrier Package dependencies: ISDN-145 PRA-146	IEC	R13
150	Directory Number Expansion	DNXP	R13
151	Call Detail Recording Expansion Package dependencies: CDR-4 DNXP-150	CDRE	R13
153	ISDN Application Protocol Third Party Vendor Package dependencies: CSL-77	IAP3P	R13
154	2.0 Mbit/s Primary Rate Interface Package dependencies: ISDN-145	PRI2	R14
155	ACD Activity Code Entry Package dependencies: ACDD-50 LNK-51 AUXS-114	ACNT	R13
157	Centrex Switchhook Flash	THF	R14
170	Meridian Modular Telephone Sets Package dependencies: DSET-88 or TSET-89	ARIE	R14
172	Console Presentation Group Level Services Package dependencies: TEN-86	CPGS	R15 --
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
173	Enhanced Controlled Class of Service Package dependencies: CCOS - 81	ECCS	R15
174	Attendant Alternative Answering	AAA	R15
175	Network Message Center Package dependencies: Network Message Center: Originating or Terminating PBX: MWC-46 NTWK-148 Tandem PBX: NTWK-148 Meridian Mail Originating PBX: EES-10 MWC-46 NTWK-148 Tandem PBX: EES-10 NTWK-148 Terminating PBX: EES-10 IMS-35 BACD-40 ACDA-45 MWC-46 CSL-77 NTWK-148 ACD Message Center: Originating PBX: MWC-46 NTWK- 148 Tandem PBX: NTWK-148 Terminating PBX: ACDA-45 MWC- 46 NTWK-148	NMC	R15
178	Network ACD Package dependencies: BQUE (28) NCOS (32) NSIG (37) ACDB (41)	NACD	R15
-continued -			

Table 7-7
Feature options and package dependencies (continued)

Option number	Feature option name and dependencies	Mnemonic	Release
	CDP (59) TOF (111) ISDN (145) PRA (146) or ISL (147) The NTWK (148) package is required for remote targets.		
203	Extended Peripheral Equipment (superloop) Package dependencies: XCT1-205	XPE	R15
204	Enhanced Conference, TDS and MFS card Package dependencies: XCT1-205	XCTO	R15
205	Superloop Administration (LD97)	XCT1	R15

Table 7-8
Feature parameters

Feature	Previous parameter	New parameter	Release for new parameter
Attendant Consoles *	63		
Attendant Incoming Call Indicators *	20		
Automatic Call Distribution (ACD)			
ACD agents .	1200		
ACDqueues*	240		
Basic Authorization Code Digits .	14		
Call Party Name Display characters	27		
Call Detail Recording Charge Account digits	23		
Coordinated Dialing Plan (CDP)			
CDP Route List Entry *	3	7	R13
CDP Route List Index *	32	128	R13
CDP Steering Codes *	5K	10K	R13
Customer Groups . *	32	100 (Note)	R14
Dial Intercom Groups .	254	2046	R14
Do Not Disturb Groups*	100		
Do Not Disturb entries per group	127		
Group Call Members (per group)	10	20	R13
Listed Directory Numbers (LDN) .	4		
Multiple Appearance DNs .	16	30	R13
Multiple Tenants .	512		
NARS/BARS Route List Entry *	8	32	R13
Network Authorization Code Digits .	7	14	R13
Network Authorization Codes .	20K	50K	R14
Network Class of Service (NCOS)			
BARS/NFCR NCOS Groups .	8	100	R13
NARS/ATVN NCOS Groups .	16	100	R13
CDP NCOS Groups .	4	100	R13

-continued -

Table 7-8
Feature parameters (continued)

Feature	Previous parameter	New parameter	Release for new parameter
New Flexible Code Restriction			
Digits per NFCR trees	50		
Trees per trunk route	8		
Trees per customer	255		
Private Line Routes *	1	512	R14
Ringling Number Pickup Groups	255	4095	R13
Speed Call Lists/Hotline Lists **	255	8191	R13
System Speed Call Lists	255	4096	R13
Trunk Groups *	128	512 (Note)	R14
Trunk Group Access Restrictions *	15	31	R13
Trunk Group Members (per trunk group)	127	254	R13
<ul style="list-style-type: none"> • Per customer ** Per system 			

Table 7-9
Program size

Package No.	Mnemonic	Package Name	Model/System Option	
			ST/21/21 A	NT/RT/XT/ 51/61/71
0		Basic PBX Features	131.91	103.24
1	OPTF	Extended PBX Features	17.67	12.58
2	CUST	Multi-Customer	9.19	6.38
3	AIOD	Automatic Inward/Outward Dialing	0.91	0.66
4	CDR	Call Detail Recording	2.48	1.76
5	CTY	CDR on TTY	1.16	0.83
6	CLNK	CDR on Mag Tape	0.89	0.64
7	RAN	Recorded Announcement	1.60	1.15
8	TAD	Time and Date	0.76	0.56
9	DNDI	Do Not Disturb Ind	0.43	0.31
10	EES	End-to-End Signaling	1.00	0.69
11	INTR	Intercept	0.00	0.00
12	ANI	Automatic Number Identification	1.74	1.26
13	ANIR	ANI Route Selection	0.22	0.18
14	BRTE	Basic Routing	7.86	5.63
15	RPE	Remote Peripheral Equipment	1.02	0.74
16	DNDG	Do Not Disturb Group	0.49	0.35
17	MSB	Make Set Busy	0.21	0.15
18	SS25	2500 Set Features	0.96	0.71
19	DDSP	Digit Display (SLI)	4.63	3.35
20	ODAS	Office Administration System	0.72	0.88
21	DI	Dial Intercom Group	0.74	0.54
22	DISA	Direct Inward System Access	0.35	0.25
23	CHG	CDR Charge Account	0.38	0.28
24	CAB	Charge Account/Authorization Code Base	1.28	0.91
-continued -				

Table 7-9
Program size (continued)

Package No.	Mnemonic	Package Name	Model/System Option	
			ST/21/21A	NT/RT/XT/ 51/61/71
25	BAUT	Basic Authorization Code	0.31	0.21
26	CASM	Centralized Attendant Service - Main	0.23	0.17
27	CASR	Centralized Attendant Service - Remote	7.85	5.56
28	BQUE	Base Queuing	2.70	1.93
29	NTRF	Network Traffic	0.54	0.38
30	CMAC	N/W Communication Management Center	1.00	0.70
31	MCDR	Mini CDR	1.31	0.91
32	NCOS	Network Class of Service	0.08	0.06
33	CPRK	Call Park	4.23	2.97
34	ssc	System Speed Call	0.10	0.08
35	IMS,UST,U MG	Integrated Message System	3.02	2.17
36	ROA	Recorded Overflow Announcement	0.43	0.31
37	NSIG	Network Control/Signal	2.69	2.01
38	MCBQ	Network Queuing Main	2.86	2.01
39	NSC	Network Speedcall	0.00	0.00
40	BACD	Automatic Call Distribution Base	17.63	12.78
41	ACDB	ACD Package B	0.13	0.09
42	ACDC	ACD Package C	20.87	14.80
43	LMAN	ACD Load Management	0.00	0.00
44	MUS	Music	1.39	0.97
45	ACDA	ACD Package A	0.00	0.00
46	MWC	Multiple Message Centre	2.80	2.03
47	AAB	Auto Answerback	0.12	0.08
48	GRP	Group Call	2.35	1.65

— continue —

Table 7-9
Program size (continued)

Package No.	Mnemonic	Package Name	Model/System Option	
			ST/21/21A	NT/RT/XT/ 51/61/71
49	NFCR	New Flexible Code Restriction	-0.50	0.35
50	ACDD	ACD Package D	1.50	1.03
51	LNK	Auxiliary Link	4.37	3.08
52	FCA	Forced Charge Account	0.00	0.00
53	SR	Set Relocation	6.56	4.61
54	AA	Attendant Administration	1.00	0.73
55	HIST	History File	0.04	0.03
56	AOP	Attendant Overflow Position	0.80	0.56
57	BARS	Basic Automatic Route Selection	0.00	0.00
58	NARS	Network Automatic Route Selection	0.00	0.00
59	CDP	Coordinated Dialing Plan	0.08	0.05
60	PQUE	Priority Queuing	0.00	0.00
61	FCBQ	Flexible Callback Queue	0.02	0.01
62	OHQ	Off-Hook Queuing	0.12	0.08
63	NAUT	Network Authorization Code	0.57	0.41
64	SNR	Stored Number Redial	0.96	0.68
65	TDET	Tone Detector	0.45	0.32
66	SCC	Special Common Carrier	0.00	0.00
67	NXFR	Network Transfer	0.72	0.50
68	ATVN	Autovon	5.52	3.99
69	ACDR	Autovon CDR	0.00	0.00
70	HOT	Hotline	0.26	0.19
71	DHLD	Deluxe Hold	0.61	0.44
72	LSEL	Line Selection	0.17	0.12
73	ss5	500 Set Dial Access	0.01	0.01
74	DRNG	Distinctive Ringing	0.58	0.42
-continued -				

Table 7-9
Program size (continued)

Package No.	Mnemonic	Package Name	Model/System Option	
			ST/21/21A	NT/RT/XT/ 51/61/71
75	PBXI	Digital Trunk Interface	7.26	5.26
76	DLDN	Departmental Listed Directory Numbers	0.09	0.07
77	CSL	Command Status Link	17.80	12.54
78	AMP	Auto Modem Pooling	1.62	1.16
79	OOD	Optional Outpulsing Delay	0.00	0.00
80	SCI	Station Category indicator	0.00	0.00
81	CCOS	Controlled Class of Service	0.70	0.50
82	RESDB	Resident Debugger	0.00	8.81
83	CDRQRED	CDR Queue Record	0.00	0.00
84	ATM	Automatic Trunk Maintenance	0.00	0.00
85	CSLA	CSL Application Interface	0.00	0.00
86	TENS	Multi-Tenant Service	0.51	0.38
87	FTDS	Fast Outpulsing TDS	0.00	0.00
88	DSET	Digital Sets	12.53	9.12
89	TSET	SL-Touch Sets	0.00	0.00
90	LNR	Last Number Redial	0.30	0.22
91	DLT2	Delta II Sets	0.00	0.00
92	PXLT	Pretranslation	0.37	0.26
93	SUPV	Supervisory Console	0.72	0.50
94	JTDS	Japan Tones & Ringing	0.00	0.00
95	CPND	Calling Party Name Display	0.90	0.64
96	SLST	Gemini Machine	0.00	0.00
97	JPN	Japan CO Trunks	0.00	0.00
98	DNIS	Directory Number Identification Service	0.00	0.00
99	BGD	Background Terminal	11.54	8.40
— continued —				

Table 7-9
Program size (continued)

Package No.	Mnemonic	Package Name	Model/System Option	
			ST/21/21 A	NT/RT/XT/ 51/61/71
100	RMS	Room Status	1.67	1.25
101	MR	Message Restriction	0.89	0.64
102	AWU	Automatic Wakeup	4.34	3.06
103	PMSI	PMS Interface	0.05	0.04
104	OPAO	Japan Output of . & #	0.05	0.04
105	LLC	Line Load Control	0.08	0.06
106	SLP	Station Loop Preemption	1.23	0.89
107	MCT	Malicious Call Trace	0.34	0.24
108	ICDR	Internal Call	0.00	0.00
109	APL	Auxiliary Processor Link	5.07	3.71
110	TVS	Trunk Verification From Station	0.00	0.00
111	TOF	Time Overflow	0.00	0.00
112	NKL	Notification Key Lamp	0.00	0.00
113	IDC	Digit Conversion	0.44	0.31
114	AUX	ACD-D Auxiliary Security	0.00	0.00
115	DCP	Direct Call Pickup	0.19	0.14
116	PAGT	ACD Priority Agent	0.00	0.00
117	CBC	Call By Call (ISA)	0.00	0.00
118	CCDR	Calling time Identification in CDR	0.00	0.00
119	EMUS	Enhanced Music	0.00	0.00
125	FTC	Flexible Tones & Cadences	0.00	0.00
129	DT12	2.0 Mbit DTI	8.57	6.12
136	JDMI	Japan Digital MUX	0.00	0.00
139	FFC	Flexible Feature Codes	2.80	2.02
140	DCON	TCM Console	0.00	<u>0.00</u>
145	ISDN	ISDN	35.28	-26.06
-continued -				

Table 7-9
Program size (continued)

Package No.	Mnemonic	Package Name	Model/System Option	
			ST/21/21A	NT/RT/XT/ 51/61/71
146	PRA	Primary Rate Access	0.00	0.00
147	ISL	ISDN Signalling Link	0.02	0.01
148	NTWK	Advanced Network Service	5.42	3.89
149	IEC	ESS #4 Interface	0.00	0.00
150	DNXP	DN Expansion	0.00	0.00
151	CDRE	CDR Expansion Due to DNXP	0.00	0.00
152	X25AP	X25	4.69	3.45
153	IAP3P	ISDN AP 3rd Party Application	0.00	0.00
154	PRI2	2.0 Megabit Primary Rate Interface	4.19	2.97
155	ACNT	ACD Activity Code	0.62	0.44
157	THF	Centrex (Trunk) SwitchHook Flash	0.00	0.00
170	ARIE	Aries Sets	0.00	0.00
171	JTDS	Japan Tones	0.00	0.00
172	CPGS	Console Presentation Group Service	0.07	0.04
173	ECCS	Enhanced Controlled Class of Service	0.00	0.00
174	AAA	Attendant Alternative Answering	0.50	0.35
175	NMC	Network Message Center	1.25	0.91
178	NACD	Network ACD	10.54	7.62
202	IPRA	International PRA	5.78	4.31

Chapter 8 — Ordering information

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Introduction

Ordering Meridian 1 Communication Systems is a straightforward process. Modularity and flexibility permits each system to be individually configured to suit specific applications. The necessary equipment and associated quantity depends upon the system requirements which essentially fall into each of the following categories:

— Hardware

- number and type of telephones (500/2500 type, digital telephones)
- number and type of trunks (CO, FX, TIE, DID, DTI/PRI)
- number and type of data units (ADM, ASIM, HSDM)
- number of network resources necessary to meet the traffic requirements for the various peripheral ports

— Software

- base software required to support the system
 - application software associated with the required optional features
-

— Power

- optional AC or DC power distribution scheme

From these requirements, the following system elements and their respective quantities are calculated.

— System Structure

- Universal Equipment Modules
- Pedestal Assembly
- Top Cap Assembly

— Common Equipment

- Common Equipment Modules
- Mass Storage Unit
- Central Processing Unit
- Memory Cards
- Network Circuit Cards
- Peripheral Signaling Cards
- **Conference/TDS** Cards
- Segmented Bus Extenders
- Multigroup Extenders
- 3-Port Extenders
- Serial Data Interfaces
- Bus Termination Units
- Dummy Faceplates

— Peripheral Equipment

- Peripheral Equipment Modules
- Peripheral Controllers
- Line Interface Cards
- Trunk Interface Cards
- **Digitone** Receivers
- Data Interface Cards
- Digital Trunk Interfaces
- Primary Rate Interfaces

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— Terminal Equipment

- . Modular Digital Telephones
- . 500/2500 Type Telephones
- . Attendant Consoles
- . Key/Lamp Add-on Modules
- . Handsfree & Headset Modules
- . Data Access Units

— Power Equipment

- . AC or DC Power Option
- . 48V Rectifiers
- . Power Converters
- . Line Transfer Units
- . Reserve Power Requirements
- . Ringing Generators
- . Power and System Monitors
- . Cooling Units
- . Distribution Units

— Software (RTU Fee)

- . Base Software
- . Optional Application Software

— Cables & Auxiliary Equipment

- . Interconnection Termination Cables
- . MDF & Cross-Connect Terminal Blocks
- . Designation Material

Autoquote

The autoquote mechanism is utilized as a base for order input. System requirements provide input for the automatic generation of associated hardware and software data. Although the autoquote system contains many engineering rules, it does not perform an exhaustive and complete configuration for every potential system requirement. The user should always review the reports produced by the system to ensure that all requirements are met. Because of this, the price quoted by the autoquote system applies only to the hardware and software items listed. It is conceivable, in some instances, that manual adjustments may have to be made to accommodate any special engineering or system requirement.

The following reports are available from the autoquote.

Print option	Description
1	Summary Price Report
3	Equipment Breakout Report
4	Engineering Summary Report
5	Equipment Summary Report
6	Input Data Listing
7	RPE Summary
9	Equipment List
11	Auxiliary Load Summary
20	Unused Capacity Summary

System options

To facilitate various system applications, Meridian 1 is available in several options, the selection of which depends upon the line size and other customer configuration requirements. The SL-1 system options are listed below.

System option	Configuration
21A	Single module • AC power only
21	Single CPU
51	Single CPU, half network group
61	Dual CPU, full network group
71	Dual CPU, multiple network groups

Package concept

Pre-packaged hardware

To simplify the ordering process and reduce the number of orderable items, pre-packaged hardware is available for each system option. The packages form the basis for all system applications and are identified as follows:

SL-1	Table
System option 21, 21A	8-1, 8-2
System option 51	8-3, 8-4
System option 61	8-5, 8-6
System option 71	8-7, 8-8

Note : The information contained in this section of the handbook is only a summary of the system ordering packages and their contents, and is subject to change. The NT Price Manual is the definitive reference in these matters and should be consulted to verify the availability of product packages and their contents.

Where applicable, systems are not offered below the basic package complement. To serve applications under the package capability, unused hardware is either reallocated or retained for use as spares.

For each system option, the basic package can be expanded up to the full capacity of the system by adding the appropriate complement of equipment. Various sub-packages are available that group together required elements, thus eliminating the possibility of overlooking certain necessary equipment. Single apparatus items are specified by their individual ordering code.

SL-1 system option 21, 21A

For small business applications, system option **21** is available in two configurations for either AC or DC power arrangements as outlined in Table 8-1. Another version, system option 21A (order code SY 1006A), which is a single-module system configured for AC-only power arrangement, is also available to address applications up to 160 ports. Table 8-2 provides a breakdown of the hardware **contained in** each of the system packages.

Table 8-1
SL-1 system option 21, 21A packages

ORDER CODE			DESCRIPTION	NOTE
AC POWER	DC POWER	DC POWER with Rectifier		
SY1001A	SY1001D	SY1001R	SL-1 system option 21 package comprising: 1 - Central Processing Unit 1 - 768K Memory Card 1 - Floppy Disk Unit 1 - Common/Peripheral Equipment Module 1 - Conference/TDS Card 1 - Network/Digitone Receiver Card	1
SY1002A	SY1002D	SY1002R	SL-1 system option 21 + PE module package comprising: 1 - Processing Unit 1 - 768K Memory Card 1 - Floppy Disk Unit 1 - Common/Peripheral Equipment Module 1 - Intelligent Peripheral Equipment Module 1 - Conference/TDS Card 1 - Network/Digitone Receiver Card 1 - Superloop Network Card	1
SY1006A			SL-1 system option 21A package (contents similar to SY1 001 A)	
AS1 001 A	AS1 001 D	AS1001 D	Pedestal Assembly	2
AS1 002A	AS1002D	AS1 002D	Two-Module Pedestal Assembly	3
<p>Note 1: Requires the addition of the appropriate Pedestal Assembly.</p> <p>Note 2: Standard pedestal assembly. Supports up to four modules per column, in any configuration.</p> <p>Note 3: Required for configurations of up to two modules only.</p>				

8-8 Ordering information

Table 8-2
 SL-1 system option **21, 21A** packages — code breakdown

QUANTITY								PACKAGE CODE	DESCRIPTION	NOTE
								SY1001A	SL-1 System Option 21 Package AC	1
								SY1002A	SL-1 System Option 21 + PE Module Package AC	1
								SY1001D	SL-1 System Option 21 Package DC	1
								SY1002D	SL-1 System Option 21 + PE Module Package DC	1
								SY1001R	SL-1 System Option 21 Package DC with Rectifiers	
								SY1002R	SL-1 System Option 21 + PE Module Package DC with Rectifiers	
								SY1006A	SL-1 System Option 21A Package AC	
								EQUIPMENT CODE	DESCRIPTION	
1	1	-	-	-	-	-	NT7D00AA	Top Cap Assembly AC		
-	-	-	-	-	-	1	NT7D00AC	Top Cap Assembly AC		
1	1	-	-	-	-	1	NT8D14AA	Common/Peripheral Equipment Power Supply AC		
-	1	-	1	-	1	-	NT8D04AA	Superloop Network Card		
-	-	-	-	-	-	1	NT8D15AA	System Monitor		
-	1	-	-	-	-	-	NT8D06AA	Peripheral Equipment Power Supply AC		
1	1	-	-	-	-	1	NT8D11AC	Common/Peripheral Equipment Module AC		
1	1	1	1	1	1	1	NT8D17AA	Conference/TDS Card		
1	1	1	1	1	1	1	NT8D18AA	Network/DTR Card		
1	1	1	1	1	1	1	NT8D19AA	Memory/Signaling Card		
— continued —										

Table 8-2
 SL-1 system option 21, 21A packages — code breakdown (continued)

QUANTITY							EQUIPMENT CODE	DESCRIPTION
-	-	-	-	-	-	1	NT8D27AC	Pedestal
-	1	-	-	-	-	-	NT8D37AA	Intelligent Peripheral Equipment Module AC
-	-	-	-	-	-	1	NT8D40AY	Power Cord AC- Option 21A
2	2	2	2	2	2	2	NT8D41AA	2 Port SDI Paddle Board
-	-	-	-	-	-	1	NT8D53AD	Power Distribution Unit
2	4	2	4	2	4	2	PO699724	Module Side Cover (Part of Modules)
1	1	1	1	1	1	1	NT8D68AA	Floppy Disk Unit
1	1	1	1	1	1	1	NT8D77AA	FDI to FDU Cable - 1.2 m (4 ft)
7	19	7	19	7	19	7	NT8D81AA	Tip & Ring Cable (Part of Modules)
3	3	3	3	3	3	3	NT8D84AA	SDI Paddle Board to I/O Cable
-	1	-	1	-	1	-	NT8D91AD	Network to PE Cable - 1.8 m (6 ft)
1	1	1	1	-	-	1	QMM42	Security Data Cartridge
1	1	1	1	1	1	1	QPC687	CPU with SDI/RTC
1	1	1	1	1	1	1	QPC742	Floppy Disk Interface
1	1	1	1	1	1	1	QPC940	ROM Card
-	-	-	1	-	1	-	NT6D40AA	Peripheral Equipment Power Supply DC
-	-	1	1	1	1	-	NT7D00BA	Top Cap Assembly DC
-	-	1	1	1	1	-	NT7D04AA	Common/Peripheral Equipment Power Supply DC
-	-	1	1	1	1	-	NT8D11DC	Common/Peripheral Module DC
1	1	1	1	1	1	1	NT8D82AD	SDI to I/O Cable - 1.8 m (6 ft)
-	-	-	1	-	1	-	NT8D37DC	Intelligent Peripheral Equipment Module DC
1	1	1	1	1	1	1	NT8D46AG	System Monitor to SDI Cable

Note 1: Requires appropriate Pedestal Assembly.

-continued —

Table 8-2
 SL-1 system option 21, 21A packages — code breakdown (continued)

QUANTITY							EQUIPMENT CODE	DESCRIPTION
-	-	1	1	-	-	-	NT8D46AW	System-Monitor TO QBL12 Cable
-	-	1	1	-	-	-	QBL12	Battery Distribution Unit
-	-	-	-	1	1	-	NT6D52AA	-52 v/30 amp Rectifier
-	-	-	-	1	1	-	NT6D54AA	Rectifier Wiring Kit
-	-	-	-	1	1	-	NT7D12AA	Rectifier Rack
-	-	-	-	1	1	-	NT7D1201	Rectifier Support/Air Baffle
-	-	-	-	1	1	-	NT8D46AT	System monitor to QBL15 Cable
-	-	-	-	1	1	-	QBL15	Power-Battery-Distribution-Unit
-	-	-	-	-	-	1	NT7D15AA	System Monitor-Option 21A
-	-	-	-	-	-	1	NT8D40BJ	System Monitor to Backplane Cable
-	-	-	-	-	-	1	NT8D82AA	SDI to I/O Cable

SL-1 system option 51

For medium-sized business applications using single CPU operation, the SL-1 system option 51 is available for either AC or DC power arrangements as outlined in Table 8-3.

To expand the SL-1 system option 51 package to a Dual CPU/Fully Redundant Memory configuration requires the addition of one AS 1005A package (redundancy assembly for AC power) or one AS1005D package (redundancy assembly for DC power).

Table 8-4 details the equipment breakdown of the package assemblies associated with the SL-1 system option 51.

Table 8-3
SL-1 system option 51 packages

ORDER CODE			DESCRIPTION
AC POWER	DC POWER	DC POWER With Rectifier	
SY1003A	SY1003D	SY1003R	SL-1 System Option 51 Package comprising: <ul style="list-style-type: none"> 1 - Central Processing Unit 1 - 768K Memory Card 1 - Half Network Group Capability 1 - Common Equipment Module 1 - Intelligent Peripheral Equip. Module 1 - Conference/TDS Card
<p>Note: In addition, requires one Floppy Disk Assembly or one Multi-Disk Assembly, as appropriate.</p>			

Table 8-4
SL-1 system option 51 packages — code breakdown

QUANTITY					PACKAGE CODE	DESCRIPTION	NOTE
					SY1003A	SL-1 System Option 51 Package AC	1
					AS1005A	CPU Redundancy Assembly AC	2
					SY1003D	SL-1 System Option 51 Package DC	1
					AS1005D	CPU Redundancy Assembly DC	2
					SY1003R	SL-1 System Option 51 Package DC with Rectifiers;	
					EQUIPMENT CODE	DESCRIPTION	
1	1	-	-	-	NT6D39AA	Common Equipment Module AC	
1	-	-	-	-	NT7D00AA	Top Cap Assembly AC;	
1	-	1	-	1	NT8D04AA	Superloop Network Card	
1	-	-	-	-	NT8D06AA	Peripheral Equipment Power Supply AC	
1	-	1	-	1	NT8D17AA	Conference/TDS Card	
1	-	1	-	1	NT8D22AB	System Monitor	
1	-	-	-	-	NT8D27AB	Pedestal AC	
-	-	1	-	1	NT7D09AA	Pedestal DC;	
1	1	-	-	-	NT8D29AB	Common Equipment Power Supply AC	
1	-	-	-	-	NT8D37AA	Intelligent Peripheral Equipment Module AC	
2	-	2	-	2	NT8D41AA	2 Port SDI Paddle Board	
1	-	-	-	-	NT8D52AA	Pedestal Blower Unit AC	
1	-	-	-	-	NT8D53AB	Power Distribution Unit AC	
4	-	4	-	4	PO699724	Module Side Cover	
1	1	1	1	1	NT8D78AA	CPU Cable	
12	-	12	-	1 2	NT8D81AA	Tip & Ring Cable	

-continued —

Table 8-4
SL-1 system option 51 packages — code breakdown (continued)

QUANTITY					EQUIPMENT CODE	DESCRIPTION
3	-	3	-	3	NT8D84AA	SDI Paddle Board-to I/O Cable
1	-	1	-	1	NT8D91AD	Superloop to PE Cable - 1.8 m (6 ft)
	1	-	1	-	NT8D99AD	CPU to Network Cable
1	1	1	1	1	QPC43R	Peripheral Signaling Card
1	1	1	1	1	QPC477A10	Bus Terminating Unit
1	1	1	1	1	QPC477A22	Bus Terminating Unit
1	1	1	1	1	QPC477A9	Bus Terminating Unit
1	1	1	1	1	QPC579	CPU Function Card
1	1	1	1	1	QPC580	CPU Interface Card
1	1	1	1	1	QPC583	Memory Card
1	1	1	1	1	QPC939A	ROM Card
-	-	1	1	1	NT6D39DC	Common Equipment Module DC
-	-	1	-	1	NT6D40AA	Peripheral Equipment Power Supply DC
-	-	1	1	1	NT6D41AA	Common Equipment Power Supply DC
-	-	1	-	1	NT7D00BA	Top Cap Assembly DC
-	-	1	-	1	NT7D10AA	Power Distribution Unit DC
-	-	1	-	1	NT8D37DC	Intelligent Peripheral Equipment Module DC
-	-	1	-	1	NT8D52DC	Pedestal Blower Unit DC
1	-	1	-	1	NT8D46AG	System Monitor to SDI Cable
1	-	1	-	1	QMM42	Security Data Cartridge
1	1	1	1	1	QPC441	3 Port Extender
1	1	1	1	1	QPC581	Changeover Memory Arbitrator
<p>Note 1: Requires AS1057 Floppy Disk Assembly or AS1 058 Multi-Disk Assembly.</p> <p>Note 2: Requires the purchase of the appropriate disk interface hardware.</p> <p style="text-align: center;">--</p>						
-- continued --						

Table 8-4
SL-1 system option 51 packages — code breakdown (continued)

QUANTITY					EQUIPMENT CODE	DESCRIPTION
-	-	1	-	-	NT8D46AW	System Monitor to QBL12 Cable
		1	▪	▪	QBL12	Battery Distribution Unit
	▪	▪	▪	1	NT6D52AA	-52 v/30 Amp Rectifier
	▪	▪	▪	1	NT6D54AA	Rectifier Wiring Kit
	▪	▪	▪	1	NT7D12AA	Rectifier Rack
	▪	▪	▪	1	NT7D1201	Rectifier Support/Air Baffle
	▪	▪	▪	1	NT8 D46AT	System Monitor to QBL15 Cable
-	-	-	-	1	QBL15	Power Battery Distribution Unit
					NT8D8OAZ	CPU Interface Cable
1	1	1	1	1	NT8D85AZ	Net to PE Cable

SL-1 system option 61

For medium-sized business applications requiring the added reliability of a Dual CPU/Fully Redundant Memory configuration, the SL-1 system option 61 is available for either AC or DC power arrangements as outlined in Table 8-5.

Table 8-6 details the equipment breakdown of the package assemblies associated with the SL-1 system option 61.

Table 8-5
SL-1 system option 61 packages

ORDER CODE			DESCRIPTION
AC POWER	DC POWER	DC POWER with Rectifier	
SY1004A	SY1004D	SY1004R	SL-1 System Option 61 Package comprising: <ul style="list-style-type: none"> 2 • Common Equipment Modules 1 • Intelligent Peripheral Equipment Module 2 • Central Processing Units 2 • 768K Memory Cards (fully redundant) 1 • Full Network Group Capability 1 • Superloop Network Card 2 • Conference/TDS Cards
Note: In addition, requires one Floppy Disk Assembly or one Multi-Disk Assembly, as appropriate.			

Table 8-6
SL-1 system option 61 packages — code breakdown

			PACKAGE CODE	DESCRIPTION
			SY1004A (see Note)	SL-1 System Option 61 Package AC
			SY1004D (see Note)	SL-1 System Option 61 Package DC
			SY1004R (see Note)	SL-1 System Option 61 Package DC with Rectifiers
QUANTITY			EQUIPMENT CODE	DESCRIPTION
2	-	-	NT6D39AA	Common Equipment Module AC
1	-	-	NT7D00AA	Top Cap Assembly AC
1	1	1	NT8D04AA	Superloop Network Card
1	-	-	NT8D06AA	Peripheral Equipment Power Supply AC
2	2	2	NT8D17AA	Conference/TDS Card
1	1	1	NT8D22AB	System Monitor
1	-	-	NT8D27AB	Pedestal AC
-	1	1	NT7D09AA	Pedestal DC
2	-	-	NT8D29AA	Common Equipment Power Supply AC
1	-	-	NT8D37AA	Intelligent Peripheral Equipment Module AC
2	2	2	NT8D41AA	2 Port SDI Paddle Board
1	-	-	NT8D52AA	Pedestal Blower Unit AC
1	-	-	NT8D53AB	Power Distribution Unit AC
6	6	6	PO699724	Module Side Cover
2	2	2	NT8D78AA	CPU Cable
12	12	12	NT8D81AA	Tip & Ring Cable
3	3	3	NT8D84AA	SDI Paddle Board to I/O Cable
1	1	1	NT8D91AD	Superloop to PE Cable - 1.8 m-(6 ft)
2	2	2	QPC43R	Peripheral Signaling Card
2	2	2	QPC441C	3 Port Extender

-continued -

Table 8-6
 SL-1 system option 61 **packages** -code breakdown (continued)

QUANTITY			CODE	DESCRIPTION
2	2	2	QPC477A10	Bus Terminating Unit
2	2	2	QPC477A22	Bus Terminating Unit
2	2	2	QPC477A9	Bus Terminating Unit
2	2	2	QPC579	CPU Function Card
2	2	2	QPC580	CPU Interface Card
2	2	2	QPC581	Changeover & Memory Arbitrator
2	2	2	QPC583	Memory Card
2	2	2	QPC939A	ROM Card
-	2	2	NT6D39DC	Common Equipment Module DC
-	1	1	NT6D40AA	Peripheral Equipment Power Supply DC
-	2	2	NT6D41AA	Common Equipment Power Supply DC
-	1	1	NT7D00BA	Top Cap Assembly DC
-	1	1	NT7D10AA	Power Distribution Unit DC
-	1	1	NT8D37DC	Intelligent Peripheral Equipment Module DC
	1	1	NT8D52DC	Pedestal Blower Unit DC
1	1	1	NT8 D46AG	System Monitor to SDI Cable
2	2	2	QMM42	Security Data Cartridge
Note 1: Requires AS1059 Floppy Disk Assembly or AS1060 Multi-Disk Assembly.				
-continued -				

Table 8-6
SL-1 system option 61 packages — code breakdown (continued)

CODE BREAKDOWN QUANTITY			CODE	DESCRIPTION
2	2	2	NT8D80AD	CPU Interface Cable
1	1	1	NT8D80AZ	CPU Interface Cable
1	1	1	NT8D85AZ	Network to PE Cable
2	2	2	NT8D99AB	CPU to Network Cable
-	1	-	NT8D46AW	System Monitor to QBL12 Cable
-	1	-	QBL12	Battery Distribution Unit
-	-	1	NT6D52AA	-52 v/30 Amp Rectifier
-	-	1	NT6D54AA	Rectifier Wiring Kit
-	-	1	NT7D12AA	Rectifier Rack
-	-	1	NT7D1201	Rectifier Support/Air Baffle
-	-	1	NT8D46AT	System Monitor to QBL15 Cable
-	1	1	QBL15	Power/Battery Distribution Unit

Note 1: Requires AS1059 Floppy Disk Assembly or AS1060 Multi-Disk Assembly.

SL-1 system option 71

For large-sized business applications, the SL-1 system option 71 provides a Dual CPU, Fully Redundant Memory configuration for either AC or DC power arrangements as outlined in Table 8-7.

To expand the SL-1 System Option 71 Package with additional Network Group Assemblies (up to a maximum of five), requires the addition of the appropriate quantity of **AS1006A** (AC Power) or **AS1006D** (DC Power) packages.

Table 8-8 details the equipment breakdown of the package assemblies associated with the SL-1 system option 71.

Table 8-7
SL-1 system option 71 packages

ORDER CODE			DESCRIPTION
AC POWER	DC POWER	DC POWER With Rectifier	
SY1005A	SY1005D	SY1005R	SL-1 System Option 71 Package comprising: <ul style="list-style-type: none"> 2 ▪ CPU Equipment Modules 2 ▪ Network Equipment Modules 2 ▪ Intelligent PE Modules 2 ▪ Central Processing Units 2 ▪ 768K Memory Cards (fully redundant) 1 - Network Group Assembly 1 ▪ Superloop Network Card 2 ▪ Conference/TDS Cards
Note: In addition, requires one Floppy Disk Assembly or one Multi-Disk Assembly, as appropriate.			

Table 8-8
SL-1 system option 71 packages — code breakdown

					CODE	DESCRIPTION	NOTE
					SY1005A	SL-1 System Option 71 Package AC;	1
					AS1 006A	Network Group Assembly AC	2
					SY1005D	SL-1 System Option 71 Package DC	1
					AS1006D	Network Group Assembly DC	2
					SY1005R	SL-1 System Option 71 Package DC With Rectifiers	
CODE BREAKDOWN QUANTITY					CODE	DESCRIPTION	
2	-	-	-	-	NT7D00AA	Top Cap Assembly AC	
4	2	4	2	-	NT7D06AA	Filter Panel - CE Module	
1	-	1	-	1	NT8D04AA	Superloop Network Card I	
2	-	-	-	-	NT8D06AA	Peripheral Equipment Power Supply AC;	
2	-	2	-	2	NT8D17AA	Conference/TDS Card	
2	-	2	-	2	NT8D22AB	System Monitor	
2	-	-	-	-	NT8D27AB	Pedestal AC	
-	-	2	-	2	NT7D09AA	Pedestal DC	
4	2	-	-	-	NT8D29AA	Common Equipment Power Supply AC	
2	-	-	-	-	NT8D34AA	Common Equipment Module AC	
2	2	-	-	-	NT8D35AA	Network Equipment Module AC	
1	-	1	-	1	NT8D36AA	Inter Group Module;	
2	-	-	-	-	NT8D37AA	Intelligent Peripheral Equipment Module AC ;	
1	-	1	-	-	NT8D46AD	System Monitor to SDI Cable	
3	-	3	-	3	NT8D49AA	Column Spacer Kit	
2	-	-	-	-	NT8D52AA	Pedestal Blower Unit AC	
2	-	-	-	-	NT8D53AB	Power Distribution Unit AC	
8	-	8	-	-	PO699724	Module Side Cover	
2	-	2	-	-	NT8D76AD	IGS to SGM Cable - 1.8 m (6 ft)	
— continued —							

Table 8-8
SL-1 system option 71 packages — code breakdown (continued)

CODE BREAKDOWN QUANTITY					CODE	DESCRIPTION
2	-	2	-	2	NT8 D76AE	IGS to IGM Cable - 2.4 m (8 ft)
2	-	2	-	2	NT8 D78AA	CPU Cable
2	-	2	-	2	NT8 D80AD	CPU Interface Cable ▪ 1.8 m (6 ft)
2	-	2	-	2	NT8D80AF	CPU Interface Cable ▪ 3 m (10 ft)
22	-	22	-	24	NT8D81AA	Tip & Ring Cable
1	-	1	-	1	NT8D82AD	SDI to I/O Cable - 1.8 m (6 ft)
2	-	2	-	2	NT8D91AD	Superloop to IPE Cable ▪ 1.8 m (6 ft)
1	-	1	-	1	NT8D90AF	SDI Multiple Port Cable ▪ External
5	5	5	5	5	NT8D99AB	Network Cable 0.6 m (2 ft)
2	2	2	2	2	QPC215C	Segmented Bus Extender
4	4	4	4	4	QPC412C	Intergroup Switch
2	2	2	2	2	QPC43R	Peripheral Signaling Card
2	2	2	2	2	QPC441c	3 Port Extender
2	-	2	-	2	QPC471 C	Clock Controller
2	2	2	2	2	QPC477A10	Bus Terminating Unit
1	-	1	-	1	QPC477A20	Bus Terminating Unit
1	-	1	-	1	QPC477A21	Bus Terminating Unit
2	2	2	2	2	QPC477A9	Bus Terminating Unit
2	-	2	-	2	QPC579	CPU Function Card
2	-	2	-	2	QPC580	CPU Interface Card
2	-	2	-	2	QPC581	Changeover & Memory Arbitrator
2	-	2	-	2	QPC583	Memory Card
1	-	1	-	1	QPC841	4 Pot-I SDI Card
2	-	2	-	2	QPC939A	ROM Card
-	-	2	-	2	NT6D40AA	Peripheral Equipment Power Supply DC
-	-	4	2	4	NT6D41AA	Common Equipment Power Supply DC

-continued -

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Table 8-8
SL-1 system option 71 packages — code breakdown (continued)

CODE BREAKDOWN QUANTITY					CODE	DESCRIPTION
-	-	1	-	1	NT6D5303	Ground LRE
-	-	2	-	1	NT7D00BA	Top Cap Assembly DC
-	-	2	-	2	NT7D10AA	Power Distribution Unit DC
-	-	2	-	2	NT8D34DC	Common Equipment Module DC
-	-	2	2	2	NT8D35DC	Network Equipment Module DC
-	-	2	-	2	NT8D37DC	Intelligent Peripheral Equipment Module DC
-	-	2	-	2	NT8D52DC	Pedestal Blower Unit DC
1	-	1	-	1	NT8D46AL	System Monitor to Serial Link Cable
2	-	2	-	2	QMM42	Security Data Cartridge
1	-	1	-	1	NT8D74AE	Clock Controller to Junctor Cable 8'
1	-	1	-	1	NT8D74AF	Clock Controller to Junctor Cable 10'
1	-	1	-	1	NT8D80AZ	CPU/MDU Interface Cable
1	-	1	-	1	NT8D85AZ	Network to PE Cable
-	-	1	-	-	NT8D46AW	System Monitor to QBL12 Cable
-	-	1	-	-	QBL12	Battery Distribution Unit
1	-	-	-	1	B0225152	Prime Power Cabinet
1	-	-	-	1	NT5C03	50 Amp Rectifier
4	-	4	-	4	NT7D06AA	CE Filler Panel
1	-	-	-	1	NT8D46AV	System monitor to Power Cabinet Cable
<p>Note 1: Requires AS1059 Floppy Disk Assembly or AS1060 Multi-Disk Assembly.</p> <p>Note 2: Requires 4-NT8D80 Cables and 4-NT8D76 Cables (length depends upon module position).</p>						

Peripheral expansion

To provide peripheral expansion to the base packages associated with the various SL- 1 system options requires the addition of one or more Peripheral Equipment Modules.

Two versions are available:

- NT8D13 for accommodating existing SL-1 peripheral interface cards
- NT8D37 for accommodating the new intelligent peripheral interface cards

Each of these PE modules is available for both AC or DC power arrangements with the NT8D13 always connected to a dual port Network Card (QPC414), and the NT8D37 always connected to the Superloop Network Card (NT8D04AA). -Table 8-9 outlines the capabilities of the Peripheral Equipment Module Assemblies.

Table 8-9

Peripheral Equipment Module packages

ORDER CODE		DESCRIPTION
ACPOWER	DC POWER	
AS1 053A	AS1 053D	SL-1 Peripheral Equipment Module Assembly Accommodates 10 existing PE cards (QPC code type) and is comprised of: 1 - SL-1 Peripheral Equipment Module 1 - Peripheral Equipment Power Supply 1 - Dual Loop Peripheral Buffer 7 - Tip and Ring Cables
AS1 054A (see Note)	AS1054D (see Note)	Intelligent Peripheral Equipment Module Assembly Accommodates 16 intelligent PE cards (NT8D code type) and is comprised of: 1 - Intelligent Peripheral Equipment Module 1 - Peripheral Equipment Power Supply 11 - Tip and Ring Cables
Note: In addition, requires one Controller-2 Card or one Controller-4 Card, as applicable, to system configuration.		

Remote Peripheral Equipment

Remote Peripheral Equipment (**RPE**) is an optional feature that is used to extend the 15.2-m (**50-ft**) range of the multiplexed loop connection between the dual port network card (QPC414) and associated SL-1 Peripheral Equipment Modules to approximately 112.6 km (70 miles) over **T1** type transmission media. This enables the peripheral interface cards (QPC code types) to be placed in closer proximity to associated telephones and terminals to effectively increase the serving area of the Meridian 1 System.

Existing RPE interface cards are used at both local and remote sites and are housed in respective RPE Carrier Modules, available for AC or DC power arrangements.

Table 8-10 outlines the capabilities of the RPE Carrier Module Assemblies.

Table 8-10
Remote Peripheral Equipment Module packages

ORDER CODE		DESCRIPTION
AC POWER	DC POWER	
AS1055A	AS1055D	RPE Carrier Module Assembly Required at both local and remote site Serves two network loops and is comprised of: 1 - RPE Carrier Module 1 - Common/Peripheral Equipment Power Supply 1 - Carrier Maintenance Card
706SL1-1	706SL1-1	Local Network Interface Serves one remote network loop and is comprised of: 1 - 1.5 Mbaud Converter 1 - Local Carrier Buffer 1 - 2 Mbaud Converter 1 - Carrier Interface
707SL1-1	707SL1-1	Remote Network Interface Serves one remote network loop and is comprised of: 1 - 1.5 Mbaud Converter 1 - Remote Peripheral Switch 1 - 2 Mbaud Converter 1 - Carrier Interface

Software

System software is provisioned on an incremental basis and falls into two categories:

- Base Software (Table 8-1 1), which is always required and configured at a minimum level depending upon the SL-1 system option selected
- Application Software (Tables 8-12, 8-13; and 8-14) which is provided on an optional basis and is equipped up to a maximum level assigned to the particular features chosen

In both cases, the associated Right-to-Use (RTU) fee is dependent upon the number of hardware ports equipped in the system. Table 8-15 shows the relationship between equipped hardware ports (in 100 increments) and the associated software levels to be applied.

Table 8-16 indicates the minimum number of hardware ports and minimum Base Software level for each SL- 1 system option. The port range depicts the number of ports which the minimum software level will support before adding incremental Base Software. For example, a system equipped with 650 hardware ports utilizes a software level factor of 7 (Table 8-14) in computing the total Base Software RTU fee (i.e., Unit Base RTU fee multiplied by 7). The same factor of 7 is also used in determining RTU fees for the Application Software feature codes selected for the system, provided that the maximum software level for the feature code has not been reached (Tables 8-12, 8-13, and 8-14).

Table 8-11
Base software

Order code	Option group	Description	Note
SW0000A	0	Basic Features	
	1	Advanced Features	
	4, 5	Call Detail Recording List	
	7	Recorded Announcement	
	8	Time & Date	
	9, 16	Do-Not-Disturb	
	10	End-to-End Signaling	
	11	Intercept Treatment	
	14, 28, 32, 57, 61	Basic Alternate Route Selection	
	17	Make Set Busy	↔
	18	2500 Set Features	
	19	Digital Display	
-continued ↔			

Table 8-11
Base software (continued)

Order code	Option group	Description	Note
	20	Office Data Administration System	
	21	Dial Intercom *	
	22	Direct Inward Dialing System	
	23, 24	Call Detail Recording Charge Account Code	
	29, 32, 60	Automatic Route Selection Traffic/Queuing	
	33	Call Park	
	34	System Speed Call	
	36	Recorded Overflow Announcement	
	44	Music Package	
	46	Basic Message Center	
	47	Auto Handsfree Answerback	
	48	Group Call	
	52	Call Detail Recording Forced Charge Account	
	55	History File	
	64	Stored Number Redial	
	70	Flexible Hotline	
	71	Deluxe Hold	
	72	Auto Line Selection	
	73	500 Set Features	
	74	Distinctive Ringing	
	75	Private Branch Exchange Interface	1
	76	Departmental Listed Directory Number	
	80	Station Category Indicator	
	81	Controlled Class of Service	
	87	Fast Tone and Digit Switch	2
	88	Meridian Digital Telephone - -	
	89	Meridian M3000 Telephone	
-- continued --			

Table 8-11
Base software (continued)

Order code	Option group	Description	Note
	90	Last Number Redial	
	91	Meridian M2317 Telephone	
	95	Call Party Name Display	
	107	Malicious Call Trace	
	108	Internal Call Detail Recording	
	115	Directed Call Pickup	
	119	Enhanced Music	
	139	Remote Call Forward/Flexible Feature Codes	
	140	M2250 Console	
	157	Centrex Switch Hook Flash	
	170	Meridian Modular Terminals	
	173	Enhanced Controlled Class of Service	
	203	Superloop	
	204	Conference/Tone Digit Switch	
	205	Superloop Administration	
<p>Note 1: Requires QPC471, vintage B or later, for Digital Trunk Interface or Primary Rate Access application.</p> <p>Note 2: Requires QPC609 Tone Digit Switch or NT8D17AA Conference/Tone Digit Switch.</p>			

Table 8-12
Application software

Order code	Option group	Description	Prerequisite	Maximum level
SW0001A	49, 110, 113	Special Application Features		10
SW0002A	53, 54	Administrative Enhancements		10
SW0005A	50, 151	Directory Number Expansion		10
SW0006A	65, 84	Automatic Trunk Maintenance		10
SW0007A	68, 69, 106	Autovon		10
SW0008A	2	Multi-Customer		10
SW0009A	186, 172	Multi-Tenant		10
SW0010A	12, 13	Automatic Number ID (ANI)		10
SW0017A	92, 99, 100, 101, 102	Hospitality/Healthcare Features		10
SW0018A	103	Property Management Systems Interface	SW0017A	10
SW0019A	56	Attendant Overflow Position		1
SW0020A	93	Supervisory Console		1
SW0021A	174	Attendant Alternative Answer		1
SW0022A	15	Remote Peripheral Equipment		1
SW0023A	25	Authorization Code		1
SW0024A	105	Line Load Control		1
SW0025A	26	Centralized Attendant Service - Main		1
SW0026A	27	Centralized Attendant Service-Remote		1
SW0027A	6	Call Detail Recording - Link		1
SW0041A	58	Network Alternate Route Selection		10
SW0042A	59	Coordinated Dialing Plan		10
SW0043A	63	Network Authorization Code	SW0023A	10
SW0044A	37, 38, 67	Basic ESN Features		10

— continued —

Table 8-12
Application software (continued)

Order code	Optiongroup	Description	Prerequisite	Maximum level
SW0045A	39, 62	Advanced Electronic Switched Network Features	SW0044A, 1 SW0041 A or S W0042A	0
SW0401A 1	0 9	Application Processor Link		10
SW0402A 3	5	Integrated Voice Messaging Link	SW0401A 1 SW0201A	0
SW0403A	77, 85	Meridian Mail Link	SW0402A 1	0
S W0404A	1 5 3	Meridian Link	SW0403A 1 SW0202A	0
S W0405A	1 5 3	Meridian Link Integrated Services Digital Network/Application Protocol Direct Connection	SW0404A	1
S W0406A	1 5 2	Meridian Link Server	SW0404A 1	0

Table 8-13
Automatic Call Distribution application software

Order code	Option group	Description	Prerequisite	Maximum level
SW0201A	40, 45, 83	Basic ACD Features (ACD A)		10
SW0202A	41, 98, 116	Advanced ACD Features (ACD B)	SW0201 A	10
SW0203A	42	ACD Reports (ACD C1)	SW0202A	10
SW0204A	43	ACD Load Management (ACD C2)	SW0203A	10
SW0205A	50, 51	ACD Link (MAWACD D)	SW0204A	10
SW0206A	114,155	ACD-MAX Reports Enhancements	SW0205A	1
SW0207A	178	Enhanced ACD Overflow	SW0202A SW0205A SW0208A	10
SW0208A	111	ACD Timed Overflow	SW0202A	10
SW0209A	207	Network ACD	SW0300A SW0044A SW0207A SW0208A SW0301A or SW0302A SW0041 A or SW0042A	10

Table 8-14
Integrated Services Digital Network application software

Order code	Option group	Description	Prerequisite	Maximum level
SW0300A	118, 145	Basic ISDN Features		1
SW0301A	146	Primary Rate Access	SW0300A QPC757 (vintage C or later)	10
SW0302A	147	ISDN Signaling Link	SW0300A QPC757 (vintage C or later)	10
SW0303A	148	Advanced ISDN Features	SW0301A or SW0302A SW0041A or SW0042A	10
S W0304A	1 4 9	Inter-Exchange Carrier	SW0301A 1	0
SW0305A 1	1 7	Call by Call Service	SW0300A 1	0
S W0306A	1 7 5	Network Message Center	SW0201A SW0301A or SW0302A SW0403A SW0401A SW0402A	10

Table 8-15
System software level configuration

Hardware Ports	Software Level
1-100	1
101-200	2
201-300	3
301-400	4
401-500	5
501-600	6
601-700	7
701-800	8
801-900	9
901-1000	10
1001-1100	11
1101-1200	12
1201-1300	13
1301-1400	14
1401-1500	15
1501-1600	16
1601-1700	17
1701-1800	18
1801-1900	19
1901-2000	20
2001-2100	21
2101-2200	22
2201-2300	23
2301-2400	24
2401-2500	25
2500andmore	*

† Divide the number of hardware ports by 100. --

Table 8-16
SL-1 system option — minimum configuration

SL-1 system option package	21A	21	21 + PE	51	61	71
Order code	SY1006A	SY1001A/D	SY1002A/D	SY1003A/D	SY1004A/D	SY1005A/D
Minimum hardware ports	40	40	101	60	60	201
Base software minimum level	1	1	2	1	1	3
Hardware port range	I-100	I-100	101-200	I-100	I-100	201-300

Meridian Modular Telephones

The following Meridian Modular Telephones are available:

- **M2006**—a single line telephone with 6 programmable keys
- **M2008**—a multi-line set with 8 programmable keys
- **M2616**—a high performance multi-line set with 16 programmable keys and integrated Handsfree unit
- **M2016S**—a Telephone Security Group Class II approved telephone designed to provide on-hook security. It is similar to the M2616, with 16 programmable keys, but has no handsfree capability.
- **M2216ACD-1**—a multi-line set for ACD operations. It has 15 programmable function keys, a special ACD Display Module and two RJ-32 jacks for modular **electret** headsets
- **M2216ACD-2**—a multi-line set for ACD operations. It has 15 programmable function keys, and a special ACD Display. It is similar to model 1, but with one PJ-327 jack for a carbon agent headset and one RJ-32 jack for an **electret** supervisor headset

The following hardware options can be add on to Meridian Modular Telephones:

- External Alerter Interface Board
- Display Module
- Programmable Data Adapter
- Key Expansion Module

Table 8-17 lists the ordering codes for the Meridian Modular Telephones, alone and with hardware options installed.

Table 8-1 8 lists the hardware options that can be purchased separately, and Table 8-19 lists miscellaneous items.

Refer to **Meridian Modular Telephones-Description and specification** (553-2201-116) for additional information.

Table 8-17
Order codes for Meridian Modular Telephones and factory installed options

Description	Ordering code
M2006 (Basic)	
Black	NTZK06AA-03
Chameleon Ash	NTZK06AA-35
Dolphin Gray	NTZK06AA-93
M2006 (with MPDA)	
Black	NTZK06AB-03 (with power board)
Chameleon Ash	NTZK06AB-35 (with power board)
Dolphin Gray	NTZK06AB-93 (with power board)
M2008 (Basic)	
Black	NTZK08AA-03
Chameleon Ash	NTZK08AA-35
Dolphin Gray	NTZK08AA-93
M2008 (with MPDA)	
Black	NTZK08AB-03 (with power board)
Chameleon Ash	NTZK08AB-35 (with power board)
Dolphin Gray	NTZK08AB-93 (with power board)
M2008 (with Display)	
Black	NTZK08BA-03 (with power board)
Chameleon Ash	NTZK08BA-35 (with power board)
Dolphin Gray	NTZK08BA-93 (with power board)
M2008 (with MPDA and Display)	
Black	NTZK08BB-03 (with power board)
Chameleon Ash	NTZK08BB-35 (with power board)
Dolphin Gray	NTZK08BB-93 (with power board)

-continued --

Table 8-17
Order codes for Meridian Modular Telephones and factory installed options (continued)

Description	Ordering code
M2616 (basic)	
Black	NTZK16AA-03
Chameleon Ash	NTZK16AA-35
Dolphin Gray	NTZK16AA-93
M2616 (with MPDA)	
Black	NTZK16AB-03 (with power board)
Chameleon Ash	NTZK16AB-35 (with power board)
Dolphin Gray	NTZK16AB-93 (with power board)
M2616 (with Display)	
Black	NTZK16BA-03
Chameleon Ash	NTZK16BA-35
Dolphin Gray	NTZK16BA-93
M2616 (with MPDA and Display)	
Black	NTZK16BB-03 (with power board)
Chameleon Ash	NTZK16BB-35 (with power board)
Dolphin Gray	NTZK16BB-93 (with power board)
M2016S (basic)	
Black	NTZK20AA-03 (with power board)
Chameleon Ash	NTZK20AA-35 (with power board)
Dolphin Gray	NTZK20AA-93 (with power board)
M2016S (with MPDA)	
Black	NTZK20AB-03 (with power board)
Chameleon Ash	NTZK20AB-35 (with power board)
Dolphin Gray	NTZK20AB-93 (with power-board)
-continued —	

Table 8-17
Order codes for Meridian Modular Telephones and factory installed options (continued)

Description	Ordering code
M2016S (with Display)	
Black	NTZK20BA-03 (with power board)
Chameleon Ash	NTZK20BA-35 (with power board)
Dolphin Gray	NTZK20BA-93 (with power board)
M2016S (with MPDA and Display)	
Black	NTZK20BB-03 (with power board)
Chameleon Ash	NTZK20BB-35 (with power board)
Dolphin Gray	NTZK20EB-93 (with power board)
M2216ACD-1 (basic-with ACD Display)	
Black	NTZK22AA-03
Chameleon Ash	NTZK22AA-35
Dolphin Gray	NTZK22AA-93
M2216ACD-1 (with MPDA and ACD Display)	
Black	NTZK22AB-03 (with power board)
Chameleon Ash	NTZK22AB-35 (with power board)
Dolphin Gray	NTZK22AB-93 (with power board)
M2216ACD-2 (basic-with ACD Display)	
Black	NTZK23AA-03 (with power board)
Chameleon Ash	NTZK23AA-35 (with power board)
Dolphin Gray	NTZK23AA-93 (with power board)
M2216ACD-2 (with MPDA)	
	--
Black	NTZK23AB-03 (with power board)
Chameleon Ash	NTZK23AB-35 (with power board)
Dolphin Gray	NTZK23AB-93 (with power board)

Table 8-18
Ordering codes for optional hardware

Description	Ordering code	Additional requirements
Meridian Programmable Data Adapter	NT2K64WA	Power Supply Board
Display Module		Power Supply Board (M2008)
Black	NT2K24WA-03	
Chameleon Ash	NT2K24WA-35	
Dolphin Gray	NT2K24WA-93	
ACD Display Module		Power Supply Board (M2008)
Black	NT2K25YH-03	
Chameleon Ash	NT2K25YH-35	
Dolphin Gray	NT2K25YH-93	
Top cover filler plate		
Black	PO778303-03	
Chameleon Ash	PO778335-35	
Dolphin Gray	PO778393-93	
22 Key Expansion Module		Power Supply Board
Black	NT2K22WA-03	
Chameleon Ash	NT2K22WA-35	
Dolphin Gray	NT2K22WA-93	
Single Key Module Footstand		
Black	PO7801 03-03	
Chameleon Ash	PO780135-35	
Dolphin Gray	PO7801 93-93	
Double Key Module Footstand		
Black	PO780203-03	--
Chameleon Ash	PO780235-35	
Dolphin Gray	PO780293-93	
-continued ---		

Table 8-18
Ordering codes for optional hardware (continued)

Description	Ordering code	Additional requirements
External Alert Interface	NT2K40WA	Power Supply Board
Power Supply Board	NT2K10WA	Transformer or closet power
120 V Transformer	A0367335	Power Supply Board
240 V Transformer	A036791 4	Power Supply Board

Table 8-19
Ordering codes for miscellaneous items

Description	Ordering code
Card, Directory Number	
Black	PO665352
Chameleon Ash	PO665352
Dolphin Gray	PO652740
Card, key labels	PO657709
Lens, Directory Number	PO652720
Handset	
Black	A0338908
Chameleon Ash	A03291 73
Dolphin Gray	A03291 74
Handset cord, 2.7m. (9 ft)	
Black	A0334590
Chameleon Ash	A031 8327
Dolphin Gray	A031 8330
Handset cord, 3.6 m. (12 ft)	
Black	A0274233
Chameleon Ash	A0274243
Dolphin Gray	A031 4423
Line cord	A0346862
Set User Guide (regular)	PO703991
Set Reference Card	PO704094
Display Module Reference Card	PO704096 --
- continued -	

Table 8-19
Ordering codes for miscellaneous items (continued)

Description	Ordering code
Display Installation Sheet	PO706836
Meridian Programmable Data Adapter User Guide	PO705986
M2216ACD User Guide	PO704747
ACD Reference Card	PO705952

Power

The Meridian 1 is available in both AC power distribution and DC power distribution versions. These two methods are discussed in more detail in Chapters 4 and 5 of this handbook, but essentially the AC system is connected directly to the commercial AC (utility) power, whereas the DC system always requires an external power plant w/rectifiers to convert the commercial AC power source into **-49v** AC for distribution within the Meridian 1 system.

Power equipment can be ordered in several different ways. System packages for **AC**-powered system options have an "A" **suffix** at the end of the package ordering code. DC system packages have a "D" suffix. These system packages generally contain all internal power-related components necessary for operation, such as the module AC-DC power supplies in AC systems and the module AC-DC power converters in DC systems. Note that Ringing Generator packs, however, are specified separately.

Several external DC power plants w/rectifiers are available as assembly packages. However, a third type of system package is available. System packages with an "**R**" suffix are DC systems with suitable rectifier assembly packages included for convenience.

Lastly, a variety of power and power-related equipment can be ordered either as assembly packages or as merchandise for individual items. Though this chapter contains a summary of most of the available packages, the **NT Pricing** Manual should be consulted for detailed breakdowns of packages and availability of merchandise items.

8-42 Ordering information

Table 8-20
DC power package assemblies

			PACKAGE CODE	DESCRIPTION	NOTE
			AS1015D	Rectifier Rack Assembly	1
			AS1017D	DC Power Assembly	2
			AS1018D	Prime Rectifier Cabinet Assembly	3
QUANTITY			EQUIPMENT CODE	DESCRIPTION	
1	-	-	NT6D52AA	30 Amp Rectifier	
1	-	-	NT6D54AA	Rectifier Wiring Kit	
1	-	-	NT7D12AA	Rectifier Rack	
1	-	-	NT7D1201	Rectifier Support/Air Baffle	
1	-	-	QBL15	Power Distribution Unit	
-	1	-	QBL12	Battery Distribution Unit	
1	-	-	NT8D46AT	System Monitor Cable	
-	-	1	NT8D46AV	System Monitor Cable	
-	1	-	NT8D46AW	System Monitor Cable	
-	-	1	B0225152	Prime Power Cabinet	
-	-	1	NT5C03	50 Amp Rectifier (Note 4)	
--	--	1	Nt6 D5303	Ground LRE	
<p>Note 1: Applies to system options 21, 51, and 61.</p> <p>Note 2: Applies to all system options when customer-provided power is used.</p> <p>Note 3: Applies primarily to system option 71. Can be used with option 61.</p> <p>Note 4: For Provisioning guidelines for power equipment., refer to NTP 553-3001-I 52.</p>					

Chapter 9: Traffic

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Introduction

All telecommunications networks possess two basic types of resources: call processing resources and call carrying resources.

Call processing resources set up and take down point-to-point connections within the network. They comprise route selection within the network, signaling between switching systems, billing, and control of special functions or features. Call processing resources are usually concentrated within the switching system. They take the form of relay or software-based logic, memory, and digit receivers/transmitters which are used to exchange signals between switching systems.

Call carrying resources are used to support a point-to-point connection established **within** the network. These resources consist of subscriber loops between telephones and switching systems, the connections through which a call passes within switching systems, and **the** transmission paths between all the switching systems in an end-to-end connection.

A fundamental quantity **called** traffic is derived from the product of two factors. One factor is the number of attempts or bids made to use **a network** resource per hour. The other is the average duration in hours that the resource is used per attempt.

Traffic engineering

Traffic Engineering predicts **the** amount of equipment required to provide high quality service at the most economical cost. Most users **take** excellent telephone service for granted. It happens so quickly and automatically that there is a tendency to believe there are unlimited resources available in the switching network



dedicated to each telephone. However, this is not the case; components of the switching equipment are shared among many callers. It is the traffic engineering which promotes the illusion of unlimited resources in an economical system.

The high quality of service currently achievable is due in part to the establishment of and adherence to communication traffic standards. These standards define the quality of service that a user will experience when gaining access to the network to place a call. In general, the higher the grade of service, the greater the amount of switching and transmission resources required. In today's telecommunications environment, the task of setting appropriate traffic standards is becoming increasingly complicated because the nature of traffic is changing. Until recently, traffic engineering consisted primarily of providing an adequate level of telephone service. Today, advances in digital technology make it possible to integrate a variety of new communications services into the common network. The traffic characteristics of this integrated stream of features differ markedly from those of basic telephone traffic in three areas: holding time, number of network connections, and traffic pattern.

The holding time or duration of an ordinary telephone call averages approximately three minutes. In an integrated office traffic stream, holding times vary from very short (a few seconds to transmit an electronic letter) to very long (30 minutes or more for a teleconference or a document processing operation).

To determine the impact of these variable holding times on traffic, the parameters that measure network performance, particularly those for blocking and access delay, must be considered.

Blocking probability is the probability that an attempt to invoke a service will be unsuccessful. At a given traffic level, the probability that blocking will occur increases as the required number of simultaneous connections increases.

Access delay is the amount of time a user waits to gain access to the service. In public networks, users experience both dial tone delay and post-dialing delay. In a private network, access to resources may also be gained on a delay basis,

Measurements of service quality have little meaning unless a standard exists against which they may be compared. Traffic standards must be carefully selected to strike the correct balance between user service expectations and cost.

Once service is deployed, operational measurements monitor traffic demands and the resulting quality of service. This data is also used to predict future load requirements. The goal of this activity is to ensure that performance objectives are met both now and in the future. The degree to which this goal is met depends largely on the accuracy of the traffic forecasts.

The average number of simultaneous calls during a given period is known as the traffic flow or intensity. The two commonly used units of traffic measurements are:

1. **ERLANG** - by definition, one erlang is equal to the traffic intensity of one circuit fully occupied for one hour.
 2. **CCS** - hundred call seconds. Since there are 3600 seconds in each hour, one hour of traffic is equivalent to 36 CCS.
- Thus the relationship between the two is that one hour of traffic is one erlang; one erlang is equal to 36 CCS.

Table 9-1
Telephone traffic units

Term	Definition
UC	Unit call (expressed in 100 seconds or CCS)
ccs	Hundred call seconds or the total amount of traffic in seconds divided by 100
ERLANG	Traffic unit used when holding times are expressed in hours. Usually designated as "E"
E	36 CCS (CCS = E/36)

For planning purposes, calculations are usually made with the level of traffic measured during the busiest hour of the day. The busy hour, therefore, is the 60-minute time period in which the system carries the most traffic during a 24-hour period. The function of traffic engineering is to determine the minimum amount of equipment required to carry a given amount of traffic while maintaining an acceptable grade of service (GOS). Since busy hour traffic is an average measurement and equipment is provisioned to cater for it accordingly, the grade of service is the probability of a call being lost. A number of mathematical formulas may be used to address grade of service. These vary according to assumptions made concerning the nature of the traffic. The three main formulas in use today are:

POISSON - Blocked Calls Held

Calls that find no idle trunk remain in the system for the period that they would have occupied had they been connected and then leave the system. Time in system is equal to the expected call duration.

The Poisson technique predicts the portion of time circuits are all busy when given the calling traffic. It utilizes what is called the "Lost Calls Held" (LCH) assumption which states that when a call receives an all trunks busy signal, the call is held waiting for a trunk to become available up to the length of its individual holding time. This assumption has been widely criticized because of the widespread belief that Poisson inflates the number of circuits required to maintain certain grades of service.

ERLANG B - Blocked Calls Cleared

Calls which find no idle trunk are cleared immediately from the system. Time in the system is zero.

Erlang B is a very accurate technique for predicting both blocking and trunk usage, particularly when alternate routes are automatically selected upon encountering blockage.

ERLANG C ▪ blocked calls delayed

Calls which find no idle trunk wait in a queue until a trunk is free and then are connected normally. Time in system is equal to the waiting time plus the expected call duration.

Erlang C is the technique used when calls are queued but has the limitation of assuming all callers encountering a delay will be willing to wait an indefinite period of time to be connected.

In summary, there are justified indictments against the traffic engineering techniques of Poisson, Erlang B, and Erlang C that result in a void in the capability of accounting for the way customers utilize today's enhanced communication services. The most pervasive influence on traffic standards comes from the development of new services. The way users perceive and interact with the network is changing, particularly in the business community, as the electronic office becomes a reality. The traditional objective of high quality service must be balanced against the cost of deploying the service using the available technology. The Meridian 1, with its flexible architecture, distributed network, and inherent traffic measurement capabilities, can be suitably configured to meet any traffic engineering application with minimum penalty to cost.

Traffic considerations

Many different analytical methods have been used for calculating the traffic capacity of the Meridian 1. Theoretical analysis, substantiated by simulation of the switching system, resulted in an admissible region of traffic handling capability that would satisfy **intra**loop and interloop blocking probabilities. Service loops were not considered in the simulation, since most of the services (such as dial tone) operate on a delay basis without contributing to the loss of traffic.

Grade of service

The following grade of service objectives are utilized for the switching network:

- (a) No more than 1.5 percent of the originating calls have to wait more than 3 seconds for dial tone.
- (b) No more than 1 percent of the incoming terminating **calls will be** lost provided the called line was free.
- (c) No more than 1 percent of the originating outgoing calls will be lost in the system (excluding the loss due to the outgoing trunks being unavailable). Furthermore, no more than 2 percent of the calls will be lost due to all the trunks being busy.
- (d) No more than 4 percent of the intraoffice calls will be lost provided the called line was free.

The grade of service (a) is concerned with dial tone delay specifications. The grade of service (b), (c), and (d), in effect, deal with the switching network and route blocking. Incoming, outgoing, and intraoffice matching losses are related to intraloop and interloop blocking probabilities.

Specification (d) requires that these blocking probabilities be less than 4 percent,

Specification (b) means that 1 percent is the allowable limit on blocking for incoming terminating calls.

Specification (c) refers to the congestion in the switching network for an outgoing call and the maximum allowable blocking probability for this case is 1 percent.

A retrial procedure is used on outgoing trunks in attempting to find an available path through the network. Hence the blocking probability for the outgoing calls will be less than that for incoming calls. Thus if specification (b) is satisfied, specification (c) is automatically satisfied for the switching network.

It should be noted that these are desirable guidelines to optimize network performance for the maximum number of terminations on a network loop. In the practical sense, a mix of peripheral interface cards more often results in fewer terminations being serviced by the network loop. With less contention for time slots, the traffic handling capability exceeds the grade of service objectives and increases the traffic capacity of the network loop. Since any type of peripheral device (telephone, terminal, trunk, data unit, digitone receiver, etc.) may be used in a connection, the traffic capacity is obtained as the traffic that can be carried by all time slots in a loop. The sum of the traffic generated by all associated peripheral terminations constitutes what is known as the loop traffic.

In order to achieve the lowest blocking probability, traffic should be evenly distributed over the available network loops. This is termed load balancing and is implemented to more readily accommodate variable traffic patterns. However, this procedure is quite meaningless if based upon unsubstantiated traffic projections prior to system installation. Although balanced from a theoretical point of view and engineered to meet grade of service recommendations, the allocation of users to peripheral devices and their subsequent network resource activity is the main criteria for achieving optimum system performance. It makes more sense to assign approximately the same number and type of terminals on each network loop and utilize the inherent system traffic measurement capabilities to determine if reassignments are necessary. All too often, inflationary traffic forecasts are made without substance and applied arbitrarily to system engineering. The result is a configuration that adopts a very conservative approach to traffic handling capability.

Non network enhanced systems

The original SL- 1 network design utilized a procedure of selecting time slots from a set of admissible pairs. This method of searching for free time slots in admissible

pairs was utilized in two of the Meridian SL-1 business system offerings--models S and MS. The concept readily met the traffic demands of small system applications. It was also utilized in the LE and XL in support of Software Generics 337 and 637 respectively. However, in recognition of the need to enhance and provide more switching capability to address the ongoing requirements of both voice and data, a new network design was introduced in 1984.

Network enhancement

The traffic impacts of network enhancement are two-fold:

The removal of the time slot pairing constraint between originating and terminating calls. The selection of time slots on an individual basis reduced mismatch probability, improved network capacity, and provided the capability for a non-blocking matrix. The net effect was an increase in loop capability of approximately ten per cent (10%), i.e., from 600 CCS/loop to 660 CCS/loop for 160 PE terminations based on the Erlang B model as before.

The doubling of network loops within a group. In the enhanced network design, the number of loops in a group is doubled from 16 to 32. The associated network card supports two loops. The number of inter-group **junctions** was also increased from 4 to 8 to improve the grade of service and reduce blocking probability in the multi-group system.

These enhancements were instrumental in the formation of two Meridian SL-1 system models - N and XN. The network design has since been incorporated in the Meridian SL-1 ST, Meridian SL-1 RT, Meridian SL-1 NT, and Meridian SL-1 XT. The Superloop, introduced on Meridian 1 System Options 21, 51, 61, and 71, is also based upon the network enhancement.

The unavailability of a time slot for call set up is a function of the amount of traffic then loaded on the loop (both voice and data) and, therefore, blockage due to all time slots being busy is the same for both voice calls and data calls. However, if the traffic level for different traffic sources varies significantly, the type of traffic sources with a lower load could encounter blocking if too many heavy traffic sources also generate traffic to the same circuit group. It is for this reason that data traffic, with its typically long holding times, be limited on inter-group junctions.

Network enhancement provides the viable alternative of assigning all data lines on a loop and data traffic within a group to effectively isolate the impact on voice traffic. It also provides complete flexibility in engineering network loops throughout the system to address the varying demands of both voice and data traffic accordingly.

Depending upon the origination and termination of a call, several situations contribute to the blocking probability, based on Erlang B formula at the network loop.

Intra-loop, Intra-group blocking

For an intra-loop intra-group call, blocking will occur when idle time slots in the network loop are less than two.

Inter-loop, Intra-group blocking

Blocking of this type could occur when a call encounters no idle time slot at either the originating loop or terminating loop.

Inter-loop, Intergroup blocking

Calls of this type can be blocked at originating loop, terminating loop, and inter-group junctors. A junctor is served as an extension of the originating and terminating loop; the same time slot at both junctor and originating loop must be idle in order to succeed in the first half of the connection. A similar match is also required at the terminating side. The time slot at the terminating loop is independent of the originating time slot.

Each inter-group call initiated requires two idle time slots on the junctors to set up the path; one time slot on the originating junctor to match the originating loop and another time slot on the terminating junctor to match the terminating loop. In other words, one inter-group call makes two time slots on the junctors busy, one on each group of junctors. Since both originating and terminating traffic between two network groups pass the same sets of junctors, a junctor group handles traffic from both directions, even though it is associated with only one network group.

Inter-loop, Intra-group calls with small traffic sources

This type of call is of particular interest since for heavy data applications, the number of terminations per network loop could be relatively small due to high CCS per data line requirements. In order to reduce blocking, high traffic data lines and computer ports are not recommended to be in the same network loop (since an **intra-loop** call takes two time slots from the same loop) or different groups (to minimize junctor traffic). Therefore, most calls from loops with small traffic sources should use inter-loop intra-group connections. The reduction in the number of terminations permits the use of the Engset formula for finite sources in place of the Erlang loss formula for infinite sources.

The Engset formula, like Erlang B, is a loss-call-cleared model with a finite source assumption which is applicable when the number of traffic sources to channels ratio is small. The **finite** source model predicts a higher capacity since it includes the number of traffic sources as a parameter in the model. When a certain number of channels or time slots are occupied, the model will correspondingly reduce the number of idle sources which could potentially generate traffic to the channels. Therefore, the projected blocking is reduced and the allowed traffic would be greater for the finite Engset source model than that for the Erlang B model since the latter has a constant rate of service demand.

Utilization of the Engset model is appropriate for those Meridian 1 and Meridian SL-1 models that incorporate network enhancement and have a traffic source to channel ratio of approximately 4: 1 or less. Therefore, it is appropriate for applications where a network loop of 30 traffic channels services up to 120 peripheral ports or traffic sources. For Meridian SL-1 applications, this is

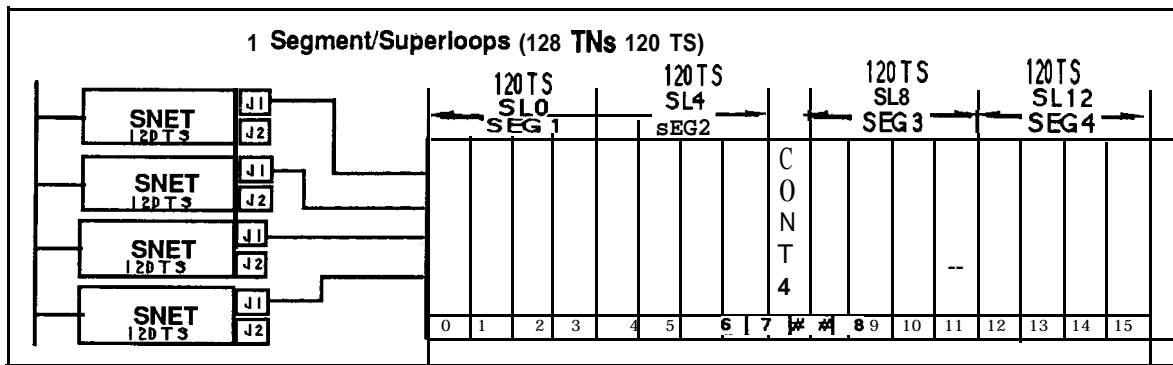
invariably the case because of the universal concept of the peripheral equipment shelf and its ability to accommodate any type of interface card.

With this in mind, significant traffic handling benefits arise in allocating a single PE shelf to a network loop. For the implementation of **double density peripheral equipment**, the capacity of the PE shelf is 80 terminations, attainable only by the provision of 8 port line cards in each of the ten card slots available. However, this rarely the case since a mix of card types is typically equipped. The varying card densities on the PE shelf combine to reduce the number of peripheral ports contending for the thirty available time slots on the supporting network loop. The fewer the PE terminations, the higher the loop traffic and vice-versa. The universal allocation of peripheral cards on the PE shelf or module permits loop traffic to vary accordingly from 735 CCS (for 80 terminations) up to 1080 CCS (for a **non-blocking matrix** of 30 terminations). It is this complete flexibility of network and peripheral organization that allows the Meridian 1 to meet any traffic requirement. Figure 9-1 shows the loop capacity as a function of traffic sources for the Engset and Erlang Loss models.

Superloop network

The Superloop Network card, introduced with Meridian , utilizes the network enhancement to combine four regular network loops to make 120 timeslots available to PE cards housed in Intelligent Peripheral Equipment Modules. This increased bandwidth and larger pool of timeslots increases the network traffic capacity by 25% for each 120 **timeslot bundle**. A Superloop may be assigned from one to eight Intelligent PE segments. A number of different superloop-to-segment configurations are possible. The configuration chosen depends upon system traffic requirements and the specific PE cards used.

**Figure9-1
Superloop segmentation**



—continued—

Figure 9-1
Superloop segmentation (continued)

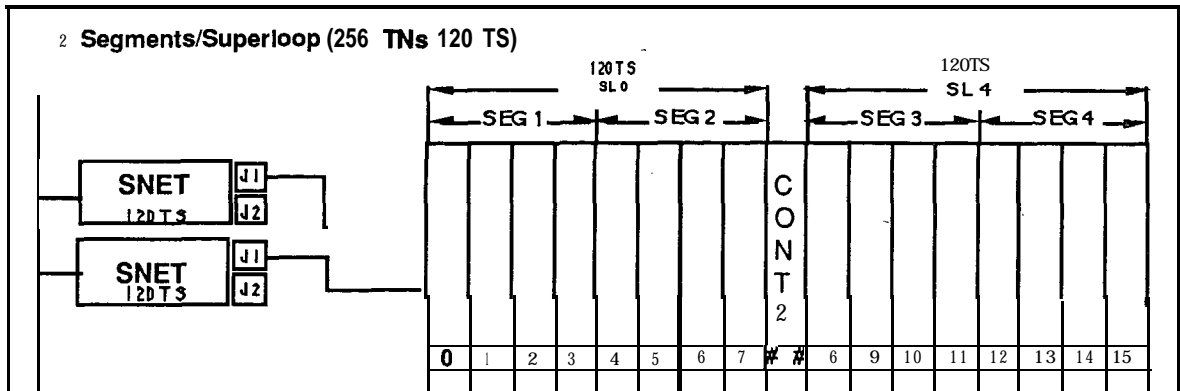


Figure 9-1 Superloop segmentation (continued)

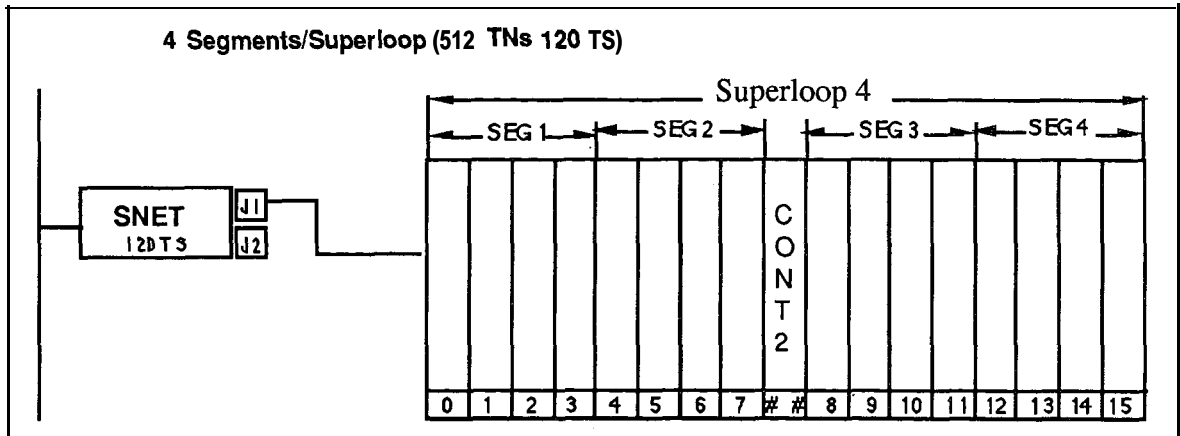


Figure 9-1 Superloop segmentation (continued)

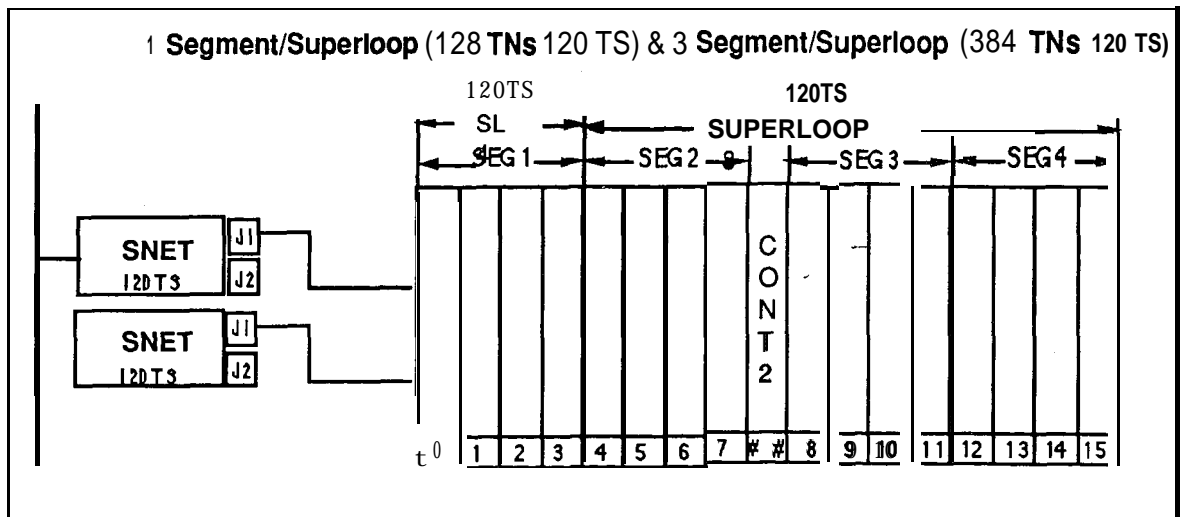


Figure 9-1 Superloop segmentation (continued)

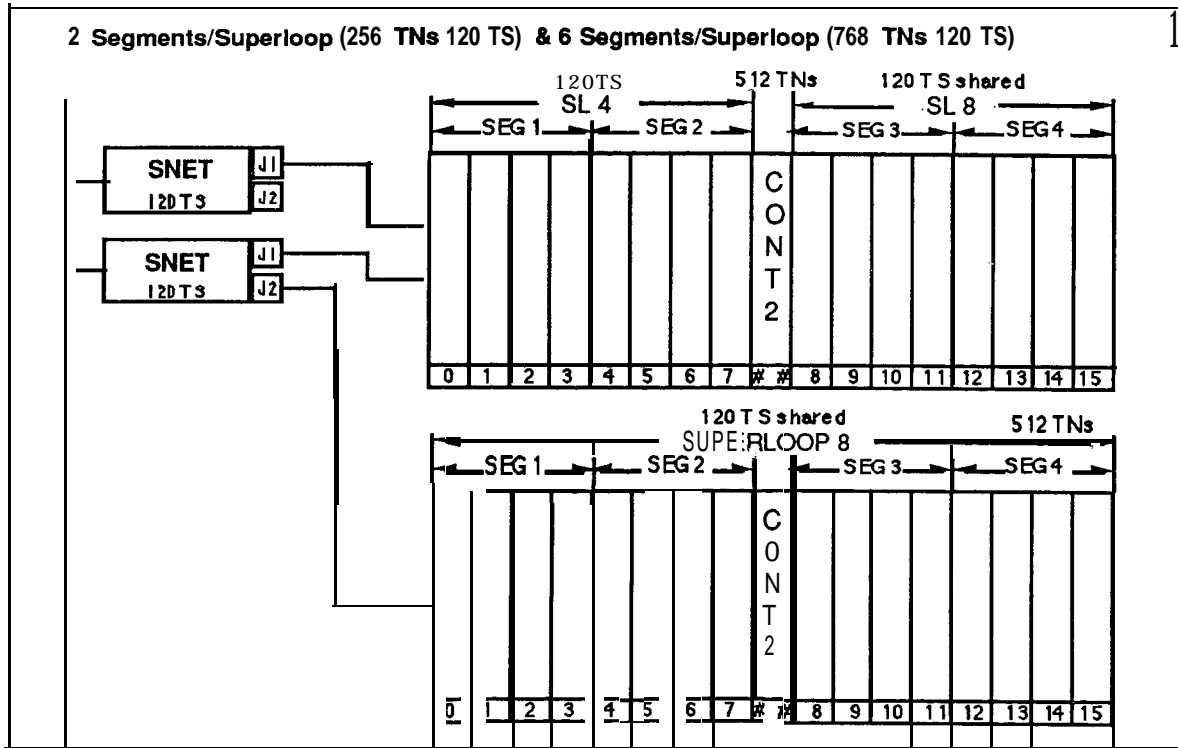
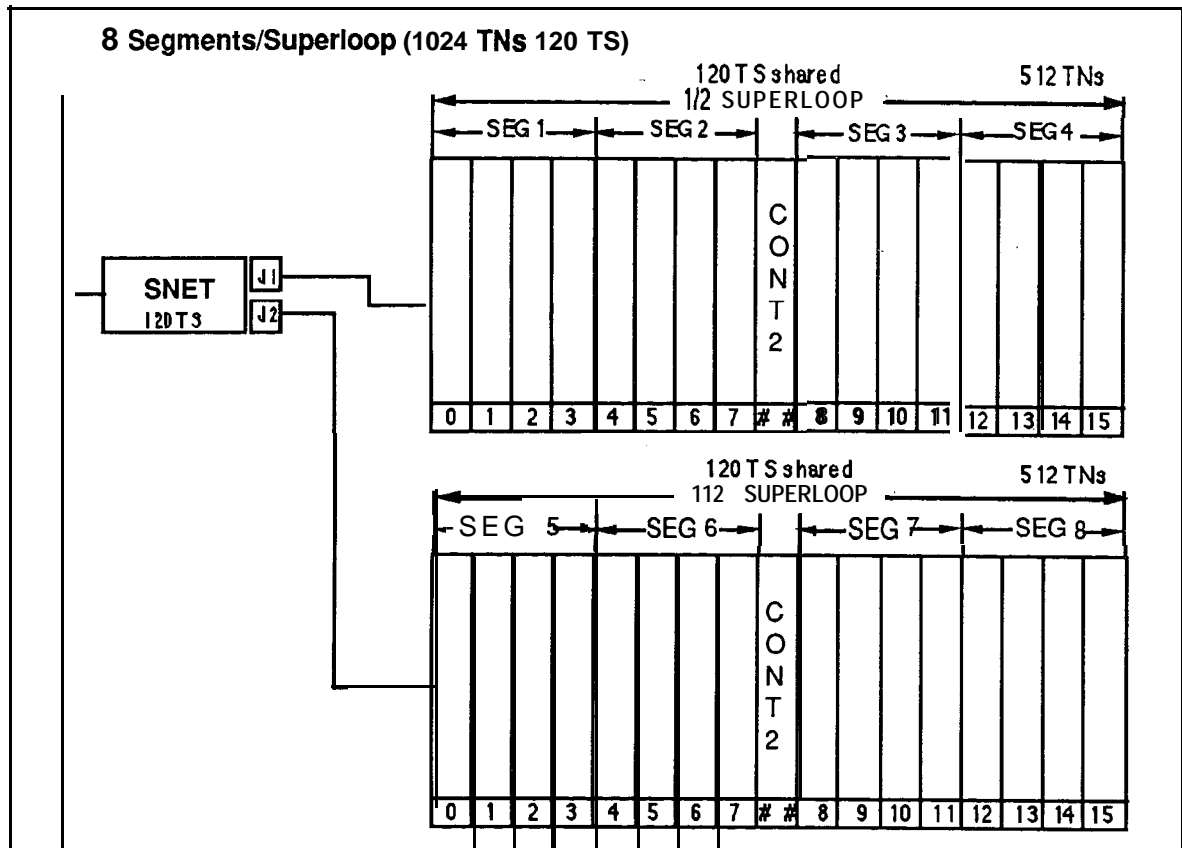


Figure 9-1 Super-loop segmentation (continued)



Service loop configuration

Since network enhancement doubled the number of loops within a group from 16 to 32, the impact on service loop provisioning was measured for typical applications. The requirements of service circuits in general are a function of call attempts seeking connections. If the average traffic per line is increased due to more traffic (longer holding time) rather than more call attempts, the increased traffic to service circuits is minimal. However, when the number of call attempts is doubled, the service circuit traffic is also approximately doubled. The object of network enhancement is to facilitate traffic handling capability rather than increase significantly the number of terminations.

In general, an equivalent number of call attempts, coupled with larger holding times for data connections, means that service circuit functions are not adversely impacted by the increase in traffic loops.

The Tone and Digit Switch (TDS) provides dial tone, busy tone, overflow tone, ringing tone, audible **ringback** tone, DP or DTMF outpulsing, and miscellaneous tones. The service circuit requirements were estimated as a linear function of terminal loops at a specified traffic level.

The conference (CONF) loop provides connections for multi-party conference calls and its provisioning is largely dependent on customer needs. The Meridian SL-1 is flexible enough to provide additional CONF loops to meet specific application requirements, such as Music-On-Hold.

Thus, every additional fourteen traffic loops adds a TDS and a CONF loop. With network enhancement, only the number of traffic loops is doubled on a network card. The TDS and CONF loops are single density circuit cards. Although, theoretically, the number of loops in a network group is doubled from 16 to 32, it is true only when they are all **traffic** loops. Any TDS or CONF loop takes the place of 2 traffic loops in the total 32 loops available. Therefore, in a fully equipped network group, the recommendation is 24 traffic, 2 TDS, and 2 CONF loops.

The **NT8D17AA** combined Conference /TDS card, introduced with Meridian 1, provides TDS and conference capability on a single circuit card, and provides the added benefit of requiring only a single loop per card, in contrast to the 2 loops per card used by the TDS and CONF cards. If the loss of the second loop is not an issue, the use of CONF cards may be more cost effective in conference intensive environments. Utilization of only a simple network card position for Conference/TDS function frees up a slot to accommodate additional traffic loops thereby increasing the network capacity of the system. The recommended allocation of TDS, CONF, and traffic loops is provided in Table 9-2.

Table 9-2
Recommended service circuit allocation with NT8D17AA
Conference/TDS Card

Network Groups	Traffic Loops	TDS Loops	Conference Loops	Total Loops
1	1-14	1	1	16
	15-28	2	2	32
2	29-42	3	3	48
	43-56	4	4	64
3	57-70	5	5	80
	71-84	6	6	96
4	85-98	7	7	112
	99-113	8	8	128
5	114-127	9	9	144
	128-140	10	10	160

Figure 9-2
Loop capacity as a Function of traffic sources

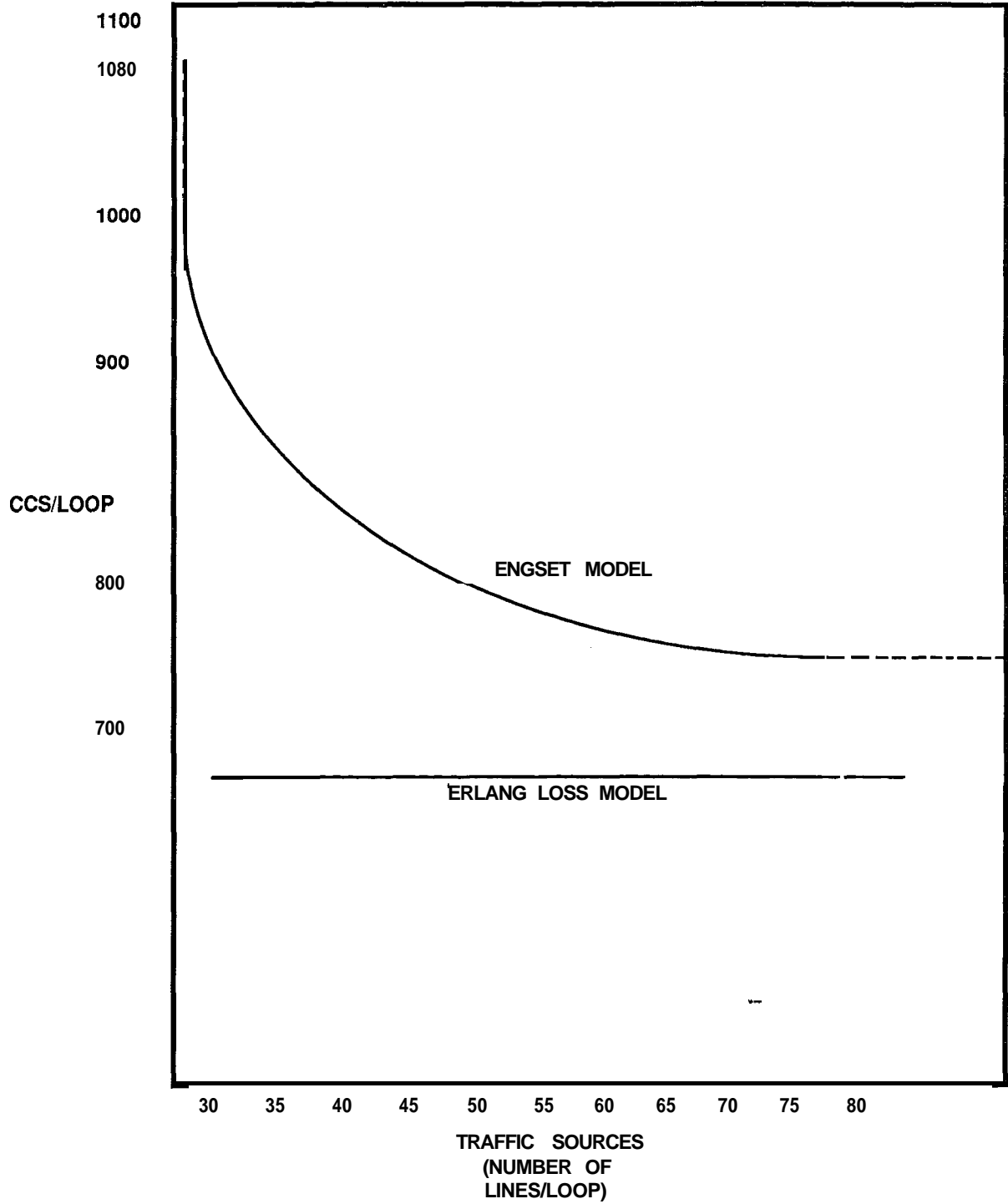


Table 10-I
Meridian 1 system specifications (continued)

Dimensions: (See also Table 10-7)	<u>Width</u>	<u>Depth</u>	<u>Height</u>
	Pedestal	81.2 cm (32 in.)	66 cm (26 in.)
Top Cap	81.2 cm (32 in.)	55.8 cm (22 in.)	10.1 cm (4 in.)
Module	81.2 cm (32 in.)	55.9 cm (22 in.)	43.2 cm (17 in.)
1 Module Column	81.2 cm (32 in.)	66 cm (26 in.)	78.7 cm (31 in.)
2 Module Column	81.2 cm (32 in.)	66 cm (26 in.)	121.9 cm (48 in.)
3 Module Column	81.2 cm (32 in.)	66 cm (26 in.)	165.1 cm (65 in.)
4 Module Column	81.2 cm (32 in.)	66 cm (26 in.)	208.2 cm (82 in.)
Note: Multi-column systems have a 3 inch spacer between each column			
Weight: (See also Table 10-7)	<u>Empty</u>	<u>Loaded</u>	
	Pedestal	18.1 kg (40 lbs)	31.7 kg (70 lbs)
Top Cap	6.8 kg (15 lbs)	6.8 kg (15 lbs)	
Module	22.7 kg (50 lbs)	58.9 kg (130 lbs)	
1 Module Column	N/A	97.5 kg (215 lbs)	
2 Module Column	N/A	156.5 kg (345 lbs)	
3 Module Column	N/A	215.4 kg (475 lbs)	
4 Module Column	N/A	274.4 kg (605 lbs)	
Power Consumption: (See also Table 10-2)	<u>Typical (WATTS)</u>	<u>Maximum (WATTS)</u>	
	NT8D11 Common/Peripheral Equipment	500	630
NT6D39 CPU/Network	360	420	
NT8D34 CPU	300	335	
NT8D35 Network	270	325	
NT8D13 Peripheral Equipment	240	300 --	
NT8D37 Intelligent Peripheral Equipment	460	700	
-- continued --			

**Table 10-1
Meridian 1 system specifications (continued)**

Power Consumption: Continued)	Typical (WATTS)	Maximum (WATTS)
See also Table 1 O-2)		
NT8D47 Remote Peripheral Equipment	175 Local Site	225
NT8D47 Remote Peripheral Equipment	100 Remote Site	150
NT6D44 Meridian Mail	400	450
NT8D36 InterGroup Module	0	0
Pedestal (Blowers)	50	80
Floor Loading (lbs./sq.ft.) See also Table 1 O-8)	lbs/ft² (kPa)	Point load (lbs/in²) (kPa)
One module	38.1 (1.8 kPa)	11 .0 (75.8 kPa)
Two modules	60.3 (2.8 kPa)	17.3 (119 kPa)
Three modules	82.4 (3.9 kPa)	23.7 (163.4 kPa)
Four modules	104.6 (5 kPa)	30.0 (206.8 kPa)
<p>Note: The numbers under "lbs/ft² (kPa)" are based on a floor area of the system of 5.64 square feet. These numbers do not include the weight of the optional overhead cable rack. The numbers under "Point load (lbs/in²) (kPa)" are based on distributing the system weight among four feet, each with an area of 4.91 square inches; these numbers do not reflect the use of optional casters.</p>		
System Powering	AC or DC power distribution	
--		
AC Input voltage (See also Table 1 O-3)	Minimum	<u>Nominal</u> <u>Maximum</u>
— continued —		

**Table 1 O-1
Meridian 1 system specifications (continued)**

System Powering (continued)	Minimum	Nominal	Maximum
Voltage (VAC) at pedestal	180	208/240	250
Frequency (Hz)	47	50/60	63
DC Input Voltage (VDC)	Minimum	Nominal	Maximum
	-40	-52	-56.5
Number of CPUs	1 for system option 21A, 21, 51 2 for system options 61, 71		
Memory	Fully Redundant (system options 61, 71) Error Correcting (system options 21A, 21)		
Word Length	24 bits plus 1 bit parity (system options 51, 61, 71)		
Software Addresses	16 bits plus 6 check bits (system options 21 A, 21)		
Physical memory	16 Mbyte words (system options 51, 61, 71) Up to 1.5 Mbytes		
Network	Up to 5 Network Groups		
Total Loops	160		
Operating environment considerations (See also Table 1 O-4)	System	Terminals	
Temperature (absolute)	50 to 113 ° F (10 to 45° C)	32 to 122° F (0 to 50° C)	
Relative humidity (absolute)	20 to 80%, non-condensing Temperature change less than 18° F (10° C) per hour.	20 to 80%, non-condensing	
Temperature (recommended)	59 to 86° F (15 to 30° C)		

System power consumption

For detailed system power calculations, the typical and worst **case** power consumption figures for each full module are shown in the following table.

The “typical power” figures are fully adequate for use in system power engineering calculations, since they are representative of most systems -with Modules fully loaded (configured) with cards, and under moderate traffic conditions (25% continuous active traffic on lines, 75% continuous active traffic on trunks). These figures **are** recommended for use in rectifier and reserve power provisioning.

The “maximum power” figures **are** shown for reference and planning purposes when needed, and were calculated for each module based on a fully-loaded card cage, in the “worst-possible” operational configuration (in terms of power consumption), with each card consuming typical power under 100% traffic, plus 10% added margin. For example, the maximum power consumption for the **NT8D37** Intelligent Peripheral Equipment Module was based on a configuration of sixteen **NT8D14AA 8-port** Universal Trunk cards, all under 100% traffic conditions, along with a Controller card, additional power margin, etc.

All figures in this section **are** given in real power (unit of Watts) for simplicity. In addition, all of the stated numbers have already taken the average efficiency of the Module power supplies into account. To convert to DC current (in amps), divide the total system power figure by 52 Vdc. This will give the total DC system load in amps. If batteries **are** present for reserve power, additional current must be allocated for charging the batteries, according to battery manufacturer’s guidelines.

To convert power to AC current (in amps), divide the total system power figure by 208 **Vac** nominal, or 240 **Vac** nominal, as appropriate. For calculations normally done in apparent, or complex, power, such as AC wire and panel size, UPS rating for AC reserve power, etc, simply divide the total real power (in Watts) by the typical system power factor of 0.6 to obtain the complex power (in VA).

Table 1 O-2
Meridian 1 power consumption

Module	Power Consumption (Watts)	
	Typical	Maximum
NT8D11 Common/Peripheral Equip.	500	630
NT6D39 CPU/Network	360	420
NT8D34 CPU	300	335
NT8D35 Network	270	325
NT8D13 Peripheral Equipment	240	300
NT8D37 Intelligent Peripheral Equip.	500	700
NT8D47 Remote Peripheral Equip.-Local Site	175	225
NT8D47 Remote Peripheral Equip.-Remote Site	100	150
NT6D44 Meridian Mail	400	450
NT8D36 InterGroup Module	0	0
Pedestal (Blowers)	50	80

Commercial power and grounding requirements

Commercial Power Source – The commercial power source refers to the main AC utility power feed, for either AC-powered or DC powered systems. For AC systems, this power is wired directly to the system. For DC systems, this power source would connect to the rectifiers, which would convert to 48VDC for distribution to the system.

In North America, the power supplied can be either 208 or 240 volts AC nominal. **Three** phase is not required but single power feeds from alternate phases would be normal practice where three phase power is available.

Table 1 O-3
Input power specifications

Input	Minimum	Nominal	Maximum
Voltage (VAC) at pedestal	180	208/240	250
Frequency (Hz)	47	50/60	63
Transient tolerance (See note)			
	Amplitude	Duration	
Surges	288 V ac	8.34 mS to 50 mS	
	276 V ac	50 mS to 500 mS	
Sags	146 V ac	8.34 mS to 50 mS	
	166 V ac	50 mS to 500 mS	
Spikes	815 V pk	<4.17 mS	
	815 V pk to 408 V pk	4.17 to 8.3 mS	
Notches	to 0 v	~4.17 mS	
	0 V to 206 V	4.17 mS to 8.3 mS	
<p>Note: These values are taken from the National Electric Code and various Telco specifications. All transients are applied at the peak of the AC waveform.</p>			

All power feeds used should contain a separate safety conductor (green wire). Northern Telecom strongly recommends that the supply conductors be dedicated and uninterrupted from a building primary source to a dedicated equipment room sub-panel.

Power Sub-Panel.- Power subpanels must meet the following requirements or be modified when used for the Meridian 1:

- . Panels should be located in the equipment room.
- . No lighting, air conditioning, heating, generators or motors shall be serviced from this equipment room panel.
- . In **areas** where isolated ground systems **are** permissible, this panel will provide sufficient ground connection points on the isolated ground plate or bar to handle the AC circuit grounds as well as the other ground reference conductors associated with the Meridian 1.

Service Receptacles – One dedicated outlet per pedestal (column) is a typical requirement for AC systems. For DC systems, or if reserve power is being used, the receptacles or conduit will serve the centralized rectifiers or UPS system directly, with power then routing to the columns.

Unless otherwise specified, these circuits should be rated for 30 Amps. All circuits must be:

- . Wired and fused independently of all receptacles.
- . Tagged at the power panel to prevent unauthorized interruption of power.
- . Not controlled by a switch.

The NEMA receptacle types are as follows:

- . Isolated Ground systems: IG-L6-30
- . Non-Isolated Ground systems: **L6-30**

* In particular, all AC System Options require one 30 A receptacle per column. For DC Systems, those using the **NT5C03 50A** rectifier, require one 30A receptacle per rectifier. The **NT6D52AA** 30A rectifier, while it had previously used a 20A input circuit, has been changed to use one 30A receptacle per rectifier, for consistency throughout the product line.

Commercial power conditioning

If the quality of the commercial power source continuously meets the Meridian 1 system requirements listed in this section, a power conditioner is not required; however, where the commercial power is of poor quality and cannot consistently meet the Meridian 1 system requirements, a power conditioner may provide some improvement.

Note: When using power conditioning equipment, simply install the equipment in series with the commercial power feed. Do not modify the Meridian 1 system grounding scheme.

System grounding requirements

Essential to trouble-free system operation and the safety of personnel is the employment of proper grounding. The Meridian 1 has several different grounds and signal **returns** that are generally referred to as grounds: logic return, battery return (for DC systems), AC “green wire” equipment ground (in AC systems), and the personal hazard equipment ground.

The Meridian 1 does not, by design, need an AC Isolated Ground (IG) system (though this is typically required by local codes such as **NEC**), but it does need a **single point ground system**. This means that each of the various grounds, from each of the columns, should terminate at a single connection point before attaching to the actual ground reference at the main AC panel or transformer. **The single-point ground** may be implemented either by the use of the Isolated Ground bus in the AC panel, or by a separate logic return equalizing bus for battery returns and logic returns where a non-isolated AC system is used.

The following must also be observed to implement the single-point ground:

- All ground conductors must be in accordance with local codes and terminate in a manner that is permanent, resulting in low impedance connections.
- All terminations should be accessible for inspection and maintenance.
- All grounding conductors must be continuous with no splices or junctions and tagged, **“WARNING • Ground Connection • Do not remove or disconnect.”**
- Conductors should be insulated against contact with foreign grounds.
- Grounding conductors must be no-load, non-current carrying cables under normal operating conditions.
- The use of building steel as integral part of the ground system is not recommended.

The DC resistance of the system ground reference wire from the IG to the building ground should be as close to zero as possible with the maximum total resistance on **all runs, within the building, not to exceed 0.5 ohms**. The insulated grounding wire size shall be in accordance with the National Electric Code (**NEC**) **250-294, 250-295** and sections 310-316 (equivalent CSA requirements when used in Canada).

Environmental requirements

Table 10-4
Meridian 1 operating environment:

Considerations	System	Terminals
Temperature (Absolute)	50 to 113 ° F (10 to 45° C)	32 to 122° F (0 to 50° C)
Relative Humidity (Absolute)	20 to 80% , non-condensing Temperature change less than 18° F (1 0° C)per hour.	20 to 80%, non-condensing
Temperature (Recommended)	59 to 88" F (15 to 30" C)	
Relative Humidity (Recommended)	20 to 55% , non-condensing	

Table 10-5
Meridian 1 storage/transportation environment:

Considerations	System	Terminals	Disk Drives (FAU/MAU)
Temperature (Absolute)	-58 to 158 ° F (-50 to 70" C)	-58 to 158° F (-50 to 70" C)	-4 to 140° (-20 to 60°)
Relative Humidity (Absolute)	5 to 95% , noncondensing Temperature change less than 54° F (30° C)per hour.	5 to 95%, non-condensing	1 0-90% non-condensing

Air conditioning requirements

The air conditioning provided must be capable of handling the heat produced by the system, as well as the additional heat produced by equipment room personnel, lighting, and the heat input of external walls, windows, floors and ceilings enclosing the room. Heat dissipation of a system is estimated in **BTU/hr**. The amount of air conditioning required can be estimated at a rate of one U.S. ton of refrigeration for every 12,000 **BTU/hr** of heat generated by the equipment and equipment room personnel, plus one ton for each 500 square feet of floor space. Each person in the equipment room generates 600 **BTU/hr**. These guidelines should be used along with the following table when estimating air conditioning requirements. Exact requirements should be determined by a qualified air conditioning engineer.

The table below shows the maximum power dissipation in the form of heat for each Equipment Module. These figures apply to both AC and DC powered systems. The power figures listed here do not necessarily correspond to total input power, since some of the power - especially for peripheral equipment - is distributed out to the sets and is not dissipated within the system.

**Table 1 O-6
Meridian 1 heat dissipation**

Module	Heat Dissipation	
	Watts	BTU/hr
NT8D11 Common/Peripheral Equip.	450	1530
NT6D39C CPU/Network	360	1220
NT8D34—CPU	300	1020
NT8D35—Network	270	920
NT8D13—Peripheral Equipment	200	680
NT8D37—Intelligent Peripheral Equip.	380	1290
NT8D47 Remote Peripheral Equip.- Local Site	175	600
NT8D47 RPE -remote Site	100	340
Note: Thermal load (BTU/hr) = Total power dissipation (Watts) x 3.4		
-continued-		

Table IO-6
Meridian 1 heat dissipation (continued)

Module	Heat Dissipation	
	Watts	BTU/hr
NT6D44 Meridian Mail	4 0 0	1 3 6 0
NT8D36 InterGroup Module	0	0

Note: Thermal load (BTU/hr) = Total power dissipation (Watts) x 3.4

Equipment dimensions and weight

Table 10-7
Meridian 1 dimensions and weight

Item	Weight Empty	Weight Full	Size Width	Size Depth	Size Height
Pedestal	40 lbs.	70 lbs.	32 in.	26 in.	10 in.
Top Cap	15 lbs.	15 lbs.	32 in.	22 in.	4 in.
Module	50 lbs.	130 lbs.	32 in.	22 in.	17 in.
1 Module	N/A	215 lbs.	32 in.	26 in.	31 in.
2 Module s	N/A	345 lbs.	32 in.	26 in.	48 in.
3 Modules	N/A	475 lbs.	32 in.	26 in.	65 in.
4 Modules	N/A	605 lbs.	32 in.	26 in.	82 in.

Floor loading estimates

Floor loading estimates should be obtained in order to plan for proper stacking of modules. (Floor loading is the weight of the system divided by the occupied floor area; Point loading is the local pressure exerted by the system feet on the floor.)

Table 10-7 shows the floor loading estimates for stacking a Meridian 1 system. The estimates given represent a fully-loaded module complete with pedestal, maximum circuit pack allowances, power supplies, and cables.

Table 10-8
Floor loading estimates

Modules	LBS/FT ² (kPa)	Point Load (lbs/in ²) (kPa)
One	38.1 (1.8 kPa)	11.0 (75.8 kPa)
Two	60.3 (2.8 kPa)	17.3 (119 kPa)
Three	82.4 (3.9 kPa)	23.7 (163.4 kPa)
Four	104.6 (5 kPa)	30.0 (206.8 kPa)

Note:
The numbers under "LBS/FT² (kPa)" are based on a floor area of the system of 5.64 square feet. These numbers do not include the weight of the optional overhead cable rack. The numbers under "Point Load (lbs/in²) (kPa)" are based on distributing the system weight among four feet, each with an area of 4.91 square inches; these numbers do not reflect the use of optional casters.

Terminal Specifications

Table 1 O-9
M2006 specifications

Line Appearances	1
Total Line/Feature Buttons	8
Programmable	6
Fixed	2 (Hold, Release) Plus Independent Volume Adjustments
Line/Feature Indicators	6 LCD
Two-way Speakerphone	No
On-Hook Dialing	Yes
Message Waiting	LED and/or Key Indicator
Display	No
Programmable Data Adapter	Optional
Data Communications Capabilities	Up to 19.2 Kbps Asynchronous
Key Expansion Modules	No
External Alerter Interface	Optional
Loop Length	3,500 ft. (1,057 meters) 24 AWG
Power	Loop - Voice only Auxiliary - Programmable Data Adapter, External Alerter Interface
Auxiliary Power Options	Local Plug-in AC Transformer, or AC or DC Closet Power
Color	Ash, Gray, Black
Dimensions	H = 3.645 in. (92.6 mm) W = 8.5 in. (212 mm) L = 8.35 in. (216 mm)
Weight	1.98 lbs. (900 grams)
Environmental	Temperature 32°-104° F (0°-40° C) Humidity 5%-95% RH

Table 1 O-1 0
M2008 specifications

Line Appearances:	1-8
Total Line/Feature Buttons ; Programmable Fixed	10 8 2 (Hold, Release) Plus Independent Volume Adjustments
Line/Feature Indicators	8 LCD
Two-way Speakerphone	No
On-Hook Dialing	Yes
Message Waiting	LED and/or Key Indicator
Display	Optional I
Programmable Data Adapter	Optional
Data Communications Capabilities	Up to 19.2 Kbps Asynchronous ;
Key Expansion Modules	No
External Alerter Interface	Optional
Loop Length	3,500 ft. (1,057 meters) 24 AWG
Power	Loop • Voice only Auxiliary • Data, Display, Alerter
Auxiliary Power Options	Local Plug-in AC Transformer, or AC or DC Closet Power
Color	Ash, Gray, Black
Dimensions	H = 3.645 in. (92.6 mm) W = 8.5 in. (216 mm) L = 8.35 in. (212 mm)
Weight	1.98 lbs. (900 grams)
Environmental	Temperature 32°-104° F (0°-40° C) Humidity 5%-95% RH

**Table 1 O-1
M2616 specifications**

Line Appearances	1-16
Total Line/Feature Buttons	18
Programmable	16
Fixed	2 (Hold, Release) Plus Independent Volume Adjustments
Line/Feature Indicators	16 LCD
Two-way Speakerphone	Software Optioned
On-Hook Dialing	Yes
Message Waiting	LED and/or Key Indicator
Display	Optional
Programmable Data Adapter	Optional
Data Communications Capabilities	Up to 19.2 Kbps Asynchronous
Key Expansion Modules	Optional - 2 maximum
External Alerter Interface	Optional
Loop Length	3,500 ft. (1,057 meters) 24 AWG
Power	Loop - Voice, Display, Handsfree Auxiliary - Data, Key Module, Alerter
Auxiliary Power Options	Local Plug-in AC Transformer, or AC or DC Closet Power
Dimensions	H = 3.645 in. (92.6 mm) W = 9.876 in. (251 mm) L = 8.35 in. (212 mm)
Weight	2.42 lbs. (1100 grams)
Environmental	Temperature 32°-104° F (0°-40° C) Humidity 5%-95% RH

Table 1 O-I 2
M2216 ACD specifications

	M2216ACD-1	M2216ACD-2
Line Appearances	1-6	18
Total Line/Feature Buttons	18	18
Programmable	16	16
Fixed ¹	2 (Hold, Release) Plus Independent Volume Adjustments	2 (Hold, Release) Plus Independent Volume Adjustments
Line/Feature Indicators	16 LCD	16 LCD
Two-way Speakerphone	No	No
On-Hook Dialing	N/A	N/A
Message Waiting	LED Indicator	LED Indicator
Display	Standard - 2 x 24'	Standard - 2 x 24
Programmable Data Adapter	Optional ¹	Optional ¹
Data Communications	Up to 19.2 Kbps Async	Up to 19.2 Kbps Async
Key Expansion Modules	Optional - 2 maximum	Optional - 2 max
External Alerter Interface	Optional	Optional
Headset Jacks	Two RJ-32 Jacks for Electret Headsets	One PJ-327 Jack for Carbon Headset, One RJ-32 Jack for Electret Headset
Loop Length	3,500 ft. (1,057 meters) 24 AWG	3,500 ft. (1,057 meters) 24 AWG
Power	Loop - Voice and Display only Auxiliary - Data, Key Module, Alerter	Auxiliary for All Operations (Power Board Included in Telephone)
Auxiliary Power Options	Local Plug-in AC Transformer, or AC or DC Closet Power	Local Plug-in AC Transformer, or AC or DC Closet Power
Color	Ash, Gray, Black	Ash, Gray, Black __
Dimensions	H = 3.645 in. (92.6 mm) W = 10.4 in. (251 mm) L = 9.48 in. (237 mm)	H = 3.645 in., (92.6 mm) W = 10.4 in. (251 mm) L = 9.48 in. (237 mm)
Weight	2.84 lbs. (1300 grams)	3.28 lbs. (1500 grams)
Environmental	Temperature 32°-104° F (0°-40° C) Humidity 5%-95% RH	Temperature 32°-104° F(0°-40° C) Humidity 5%-95% RH

Table 1 O-1 3
M2016S specifications

Classification	TSG Approved, Type-Accepted Class 2 - Meets On-Hook Security
Line Appearances	1-16
Total Line/Feature Buttons Programmable Fixed	18 16 2 (Hold, Release) Plus Independent Volume Adjustments
Line/Feature Indicators	16 LCD
Two-way Speakerphone	No
On-Hook Dialing	Yes
Message Waiting	LED and/or Key Indicator
Display	Optional
Programmable Data Adapter	Optional
Data Communications Capabilities	Up to 19.2 Kbps Asynchronous
Key Expansion Modules	Optional - 2 Maximum
External Alerter Interface	No
Loop Length	3,500 ft (1,057 meters) 24 AWG
Power	Auxiliary for All Operations (Power Board Included)
Auxiliary Power Options	Local Plug-in AC Transformer, or AC or DC Closet Power
Dimensions	H = 3.645 in. (92.6 mm) W = 9.876 in. (251 mm) L = 8.35 in. (212 mm)
Weight	2.42 lbs. (1100 grams)
Environmental	Temperature 32°-104° F (0°-40° C) Humidity 5%-95% RH

Table 1 O-I 4
M2317 specifications

Line Appearances	1-11
Total Line/Feature Buttons Programmable Fixed	19 11 Plus 5 Softkeys for Over 35 Features and Prompts 3 (H/F Mute, Hold, Release) Plus Independent Volume Adjustments
Line/Feature Indicators	12 LCD Plus Display Softkeys
Two-way Speakerphone	Standard
On-Hook Dialing	Yes
Message Waiting	Via Display Icon
Display	2 Line x 40 Character LCD
Asynchronous Data Option (ADO)	Optional
Data Communications Capabilities	Up to 19.2 Kbps Asynchronous
Key Expansion Modules	No
External Alerter Interface	No
Loop Length	3,500 ft (1,057 meters) 24 AWG
Power	Loop, plus Auxiliary (Supplied with Set)
Color	Ash, Gray, Black
Dimensions	H = 2.9 in. (73.5 mm) W = 10.1 in. (272 mm) L = 9 in. (226.5 mm)
Weight	3.09 lbs. (1400 grams)
Environmental	Temperature 32°-104° F (0°-40° C) Humidity 5%-95% RH

Table 1 O-I 5
M3000 specifications

Line Appearances	1-6
Total Line/Feature Buttons	N/A
Programmable	N/A
Fixed Feature Appearances	5
Line/Feature Indicators	N/A
Two-way Speakerphone	Standard
On-Hook Dialing	Yes
Message Waiting	Via Display Icon
Display	Full Screen, Touch Sensitive
Directory	Over 130 Dial-by-Name Entries
Asynchronous Data Option (ADO)	Optional
Data Communications Capabilities ;	Up to 19.2 Kbps Asynchronous ;
External Alarmer Interface	No
Key Expansion Modules ;	No
Loop Length	3,500 ft. (1,057 meters) 24 AWG
Power	Loop, plus Auxiliary (Supplied with Set)
Color	Black
Dimensions	H = Tilt Adj. W = 12 in. (302 mm) L = 8.5 in (214 mm)
Weight	3.28 lbs. (1500 grams)
Environmental	Temperature 32°-104° F (0°-40° C) Humidity 5%-95% RH

**Table 1 O-I 6
Telephone Set Overview**

	M2006	M2008	M2616
Line Appearances.	1	1-8.	1-16
Total Line/Feature Buttons Programmable	8 6	10 8	18 16
Fixed	2 Plus Volume Adjustment	2 Plus Volume Adjustment	2 Plus Volume Adjustment.
Line/Feature Indicators .	6 LCD	8 LCD	16 LCD
Integrated Speakerphone	No	No	Software Option
On-Hook Dialing	Yes	Yes	Yes
Message Waiting	LED Indicator	LED Indicator	LED Indicator
Display (LCD)	No	Opt. 2 x 24	Opt. 2x24.
Directory	No	No	No
Data Option	PDA	PDA	PDA
Data Com Capabilities	Up to 19.2 Kbps Async.	Up to 19.2 Kbps Async.	Up to 19.2 Kbps Async.
Key Expansion Modules	No	No	Optional
External Alerter Interface	Optional	Optional	Optional
Multiple Languages	N/A	2 or 6	2 or 6
Loop Length	3,500 ft.	3,500 ft.	3,500 ft.
Power	Loop - Voice Aux. - Data, Alerter	Loop - Voice Data, Display, Alerter	Loop-Voice, Display, H/F Aux. • Data, Display, Alerter
Color	Ash, Gray, Black	Ash, Gray, Black	Ash, Gray, Black

Table 1 O-1 7
Telephone Set Overview

	M2216ACD-1	M2216ACD-2	M2016S
Line Appearances	1-16	1-16	1-16
Total Line/Feature Buttons Programmable	18 16	18 16	18 16
Fixed	2 Plus Volume Adjustment	2 Plus Volume Adjustment	2 Plus Volume Adjustment.
Line/Feature Indicators	16 LCD	16 LCD	16 LCD
Integrated Speakerphone	No	No	No
On-Hook Dialing	N/A	N/A	Yes
Message Waiting	LED Indicator	LED Indicator	LED Indicator
Display (LCD)	Std. 2 x 24	Std. 2 x 24	Opt. 2 x 24
Directory	No	No	No
Data Option	PDA	PDA	PDA
Data Com Capabilities	Up to 19.2 Kbps Async.	Up to 19.2 Kbps Async.	Up to 19.2 Kbps Async.
Key Expansion Modules	Optional	Optional	Optional
External Alerter Interface	Optional	Optional	No
Multiple Languages	6	6	2 or 6
Loop Length	3,500 ft.	3,500 ft.	3,500 ft.
Power	Loop • Voice, Display Aux. • Data, Alerter, Key Module	Auxiliary for All Operations (Power Board Included)	Auxiliary for All Operations (Power Board Included)
Color	Ash, Gray, Black	Ash, Gray, Black	Ash, Gray, Black

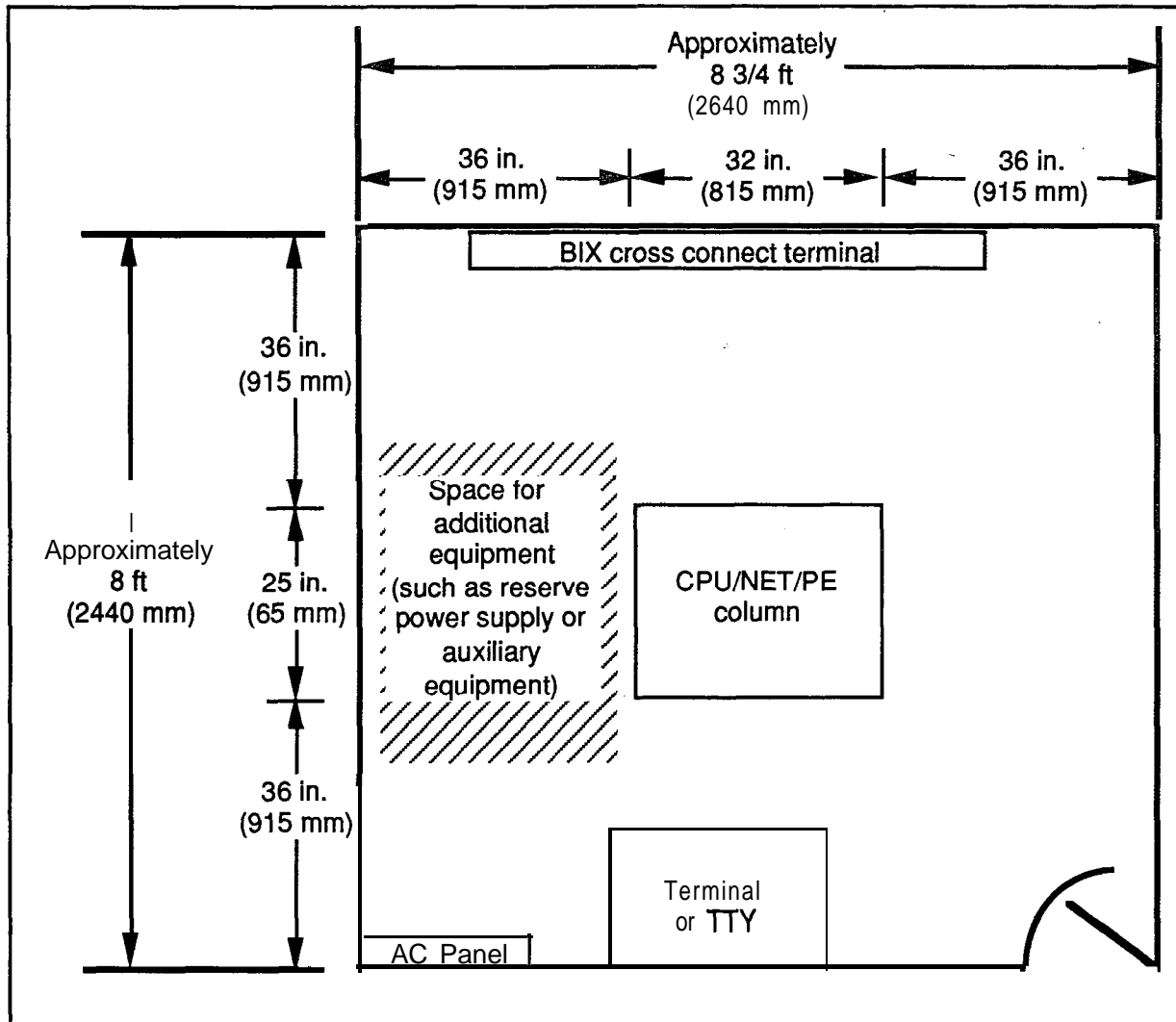
10-24 Technical specifications

Table 10-18
Telephone Set Overview

	M2009	M2112	M2317	M3000
Line Appearances	1-9	1-12	1-11	1-6
Total Line/Feature Buttons Programmable	9	12	19	N/A
Fixed	2 Plus Volume Adjustment	2 Plus Volume Adjustment	3 Plus Volume Adjustment	5 Feature Appearances
Line/Feature Indicators	9 LCD	12 LCD	12 LCD	LCD
Integrated Speakerphone	No	Yes	Yes	Yes
On-Hook Dialing	Yes	Yes	Yes	Yes
Message Waiting	LED Indicator	LED Indicator	LCD Icon	LCD Icon
Display (LCD)	No	No	Built in 2 x 40)	Built-in Screen
Directory	No	No	No	Yes
Data Option	ADO	ADO	ADO	ADO
Data Com Capabilities	Up to 19.2 Kbps Async.	Up to 19.2 Kbps Async.	Up to 19.2 Kbps Async.	up to 19.2 Kbps Async.
Key Expansion Modules	No	No	No	No
External Alert Interface	No	No	No	No
Multiple Languages	N/A	N/A	2	No
Loop Length	3,560 ft.	3,500 ft.	3,560 ft.	3,500 ft.
Power	Loop • Voice Aux. • Data	Loop, Plus Auxiliary (Provided With Set)	Loop, Plus Auxiliary (Provided With Set)	Loop, Plus Auxiliary (Provided With Set)
Color	Ash, Gray, Black	Ash, Gray, Black	Ash, Gray, Black	Black

System Option 21-Floor plan example

Figure 1
System Option 24 equipment room floor plan

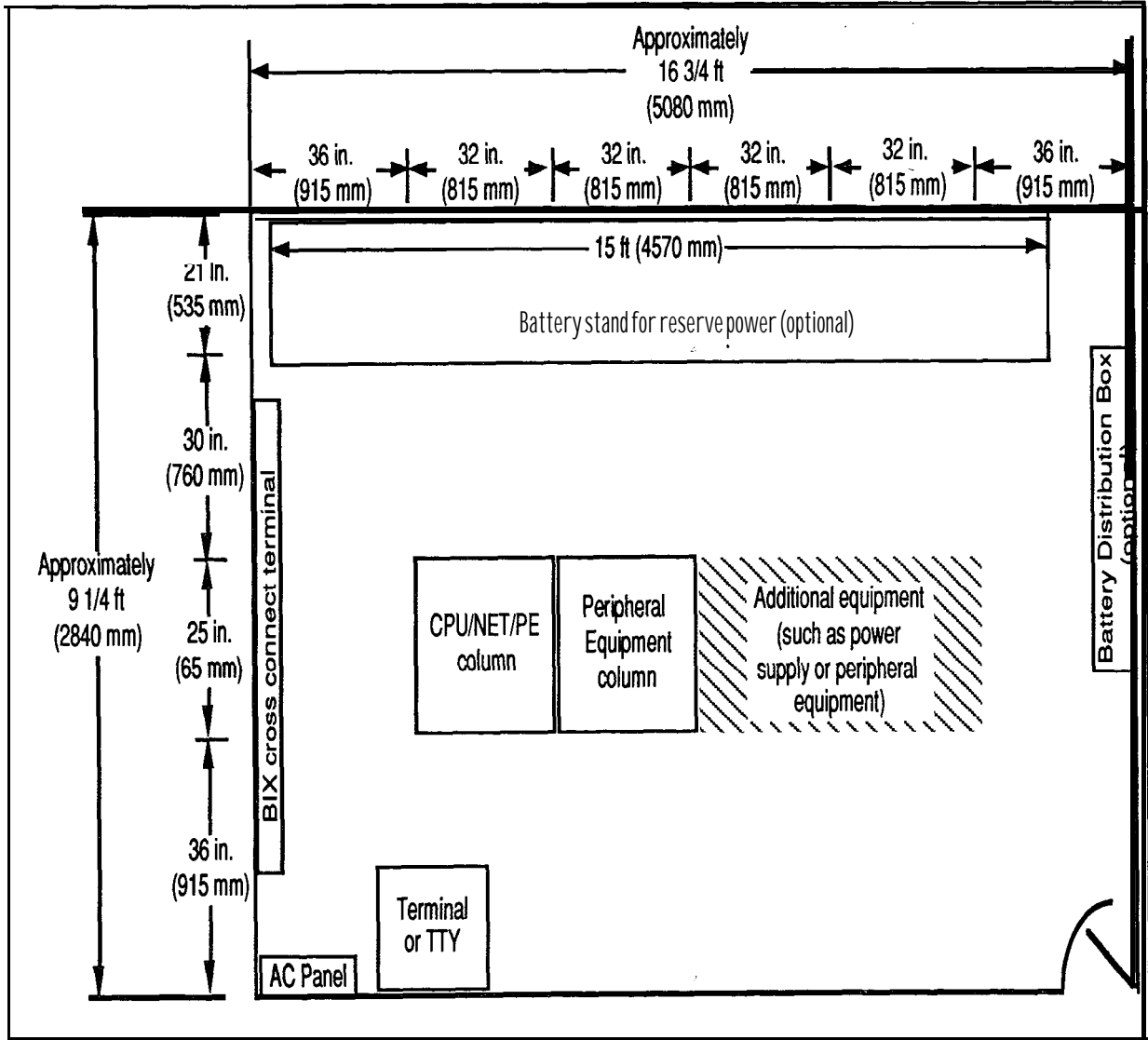


Notes to floor plans:

- 1.) These sample floor plans may vary from your own depending on your system needs and the size/arrangement of your equipment room.
- 2.) A template for system placement and floor drilling procedures is available. The drawing (part number P0709207) is delivered with the system packing instructions.
- 3.) If a conflict arises between a code included in this document and a local or national code, follow the local or national code.

System Option 51 and 61-Floor plan example

Figure 2
System Option 51 and 61 equipment room floor plan

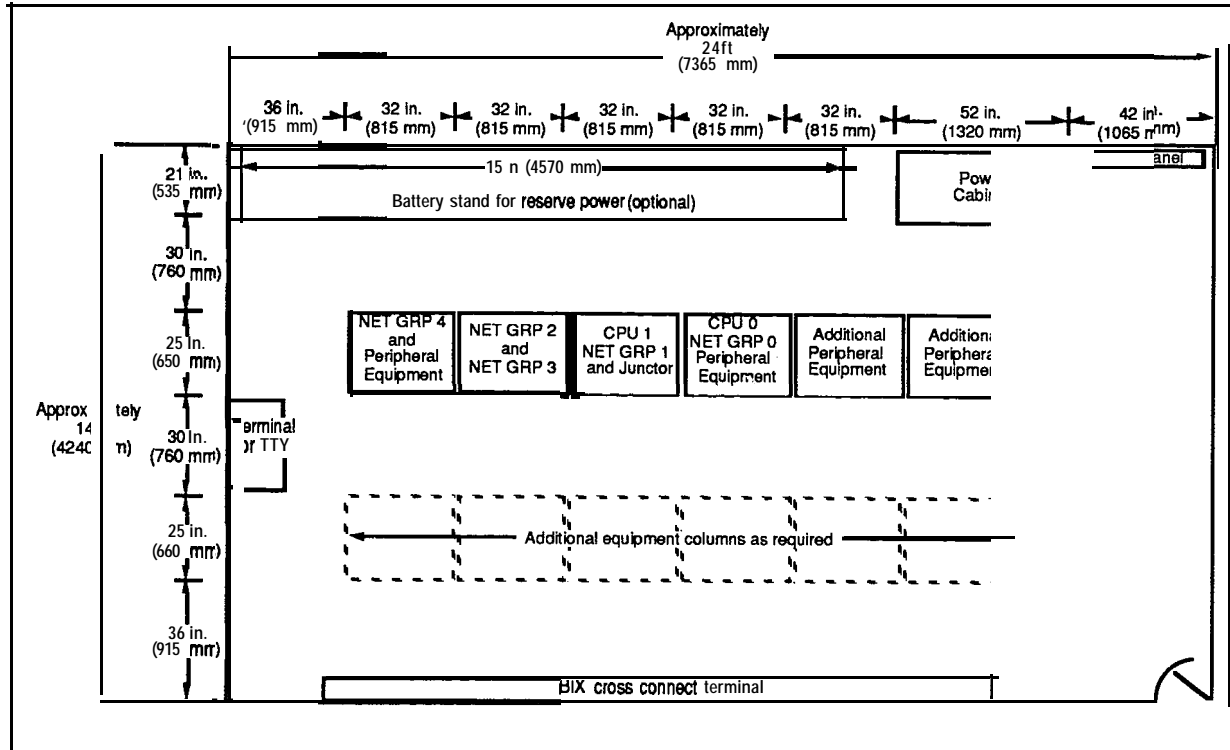


Notes to floor plans:

- 1.) These sample floor plans may vary from your own depending on your system **needs** and the size/arrangement of your equipment room.
- 2.) A template for system placement and floor drilling procedures is available. The drawing (part number **P0709207**) is delivered with the system packing instructions.
- 3.) If a conflict arises between a code included in this document and a local or national code, follow the local or national code.

System Option 71-Floor plan example

Figure 3
System Option 71 equipment room floor plan



Note:

Meridian 1 Option 71 may also expand to additional rows of Peripheral Equipment Modules.

Notes to floor plans:

- 1.) These sample floor plans may vary **from** your own depending on your system needs and the size/arrangement of your equipment room.
- 2.) A template for system placement and floor drilling procedures is available. The drawing (part number P0709207) is delivered with the system packing instructions.
- 3.) If a conflict arises between a code included in this document and a local or national code, follow the local or national code.

Chapter 11—List of terms

Access time

The time required to retrieve information from or store information in a computer's memory.

Acoustic coupler

A data set which converts electrical signals into audio signals suitable for transmission over telephone circuits. The telephone handset is placed into a cradle device that acoustically couples the transmitter and receiver in order to send or receive the modulated signal.

Address

A number designating a location in memory.

Adjacent channel

The channel closest to the channel being used for transmission, either in physical proximity or in electronic characteristics.

A-law

The **companding** law used in PCM systems in the European countries is the A-Law, which is defined as follows:

$$y = \frac{1 + \frac{1}{A} \ln x}{1 + \ln A} \quad \frac{1}{A} < x < A$$

where x is the input signal
 y is the compressed output signal
 A is a constant, set to 87.6
 \ln is the natural logarithm

Algorithm

A set of processes in a computer program used to solve a particular problem in a finite number of steps.

Analog signal

Any voltage or current waveform that varies continuously with time.

Analog -to-digital (A/D) converter

Circuitry which changes an analog signal into a digital pulse stream.

ANSI (American National Standards Institute)

The principal standards organization in the USA, formed in 1918, and run as a non-profit, non-government body supported by private industry and professional organizations. Its role is to coordinate voluntary standards activities.

ASCII Code (American Standard Code for Information Interchange)

A binary code used to exchange information between computers.

Assembly language

A programming language in which each statement corresponds to a machine language instruction. Codes are less close to everyday language than those of high level languages, therefore mnemonic devices are included.

Asynchronous

Characteristic of any operation that is independent of a master clock or timing signals.

Asynchronous transmission

Data transmission in which the characters may be transmitted at varying intervals or in blocks, and which uses start and stop elements at the beginning and end of each character, instead of synchronizing the whole message block.

Automatic Call Distribution (ACD)

A switching system which automatically distributes incoming calls to a centralized group without going through a switchboard operator. If no answering positions are available, the calls will be automatically held until one becomes free. Used in catalog ordering, airline information, and credit-card authorization centers of larger businesses.

Automatic Number Identification (ANI)

The automatic line identification of outward dialed long distance calls which permits call completion and billing without the telephone company's operator intervention.

B channel

The 64-Kbps channel of a digital subscriber link (DSL) (where there are two) or an extended DSL (where there are 23) that is circuit switched and can carry either voice or data. Usually considered to stand for "Bearer" channel.

Balancing network

Electronic circuitry used to match two-wire to four-wire toll facilities in order to maximize power transfer and minimize echo.

BASIC language (Beginner's All-purpose Symbolic instruction Code)

A simplified computer programming language based upon common English language terms.

Basic Rate Access

Two 64-Kbps B channels and one 16-Kbps D channel (2B+D) over a single digital subscriber line.

Baud

A unit of signaling speed which measures the number of signal changes per second. If each signal element or state change represents one bit, then the baud rate equals the bit rate; otherwise, the two differ.

Bell 103

A North American Bell System modem standard which provides asynchronous data transmission at speeds up to 300 bps.

Bell 113

As Bell 103, but provides either originate or answer capability only.

Bell 201

A North American Bell System modem standard which provides synchronous data transmission at 2400 bps.

Bell 202

A North American Bell System modem standard which provides asynchronous data transmission at 1800 bps. Requires four-wire line for full duplex operation.

Bell 208

A North American Bell System modem standard which provides synchronous data transmission at 4800 bps.

Bell 209

A North American Bell System modem standard which provides synchronous data transmission at 9600 bps.

Bell 212

A North American Bell System modem standard which provides full-duplex asynchronous or synchronous data transmission at 1200 bps on the dial network.

Binary

A system of numbers or codes involving only two states, typically 1 or 0.

Binary coded decimal (BCD)

A coding scheme in which four bits are used to represent numbers and six bits to represent letters and special symbols.

Binary Synchronous Communications (BSC, "BISYNC")

An IBM byte-controlled protocol using a defined set of control characters and sequences for synchronous binary coded data transmission.

Binary word

A group of bits that represent one piece of information. In PCM systems, an eight bit binary word is used to represent the magnitude of an analog signal at a particular instant in time.

Bipolar

Refers to two polarities, positive and negative. Digital information is normally transmitted in alternating bipolar pulses.

Bisync

Short for "Binary Synchronous Communications," a half-duplex, character-oriented protocol developed by IBM.

Bit

A contraction of the term "binary digit" which represents a single character in a group, either 1 or 0.

Bit interleaved

This refers to the format of the resulting higher rate bit stream in a TDM system where the higher rate bit stream is generated by taking single bits from each of the lower rate bit streams in turn.

Bit rate

The speed at which bit positions are transmitted, normally expressed in bits per second.

Bit stream

A continuous string of bit positions occurring serially in time.

Bit stream format

In some bit streams the bit positions, or groups of bit positions, have specific uses. The way in which the bit stream is subdivided is the format of the bit stream. In order to locate the position of the format within the bit stream a recurring alignment signal is required either internal or external to the bit stream.

Black box

A term used to describe a device which handles known input and produces known output, but whose mechanism is hypothetical or unknown.

Blocking

(1) A switching system condition in which no circuits are available to complete a call, and a busy signal is returned to the caller. (2) The creation of blocks from individual records in a computer memory file.

Bootstrap routine

A computer technique of inputting data before loading a program and thereby initiating the loading of the program.

Bubble memory

A high capacity RAM memory in which a bit of information is recorded as a bubble on a thin film of magnetic silicate, and read by an electronic reading head.

Buffer

A temporary storage facility used as an interface between system elements whose data rates are different.

Bus

A major electrical path used to transfer information between two or more electrical circuits.

Busy hour

The peak hour of communications traffic in a carrier facility.

Byte

The smallest number of binary digits which is acted upon as if it were a single entity. In most present-day systems, a byte is equivalent to 8 bits.

Byte interleaved

This refers to the format of the resulting higher rate bit stream in a TDM system where the higher rate bitstream is generated by taking groups of bits (ie bytes) from each of the lower rate bit streams in turn.

Cable, coaxial

A cable containing a central conductor insulated from a surrounding conductor, or several such pairs. An efficient carrier of high frequency signals, and capable of being multiplexed.

Call processing programs

Software that controls the switching network in an electronic switching system.

Carrier system

A means of producing several channels from one communications link by combining signals at the originating end, transmitting them in a wideband or high speed signal, and separating them at the receiver. --

Carrier wave

A signal of a certain frequency and amplitude which can be modulated with respect to amplitude, frequency and phase, and transmitted as a data signal.

CCITT

Comite Consultatif International Telegraphique et Telephonique. An international committee that sets telephone, telegraph, and data communications standards.

CCITT #7 signaling

The standard for signalling within telecommunications networks being developed by CCITT. It will eventually replace the CCIS6 network in the U.S. Usually referred to as SS7.

CCITT v.21

Standards for modems operating asynchronously at 200-300 bps, full-duplex, on the dial network (similar to Bell 103).

CCITT v.22

Standards for synchronous half-duplex modems operating on the dial network at 1200 bps (similar to Bell 212A).

CCITT V.23

Standards for asynchronous half-duplex modems on the dial network, and full-duplex on a leased four-wire line, operating at 600 or 1200 bps.

CCITT V.24

Recommendation for interchange circuits between data communications equipment and terminals (similar to RS-232C).

CCITT V.25

Recommendation defining a packet switching network protocol.

CCITT V.26

Standards for modems operating at **2400/1200** bps, half-duplex on the dial network, and full-duplex on a leased four-wire line (similar to Bell 201).

CCITT V.27

As V.26, but at 4800 bps on leased telephone-type circuits (similar to Bell 208).

CCITT V.28

Recommendation for the electrical characteristics for unbalanced double-current interchange circuits operating at data signaling rates below the limit of 20,000 bps (Geneva 1972).

CCITT v.29

Standards for synchronous modems operating at 96000 bps on a leased four-wire line (similar to Bell 209).

CCITT X.25

Recommendation defining a packet switching networks protocol.

CCS

A communications unit of traffic measurement equivalent to 100 call-seconds, so that there are 36 CCS in one hour.

Central Processing Unit (CPU)

The portion of a computer which controls its operation and manipulates the data being processed.

Centrex

A private exchange service permitting incoming calls to be dialed direct to extensions, without operator intervention. Usually provided from the telephone company's central office facilities.

Channel

A signal pathway in a communications system between two or more points, furnished by a wire, radio, light fibers, satellite or a combination thereof.

Channel bank

An electronic device used to digitally encode analog signals and time division multiplex the resultant digital signals and also demultiplex and decode these digital signals.

Character

An actual or coded representation of a letter, number or symbol.

Chip

A small (1-5 cm) integrated circuit of several elements with external connections to other electronic circuits.

Circuit

A complete transmission path to and from two points in a communications system.

Circuit switching

A method of communications in which individual circuits are connected to establish a continuous connection for the use of stations on the circuit until it is disconnected.

Class Of Service (COS)

The type of service in use by a subscriber of a communications system, including the type of telephone equipment, and the calling privileges or restrictions.

Clear-to-send delay

The time required for a data set to inform a terminal that it is ready to send or reply. (Also called modem turnaround.)

Clock

--

A device that generates periodic signals used for system synchronization.

Cluster

A group of terminals connected to a communications facility by a cluster controller so that they may operate together.

COBOL (Common Business Oriented Language)

A high level programming language used for business data manipulation.

Code

The representation of an alphanumeric character or symbol in machine language

Code conversion

The translation from one code to another (e.g., ASCII to Baudot), so that machines using different codes may communicate with each other.

CODEC (Coder/Decoder)

A device used to convert analog voltage samples into binary coded digital data and vice versa. A **codec** encodes analog signals into 8 bit, $\mu = 255$, PCM. It also performs the reverse function of decoding PCM signals into analog signals.

Common channel signaling

A technique in which signaling information relating to several circuits is conveyed by addressed messages over a single signaling channel.

Common Channel Interoffice Signaling (CCIS)

A method where all signaling data is sent over a dedicated connection between the processors of two switching systems. Signaling and transmission are completely segregated and handled over separate facilities.

Common control

Equipment which receives and stores subscriber-dialed information for subsequent processing.

Communications terminal

Any device which produces tones or electrical signals which can be transmitted over a communications facility.

Companding

The process of compressing quantized speech samples at low speech amplitudes at the transmitting end of a system and then expanding these levels at the receiving end, thus reducing quantizing distortion.

Companding law

Many different algorithms (i.e. companding laws) could be used to obtain companding effects. Two companding laws in widespread use in PCM systems are the "MU-Law" and the "A-Law". The MU-Law is used in North America and the A-Law is used in European countries.

Compiler

A computer program used to convert symbols meaningful to a human operator to codes meaningful to a specific computer.

Concentrator

A device used in data communications which can subdivide a channel into a larger system of data routes to permit the transfer of more data than would otherwise be possible. Low speed buffered asynchronous channels are fed into a high speed synchronous channel via a concentrator, which creates several channels of lower speed.

Conditioning

The improvement of standards of a data transmission line in order to increase the data rate and decrease the error rate.

Contention

A method of communications line control in which users compete for transmission time on a first-come, first-served basis, and must wait until a channel is free.

Continuity check

A check made of a communications link to ensure that a proper data connection exists.

Control character

A character included with a data communications signal to control and facilitate transmission. Examples are CR (carriage return), EOT (end of text), ACK (acknowledgment), STX (start of text).

Conversation mode

An on-line dialogue between a terminal and a computer in which each responds to data presented by the other on a character-by-character basis.

Conversation time

The portion of time used in a call devoted to actual data or speech transmission as opposed to that used for call connection and coordination.

Converter

A peripheral device which converts data from one medium or mode to another; e.g., paper tape to magnetic disc.

CPE-customer premise equipment

The generalized term for any equipment that resides on the end user's side of the network interface boundary.

Crosstalk

Interference on a "disturbed" circuit caused by the transfer of energy from a nearby "disturbing" circuit.

CRT-cathode ray tube

An electronic display screen similar to a television picture tube.

CSA-Canadian Standard Association

A Standards Council of Canada body which sets electric and electronic standards including those applicable to data communications.

Cursor

An illuminated marker on a visual display unit which shows the position of the next character to be generated, and which can be moved about the screen to perform text control operations.

Cycle time

The shortest period of time necessary to complete one computer instruction.

D channel

The packet-switched channel on a DSL (where it is 16 Kbps) or an EDSL (where it is 64 Kbps) that carries signaling messages and packet-switched user data. Usually considered to stand for "Delta" or Data channel.

Data

Any set of characters which can represent a meaningful message and which can be transmitted electronically.

Data base

(1) Specific information pertaining to a particular office such as subscriber directory numbers, trunk routes, etc. This information is utilized by the generic program. (2) A set of data which can be stored for computer access.

Data communications

The transmission of data over electronic communications channels, often involving two-way data exchange over long distances.

Data compression

The use of special coding devices to reduce the size of data elements in order to reduce the storage space, increase channel bandwidth, or reduce cost and time required to transmit data.

Data coupler

A device which allows a subscriber's data set to interface with the telephone network by controlling signaling functions and limiting the power applied to the line.

Data link

The hardware in a data terminal which establishes protocols and a data link with another data terminal.

DATAPAC network

A common user packet switched commercial network which links TELENET in the USA with the Trans-Canada Telephone Network in Canada.

Data set

(1) A device which interfaces a data terminal and a data communications facility, and which may modulate or demodulate the signal (see modem), and perform control functions.

(2) A collection of related data records stored in a computer.

Data station

The hardware making up a data station, including the data terminal and circuit terminating equipment.

Data terminal equipment (DTE)

Any equipment defining the beginning or end of a data link, and which usually comprises the data source and data sink.

DC signaling

Transmission of data over physical wires using **DC** pulses at speeds below 150 baud.

Decibel (db)

A unit of signal strength relative to a standard (usually 1 milliwatt). In acoustics, a measure of sound intensity: 1 db is the smallest amplitude difference the human ear can detect.

Decode

To convert received PCM code words into pulse amplitude modulated pulses which are the same as the quantized samples at the transmitting end.

Dedicated access

A direct connection between a terminal and either a service, network, or a computer.

Dedicated data channel

A communications channel assigned for a subscriber's exclusive use.

Default option

An assumption which a computer system is programmed to make unless an alternate instruction is given it by a user.

Degradation

The deterioration of the qualities of a signal or system.

Delay, absolute

The time taken for a signal to travel a certain distance in a communication system, dependent on the frequency, distance, and physical medium of transmission.

Delay distortion

Distortion of a signal produced by the unequal transmission speeds of different frequencies of that signal in a communications medium.

Delta modulation

A method of digitally encoding an analog waveform that looks at the difference in magnitude between successive analog signal samples. Only one quantizing level is available so only one bit is needed to record whether the signal went up or down. This system is simple to implement but requires a faster sampling than the Nyquist Frequency.

Demodulation

The process of retrieving an original signal from a modulated carrier wave.

Diagnostic

Relating to test programs used for error and fault detection in the functioning of hardware or software.

Digital Multiplex Switching System (DMS)

Switching systems which permit digital switched transmission circuits for voice and data. They use pulse code modulation and time division multiplexing to allow direct switching of PCM signals without modulation into an analog form.

Digital pad

A device that introduces loss in an analog signal that is digitally encoded.

Digital signal

A series of pulses or rapidly changing voltage levels that vary in discrete steps or increments.

Digital-to-analog (D/A) converter

Circuitry which changes digitally encoded data into an analog signal.

Digital transmission system

The transmission of data in digital pulses which can be regenerated along the line, as opposed to analog transmission, in which waveform signals are transmitted via amplifiers in the line.

Digitize

The conversion of a continuous analog signal to digital form.

Disk, magnetic

A high capacity circular plate of varying size with a magnetic surface divided into addressable sectors used for Random Access Memory storage. Read/write heads enter and access data on each sector, permitting rapid access to data. Disc technology is rapidly producing discs of different types (including the mini-floppy, floppy, floppy and hard), with increasing memory capacity.

Display unit

A terminal device which produces a visual display of data. Usually a CRT display, but may be liquid crystal or other electronic medium (as opposed to hard copy printouts of data).

Distortion

The undesirable change of signal characteristics during transmission due to distance effects, noise, or interference.

Down-line load

The loading of software programs into a computer from a remote device or computer using a communications channel.

Downtime

The time period during which a device or system is not functioning properly.

Drive

A device which accepts a magnetic storage medium and transfers its contents upon request to the terminal.

Drop

The external wire between a subscriber's premises and the telephone distribution cable.

DS0

The common terminology for a single, 64-Kbps voice channel.

DS1

The common terminology for a T-carrier that multiplexes 24 channels into a single, 1.544-Megabit bit stream.

DSL-digital subscriber line

The ISDN DSL combines two B channels and one D channel on a single line. Also called the basic access rate.

Dumb terminal

A keyboard and display unit with no processing capability of memory storage of its own, until connected to a computer.

Dump

The process of copying the data contents of an internal storage device into an external device.

Echo

The reflection of a signal from the terminating end back along the line, causing interference in voice signals. It can be suppressed for voice transmission, but is normally non-distorting of data signals.

EDSL-extended digital subscriber line

The ISDN EDSL combines 23 B channels and one D channel on a single line. Also called the primary access rate.

EIA (Electronic Industries Association)

a US manufacturers' group which sets electronic equipment standards.

Electronic switching system (ESS)

A digital switching system controlled by computer, able to provide custom services such as three way calling, speed dialing, and call transfer..

Emulator

Hardware and/or software which allows a system or device to operate as if it had properties which it does not have, and thus interface with devices having those properties. For example, an 8-bit microprocessor may emulate the features of a 16-bit processor, and thus be able to accept 16-bit data from a true 16-bit device.

Encode

To convert quantized samples into PCM words.

Encryption

The security coding of a message to prevent unauthorized interception during transmission.

EPROM (erasable programmable read-only memory)

ROM which can be programmed, erased, and reprogrammed.

Equalization

An electronic technique used in telecommunications to compensate for distortion present on a channel, causing uneven frequency response.

Error detection and correction

Methods used in data transmission to allow the receiver to detect errors in data received, to request retransmission, or, in some cases, to correct it at the receiving end.

Errorrate

The frequency of errors in data transmission. The rate depends on several variables, including the type of circuit, channel, or switching network the data passes through.

Exclusion

The ability of a user on some telephone systems to exclude all other users from a line or channel.

Facility

A transmission link between two or more points without-either terminating or signaling equipment. A link with such equipment would be either a channel, central office, or trunk.

Facsimile

A representation of an image transmitted over a telecommunications link. An electro-mechanical scanning device converts the image (photo, document, graph)

into an electrical signal which is transmitted over either an analog or digital facility and reconstituted by the receiving equipment as an image on paper or film.

Failure rate

The number of failures which occur during a given period of time.

Feedback

The return of part of a machine's output to its input. It is used to control the output by comparison with the input, or for re-entry into another phase of processing.

FEP-front-end processor

An FEP sits between a host computer and the terminals (or cluster controllers) to which it is connected. It performs the multiplexing function that allows many data communication lines to access a single host computer port.

Fiber optic transmission system (FOTS)

A transmission system in which light from lasers or LEDs is modulated and transmitted over very thin glass fibers and read by photodiodes in the receiver. FOTS is capable of data rates a thousand times that of copper wire, with very low interference effects.

Field effect transistor (FET)

A small, low-power, high input impedance semiconductor used to replace vacuum tubes in most applications, especially small circuitry.

File

Any organization collection of data, itemized, structured and stored for convenient access.

Filter

An electronic circuit used in telecommunications which blocks frequencies above and below a specified bandwidth ("band-pass") but lets other frequencies pass undisturbed.

Firmware

A program written into a non-erasable computer storage location (ROM) to prevent accidental loss, and to avoid the necessity of repeated loading of the program into RAM.

Floppy disk

A thin, flexible, flat circular plate used to store information--

FORTRAN (Formula Translation)

A high level computer programming language used for mathematical and scientific applications.

Frame

(1) A string of bits running across the width of paper or magnetic tape, representing one character. (2) In Videotex, a 24-line, 40 character screen **full** of data. (3) In telecommunications, an **information identification structure** used by receivers. A group of digits is framed so as to be treated as one information unit.

Framing bit

A bit which signals the beginning and/or end of a data **unit** in data communications, and allows the terminals to synchronize transmission and reception of data bits.

Framing pattern

A particular arrangement of framing bits.

Frequency division multiplexing (FDM)

The division of a channel bandwidth into several smaller bandwidths, each of which becomes a separate data channel.

Frequency modulation

The modification of a single frequency carrier wave so that changes in its frequency correspond to variations of an information signal.

Frequency shift keying (FSK)

A form of frequency modulation in which frequency values are assigned to represent a "0" and a "1", and in which the carrier wave shifts frequency between these values according to the data.

Frontend

An input device to a computer or other system which is used to enter data and control codes.

Function keys

Special keys on a computer keyboard which initiate system or control commands, rather than text input.

Gain

The increase in strength of a signal (in db) when it is amplified.

Gate

An electronic switch, basic to computers, which recognizes only two possible states, and will pass a signal into one of them ("off" or "on", "0" or "1").

Gateway

(1) Equipment which allows terminals on one communications network to access terminals or data on another network. (2) A Videotex software package which **allows Viewdata** users to access data on external networks.

Global

A term used in computer software to indicate a complete application of a routine to data available. Thus “global search” indicates that a search routine will go through all relevant data in storage.

Grade of service

A measure of the circuits available for calls in a communications service at the peak hour. Calculated in calls blocked or average delay.

Graphic display terminal (GDT)

A visual computer display capable of presenting graphic material such as charts, diagrams or line drawings.

Handshaking

Initial signaling between two data sets on a data communications link which sets up communication between them.

Hard copy

Any system information printed in some permanent form.

Hardware

The mechanical parts of a computer or business machine, including the electronic wiring and storage components, but excluding the software programs (see firmware).

HDLC (high-level data link control)

An International Standards Organization bit-oriented communications protocol which includes frame error checking sequences, start-up and shut-down procedures.

Head

A device which reads and writes data on a storage unit.

Header

The initial string of codes in some data communication systems which informs the receiver of the type of data to follow and its address.

High-level language

A computer program language whose statements are translated into more than one machine instruction. Examples include BASIC, FORTRAN, PASCAL, ALGOL, and SL-1.

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High speed

(1) Data communication rates over 9600 bps (the limit of most voice grade channels).

(2) A printer which runs fast enough to print as data becomes available to the computer.

High speed multiplex link

A transmission circuit between two multiplexers or a terminal and a multiplexer, capable of carrying several user signals which can be separated at the receiving end.

Highway

A transmission path capable of carrying multiplexed data.

Host

A large, centralized computer holding a database to which access can be supplied to users on a subscription basis.

Hybrid circuit

A complex circuit built up on film using integrated circuitry, transistors, resistors and capacitors.

Impedance

The opposition of a circuit to the flow of electricity. The sum of resistance and reactance (a resistance effect caused by inductance).

Impulse noise

Short-lived, high-amplitude interference bursts on a communications channel caused by lightning, sparking machinery or switch contacts.

Information

Data which has been processed according to accepted conventions so that it is meaningful to a user.

Information bit

A bit which carries text information, generated by the data source, and not used for transmission control purposes.

In-house system

A data communications network operated by one organization for its own needs, usually on its own premises, and without the use of common carrier facilities.

Instruction

A written statement, or the equivalent computer-acceptable code, that tells the computer to execute a specified single operation.

Integrated circuit

A functional circuit whose components and interconnecting "leads" are formed on a single chip of semiconductor material.

Integrated Services Digital Network (ISDN)

A network, generally evolving from the existing telephony digital network, that provides end-to-end digital connectivity to support a wide range of voice and non-voice services to which users have access via a set of standard multipurpose user to network interfaces.

Intelligent terminal

A terminal containing internal storage and a CPU, capable of performing operations on data without connection to an external computer.

Interactive

A system in which input elicits a response from a computer in real time, and in which the computer may ask for further input from the user.

Interface

The connection between two systems. Usually, the hardware and software connecting a computer terminal with peripherals such as data sets, printers, etc..

Interference

Loss of clarity of a communications signal caused by unwanted noise signals.

Interrupt

The pause of a computer operation initiated either by commands in the program it is using, or by conditions which arise in the hardware ("priority interrupt"). Some specified operation must be performed during the interrupt before the original operation may be resumed.

I/O buffer (Input/output)

A short-term storage for computer input and output.

I/O device (Input/output)

An interface between a computer or switching system and the outside world.

I-series recommendations

CCITT recommendations on standards for ISDN services, ISDN networks, **user-**network interfaces, and internetwork and maintenance principles.

ISO (International Standards Organization)

A body concerned with international computer and communications standards.

Jitter

The phase shift effect on a digital signal caused by transmission facility delays

Key system (telephone)

A multi-key telephone system on subscriber premises permitting several users to place calls on several lines.

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LAN-local area network

A high-volume data transmission facility interconnecting a number of data devices, generally within a building or campus.

Language

The set of symbols, rules and conventions used to convey information, either at the human level or the computer level.

Large scale integration (LSI)

Large functional circuits made up of hundreds of gate circuits which form a complete system or instrument. Examples are memories, computers and certain instruments.

Laser communications

The use of a coherent, single-frequency, high-energy beam of light which can be modulated to transmit information.

LCD (Liquid Crystal Display)

A form of visual data display using liquid crystals which can be electronically changed from a transparent to an opaque state.

Leased line

An **unswitched** telecommunications channel linking two or more points inside the same exchange, leased to subscribers for their exclusive use.

LED (Light Emitting Diode)

An electrical switching device which emits light when current is applied, and is used for some visual displays.

Level

(1) The amplitude of a signal. (2) The number of bits required by a code to represent one character. (3) The number of discrete signal elements in a modulation system. (4) A procedure set in a communications protocol which enables higher-level signaling.

Limited Distance Data Set (LDDS)

A data set used for transmission over short distances (30 miles).

Line

A communications **link**, channel, circuit, trunk or facility. Usually refers to a telephone link between the local switching equipment and the network.

Line speed

The rate at which data signals may be passed over a particular channel, measured in baud or bits per second.

Link

(1) A circuit or path joining two communications channels in a network. (2) A line connector in a common control telephone switching system. --

Loading, cable

The addition of inductance through load coils along a cable to reduce amplitude distortion and improve frequency response. The loading restores capacitance balance to cable conductors, but is not used for high speed data channels.

Logic circuit

An electronic element which takes a series of inputs and produces outputs according to the specific function the element is designed to perform.

Loopback test

A circuit fault-testing procedure in which a signal is sent from a point on the line to a data set and back to the test point.

Low speed

Data communications below **2400** bps.

LSI (Large Scale Integration)

An LSI circuit is a complex electronic circuit (thousands of transistors) reproduced on a silicon chip.

Machine language

Coded information consisting of binary digits that can be accepted and utilized by the computer.

Main distributing frame

The cable rack used to terminate all distribution and trunk cables in a central office or PBX.

Mainframe

A large computer with peripherals, software and database maintained by large corporations for internal use and subscriber access.

Matrix

An orderly array of elements used to switch calls from one part of the system to another.

Matrix printer

An impact printer for hard copy output which uses an array of steel pins to create the shape of a character in dots.

Mean Time Between Failures (MTBF)

The average trouble-free working period for a system or device, calculated statistically over time.

Mean Time to Repair (MTTR)

The average time elapsed between the discovery of a fault and its correction.

Medium Scale Integration (MSI)

Functional circuitry consisting of 12 or more gates which form a complete functional operating unit such as a decoder, counter or multiplexer.

Medium speed

Data communications generally between the rates of 2400 and 9600 bps on a voice grade channel.

Memory

An organized collection of storage elements into which units of information consisting of binary digits can be stored and from which this information can be later retrieved.

Message

A communication prepared for telecommunications consisting of control signals, header, start and end of text indicators, and text.

Message switching

A method of "Store-and-Forward" switching in telecommunications. A message is received somewhere in the network, stored, and retransmitted down the line when a suitable channel is free.

Metal Oxide Semiconductor (MOS)

A type of small, field-effect transistor.

Micro

A Greek prefix used to mean "very small", as in microcomputer, or "one-millionth of a unit" as in microsecond.

Microcomputer

An electronic device consisting of a microprocessor, program memory, data memory, and input-output circuitry capable of accepting, storing and arithmetically manipulating data.

Microprocessor

An electronic circuit contained on a single chip of silicon which performs the arithmetic logic and control operations of a digital microcomputer.

Microwave

A high-capacity, low interference transmission network using high-frequency radio bandwidths transmitted via relay towers.

Minicomputer

An intermediate-sized computer usually capable of multi-terminal networking.

Mnemonic

An abbreviation or arrangement of symbols which stands for a particular instruction or process.

Mnemonic coding

Any coding system using parts of the vernacular spoken language to aid understanding and recall of its codes. E.g., ED for edit, EXT for end of text, DV for divide, etc.

Modem

A **MOdulator-DEModulator**: a data set which can convert analog signals to digital or vice-versa.

Modem pooling

The pooling of modems so that there need not be a one-to-one correspondence with “casual” terminal users, thereby reducing data service costs.

Modulation

The process by which some characteristic of a high frequency carrier signal, such as frequency, phase or amplitude, is varied by a low frequency information signal.

Multidrop line

A single communications link connecting several terminals, and which supports polling and selecting operations.

Multiplexer

A device which enables the passage of several signals along one path, either through time or frequency division of the signals.

Narrowband

A communications bandwidth less than that of a voice grade circuit (normally less than 300 Hz) used for communication at 300 bps or less.

Network Channel Terminating Equipment (NCTE)

Generic name for equipment that provides line transmission termination from a network to the customer’s premises.

Network

A set of communications points interconnected by communications channels.

Network termination 1 (NT1)

The **CCITT** name for **ISDN NCTE**. Provides the functions of line transmission termination and layer- 1 maintenance and multiplexing, terminating a two-wire U interface.

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Network termination 1, 2 (NT12)

A single piece of equipment that provides the combined functions of NT1 and NT2.

Network termination 2 (NT2)

Terminates the four-wire T interface. Examples are a PBX, LAN, and terminal controller.

Node

A convergent point in a communications network where lines from many sources meet, and may be switched. In Datapac, a node is a packet switch location.

Non-volatile memory

A storage element whose contents are not destroyed if power is lost.

Nyquist frequency

In order to adequately reproduce an analog waveform a sampling frequency of at least twice the maximum analog waveform frequency must be used. The minimum acceptable sampling frequency (ie. twice highest waveform frequency) is termed the Nyquist Frequency.

Off-line

Referring to circuitry or devices not under direct control of the operating systems.

On-line

Referring to circuitry or devices in direct connection to, or under direct control of, the operating system.

Open Systems Interconnection reference model (OSI)

Established by the International Standards Organization (ISO), the model describes seven functional layers that define how interconnected telecommunications systems should interface. The seven layers are: 1) physical, 2) data link, 3) network, 4) transport, 5) session, 6) presentation, and 7) application.

Operating system (OS)

Computer software which permits the control and use of all particular programs fed into the computer, coordinates storage and recall functions, and supervises remote terminal interaction.

Overload level

The highest amplitude of an analog signal for which a PCM code word exists.

Packet

A data block with its own address and control signals transmitted as a unit through a telecommunications system.

Packet Assembler/Disassembler (PAD)

Devices which provide packet assembly and disassembly capability to non-packet-mode terminals.

Packet switched data transmission service

A service which transmits data in packets, including packet assembly and disassembly, if required.

Packet switching

The routing of message packets through a network as channels are available. Each channel is busy for the duration of only one packet, then becomes free for another packet. Packets of one message take different routes, determined by the network itself, and are rejoined and resequenced at the destination.

Packet terminal

A terminal which can communicate with a packet network, such as X.25.

Parallel transmission

The simultaneous transmission of bits of one data character using several links, or multiplexed channels in one link.

Parity bit

A binary digit 1 added to an information word to make the total number of 1 bits either always odd or always even. This permits checking the accuracy of information transfers.

Password

A set of characters which must be input to a system before the security program will allow access to data and operations.

PCM word

An 8-bit code group representing a specific quantized level.

Port

An access to a switching system.

Port concentration

A device which permits several terminals to share a single port.

Primary Rate Access

Twenty-three 64-Kbps B channels and one 64-Kbps D channel (23B+D) over an extended digital subscriber line.

Program

Step-by-step instructions that tell a computer what operations to perform.

Program memory

The data storage area of a computer which contains the instructions that tell the computer what operations to perform. --

PROM (Programmable Read-Only Memory)

A permanent data storage system which holds information which can be repeatedly read but altered only through a programming operation.

Protocol converter

A device which can convert one communications protocol into another.

Public data network

A data transmission network operated by a private telecommunications administration specifically for public subscription and use.

Pulse

A very short-lived electric current. Usually; a DC signal burst used for digital data transmission.

Pulse Amplitude Modulation (PAM)

A time division modulation technique in which signal intelligence is represented by a pulse whose amplitude represents the amplitude of the modulating wave at a specific instant of time.

Pulse code modulation

The most common technique used to digitize analog voice signals. Individually sampled segments of a voice signal are coded into eight-bit digital words for transmission.

Pulse modulation

The modulation of the amplitude (PAM), duration (**PDM**) or position (**PPM**) of pulses to create a digital data signal. Pulse Code Modulation (PCM) samples analog signals at short intervals and converts this information into a digitized information signal.

Quantizing

The process of dividing a sampled analog signal into discrete levels. In a PCM system, a finite number of bits are available for encoding each PAM sample. This establishes the number of different magnitudes, or levels, that can be encoded. For example, 8 bit PCM has 256 possible codes, each code representing a specific signal level. Each PAM sample is assigned the encoded value of the nearest level to it. This "rounding off" to the nearest level is termed quantizing.

RAM (Random Access Memory)

A volatile storage system in which any storage location can be read from or written to, independent of the last storage location accessed.

ROM (Read Only Memory)

A permanent storage system manufactured with predetermined data content, to be read but not altered during computer operation.

Real time

The actual time in which a process or event takes place. In computer processing, the running of an input/process/output cycle during the time in which an external event is occurring, and in time to influence that event.

Repeater

A bi-directional digital signal regenerator.

Request to Send (RTS)

RS-232C defined signal to a modem indicating that the attached DTE would like to send.

RF channel

A radio frequency channel nominally 36, 54, and 72 MHz bandwidth through a satellite.

Routing

The path selection made for a given telecommunications signal through the network to its destination.

RS232, 232C

Technical specifications established by the Electronic Industries Association (EIA) that define electrical and mechanical interfaces between terminals, modems, computers and communications lines.

Sampling

The taking of measurements or specimens from representative elements of a body under investigation in order to project truths about the body as a whole from this data.

SDLC (Synchronous Data Link Control)

An IBM communications protocol using synchronous data transfer techniques.

Semiconductor

An electronic device made of silicon or germanium which will pass a high voltage, but block a low one. Examples are transistors, diodes and integrated circuits.

Serial transmission

A transmission method in which data bits are sent sequentially along the same channel (see parallel transmission).

SF (Single Frequency signaling)

The use of single tone frequencies for control functions on a circuit, e.g., "disconnect" on Direct Distance Dialing.

Signal (analog)

An electrical signal which has continuous waveform, the amplitude, frequency or phase of which can be modified to represent data.

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Signal (digital)

A discontinuous sequence of pulses representing combinations of binary digits.

Simulation

The fabrication of a mathematical or physical model of a process or event for the purpose of testing, training or experimentation.

Software

The instructions, programs and procedures which direct the operation of a computer system.

Solid state device

An electronic device which does not use vacuum tubes but which duplicates their function.

Space matrix

An array of crosspoints separated in space. In many modem switching systems every inlet has access to every outlet by means of separate paths-.

Span lines

Digital transmission media between central offices and between host and remote units.

Start/stop

A data transmission system in which each character is preceded by a start bit and followed by a stop bit which set and reset the receiver for data reception. Also known as synchronizing bits.

Store and forward

A message handling routine used in a message switching system.

Stored program control

A network switching system using programs stored in memory which are used during the switching operations, and which can be changed as the need arises.

Stored program computer

A computer controlled by an internally stored set of instructions.

Subroutine

A small, self-contained part of a computer program which can be called into operation when required, with control returned to the main program after its use.

Switching

The temporary, controllable connection of two or more points in a communications network.

Synchronous

Any operation where a series of events takes place under the-control of a clocking device; the same operations taking place in different systems, or different parts of the same system, at exactly the same time.

Synchronous data network

A data network in which **all** components are synchronized by a single timing control.

Synchronous transmission

A transmission system in which bits are sequenced according to fixed time intervals, and which may not have start and stop bits framing each character.

System Network Architecture (SNA)

An IBM communications system design which includes structure, formats, protocols and operating sequences.

T interface

The four-wire, physical interface between an NT1 and either an NT2 or ISDN terminal. This interface can only be about one kilometer long. .

T1

A digital transmission standard that in North America carries traffic at the DS 1 rate of 1.544 Mbps.

Tandem switching

An intermediate switching office which handles traffic between two switching offices in the same exchange.

Telecommunications

A general term for the transmission and reception of intelligent signals via physical, electronic, optical or other means.

Telegraphy

A communications facility for telegraph key generated signals.

Telemetry

The transmission of measurement readings over distance, usually by electronic means.

Telephony

A communication facility for the transmission of voice and data over voice-grade circuits.

Teletypewriter

A typewriter-like device connected to a telegraphic circuit for the transmission and reception of alphanumeric data.

Teleprocessing

Data processing carried out by computers using data communications facilities.

Terminal

A point of data entry or exit in a communications network, or the device which performs entry and exit functions.

Terminal Adaptors (TA)

ISDN TAs provide protocol conversion from standard non-ISDN interfaces (e.g. X.25, RS232) to ISDN interfaces.

Terminal Equipment type 1 (TE1)

Refers to devices that support the standard ISDN interface. Examples are digital telephones, IVD terminals, and other digital equipment.

Terminal Equipment type 2 (TE2)

Encompasses the existing non-ISDN equipment that requires a Terminal Adaptor (TA) to connect to an ISDN interface. Examples are RS-232, RS-422, and V.35.

Text messaging

The use of a computer-based network of terminals to store and transmit alphanumeric messages among users. An electronic mail service.

Throughput

The amount of data input, processed, and output in a given period by a machine or system.

Tie line, Tie trunk

A private communications link leased from a common carrier connecting two or more private branch exchanges.

Time Compression Multiplexing (TCM)

A digital transmission technique that permits full-duplex data transmission by sending compressed bursts of data in a "ping pong" fashion.

Time Division Multiplexing (TDM)

The merging of several bit streams into a composite signal for transmission over a single communication channel.

Time matrix

A series of memory devices used to rearrange the order of channels in a time division multiplexed bit stream, thus switching the channels in time.

Time-sharing

Shared access to a central computer by several users, all of whom use it over a given real-time period, but who do not notice each others' presence due to the high processing speed of the computer.

Time slot

A group of one or more bit positions which recurs at a constant interval and can be uniquely identified.

Time slot interchange

The functional element of a digital system which performs the switching of digital voice data. Provides the path by which information is passed between the calling line and the called line.

Tracking

A measure of how accurately a reconstructed analog waveform compares to the original analog signal that was digitally encoded.

Transceiver

A device which has both transmit and receive modes.

Transmission system

Physical transmission medium used to transfer data from one point to another.

Transparent

A transmission procedure in which control signals pass unseen by the transmission facility so that no control actions are taken.

Trunk

A communications channel between two switching centers, provided with signaling and terminating equipment.

MU-law

The **companding** law used in PCM systems in North America is the MU-Law which is defined as follows:

$$y = \frac{\ln(1 + ux)}{\ln(1 + u)} \quad -1 < x < +1$$

where x is the input signal
 y is the compressed output signal
 u is a constant (set to 255 in North America)
 \ln is the natural logarithm

U interface

The two-wire, physical interface between the network (i.e., switch) and an **NT1**.

Unipolar

Refers to one polarity. In digital systems, unipolar pulses are generated and used **within** the equipment, but are seldom transmitted over cables-or other transmission media.

User profile

The set of needs and specifications provided by a subscriber which define the type of service which will be supplied by the facility.

Value-added telecommunications service

A service which uses a common carrier's network, but which offers its own services based on computer's software and hardware, e.g., message forwarding, data pooling, etc.

Virtual circuit

A link between two **DTEs** in a network permitting message exchange according to protocol, but which uses network bandwidth only during actual data exchange.

Voice messaging

An electronic system which uses a telephone, computer, or other devices to 'send, store and access voice messages between senders and recipients.

Volatile memory

A storage element whose contents are destroyed when power is removed.

Watchdog timer

A programmed timing circuit which can be set to interrupt a program **after** a set number of seconds as a safeguard against an endless loop caused by a programming error, or unanticipated problems due to hardware breakdown.

Wideband

A channel bandwidth greater than voice grade, capable of data transmission at rates of 50,000 bps.

x.25

A standard for packet switching communications established by **CCITT**.

x.75

The standard for internetwork gateways between data networks.

Meridian 1 Engineering Handbook

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Meridian 1
Communication Systems

Autoquote Bulletin

April 24, 1990

Dear Autoquote **User,**

Your update to the following Autoquote User guide chapters is enclosed.

Overview
Meridian 1 SL-1
Meridian Mail
ACD-MAX
Meridian MS-1
Meridian Message Center

You may use the updated chapters with your existing **Autoquote** User Guide binder and tabs.

Note that the Meridian 1 SL-1 chapter does not cover the T-series models (ST,RT,NT,XT). If you still plan to quote these models, please retain the old Meridian SL-1 Autoquote User Guide chapter. All other chapters may be discarded.

Due to proposed product changes, the Lanstar and Banyan chapters have not yet been updated. These chapters will be updated and distributed in the near future.

The Autoquote User Guide distribution list will be audited before the next update. To remain on the distribution list, please complete and **mail** the Distribution List Update Form on the next page. If this *form* is not received by June 4, 1990, your name will be removed **from the list.**

nt northern
telecom

Meridian 1

Communication Systems

AUTOQUOTE USER GUIDE

OVERVIEW



INTRODUCTION AND OVERVIEW
 AUTOQUOTE USER GUIDE CHAPTER

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1. ORGANIZATION OF USER GUIDE

This user guide is organized with one chapter dedicated to each product supported by the Autoquote System. In addition, this is an introductory chapter pertaining to all products and the Autoquote System as a whole. The information provided in each product chapter assumes this chapter has been read and understood.

2. PRODUCT CHAPTERS

As each user does not necessarily quote all products supported by the Autoquote **system**, only the chapters applicable to **each** user may be included in his user guide.

The following product chapters may be included in an Autoquote User Guide:

- Meridian 1 SL-1
- Meridian Mail
- ACD-MAX
- Meridian MS-1
- Meridian Message Center

2.1 PRODUCT CHAPTER FORMAT

Each of the product chapters is organized **similarly** to simplify using this manual for various products. Each product chapter consists of the following sections:

- Introduction**
- Inputs**
- Engineering/Provisioning**
- Reports**

Some chapters may include other sections as well, such as installation parameters or special applications.

This consistent format will allow an Autoquote user--familiar with one product chapter to use other product chapters with little difficulty.

2.2 NUMBERING SCHEME

The sections and subsections within each chapter **of** the User Guide are numbered hierarchically. This numbering scheme allows for quick reference to specific topics and **also aids** in highlighting the organization of each chapter. For example, section 2.1.2 indicates section 2, subsection 1, part 2.

3. AUTOQUOTE OVERVIEW

The Northern Telecom MBS Autoquote System is an on-line, computerized sales tool used in preparing quotations for new **systems as** well as some peripheral devices that may be added to existing systems. The Autoquote programs produce pricing and engineering reports that support sales.

The price quoted by the Autoquote System applies **only** to the items listed in the quote. The features and functions available on a system configuration are based solely on the inputs. The actual system price depends on particular applications and finalized system engineering . which may require manual adjustments to the quote.

The general process for using the Autoquote System is as follows:

- 1) Define the requirements of the quote
- 2) Complete associated Autoquote input Sheets
- 3) Access the Autoquote **System** by dialing in to the host computer
- 4) Input the requirements of the quote
- 5) Run and analyze pricing and engineering reports
- 6) If necessary, re-define requirements and repeat the process

3.1 QUOTING PROCESS

The quotation process is divided into three parts: inputs, processing and output (reports).

3.1.1 Inputs

Inputs comprise the interactive part of the program. All desired options must be specified via associated inputs. In **some cases**, inputs will default to predetermined values if no entry is made. **Inputs** define the configuration.

3.1.2 Processing

The processing of the input data begins when Reports are requested. This phase of Autoquote **may** last from **as** little as 30 seconds to as much as **5** minutes, depending on thg system size and the activity on the

computer. The processing performs engineering and provisioning calculations to generate a configuration and pricing.

3.1.3 Reports

Reports represent the output of the Autoquote process. The general categories of reports are pricing, equipment **list** and engineering.

3.2 SECURITY

The Autoquote System is one of Northern Telecom's primary sources of pricing and configuration information. As such, use of the system is restricted. Access to the Autoquote System is controlled with various **ID's** and passwords which should be-handled conscientiously.

Two levels of passwords are used to restrict access to the Autoquote system. The first level allows access to the computer and is changed approximately every two months. This password is called "**User Password.**" The second level allows access to the Autoquote programs within your specific user file. User files are called "**Location Codes.**" If the file is not segmented by user ID's, a "**Location Authorization Code**" is the second level password; this password is changed approximately every three months. If user ID's are utilized for a Location Code, the second level password is called "**User Code Password.**" User ID's and associated passwords are maintained by the administrator or controller of the Location Code; changes typically occur infrequently.

Since this document provides detailed information on how to access and use the Autoquote System, it must be handled with the same attention to security that is accorded Northern Telecom Pricing Manuals.

3.3 SYSTEM ACCESS PROCEDURES

Accessing the Northern Telecom MBS Autoquote System requires two separate levels of access procedures. The first level is accessing the computer itself. The second level is accessing the Meridian Autoquote programs within the computer.

3.3.1 ACCESSING THE COMPUTER

Access to the computer is accomplished by dialing into the computer with the use of a modem. Various "dumb" terminals, ~~teletypewriters~~ and personal computers can be used to access the **system**. Most **users** will be dialing in to the computer through the Telenet network. However, if the user is in the Dallas area or if there are Telenet problems, he will dial in directly. Once connected to the computer, you will be required to enter an account sign-on and user password. These will be provided by your Sales Channel Point-of-Contact.

3.3.1.1 Telenet

The following procedure is required to access the host computer through Telenet:

- 1) Determine your local Telenet dial-in number. These numbers are contained in Appendix 1.1 at the end of this chapter. Note that there are different numbers for different baud rates.
- 2) Dial the Telenet number with your modem and wait for an audible or visual connect response. At this response, enter two carriage returns. (For 2400 baud, enter one "@" then a carriage return.)
- 3) After the carriage returns, you will see the following prompt:

```
TELENET  
214 8Q  
TERMINAL = ____
```

Enter **D1** and press **<ENTER>**.

- 4) After responding to step 3, you will see the following symbol:

```
@
```

Enter "C 214156" and a carriage return after this "@" prompt. This designates the host address on Telenet.

- 5) You will now see "214156 CONNECTED" indicating you are connected to the host computer. Enter another carriage return and the host will send a ":" prompt.
- 6) To access the computer, enter "HELLO XXXXXXXX,YYYY.NTII" at the ":" prompt, where "XXXXXXX" is your Location Code and "YYYY" is your account sign-on. For example: **HELLO MBS,DIRECT.NTII.**
- 7) The computer will now prompt the following: ENTER USER () PASSWORD:
Enter the User Password supplied by your Sales Channel **Point-of-Contact**. The "()" will include your sales channel I.D.
- 8) After the password has been successfully entered, the computer will display a system menu from which the SL-1 Autoquote System can be accessed.

--

3.3.1.2 Direct Access

Accessing the Computer directly requires fewer steps:

- 1) Dial (214) 301-7764 with your modem and wait for an audible or visual connect response. Wait approximately five (5) seconds, then enter a carriage return. You will then receive a ":" prompt from the host computer. You are now at the same point as Step 5 described in paragraph 0 above.

2) Perform steps 6 through 8 in paragraph 0 above to complete the logon procedure.

3.3.2 AUTOQVOTE MENUS

Once the Autoquote system has been accessed the following "primary" menu will be presented allowing the user to-choose between the SL-1 and **SL-100** Autoquote systems or to EXIT and logoff the system.:

N O R T H E R N T E L E C O M

 M E ' R I D I A N 1
 Communication Systems

Welcome to the Autoquote system. Select one of the following:

 1 for SL-1 Autoquote

 1 0 0 for SL-100 **Autoquote/PMI**

 E to Exit

(This system is designed for the exclusive use of **NTI** and its authorized distributors and is not for Public Disclosure.)

Selection:-

The primary menu allows the user to select either the SL-1 Autoquote, SL-100 Autoquote **or** Exit by entering 1,100 or E respectively. As this user guide only addresses the SL-1 Autoquote System, enter a "1" at this selection to continue or an "E" to Exit.

Once a the SL-1 Autoquote **System has** been selected, the user will see the **INFORMA** message file. PLEASE PAY SPECIAL ATTENTION TO THESE MESSAGES **AS THEY** CONVEY IMPORTANT **INFORMATION** TO AUTOQUOTE USERS. Once these INFORM messages have been read, press **<RETURN>** to continue.

After the initial INFORM messages have been read and the **<RETURN>** key pressed, the following secondary menu will appear:

N O R T H E R N T E L E C O M

M E R I D I A N 1
Communication Systems

Welcome to SL-1 Autoquote! Select one of the following:

- AQ** - Autoquote Main Menu
- INFORMA** - Display message file A
- INFORMB** - Display message file B
- INFORMC** - Display message file C
- INFORMF** - Display message file F
- E** - Exit SL-1 Autoquote

(This system is designed for the exclusive use of **NTI** and its authorized distributors and is not for Public Disclosure.)

Selection:-

This menu allows the user to select **"AQ"** to enter the Autoquote application, **"E"** to exit to the primary menu or **"INFORM-"** to view one of the indicated **INFORM** messages.

3.3.3 INFORM FILES

After the user selects the SL-1 Autoquote System the **INFORMA** message file will be displayed. The **INFORMA** message file displays special access and alert messages, and brief information regarding the contents of other **INFORM** message files. Typically, these messages will indicate new product releases available in Autoquote, changes in the quoting of existing products or changes to the system itself. **INFORMF** typically has the most current on-line input form. The **INFORM** message files will be dated to indicate when these files were last updated.

3.3.4 ACCESSING THE AUTOQUOTE APPLICATION

After selecting Autoquote from the secondary menu you **will now** see the following prompt:

NORTHERN TELECOM AUTOQUOTE SYSTEM:

ENTER LOCATION CODE
sssssssss

Enter the Location Code supplied by your **Sales** Channel Point-of-Contact and wait for the next prompt. If the Location Code file is not divided into User Code ID's, skip the next two steps. If the file is using User Code segmentation, the next prompt is:

ENTER USER CODE **ID--**
sssssssss

Enter the User Code ID supplied by the administrator or controller of the Location Code, usually your Sales Channel Point-of-Contact, and wait for the next prompt:

ENTER PASSWORD FOR THIS USER **CODE--**
sssssssss

Enter the User Code Password supplied with the User Code.

If the Location Code File is not divided into User Codes, the prompt after ENTER LOCATION CODE is:

ENTER LOCATION AUTHORIZATION CODE--
sssssssss

Enter the location authorization code supplied by your Sales Channel Point-of-Contact.

The next prompt is only applicable to certain Location Codes. This input indicates the amount of information to be included on certain reports.

ENTER REPORT LEVEL ACCESS--

If your access level and the associated passwords are known, enter the proper indicator here, otherwise enter "1" to this prompt. Other entries will require the user to **enter** the "**Report Level Access Password.**"

After successfully entering the previous codes, the following messages are displayed:

END OF PROGRAM

PLEASE ENTER REQUIRED SELECTION OR CARRIAGE RETURN FOR SERVICE MENU

You are now ready to begin the quoting process. Upon entering a carriage return, **you will see** the service menu.

3.4 THE SERVICE MENU

All activities available in the Autoquote System begin at the Service Menu. The following message will appear when you are at the Service Menu:

PLEASE ENTER REQUIRED SELECTION OR **CARRIAGE RETURN** FOR SERVICE MENU

It is recommended that novice users always view the Service Menu when first entering the Autoquote System. To view the menu, enter RETURN.

CODES: N- **SET** UP NEW QUOTE
 0- LOAD OLD QUOTE
 G- GENERAL INFORMATION
 M- MODEL/SOFTWARE GENERIC
 I- INPUT
 S- SAVE QUOTE
 X- AUX LOAD
 R- REPORT
 L- LIST EXISTING QUOTES
 C- COPY OLD QUOTE
 D- DELETE QUOTE
 Q- QUIT AUTOQUOTE

A quote must be loaded into your working file (option N or 0) before the functions G,M,I,S,X, and R can be used. The general procedure for setting up a new quote requires using the options to:

- 1) **Set up a new quote**
- 2) **Save the quote**
- 3) **Run reports**

These major options are explained in the following paragraphs along with the other available options shown in the service menu.

3.4.1 N - SET UP NEW QUOTE

Enter "**N**" to set up a new quote. The user is prompted for a set of General Information (G) and Model/Software Generic (**M**) entries. Upon completion of these entries, the user is automatically put into the input phase without having to go back to the Service Menu. --

General Information/Model Code

All entries regarding General Information and Model Code are prompted when setting up a new quote. The prompts and appropriate responses are listed below.

ENTER SALESMAN NAME

Enter the name **of** the user and/or salesperson.

ENTER RUN TYPE: **1=ACTUAL** QUOTE, **2=CONFIRMATION** QUOTE, **3=TEST** QUOTE

Run types do not affect the result of an Autoquote but are used in the analysis of Autoquote usage. A valid entry is required.

ENTER CITY CODE FOR LABOR RATE

This input applies only to the Direct Sales channel. Enter a carriage return for a listing of valid city codes, then enter the appropriate code. A valid entry is required; the entry will be validated by Autoquote.

ENTER END-USER INDUSTRY CODE

Enter a carriage return for a listing of the industry codes, then enter the appropriate code. A valid entry is required; the entry will be validated by Autoquote.

ENTER END-USER COMPANY NAME

Enter the customer's company name.

ENTER END-USER LOCATION

Enter the company's business location.

ENTER SYSTEM CUTOVER DATE (MMDDYY)

The cutover date must be equal to or greater than the current date. Format is month, day and year (MMDDYY). A valid entry is required.

ENTER MODEL GENERIC CODE

ENTER **RELEASE** NUMBER

These prompts determine the product and system type to be quoted. Refer to Section 1 of the various product chapters for valid responses to this prompt.

3.4.1.1 Inputs Phase

After responding to the previous prompts, the **user** is now ready to input his data for each input class. For example, the input classes for Meridian 1 SL-1 are:

Software Options
Phones, Lines and Trunks
Miscellaneous/Memory
Basic Information

The program will prompt for each class in the order listed above. (Refer to the Inputs section of the various product chapters for information on the input classes.) In each class, there will be a prompt phase (questions asked by Autoquote) followed by the statement:

END OF PROMPTS

BEGIN MANUAL INPUT

The user simply answers the prompted questions (if any), and then manually inputs any other requirements. Prompted entries may be changed during the manual input phase. Refer to paragraph 3.4.5.1 Input Formats, page 12 for detailed information of inputting data.

After all input entries have been completed, the Service Menu is presented. At this point, the user may change General Information, Model and/or Inputs by entering G, M and/or I respectively. Refer to the explanations of these Service Menu selections in paragraphs: 3.4.3, 3.4.4, and 3.4.5.

IMPORTANT: It is recommended the quote be saved after initial input or after any changes have been made. Otherwise, the data could be lost if a communication line were to go down or the user began another quote without saving the current one.

3.4.2 0 - LOAD OLD QUOTE

When the "0" is selected from the Service Menu, the system will respond with the following:

PLEASE ENTER OLD QUOTE NUMBER

Enter the old quote number. The existing quote numbers may be displayed using the "L" command as described in paragraph para-num:List .

DO YOU WANT A PRINT OF THE SAVED DATA? (Y/N)

Enter "Y" if you want to view the inputs for this quote as the quote is loading. The inputs are printed out in their "raw" format. This feature allows the inputs to be viewed without running a quote (i.e. entering the Report function - paragraph 3.4.8).

PLEASE ENTER REQUIRED SELECTION OR CARRIAGE RETURN FOR SERVICE MENU

Now that the quote has been loaded into the working file, the user can select another option from the Service Menu such as R for reports or G to change the General Information.

3.4.3 G - GENERAL INFORMATION

This function allows the user to make changes to the General Information entered when the quote was first created. Upon entering "G" at the Service Menu, the user will be prompted for the following:

```
ENTER SALESMAN NAME
ENTER RUN TYPE: 1=ACTUAL QUOTE, 2=CONFIRMATIONQUOTE, 3=TEST QUOTE
ENTER CITY CODE FOR LABOR RATE (Direct Sales channel only)
ENTER END-USER INDUSTRY CODE
ENTER END-USER COMPANY NAME
ENTER END-USER LOCATION
ENTER SYSTEM CUTOVER DATE (MMDDYY)
```

An explanation of these prompts is given in Section 3.4.1, N-New, page 8.

3.4.4 M - MODEL/SOFTWARE GENERIC

This function allows the user to change the Model/Software Generic of an existing quote. For example, if quote number 10 is an Option 21, it could be changed to a Option 51 without having to re-input the requirements. Please refer to Introduction section of the various product chapters for the valid Model/Generic codes. Upon entering "M" at the Service Menu, the user will be prompted for the following:

```
ENTER MODEL GENERIC CODE
ENTER RELEASE NUMBER
```

An explanation of these prompts is given in Section 3.4.1, N-New, page 8.

3.4.5 I - INPUT

The "I" is entered at the Service menu when the user wishes to change the inputs which were specified when the quote was first set up with the "N" command. The following prompt will appear:

```
PLEASE ENTER DESIRED INPUT CLASS, END OR CARRIAGE RETURN FOR THE
INPUT MENU
```

If a carriage return is entered, an input menu will display. For Meridian 1 SL-1, the following input menu will appear:

```
S - SOFTWARE OPTIONS
G - SOFTWARE OPTION GROUPS
P - PHONES, LINES AND TRUNKS
M - MISCELLANEOUS/MEMORY
B - BASIC INFORMATION
```

Enter the appropriate letter for the input class desired.

Once a user is in a specific input category and all changes are complete, "END" may be entered to get back to the Input Menu or "ABORT" to return to the Service Menu. Refer to the Inputs section of each product chapter for specific inputs.

3.4.5.1 Input Formats

Input of data into the MBS Autoquote System may be required in one of three different input types. These different types are needed for some inputs that require more information than others. For example, a certain input may need to include just a quantity whereas another might need to include a quantity "nnnn" and a "type." The three input formats are as follows:

Input Type	Format
1	I/A
2	I/A,A
3	I/A,A,A

where I = Input code Number

A = an integer value and/or a one decimal value

When entering data, the input code is separated from the input data values by a slash ("/") and data values are separated from each other by a comma (","). Blank spaces or leading zeros when entering data are not required or recommended. Some example inputs are shown below:

```
Type 1:      7/10
Type 2:      3/2,1
Type 3:      5/40,60,6
              23/400
              17/1000,10
              15/10,15,3.5
```

In some cases, not all data values need to be entered as Autoquote will supply default values. Information on input defaults is included in the Inputs section of each of the various product chapters.

Input Echo

Whether supplied by the end user or defaulted, the program will echo each line of input back to the terminal for verification. This not only allows the user to verify each input, but also to view any-defaulted value. The echoed values do not contain a decimal point and appear to be increased by a magnitude of 10. For example, Entering "1/1" will appear as 001/00000010.

3.4.6 S • SAVE QUOTE

When "S" is selected for a new quote, the system will respond by assigning a quote number and providing a statement confirming the quote

has been saved. The quote will be saved for only four (4) months from the creation date. If necessary, the quote may be copied to a new quote number to extend the life four more months. The creation date *of* a quote is either the date it was saved for the first time or the date it was copied.

When **"S"** is selected for an existing quote, the system will respond by providing a statement confirming the quote has been saved.

3.4.7 x - **AUX LOAD**

Auxiliary loads are used to combine the engineering of a single or multiple RPE sites and/or other peripheral devices with the main site or **system**. When **"X"** is entered, the system prompts for the AUX quote numbers one at a time. After each AUX quote number is entered, press ENTER and the system will prompt for another. After all AUX quote numbers have been entered, the user enters "END".

Refer to the Aux Loading section for Meridian 1 SL-1 chapter for a complete description of the AUX LOAD requirements regarding RPE.

3.4.8 R - **REPORT**

This selection is used to generate reports on the quote. After the **"R"** is entered, there will be a pause while the computer runs through the calculations. This phase of Autoquote may last from as little as 30 seconds to as much as 5 minutes, depending on the system size and the activity on the computer. After completing the calculations, the system will print the "Header" report which includes general information and Autoquote disclaimers. Autoquote disclaimers. The system will t

PLEASE ENTER REPORT NUMBER(S)

Reports may be requested in any order and may be entered one at a time or several separated by commas. Refer to the Reports Section of each the various product chapters for a list of report numbers and titles.

All reports except the header are optional and can be printed as desired by the user.

Enter "End" at the prompt to return to the Service Menu.

--

3.4.9 L - **LIST EXISTING QUOTES**

This option allows a "directory" list to be displayed, showing all of the quotes in the file. The quotes are listed by quote number in descending order. When "L" is entered, the system prompts:

PLEASE ENTER QUOTE NUMBER TO LIST PROM OR CARRIAGE **RETURN**

Enter the quote number from which you want the list to begin. Carriage return will cause the list to begin from the latest quote.

PLEASE ENTER NUMBER OF QUOTES TO BE DISPLAYED AT ONE TIME OR END

When the number is entered, the system will list the 'number of quotes specified. The list will start with the quote number specified and end after the correct amount has been displayed.

After viewing the quotes in the list, the user can continue with more listings or enter "END" to return to the Service Menu.

3.4.10 C - COPY OLD QUOTE

With this entry, the system will prompt for the quote number to be copied. When the quote number is entered, the **system** makes a copy of the saved information and assigns it a new **quote** number with a new creation date.

This feature allows a quote to be modified and saved without disturbing the original quote.

3.4.11 D - DELETE OLD QUOTE

A quote may be deleted from the file if it is no longer needed. After entering "D" at the Service Menu, the system will prompt for the quote number to be deleted. A second prompt will echo back the quote number to be deleted for verification.

3.4.12 Q - QUIT AUTOQUOTE

Enter "Q" at the Service Menu to return to the secondary Autoquote menu.

3.5 HELP

When this User Guide is **read and** followed, the user will experience little or no difficulty in using the MBS Autoquote System. If, however, questions or problems **do arise**, read the following subsections for **assistance information**. These items are presented in the order problems may be encountered when using the Autoquote **system**. --

3.5.1 Host Access

If, when accessing Autoquote, you encounter problems before getting the host prompt (:)

Telenet Users call Telenet Customer Service at 800-336-0437.

Direct Users call the Information Center at 214-437-8711

3.5.2 COMPUTER RELATED QUESTIONS

For computer access or terminal time-out problems, call the Information Center at 214-437-8111.

3.5.3 ACCESS OR AUTHORIZATION CODE QUESTIONS

Call your Sales Channel Point-of-Contact or password administrator/controller. Autoquote Administration cannot give out password information.

3.5.4 AUTOQUOTE OPERATIONAL OR TECHNICAL QUESTIONS

There are three sources of information available to answer Autoquote and/or technical questions.

- 1) Consult this User Guide for both access and configuration information.
- 2) Call your NT support person or group (District Sales Manager).
- 3) Contact Autoquote Administration at (214) 437-8529.

3.5.5 PRICING QUESTIONS

Many pricing questions can be answered by consulting your pricing manual. However, if the pricing manual does not contain the answer, contact your NT Representative.

4. CAVEATS

This section contains information on the characteristics and functionality of the Autoquote system. It is important that this section is understood to prevent any misuse of the Autoquote system.

4.1 GENERAL

The Meridian Autoquote System is a sales **tool** to be used in preparing quotations for new systems as well as some peripheral devices. Although the **system** contains precise engineering rules, it does not perform an exhaustive and **complete system** configuration of every potential configuration. The engineering rules are designed to accurately configure an average system. Therefore, the user should always review the reports produced by the system to ensure a correct and reasonable configuration. These reviews are necessitated by Autoquote program functionality and not by limitations of the products supported in the Autoquote **System.**

Although a concerted effort has been made to engineer each Meridian system configuration completely with the Autoquote System, there may be situations requiring further engineering or configuration adjustments. Because of this, the price quoted by the Autoquote System applies only to the items of equipment and software listed in the Equipment Breakout Report. This report contains a line entry for each item of equipment or software that is quoted. No item is priced into the quote unless it is detailed in this report. Pricing adjustments will be required if there are any additions or deletions to this list.

4.2 OPERATIONAL • SALES CHANNELS

The Autoquote System is used by all Sales Channels. For each Sales Channel, it quotes only those items which Northern Telecom supplies to that channel. Autoquote may treat some inputs differently depending on the Sales Channel.

5. APPENDIX 1 TELENET ACCESS NUMBERS

For customer service, call toll-free 1-800/336-0437. From overseas locations with non-WATS access, call **703/689-6400**.

ST	AC	CITY	300/1200 BPS	2400 BPS	9600 BPS	CLASS
AL	205	Anniston	236-9711			B
AL	205	Birmingham	328-2310	251-1885		B
AL	205	Decatur	355-0206			B
AL	205	Dothan	793-5034			B
AL	205	Florence	767-7960	767-0497		B
AL	205	Huntsville	539-2281	539-1631		B
AL	205	Mobile	432-1680	438-6881		B
AL	205	Montgomery	269-0090	832-4314		B
AL	205	Tuscaloosa	752-1472	758-5799		C
AK	907	Anchorage	276-0453	(2) 276-0453		-
AK	907	Barrow	852-2425	(1,2)		-
AK	907	Bethel	543-2411	(1,2)		-
AK	907	Cold Bay	532-2371	(1,2)		-
AK	907	Cordova	424-3744	(1,2)		-
AK	907	Deadhorse	659-2777	(1,2)		-
AK	907	Delta Junction	895-5070	(1,2)		-
AK	907	Dillingham	842-2688	(1,2)		-
AK	907	Fairbanks	456-3282	(1,2)		-
AK	907	Glennallen	822-5231	(1,2)		-
AK	907	Homer	235-5239	(1,2)		-
AK	907	Iliamna	571-1364	(1,2)		-
AK	907	Juneau	789-7009	(1,2)		-
AK	907	Ketchikan	225-1871	(1,2)		-
AK	907	King Salmon	246-3049	(1,2)		-
AK	907	Kodiak	486-4061	(1,2)		-
AK	907	Kotzebue	442-2602	(1,2)		-
AK	907	McGrath	524-3256	(1,2)		-
AK	907	Name	443-2256	(1,2)		-
AK	907	Northway	778-2301	(1,2)		-
AK	907	Palmer	745-0200	(1,2)		-
AK	907	Prudhoe Bay	659-2777	(1,2)		-
AK	907	St Paul	546-2320	(1,2)		-
AK	907	Seward	224-3126	(1,2)		-
AK	907	Sitka	747-5887	(1,2)		-
AK	907	Soldotna	262-1990	(1,2)		-
AK	907	Talkeetna	733-2227	(1,2)		-
AK	907	Tanana	366-7167	(1,2) (300 BPS ONLY)		-
AK	907	Valdez	835-4987	(1,2)		-
AK	907	Whittier	472-2467	(1,2)		-
AK	907	Yakutat	784-3453	(1,2)		-
AZ	602	Phoenix	254-0244	256-6955	254-0040	A
AZ	602	Flagstaff	773-0588	773-0588		B
AZ	602	Tucson	* 747-0107	747-9395		B
AR	501	Fayetteville	442-0212	442-0212		B

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AR 501 Ft Smith	782-2852			C
AR 501 Hot Springs	623-3159	623-3159		B
AR 501 Little Rock	372-4616	374-2861		B
AR 501 Texarkana	772-6181	772-6181		B
CA 805 Bakersfield	327-8146	327-5321		B
CA 916 Chico	894-6882			B
CA 714 Colton	824-9000	824-8976		B
CA 213 Compton	516-1007			C
CA 415 Concord	827-3960	674-0127		C
CA 916 Davis	753-4387	753-4387		B
CA 619 Escondido	741-7756	741-9536		B
CA 707 Eureka	444-3091			B
CA 415 Fremont	490-2050	490-2050		B
CA 209 Fresno	233-0961	441-1861		B
CA 714 Garden Grove	898-9820	895-1207		B
CA 818 Glendale	507-0909	246-3886		B
CA 415 Hayward	881-1382			B
CA 213 Los Angeles	624-2251	622-1138	937-0233	A
CA 213 Los Angeles	937-3580	622-1138	937-0233	A
CA 213 Marina Del Rey	306-2984	306-4922		B
CA 209 Merced	383-2557			B
CA 209 Modesto	576-2852			B
CA 408 Monterey	646-9092	646-5122		C
CA 213 Norwalk	404-2237			C
CA 415 Oakland	836-4911	834-3194		B
CA 619 Oceanside	430-0613			C
CA 619 Palm Springs	951-2612	951-2612		B
CA 415 Palo Alto	856-9995	856-0484		B
CA 415 Pinole	724-2400	724-2225		C
CA 714 Pomona	626-1284			C
CA 916 Redding	243-0690	243-0690		B
CA 916 Sacramento	448-6262	443-7434		B
CA 408 Salinas	443-4940	443-8791		B
CA 415 San Carlos	591-0726	595-8870		B
CA 619 San Diego	233-0233	231-1703		B
CA 415 San Francisco	956-5777	788-0825	956-6317	A
CA 408 San Jose	294-9119	286-6340		B
CA 213 San Pedro	548-6141	514-1590		B
CA 415 San Rafael	472-5360			C
CA 415 San Ramon	829-6705			B
CA 714 Santa Ana	558-7078	550-4625		B
CA 805 Santa Barbara	682-5361	564-1158		B
CA 408 Santa Cruz	429-6937	429-9192	--	C
CA 805 Santa Maria	925-7039	925-7039		B
CA 707 Santa Rosa	578-4447	578-1055		C
CA 209 Stockton	957-7610	957-7627		C
CA 805 Thousand Oaks	495-3588			B
CA 805 Ventura	656-6760	650-1070		B
CA 209 Visalia	627-1201			B
CA 818 West Covina	915-5151			C
CA 818 Woodland Hills	887-3160	348-7141		B
CO 719 Colorado Springs	635-5361	635-2551		B
CO 303 Denver	337-6060	696-0159	337-3304	A
CO 303 Ft Collins	493-9131	493-4014		B
CO 303 Grand Junction	241-3004			C

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CO 303 Greeley	352-8563			B
CO 719 Pueblo	542-4053			C
CT 203 Bridgeport	335-5055	367-9130		B
CT 203 Danbury	794-9075	792-5354		B
CT 203 Hartford	247-9479	724-9396		B
CT 203 Middletown.	344-8217			B
CT 203 New Britain	225-7027			B
CT 203 New Haven	624-5954	7-73-3569		B
CT 203 New London	447-8455	437-0909		B
CT 203 Norwalk	866-7404			B
CT 203 Stamford	348-0787	359-9404		B
CT 203 Waterbury	753-4512	756-0342		C
DE 302 Dover	678-8328			B
DE 302 Newark	454-7710	737-4340		B
DC 202 Washington	429-7896	429-0956	429-9145	A
DC 202 Washington	429-7800	429-0956	429-9145	A
FL 407 Boca Raton	338-3701			C
FL 813 Cape Coral	275-7924			C
FL 407 Cocoa Beach	267-0800			B
FL 904 Daytona Beach	255-2629			C
FL 305 Ft Lauderdale	764-4505	524-5304		B
FL 813 Ft Myers	275-4153	275-4153		B
FL 407 Ft Pierce	466-4566	466-4566		B
FL 904 Gainesville	338-0220	338-1700		B
FL 904 Holly Hill	257-4770	257-4770		B
FL 904 Jacksonville	353-1818	791-9201		B
FL 813 Lakeland	683-5461	687-0666		C
FL 904 Leesburg	787-0799	787-0799		B
FL 407 Melbourne	242-8247			C
FL 305 Miami	372-0230	372-1355	372-9684	A
FL 813 Naples	263-3033			C
FL 904 Ocala	351-3790	351-0263		C
FL 407 Orlando	422-4088	422-8858		B
FL 904 Panama City	763-8377	763-8377		B
FL 904 Pensacola	432-1335	434-2103		C
FL 305 Pompano Beach	941-5445			C
FL 813 St Petersburg	323-4026	327-1163		B
FL 813 Sarasota	923-4563	925-1499		C
FL 904 Tallahassee	681-1902	561-8830		B
FL 813 Tampa	224-9920	223-5859		B
FL 904 Valparaiso	897-3421	897-3421		B
FL 407 West Palm Beach	833-6691	655-2993		B
GA 912 Albany	888-3011	431-9384		C
GA 404 Athens	548-5590			B
GA 404 Atlanta	523-0834	584-0212	523-5512	A
GA 404 Augusta	724-2752	724-4494		B
GA 404 Columbus	571-0556	323-8931		B
GA 404 Gainsville	532-9880	532-9880		B
GA 912 Macon	743-8844	741-2108		C
GA 404 Rome	234-1428			B
GA 912 Savannah	236-2605	236-2875		B
HI 808 Oahu	528-0200	528-0200 (2)		
HI 800 Other Islands	272-5299	272-5299 (2)		
ID 208 Boise	343-0611	343-1272		B
ID 208 Idaho Falls	529-0406	529-0406		B

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ID 208	Lewiston	743-0099	743-5885		C
ID 208	Pocatella	232-1764	232-1764		B
IL 312	Arlington Heights	255-6465	255-6465		A
IL 312	Aurora	896-0620	896-3363		B
IL 618	Bellevue	227-5483	227-5483		B
IL 309	Bloomington	827-7000	828-2573		B
IL 312	Chicago	938-0600	938-8725	938-4401	A
IL 217	Decatur	429-0235	429-6054		C
IL 815	Dekalb	758-2623	758-5046		B
IL 815	Joliet	726-0070	726-8731		C
IL 708	Libertyville	362-7838	362-7838		B
IL 708	Naperville	355-2910	355-2910		B
IL 309	Peoria	637-8570	637-8582		B
IL 815	Rockford	965-0400	965-0696		B
IL 217	Springfield	753-1373	753-1391		B
IL 217	Urbana	384-6428	328-0317		B
IN 812	Bloomington	332-1344			C
IN 812	Evansville	424-7693	428-2522		B
IN 219	Ft Wayne	426-2268	422-3431		B
IN 219	Gary	882-8800	882-1835		B
IN 317	Indianapolis	299-0024	299-6766		B
IN 317	Kokomo	455-2460	452-0073		C
IN 317	Lafayette	742-6000			C
IN 317	Muncie	282-6418			C
IN 219	South Bend	233-7104	233-4031		B
IN 812	Terre Haute	232-5329	234-4119		C
IA 515	Ames	233-6300	233-2603		C
IA 319	Burlington	752-2516	752-2516		B
IA 319	Cedar Rapids	364-0911	362-2764		B
IA 319	Davenport	324-2445	324-8902		C
IA 515	Des Moines	288-4403	288-6206		B
IA 319	Dubuque	556-0783			C
IA 319	Iowa City	351-1421	354-0676		C
IA 712	Sioux City	255-1545			C
IA 319	Waterloo	232-5441	232-0195		B
KS 913	Lawrence	843-8124			B
KS 913	Leavenworth	651-0015	651-0015		B
KS 913	Manhattan	537-0948			B
KS 913	Salina	825-7900			B
KS 913	Topeka	233-9880	233-4660		B
KS 316	Wichita	262-5669	262-7961		B
KY 502	Bowling Green	782-7941	782-6380		B
KY 502	Frankfort	875-4654	875-1942		B
KY 606	Lexington	233-0312	233-7217		B
KY 502	Louisville	589-5580	583-1006		B
KY 502	Cwensboro	686-8107			B
LA 318	Alexandria	445-1053			B
LA 504	Baton Rouge	343-0753	343-0771		A
LA 318	Lafayette	233-0002	234-8451		B
LA 318	Lake Charles	436-0518			C
LA 318	Monroe	387-6330	322-9826		B
LA 504	New Orleans	524-4094	522-3967	524-7337	A
LA 318	Shreveport	221-5833	424-2255		B
ME 207	Augusta	622-3123	622-7364		B
ME 207	Brewer	989-3081			C

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ME 207	Lewiston	784-0105			C
ME 207	Portland	761-4000			C
MD 301	Annapolis	224-8550	224-0795		B
MD 301	Baltimore	727-6060	752-5555	727-2044	A
MD 301	Frederick.	293-9596			B
MA 617	Boston	292-0662	574-9244	292-9522	A
MA 508	Brockton	580-0721			B
MA 617	Dedham	326-4064	3 2 6 - 4 0 6 4		B
MA 508	Fall River	677-4477			B
MA 508	Framingham	879-6798			B
MA 508	Lawrence	975-2273			B
MA 617	Lexington	863-1550	863-1745		B
MA 508	Lowell	937-5214			B
MA 508	New Bedford	999-2915	999-9667		B
MA 413	Northampton	586-0510			C
MA 413	Pittsfield	499-7741			B
MA 508	Salem	744-1559			B
MA 413	Springfield	781-3811	737-9285		B
MA 508	Woods Hole	540-7500	457-9390		C
MA 508	Worcester	755-4740	792-1785		B
MI 313	Ann Arbor	996-5995	665-2900	996-0035	A
MI 616	Battle Creek	968-0929	968-9851		B
MI 313	Detroit	964-2988	963-2274	9 6 4 - 3 1 3 3	A
MI 313	Flint	235-8517	235-5477		B
MI 616	Grand Rapids	774-0966	774-0131		B
MI 517	Jackson	782-8111			C
MI 616	Kalamazoo	345-3088	345-3122		B
MI 517	Lansing	484-0062	484-6301		B
MI 517	Midland	832-7068			B
MI 616	Muskegon	726-5723			C
MI 313	Pontiac	332-5120			B
MI 313	Port Huron	982-8364			B
MI 517	Saginaw	790-5166	799-3190		B
MI 313	Southfield	827-4710			B
MI 616	Traverse City	946-2121			C
MI 313	Warren	575-9152	558-8460		B
MI 313	Wayne	326-4210	326-4210		B
MN 218	Duluth	722-1719	722-5032		B
MN 507	Mankato	388-3780			B
MN 612	Minneapolis	341-2459	338-1661	3 4 1 - 0 3 2 4	A
MN 507	Rochester	282-5917	282-0253		C
MN 612	St Cloud	253-2064			C
MS 601	Hattiesburg	264-0815	264-0815		B
MS 601	Gulfport	863-0024		--	B
MS 601	Jackson	969-0036	9 6 9 - 0 1 5 2		B
MS 601	Meridian	482-2210			B
MS 601	Starkville	3 2 4 - 2 1 5 5			B
MO 314	Columbia	449-4404			B
MO 314	Jefferson City	634-5178	634-8436		C
MO 816	Kansas City	221-9900	472-1430	221-9407	A
MO 816	St Joseph	279-4797			C
MO 314	St Louis	421-4990	421-0381	4 2 1 - 1 3 7 6	A
MO 417	Springfield	864-4814	864-4945		B
MT 406	Billings	* 245-7649	248-6373		C
MT 406	Great Falls	771-0067			B

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MT 406 Helena	443-0000	443-0527		B
MT 406 Missoula	721-5900	543-5575		C
NE 308 Grand Island	381-2049	381-2049		B
NE 402 Lincoln	475-4964	475-3839		B
NE 402 Omaha	341-7733	346-6419		B
NV 702 Las Vegas	737-6861	737-5466		B
NV 702 Reno	827-6900	827-5290		B
NH 603 Concord	224-1024	225-8710		B
NH 603 Durham	868-2924			B
NH 603 Manchester	627-8725	625-8088		B
NH 603 Nashua	880-6241	880-3901		C
NH 603 Portsmouth	431-2302	431-7592		B
NJ 609 Atlantic City	348-0561	344-8571		B
NJ 201 Freehold	780-5030	780-9122		B
NJ 201 Hackensack	488-6567	488-2063		B
NJ 609 Marlton	596-1500	596-8659		B
NJ 609 Merchantville	663-9297	665-6860		B
NJ 201 Morristown	455-0275	644-4745		B
NJ 201 New Brunswick	745-2900	745-7010		B
NJ 201 Newark	623-0469	623-7122	623-0900	A
NJ 201 Passaic	778-5600	773-3674		B
NJ 201 Paterson	684-7560	742-4415		B
NJ 609 Princeton	799-5587	936-0231	799-0244	A
NJ 201 Rahway	815-1885			B
NJ 201 Redbank	571-0003			B
NJ 201 Roseland	227-5277	227-6722		B
NJ 201 Sayreville	525-9507			B
NJ 201 Summit	273-9619	273-9619		B
NJ 609 Trenton	989-8847	989-7127		B
NM 505 Albuquerque	243-4479	242-1742		B
NM 505 Las Cruces	526-9191			B
NM 505 Santa Fe	473-3403			C
NY 518 Albany	465-8444	465-8632		B
NY 607 Binghamton	772-6642	772-9526		B
NY 716 Buffalo	847-1440	847-1825		B
NY 516 Deer Park	667-5566	243-1105		B
NY 516 Hempstead	292-3800	485-3380		B
NY 607 Ithaca	277-2142	272-9980		C
NY 212 New York City	741-8100	645-0560	633-1117	A
NY 212 New York City	741-4950	645-0560	633-1117	A
NY 212 New York City	620-6000	645-0560	633-1117	A
NY 716 Niagara Falls	282-1462	282-3284		C
NY 518 Plattsburgh	562-1890		--	C
NY 914 Poughkeepsie	473-2240	473-3200		B
NY 716 Rochester	454-1020	454-5730		B
NY 315 Syracuse	472-5583	479-5445		B
NY 315 Utica	797-0920	797-0228		B
NY 914 White Plains	328-9199	682-3505		B
NC 704 Asheville	252-9134	252-0133		B
NC 704 Charlotte	332-3131	333-6204	332-3705	A
NC 919 Fayetteville	323-8165	323-4148		C
NC 704 Gastonia	865-4708			B
NC 919 Greensboro	273-2851	275-1251		B
NC 919 High Point	889-7494			B
NC 919 North Wilkesboro	838-9034			C

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NC 919	Raleigh	834-8254	834-8254		B
NC 919	Res Tri Park	549-8139	541-9096		B
NC 919	Tarboro	823-0578			C
NC 919	Wilmington	763-8313	251-8900		C
NC 919	Winston-Salem	725-2126	777-0312		B
ND 701	Fargo	235-7717	235-9069		C
ND 701	Grand Forks	775-7813			B
ND 701	Mandan	663-2256	663-6339		B
OH 216	Canton	452-0903	452-6642		B
OH 513	Cincinnati	579-0390	241-8008	579-1583	A
OH 216	Cleveland	575-1658	771-6480	575-1308	A
OH 614	Columbus	463-9340	461-9044	463-9110	A
OH 513	Dayton	461-5254	461-0755		B
OH 216	Elyria	322-8712	322-8645		C
OH 419	Findlay	422-8188	422-8188		B
OH 513	Hamilton	863-4116			B
OH 216	Kent	678-5115	678-5043	678-6774	A
OH 216	Lorain	960-1771			C
OH 419	Mansfield	526-0686			C
OH 419	Sandusky	627-0050			B
OH 513	Springfield	324-1520			C
OH 419	Toledo	255-7881	255-1906		B
OH 216	Warren	394-0041			C
OH 216	Wooster	264-8920			B
OH 216	Youngstown	743-1296	743-6843		B
OK 918	Bartlesville	336-3675			B
OK 405	Lawton	353-0333	353-0225		B
OK 405	Oklahoma City	232-4546	232-9513		B
OK 405	Stillwater	624-1112	743-1447		B
OK 918	Tulsa	584-3247	587-2774		B
OR 503	Corvallis	754-9273	754-0559		C
OR 503	Eugene	683-1460	342-6626		C
OR 503	Hood River	386-4405			C
OR 503	Klamath Falls	882-6282	882-6282		B
OR 503	Medford	779-6343	773-7601		B
OR 503	Portland	295-3028	241-0496	295-2936	A
OR 503	Salem	378-7712	378-1660		B
PA 215	Allentown	435-3330	770-1405		B
PA 814	Altoona	949-0310			B
PA 717	Carlisle	249-9311			C
PA 717	Danville	271-0102			C
PA 814	Erie	899-2241	453-3793		B
PA 412	Greensburg	836-4771	836-4771		B
PA 717	Harrisburg	236-6882	236-2007		B
PA 814	Johnstown	535-7576	536-3630		B
PA 215	King of Prussia	337-4300	337-2850		B
PA 717	Lancaster	295-5405	295-7128		C
PA 215	Levitown	946-3439	946-3439		B
PA 412	Monroeville	856-1330	856-1330		B
PA 215	Philadelphia	574-9462	574-0990	574-0094	A
PA 412	Pittsburgh	288-9950	471-6430	281-8782	A
PA 412	Pittsburgh	288-9974	471-6430	281-8782	A
PA 215	Reading	376-8750	375-6945		C
PA 717	Scranton	961-5321	961-5480		B
PA 814	State College	231-1510			C

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PA 215	Warrington	343-6010	343-6010		B
PA 215	West Chester	436-7406	436-7406		B
PA 717	Wilkes-Barre	829-3108	824-8209		B
PA 717	Williamsport	494-1796			C
PA 717	York	846-6550	843-0039		B
RI 401	Providence	751-7912	831-3990		B
RI 401	North Kingston	295-7100	295-7100		B
RI 401	Woonsocket	466-4566	466-4566		B
SC 803	Charleston	722-4303	577-4710		B
SC 803	Columbia	254-0695	252-0328		B
SC 803	Greenville	233-3486	271-0231		B
SC 803	Spartanburg	585-1637			B
SD 605	Pierre	224-0481	224-2257		B
SD 605	Rapid City	348-2621			C
SD 605	Sioux Falls	336-8593	336-6438		B
TN 615	Bristol	968-1130	968-2480		C
TN 615	Chattanooga	756-1161	265-7929		B
TN 615	Clarksville	552-0032			B
TN 615	Johnson City	282-6645			C
TN 615	Knoxville	523-5500	521-5072		B
TN 901	Memphis	521-0215	527-5175		B
TN 615	Nashville	244-3702	255-2608		B
TN 615	Oak Ridge	481-3590			C
TX 915	Abilene	676-9151			B
TX 806	Amarillo	373-0458	373-1833		B
TX 214	Athens	677-1712			C
TX 512	Austin	928-1130	929-3622		B
TX 512	Brownsville	542-0367	544-7073		C
TX 409	Bryan	822-0159			C
TX 512	Corpus Christi	884-9030	884-6946		B
TX 214	Dallas	748-6371	745-1359	748-3541	A
TX 817	Denton	381-1897	381-1897		C
TX 915	El Paso	532-7907	541-1931		B
TX 817	Ft Worth	332-4307	332-6794	332-8424	A
TX 409	Galveston	762-4382	765-7298		B
TX 713	Houston	227-1018	227-8208	227-1760	A
TX 512	Laredo	724-1791			C
TX 214	Longview	236-4205			C
TX 806	Lubbock	747-4121			C
TX 512	McAllen	686-5360	686-2452		B
TX 915	Midland	561-9811	561-8597		B
TX 409	Nederland	722-3720	727-4090		B
TX 915	San Angelo	944-7621	949-1231	--	B
TX 512	San Antonio	22 S-8004	225-3444		B
TX 214	Sherman	893-4995			B
TX 817	Temple	773-9723			C
TX 214	Tyler	597-8925			C
TX 512	Victoria	572-3197	572-3197		B
TX 817	Waco	752-9743			C
TX 817	Wichita Falls	322-3774			B
UT 801	Logan	752-3421	752-3421		B
UT 801	Ogden	627-1630	627-1640		C
UT 801	Provo	373-0542	375-2084		B
UT 801	Salt Lake City	359-0149	359-0578		B
VT 802	Burlington	864-0808			B

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VT 802	Montpelier	229-4966			B
VT 802	Rutland	775-1676			C
VT 802	White River Jct	295-7631			C
VA 703	Blacksburg	552-9181			C
VA 804	Charlottesville	977-5330			C
VA 703	Covington	962-2217			C
VA 703	Fredericksburg	371-0188			B
VA 703	Harrisonburg	434-7121	434-0374		C
VA 703	Herndon	435-1800	4 8 1 - 6 8 0 7		B
VA 804	Lynchburg	845-0010			C
VA 804	Newport News	596-6600	596-2710		B
VA 804	Norfolk	625-1186	625-2408		B
VA 703	Occoquan	494-0836	494-0836		B
VA 804	Richmond	788-9902	343-4140		B
VA 703	Roanoke	344-2036	344-2404		B
WA 206	Auburn	939-9982			B
WA 206	Bellingham	733-2720	733-2873		B
WA 206	Everett	775-9929	774-7466		C
WA 206	Longview	577-5835	577-3992		B
WA 206	Lynwood	774-7466	774-7466		B
WA 206	Olympia	754-0460	786-5066		C
WA 509	Pullman	332-0172	332-0172		B
WA 509	Richland	943-0649	946-2350		B
WA 206	Seattle	625-9612	623-9951	6 2 5 - 9 0 0 8	A
WA 509	Spokane	455-4071	838-9065		B
WA 206	Tacoma	627-1791			B
WA 206	Vancouver	693-6914			B
WA 509	Wenatchee	663-6227	663-9180		B
WA 509	Yakima	575-1060			B
WV 304	Charleston	345-6471	345-7140		B
WV 304	Huntington	523-2802			C
WV 304	Morgantown	292-0104	292-0492		C
WV 304	Wheeling	233-7732			B
WI 608	Beloit	362-5287			B
WI 715	Eau Claire	836-9295	836-0097		C
WI 414	Green Bay	432-2815	432-0346		B
WI 414	Kenosha	552-9242			C
WI 608	La Crosse	784-0560			B
WI 608	Madison	257-5010	257-8472		B
WI 414	Milwaukee	271-3914	278-8007	2 7 1 - 2 2 3 8	A
WI 414	Neenah	722-7636	731-1560		C
WI 414	Racine	632-6166	632-2174		C
WI 414	Sheboygan	452-3998			C
WI 715	Wausau	845-9589			B
WI 414	West Bend	334-2206			B
WY 307	Casper	265-5167	2 6 5 - 8 8 0 7		C
WY 307	Cheyenne	638-4421	637-3958		B
WY 307	Laramie	721-5878			C

- (1) Service is provided by Alascom, Inc. via Alaskanet, which is restricted to collect call access to U.S. hosts connected to the **SprintNet** network. If prepaid access is required, contact a US Sprint representative. For sign-on information, call Alascom

Customer Service at 907/264-7391 (inside Alaska) or 1-8001544-2233
(outside Alaska).

(2) International data rate schedule applies.

* An asterisk indicates a change in number, a service upgrade or a new location. Refer to the 'New' listing for further explanations of these changes.

Meridian 1

Communication Systems

AUTOQUOTE USER GUIDE

MERIDIAN 1 SL-1



MERIDIAN 1 SL-1
PRIVATE BRANCH EXCHANGE COMMUNICATION SYSTEM
AUTOQUOTE USER GUIDE CHAPTER

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1. INTRODUCTION

This chapter of the Meridian Business Systems Autoquote User Guide provides information on quoting the Meridian 1 SL-1 Communication System. It includes the following sections:

Section 1: Introduction
Section 2: Inputs
Section 3: Engineering/Provisioning
Section 4: Reports
Section 5: Auxiliary Loading
Section 6: Appendix 1: Input Form

The mechanics of using Autoquote are not included in this product chapter. Refer to the Introduction and Overview chapter for detailed information on how to use the Autoquote System.

1.1 PRODUCT DESCRIPTION

The Meridian 1 SL-1 is a computer controlled, digital switching, Private Branch Exchange (PBX). The Meridian 1 SL-1 can support from 40 to 10,000 analog and/or digital lines. The Meridian 1 SL-1 is available powered either AC, DC, or DC with rectifiers for most system options.

The Meridian 1 SL-1 is packaged in stackable modules. A modular version Meridian Mail Voice Messaging System can be configured as a system option for the Meridian 1 SL-1 Models. The Autoquote System will provide for integration the Meridian 1 SL-1 with the following systems: Remote Peripheral Equipment, Meridian Mail Voice Messaging Systems, and Automatic Call Distribution (ACD-MAX) Systems.

1.2 VALID MODELS

There **are** four Meridian 1 SL-1 Autoquote Models currently available:

Model	Generic	Release
21 or 21A	21	15
51	51	15
61	61	15 --
71	71	15

Note: To quote a 21A system enter 21 for the model generic code. A 21A will be quoted if the system fits within the constraints of the 21A system.

Note : The minimum purchase requirements for each Meridian 1 SL-1 Model that are outlined in the Hardware section of the Meridian 1 Communication Systems Pricing Manual are applied by the Autoquote system and restrict the configurations that may be quoted.

2. INPUTS

This section covers all inputs associated with the Meridian 1. The following sections are covered within this section.

Input Classes

Input Codes, Descriptions, and Default Values
Software Options
Phones, Lines and Trunks
Miscellaneous/Memory
Basic Information

As with all **Autoquote** models, data input consists of responses to prompted entries and manual inputs associated with specific input codes. An input can require one, two, or three entries (types 1, 2, or 3). The mechanics of using **Autoquote** are not included in this product chapter. Refer to the Introduction/Overview chapter **for** detailed information on how to use the Autoquote system.

A blank input form is included in the back of this section. It is recommended that copies be used for preparing quotations. An on-line input form is also available on the Autoquote system, select INFORMF at the secondary menu prompt (:).

2.1 INPUT CLASSES

Meridian 1 inputs are organized into four input classes:

Software Options	[S]
Phones, Lines, Trunks	[P]
Miscellaneous	[M]
Basic Information	[B]

Autoquote will prompt for each input class in the order listed above when setting up a new quote. The letter designation is used to make selections from the Input Menu.

2.2 INPUT CODES, DESCRIPTIONS, AND DEFAULT VALUES

The following pages contain information on each Meridian 1 input: codes, descriptions, and default values where appropriate.

2.2.1 Software Option Inputs

This section gives explanations for Meridian 1 software inputs where necessary. Enter a 1 to select a software input or a 0 to remove. Note that the software inputs are organized in the order they appear on the input form and not in numerical sequence.

If information is needed on feature descriptions, please refer to the **X11** Feature Document.

2 Multi-Customer

5 CDR Link

This input indicates that CDR Tape is desired. CDR List is included in the Meridian Base Software package.

12 Automatic Number Identification

This input is used to specify AN1 and AN1 Route Selection.

15 Remote Peripheral Equipment

This option must be present at the main site to support an RPE quote.

26 Centralized Attendant Service (CAS)/Main

CAS/Main cannot be quoted with Attendant Overflow (Input 56).

27 Centralized Attendant Service (CAS)/Remote

CAS/Remote cannot be quoted with Attendant Overflow (Input 56).

56 Attendant Overflow Position

Attendant Overflow cannot be quoted with **CAS/Main** (Input 26) or **CAS/Remote** (Input 27).

57 Attendant Alternative Answer

93 Supervisory Console

To support this feature, the M1250 console, a QPC297 Supervisory Console line card, and EPE module must be provisioned.

68 Autovon

Autovon and Multi-Tenant (input 86) are mutually exclusive software options. Only one of these may be selected in a quote.

84 Automatic Trunk Maintenance

One QPC442 Tone Detector will be provisioned when this option is selected. The Tone Detector requires one EPE card slot.

86 Multi-Tenant

Multi-Tenant and Autovon (input 68) are mutually exclusive software options. Only one of these may be selected in a quote.

105 Line Load Control

110 Special Application Features

This input is used to quote Trunk Verification from a Station and Incoming DID Digit Conversion.

150 Directory Number Expansion

102 Hospitality/Healthcare Features

This software input is a prerequisite for PMSI (Input 103).

103 Property Management System Interface

Hospitality/Healthcare (Input 102) is a prerequisite for this feature

37 Basic ESN Features

This software input is a prerequisite for Advanced ESN Features (Input 39).

39 Advanced ESN Features

Basic ESN Features (Input 37) is a prerequisite for this feature.

58 Network Automatic Route Selection (NABS)

NARS and **BARS** (Base package) are mutually exclusive software options. If this input is selected, BARS will be excluded from the Meridian Base Software package. P-DATA memory requirements for **NARS** must be added manually using **Miscellaneous/Memory** Input 47.

59 Coordinated Dialing Plan (CDP)

P-DATA memory requirements for CDP must be added manually using Miscellaneous/Memory Input 47.

63 Network Authorization Codes

109 Auxiliary Processor Link

This option is required when Meridian Mail is used and will be included if Meridian Mail is quoted.

35 IVMS

This option is required **when** Meridian Mail is used and will be included if Meridian Mail is quoted.

77 Meridian Mail

This option is required when Meridian Mail is used and will be included if Meridian Mail is quoted.

152 Meridian Link • Server

This input is mutually exclusive with Meridian **Link-ISDN/AP** (Input 153).

153 Meridian Link • ISDN/AP Direct Connect

This input is mutually exclusive with Meridian Link-Server (Input 152).

45 Basic ACD (ACD-A)

This **feature** is required when Meridian Mail is used and will be included when Meridian Mail is quoted.

41 Advanced ACD (ACD-B)

111 ACD Timed Overflow

One of the following ACD applications are a prerequisite for ACD Timed Overflow

- Advanced ACD Features (Input 41)
- ACD Reports (Input 42)
- ACD Load Management (Input 43)
- ACD Link • **MAX** (Input **50**)
- ACD Link • ACD-D (Input 51)

- 121 Enhanced ACD Overflow
 - 42 ACD Reports (ACD-C1)
 - 43 ACD Load Management (ACD-C2)
- 50 ACD Link - MAX Application

This option is required if ACD-MAX is used.

- 51 ACD Link - ACD-D Application
- 114 ACD-D/MAX Report Enhancements

122 Network ACD

The following **software features** are prerequisites for Network ACD:

- Advanced ACD Features (Input 41)
- Enhanced ACD Overflow (Input 121)
- Basic ESN Features (Input 37)
- Coordinated Dialing Plan (Input 59)
- Advanced ISDN Features (Input 148)

146 Primary Rate Access (PRA)

147 ISDN Signalling Link (ISL)

117 Call by Call Service

PRA (Input 146) is a prerequisite for this input.

148 Advanced ISDN Features

The following are prerequisites for this input:

- Basic ESN Features (Input 37)
- NAPS (Input 58) or CDP (Input 59)
- PRA** (Input 146) or ISL (Input 147)

149 Inter-Exchange Carrier

PRA (Input 146) is a prerequisite for this input.

120 Network Message Center

The following are prerequisites for this-input:

- Meridian Mail (Input 77)
- PRA** (Input 146) or ISL (Input 147)
- Advanced ISDN Features (Input 148)

2.2.2 Phones, Lines, and Trunks

This input class consists of two categories of inputs: ports (lines and trunks) and terminal devices (telephone sets). Ports inputs generally accept equipped and wired quantities. It is with wired inputs that the built-in growth of a system is provisioned. PE cards' are quoted at the equipped level, all other items are quoted at the-wired level. Therefore, only PE cards must be added to grow a system from the equipped to the wired size.

2.2.2.1 Port Inputs

Phones, Lines, and Trunks port inputs are numbers 1-43, 101-143, and 171-178. Inputs 101-143 are for non-blocking ports. Input 101 (non-blocking) corresponds to input 1 (**P.01**), input 102 (non-blocking) corresponds to input 2 (**P.01**), etc.

Unless otherwise noted, all port inputs accept three entries:

1. Equipped Ports Desired.

2. Wired Ports Desired.

If no entry is made, this entry will default to the equipped quantity entered. The wired value cannot be less than the equipped value.

3. Traffic (CCS) Per Port.

Maximum traffic allowed is 36 CCS. Traffic defaults that are listed below in the Traffic Defaults Table, are for **P.01 Grade** of Service (GOS) ports unless otherwise noted. **Non-blocking** port inputs default to 36 CCS for those entries not affecting **Digitone** Receiver (DTR) requirements. **Non-blocking** inputs affecting **DTR's** default to the **P.01** GOS value.

, Note that telephone sets are entered independently of the ports.

2.2.2.1.1 Traffic Defaults Table

<u>Port Type</u>	<u>Quantity</u>	<u>Default CCS</u>
Voice	¹ n	5
Data	¹ n	10
Voice/Data	1,	15
² Type A Trunk (no queuing)	1 - 10	16
	11 - 25	22
	26 - 50	26
	51 -100	30
	>100	31
² Type B Trunk (queuing)	1 - 10	28
	11 - 25	30
	26 - 50	32
	51 -100	34
	>100	35

¹ n designates any quantity

² Trunk defaults assume one destination point for the entire quantity of trunks.

Type A (No Queuing Assumed)

CO Trunks
 DID Trunks
 FX Trunks
 RAN Trunks
 Paging Trunks
 Dictation Trunks

Type B (Queuing Assumed)

WATS Trunks
 CCSA Trunks
TIE Trunks/2W-E&M
TIE Trunks/4w-E&M
 TIE Trunks/Loop
RLT Remote Trunks

Special notes about the **P.01** Grade of Service port inputs are included below. These notes also apply to the corresponding non-blocking inputs.

1 Digital Voice Only Lines (NT8D02AA)

This input is used to enter digital voice lines.

2 Digital Voice/Data Lines (NT8D02AA)

This input differs from Input 1 in that two Terminal Numbers (**TNs**) are counted per port and the CCS per port default is increased to account for the data portion of the line.

42 Digital ACD Voice Lines (NT8D02AA)

This input specifies digital voice lines to be used in ACD applications. ACD applications have a larger impact on **CPU** Real Time and **may** require a higher CCS.

43 Digital ACD Voice/Data Lines (NT8D02AA)

This input is the same **as** Input 42 with the exception that two **TNs** will be counted per port and the CCS may be higher to account for the data portion.

- 3 2500 Lines (**NT8D03AA**)
- 4 500 Lines (**NT8D03AA**)
- 5 Message Waiting 2500 Lines (**NT8D09AB**)
- 6 Message Waiting 500 Lines (**NT8D09AB**)
- 7 OPX 2500 Lines (**QPC192**)
- 8 OPX 500 Lines (**QPC192**)

OPX 2500 and OPX 500 Lines require an EPE shelf.

Differentiation between 2500 and 500 lines is necessary to properly determine **Digitone** Receiver (DTR) **requirements**.

10 Console (NT8D02AA or QPC297)

One console is quoted for each equipped console port entered. The traffic default for consoles is 30 CCS.

Inputs 11-22 **are used to quote analog** trunk ports.

The **P.01** Grade of Service traffic defaults depend on the trunk type (refer to the **Traffic Defaults Table**).

The following trunks are Type **A** (No Queueing Assumed)

- 11 **CO Trunks (NT8D14AA)**
- 12 **DID Trunks (NT8D14AA)**
- 14 **FX Trunks (NT8D14AA)**
- 19 **RAN Trunks (NT8D14AA)**
- 20 **Paging Trunks (NT8D14AA or NT8D15AA)**
- 21 **Dictation Trunks (NT8D15AA)**

The following trunk are Type **B** (Queueing Assumed)

- 13 **WATS Trunks (NT8D14AA)**
- 15 **CCSA Trunks (NT8D15AA)**

- 16 **DX Trunks (QPC71)**

DX Trunks require an EPE shelf.

- 17 **TIE Trunks - E&M (NT8D15AA)**
- 18 **TIE Trunks - Loop (NT8D14AA)**
- 22 **RLT - Release Link Trunks (QPC250)**

Release Link Trunks are used for Remote Centralized Attendant Service (CAS) applications. Software Input 27 must be selected for these circuits to function. **RLT** Trunks require an EPE shelf.

DID (input 12), CCSA (input 15), and TIE (inputs 15,16,17) trunk incoming traffic may use **Digitone** signaling. This information will be prompted for in the Basic Information input class when setting up a new quote. All **digitone** traffic will affect the number of **Digitone** Receivers (**DTR's**) provisioned.

The remaining entries are for data lines, and digital trunks.

- 23 **Sync/Async CPU Terminations (QPC432)**

This input is the same as input 28 with the exception of the traffic default. The traffic default for CPU terminations will correspond to Type B trunk values (Queueing assumed) since they typically have greater usage than station terminations.

- 24 **Async Modem Pool Lines (QPC723 & NT8D03AA)**

Two physical ports are provisioned for this modem pool application-- one QPC723 RILC port and one **NT8D03AA 500/2500 port**. The traffic is presented to the switching matrix twice, therefore Autoquote will double the traffic input when determining network requirements. The traffic default will correspond to Type B Trunk values (Queueing assumed).

27 **Sync/Async** Modem Pool Lines (QPC432 & NT8D03AA)

Two physical ports are provisioned for this modem pool application: one QPC723 RILC port and one NT8D03A.A 500/2500 port. The traffic is presented to the switching matrix twice, therefore Autoquote will double the traffic input when determining network requirements. The traffic default will correspond to Type B Trunk values (Queueing assumed).

28 **Sync/Async** Data Lines (QPC432)

QPC432 data line cards provide access to the Meridian 1 switching matrix for sync or **async** devices. An **Async/Sync** Interface Module (ASIM) or High-Speed Data Module (HSDM) is used to interface RS-232 ports to QPC432 ports. An adapter cable may be used for a V.35 connection on the HSDM.

29 **Async** Data Lines (QPC430)

QPC430 data line cards provide access to the Meridian 1 switching matrix for **async** devices. An **Async** Interface Module (AIM), **Async** Interface Logical Unit (AILU), or Personal Computer Interface (PCI) card is used to interface RS-232 ports to QPC430 ports. Some devices may interface directly to the QPC430 data line card using a compatible RS-422 port.

30 MCDS **Async** Lines (QPC432, QPC397)

Multi-Channel Data System is a rack or cabinet mounted version of **async-only ADM's**, used primarily to interface to CPU ports. This input is used to provision the Meridian 1 EPE (QPC432 data line card) as well as the MCDS hardware. The traffic default is 30 CCS.

31 CIM Lines(QPC432)

Although this input results in the same Meridian 1 hardware provisioning as input 28, the specific application represented is Coax Elimination and Switching using the Coax Interface Module (CIM) to interface a coax terminal device.

32 MCCA Lines (QPC432, NT9N02)

This input represents the host/controller end of the Coax Elimination and Switching application. It is used to provision the Meridian 1 PE (QPC432 data line card) as well as the Multi-Channel Coax System (MCCA) hardware. The traffic default is 30 CCS.

35 RILC Data Lines (QPC723)

This data line card provides **for** direct RS-232 access to the switching matrix. Using this card in a modem pool application will result in traffic being introduced into the system only once.

40 **DTI (QPC720)**

41 **CPI (QPC720)**

These input accept two entries.

1st entry is number desired. Equipped/wired quantities are not used since DTI/CPI hardware is not Peripheral Equipment (**PE**). DTI/CPI cards interface directly to network loops and are housed in Common Equipment and/or Network Equipment shelves.

2nd entry is traffic (in CCS) per channel. This entry will default to Type **B** trunk values. (Each DTI/CPI is treated like 24 trunks.)

A **DTI/CPI** link is essentially non-blocking since it interfaces directly to a network loop. There are no corresponding **non-blocking** DTI/CPI inputs.

- 171 PRI (**QPC720 & QPC757**)
- 172 PRI (**QPC720 & QPC757**)
- 173 PRI (**QPC720 & QPC757**)
- 174 PRI (**QPC720 & QPC757**)
- 175 PRI (**QPC720 & QPC757**)
- 176 PRI (**QPC720 & QPC757**)
- 177 PRI (**QPC720 & QPC757**)
- 178 PRI (**QPC720 & QPC757**)

Each input corresponds to a different destination point; up to eight destinations can be selected. Differentiating between destinations is required to determine the required number of D-Channel Interface cards. PRA (Software input 146) and PBX Interface (Base package) are prerequisites for this application. These inputs accept two entries.

1st entry is number desired. Equipped/wired quantities are not used since PRI hardware is not Peripheral Equipment (**PE**). PRI cards interface directly to network loops and are housed in Common Equipment and/or Network Equipment shelves.

2nd entry is traffic (in CCS) per channel. This entry will default to Type **B** trunk values. (Each PRI is treated like 24 trunks.)

Telephone Set Inputs

Phones, Lines, and Trunks inputs **51-100**, and 206-281 are used for selecting terminal devices **and** accessories. All phone inputs accept one entry, indicating the number of units desired. Please refer to the sample input sheet at the end of this section for the actual Telephone set inputs.

Inputs 269, **270 and** 271 are used to allow Modular Set Power overrides. Entering a 1 for Input 271, allows the number of 110 **V** transformers **and** power boards to be entered using Inputs 269 and 270 respectively.

2.2.3 Miscellaneous/Memory

There are common rules regarding the number of entries a Miscellaneous/Memory input may accept. Refer to the input sheet and the information provided below for the **number of** entries each input **accepts**.

Information **on** the Miscellaneous/Memory inputs is included below. Note that the input descriptions appear in the order of the Input Sheet and are not in numerical order.

1 Power Indicator

This input applies to the way in which the system will be powered. Enter 1 for AC Power, 2 for DC using Customer Provided Power, or 3 for DC using Rectifiers and Battery Backup (input 9). If this input is set to 2, (DC using Customer Provided Power), no rectifiers will be included in the quote.

9 Battery Backup

This entry accepts two entries.

The 1st entry is the number of hours of battery backup desired. For Option 71 quotes, this input will be set to 4 if no entry is made.

The 2nd entry is the battery type indicator: zero (0) indicates Absolyte and one (1) indicates Lead Calcium battery hardware.

Please see Report 4 to determine battery backup requirements. Note that no batteries will be included in the quote.

10 UPS

This input is used to indicate the UPS vendor desired: one (1) for Exide, two (2) **for** Best, or three (3) for Alpha. **Please** see Report 4 to determine UPS rating requirements. Note that the UPS system will not be included in the quote.

2 Hard Disk Drive

..

Enter **one** (1) if desired, enter **zero** (0) to remove from quote. **This option is available only on the Option 51, 61, and 71.**

3 Emergency Transfer Units (ETU)

Enter the number desired. The **NT8939AA** ETU Assembly is provisioned on all systems. Each one allows eight **500/2500** phones to be connected to CO lines. Since this unit is external to the Meridian 1 cabinet, it **does** not impact system engineering.

4 Attendant Admin Overlay

Enter the number of Overlays desired.

5 Supervisory Console Functionality

This input only applies to Remote Peripheral Equipment (**RPE**) quotes. Enter one (1) for this input if the QPC297 Supervisory Line Card should be quoted.

11 Pedestal/Top Cap Provisioning Indicator

This input applies to the Option 21 only. It is used to override the calculated Pedestal/Top Cap assembly to a higher one. Zero (0) indicates that the most cost effective Pedestal/Top Cap assembly will be provisioned; two (2) indicates that the Two-Module Pedestal will be the minimum provisioned; four (4) indicates that the Four-Module Pedestal will be provisioned.

12 Rectifier/Power Cabinet (Options 51,61 only)

Enter one (1) to provision the Prime Power Cabinet Assembly. This cabinet houses up to four 50 Amp rectifiers to be used in lieu of 30 Amp rectifiers.

14 CDR Usage (Outgoing, Incoming, Internal)

This input is used to calculate CPU Real Time impact of CDR. Enter one (1) to indicate either Outgoing, Incoming or Internal usage for CDR. As an example, the input **14/1,0,1** indicates that the CDR will be used for Outgoing and Internal calls only. The default is **14/1,0,0** meaning that CDR is limited to Outgoing calls only.

15 Code Restriction Route

Enter the number of code restriction routes used in the system. This input is used for memory.

16 Speed Call Lists/1 Digit

17 Speed Call Lists/2 Digit

18 Speed Call Lists/3 Digit

These inputs are used to calculate required P-Data for Speed Call Lists. They accept three entries:

The 1st value is the number of lists desired.

The 2nd value is the number of entries per speed call list. The maximum is 10 for 1-digit lists (input 16), 100 for 2-digit lists (input 17), 1000 for 3-digit lists (input 18). This entry will default to 7 digits for 1-digit lists (input 16) and 40 for 2-digit and 3-digit lists (inputs 17,18).

The 3rd value is the number of digits per speed call list. The maximum allowed is 31 and the default value is 10 for all three inputs.

19 Data Modem

Enter the quantity desired.

20 Dual NTP Storage Sleeve

Enter the number of NTP storage sleeves desired. Each storage sleeve holds two NTP's. Typically four sleeves are required for a complete set of NTP's.

23 Average Holding Time

Enter the Average Holding Time per (P.01) call in seconds. Autoquote will set this input to 180 seconds if no entry is made.

25 MCDS Cabinet

Enter 1 if MCDS cabinets are to be quoted to house the MCDS shelves. These shelves can be housed in standard 19 inch racks.

27 Number of AD/SNR/LNR Entries

This input is prompted on every Meridian 1 model. It is used to calculate memory requirements for Auto-Dial, Stored Number Redial, and Last Number Redial entries/keys in the system. This input accepts two entries. The 1st value is the number of entries or keys assigned with these features. The 2nd value is digits per entry. The maximum is 31 and the default is 16 digits.

28 Number of Do-Not-Disturb Stations

This input is prompted when the Do-Not-Disturb feature is equipped. It is used to calculate memory requirements for feature implementation. Enter the quantity desired.

29 Number of Dial Intercom Groups

This input is prompted when the Dial Intercom feature is equipped. It is used to calculate memory requirements for feature implementation. Enter quantity desired.

30 Number of Group Call Groups

This input is prompted when the Group Call feature is equipped. It is used to calculate memory requirements for feature implementation. Enter quantity desired.

31 Number of ACD Queues

32 Number of ACD Agent Positions

33 Number of ACD Auto-Terminate Trunk Routes

34 Number of ACD Auto-Terminate Trunk Routes

35 Number of ACD CRT's

Inputs 31, 32, and 34 are prompted when any ACD option group is equipped. Input 33 and 35 are prompted only if ACD-C1 or **ACD-C2** is equipped. These inputs are used to calculate memory requirements for the ACD application. All of these inputs accept two entries: 1st entry is equipped quantity, 2nd entry is wired quantity.

40 Number of Customers

The input indicates the number of customers desired. A maximum number of 32 customers may **be entered**. BARS (input 41) and Multi-Tenant (input 41) are implemented on a customer basis. Memory requirements are determined using Miscellaneous/Memory inputs 40-42 when applicable.

41 Number of Customers Equipping BARS

This input is prompted if the Multi-Customer and BARS features are equipped. BARS is implemented on a customer basis. This input is used to calculate memory requirements for the BARS application.

42 Number of Customers with Multi-Tenant Service Equipped

This input is prompted if the Multi-Customer and Multi-Tenant **features are equipped**. Multi-Tenant is implemented on a customer basis. This input is used to calculate **memory** requirements for **the Multi-Tenant** application.

43 Total Number of Tenants Equipped

44 Total Number of Tenant Stations

These inputs are prompted **if** the Multi-Tenant feature is equipped. They **are used to calculate** memory requirements for Multi-Tenant application.

45 Number of ISDN **Signalling** Links

This input is used to select the number of ISDN Signaling Links (**ISL's**) required. The ISL option (Software input 147) is a prerequisite for this input.

46 **CE/Disk** Drive Provisioning - Override

Applicable to the Meridian 1 Option 21 only, this input is used for Disk Drive placement.

There are two scenarios for housing the Disk Drive:

- 0 = CE Placement in the **CE/PE** Module.
- 1 = PE Placement in the **CE/PE** Module.

Autoquote will provision the Disk Drive in the CE shelf unless network requirements force it into PE placement. The user may force PE placement by entering a one (1) for this input.

47 **Additional P-Data (kwords)**

This input accounts for additional memory requirements. Values are entered in thousands of words; i.e. if a one (1) is entered, 1000 P-Data words are added.

48 **Additional U-Data (kwords)**

This input accounts for additional memory requirements. Values are entered in thousands of words: i.e. if a one (1) is entered, 1000 U-Data words are added.

49 **Number of Call Party Name Display Entries**

These inputs are prompted if the Call Party Name Display feature is equipped. They are used to calculate **memory** requirements for CPND application. This input accepts two entries. The 1st value is the number of entries. The 2nd value is characters per entry. The default is 15 characters.

50 **Number of Auth Codes**

This input accepts two entries. Both are used to allocate **P-Data for authorization codes**. **1st entry** is the number of authorization codes used in the system (maximum allowed is 4096). **2nd entry** is number of digits per authorization code (maximum is 14). The default value is 8 digits.

21 Additional SDI Ports

Autoquote provisions the number of **SDI** ports required to support software and maintenance (local and remote). This input is used to specify additional **SDI** ports for other applications such as **SDI's** to connect **CRT's** for ACD supervisors. One **SDI** cable is provisioned for each **SDI** port. Autoquote does not determine cable connector type (**M/M** or **F/F**). The user must specify the connector type when placing the order.

37 Additional SDI Ports for APL's

This is used to determine the number of **SDI** ports required for Application Processor Links. Only the quantity not included within AUX-Loaded models must be entered. (Refer to the Introduction/Overview chapter for more information on the AUX-Load mechanism.)

38 Additional Conference Cards for MOH/AWU

This input is prompted when Music-on-Hold and/or Automatic Wake-up features are equipped. It is used to specify the number of additional Conference Cards required to support these features. The Automatic Wake-up feature requires one dedicated Conference Card per system. Music-on-Hold, on the other hand, may share a Conference Card with a normal conference traffic. The total number of Conference cards required on any system depends on the specific application.

39 Additional ESDI Ports

Enhanced **SDI** (ESDI) ports are used to support Command Status Link (CSL) and **ISDN/AP** Link (The CSL provides the interface for Meridian Mail). This input is used to specify the number of additional ESDI ports required; i.e., ports in addition to the ports required for Meridian Mail either AUX- Loaded or system integrated, and/or the default ports based on software option selection. One ESDI port will be included when **ISDN/AP** software is quoted. Autoquote will also include support for one ESDI when CSL software is quoted and no Meridian Mail application is quoted (integrated or AUX Loaded.) When Meridian **Mail** is quoted, ESDI cards are generally provisioned via Meridian Mail base hardware packages. (Refer to the Introduction/Overview chapter for more information on the AUX-Load mechanism.)

180 Additional Network Groups

This input applies to the Option 71 only. It is used to **increase the number** of network groups calculated by the Autoquote. The maximum value is 4.

181 Additional Superloops

182 Additional Non-blocking Superloops

These inputs are used to provide additional Superloops (**NT8D04AA**) to the system. The net amount of Enhanced Loops must be greater than or equal to the minimum required to maintain **P.01** Grade of Service.

183 Additional Network Loops

184 Additional Non-blocking Network Loops

These inputs are used to provide additional Enhanced Network Loops (**QPC414**) to the system. The number of Enhanced Loops must be greater than **or equal** to the minimum required to maintain **P.01** Grade of Service.

190 Ringing Generator Provisioning Factor

Ringing Generators are required in IPE Shelves which support Analog Cards. The calculation to determine the number of ringing generators is as follows:

Ringing Generators = % Analog Cards * Factor * PE Shelves
where Factor defaults to 2. This input allows the user to override the default factor of 2 and enter another if necessary. The factor may not be less than 1.0.

99 Software Graduation Level Override

This input is used to directly enter the Software Graduation Level **desired**. This input will override Miscellaneous Input 100 **as long as** the input value is not less than the minimum level required. **As** an example, if the Equipped **configuration equated** to 5 Software Graduation Levels and the Wired configuration equated to 8 Software Graduation Levels, this input could be used to request a level of 7, 9 or any level **not** less than 5.

100 Software Graduation Level Indicator

This input is used to select the whether the Software Graduation Level will be calculated using the Equipped or **Wired configuration**. Enter zero (0) for Equipped or one (1) **for Wired**. The default is Equipped. Note that this input will not apply if-Input 99 is used.

101 Module Placement Indicator

This input only applies to Option 71 quotes. If one (1) is **entered** for this input, module positions for network groups will be reserved for future growth.

102 Cable **Egress** Indicator

This input is used to determine the way in which cables will be wired out of modules. Enter one (1) for Bottom Egress, two (2) for Top Egress or three (3) for Top Egress with Cable Tray Kit.

103 **Earthquake Bracing Kit**

Enter one (1) if Earthquake Bracing equipment is required.

145 TDR Unit

This unit applies to the Direct **sales** channel only. It is applicable to the Meridian 1 Option 21, 51 and 61. This input accepts three entries.

1st entry indicates the firmware package: one (1) for the Business package, two (2) for the Professional Billing package, and three (3) for the Lodging package.

2nd entry is the total number of calls made per month in thousands. **For** example, enter three (3) if 3000 calls per month are to be supported. This value is used to size the TDR Unit. If no entry is made, the number of calls will be **a** function of the number of calls per station per month (3rd entry) .

3rd entry is the number of calls per station per month. This entry will default to 100. The number of calls per station per month will be used to determine the total number of calls per month if no entry is made for the 2nd value.

Inputs 150-156 are used to quote the Meridian Mail Option and associated features.

150 **Meridian Mail**

The Meridian Mail Software package (Software input 77) is a prerequisite for this input. This input accepts three entries:

1st entry is the number of voice processor ports desired. The maximum value allowed is 48. All entries **will** be converted to the next voice processor port increment available on the product (**4,8,12,16,20,...,or 48** ports).

2nd entry is the total number of hours of voice storage desired. The maximum value allowed is 240. All entries will be converted to the next voice storage increment available on the product (**5,11,24,36,...,or 240** hours).

3rd entry is number of registered users supported. This entry will determine the number of User Guides provided and real time impact.

151 Meridian Mail Voice Menus

Enter the number of Voice Menu calls during the busy hour. Any value entered greater than zero will provision Voice Menus Software. The number of voice menu calls during the busy hour is requested to help determine CPU real time impact.

152 Meridian Mail Console Software

Enter one (1) if this option is desired.

153 Meridian Mail Access Development Software

Enter one (1) if this option is desired. Meridian Mail Console Software is a prerequisite for this option.

155 Meridian Mail Networking Ports

Enter the number of ports desired to be used for networking Meridian Mail Options together. Note that this input is used to provision the correct amount of Meridian Mail Networking Hardware and Modem Packages as well as Networking Software. The total number of actual Meridian Mail ports provisioned is only indicated in Input 150.

156 Meridian Secured Messaging

Enter a one (1) if this option is desired.

169 CPlus Directory & Messaging PC Software

This input is used to specify the PC based CPLUS Attendant Console Software. Enter the number of copies desired.

171 Meridian Manager - Work Order System

Enter one (1) to quote this option. Note that Meridian Manager-Station Administration is included with the base Meridian 1 software package.

172 Meridian Manager-Traffic Reporting

Enter one (1) to quote this option. Note that Meridian Manager-Station Administration is included with the base Meridian 1 software package.

Inputs 51-84 are used to quote non-blocking PE 'cards and modules. Each input accepts two entries: 1st entry is equipped quantity, 2nd entry is wired quantity. These inputs are required to specify exact quantities of hardware required for non-blocking application. These values cannot be calculated by Autoquote since there is a possibility that some ports and/or some PE slots may be unusable in a non-blocking situation. Autoquote can determine the minimum required PE cards and shelves based on port inputs. During the calculation process Autoquote will make sure all non-blocking PE quantities are not less than the minimum calculated. Refer to Non Blocking Applications, page 54.

123 Average Holding Time (non-blocking)

Enter the Average Holding Time per call in seconds.
Autoquote will set this input to 180 seconds if no entry is made.

2.2.4 Basic Information

All Basic Information inputs accept one entry. Inputs are prompted if applicable to the hardware/software selected. Changes to prompted entries may be made during the manual input, phase of this input class.

1 Number of Trunk Groups

This input is prompted for all Meridian 1 models. This entry must be greater than zero.

2 Percent Tie Line Traffic that is Digitone

3 Percent CCSA Traffic that is Digitone

Digitone Receivers (DTR's) are required for incoming **digitone** calls on tie line and CCSA trunks. All tie line and CCSA traffic is considered when determining the portion that is digitone. Therefore, the percentage entered must consider which end of the trunk originates the call; outgoing calls do not require the use of DTR's. If incoming traffic is **digitone** and if total tie line and/or CCSA traffic is split evenly between incoming and outgoing, 50% of the traffic is **digitone** for purposes of determining the number of required DTR's.

4 DID Traffic is Digitone

Enter one (1) if DID trunks will use **digitone** signaling. Similar to Inputs 2 and 3, this input is used to calculate the number of DTR's required.

5 Amount of DISA Traffic (in CCS)

Enter the Busy Hour DISA CCS. If all DISA calls occur outside the busy hour, enter zero (0). As a quick estimate, multiply estimated DISA calls during the busy hour by 0.2.

6 Number of Type 1 Signaling 4-Wire Tie Trunks

Type 1 signaling requires the Meridian 1 to provide more power for 4-wire tie trunks. This input is used to accurately determine power requirements.

7 Number of Templates

This input is prompted for all Meridian 1 models. All **stations entered into the Meridian 1** data base will use a template. A new template is created each time a station with unique feature and key assignment characteristics is entered. If all sets are configured the same (except for **DN's**), only one template is used. If 100 sets with minor differences **are** configured, 100 templates are used. The minimum, value-allowed for this entry is 2. The number of templates is used to calculate memory requirements.

8 Number of Autovon Trunks

This input is used to calculate the additional memory requirements for Autovon trunks.

9 Percent DTI Traffic that is Digitone

Since DTI can function as a tie line or DID trunk, **digitone** signaling may be used. Enter percent of total traffic that is incoming digitone. See explanations for inputs 2 and 4 for more information.

10 Number of DTI/PRI Tie Lines

Enter the number of **DTI/PRI** Tie Lines expected in the configuration. This input is used to determine CPU Real Time impact.

3. ENGINEERING/PROVISIONING

This section covers the Engineering/Provisioning rules used in generating Meridian 1 configurations.

The following sections are included:

- Software Provisioning
- Peripheral Equipment Cards And Modules
- Network Loop** Engineering
- SDI/ESDI/DCHI/CONFERENCE/TDS** Provisioning
- PRI/DTI/CPI** Provisioning
- Common Equipment Card Placement Rules
- Module And Column Provisioning
- Power
- Memory
- Real Time
- Non-Blocking Applications
- Meridian Mail
- Remote Peripheral Equipment (RPE)

3.1 SOFTWARE PROVISIONING

The following is a list of software packages and the software options that are included in each package. Packages are selected by entering the corresponding Software Inputs. Please refer to the Software section of the input sheet at the end of this section.

INPUT	ORDER CODE	DESCRIPTION	SOFTWARE OPTIONS
N/A	SW0000A	MERIDIAN BASE SOFTWARE	0,1,4,5,7,8,9,10,11,14,16,17,18,19,20,21,22,23,24,25,28,29,32,33,34,36,44,46,47,48,49,52,53,54,55,57,60,61,64,70,71,72,73,74,75,76,80,81,87,88,89,90,91,95,107,108,115,119,139,140,157,170,173,203,204,205
110	SW0001A	SPECIAL APPLICATION FEATURES	110,113
150	SW0005A	DN EXPANSION	150,151
84	SW0006A	AUTOMATIC TRUNK MAINTENANCE	65,84
68	SW0007A	AUTOVON	68,69,106
2	SW0008A	MULTI-CUSTOMER	2
86	SW0009A	MULTI-TENANT	86,172
12	SW0010A	AUTOMATIC NUMBER IDENTIFICATION	12,13
102	SW0017A	HOSPITALITY APPLICATION	92,99,100,101,102
103	SW0018A	PROPERTY MAN. SYS. INTERFACE	103
56	SW0019A	ATTENDANT OVERFLOW POSITION	56
93	SW0020A	SUPERVISORY CONSOLE	93
57	SW0021A	ATTENDANT ALTERNATIVE ANSWER	174
15	SW0022A	REMOTE PERIPHERAL EQUIPMENT	15
105	SW0024A	LINE LOAD CONTROL	105
26	SW0025A	CAS-MAIN	26
27	SW0026A	CAS-REMOTE	27
5	SW0027A	CDR LINK	6
N/A	SW0028A	FAST TDS	87
58	SW0041A	NARS	58
59	SW0042A	COORDINATED DIALING PLAN	59
63	SW0043A	NETWORK AUTHORIZATION CODE	63
37	SW0044A	BASIC ESN FEATURES	37,38,67
39	SW0045A	ADVANCED ESN FEATURES	39,62
45	SW0201A	BASIC ACD FEATURES (ACD-A)	7,17,40,45,83
41	SW0202A	ADVANCED ACD FEATURES (ACD-B)	41,98,116
42	SW0203A	ACD REPORTS (ACD-C1)	42
43	SW0204A	ACD LOAD MANAGEMENT (ACD-C2)	43
50/51	SW0205A	ACD LINK (ACD-D or MAX)	50,51
114	SW0206A	ACD-MAX REPORTS ENHANCEMENTS	114,155
121	SW0207A	ENHANCED ACD OVERFLOW	178
111	SW0208A	ACD TIMED OVERFLOW	111
122	SW0209A	NETWORKED ACD	207
N/A	SW0300A	BASIC ISDN FEATURES	118,145
146	SW0301A	PRIMARY RATE ACCESS	146
147	SW0302A	ISDN SIGNALING LINK	147
148	SW0303A	ADVANCED ISDN FEATURES	148
149	SW0304A	INTER-EXCHANGE CARRIER	149
117	SW0305A	CALL BY CALL SERVICE	117
120	SW0306A	NETWORK MESSAGE CENTER	175
109	SW0401A	APPLICATION PROCESSOR LINK	109
35	SW0402A	IVMS LINK	35
77	SW0403A	MERIDIAN MAIL LINK	77,85
153	SW0405A	MERIDIAN LINK ISDN/AP DIRECT CONN	153
152	SW0406A	MERIDIAN LINK SERVER	152

3.2 PERIPHERAL EQUIPMENT CARDS AND MODULES

There are two generations of Peripheral Equipment (PE) which can be provisioned -- Intelligent PE (IPE) and Enhanced PE (EPE). This notation is used throughout this section to distinguish between the two when necessary.

3.2.1 IPE Cards

Card	Functionality	Ports
NT8D02AA	Console (5 ports/3 TNs) Digital Voice & Data Lines (2 TNs/Line) Digital Voice Only Lines	16
NT8D03AB	2500 Analog Lines 500 Analog Lines ¹ Async Modem Pool Lines ² Sync/Async Modem Pool Lines	16
NT8D09AA	2500 Analog Lines 500 Analog Lines Message Waiting 2500 Analog Lines Message Waiting 500 Analog Lines	16
NT8D14AA	CO Trunks DID Trunks FX Trunks Loop Tie Trunks Paging Trunks RAN Trunks WATS Trunks	8
NT8D15AA	CCSA Trunks Dictation Trunks E&M Tie Trunks Paging Trunks	4
NT8D16AA	Digitone Receiver	8

¹ **Async** Modem Pool Lines require both a **NT8D03AB** port and a QPC723 port,

² Sync/Async Modem Pool Lines require both a **NT8D03AB** port and a QPC432 port.

3.2.2 EPE Cards

Card	Functionality	Ports
QPC71	DX Signalling Trunks	2
QPC192	OPX 2500 Lines	4
	OPX 500 Lines	
QPC250	RLT - Remote Trunks	4
QPC297	Supervisory Line Card	4
QPC432	CIM Lines	4
	MCCS Lines	
	MCDS Async Lines	
	MCDS High Speed Lines	
	Sync/Async CPU Terminations	
	Sync/Async Data	
	² Sync/Async Modem Pool Lines	
QPC430	Async Data Lines	4
QPC422	Tone Detector	2
QPC723	¹ Async Modem Pool Lines	4
	RILC Data Lines	

¹ **Async** Modem Pool Lines require both a **NT8D03AB** port and a QPC723 port.

² Sync/Async Modem Pool Lines require both a **NT8D03AB** port and a QPC432 port.

Autoquote optimizes the number of PE cards required by assigning multiple types of ports on the same card. **For** example:

Unused Message Waiting (**NT8D09AA**) ports are used **for 500/2500** and Data Analog lines before the number of Analog (**NT8D03AA**) card are calculated.

Unused Universal Trunk (**NT8D14AA**) ports are used for CO, WATS, FX and Paging lines **before the** number of XCOT and E&M (**NT8D15AA**) cards are calculated.

3.2.3 Digitone Receivers

Digitone Receivers (**DTR's**) interpret all **digitone** signals for the SL-1 CPU. The number of DTR cards is determined in **a** three step procedure:

- 1) Calculate DTR traffic.
- 2) Determine the DTR ports needed to support DTR traffic.
- 3) Calculate DTR cards to accommodate required-DTR ports.

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3.2.3.1 DTR Traffic

The model below illustrates the port types, autoquote inputs and factors from which DTR CCS is calculated. (Note: **The demand on DTR's caused by CAS Authorization Codes, and/or CDR Charge Account Codes is NOT addressed in the Autoquote system. Additional DTR's required for these applications must be manually added to the quote.j**)

P3 in the inputs column denotes Phones Lines and Trunks input 3.

DTR CCS CALCULATION	Inputs

2500 Lines CCS	P3 (Ports * CCS)
+ Message Waiting 2500 Lines CCS	PS (Ports * CCS)
+ OPX 2500 Lines CCS	P7 (Ports * CCS)

Total 2500 CCS	
* 10.114 (Constant)	

= 2500 DTR CCS	
DX Signalling Trunks CCS	P16 (Ports * CCS)
+ E&M Tie Trunks CCS	P17 (Ports * CCS)
+ Loop Tie Trunks CCS	P18 (Ports * CCS)

= Total Tie Line CCS	
* % Digitone Tie Line Traffic	B2 / 100
* 10.114 (Constant)	

= Tie DTR CCS	
CCSA Trunks CCS	P12 (Ports * CCS)
* % Digitone CCSA Traffic CCS	B3 / 100
* 10.114 (Constant)	

= CCSA DTR CCS	
DID Trunks CCS	P40 (Ports * CCS)
* DID Traffic Digitone (0 or 1)	B4
* 2.5 (Constant)	

= DID DTR CCS	
2500-DTR CCS	
+ Tie-DTR CCS	
+ CCSA-DTR CCS	
+ DID-DTR CCS	

= Total DTR CCS	
/ Average Holding Time	M23

= DTR CCS (avg)	

3.2.3.2 DTR Port Provisioning Table

The number of DTR Ports is determined by cross-referencing the calculated DTR CCS with the following table:

DIGITONE RECEIVER PROVISIONING TABLE
(assumes 11 second -holding time)

CCS			ccs			CCS		
From	To	PORTS	From	To	PORTS	From	To	PORTS
1	2	2	952	984	39	2241	2275	76
3	9	3	985	1017	40	2276	2310	77
10	19	4	1018	1050	41	2311	2345	78
20	34	5	1051	1084	42	2346	2380	79
35	50	6	1085	1118	43	2381	2415	80
51	69	7	1119	1153	44	2416	2450	81
70	89	8	1154	1188	45	2451	2485	82
90	111	9	1189	1223	46	2486	2520	83
112	133	10	1224	1258	47	2521	2555	84
134	157	11	1259	1293	48	2556	2590	85
158	182	12	1294	1329	49	2591	2625	86
183	207	13	1330	1365	50	2626	2660	87
208	233	14	1366	1400	51	2661	2695	88
234	259	15	1401	1435	52	2696	2730	89
260	286	16	1436	1470	53	2731	2765	90
287	313	17	1471	1505	54	2766	2800	91
314	342	18	1506	1540	55	2801	2835	92
343	371	19	1541	1575	56	2836	2870	93
372	398	20	1576	1610	57	2871	2905	94
399	427	21	1611	1645	58	2906	2940	95
428	456	22	1646	1680	59	2941	2975	96
457	487	23	1681	1715	60	2976	3010	97
488	515	24	1716	1750	61	3011	3045	98
516	545	25	1751	1785	62	3046	3080	99
546	576	26	1786	1820	63	3081	3115	100
577	607	27	1821	1855	64	3116	3150	101
608	638	28	1856	1890	65	3151	3185	102
639	667	29	1891	1925	66	3186	3220	103
668	698	30	1926	1960	67	3221	3255	104
699	729	31	1961	1995	68	3256	3290	105
730	761	32	1996	2030	69	3291	3325	106
762	793	33	2031	2065	70	3326	3360	107
794	825	34	2066	2100	71	3361	3395	108
826	856	35	2101	2135	72	3396	3430	109
857	887	36	2136	2170	73	3431	3465	110
888	919	37	2171	2205	74			
920	951	38	2206	2240	75			

3.2.3.3 DTR Cards

The number of DTR Cards required (**NT8D16AA**) is calculated by dividing total DTR Ports by 8 except on the Option 21. The Option 21 has 8 DTR ports in the base Network/Controller Card. These are used before any **NT8D16AA** are added. Example:

Option 21

DTR Cards = Round Up [(DTR Ports * 8)/(8 Ports Per DTR Card)]

Options 51,61,71

DTR Cards = Round Up [(DTR Ports)/(8 Ports Per DTR Card)]

3.2.4 Tone Detector

A tone detector (QPC422) is provisioned if Automatic Trunk Maintenance (ATM) software is requested. The QPC422 requires an EPE shelf.

3.2.5 IPE Modules

IPE shelves have 16 slots for cards plus one slot for a Ringing Generator and one Slot for a controller card. There are four 4-slot segments in each IPE shelf.

The Option 21 has one dedicated 10 slot IPE shelf in the base module. This shelf has no segmentation.

3.2.6 EPE Modules

EPE shelves have 10 Slots for PE cards plus one slot for a Ringing Generator and one Slot for a **QPC659** Buffer. There are two 5-Slot segments in each EPE shelf.

3.2.6.1 Controller Cards

An **NT8D01AD** Controller 2 is provisioned for IPE shelves supported by 2 or less Superloops. An **NT8D01AC** Controller 4 is provisioned for IPE shelves supported by 3 or 4 Superloops. A **QPC659** Dual Loop Buffer is used for all EPE shelves.

3.2.6.2 Ringing Generators

Ringing Generators (**NT8D21AA, NT7D03AA**) are required in all IPE and PE shelves which house analog line cards (**NT8D03AA, NT8D09AA** for IPE and **QPC192** for EPE). The **NT8D21AA** is provisioned for AC powered systems and the **NT7D03AA** is provisioned for DC systems.

To determine the quantity of ringing generators the following calculation is used for IPE and EPE shelves individually.

$$\text{Ringing Generators} = (\% \text{ Analog}) * \text{Factor} * (\text{PE Modules})$$

% Analog Cards = Analog Cards/PE Slots.

Factor defaults to 2.0

This calculation allows for even distribution of Analog Cards while minimizing the number of Ringing Generators which must be purchased. The user has the option to use a Factor other than the default of 2.0 (Miscellaneous/Memory Input 190). A higher factor will **result in** more PE shelves containing Ringing Generators.

The Option 21 has a 10 slot IPE shelf in the base module which gets ringing current from the **CE/PE** Power supply and therefore does not require a Ringing Generator.

3.3 NETWORK LOOP ENGINEERING

This section covers the rules used for provisioning network loops for Meridian 1 Systems. Models (Option 21, 51, 61 and 71) are only mentioned if a rule is different for a particular model.

3.3 .1 Calculating Network Loops

There are two types of network loops: Superloop (NT8D04AA) and Enhanced Loop (QPC414). The Superloop (NT8D04AA) supports the traffic in IPE modules. The Enhanced Loop (QPC414) supports the traffic in EPE modules and is also required for Meridian Mail and applications of Primary Rate Interface (PRI), Digital Trunk Interface (DTI), and Computer to PBX interface (CPI).

Separate calculations for the following are required to provision network loops.

- Option 21
- IPE Modules **P.01** GOS
- EPE Modules **P.01** GOS
- Meridian Mail
- PRI,DTI,CPI
- Non-blocking

3.3.2 Option 21 Special Case

The Option 21 base module contains a combination network/controller card which is dedicated to the 10 slot IPE shelf in that module. There is no network loop engineering required for this loop as it will support all traffic requirements of the 10 slot shelf.

3.3.3 IPE Modules (P.01 GOS)

Superloop requirements to support IPE modules is determined from the total IPE modules CCS and the total number of IPE modules:

The **P.01** GOS capacity for a Superloop is 3500 CCS, 120 time slots.

A maximum of two IPE modules may be supported by a single Superloop.

The number of Superloops required to support IPE modules is the greater number of the following calculations:

Superloops Required to Support Traffic (P.01 GOS)

Roundup[(Total IPE CCS) / (3500 CCS/Superloop)]

or

Superloops Required to Support IPE Modules:

Roundup[(Number of IPE Modules) / (2 Modules/Superloop)]

3.3.4 EPE MODULES (P.01 GOS)

Enhanced Loop requirements to support EPE modules is determined from the total EPE modules CCS and the total number of modules:

The P.01 GOS capacity for an Enhanced Loop is 700 CCS, 30 time slots. 700 CCS is being used for Enhanced Loops as opposed to the previous 660 CCS because these loops will support a low number of terminations.

The QPC414 contains two Enhanced Loops.

A maximum of two EPE modules may be supported by a single Enhanced Loop.

The number of enhanced loops required to support EPE modules is the greater number of the following calculations:

Enhanced Loops Required to support EPE traffic (P.01 gos):

Roundup[(Total EPE CCS) / (700 CCS/Enhanced Loop)]

or

Enhanced Loops Required to support EPE modules (P.01 GOS):

Roundup[(Number of IPE Modules) / (2 Modules/Enhanced Loop)]

The number of Enhanced Network Cards (QPC414) required is calculated by dividing the number of Enhanced Loops by two:

Enhanced Network Cards Required to support EPE traffic (P.01 GOS):

Roundup[(Required Enhanced Loops) / 2]

3.3.5 Network Segmentation

The IPE shelves contain four 4-slot segments. One Superloop can support from one to four segments per IPE module and up to a maximum of two IPE modules.

The EPE shelves contain two 5-slot segments. An enhanced loop can support one or two segments per EPE module and up to a maximum of two EPE modules.

The assignment of segments to loops for both IPE and EPE modules is accomplished by:

- a) trying to achieve even distribution (i.e same number of segments assigned to all loops)
- b) if even distribution is not possible, the next choice is to choose the quantity of loops and segments per loop which

gives the best distribution possible.

In case b, Autoquote will display a warning message on the reports indicating that an even distribution of segments to loops was not possible. The user has the option to do a manual assignment and determine that a **P.01** GOS can be obtained with the uneven distribution or add additional network loops to make the distribution even.

3.3.6 Meridian Mail Loops

Each Meridian Mail Voice Channel requires 28 CCS of traffic capacity on an Enhanced Loop.

If the total traffic requirement for Meridian Mail does not increase the total number of network loops required then Meridian Mail traffic is assumed to be "shared" with PE shelf traffic.

If the total traffic requirement for Meridian Mail does increase the total number of network loops required, then the additional network loops are assumed to be "dedicated" to Meridian Mail.

The 28 CCS per Voice Channel equates to one network loop being required for every 24 Voice Messaging Channels.

3.3.7 PRI/DTI/CPI

One Enhanced traffic loop (2 per QPC414) is required to support a **PRI/DTI/CPI** link. No traffic engineering is required since each channel will always have access to a **timeslot** on the network loop (Refer to **Section** , **PRI/CPI/DTI** Provisioning).

3.3.8 Non Blocking

Superloops and Enhanced Loops for Non Blocking applications are dedicated Non Blocking only (Refer to Non Blocking Applications, page 54:

3.4 **SDI/ESDI/DCHI/CONFERENCE/TDS** PROVISIONING

3.4.1 *SDI Provisioning:*

3.4.1.1 **SDI** Ports:

Each system requires a minimum of four ports to serve the following: system monitor, local maintenance, remote maintenance, and CDR list. In addition each of the following inputs provisions an additional **SDI** port.

INPUT	CLASS	NUMBER
CDR Link (CDR Mag Tape)	SOFTWARE	5
ACD Load Management (ACD-C2)	SOFTWARE	43
ACD Link (ACD-D)	SOFTWARE	50
Meridian Manager Traffic	MISC/MEM	172

The total number of **SDI** ports quoted is the sum of the four required ports, the additional required ports noted above, and additional ports requested via Miscellaneous/Memory input 21.

3.4.1.2 **SDI** Cards:

There is one **SDI** port on the Option 21A and Option 21 CPU (QPC687) card. There is also one **SDI** port on each DCHI (QPC757) card. If more **SDI** ports are required than are available on the CPU and DCHI cards, than **SDI** Paddle Boards may be provisioned.

Each **SDI** Paddle Board (**NT8D41AA**) provides two **SDI** ports. They are quoted in the AS1052 2-Port Paddle Board Assembly and are housed on the rear of the **CE/PE** or **CE/NE** modules (no common equipment slots are used). The maximum number of **SDI** Paddle Boards provisioned depends on the system type.

<u>System</u>	<u>Maximum SDI Paddle Boards</u>
Option 21A	2
Option 21	3
Option 51	2
Option 61	4
Option 71	0

If the maximum **SDI** Paddle Boards is provisioned and more **SDI** ports are still required, then four port **SDI** cards (**QPC841**) are quoted. These cards are provisioned in the AS1051 4-Port **SDI** Assembly and are housed in common equipment slots.

3.4.1.3 **SDI** Cables:

One 48ft cable is provisioned for each CDR List and/or CDR Link application. If a **SDI** Paddle Board is quoted the **NT8D93AW** is provisioned, otherwise the **NT8D95AW** is used.

One 16ft cable is provisioned for each remaining SDI port. The NT8D93AJ is provisioned for SDI Paddle Boards and the NT8D95AJ is provisioned for CPU, DCHI, and SDI cards.

3.4.2 ESDI Provisioning:

ESDI ports are determined by software options that require ESDI ports and engineering adjustments made to inputs. The following software options require one ESDI port: Command and Status Link (77), and ISDN/AP Third Party Vendor (153).

Each ESDI Card (QPC513) provides two ESDI ports. They are provisioned as additional equipment except when included in a Meridian Mail assembly.

3.4.3 DCHI Provisioning:

DCHI Cards are provisioned based on PRI inputs. One card is required for every 16 PRI links serving a particular destination. For example, if destination A needs three links and destination B needs nineteen links, a total of three DCHI cards is required. A maximum of eight DCHI cards may be configured.

3.4.4 Conference/TDS Card Provisioning:

The quantity of Conference/TDS (NT8D17AA) cards quoted is the minimum number of Conference cards required by the system. As noted below, the minimum number of Conference cards depends on system model and size.

<u>System</u>	<u>Minimum Conference Cards</u>
21	1
51	1
61	2
71 - 1 Group	2
71 - 2 Groups	4
71 - 3 Groups	6
71 - 4 Groups	7
71 - 5 Groups	9

Additional Conference cards requested by Miscellaneous/Memory input 38 will be provisioned as QPC444 Conference cards.

3.5 PRI/DTI/CPI PROVISIONING

3.5.1 General Information

Software Requirements

PBX Software is a prerequisite for all three applications.
PRA Software is a prerequisite for **PRA** applications.

Traffic Engineering

One Enhanced traffic loop (QPC414) is required to support a **PRI/DTI/CPI** link. No traffic engineering is required since each channel will always have access to a **timeslot** on the network loop.

General Provisioning

The number of links provisioned corresponds to the quantities selected via the following Lines, and Trunks inputs:

DTI • Input 40
CPI • Input 41
PRI • Inputs 171-178

3.5.2 Hardware

PRI

The **QPC720** Primary Rate Interface, QPC757 D-Channel Interface, and the QPC471 Clock Controller are the primary hardware components used in PRA applications. The **QPC720** is also used in DTI/CPI applications. The **QPC720** is a double wide card and requires two adjacent Common Equipment card slots.

Clock Controller

The QPC471 Clock Controller(s) is provisioned when PRA and/or DTI is quoted. Only one is required for non-redundant systems (Options 21 and **51**), two are required for redundant systems (Options 61 and 71).

DCHI

The QPC757 D-Channel Interface (DCHI) is provisioned for every 16 PRI links terminating at the same destination, and one is provisioned for each ISDN Signaling Link. A maximum of eight QPC757 **DCHI's** can be provisioned on a system.

DTI

The QPC720 and the QPC471 are the primary hardware components used in DTI applications.

CPI

The CPI application uses the **QPC720** only; the QPC471 is not required.

PRI/DTI/CPI Expansion (Network) Modules

Additional network modules can be provisioned to house the **QPC720** cards on all system options. Each module can support up to 6 **QPC720** cards.

Clock Controller Cables

The following cables are provisioned when PRI and/or DTI are quoted:

NT8D79AF (PRI to Clock Controller)

One for each PRI/DTI card, up to a maximum of two on non-redundant systems (Options 21 and 51) four on redundant systems (Options 61 and 71).

NT8D75AD (Clock Controller to Clock Controller)

One for redundant systems (Options 61 and 71) only.

3.6 COMMON EQUIPMENT CARD PLACEMENT RULES

The following is a list of CE cards that must be placed. Other CE cards that have fixed slot placement are not mentioned.

NT8D04AA	Superloop
QPC414	Enhanced Network Loop
QPC720	PRI
QPC471	Clock Controller
QPC757	DCHI
QPC814	SDI
QPC513	ESDI
NT8D17AA	Conference/TDS

3.6.1 General Rules:

Each Superloop takes one physical slot and one virtual slot on all Options except the Option 21. This is required because the Superloop uses 4 consecutive network buses. (e.g. 0-3,4-7,8-11). This means that no card that requires a network bus may be placed in a virtual slot of a Superloop, but other cards can be placed in the virtual slot. If two Superloops are placed in such a way that the two virtual slot are adjacent, then double wide cards (e.g. **QPC720**) that only require power or signalling can be placed between the Superloops.

On the Option 21 Superloops may be placed in adjacent slots. This is the only exception to the above rules on Superloops.

The **QPC720** PRI Card **and** the **NT8D68AA** Floppy Disk Unit are double wide cards **and** require two adjacent slots.

The **NT8D69AA** Multi-Disk Unit requires three adjacent slots.

3.7 MODULE AND COLUMN PROVISIONING

3.7.1 Module Provisioning

This section explains module provisioning and module placement rules for Common Equipment, Peripheral Equipment and Other Equipment modules. The term "Column" is used to represent a stack of modules. A column can contain up to four modules. As such, the term "Module Level" refers to the level from the bottom that a module occupies. Therefore, Column 2, Level 3 indicates the third module of column two.

3.7.1.1 Common Equipment Modules and Placement

The Common Equipment module types to be provisioned are:

<u>Module</u>	<u>Description</u>	<u>System Type(s)</u>
CEPE	Common/Peripheral Equipment	Option 21
CNE	CPU/Network	Option 51,61
CPU	CPU	Option 71
NET	Network	Option 71
NET/PRI	PRI Network Expansion	Option 21,51,61,71

3.7.1.1.1 Common/Peripheral Equipment Module (CEPE)

The Common/Peripheral Equipment Module (CEPE) is provisioned for all Option 21 systems. No other systems use this module. This module contains the CPU function, network slots and 10 slots of Intelligent PE (IPE) and is always located at the first module level of an Option 21.

3.7.1.1.2 CPU/Network Module (CNE)

One CPU/Network (CNE) Module is provisioned with the Option 51 (**half-network group**); two are provisioned with the Option 61 (**full network group**). The CNE Module(s) contain the CPU and Network functions for the Option 51 and 61. This module is located in module level 1 on an Option 51 and in module levels 1 and 2 on the Option 61.

3.7.1.1.3 CPU Module (CPU)

Two CPU Modules are provisioned on the Option 71, one for CPU 0 and another for CPU 1. Each CPU modules are positioned in module level 1 of adjacent columns.

3.7.1.1.4 Network Module (NET)

The Network Module is only provisioned on the Option 71 as a primary network module which will house network cards. Two Network modules comprise a network group. The Option 71 can accommodate up to five network groups, therefore, ten Network modules. The two network shelves

which comprise a network group must be positioned together in a column. The first two network groups for an Option 71 are positioned directly above the CPU modules as mentioned above. The remaining three network groups can be positioned in any remaining module positions.

3.7.1.1.5 PRI Network Expansion Module- (NET/PRI)

The PRI Network Expansion Module can be used on the Option 21, 51, 61 and 71. Each NET/PRI module can house up to six QPC720 PRI packs and in the case of the Option 21 can house the Floppy Disk Unit. NET/PRI modules are provisioned if primary CE slots are not available for the QPC720 PRI packs. Generally, there is no limit to the number of NET/PRI modules that can be provisioned with a system; the limiting factor is Network module space to house the supporting QPC414 network cards, clock Controller cards and D-Channel Interface cards.

3.7.1.2 Peripheral Equipment Modules

The Peripheral Equipment module types to be provisioned are:

<u>Module</u>	<u>Description</u>	<u>System Type(s)</u>
IPE	Intelligent Peripheral Equipment	Option 21,51,61,71
EPE	Enhanced Peripheral Equipment	Option 21,51,61,71

3.7.1.2.1 Intelligent Peripheral Equipment Module

The Intelligent Peripheral Equipment module contains 16 slots for housing Intelligent PE cards. These modules are provisioned based on the number required to house the wired for IPE cards. The IPE module can be housed in any module level.

3.7.1.2.2 Enhanced Peripheral Equipment Module

The Enhanced Peripheral Equipment module contains 10 slots for housing Enhanced PE cards. These modules are provisioned based on the number required to house the wired for EPE cards. The EPE module can be housed in any module level.

3.7.1.3 Other Equipment Modules

The Other Equipment Modules provisioned are:

<u>Module</u>	<u>Description</u>	<u>System Type(s)</u>
MM	Meridian Mail	Option 21,51,61,71
RPE	Remote Peripheral Equipment	Option 21,51,61,71
IGM	Inter-Group Module	Option 71

3.7.1.3.1 Meridian Mail (MM)

There are two basic types of Meridian Mail Modules. The first is the Prime Node which houses the Tape Drive Module. All additional modules are referred to as Voice Nodes. The Prime Meridian Mail module will be provisioned with any Meridian Mail system. Additional Voice Node Meridian Mail modules will be provisioned based on the number of Network Voice Processors (NVP) required. The positioning rules for Meridian Mail modules in Autoquote assume a maximum room temperature of 40 degrees Celsius (104 degrees F). The Prime node can be placed in the first two module level positions. The additional Voice Nodes can be placed in the first, second, or third module positions. In addition, Meridian Mail modules need to be co-located for connectivity.

3.7.1.3.2 Remote Peripheral Equipment (RPE)

The RPE modules which contains the Local Carrier Interface equipment are provisioned based on the number of RPE loops required. Each RPE module supports two. remote loops. The RPE module can be located in the first or second module level

3.7.1.3.3 Inter-Group Module (IGM)

The Inter-Group module is only used on the Option 71. One IGM module will be provisioned per Option 71 system for inter-network group connectivity.

3.7.2 Pedestals and Sidepanel/Spacer Kits

In determining the module and column configuration for Meridian 1, the pedestal types and **sidepanel/spacer** kits must be considered.

3.7.2.1 Pedestals

The same general pedestal is used in all configurations, however, the contents of the pedestal assembly can differ as explained below. Please refer to the Pricing Manual for package breakdowns and assembly codes.

The Option 21A **Pedestal/Topcap** assembly is used on all **single** module Option 21A systems. This assembly contains a **blower** unit designed for cooling a one module system.

A Two-Module Pedestal Assembly is provisioned on Option 21 systems which contain two modules. This assembly contains a Pedestal Fan Unit designed for cooling a two module system.

The standard Pedestal Assembly is used for columns which will include up to four module levels.

A Special Pedestal assembly is used for systems containing

Meridian Mail. This assembly contains the same pedestal equipment as in the standard Pedestal Assembly mentioned above, however a maximum of one of these assemblies can be ordered in systems which contain Meridian Mail.

The minimum required pedestal assemblies will be provisioned based on the configuration quoted. However, Miscellaneous/Memory Input 11 can be used to override the pedestal provisioning assumptions. If Input 11 is set to 2, at least a two module pedestal assembly will be provisioned and if Input 11 is set to 4, a four module pedestal assembly will be required.

3.7.2.2 Sidepanels/Spacer Kits

Sidepanels are provisioned for all module sides which are exposed. Spacer Kits are provisioned for every two adjoining modules. The number of Sidepanels and Spacer Kits provisioned is based on the number of modules as well as the module placement within columns.

3.0 POWER

3.8.1 Power Configurations

Except for the Option **21A**, all Meridian 1 systems may be configured for either an AC or DC power source. The Option 21A -is strictly an AC powered system.

A DC powered system may be quoted with or without rectifiers. A **DC** system quoted without rectifiers is assumed to have a customer provided power source.

The power configuration quoted is determined by the value of Miscellaneous/Memory input 1.

- 1 = AC
- 2 = **DC** - Customer Provided Power
- 3 = DC - Using Rectifiers

3.8.2 Power Calculations .

System Power, BTU Output, and Load are calculated using the following module power values.

Power Requirements Per Module	Consumption (Watts)	Dissipation BTU (Watts)
CE/PE	500	450
CPU/Network	360	360
CPU	300	300
Network	270	270
EPE	240	200
Intelligent PE	460	380
RPE local side (w/DTI)	175	175
RPE remote side	100	100
Meridian Mail	400	400
Intergroup Module	0	0
Pedestal (Blowers)	50	0
Rectifiers:	30 Amp	175
	50 Amp	290

System Power is calculated by summing the power consumption of-all modules quoted.

System BTU Output is calculated by summing the power Dissipation of all modules and rectifiers and multiplying **by** the constant 3.415.

System Load (Amps) is determined by dividing the System Power by the appropriate divisor: 52 Volts for DC **systems**, 230 Volts for AC systems.

3.8.3 Power Components

All power components for AC systems are included in the base system packages.

DC systems using customer provided power are provisioned the AS1017D Customer Provided Power Assembly which includes a QBL12 Battery Distribution Unit.

DC systems with rectifiers are provisioned the number of rectifiers required to support the system load.

$$\begin{aligned} \text{Quantity of Rectifiers} &= \text{System Load} / \text{Amps per Rectifier} \\ \text{Rectifier Output} &= \text{Quantity of Rectifiers} * \text{Amps per Rectifier} \end{aligned}$$

Options 21, 51, and 61 are quoted with 30 Amp Rectifiers (NT6D52AA). These rectifiers **are** housed in a rectifier rack (NT7D12AA) which supports a maximum of three rectifiers and/or a maximum of eight modules. Thus the quantity of racks quoted is the larger of the following expressions.

$$\begin{aligned} \text{Quantity of Racks} &= \text{Rectifiers} / 3 \\ \text{Quantity of Racks} &= \text{Modules} / 8 \end{aligned}$$

Note that one rectifier and one rectifier rack are included in the base system packages.

Option 71 utilizes 50 Amp Rectifiers (NT5C03) housed in Prime Rectifier Cabinets (B0225152). Each cabinet may house up to four rectifiers. Note that the Option 71 base system package contains one prime cabinet and one 50 amp rectifier. If desired, the prime rectifier cabinet may be quoted on an option 51 or 61 using Miscellaneous/Memory input 12.

3.8.4 Reserve Power

Both AC and DC powered systems may utilize reserve power sources.

3.8.4.1 AC Systems (UPS):

Reserve power for an AC system is provided by an Uninterruptible Power Supply (UPS). Autoquote calculates the UPS rating as follows.

$$\text{UPS rating} = \text{System Power} / 0.6$$

One UPS cable is required for any AC system with reserve power. The actual cable provisioned is dependent on the UPS vendor as indicted by Miscellaneous/Memory input 10.

3.8.4.2 DC Systems (Batteries):

Autoquote calculates battery requirements as follows.

$$\text{Battery Requirements} = \text{System Load} * \text{Battery Factor}$$

The Battery Factor is dependent on the hours of backup required and the battery type used.

Hours	Absolyte	Lead-Calcium
1	1.8	3.0
2	3.1	4.0
3	4.2	5.0
4	5.2	5.9
5	6.2	6.9
6	7.1	7.7
7	7.8	a.5
a	a.5	9.3
9	9.4	10.1
10	10.2	10.9

If more than 10 hours of backup is required, the factor becomes linear. For example, if 15 hours are required the factor is 15.

Note that the Option 71 requires a minimum of 4 hours of battery backup.

3.9 MEMORY

Autoquote calculates three memory components for each Meridian 1 system: Protected Data (P-Data), Unprotected Data (U-Data), and Program Store. Utilization of these components is estimated at equipped and wired levels. These utilization measures are compared to appropriate capacities to ensure the system has adequate memory for the quoted functionality.

3.9.1 Memory Calculations

Autoquote employs memory values and calculations detailed in the Controlled Release Memory documents. Exceptions and special notations are listed below. Each 1024 words equals **1k** of memory.

A 5% error factor is included for each memory component.

A 900 word error margin is added to P-Data and U-Data utilization to account **for** the error factor of low memory systems.

P-Data is not calculated for the following software options:

- New Flexible Code Restriction
- Network Automatic Route Selection
- Coordinated Dialing Plan

P-Data required for these features should be calculated manually based on specific customer requirements. Additional P-Data may be added to a quote using Memory input 47.

P-Data required for Basic Automatic Route Selection (BARS) is estimated to be **7000 words**. **No factor is included for Specialized Common Carriers**

requiring 6-digit translation.

An additional 12% P-Data requirement is incorporated for DN translation.

P-Data and U-Data values used for various line ports are:

<u>Lines</u>	<u>P-Data</u>	<u>U-Data</u>
500/2500 Ports	10.5	4.5
Digital Voice Ports		
< 16 Buttons	22.5	14.5
>= 16 Buttons	26.5	14.5
Sync Data Ports	14.5	14.5
Async Data Ports	9.5	14.5

3.9.2 Memory Capacities

Memory capacities vary depending on system type.

3.9.2.1 Option 21

One **NT8D19AA** memory/signaling card is included in each system package. Although this card provides 768k total storage, it is addressed by pages of 64k for the following purposes.

	<u>Pages</u>	<u>Storage</u>
I/O Addressing	1	64k
U-Data	1	64k
P-Data	1	64k
Program Store	9	576k
Total	12	768k

If necessary, Program Store may overflow into the P-Data page. Due to this paging, **memory** utilization is limited as noted below.

	<u>Capacity</u>
U-Data	64k
P-Data	64k
P-Data + Program Store	640k

3.9.2.2 Option 51

One QPC583 memory card is included in each system **package**. This card provides 768k total storage. No paging limitations exist. The sum of U-Data, P-Data, and Program Store may not exceed 768k.

3.9.2.3 Option 61

Two QPC583 memory cards are include in each system package. These cards provide 768k **total* redundant** storage. No paging limitations exist. The

sum of U-Data, P-Data, and Program Store may not exceed 768k.

3.9.2.4 Option 71

Two **QPC583** memory cards are include in each system package. These cards provide 768k redundant storage. No paging limitations exist. **Two** additional QPCS83 memory cards may be added to provide **1536k** redundant storage. Four additional QPC583 memory cards may be added to provide **2304k** total redundant storage. The sum of U-Data, P-Data, and Program Store may not exceed **2304k**.

3.10 REAL TIME

CPU Real Time utilization is estimated for each Meridian 1 system based on system traffic and applications. A rated call carrying capacity is determined assuming 70% of the busy hour (2520 seconds) is available for call processing. This rated capacity may not be exceeded by the wired calls per hour.

3.10.1 Rated Call Carrying Capacity

The rated call carrying capacity incorporates the following factors.

- 500/2500** Set Calls
- Digital Set Calls
- Trunk Calls
- Tie Line Calls
- Call Party Name Display
- Coordinated Dialing Plan
- Automatic Call Distribution (ACD)
- Meridian Mail
- Call Detail Recording (CDR)
- Authorization Codes
- Off-Hook Queuing
- Basic Automatic Route Selection (BARS)
- Network Automatic Route Selection (NARS)
- New Flexible Code Restriction
- Primary **Rate** Access
- Superloop Ports

3.10.2 Call Detail Recording (CDR)

CDR has a great impact on CPU real time. To ensure this impact is accounted for correctly, Miscellaneous Memory input 14 is used to specify how CDR will be used. Default CDR Usage is outgoing calls only.

3.10.3 Tie Line Calls

To accurately account for **tie line** calls, Basic Information input 10 is used to specify the number of **DTI/PRI** links which will serve **as tie**

lines. The default is zero.

3.10.4 *Calls Per Hour*

The number of calls per hour is calculated as follows.

$$P * 100 * 0.5 / H$$

where P = Total traffic in CCS

H = Average Holding Time

The default Average Holding Time is 180 seconds, but **may** this be altered using Miscellaneous/Memory input 23.

3.11 NON-BLOCKING APPLICATIONS

Non-Blocking applications require that all ports have access to a network loop **timeslot** at all times. In other words, the number of ports supported by a loop cannot exceed the number of timeslots on that loop. Options 21, 51, 61 and 71 can be quoted as totally or partially **non-blocking**. Autoquote assumes that non-blocking **PE** modules are partitioned and separate from normal **P.01** PE modules. In addition, Intelligent PE (IPE) and Enhanced PE (EPE) non-blocking applications require separate modules. Generally the number of non-blocking ports which can be quoted is based on the network **timeslot** capacity of the system.

3.11.1 Non-Blocking Inputs

Quoting a non-blocking configuration requires entering inputs for **non-blocking** ports, cards and modules. In addition, the non-blocking Average Holding Time (AHT) can be adjusted using Miscellaneous/Memory Input 123. The non-blocking average holding time defaults to 600 seconds. Please refer to the sample input sheet at the end of this section for actual inputs.

Non-blocking ports are entered with Phones/Lines and Trunks inputs 101 through 143. For these inputs, CCS values generally default to 36. Note that Input 143 is the Voice/Data ISDL input. Two timeslots are required for each non-blocking Voice/Data ISDL port.

Miscellaneous/Memory Inputs 51 through 84 are used to specify the **non-blocking** PE cards and modules. Note that there are separate inputs for Intelligent PE (IPE) and Enhanced PE (EPE) modules.

3.11.2 Recommended Quoting Procedure

The following steps **are** recommended to be used when quoting non-blocking applications:

- 1) Determine the quantity of non-blocking ports by card type for both Intelligent PE (IPE) and Enhanced (PE).
- 2) Determine the number of network loops required. For IPE divide the total non-blocking ports by 120; for EPE divide the total non-blocking ports by 30. These values **should** be rounded up to the nearest-number.

3) Determine the number of PE cards and shelves required by manually mapping out each loop with the type of ports to be assigned to that loop. PE card calculation should include any **Digitone** Receiver requirements. (This drawing can be sent in with the order to assure the system is built as the non-blocking system quoted) Note that analog line cards require Ringing Generators. Therefore, by noting the quantity of IPE and EPE shelves which contain analog line cards, this value can be entered into Miscellaneous Inputs 83 and 84. Also, for each Intelligent PE module which require more than 2 Superloops, a Controller-4 Card will have to be entered in Miscellaneous/Memory Input 82.

Total all non-blocking IPE and EPE shelves and cards from step 3..

Enter non-blocking ports in the appropriate non-blocking Phones Lines and Trunks inputs and enter the results of step 4 into the non-blocking Miscellaneous Memory Input section.

3.12 MERIDIAN MAIL

Meridian Mail may be quoted with Options 21, 51, 61 and 71. Meridian Mail is quoted by either using Miscellaneous/Memory Input 150 for the Meridian Mail Modular system or **by Aux** Loading a Meridian Mail X Cabinet onto an existing quote.

3.12.1 Meridian Mail Modular

The Meridian Mail Modular system can be quoted by entering the desired Ports, Hours and Users in Miscellaneous Memory Input 150. When this input is used, the complete Meridian Mail hardware and software packaging will be included in the quote as well as any supporting equipment such as network loops, ESDI card slots, pedestals and power. This section addresses the configuration rules for the Meridian Mail hardware and software. For information on switch impact of Meridian Mail, please refer to previous portions of this Engineering/Provisioning section.

Meridian Mail Hardware is based upon the amount of Voice Processor Ports and Hours of storage requested. Meridian Mail Modular configurations consist of a combination of a Base Package, additional Network Voice Processor Cards (NVP), Expansion Storage Software and Expansion Assemblies. **Each NVP card contains** four Voice Processor ports. Voice Storage hours is determined by the amount of disk space available. Configurations include different combinations of **155MB**, **300MB** and **600MB** disks. The following chart shows the relationship of these configurations. Note that the Ports column shows the capacities with **additional NVP cards added**.

Base Package		With Expanded Storage		With Exp. Assembly		With Both	
PORTS	HOURS	PORTS	HOURS	PORTS	HOURS	PORTS	HOURS
4	5	--	--	--	--	12	5
4	11	12	24	20	26	20	54
4	36	12	54	20	64	20	114
24	45	36	90	48	60	48	120
24	120	36	180	48	180	48	240

The corresponding order codes for these configurations are as follows:

<u>Base Package</u>	<u>Base Software</u>	<u>Expanded Software</u>	<u>EXD. Assembly</u>
SY7000	SW7001	--	--
SY7001	SW7000	SW7003	AS7000
SY7002	SW7000	SW7003	AS7001
SY7003	SW7000	SW7003	AS7004
SY7004	SW7000	SW7003	AS7005

As shown in the above chart, every Meridian Mail Modular system comes with a Base Software Package. For configurations of not more than five hours of storage, the SW7001 5 Hour Software base package is included. All other configurations require the SW7000 Meridian Mail Base Software. Expansion Storage Software (SW7003) is provisioned to increase voice storage capacity if required.

The remaining Meridian Mail applications are selected using Miscellaneous/Memory Inputs 151-156. As most of these inputs are software applications, enter a 1 to select the option. In the case of Voice Menus, any positive number input will provision Voice Menus software, however, by entering the number of Voice Menu Calls expected during the busy hour, this input can also be used in determining the CPU Real Time impact.

Input 155 is Meridian Mail Networking Ports. By entering the number of Meridian Mail Networking Ports required in this input, the Meridian Mail Networking Software and appropriate hardware will be provisioned. The hardware for this application includes a Networking Hardware Package and a Modem Package. The Networking Hardware Package includes one 4-port RS232 board and 2 modems. The Modem package is provisioned if more than two total networking ports are required and includes 2 additional modems.

3.12.2 Meridian Mail X Cabinet

The Meridian Mail X Cabinet can be quoted in conjunction with a Meridian 1 system by creating a separate Meridian Mail quote and Aux Loading it onto the Meridian 1. Creating the Meridian Mail X quote is accomplished using the Autoquote Model "MM". Please refer to the Meridian Mail Product Chapter **for** information on quote the X Cabinet.

3.13 REMOTE PERIPHERAL EQUIPMENT (RPE)

Remote Peripheral Equipment (RPE) may be quoted with any Meridian 1 Option 21, 51, 61 or 71. The quoting process is identical to a normal Meridian 1 quotation with the addition of the AUX Loading function as described in Section 4 of this User Guide.

As there is no Common Equipment (CE) in an RPE system, the Software Input Class does not apply. Therefore the only inputs necessary on an RPE system are:

- Phones Lines and Trunks
- Miscellaneous/Memory
- Basic Information

To set up an RPE quote, use either the RPE or RPEC Autoquote Models. (These models do not have an associated release number; enter a RETURN at the Release prompt.) The RPE model is used **to quote** the Meridian 1 modular packaged RPE while the RPEC model is used to quote the QCA74 style RPE cabinet.

Although networks, **digitone** receivers and memory are not quoted for an RPE system, they are calculated so they can be **accomodated** at the main site when Aux Loading is performed.

Please reference Section 5, Aux Loading, page 77 of this User Guide for information on how to Aux Load an RPE system. RPE software must be selected on the Main circuit switch quote before Auxiliary Loading.

4. REPORTS

This section contains samples of **most reports** available on Meridian SL-1 quotation models. An explanation of each report is also included.

Report	#
-----	----
Header Report	9999
Price Summary	1
Engineering Summary	4
Equipment Summary	5
Input Listing	6
Auxiliary Quote Summary	7
Equipment List	9
Unused Capacity Summary	2 0

A sample of report 15 Discount Summary and Report 11 Auxiliary Price Summary will not appear in the User guide. These reports provide discounting information which may vary for different Autoquote users. Report 3 is available and is the same as Report 9 without pricing information.

Please note that many of the engineering and configuration reports display "Equipped" and "Wired" values for hardware. The Meridian SL-1 Autoquote models calculate equipped and wired configurations in the same run. Details on these two values are often needed when the customer requires a certain amount of growth capacity engineered into the system. For all line, trunk and data **ports**, the user can input both the equipped and wired quantities desired. The **SL-1** Autoquote will then configure a system where all hardware needed for the equipped configuration is included and the only things lacking for the wired configuration are PE cards. All other hardware (CE equipment, power equipment, memory, network capacity, cabinets and shelves) is quoted to support the wired configuration.

The mechanics of using Autoquote are not included in this product chapter. Refer to the Introduction and chapter for detailed information on how to use the Autoquote system.

4.1 Header • Report 9999

The "Report Header" is produced each time that Report is selected from the service menu or it can be reproduced by requesting report number 9999. This report displays general information that is input when a New Quote is created or that has been entered by selecting General Information at the Service Menu.

NORTHERN TELECOM MBS QUOTATION SYSTEM

¹RUN DATE: 04/04/90
'CREATION DATE 04/04/90

QUOTATION FOR: QUOTATION. NUMBER: 00003556
³AUTOQUOTE USER GUIDE

'MERIDIAN 1 SYSTEM OPTION 21 ⁵AC
⁶X11 RELEASE 15

QUOTED BY (⁷AQM):
⁸AUTOQUOTE ADMIN

'ORDER DATE: 11/11/99

10* THIS CONFIGURATION IS BASED UPON **NTI** ENGINEERING RULES IN EFFECT AS OF THIS DATE BUT PRIOR TO DISTRIBUTORS SUBMISSION OF AN ORDER. ALTHOUGH ENGINEERING RULES MAY CHANGE IN THE FUTURE, **NTI** WILL HONOR THE QUOTED FUNCTIONALITY FOR SIXTY DAYS FROM THIS DATE. PRICING IS GOVERNED SOLELY BY THE **NTI** CPE DISTRIBUTORSHIP AGREEMENT BETWEEN EACH DISTRIBUTOR AND **NTI**, AND THE MERIDIAN BUSINESS SYSTEMS PRICING MANUAL IN EFFECT ON THE DATE **NTI** ACCEPTS THE DISTRIBUTORS ORDER.

THE PRICE QUOTED BY THE AUTOQUOTE SYSTEM APPLIES ONLY TO THE ITEMS OF EQUIPMENT AND SOFTWARE LISTED 'IN THE EQUIPMENT BREAKOUT (IE. REPORT 3). THESE ITEMS ARE BASED SOLELY ON THE INPUTS. THE ACTUAL SYSTEM PRICE DEPENDS ON PARTICULAR APPLICATIONS AND FINALIZED SYSTEM ENGINEERING WHICH MAY REQUIRE MANUAL ADDITIONS OR DELETIONS TO THIS QUOTE.



¹RUN DATE is the date on which the quotation was run (MM/DD/YY).

²CREATION DATE is the date on which the quote was created as a new quote or copied to a new quote number.

³QUOTATION FOR is the END USER COMPANY NAME entered as part of the information entered when setting up a new quote or changed within General Information.

⁴This is the system type being quoted. The system type is determined by the response to MODEL/GENERIC entered as part of a new quote or changed quote using the MODEL command

⁵Either AC or DC depending on the system power option that was selected under miscellaneous inputs.

⁶The Software Release is input at the RELEASE prompt when creating a new quote or changing an existing quote using the Model command

⁷Sales Channel Acronym, entered as part of the system sign on procedure: HELLO (Location ID),(Sales Channel).NTII

⁸Salesperson entered when creating a new quote or changing an existing

quote using the General Information command.

⁹ **Order Date** is the anticipated order date input when creating a new quote or changed quote using the General Information command.

¹⁰ Caveats, Disclaimers, and Notes

4.2 Price summary - Report 1

This report subtotals Commercial List Price (CLP) by product group.

```
=====
R1--- SUMMARY PRICE ---                QUOTE: 00003556      104/04/90
2(01) SL-1 EQUIPMENT                      $ 104615.00
   (02) RPE EQUIPMENT                      7675.00
   (03) SL-1 SOFTWARE                      26660.00
   (04) TERMINALS - PROPRIETARY            6600.00
   (13) MERIDIAN MAIL HARDWARE            20100.00
   (14) MERIDIAN MAIL SOFTWARE            16000.00
   (20) TERMINALS - MTD                    640.00

TOTAL CLP ----- $ 182290.00
```

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¹RUN DATE is the date on which the quotation was run (MM/DD/YY).

²Subtotal of CLP by equipment type; The numerals in TP (type code) column of Report 9 correspond to the code on left of the each Equipment type.

4.3 Report 9 Equipment List

This report lists all items which are included in the price quoted. If a hardware or software item is not listed in this report, it is not included in the price. Package and assembly codes are used wherever possible. Refer to the Meridian 1 Communication Systems Pricing Manuals for breakdown of packages and assemblies.

=====

R9 --- EQUIPMENT LIST --- QUOTE: 00003556 04/04/90

QNTY	EQP CODE	DESCRIPTION	³ TP	UNIT CLP	EXTENDED CLP
*	1	SY1002A OPTION 21 SYS PKG +PE MODULE AC	I01\$	3760.00 \$	3760.00
'FOLLOWING IS A PARTIAL LIST OF PREPACKAGE ITEMS FOR THE ABOVE SYSTEM. --					
-- THEY ARE LISTED FOR REFERENCE ONLY. --					
1	NT7D00AA	TOP CAP AC			
1	NT8D18AA	NETWORK/DTR CARD			
1	NT8D17AA	CONFERENCE/TDS CARD			
1	NT8D04AA	SUPERLOOP NETWORK CARD			
2	AS1052	2 PORT SDI PADDLE BOARD ASSEMBLY			
1	AS1054A	INTELLIGENT PE MODULE ASSEMBLY AC			
1	NT8D91**	NETWORK TO CONTROLLER CABLE			
4	PO699724	MODULE SIDE COVER			

--ADDITIONS REQUIRED TO THE SYSTEM PACKAGE ARE :					
1	AS1001A	PEDESTAL ASSEMBLY AC	101	4910.00	4910.00
1	NT7D00AA	TOP CAP AC	101	495.00	495.00
1	AS1055A	RPE CARRIER MODULE ASSEMBLY AC	so2	4595.00	4595.00
1	706SL1-1	LOCAL NETWORK INTERFACE ASSY.	so2	3080.00	3080.00
1	AS2001A	SPECIAL 'PEDESTAL ASSEMBLY AC	101	3000.00	3000.00
1	NT8D93AW	2 PORT SDI I/O TO DTE/DCE CAB 48'	D01	80.00	80.00
3	NT8D93AJ	2 PORT SDI I/O TO DTE/DCE CAB 16'	D01	50.00	150.00
1	NT8D95AJ	SDI I/O TO DTE/DCE CABLE 16 FT.	D01	50.00	50.00
1	QPC414	NETWORK CARD	101	1715.00	1715.00
1	QPC471	CLOCK CONTROLLER	D01	885.00	885.00
2	NT8D79**	CABLE/PRI/DTI TO CLOCK CONT	D01	40.00	80.00
2	AS1061	PRI ASSEMBLY	so1	2760.00	5520.00
1	AS1054A	INTELLIGENT PE MODULE ASSEMBLY AC	101	10220.00	10220.00
2	NT8D01AD	CONTROLLER CARD-2	101	3950.00	7900.00
1	AS1053A	PE MODULE ASSEMBLY AC	101	3140.00	3140.00
3	NT8D21AA	RING GENERATOR AC	D01	1060.00	3180.00
1	NT8D91**	NETWORK TO CONTROLLER CABLE	D01	60.00	60.00
3	NT8D85**	NETWORK TO PE CABLE	D01	40.00	120.00
1	AS1013	SPECIAL CONSOLE/LINE CARD PKG	101	4580.00	4580.00
5	NT8D02AA	DIGITAL LINE CARD	101	3085.00	15425.00
7	NT8D03AB	ANALOG LINE CARD	101	3085.00	21595.00
1	NT8D09AB	ANALOG MESSAGE WAITING LINE CARD	101	3240.00	3240.00
3	NT8D14AA	UNIVERSAL TRUNK CARD	101	3195.00	9585.00
1	QPC192	OPX LINE	101	1695.00	1695.00
2	QPC723	RILC-RS-232C INTERFACE LINE CARD	101	1235.00	2470.00
T ² 40	NTZK08AA	M2008 TELEPHONE	D04	165.00	6600.00
10	SILHUETE	SILHOUETTE w/DIAL-IN HANDSET	H20	64.00	640.00
1	SW1001A	MERIDIAN MANAGER STATION ADMIN	D05	.00	.00

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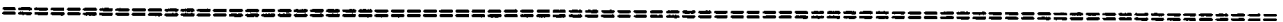
*2	1	SY7001A	M-MAIL MOD OPT 4PT 11HR AC	D13	20100.00	20100.00
	1	SW7000	RTU/MM MOD OPT BASE SW	D14	2000.00	2000.00
	1	SW7003	RTU/MM MOD OPT EXPANDED SW	D14	12000.00	12000.00
	1	SW7005	RTU/MM MOD OPT VOICE MENUS	D14	2000.00	2000.00
	3	NT8D49AA	COLUMN SPACER KIT	DO1	190.00	570.00
	2	PO699724	MODULE SIDE COVER	DO1	95.00	190.00
	4	SW0000A	RTU/MERIDIAN BASE SOFTWARE	R03	5250.00	21000.00
	4	SW0008A	RTU/MULTI-CUSTOMER	IO3	225.00	900.00
	1	SW0022A	RTU/RPE	103	560.00	560.00
	1	SW0028A	RTU/FAST TDS	103	.00	.00
	4	SW0401A	RTU/AUX PROCESSOR LINK	103	125.00	500.00
	4	SW0402A	RTU/IVMS LINK	103	800.00	3200.00
	4	SW0403A	RTU/MERIDIAN MAIL LINK	IO3	100.00	400.00
	1	SW0201A	RTU/BASIC ACD FEATURES (ACD A)	103	100.00	100.00

***2** INDICATES CONTROLLED RELEASE; PROPER AUTHORIZATION IS REQUIRED TO QUOTE.

SOFTWARE OPTIONS :

1	2		4	5		7	8	9	10
11			14	15	16	17	18	19	20
21	22	23	24	25			28	29	
	32	33	34	35	36				40
			44	45	46	47	48	49	
	52	53	54	55		57			60
61			64						70
71	72	73	74	75	76	77			80
81		83		85		87	88	89	90
91				95					
						107	108	109	
				115				119	
								139	140
						157			
									170
	173								
	203	204	205						

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¹A reference listing of the major system package contents is included in the Equipment List report. This is only a reference and extends down to the "*****" line.

²Symbols in the left hand column are used to indicate that a product requires Controlled Release procedures (*), or is a Meridian Terminals Division product (T).

³The number in the "TP" column is the Autoquote equipment type code. It is used to designate logical groupings of hardware and software.

4.4 Report 4 Engineering Summary

The Engineering Summary Report displays engineering information on memory, power, system traffic and processor real time. For details on calculating these items, please see Section 3, Engineering\Provisioning, page 27.

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=====
R4 --- ENGINEERING SUMMARY ---                QUOTE: 00003556      04/04/90

- MEMORY (Kwords) -                            EQUIPPED      WIRED      QUOTED CAPACITY
  UNPROTECTED DATA                            26            31            64
  PROTECTED DATA                              15            18            64
  PROGRAM STORE                                -295          295
  PROTECTED DATA + PROGRAM STORE              310           313            640

- POWER VALUES -                               EQUIPPED      WIRED
  SYSTEM POWER (WATTS)                         1520          2380
  SYSTEM UPS FACTOR (KVA)                      2.53          3.96
  SYSTEM HEAT OUTPUT (BTU'S/hr)               4439          5737

- SYSTEM TRAFFIC (CCS) -                       EQUIPPED      WIRED      QUOTED CAPACITY
  DTI/CPI                                       1536          1536            1728
  LINE                                          995           1770
  TRUNK                                        320           650
  OTHER                                        91            111
  P.01 GOS - SUPERLOOP                        1406          2531            7000
  P.01 GOS - NET MAIN                          177           247            700
  TOTAL P.01 GOS                              1471          2666            7700
  GRAND TOTAL                                  3007          4202            9428

- TRAFFIC AVERAGES -                          EQUIPPED      WIRED      QUOTED
  P.01 GOS INTELLIGENT PE TRAFFIC
  CCS/PORT                                     6.221         6.375         6.221
  CCS/CARD                                     83            94            83
  CCS/SHELF                                    703           844           469
  CCS/LOOP                                    703           1266          703

  P.01 GOS PE TRAFFIC (MAIN)
  CCS/PORT                                     8.125         9.000         8.125
  CCS/CARD                                     22            34            22
  CCS/SHELF                                    65            135           65
  CCS/LOOP                                    65            135           65

- REAL TIME -                                  EQUIPPED      WIRED      QUOTED CAPACITY
  CALLS PER HOUR                              833           1164          5682
  PERCENT UTILIZATION                         15            21            100
=====

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4.4.1 Memory

For questions regarding Memory values refer to Section 3.9, Memory, page 50.

UNPROTECTED DATA, PROTECTED DATA and PROGRAM STORE memory values are displayed for the Equipped and Wired configurations. System capacities are also displayed when appropriate; e.g. for PROGRAM STORE + P-DATA and TOTAL MEMORY. All values are in words of memory.

4.4.2 Power

For questions regarding power values refer to Power, page 47.

SYSTEM POWER is the sum of the modules power in Watts.

SYSTEM UPS (**Uninterruptable** Power Supply) FACTOR is (System Power) / **(.6)** for AC Systems.

SYSTEM HEAT OUTPUT is the sum of the modules and rectifiers heat output.

HOURS BATTERY BACKUP is the number of hours of battery backup requested (For DC Systems).

BATTERY REQUIREMENTS (AMP HOURS) is the amount of amp-hours the batteries must be rated to support the specified amount of backup (For DC Systems).

RECHARGE TIME is the number of hours required to recharge the quoted batteries after they have been completely discharged (For DC Systems).

4.4.3 System Traffic

For questions regarding traffic values refer to Network Loop Engineering, page 36.

Total system traffic is broken into NON-BLOCKING, **PRI/DTI/CPI**, and **P.01** GOS quantities **for** both the Main and RPE sites. OTHER CCS represents Console, **Digitone** Receiver (main location) and Meridian Mail traffic calculated for the system.

--

4.4.4 Real Time

For questions regarding real time values refer to Section 3.10, Real Time, page 52.

The values described in this section of Report 4 deal with the processing **time** of the CPU. When applicable, equipped and wired values are given.

The equipped and wired CALLS PER HOUR is a measure of the number of calls made per hour based on traffic and average holding time. The CALL PER HOUR quoted capacity is a rated capacity based on system feature utilization. Real time intensive features (CDR, ACD, Meridian Mail) decrease this CALL PER HOUR quoted capacity since the **feature utilization** reduces the time **available** for call processing.

PERCENT UTILIZATION is **simply** a percentage measure of the CALLS PER HOUR equipped or wired versus the CALLS PER HOUR quoted capacity. The PERCENT UTILIZATION quoted capacity is always 100.

4.5 Report 5 Equipment Summary

Report 5 provides a summary of the configuration in terms of the main hardware components and ports.

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=====
```

R5 --- EQUIPMENT SUMMARY ---	QUOTE: 00003556	04/04/90
------------------------------	-----------------	----------

- HARDWARE -	EQUIPPED	WIRED	QUOTED
TOTAL ROWS	1	1	1
TOTAL COLUMNS	2	2	2
TOTAL MODULES	5	6	6
RPE CARRIER MODULES	1	1	- 1
MERIDIAN MAIL MODULES	1	1	1
10-SLOT CE/PE MODULE (P.01)	1	1	1
NETWORK/DTR (P.01)	1	1	1
INTELLIGENT PE MODULES (P.01)	1	2	2
PE MODULES (P.01)	1	1	1
SUPERLOOPS (P.01)	1	1	'1
NETWORK LOOPS (P.01)	2	2	2
PRI/DTI/CPI LOOPS	2	2	2
INTELLIGENT PE CARDS - P.01			
LINE CARDS	14	23	14
TRUNK CARDS	3	4	3
DISK DRIVE SLOTS (N/A)	2	2	2
TOTAL INTELLIGENT PE SLOTS	19	29	19
TOTAL INTELLIGENT PE CARDS	17	27	17
PECARDS			
TOTAL P.01 GOS CARDS	3	4	3
- PORTS -	EQUIPPED	WIRED	QUOTED
SDI PORTS	4	4	5
ESDI PORTS	--	1	1
P.01 INTELLIGENT PE			
VOICE PORTS	202	357	202
TRUNK PORTS	17	32	17
DTR PORTS	7	8	7
TOTAL	226	397	226
AVG. PORTS/SHELF	113	133	-- 76
AVG. PORTS/LOOP	22.6	397	226
P.01 GOS PE			
VOICE PORTS	3	3	3
DATA PORTS	5	12	5
TOTAL	8	15	8
AVG. PORTS/SHELF	8	15	8
AVG. PORTS/LOOP	8	15	8
TOTAL PORTS (TN'S)	364	542	364

4.5.1 Hardware

The information in the Hardware section of this report represents the number of key of an item equipped, wired and quoted. The quoted level should correspond to the equipped **level** for calculations of Peripheral Equipment (EPE & IPE) cards, ports , and **TN's**. For all other calculations the quoted level should correspond to the wired level.

For details on calculating these items, see Section 3, Engineering \ Provisioning, page 27.

4.5.2 Ports

SDI, D-Channel Interface, and ESDI (Enhanced **SDI** for Meridian Mail) ports are listed for reference.

Ports average are calculated at module and network loop level for **P.01** Grade of Service (GOS) and Non-blocking configurations.

4.6 Report 6 Input Listing

This report lists all inputs used to engineer and provision the Meridian 1 SL-1 system. Default values and input adjustments will be reflected in this report. Actual "saved" inputs can be viewed when loading an existing quote. The inputs will be stored as shown on this report if the quote is "saved" after running reports.

```
=====
R6 --- INPUT LISTING ---          QUOTE: 00003556          04/04/90
```

- SOFTWARE OPTIONS -

```
002 /      1          MULTI-CUSTOMER
015 /      1          REMOTE PERIPHERAL EQUIPMENT (RPE)
077 /      1          MERIDIAN MAIL APPLICATION
```

- PHONES, LINES & TRUNKS -

```
001 /      78 ,    134 ,    5.00    DIGITAL VOICE LINES
003 /    113 ,    212 ,    5.00    2500 LINES
005 /      8 ,      8 ,    5.00    MSG WAITING 2500 LINES
007 /      3 ,      3 ,    5.00    OPX 2500 LINES
010 /      1 ,      1 ,   30.00    CONSOLES
011 /      8 ,     23 ,   22.00    CO TRUNKS
012 /      9 ,      9 ,   16.00    DID TRUNKS
035 /      5 ,     12 ,   10.00    RILC DATA LINES
040 /      2 ,   32.0          DIGITAL TRUNK INTERFACE (DTI)
100 /     10          SILHOUETTE
230 /     40          M2008
```

- MISC/MEMORY DATA -

```
001 /      1          POWER INDICATOR (1=AC, 2=DC, 3=DC w/RECTIFIERS)
023 /    180          AVERAGE HOLDING TIME
040 /      2          NUMBER OF CUSTOMERS
102 /      1          CABLE EGRESS INDICATOR~ {1=Bottom,2=Top,3=Top/Tray
150 /      4 ,     12 ,    100    MERIDIAN MAIL OPTION
151 /     23          MERIDIAN MAIL VOICE MENUS (# CALLS)
```

- BASIC INFORMATION -

```
001 /      2          NUMBER OF TRUNK GROUPS
005 /      2          AMOUNT OF DISA TRAFFIC (IN CCS)
007 /     25          NUMBER OF TEMPLATES
009 /     40          PERCENT DTI TRAFFIC THAT IS DIGITONE
```

4.7 Report 7 Auxiliary Quote Summary

There are two versions of Report 7: the Auxiliary Quote Summary and the RPE Summary. The latter is available on the RPE models only. If printed from a "Main" quote, it provides an overview of any "AUX Loaded" quote run with the "Main" quote. The summary consists of System Traffic (ccs) and the number of Network Loops for RPE's and Voice ports and Hours of storage for Meridian Mail. If this report is printed from an RPE quote, a summary of the engineered values which will impact the "Main" quote are printed.

4.7.1 Main Quote Version

```

=====
R7--- AUXILIARY QUOTE SUMMARY      QUOTE:  00003556      04/04/90
=====
- MAIN/RPE
  END-USER      QUOTE #      SYSTEM  TRAFFIC  NETWORKS      CLP
                00003556      2942    5         5         $ 182290.00
                00003557      390     1         1         $  37350.00

  SUBTOTAL      3397          6

  TOTAL                          $ 219640.00
=====
    
```

4.7.2 RPE Quote Version

```

=====
R7--- RPE SUMMARY ---              QUOTE:  00003557      04/04/90
=====
  END-USER:                          CLP:  $   37350

                                EQUIPPED      WIRED

  UNPROTECTED DATA      2475      2475
  PROTECTED DATA        4664      4664

  P.01 ccs                390      390
  P.01 TRAFFIC LOOPS      1         1         ..
=====
    
```

4.8 Report 20 Unused Capacity Summary

Unused Capacity is the result of hardware being able to support a range of usage. For example an IPE module can support from 1 to 16 IPE cards. If only **one IPE** card is needed at the equipped for level then the equipped unused capacity is 15 slots. For details on calculating these items, please see paragraph 0 Engineering \ Provisioning page 27.

=====

R20--- UNUSED CAPACITY SUMMARY --- QUOTE: 00003556 04/04/90

- MEMORY (Kwords) -	EQUIPPED	WIRED
UNPROTECTED DATA	34	29
% AVAILABLE	54	46
PROTECTED DATA	44	41
% AVAILABLE	69	64
PROTECTED DATA + PROGRAM S	325	322
% AVAILABLE	51	51

- HARDWARE -	EQUIPPED	WIRED	QUOTED
IPE CARD SLOTS (P.01 GOS)	7	13	23
PE CARD SLOTS (P.01 GOS)	7	6	7
SUPERLOOPS	--		

- PE PORTS (P.01 GOS) -	EQUIPPED	WIRED
NT8D02AA DIGITAL LINE CARD	13	5
NT8D09AB ANALOG MESSAGE WAITING LINE CARD	7	4
QPC192 OPX LINE	1	1
QPC723 RILC-RS-232C INTERFACE LINE CARD	3	
NT8D14AA UNIVERSAL TRUNK CARD	7	

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=====

4.8.1 *Memory*

Unused memory capacities are calculated and displayed when appropriate, e.g. UNPROTECTED DATA, PROGRAM STORE + P-DATA, and TOTAL MEMORY. All values are in words of memory. **% AVAILABLE** is also calculated for each memory category.

4.8.2 *Hardware*

PE CARD SLOTS (**P.01** GOS) are the number of card slots available on **P.01** PE shelves in the configured system. Unused card slots for the Quoted configuration **may be** large since modules are quoted at the Wired quantity while PE cards are quoted at the Equipped quantity.

SUPERLOOPS is the number of loops that may be added to the existing CE/NET modules.

4.8.3 *PE Ports*

This section displays the spare number of ports for each line card type in the system at the Equipped and Wired levels.. REPORTS

5. AUXILIARY LOADING

Auxiliary Loading is used to combine the engineering of one or more peripheral devices with a main system. Auxiliary Loading is required since each system, peripheral or **main**, is a unique quote with a unique quote number. As an example, one or more Remote Peripheral Equipment (RPE) quotes can be Aux Loaded onto a main quote (Option **21,51,61** or 71). Note that Aux Loading DOES NOT COMBINE QUOTES together, but simply allows the main to be configured with the necessary equipment to support the peripheral/auxiliary systems. Please reference the Engineering/Provisioning Section on RPE and Meridian Mail for specifics on these products.

The general procedure of how to use the Auxiliary Load function is as follows:

- 1) Create, save and run reports for all auxiliary quotes. Although it is **not** necessary to print all reports, the Report function must be initiated for each Auxiliary quote to calculate the required information for inclusion into the Main quote. If desired, Reports for each Auxiliary quote may be printed in the normal manner.

- 2) Create the Main quote (or Load the main quote if already created). Make **sure** all required software to support the peripherals has been included on the Main quote. At the service menu, enter **"X"** for Aux Load (refer to the Introduction/Overview chapter for how to select the Aux Load command from the Service Menu). At this point, the system will prompt you for:

PLEASE ENTER **AUX QUOTE** NUMBER OR END

Enter the quote number of the first Auxiliary quote. Since more than one Auxiliary quote can be combined with the Main quote, the system will continue to prompt for Auxiliary quote numbers until "END" is entered.

- 3) After "END" has been entered for step 2, the Service Menu will be displayed. At this point, Reports can be selected for the Main site by entering "R". The configuration calculated and printed for this main quote will contain the necessary equipment required to support the peripheral quotes Aux Loaded.. **The** Auxiliary Quote Summary **Report (7)** and the Auxiliary Price- Summary Report (11) may be printed to verify the Aux Load quote numbers.

The Main quote and any Auxiliary quotes remain separate quotes. The Aux Load function simply allows the main quote to be configured to support auxiliary sites. The list of Aux Load quotes are not saved with the input data of the main quote. Therefore, the process of entering the auxiliary quotes as described in step 2 above should be completed each time the main quote is loaded.

If any changes are made to the auxiliary quotes, the Reports option (R)

must be selected for each auxiliary quote changed. By doing this, any configuration changes are calculated and saved for inclusion in the Main quote. Likewise, the Main quote will have to be re-run Aux Loading the auxiliaries with the above steps.

6. APPENDIX 1: INPUT FORM

QUOTATION REQUEST FORM

Autoquote Numbers:
TELENET: 214156
301-7764

Salesman Name: _____ Type of Quote: 1, 2 or 3

City/Labor-Code: _____ End-User Industry Code: _____

End-User Company Name: _____

End-User Location: _____

System Cutover Date (MMDDYY): _____

Model/Generic Code: _____ Release: _____

Report Options:

- | | |
|--------------------------|------------------------------|
| 1 = Price Summary | 3 = Equipment List |
| 4 = Engineering Summary' | 5 = Equipment Summary |
| 6 = Input Listing | 7 = RPE Summary |
| 9 = Equipment List | 11 = Auxiliary Load Summary |
| 15 = Discount Summary | 20 = Unused Capacity Summary |

Autoquote Userguide - April 20, 1990

SOFTWARE OPTIONS

All software option inputs are require one entry. Enter 1 if software is desired; enter 0 to remove software.

- 2 _____ Multi-Customer
- 5 _____ CDR Link
- 12 _____ Automatic Number Identification
- 15 _____ Remote Peripheral Equipment
- 26 _____ Centralized Attendant Service (CAS)/Main
- 27 _____ Centralized Attendant Service (CAS)/Remote
- 110 _____ Special Application Features

- 56 _____ Attendant Overflow Position
- 57 _____ Attendant Alternative Answer
- 93 _____ Supervisory Console

- 68 _____ Autovon
- 84 _____ Automatic Trunk Maintenance
- 86 _____ Multi-Tenant
- 105 _____ Line Load Control
- 150 _____ Directory Number Expansion

- 102 _____ **Hospitality/Healthcare** Features
- 103 _____ Property Management System Interface (103)

- 37 _____ Basic ESN Features
- 39 _____ Advanced ESN Features
- 58 _____ Network Automatic Route Selection (NARS)
- 59 _____ Coordinated Dialing Plan (CDP)
- 63 _____ Network Authorization Codes

- 109 _____ Auxiliary Processor Link
- 35 _____ **IVMS**
- 77 _____ Meridian Mail
- 152 _____ Meridian Link - Server
- 153 _____ Meridian Link - ISDN/AP Direct Connect

- 45 _____ Basic ACD (ACD-A)
- 41 _____ Advanced ACD (**ACD-B**)
- 111 _____ ACD Timed Overflow
- 121 _____ Enhanced ACD Overflow
- 42 _____ ACD Reports (ACD-C1)
- 43 _____ ACD Load Management (ACD-C2)
- 50 _____ ACD Link - MAX Application
- 51 _____ ACD Link - ACD-D Application
- 114 _____ ACD-D/MAX Report Enhancements
- 122 _____ Network ACD

- 146 _____ Primary Rate Access (PRA)
- 147 _____ ISDN Signaling Link (ISL)
- 117 _____ Call By Call Service
- 148 _____ Advanced ISDN Features
- 149 _____ Inter-Exchange Carrier
- 120 _____ Network Message Center

PHONES, LINES, & TRUNKS

Inputs (1-35 and 42-43) accept 3 entries: 1st entry is "equipped" quantity, 2nd entry is "wired" quantity, and 3rd entry is busy hour traffic (CCS) per port. Inputs 40, 41, and 171 - 178 accept 2 entries: 1st entry is quantity desired and 2nd entry is CCS per channel. All terminal inputs accept 1 entry; enter quantity desired.

- 1 ___/___/___ Digital Voice Only Lines (NT8D02AA)
- 2 ___/___/___ Digital Voice/Data Lines (NT8D02AA)
- 42 ___/___/___ ACD Digital Voice Only Lines (NT8D02AA)
- 43 ___/___/___ ACD Digital Voice/Data Lines (NT8D02AA)
- 3 ___/___/___ 2500 Lines (NT8D03AA)
- 4 ___/___/___ 500 Lines (NT8D03AA)
- 5 ___/___/___ Msg Waiting 2500 Lines (NT8D09AA)
- 6 ___/___/___ **Msg** Waiting 500 Lines (NT8D09AA)
- 7 ___/___/___ OPX 2500 Lines (QPC192)
- 8 ___/___/___ OPX 500 Lines (QPC192)
- 10 ___/___/___ Console (NT8D02AA, QPC297)

- 11 - \ - \ - CO Trunks (NT8D14AA)
- 12 - I - \ - DID Trunks (NT8D14AA)
- 13 - \ - \ - WATS Trunks (NT8D14AA)
- 14. ___/___/___ FX Trunks (NT8D14AA)
- 15 _____ CCSA Trunks (NT8D15AA)
- 16 _____ DX Signaling Trunks (QPC71)
- 17 - \ - I - E&M TIE Trunks (NT8D15AA)
- 18 - \ - \ - Loop TIE Trunks (NT8D14AA)
- 19 _____ RAN Trunks (NT8D14AA)
- 20 _____ Paging Trunks (NT8D14AA, NT8D15AA)
- 21 ___/___/___ Dictation Trunks (NT8D15AA)
- 22 ___/___/___ RLT - Remote Trunks (QPC250)

- 23 ___/___/___ Sync/Async CPU Terminations (QPC432)
- 24 ___/___/___ **Async** Modem Pool Lines (QPC723 & NT8D03AA)
- 27 ___/___/___ Sync/Async Modem Pool Lines (QPC432 & NT8D03AA)
- 28 ___/___/___ **Sync/Async** Data (QPC432)
- 29 ___/___/___ **Async** Data Lines (QPC430)
- 30 ___/___/___ MCDS **Async** Lines (QPC432, QPC397)
- 34 ___/___/___ MCDS High Speed Lines (QPC432, QPC918)
- 31 ___/___/___ CIM Lines (QPC432)
- 32 ___/___/___ MCCS Lines (QPC432, NT9N02)
- 35 ___/___/___ RILC Data Lines (QPC723)

- 40 /_____ DTI (QPC720)
- 41 _____/_____ **CPI** (QPC720)
- 171 _____ PRI 1 (QPC720, QPC757)
- 172 _____ PRI 2 (QPC720, QPC757)
- 173 _____ PRI 3 (QPC720, QPC757)
- 174 _____ PRI 4 (QPC720, QPC757)
- 175 _____ PRI 5 (QPC720, QPC757)
- 176 _____ PRI 6 (QPC720, QPC757)
- 177 _____ PRI 7 (QPC720, QPC757)
- 178 _____ PRI 8 (QPC720, QPC757)

51	Unity I
52	Unity II
53	Unity III
56	Quick Touch
57	Harmony Decorator
58	Unity I/Msg Waiting
59	Rapport/Msg Waiting
69	Companion 4S
80	Unity Wall Mount
98	Displayphone 220 W/Modem
100	Silhouette
77	Venture Headsets
78	Headset Adaptor
63	RILC Cable (Female)
64	RILC Cable (Male)
85	HSDM (QMT21)
86	RS232 - V.35 Adapter (Male)
87	RS232 - v.35 Adapter (Female)
88	AILU/Female (A0322496)
89	AILU/Male (A0322493)
92	ASIM (QMT11)
94	CIM (NT9N20AA)
95	AIM (QMT9)
96	PC Interface Card (QPCS12)
206	M2112
207	M2112 w/Data
209	M3000 Touchphone
210	M3000 Touchphone w/Data
212	M2009
213	M2009 w/Data
217	M2317
218	M2317 w/Data
225	M2006
226	M2006 w/Data
230	M2008
231	M2008 w/Display
232	M2008 w/Data
233	M2008 w/Display & Data
235	M2616
236	M2616 w/Display
237	M2616 w/Data
238	t42616 w/Display & Data
240	M2016S
241	M2016S w/Display
242	M2016S w/Data
243	M2016S w/Display & Data
245	M2216 ACD-1
246	M2216 ACD-1 w/Data
248	M2216 ACD-2
249	M2216 ACD-2 w/Data

261	_____	Key Module (22)
262	_____	Key Module (44)
265	_____	External Alerter
267	_____	ACD Display
269	_____	Power Supply Board Override
270	_____	110V Transformer Override
271	_____	Modular Set Power Override Enabler
280	_____	Adjustable Stand for M1250/M2250
281	_____	Busy Lamp Field/Console Graphics Module

MISCELLANEOUS/MEMORY DATA

These inputs are used to quote miscellaneous hardware and to provide information necessary to calculate memory requirements. There is no common rule regarding the number of entries a Miscellaneous/Memory input accepts. Some of the inputs are prompted depending on previous selections. Changes to prompted entries may be made during the manual input phase.

- 1 _____ Power Indicator (**1=AC, 2=DC, 3=DC** w/RECTIFIER)
- 9 _____ Battery Backup (Hrs, Type)
- 10 _____ **UPS (Type)**

- 2 _____ Hard Disk Drive
- 3 _____ Emergency Transfer Units (ETU)
- 4 _____ Attendant Admin Overlay
- 5 _____ Supervisory Console Functionality (**1=Yes**) (RPE Only)
- 11 _____ Pedestal/Top Cap Provisioning Indicator (Option 21 Only)
- 12 _____ Rectifier/Power Cabinet (Options **51,61** only)

- 14. - \ - I - CDR Usage Indicator(Outgoing,Incoming,Internal)
- 15 _____ Code Restriction Routes
- 16 - \ - \ - Speed Call Lists/1 Digit
- 17 _____ Speed Call Lists/2 Digit
- 18 - I - \ - Speed Call Lists/3 Digit

- 19 _____ Data Modem
- 20 _____ Dual NTP Storage Sleeve
- 23 _____ Average Holding Time (AHT)
- 25 _____ MCDS Cabinet

- 27 _____ Number of **AD/SNR/LNR** Entries (No.,Length)
- 28 _____ Number of Do-Not-Disturb Stations
- 29 _____ Number of Dial Intercom Members
- 30 _____ **Number** of Group Call Groups

- 31 _____ Number of ACD Queues
- 32 _____ Number of ACD Agent Positions
- 33 _____ Number of ACD Auto-Terminate Trunk Routes
- 34 _____ Number of ACD Auto-Terminate Trunks
- 35 _____ Number of ACD-CRTs

- 40 _____ Number of Customers
- 41 _____ Number **of** Customers equipping BARS
- 42 _____ Number of Customers, with Multi-Tenant Service **Equipped**
- 43 _____ Total Number of Tenants
- 44 _____ Total Number of Tenant Stations

- 45 _____ Number of ISDN Signaling Links
- 46 _____ **CE/Disk** Drive Provisioning - Override (Option 21 Only)
- 47 _____ Additional P-Data (kwords)
- 48 _____ Additional U-Data (kwords)
- 49 - \ - Number of Call Party Name Display Entries (No.,Length)
- 50 _____ Number of Auth **Codes** (No.,Length)

21	_____	Additional SDI Ports
37	_____	Additional SDI Ports for APLs
38	_____	Additional Conference Cards for MOH/AWU
39	_____	Additional ESDI Ports

180	_____	Additional Network Group (Option 71 Only)
181	_____	Additional Superloops
182	_____	Additional Non-blocking Superloops
183	_____	Additional Network Loops
184	_____	Additional Non-blocking Network Loops
190	_____	Ringng Generator Provisioning Factor
99	_____	Software Graduation Level Override (Enter Level)
100	_____	Software Graduation Level Indicator (0=Equipped,1=Wired)
101	_____	Module Placement Indicator (Option 71 Only)
102	_____	Cable Egress Indicator (1=Bottom,2=Top,3=Top/Tray Kit)
103	_____	Earthquake Bracing (1=Yes)
145	- ' - ' -	TDR Unit
150	_____	Meridian Mail
151	_____	Meridian Mail Voice Menus (# Calls)
152	_____	Meridian Mail AdminPlus Software
153	_____	Meridian Mail Access Development Software
155	_____	Meridian Mail Networking Ports
1 5	<u>6</u>	Meridian Secured Messaging
169	_____	CPlus Directory & Messaging PC Software
171	_____	Meridian Manager - Work Order System
172	_____	Meridian Manager - Traffic Reporting

BASIC INFORMATION

All inputs accept one entry; enter required number or indicator. Changes to prompted entries may be made during the manual input phase.

- 1 _____ Number of Trunk Groups
- 2 _____ Percent Tie Line Traffic that is **Digitone**
- 3 _____ Percent CCSA Traffic that is **Digitone**
- 4 _____ 1 if DID Traffic is **Digitone**
- 5 _____ Amount of DISA Traffic (in CCS)
- 6 _____ Number of Type 1 Signalling 4W Tie Trunks
- 7 _____ Number of Templates
- 8 _____ Number of Autovon Trunks
- 9 _____ Percent DTI Traffic that is **Digitone**
- 10 _____ Number of DTI/PRI Tie Lines

NONBLOCKING INPUTS

PHONES, LINES, & TRUNKS

Non-blocking port inputs accept 3 entries: 1st entry is "equipped" quantity, 2nd entry is "wired" quantity, and 3rd entry is busy hour traffic (ccs) per port.

101	- , - , -	NB Digital Voice Only Lines (NT8D02AA)
102	___, ___, ___	NB Digital Voice Only Lines (NT8D02AA)
142	___, ___, ___	NB Digital Voice Only Lines (NT8D02AA)
143	___, ___, ___	NB Digital Voice/Data Lines (NT8D02AA)
103	___, ___, ___	NB 2500 Lines (NT8D03AA)
104	___, ___, ___	NB 500 Lines (NT8D03AA)
105	___, ___, ___	NB Msg Waiting 2500 Lines (NT8D09AA)
106	___, ___, ___	NB Msg Waiting 500 Lines (NT8D09AA)
107	___, ___, ___	NB OPX 2500 Lines (QPC192)
108	___, ___, ___	NB OPX 500 Lines (QPC192)
110	___, ___, ___	NB Console (NT8D02AA)
111	___, ___, ___	NB CO Trunks (NT8D14AA)
112	___, ___, ___	NB DID Trunks (NT8D14AA)
113	___, ___, ___	NB WATS Trunks (NT8D14AA)
114	___, ___, ___	NB FX Trunks (NT8D14AA)
115	___, ___, ___	NB CCSA Trunks (NT8D15AA)
116	- , - , -	NB DX Signalling Trunks (QPC71)
117	- , - , -	NB E&M TIE Trunks (NT8D15AA)
118	___, ___, ___	NB Loop TIE Trunks (NT8D14AA)
119	___, ___, ___	NB RAN Trunks (NT8D14AA)
120	___, ___, ___	NB Paging Trunks (NT8D14AA)
121	___, ___, ___	NB Dictation Trunks (NT8D15AA)
122	___, ___, ___	NB RLT = Remote (QPC250)
123	___, ___, ___	NB Sync/Async CPU Terminations (QPC432)
124	___, ___, ___	NB Async Modem Pool Lines (QPC723 & NT8D03AA)
127	___, ___, ___	NB Sync/Async Modem Pool Lines (QPC432 & NT8D03AA)
128	___, ___, ___	NB Sync/Async Data (QPC432)
129	___, ___, ___	NB Async Data Lines (QPC430)
130	___, ___, ___	NB MCDS Async Lines (QPC432, QPC397)
134	___, ___, ___	NB MCDS High Speed Lines (QPC432, QPC918)
131	___, ___, ___	NB CIM Lines (QPC432)
132	___, ___, ___	NB MCCS Lines (QPC432, NT9N02)
135	___, ___, ___	NB RILC Data Lines (QPC723)

NON BLOCKING MISCELLANEOUS/MEMORY DATA

All non-blocking Miscellaneous/Memory inputs except 123 accept 2 entries: 1st entry is "equipped" quantity and 2nd entry is "wired" quantity.

51	_____	NB Digital Line Card (NT8D02AA)
52	_____	NB Analog Line Card (NT8D03AA)
53	- . -	NB Msg Waiting Line Card (NT8D09AA)
54	- . -	NB OPX Line Card (QPC192)
55	_____	NB Supervisory Console Line Card (QPC297)
57	_____, _____	NB Universal Trunk Card (NT8D14AA)
59	- . -	NB E&M Trunk Card (NT8D14AA)
58	_____	NB DX Signalling Card (QPC71)
62	_____	NB RLT Card (QPC250)
65	- . -	NB Sync/Async Data Line Card (QPC432)
66	- , -	NB Async Data Line Card (QPC430)
68	_____	NB RILC (QPC723)
80	_____	NB Intelligent PE Modules
81	_____	NB PE Modules
82	_____	NB Controller-4 Cards
83	- . -	NB Intelligent PE Ringing Generators
84	_____, _____	NB PE Ringing Generators
123	_____	NB Average Holding Time (AHT)



Meridian 1

Communication Systems

AUTOQUOTE USER GUIDE

MERIDIAN MAIL

MERIDIAN MAIL
VOICE MESSAGING SYSTEMS
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1. INTRODUCTION

This chapter of the Meridian 1 Communication Systems Autoquote User Guide provides information on quoting the Meridian Mail Modular Option, the Meridian Mail X-Cabinet, the Meridian **Mail ST/RT** Option tier, the Meridian Mail Option shelf. It includes the following sections:

Section 1:	Introduction
Section 2:	Inputs
Section 3:	Engineering/Provisioning
Section 4:	Reports

The mechanics of using Autoquote are not included in this product chapter. Refer to the Introduction and Overview chapter for detailed information on how to use the Autoquote **System**.

1.1 PRODUCT DESCRIPTION

Meridian **Mail** is a dedicated voice services peripheral device which is functionally integrated with the Meridian 1.

This system can be integrated with the **SL-1ST**, MS, RT, LE, N, NT, XL, XN, XT, and **all** of the Meridian 1 products. The other versions of the product are the Meridian Mail **ST/RT** Option and the Meridian Mail Option (for **SL-1MS**, LE, N, NT, XL, XN, and XT).

All of these Meridian Mail versions interface to the Meridian 1 Circuit Switch via an Enhanced Serial Data Interface (ESDI) port and network loops (QPC414). The **ST/RT** Option and Shelf Option will support up to 20 ports and 114 hours of voice storage. The Modular Option and X-Cabinet will support up to 48 ports and 240 hours of storage.

1.2 VALID MODELS

There are two valid Meridian Mail Autoquote models.

Model Generic	Code	Release

Meridian Mail	MM	<RETURN>
On-line Input Form	MMF	<RETURN>

Neither of the models has an associated release; i.e. enter RETURN at the release prompt.

Meridian Mail may be **quoted** two ways with the "MM" model. The first way is to quote the Meridian Mail system as merchandise. The second way is to quote it along with a Meridian 1 system using the "AUX LOAD" function. (See the Meridian 1 Product Chapter in this User Guide for more information on using the "AUX LOAD" function in conjunction with the "MM" generic.)

** All of the versions of the product may be "AUX LOADED" onto a Meridian 1 configuration except the center mount Meridian Mail Option.

2. INPUTS

This section covers all inputs associated with the Meridian Mail generic. The following subsections are contained within this section:

Input Classes Input Codes, Descriptions, and Default Values Special Notes

As with all Autoquote models, data input consists of responses to prompted entries and manual inputs associated with specific input codes. A blank input form is included in the back of this chapter. It is recommended that copies be used **for** preparing quotations. An on-line input form is also available on the Autoquote system (Generic Code "MMF").

2.1 INPUT CLASSES

Meridian Mail inputs **are** organized into three input classes:

Software Options	{A}
Ports/Services Usage	{P}
System Options	{S}

The Autoquote will prompt for each input class in the order listed above when setting up a new quote. The letter designation is used to make selections for that input class from the Input Menu.

2.2 INPUT CODES, DESCRIPTIONS, AND DEFAULT VALUES

The following pages contain information on each Meridian Mail input: codes, descriptions, and default values where appropriate.

2.2.1 Software Options

All Software Option inputs **accept** one entry. Enter one (1) if the software option is desired; enter zero (0) to **remove** a software option.

1 Meridian Mail

This input is used to provision the base Meridian Mail Software. This input will automatically be selected by **Autoquote** if necessary. Autoquote will also select the appropriate Meridian Mail options depending on the number of voice processor ports and hours of storage quoted.

2 Voice Menus Options

This will provision Meridian Mail voice menus software.

3 Meridian Mail Networking

This input provisions Meridian Mail Networking software.

50 Meridian Mail Admin Plus

This input provisions Meridian **Mail** Admin Plus software.

51 Access Development Software

This input provisions Access Development software. Meridian Mail Admin Plus (input 50) is a prerequisite for this option.

2.2.2 Ports/Services Usage

There is no common rule regarding the number of entries a Ports/Services Usage input may accept. Refer to the input sheet or the information provided below for the number of entries each input accepts..

1 Voice Messaging Users

This input is used to determine the appropriate number of voice processor ports and hours of storage needed on the system based on usage. It accepts three entries.

- o Number of Registered Users

If no entry is made, this input will default to 1.

- o Seconds of Usage during the Busy Hour

Default is 39 seconds.

- o Voice Storage in minutes for each user

Default is 1.6 minutes.

5 Networking Ports

Enter the number of networking ports desired.

10 Voice Menus (**No., Hours**)

This input accepts two entries.

- o Number of Menus

Maximum allowed is 1000. If no entry is made, this input will be set to the number of separate Voice Menu groups specified via Voice Menu Usage inputs 11-14.

- o Hours of Storage for all Voice Menus

Maximum allowed is 48 hours (24 hours for the **ST/RT** and Shelf Options); the default is 1 hour.

- 11 Voice Menu Usage
- 12 **Voice** Menu Usage
- 13 Voice Menu Usage
- 14 Voice Menu Usage

These inputs accept two entries, and are used to specify different amounts of traffic for the different menus used in the system.

- o Number of Voice Menu Calls during the Busy Hour
- o Average Holding Time per Menu Call in Seconds

The default is 25 seconds. Multiple inputs are available so that different menu groups with varying usage characteristics can easily be entered. If no usage is entered and Voice Menu software is selected, input 11 will default to 1 for the first **value**, and 25 for the second value.

20 Voice Menu Usage Indicator (**1=Dedicated**)

Enter one (1) if the Voice Menu traffic is dedicated, i.e. ports for menu use will not be shared with ports used for Voice Messaging. Making an entry in the Voice Menu Ports override input (Systems Option input 53) also results in dedicated menu ports.

Dedicating Voice Menu ports will generally result in more voice processor ports being provisioned on a system because of a loss in traffic carrying efficiency.

21 Networking Usage Indicator (**1=Dedicated**)

Enter one (1) if the Networking traffic is dedicated, i.e. ports for networking use will not be shared with ports used for normal Voice Messaging.

Dedicating Networking ports will generally result in more voice processor ports being provisioned on a system because of a loss in traffic carrying efficiency.

50 Admin Plus Usage (**Access**)

Meridian Mail Admin Plus (Software input 50) is a prerequisite **for** this application.. This input accepts two entries.

- o Number of Admin Plus Access Ports required
- o Storage in Hours for Admin Plus applications

Default is 1 hour.

51 Meridian Mail PC Users (Access)

* Meridian Mail Admin Plus (Software input 50) is a prerequisite for this application. This input accepts three entries.

- o Number of Registered Users
- o Seconds of Usage during the Busy Hour
 - Default is 80 seconds.
- o Voice Storage in Minutes for each User
 - Default is 4 minutes.

2.2.3 System Options

All inputs accept 1 entry; enter desired number or indicator. The system will default to the Meridian Mail Modular Option (Input 47) when setting up a new quote.

2 Distribution Lists

3 Spoken Names

Enter the desired number of each. Both of these inputs, along with the number of registered users, will impact voice storage capacity.

5 Modular Option Power

This input will default to- zero (0); for AC power. If DC power is required, enter a one (1) for this input.

21 Model Indicator

This input will be prompted when running a new quote.

Valid entries are:

- 1 = LE (SINGLE CPU)
- 2 = LE (DUAL CPU)
- 3 = N (SINGLE CPU)
- 4 = N (DUAL CPU)
- 5 = XL
- 6 = XN (w/MEMORY ENHANCEMENT) ..
- 7 = XN (w/out MEMORY ENHANCEMENT)>
- 8 = RT/NT
- 9 = XT
- 10 = ST
- 11 = MS
- 12 = Options 21,51,61,71

This input indicates what type of Circuit Switch the Meridian Mail system will be interfacing. It is used to determine if a ROM card must be included in the Meridian Mail **quote** and to calculate Circuit Switch **memory** and real time impact of the Meridian Mail system.

47 Meridian Mail Modular Option Indicator (1 = Modular Option)

48 Meridian Mail X-Cabinet Indicator (1 = X-Cabinet)

Enter a one (1) to indicate the option desired. When setting up a new quote, the **system** will default to the Meridian Mail Modular Option.

49 Meridian Mail Option Indicator

This input is used to **quote** the other Meridian Mail Options. Valid entries **are:**

- 1 = Meridian Mail **ST/RT** Option (Tier)
- 2 = Meridian Mail Shelf Option (Cantilever Mount)
- 3 = Meridian Mail Shelf Option (Center Mount)

The cantilever mount version of the Meridian **Mail** Option is *used for SL-1 systems utilizing the front/rear entry PE cabinets. The center mount version of the Meridian Mail Option is used for SL-1 **systems** utilizing the front entry only PE cabinets.

50 System Purchase Indicator (1=No)

Enter 1 if the Meridian Mail system is not purchased with a Meridian 1 system, i.e. the quote is for a merchandise purchase. No entry or an entry of zero (0) will indicate that this Meridian Mail configuration is part of a system purchase.

51 Voice Messaging Ports (Optional Override)

This input allows the user to specify the number of voice processor ports for Voice Messaging; this value overrides requirements based on **usage** inputs. This entry includes shared services (voice menus) when appropriate. The maximum is 48.

52 Hours of Voice Storage (Optional Override)-

This input allows the user to specify the amount of total voice **storage**; this value overrides requirements calculated based on the usage inputs (Ports/Services Usage Inputs). **The** maximum is 240.

53 Voice Menu Ports - Dedicated (Optional Override)

This input allows the user to specify the number of voice processor ports dedicated to all Meridian **Mail Admin Plus (Access)** applications; this value overrides requirements based on usage inputs. The maximum 48.

54 Admin Plus Access Ports (Optional Override)-

This input **allows** the user to specify the number of voice processor ports dedicated to all Meridian Mail Access **Gateway** applications; this value overrides requirements based on the usage inputs. The maximum is 48.

2.3 SPECIAL NOTES

To run a simple Voice Messaging quote where the number of ports and amount of voice storage required are known, the following inputs **are** all that have to be entered:

Software Options:

. **1/1** Meridian **Mail**

Ports/Services Usage:

1/x Voice Messaging Users
x = number of registered voice messaging users.
Let the other two values default.

System Options:

21/y SL-1 Model Indicator

y = appropriate SL-1 indicator (1-12)

51/a Voice Messaging Ports (Optional Override)

a = required ports

52/b Hours of Voice Messaging Storage (Opt.Override)

b = required hours of voice storage.

3. ENGINEERING/PROVISIONING

This section contains the engineering/provisioning rules used to configure the Meridian Mail Modular **Option, Meridian Mail X-Cabinet, and Meridian Mail Shelf Options.** As the engineering rules for these are very similar, they will only be distinguished when different. The following subsections are contained within

this section.

Overview
Software Options
 Voice Processor Port Requirements
 Disk Storage Requirements
Hardware/Software provisioning
Power Values
Meridian 1 Equipment Provisioning
Meridian 1 Impact

3.1 OVERVIEW

A Meridian Mail configuration generated by **Autoquote** is based upon **NTI** engineering rules in effect as of the run date but prior to submission of an order. Although engineering rules may change in the future, **NTI** will honor the quoted functionality for 60 days from the run date. However, pricing is governed solely by the **NTI** CPE Distributorship Agreement between each distributor and **NTI**, and the Meridian One Communication Systems Pricing Manual in effect on the date **NTI** accepts the order.

The price quoted by the Autoquote applies only to the items of equipment and software listed in the Equipment List report. This report contains a line entry for each item of equipment and software that is quoted. No item is priced into the quote unless it is detailed in this report. Pricing adjustments are required if there are any additions or deletions to this list:

The contents of any quote depends solely on the inputs and the engineering rules. The actual configuration depends on particular applications and finalized system engineering which may require manual additions or deletions. In this section, inputs will be used in some of the equations. The input class letter designation and code number will be used to represent specific inputs. The three input **classes are:**

Class Designation	
Software Options	[A]
Ports/Services Usage	[P]
System Options	[S]

For example:

- P1(#)** - refers to Ports/Services Usage input and indicates the number of registered Voice Messaging users,
- P1(sec)** - indicates the number of seconds of usage for **each** user during the busy hour, and
- P1(min)** - indicates the number of minutes of voice storage **for each** user. Unless otherwise noted, the answers to all **calculations** used in this subsection are rounded to the next whole number.

3.2 SOFTWARE OPTIONS

The current release of Meridian Mail can support up to 48 voice processor ports and 240 hours of voice storage. The base software provisioned on a quote depends on the base system equipped.

The Meridian Mail Modular Option, with the exception-of the 4 port/5 hour package, uses Meridian Base Software (**SW7000**). The 4 port, 5 hour system package uses the 5 Hour Base Software (**SW7001**).

For the Meridian Mail **ST/RT** Option, Meridian Mail Shelf Option, and the Meridian Mail X-Cabinet, use the following to determine which software will be provisioned.

Hours of Storage	Software
<= 5	12/5 Meridian Mail Base Software (52601)
> 5	Meridian Mail Base Software (52600)
X-Cabinet	Meridian Mail Release 5 Software (63051)

Optional Meridian Mail software is provisioned only when requested.

Meridian Mail Expanded Storage Software will be provisioned if storage requirements determine it's need.

The following is a table of basic information about the various Meridian Mail Modular Option packages.

Ports	Base Hours	Hrs w/ Exp S/W	Hrs w/ Exp Assy	Max Hours	Base Package	Base Software	Expansion Assembly
4-12	5	11	n/a	11	SY7000A/D	SW7001	n/a
4-20	11	24	26	54	SY70	4-20 11	24 26 54 SY70
4-20	36	54	a4	114	SY7002A/D	SW7000	AS7001A/D
24-48	45	90	90	114	SY7003A/D	SW7000	AS7004A/D
24-48	120	180	180	240	SY7004A/D	SW7000	AS7005A/D

3.3 VOICE PROCESSOR PORT REQUIREMENTS

Meridian Mail is engineered primarily on the number of voice processor ports equipped. Voice processor ports are based on the number of simultaneously active voice messaging users, voice menus, Meridian Mail PC users-and Access Gateway usage. This section describes how the required amount of voice processor ports are determined and section 3.5, Hardware/Software Provisioning, explains which packages will be provisioned.

There are two ways the number of voice processor ports are determined:

- (1) utilizing Autoquote engineering rules or,
- (2) via the override input.

3.3.1 AQ Engineering

Autoquote engineering can be used to determine the number of voice processor ports required for any *or* all parts of a Meridian Mail system. The Engineering rules make use of Traffic Tables and Call Overhead to determine the number of voice processor ports needed for the system.

3.3.1.1 Traffic Table

When traffic is the **usage** parameter, a delay traffic table is used to determine the number of required voice processor ports. The standard grade of service is the probability that the delay will be greater than one-sixth the **average** holding time is equal to 5%. This delay characteristic can be expressed as follows:

$$\text{Probability of Delay} \gg \text{Holding Time} / 6 = 6\%$$

If the average holding time per voice messaging call is 60 seconds, only one in 20 calls (5%) will be delayed longer than 10 seconds. See the traffic table below for the relationship between traffic and voice processor ports using this grade of service.

3.3.1.1.1 Voice Processor Ports Traffic Table

Traffic (CCS)	Ports	Traffic (CCS)	Ports
0 - 2	1	916 - 948	33
3 - 14	2	949 - 981	34
15 - 32	3	982 - 1015	35
33 - 54	4	1016 - 1048	36
55 - 78	5	1049 - 1082	37
79 - 103	6	1083 - 1115	38
104 - 130	7	1116 - 1149	39
131 - 157	8	1149 - 1183	40
158 - 185	9	1184 - 1217	41
186 - 214	10	1218 - 1251	42
215 - 243	11	1252 - 1284	43
244 - 273	12	1285 - 1318	44
274 - 303	13	1319 - 1352	45
304 - 334	14	1353 - 1386	46
335 - 365	15	1387 - 1420	47
366 - 396	16	1421 - 1455	48
397 - 427	17	1456 - 1489	49
428 - 458	18	1490 - 1523	50
459 - 490	19	1524 - 1557	51
491 - 522	20	1558 - 1591	52
523 - 554	21	1592 - 1626	53
555 - 586	22	1627 - 1660	54
587 - 619	23	1661 - 1694	55
620 - 651	24	1695 - 1729	56
652 - 684	25	1730 - 1763	57
685 - 716	26	1764 - 1797	58
717 - 749	27	1798 - 1832	59
750 - 782	28	1833 - 1866	60
783 - 815	29	1867 - 1901	61
816 - 848	30	1902 - 1935	62
849 - 881	31	1936 - 1970	63
882 - 915	32	1971 - 2004	64

3.3.1.2 Call Overhead

The total traffic or usage of a Meridian Mail system is made of many different elements. The call overhead elements **for** Voice Messaging include:

- listening to greetings,
- logging in to retrieve messages, and
- listening to messages (sometimes repeatedly).

There are no overhead elements for Voice Menus since listening to the system **messages** and/or prompts is the service. Overhead elements for Meridian Mail PC calls will generally be similar to Voice Messaging calls, therefore, overhead for those calls are assumed to be the same as for Voice Messaging. Specific overhead assumptions used for Voice Messaging/Meridian Mail PC in Autoquote are:

Overhead per message left: **15** seconds
 Overhead per **login**: **20** seconds
 Messages received per **login**: **2**
Average number of replays: **5%**

Adjusted **message** length must be determined to properly calculate Voice Messaging traffic. The following equations are used to determine adjusted message length using the variable a = average message length:

Time to leave 1 message: a + 15 seconds overhead
Overhead per message left: 20 **secs** overhead/2 **messages** per **login**
 = 10 seconds

Average time to retrieve 1 message:
 Time to listen to messages * 5% replay factor + Overhead/message
 = **1.05a** + 10 seconds

Adjusted message length:
 Time to leave message + Time to retrieve 1 message
 = (a + 15) + (**1.05a** + 10)
 = **2.05a + 25**

The above formula allows us to derive the default values for Voice **Messaging** users based on the following assumptions:

Messages per day: 3
Days of storage: 1
Average length of message: 32 **seconds**
Busy Hour traffic: 14 **%**

The following **equations are used** to determine the default values:

**Usage (seconds) = 3 messages x [(2.05 x 32 seconds per message)
 + 25 seconds overhead] x 14 % busy hour traffic
 = 39 seconds of usage**

**Storage (minutes) = 3 messages x 32 seconds per message
 = 1.6 minutes**

These values are the usage defaults for Voice Messaging users in Autoquote (P1(sec), P1(min)).

Overhead and usage assumptions can be modified to fit any application for Voice Messaging and/or Meridian Mail PC users. The resulting busy hour usage and storage requirements can be entered into the Autoquote (P1(sec), P1(min)), to accurately determine the number of voice processor ports required to support those usage assumptions.

3.3.1.3 Voice Messaging Ports

The busy hour Voice Messaging **traffic** (in **CCS**) is determined by the following equation:

$$(P1(\#) \times P1(\text{sec})) / 100$$

This traffic is taken to Section 3.3.1.1.1, Voice **Processor** Ports Traffic Table, to determine the number of required voice processor ports for Voice Messaging. When Voice Menu **traffic** is shared, the sum of the voice messaging and voice menus traffic values is taken to the table to determine required voice processor ports. The maximum number of voice processor ports supported on Meridian Mail is 48 for the Modular or X-, Cabinet Options, and 20 for the **ST/RT** and Shelf Options.

3.3.1.4 Voice Menus Ports

The busy hour Voice Menu traffic (CCS) is determined summing all four of the voice menu usage inputs by the following equation:

$$[P11(\#) \times P11(\text{sec}) + P12(\#) \times P12(\text{sec}) + P13(\#) \times P13(\text{sec}) + P14(\#) \times P14(\text{sec})] / 100$$

This traffic is taken to Table 3.1 to determine the number of required voice processor ports for **Voice** Menus; this number cannot be greater than 48 for the Modular or X-Cabinet Options, and 20 for the **ST/RT** and Shelf Options. When Voice Menu ports are dedicated, the number yielded by the traffic table is the number of ports provisioned. When Voice Menu usage is shared, the traffic is added to the Voice Messaging traffic (refer to Section 3.3.1.3, Voice Messaging Ports).

3.3.1.5 Admin Plus Ports

Admin Plus (Access) usage is comprised of Meridian Mail PC and other Admin Plus applications. Voice processor ports for other Access applications are entered directly by the user via Input **P50(#)**. The sum of the Meridian Mail PC ports and the number input for other applications is the total voice processor ports for Admin Plus (Access).

Port requirements for Meridian Mail PC users is determined utilizing traffic engineering. The busy hour Meridian Mail PC traffic (CCS) is determined by the following equation:

$$(P55(\#) \times P55(\text{sec})) / 100$$

This traffic is taken to Section 3.3.1.1.1, Voice Processor Ports Traffic Table, to determine the number of required voice **processor** ports for Meridian Mail PC users; this number cannot be greater than 48 for the Modular or X-Cabinet Options, and 20 for the **ST/RT** and Shelf Options.

3.3.2 Override Inputs

System Options inputs 51, 53, and 54 are used to override AQ engineering of voice processor ports. In any case, a non-zero input **will result in that number** of ports being provisioned for a particular service, and Autoquote engineering for that service will be ignored.

S51(#) Voice Messaging Ports'
S53(#) Voice Menu Ports - Dedicated
S54(#) Admin Plus Ports

The sum of these entries cannot be greater than the maximum number of voice processor ports supported by the system - 48 for the **Modular** and X-Cabinet Options, and 20 for the **ST/RT** and Shelf Options.

3.4 DISK STORAGE REQUIREMENTS

The amount of disk storage provisioned by Autoquote depends first on the voice storage requirements, and second on the Meridian Mail system packages. Section 3.5, Hardware/Software Provisioning, lists the available packages.

There are two ways the disk storage requirements are determined:

- (1) utilizing Autoquote engineering or,
- (2) via the override input.

3.4.1 AQ Engineering

Disk storage requirements are expressed in hours of voice storage. The voice storage requirement is the sum of all the storage elements determined using the following equations:

Voice Messaging:	$P1(\#) \times P1(\text{min}) / 60$
Voice Menus:	P10(hours)
Admin Plus (Access):	P50(hours)
Meridian Mail PC:	$P55(\#) \times P55(\text{min}) / 60$

If Voice Menu storage requirement is 6 minutes (0.1 hours) or less, there will be no impact to total storage requirements.

3.4.2 Override Input

To manually override the number of hours of storage required, System Options input 52 can be used. A non-zero value entered for this input overrides Autoquote engineering; voice storage capacity is 240 hours for the Modular or X-Cabinet Options, and 114 hours **for** the **ST/RT** Option and Shelf Option.

3.5 HARDWARE/SOFTWARE PROVISIONING

Once the required amount of disk storage and number of voice processor ports are determined, a Meridian Mail package and other required hardware and software are matched to meet these requirements. The following subsections summarize the hardware and software provisioned for different voice processor port/disk **storage** requirements.

3.5.1 Meridian Mail Modular Option

Ports	Hours	Hardware	Description	Software	Exp S/W	Hrs w/ Exp S/W
155 MB Disk Drive						
1-12	5	SY7000A/D	4 Port/5 Hour Modular	SW7001	SW7002	11
300 MB Disk Drive (Standard)						
1-12	11	SY7001A/D	4 Port/11 Hour Modular	SW7000	SW7003	24
13-20	26	AS7000A/D	16-20 Port Expansion			54
1-36	45	SY7003A/D	24 Port/45 Hour Modular	SW7000	SW7003	90
37-48	60	AS7004A/D	36-40 Port Expansion			120
600 MB Drive (Large)						
1-12	36	SY7002A/D	4 Port/36 Hour Modular	SW7000	SW7003	54
13-20	84	AS7001A/D	16-20 Port Expansion			114
1-36	120	SY7004A/D	24 Port/120 Hour Modular	SW7000	SW7003	180
37-48	180	AS7005A/D	36-40 Port Expansion			240

3.5.2 Meridian Mail X-Cabinet

Ports	Hours	Hardware	Description	Software	Exp S/W	Hrs / Exp S/W
1-12	11	NT9D70AB	4 Port/11 Hour Pkg	63050	63051	24
13-16	26	NT9D80AB	12-16 Port Exp Assy (Std)			54
1-12	36	NT9D71AB	4 Port/36 Hour Pkg	63050	63051	54
13-16	84	NT9D81AB	12-16 Port Exp Assy (Lg)			114
1-20	26	NT9D72AB	20 Port/26 Hour Pkg	63050	63051	54
21-32	45	NT9D82AB	20-24 Port Exp Assy (Std)			90
1-20	84	NT9D75AB	20 Port/84 Hour Pkg	63050	63051	114
21-32	120	NT9D83AB	20-24 Port Exp Assy (Lg)			180
1-36	45	NT9D73AB	36 Port/45 Hour Pkg	63050	63051	90
37-44	60	NT9D84AB	36-40 Port Exp Assy (Std)			120
1-36	120	NT9D76AB	36 Port/120 Hour Pkg	63050	63051	180
37-44	180	NT9D85AB	36-40 Port Exp Assy (Lg)			240
1-48	60	NT9D74AB	48 Port/60 Hour Pkg	63050	63051	120
1-48	180	NT9D77AB	48 Port/180 Hour Pkg	63050	63051	2 4 0

3.5.3 Meridian Mail ST/RT Option

Ports	Hours	Hardware	Description	Software	Exp S/W	Hrs w/ Exp S/W
1-12	5	NT9D20AB	4 Port/5 Hour Pkg	52601	52602	11
1-12	11	NT9D21AB	4 Port/11 Hour Pkg	52600	52603	24
13-20	26	NT9D27AB	16-20 Port Exp Assy (Std)			54
1-12	36	NT9D22AB	4 Port/36 Hour Pkg	52600	52603	54
13-20	84	NT9D28AB	16-20 Port Exp Assy (Lg)			114
1-20	26	NT9D23AB	16 Port/26 Hour Pkg	52600	52603	54
1-20	84	NT9D24AB	16 Port/84 Hour Pkg	52600	52603	114

3.5.4 Meridian Mail Option (Cantilever)

Ports	Hours	Hardware	Description	Software	Exp S/W	Hrs w/ Exp S/W
1-12	5	NT6R00AB	4 Port/5 Hour Pkg	52600	52602	11
1-12	11	NT6R00AB	4 Port/11 Hour Pkg	52600	52603	24
13-20	26	NT6R30AB	16-20 Port Exp Assy (Std)			54
1-12	36	NT6R02AB	4 Port/36 Hour Pkg	52600	52603	54
13-20	84	NT6R31AB	16-20 Port Exp Assy (Lg)			114
1-20	26	NT6R03AB	16 Port/26 Hour Pkg	52600	52603	54
1-20	84	NT6R04AB	16 Port/84 Hour Pkg	52600	52603	114

3.5.5 Meridian Mail Option (Center)

Ports	Hours	Hardware	Description	Software	Exp S/W	Hrs w/ Exp S/W
1-12	5	NT6R20AB	4 Port/5 Hour Pkg	52600	52602	11
1-12	11	NT6R21AB	4 Port/11 Hour Pkg	52600	52603	24
13-20	26	NT6R32AB	16-20 Port Exp Assy (Std)			54
1-12	36	NT6R22AB	4 Port/36 Hour Pkg	52600	52603	54
13-20	84	NT6R33AB	16-20 Port Exp Assy (Lg)			114
1-20	26	NT6R23AB	16 Port/26 Hour Pkg	52600	52603	54
1-20	84	NT6R24AB	16 Port/84 Hour Pkg	52600	52603	114

3.6 POWER VALUES

The Meridian Mail power values used to engineer power, air **conditioning**, rectifier and battery requirements are determined as shown in the following sections.

3.6.1 System Load - Amps

The draw in amperage on the Meridian 1 by the different Meridian Mail systems are given in the following table:

Option	Amps
Modular Option - AC	7.7 per module
Modular Option - DC	1.7 per module
X-Cabinet (1 node) - AC	1.2
X-Cabinet (2 node) - AC	2.0
X-Cabinet (4 node) - AC	3.8
X-Cabinet (5 node) - AC	5.0
X-Cabinet (1 node) - DC	8.0
X-Cabinet (2 node) - DC	15.0
X-Cabinet (4 node) - DC	30.0
X-Cabinet (5 node) - DC	37.5
ST/RT Option	5.0

The Meridian Mail Shelf Options draw the same number of Amps as two PE shelves. Please see the Meridian 1 Product Chapter for exact numbers.

3.6.2 AC System Power - Watts

The amount of power in Watts by the Meridian **Mail** options are given in the table below:

Option	Watts
Modular Option (AC/DC)	400 per module
X-Cabinet (1 node) - AC	276
X-Cabinet (2 node) - AC	460
X-Cabinet (4 node) - AC	874
X-Cabinet (5 node) - AC	1150
X-Cabinet (1 node) - DC	416
X-Cabinet (2 node) - DC	780
X-Cabinet (4 node) - DC	1560
X-Cabinet (5 node) - DC	1950
ST/RT Option	500 --

The Meridian Mail Shelf Options require two PE shelf positions. The number of Watts for the supporting Circuit Switch Equipment (CSE) is determined by the number of modules/cabinets equipped. Please see the Meridian 1 product chapter **for** exact calculations.

3.6.3 Heat Dissipation - BTU

Heat dissipation is a function of AC power. Heat dissipation may be used to determine the air-conditioning load.

Heat dissipation (BTU/hr) is calculated as follows:

$$3.415 \times \text{System Power(watts)}$$

'One ton of air conditioning is required for every:

12,000 BTUs.

500 sq. ft. of equipment room area.

Other factors to consider:

Lights
Other equipment
People

3.7 MERIDIAN 1 EQUIPMENT PROVISIONING

Interfacing Meridian Mail to the Meridian 1 requires the following supporting hardware:

3.7.1 ROM Card

In the following system types, an enhanced ROM card must be added to support the Command and Status Link (CSL):

SL-1 Type	ROM Card
SL-1MS	QPC662
SL-1LE	QPC573
SL-1N	QPC571
SL-1XL	QPC599
SL-1XN (w/out memory enhancement)	QPC600
SL-1XN (w/memory enhancement)	QPC601

Any **system** that does not appear in the list does not require a ROM card. The proper card type and number are provisioned based on System Options input 21 (Model Indicator).

3.7.2 ESDI Card

One Enhanced **SDI** (ESDI) port is required for each Meridian Mail system interfacing to the Meridian 1. The Meridian **Mail** Modular Option uses the **QPC513F** ESDI card. This card allows the Meridian 1 CPU a path to talk to the Meridian **Mail** system **via** the Command and Status Link. The ESDI card will be provisioned by way **of** the **Meridian Mail base hardware packages**.

The ESDI card **can** be housed in any slot in the Meridian 1 that is capable of supporting a normal Serial Data Interface (SDI) card.

3.7.3 Other Equipment

Two components are required when provisioning the Meridian Mail Shelf Option in a PE cabinet: a Power Distribution Unit and a Cooling Unit. The actual equipment provisioned depends on type mount used, cantilever versus center mount.

Cantilever:	QBL21 Power Distribution Unit QUD20 Cooling Unit
Center:	QBL10 Power Distribution Unit QUD5 Cooling Unit

These items are not required if the Meridian Mail Shelf Option is to be housed in the QCA55 SL-1 XT CE Cabinet in the place of a network group shelf. Refer to the Meridian 1 Product Chapter for more information on CE shelf and PE shelf housing within **SL-1NT** and XT systems.

3.8 MERIDIAN 1 IMPACT

Several **areas** of impact to the circuit switch must be addressed: memory, real time, network cards, ports, and traffic.

3.8.1 Memory

Meridian 1 memory is divided into three segments: Program Store, Protected Data (PDATA) and Unprotected Data (UDATA).

3.8.1.1 Program Store

Impact is due to the required software:

- Basic Message Center (SW0000A)
- Auxiliary Processor Link (SW0401A)
- IVMS** Link (SW0402A)
- Basic ACD Features (SW0201A)
- Meridian Mail Link (SW0403A)

3.8.1.2 Protected Data/Unprotected Data

The ACD configuration used in Meridian Mail impacts both Protected Data and Unprotected Data in the **same** manner-as existing Meridian 1 features:

- Voice Processor Ports impacts ACD Agent memory
- Meridian Mail configuration impacts ACD Queue **memory**

3.8.1.3 Protected Data:

Additional impact for Meridian Mail specific items is given below:

Voice Processor Port (TN)	1a.50	words
ESDI Port	23.00	words
Command and Status Link/Other	263.00	words

3.8.1.4 Unprotected Data:

Additional impact for Meridian Mail specific items is given below in words of memory:

Voice Processor Port (TN)	15.25	words
Command and Status Link	367.00	words

3.8.2 Real Time

The number of calls to Meridian Mail per hour is used to calculate real time impact. The total calls per hour is the sum of the Voice Menu calls and the non-Menu Meridian Mail calls. The number of Voice Menu calls is determined using input usage in the following equation:

$$P11(\#) + P12(\#) + P13(\#) + P14(\#)$$

The number of non-Menu calls per hour is the smaller of the following values:

Number of non-Menu ports x 60 or,

Number of registered Voice Messaging users +
2 x (Number of Meridian Mail PC Users)

The first equation assumes that one call per non-Menu port per minute during the busy hour is used, and the second assumes that one call per registered Voice Messaging user and two calls per registered Meridian Mail PC user during the busy hour.

Using the smaller number ensures the impact of small Meridian Mail systems is not overestimated.

The actual number of CPU seconds used for Meridian Mail is -- calculated as follows:

Number of Meridian Mail Calls per Hour x ART

where, ART = Average Real Time per VM Call.

Average Real Time is typically expressed in milliseconds (ms). ART depends on the Meridian 1 system type.

System	ART (ms)
LE	1682
ST/N	1401
21	1401
XL	364
XN	340
RT/NT/XT	221
51/61/71	221

If the total real time impact of Meridian Mail exceeds 1050 seconds (50% of 2100 CPU seconds capacity), an error message will display and the quotation process will stop.

3.8.3 Network Cards

Meridian Mail interfaces to the Meridian 1 switching matrix directly through a network loop (QPC414).

The number of network loops needed to support the Meridian Mail system depends on the number of Meridian mail nodes. Each node can house up to 12 voice processor ports. A single dedicated network loop can support up to 2 Meridian Mail nodes, and two dedicated network loops can support up to 5 nodes.

The Meridian Mail Modular Option packages contain network cards; 1 **QPC414B** for each of the 4 port base packages and 2 **QPC414B's** for the 24 port **base** packages.

Refer **to** the Meridian 1 Product Chapter for more information on Common Equipment cards and network loops.

3.8.4 Traffic

Autoquote assumes 28 CCS will be added to the total system busy hour traffic for each voice processor port provisioned. For most **systems**, this traffic will be added to total **P.01** Grade of Service traffic. For Meridian 1 **systems** provisioned as totally non-blocking, the number of voice processor ports will be added to the total non-blocking ports. In **either case**, network provisioning may or may not be impacted by the Meridian Mail requirements depending on the size of the Meridian Mail system and the amount of traffic on the switch.

Refer to the Meridian 1 Product Chapter for **more** information on network loops and traffic engineering.

3.8.5 Meridian Mail Integration Considerations

Differences of integration with the Meridian 1 between the various Meridian Mail Options are covered in the following subsections.

3.8.5.1 Meridian Mail Modular Option

The Meridian Mail Modular Option resembles any other Meridian 1 module. The number of modules provisioned depends on the size of the system. The following table summarizes the module provisioning:

Ports	Modules
<13	1
13-20	2
21-36	4
37-48	5

The Meridian Mail Modular Option requires at least one pedestal and top cap, and side **covers** if it is to be used as a stand alone system.'

When integrated with a Meridian 1 System 21, **51**, 61, or 71, the AUX LOAD function will determine the appropriate number of pedestals, top caps, side **covers**, and spacer kits necessary. Please refer to the Meridian 1 Product Chapter in this User Guide for more information on using the "AUX LOAD" function in conjunction with the "MM" generic.

3.8.5.2 Meridian Mail X-Cabinet

The Meridian Mail X-Cabinet is a stand-alone cabinet (**NT4R21AA**) that includes all necessary power equipment to function.

The 36 port packages contain an expansion assembly (**NT4R24AA**) that grows the system to a second tier. The 48 port packages include two expansion assemblies (**NT4R24AA**, **NT4R22AA**) that grow the system into three total tiers.

3.8.5.3 Meridian Mail **ST/RT** Option

The Meridian Mail **ST/RT** Option tier includes a full tier with one half dedicated to the Meridian Mail portion and the other half as a Peripheral Equipment (PE) shelf backplane. The PE shelf backplane can be equipped with a **QPC706** power card and a QPC659 Dual Loop Buffer card to make it a functional PE shelf. The **ST/RT** Option tier can be provisioned as any tier on any cabinet except for the first tier. The Option tier does not have a base which allows it to sit directly on the floor; it requires a base tier beneath it.

3.8.5.4 Meridian Mail Shelf Option

The Meridian Mail Option shelf requires cooling and power. When provisioned in a PE cabinet, a power distribution unit and cooling unit must be provided (refer to **Section 3.7.3**, Other Equipment). With these two units, the Meridian **Mail** Option requires two vertical PE shelf positions.

The Meridian Mail Option **may** be housed in an **SL-1XT** network shelf position if less than six network shelves are housed in the **QCA55 SL-1XT** CE cabinet.

4. REPORTS

This section provides information on most reports available with the Meridian Mail quotation model. An explanation and example of each report is included.

- 1 - Price Summary
- 4 - Engineering Summary
- 6 - Input Listing
- 9 - Equipment List
- 17 - Circuit Switch Impact
- 21 - Power Summary

A sample of report 15 Discount Summary will not appear in the User Guide; this report subtotals price by discount categories. Only authorized users have access to any discounting information.

The header report (Report 9999) will print out **automatically** when reports are requested; this report may also be requested-like any other report.

Within each subsection there are explanations of the contents of the report being discussed.

The mechanics of using Autoquote are not included in this product chapter. Refer to the Introduction and Overview chapter for detailed information on how to use the Autoquote system.

4.1 Report 1 - Price Summary

This report subtotals Commercial List Price (CLP) by product group. CLP subtotals are for quoted items listed in Report 9 Equipment List.

```
=====
R1--- SUMMARY PRICE ---                QUOTE: 00000002      04/01/90

      SL-1 EQUIPMENT                    $    5785.00
      MERIDIAN MAIL HARDWARE             108800.00
      MERIDIAN MAIL SOFTWARE             9500.00
      DOCUMENTATION                      459.00

TOTAL CLP ----- $ 124544.00
```

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=====

4.2 Report 4 - Engineering Summary

This report is divided into three parts: Voice Messaging Usage, Dedicated Voice Port Services, and Voice Storage each part will be discussed separately.

4.2.1 Voice Messaging Usage

REGISTERED USERS refers to the number of individuals which have access to the voice mail system.

INPUT **VM** TRAFFIC (CCS) refers to the total Voice Messaging traffic on the system based on inputs.

REQUIRED PORTS refers to the number of Voice Messaging ports required to support the system based on inputs. (This may include Menu traffic if the **user** indicates shared usage.)

DESIRED VU PORTS PROVISIONED is the number of Voice Messaging ports provisioned based on the override input (Systems Option input 51).

4.2.2 *Dedicated Voice Port* Services

VOICE MENUS is the total number of Voice Menus supported on the system. (These ports will appear under Voice Messaging Usage, above, if service is shared.)

VOICE MENU TRAFFIC (CCS) is the total menu traffic on the **system** based on inputs. (This line will appear under Voice Messaging Usage if service is shared.)

REQUIRED PORTS is the number of dedicated voice processor ports required to support the **system** traffic.

DESIRED VOICE MENU PORTS PROVISIONED is the number of menu voice processor ports provisioned based on the override input (Systems Option input 53).

MERIDIAN MAIL PC TRAFFIC (CCS) is the **total** Meridian Mail PC voice messaging traffic offered to the **system** based on inputs.

REQUIRED MERIDIAN RAIL PC PORTS is the number of voice processor ports required to support Meridian Mail PC traffic based on inputs.

OTHER ACCESS GATEWAY PORTS is the number of voice processor ports required to support other Access Gateway applications.

DESIRED ACCESS GATEWAY PORTS PROVISIONED is the number of voice processor ports provisioned based on the override input. (System Options Input 54).

TOTAL REQUIRED **ACCESS** GATEWAY PORTS is the number of voice processor ports required to support all Access Gateway applications based on inputs.

4.2.3 *Voice Storage*

VOICE MESSAGING, VOICE **MENU** STORAGE, USERS STORAGE and ACCESS APPLICATIONS STORAGE are all the individual requirements for the associated application.

TOTAL REQUIRED is the total voice storage requirements based on inputs).

DESIRED VOICE **STORAGE** is the number **of hours** of storage provisioned based on the override input (Systems Option input 52).

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```

=====
R4 --- ENGINEERING SUMMARY ---                QUOTE:  00000002      04/01/90

* TOTAL VOICE PROCESSOR PORTS USED                20

- VOICE MESSAGING USAGE -
  REGISTERED USERS                                350
  INPUT VM TRAFFIC (CCS)                          137
  REQUIRED PORTS                                     8
  DESIRED VM PORTS PROVISIONED                     10

- DEDICATED VOICE PORT SERVICES -
  VOICE MENUS                                       4
  VOICE MENU TRAFFIC (CCS)                         13
  REQUIRED PORTS                                     2
  DESIRED VOICE MENU PORTS PROVISIONED              2

  NETWORKING PORTS                                  2

  OTHER ACCESS GATEWAY PORTS                        5
  DESIRED ACCESS GATEWAY PORTS PROVISIONED          6

- VOICE STORAGE -
  VOICE MESSAGING                                  10
  VOICE MENU STORAGE                               10
  ACCESS APPLICATIONS STORAGE                      1
  TOTAL REQUIRED (HOURS)                            21
  DESIRED VOICE STORAGE HOURS                      65
=====

```

4.3 Report 6 - Input Listing

This report lists all inputs used to engineer and provision the Meridian Mail system quoted. Default values and input adjustments will be reflected in this report. Actual "saved" inputs can be viewed when loading an existing quote. The inputs will be stored as shown on this report if the quote is "saved" after running reports.

```

=====
R6 --- INPUT LISTING --- QUOTE: 0000002 04/01/90

- SOFTWARE OPTIONS -

001 1.0 MERIDIAN MAIL
002 1.0 VOICE MENUS OPTION
003 1.0 MERIDIAN MAIL NETWORKING
004 1.0 SECURED MESSAGING
050 1.0 MERIDIAN MAIL ADMIN PLUS SOFTWARE
051 1.0 ACCESS DEVELOPMENT SOFTWARE

- PORTS/SERVICES USAGE -

001 350.0 39.0 1.6 VOICE MESSAGING USERS
005 2.0 NETWORKING PORTS
010 4.0 10.0 VOICE MENUS (No.,Hours)
011 5.0 25.0 VOICE MENU USAGE
012 10.0 25.0 VOICE MENU USAGE
013 15.0 25.0 VOICE MENU USAGE
014 20.0 25.0 VOICE MENU USAGE
020 1.0 VOICE MENU USAGE INDICATOR (1=DEDICATED)
021 1.0 NETWORKING USAGE INDICATOR (1=DEDICATED)
050 5.0 1.0 CONSOLE USAGE (ACCESS)

- SYSTEM OPTIONS -

002 1.0 DISTRIBUTION LISTS
005 1.0 POWER OPTION (0=AC, 1=DC)
021 12.0 MODEL INDICATOR
047 1.0 MERIDIAN MAIL MODULAR OPTION INDICATOR
051 10.0 VOICE MESSAGING PORTS (OPTIONAL OVERRIDE)
052 65.0 HOURS VOICE STORAGE (OPTIONAL OVERRIDE)
053 2.0 VOICE MENU PORTS - DEDICATED (OPT. OVERRIDE)
054 6.0 ADMIN PLUS ACCESS PORTS (OPTIONAL OVERRIDE)
=====

```


4.4 Report 9 - Equipment List

This report lists all items which are included in the price quoted. If a hardware or software item is not listed in this report, it is not included in the price. Package and assembly codes are used wherever possible.

For each of these items, the quantity, equipment code, description, type code, unit Commercial List Price (CLP) and extended CLP are displayed. In addition, the leftmost field of the report displays if the item in question is in a controlled release status. An asterisk (*) indicates that the item is on a controlled release basis.

The number in the "TP" column is the Autoquote equipment type code. It is used to designate logical groupings of hardware and software.

The prices in the following report are not actual prices but are put in as an example, refer to the Meridian 1 Communications Systems Pricing Manual for pricing information.

```

=====
R9 --- EQUIPMENT LIST ---                QUOTE: 00000002          04/01/90
                                           UNIT          EXTEN
DED
QNTY  EQP CODE  DESCRIPTION                TP          CLP          CLP
  1   AS1001D  PEDESTAL ASSEMBLY DC      101        5910.00     5910.00
  1   NT7D00BA TOP CAP DC                  101         595.00       595.00
  4   P0699724 MODULE SIDE COVER          D01         105.00       420.00
*  1   SY7002D  M-MAIL MOD OPT 4PT 36HR DC D13       35800.00    35800.00
*  1   AS7001D  M-MAIL MOD 12 TO 16 EXP (LRG) DC D13    39000.00    39000.00
  3   NT4R01AC NETWORK VOICE PROCESSOR     D13    11000.00    33000.00
*  1   NT9D67AA MERIDIAN MAIL OPTION NETWORK PKG D13     7000.00     7000.00
  1   SW7000   RTU/MM MOD OPT BASE SW     D14     3100.00     3100.00
 17   P0706431 M-MAIL USER GUIDES (15)    H49         32.00       544.00
  1   SW7005   RTU/MM MOD OPT VOICE MENUS D14     2600.00     2600.00
  1   60010    RTU/MM NETWORKING          D14     2300.00     2300.00
  1   60013    RTU/MM SECURED MESSAGING SW D14     2200.00     2200.00
*  1   P0702575 RTU/MM ADMINPLUS SW        D14     1600.00     1600.00
*  1   P0702577 RTU/MM ACCESS DEVELOPMENT SW D14      620.00      620.00
=====

```

* INDICATES CONTROL RELEASE; PROPER AUTHORIZATION REQUIRED FOR THESE ITEMS.

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4.5 Report 17 - Circuit Switch Impact

This report details the items which will be affected on the Meridian 1 circuit switch supporting the Meridian Mail system.

Memory is the first area addressed in the report. The U-data, P-data, and Program Store values listed reflect the addition of all required software options plus the ACD configuration and TN requirements. If the existing Meridian 1 system is already equipped with one or more of these features, the memory requirements for adding Meridian Mail will be less.

The required software options to support Meridian Mail are listed next. Note that Auxiliary Processor Link software is applicable to **X11** Release 10 or later.

REAL TIME capacity is also affected by the Meridian Mail integration. The impact is listed as TOTAL SECONDS and PERCENT of capacity; the parameters used to calculate these values are also included.

OTHER **INFORMATION** lists the number of Serial Data Interface (SDI) slots required to house the ESDI card.

VOICE MESSAGING TRAFFIC (CCS) is total traffic added to the Meridian 1 because of Meridian Mail system.

=====

R17--- CIRCUIT SWITCH IMPACT --- QUOTE: 00000002 04/01/90

- MEMORY -

UNPROTECTED DATA	2555
PROTECTED DATA	1128
PROGRAM STORE	33,144
ACD AGENTS	20
ACD QUEUES	4

- SOFTWARE -

REQUIRED OPTIONS:

MERIDIAN BASE SOFTWARE (SW0000A)	7,17,46
AUXILIARY PROCESSOR LINK (SW0401A)	109
IVMS LINK (SW0402A)	35
BASIC ACD FEATURES (SW0201A)	40,45,83
MERIDIAN MAIL LINK (SW0403A)	77,85

NOTE: AUXILIARY PROCESSOR LINK IS ONLY REQUIRED FOR X11 RELEASE 10 OR LATER.

- REAL TIME -

TOTAL SECONDS	133
PERCENT (OF 2100 SEC)	7
NUMBER OF VM CALLS	600
REAL TIME PER VM CALL (ms)	121

- OTHER INFORMATION -

SDI SLOTS (for ESDI)	1
VOICE MESSAGING TRAFFIC (CCS)	560

=====

4.6 Report 21 - Power Summary

This report contains information concerning several aspects of power.

AC CURRENT (AMPS) is the current load of the system.

AC POWER (WATTS) is the total utility power required for the system.

HEAT OUTPUT (BTU's/hr) is the heat output of the system.

```
=====
R21--- POWER SUMMARY ---                QUOTE:  0000002      04/01/90

CURRENT  (AMPS)                          16.0

POWER    (WATTS)                          800      .
HEAT OUTPUT (BTU/hr)                      2732
=====
```

5. APPENDIX 1: INPUT FORM

=====

MERIDIAN MAIL **SP/OPTION** QUOTATION REQUEST FORM 04/06/90

SALESMAN: _____ TYPE QUOTE: 1 2 3
INDUSTRY CODE: _____

END-USER NAME: _____ CUTOVER DATE: _____
END-USER LOC: _____

MODEL/GENERIC CODE: _____ SOFTWARE RELEASE: _____

SOFTWARE OPTIONS 04/06/90

- 1/ _____ MERIDIAN MAIL
- 2/ _____ VOICE MENUS OPTION
- 3/ _____ MERIDIAN MAIL NETWORKING
- 4/ _____ SECURED MESSAGING
- 5/ _____ GUEST VOICE MESSAGING
- 50/ _____ MERIDIAN MAIL ADMINPLUS SOFTWARE
- 51/ _____ ACCESS DEVELOPMENT SOFTWARE

PORTS/SERVICES USAGE 04/06/90

- 1/ __, __, __ VOICE MESSAGING USERS
- 5/ _____ NETWORKING PORTS
- 10/ __, __ VOICE MENUS (No.,Hours)
- 11/ _____ VOICE MENU USAGE
- 12/ _____ VOICE MENU USAGE
- 13/ _____ VOICE MENU USAGE
- 14/ _____ VOICE MENU **USAGE**
- 20/ _____ VOICE MENU USAGE INDICATOR (1=DEDICATED)
- 21/ _____ NETWORKING USAGE INDICATOR (1=DEDICATED)
- 50/ _____ CONSOLE USAGE (ACCESS)
- 55/ __, __, __ MERIDIAN MAIL PC USERS (ACCESS)

SYSTEM OPTIONS 04/06/90

- 2/ _____ DISTRIBUTION LISTS
- 3/ _____ SPOKEN NAMES
- 5/ _____ MERIDIAN MAIL MODULAR OPTION POWER ((0=AC, 1=DC)
- 21/ _____ **MODEL INDICATOR**
- 47/ _____ MERIDIAN MAIL MODULAR OPTION (1=YES)

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48/ _____ MERIDIAN MAIL X INDICATOR (1=MERIDIAN MAIL X)
49/ _____ OPTION INDICATOR (0=MM-S, 1=ST/RT OPTION, 2=CANT, 3=CENT
50/ _____ SYSTEM PURCHASE INDICATOR (1=NO)
51/ _____ NUMBER OF VOICE MESSAGING PORTS (OPTIONAL OVERRIDE)
52/ _____ HOURS VOICE STORAGE (OPTIONAL OVERRIDE)
53/ _____ VOICE MENU PORTS - DEDICATED (OPTIONAL OVERRIDE)
54/ _____ CONSOLE ACCESS PORTS (OPTIONAL OVERRIDE)

Meridian 1

Communication Systems

AUTOQUOTE USER GUIDE

ACD-MAX



MERIDIAN ACD-MAX
AUTOMATIC CALL DISTRIBUTION SYSTEM
AUTOQUOTE USER GUIDE CHAPTER.

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1. INTRODUCTION

This chapter of the Meridian 1 Communication Systems Autoquote User Guide provides information on quoting the ACD-MAX. It includes the following sections:

Section 1:	Introduction
Section 2:	Inputs
Section 3:	Engineering/Provisioning
Section 4:	Reports

The mechanics of using Autoquote **are** not included in this product chapter. Refer to the Introduction and Overview chapter for detailed information on how to use the Autoquote System.

1.1 PRODUCT DESCRIPTION

ACD-MAX is a PC based stand alone Automatic Call Distribution (ACD) system providing call report capabilities to the smaller user who requires sophisticated reporting. ACD-MAX provides real time displays with exception highlighting, ad hoc reports and scheduled historical reports.

1.2 VALID MODELS

There are two valid Meridian Mail Autoquote models.

Model	Code	Release
Generic		
ACD-MAX	MAX	<RETURN>
On-line Input Form	MAXF	<RETURN>

Neither of the models has an associated release; i.e. enter RETURN at the release prompt.



.



2. INPUTS

This section covers all inputs associated with the ACD-MAX generic. The following subsections are contained within this section:

Input Classes
Input Codes, Descriptions, And Default Values

2.1 INPUT CLASSES

ACD-MAX inputs are organized into the three following input classes:

ACD-MAX Configuration	[C]
ACD-MAX Software	[S]
ACD-MAX Hardware	[H]

The letter designation is used to select the input class from the input menu.

2.2 INPUT CODES, DESCRIPTIONS, AND DEFAULT VALUES

The following section contains information on each ACD-MAX input. Descriptions and defaults are included where appropriate.

2.2.1 Configuration

The following inputs are used to determine the appropriate ACD-MAX **system and** to determine traffic and memory values.

1 Number of ACD Agents

Enter the number agent positions on the ACD-MAX; the maximum is 500 agents.

2 Number of Supervisory Terminals

Enter the total number of Supervisory Terminals desired on the **system**. These will include the **HP770/22** Terminals and any PC's that will be used as Color-Graphics Terminals. One terminal is required, and a maximum of 32 terminals is supported.

3 Number of ACD Queues

Enter the Number of ACD Queues to be supported on the **ACD-MAX** system. A maximum of 30 queues can be supported.

4 Calls per Hour

Enter the maximum number of calls per hour to be handled by the ACD-MAX system. A maximum of 10000 calls per hour are supported on a Dual Tower system (3000 on a Single Tower).

5 Dual Tower Required

Enter a one (1) to ignore Autoquote calculations on system sizing. A one (1) will automatically provision a dual tower system.

2.2.2 Software

Software inputs are used to provision optional software that can be used to enhance the **ACD-MAX** system.

1 Configuration Control

Enter a one (1) if Configuration Control software is desired. Enter a zero (0) to remove the software.

2 Custom Calculator

Enter a one (1) if Custom Calculator software is desired. Enter a zero (0) to remove the software.

3 Networked ACD

Enter a one (1) if Networked ACD software is desired. Enter a zero (0) to remove the software.

2.2.3 Hardware

The following inputs **are used** to provision peripheral hardware for the ACD-MAX system.

1 **HP770/22** Amber Terminal

Enter the number **of** Amber Terminals desired.

2 HP **RuggedWriter** Printer

Enter the number of **RuggedWriter** Printers desired.

3 HP **PaintJet** Printer

Enter the number of **PaintJet** Printers desired.

4 **HP** DeskJet Printer

Enter the *number* of DeskJet Printers desired.

5 BP LaserJet Printer

Enter the number of LaserJet Printers desired.

6 Supervisor Color Graphic Cables

Enter the number of **Supervisor** Color Graphic Terminals will be used on the system. This input **is** used to provision cables for the Color Graphic **PC's**.

7 Additional 3M Backup Tapes

Enter the number of additional tapes desired for backup of the **ACD-MAX** system.

3. ENGINEERING/PROVISIONING

This section contains information about the engineering and provisioning rules used to configure the ACD-MAX system. **The** following subsections are contained within this section:

- Overview
- ACD-MAX Systems
- ACD-MAX Software
- ACD-MAX Hardware
- Circuit Switch Requirements

3.1 OVERVIEW

An ACD-MAX system consists of a Base system and additional peripheral hardware. The equipment provisioned is determined by the user inputs and Autoquote defaults. The Autoquote will provision the minimum system possible base on user inputs.

3.2 ACD-MAX SYSTEMS

There are two packages available of ACD-MAX; the Single Tower and Dual Tower versions. Some important information about the two systems is given below:

System	Maximum Terminals	Maximum Printers
Single Tower (NT9D90BA)	8	2
Dual Tower (NT9D90AB)	32	8

For the Single Tower configuration, all of the peripheral equipment will reside on the tower via the 8 port terminal concentrator. One additional terminal concentrator may be added to a Single Tower system.

In the Dual Tower configuration, all printers and the high speed link cable will reside on the first tower. All terminals and the optional configuration control cable will reside on the second tower.

3.3 ACD-MAX SOFTWARE

The appropriate base software will be provisioned with the ACD-MAX system. Any optional software will only be provisioned if asked for through the software inputs. The following table summarizes the software options by system:

Software	Single Tower System	Dual Tower System
Base Software	NT9D92AA	NT9D92AB
Configuration Control	921SL1-1	924SL1-1
Custom Calculator	922SL1-1	925SL1-1
Networked ACD	923SL1-1	926SL1-1

Note: Configuration Control software requires two additional cables, and one port on the Terminal Concentrator to function. One PO700816 Configuration Control Cable, and one A0365365 Printer Cable (**TC/FM** with Modem Control).

3.4 ACD-MAX HARDWARE

In addition to the basic system, additional peripheral equipment may be added to the system. The discussion of additional hardware will be discussed in the following sections: Terminals, Printers, Terminal Concentrators, Cables, and Tapes.

3.4.1 Terminals

Up to 32 supervisory terminals may be supported on the Dual Tower system, 8 on the **Single Tower**. These may be the **HP770/22** Amber Terminals provisioned through Hardware Input 1, or they may be Color Graphic Terminals (PC's).

The Color Graphic PC's must be purchased separately, but require a Color Graphics Cable provisioned through Hardware Input 6.

The total number of terminals is entered in Configuration Input 1.

3.4.2 Printers

Any **combination** of printers may be added to the ACD-MAX **system** as long as it does not exceed a total of 8 supported by the Dual Tower system (2 on the Single Tower). The printers are provisioned via Hardware Inputs 2 through 5. Each printer also requires a printer cable that will be provisioned with that printer. Cables provisioning is covered later in this section.

3.4.3 Terminal Concentrators/FM (TC's)

The 8 port Terminal Concentrator (TC) is used to connect all peripheral

devices to the **ACD-MAX** system. The Single Tower provides one, and the Dual Tower provides two with the system, one for each tower. All Terminal Concentrators provisioned will have Modem Control functionality. (A0368534)

The following equations are used to determine the number of **TC's** that will be provisioned. In the equations-below, if Configuration Control is equipped then the value is equal to one (1), if not equipped, then it is equal to zero (0). HSL Cable refers to the High Speed Link Cable used to interface with the Meridian 1, and will always equal to 1. The value used for Communications Port in the Dual Tower Configuration is 1.

3.4.3.1 Single Tower Configuration:

TC's = Terminals + Printers + Configuration Control + HSL Cable

If the equation is **<=8** then no additional **TC's** will be added to the system.

If the equation is **>8** then one (1) additional TC will be added to the Single Tower system.

3.4.3.2 Dual Tower Configuration:

Because there are two towers, the **TC's** will be calculated separately for each tower.

1st Tower **TC's** = Printers + HSL Cable + Communications Port

If the 1st Tower equation **<= 6** than no additional TC will be provisioned for the first tower.

If the 1st Tower equation **> 6** than one (1) additional TC will be provisioned on the first tower.

2nd Tower **TC's** = Terminals + Configuration Control

If the 2nd Tower equation **<= 8** than no additional **TC's** will be provisioned on the second tower.

If the 2nd Tower equation **>8** and **<= 16** than one (1) additional TC will be provisioned for a total of two on the-second tower.

If the 2nd Tower equation **>16** and **<= 24** than two (2) additional **TC's** will be provisioned for a total of three on the second tower.

If the 2nd Tower equation **>24** and **<= 32** than three (3) additional **TC's** will be provisioned for a total of four on the second tower.

3.4.4 Cables

All cables provisioned will have Modem Control functionality. One cable is needed for each Terminal, each Printer, and special cables are needed for Color Graphic Supervisory Terminals and for the Configuration Control software option. All cables will be provisioned automatically with the associated hardware that is **provisioned.**

The following cable summarizes the cables used when provisioning an **ACD-MAX** system:

- A0353364 Supervisor Color Graphic PC Cable (with Modem Control)
- A0356365 Printer Cable (12 ft.) for the **TC/FM** (with Modem Control)
- A0365366 Terminal Cable (50 **ft.:**) for the **TC/FM** (w/Modem Control)
- PO700816 Configuration Control Cable

Note: Configuration Control software requires one Configuration Control cable and one Printer Cable to function.

3.4.5 Tapes

One tape is provided with each ACD-MAX system for daily backup. Three tapes are recommended for each ACD-MAX system. Additional tapes are provisioned via Hardware Input 7.

3.5 CIRCUIT SWITCH REQUIREMENTS

3.5.1 Software

There is certain required software and some optional software that is provisioned on the Meridian 1.

Required Software:

- Basic ACD Features (SW0201A)
- Advanced ACD Features (SW0202A)
- ACD Reports (SW0203A)
- ACD** Load Management (SW0204A)
- ACD Link (SW0205A)
- ACD-D/MAX Reports Enhancements (SW0206A)

Note: ACD-D/MAX Reports Enhancements should be ordered for-all systems running **X11** Release 13 OR higher.

Optional Software:

- Enhanced ACD Overflow (SW0207A)
- ACD Timed Overflow (SW0208A)

3.5.2 *Serial Data Interface (SDI)*

The ACD-MAX is connected to the Meridian 1 via an **SDI** port and a High Speed Link cable. The High Speed Link cable is provided in the ACD-MAX system package, and the **SDI** port will be provisioned on the Meridian when ACD Load Management **software is** provisioned.

Autoquote Userguide - April 20, 1990

4. REPORTS

This section provides information on most reports available with the Meridian Mail quotation model. An explanation and example of each report is included.

- 1 - Price Summary
- 6 - Input Listing
- 9 - Equipment List

The header report (Report 9999) will print Out automatically when reports are requested; this report may also be requested like any other report.

Within each subsection there are explanations of the contents of the report being discussed.

The mechanics of using Autoquote are not included in this product chapter. Refer to the Introduction and Overview chapter for detailed information on how to use the Autoquote.

4.1 Report 1 - Price Summary

This report subtotals Customer List Price (CLP) by product group. CLP subtotals are for quoted items listed on the Report 9 Equipment List.

```

=====
R1--- SUMMARY PRICE ---                QUOTE:  00000023      04/01/90
      APPLICATION/PERIPHERAL DEVICE HARDWARE          54404.00
      APPLICATION/PERIPHERAL DEVICE SOFTWARE          53350.00
      TOTAL CLP ----- $ 107754.00

```

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=====

4.2 Report 6 - Input Listing

This report lists all inputs used to engineer and provision the **ACD-MAX** system quoted. Default values and input adjustments will be reflected in this report. Actual "saved" inputs can be viewed when loading an existing quote. The inputs will be stored as shown on this report if the quote is "saved" after running reports.

```
=====
R6 --- INPUT LISTING ---                QUOTE: 00000023      04/16/90
=====
- CONFIGURATIONS -
001    165.0          NUMBER OF ACD AGENTS
002     12.0          NUMBER OF SUPERVISORY TERMINALS
003      4.0          NUMBER OF ACD QUEUES
003   1200.0          MAXIMUM NUMBER OF CALLS PER HOUR

- SOFTWARE -
001      1.0          CONFIGURATION CONTROL
002      1.0          CUSTOM CALCULATOR
003      1.0          NETWORKED ACD

- HARDWARE -
001      8.0          HP770/22 AMBER TERMINAL
002      2.0          HP RUGGEDWRITER PRINTER
005      1.0          HP LASERJET SERIES II PRINTER
006      2.0          SUPERVISOR COLOR GRAPHIC
007      4.0          ADDITIONAL 3M TAPES FOR BACKUP
=====
```


4.3 Report 9 - Equipment List

This report lists all items which are included in the price quoted. If a hardware or software item is not listed in this report, it is not included in the price. Package and assembly codes are used wherever possible.

For each of these items, the quantity, equipment code, description, type code, unit Commercial List Price (CLP) and extended CLP are displayed. In addition, the leftmost field of the report displays if the item in question is in a controlled release status. An asterisk (*) indicates that the item is on a controlled release basis.

The number in the "TP" column is the Autoquote equipment type code. It is used to designate logical groupings of hardware and software.

The prices in the following report are not actual prices but are put in as an example, refer to the Meridian 1 Communications Systems Pricing Manual for pricing information.

```

=====
R9 --- EQUIPMENT LIST ---                QUOTE:  00000023      04/01/90
=====

```

QNTY	EQP CODE	DESCRIPTION	TP	UNIT CLP	EXTENDED CLP
* 1	NT9D90AB	HP VECTRA BASIC SYSTEM - DUAL	H11	42000.00	42000.00
* 2	A0368534	8 PORT TC/FM W/MODEM CONTROL	H11	950.00	1090.00
* 2	A0353378	HP RUGGEDWRITER PRINTER	H11	1884.00	3768.00
* a	A0354417	HP700/22 TERMINAL AMBER	H11	552.00	4416.00
* 1	A0362144	HP LASERJET SERIES II PRINTER	H11	5670.00	5670.00
* 4	A0314597	3M TAPE CARTRIDGE (DC600A)	H11	35.00	140.00
* 12	A0365366	TERMINAL CABLE 50 FT. TC/FM	H11	67.00	804.00
* 3	A0356365	PRINTER CABLE/12 FT. TC/FM	H11	45.00	135.00
* 2	A0353364	CABLE/SUP. COLOR GRAPHIC PC TC/FM	H11	75.00	150.00
* 1	A0356365	PRINTER CABLE/12 FT. TC/FM	H11	36.00	36.00
* 1	NT9D92AB	DUAL TOWER ACD-MAX SOFTWARE	112	29200.00	29200.00
* 1	924SL1-1	CONFIG CONTROL OPTION (DUAL)	112	9965.00	9965.00
* 1	925SL1-1	CUSTOM CALCULATOR OPTION (DUAL)	I12	6850.00	6850.00
* 1	926SL1-1	ACD-MAX NETWORKING OPTION (DUAL)	112	9945.00	9945.00

* INDICATES CONTROL RELEASE; PROPER AUTHORIZATION REQUIRED FOR THESE ITEMS.

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```

=====

```



5. APPENDIX 1: INPUT FORM

=====

ACD-MAX QUOTATION REQUEST FORM 04/06/90

SALESMAN: _____ TYPE QUOTE: 1 2 3
INDUSTRY CODE: _____

END-USER NAME: _____ CUTOVER DATE: _____
END-USER LOC: _____

MODEL/GENERIC CODE: _____ SOFTWARE RELEASE: _____

[C] CONFIGURATIONS INPUT CLASS

- 1/ _____ Number of ACD Agents
- 2/ _____ Number of Supervisory Terminals
- 3/ _____ Number of ACD Queues
- 4/ _____ **Calls Per** Hour

[S] SOFTWARE INPUT CLASS

- 1/ _____ Configuration Control
- 2/ _____ Custom Calculator
- 3/ _____ Networked ACD

[H] HARDWARE INPUT CLASS

- 1/ _____ **HP770/22** Amber Terminal
- 2/ _____ HP **RuggedWriter** Printer
- 3/ _____ HP **PaintJet** Printer
- 4/ _____ HP DeskJet Printer
- 5/ _____ **HP LaserJet** Printer
- 6/ _____ Supervisor Color Graphic
- 7/ _____ Additional **3M Tapes** for Backup

=====

Meridian 1

Communication Systems

AUTOQUOTE USER GUIDE

MERIDIAN MS-1



MERIDIAN MS-1
MEETING COMMUNICATION SYSTEM
AUTOQUOTE USER GUIDE CHAPTER

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1. INTRODUCTION

This chapter of the Meridian Business Systems Autoquote User Guide provides information on quoting the Meridian **MS-1 Meeting** Communication System. The mechanics of using Autoquote are not included in this product chapter.- Refer to the Introduction and Overview chapter for detailed information on how to use the Autoquote System.

1.1 PRODUCT DESCRIPTION

The Meridian MS-1 Meeting Communication System is a digital, audio teleconferencing system providing superior audio quality for up to **forty-eight** simultaneous users.

1.2 VALID MODELS

There are two Meridian MS-1 Autoquote models.

Model	Generic	Release
Meridian MS-1	MS1	<cr>
On-line Input Form	MS1F	<cr>

Since neither model has an associated release, simply enter a carriage return at the release prompt.

2. INPUTS

This section covers all inputs associated with the Meridian MS-1 generic.

As with all Autoquote models, data input consists of responses to prompted entries and manual inputs associated with specific input codes. A blank input form is included in the back of this chapter. It is recommended that copies be used for preparing quotations. An on-line input form is also available on the Autoquote system (Model/Generic "MS1F").

2.1 INPUT CLASSES

Meridian MS-1 inputs are organized into two input classes:

System Options	[S]
Peripherals	[P]

When creating a new quote, Autoquote will prompt for each input class in the order listed above. The letter designation is used to make selections from the Input Menu.

2.2 INPUT CODES, DESCRIPTIONS, AND DEFAULT VALUES

The following pages contain information on each Meridian MS-1 input: codes, descriptions, and default values where appropriate.

2.2.1 System Options

All System Options inputs accept one entry.

1 Number of Ports

Enter the number of ports desired for the system. This value determines the maximum number of participants (in one or more conference) supported at one time. The appropriate system package, 18, 24, or 48 port, **will** be provisioned.

2 Trunk Type (1=T1, 2=Ground Start, 3=4-Wire E&M)

This input indicates the type of trunking to be utilized. Enter one (1) for Digital T1, two (2) for Analog Ground Start, or three (3) for 4-Wire E&M trunks.

3 Power Indicator (1=AC, 2=DC)

Enter one (1) to provision 110V AC power equipment or two (2) to provision -48V DC equipment.

50 Reservations Software

Enter one (1) if Reservations functionality is desired.

2.2.2 Peripherals

All Peripherals inputs accept one entry.

1 M4020 Terminals

Enter the number desired. The MS-1 supports a maximum of five terminals.

20 Additional LAN Interface Unit (LIU)

Enter one (1) for an additional LIU.

30 System Matrix Printer to M4020

Enter one (1) if a System Printer is to be connected to a M4020 terminal. Only one System Printer may be requested per system.

32 System Matrix Printer to LIU

Enter one (1) if a System Printer is to be connected to an **LIU**. Only one System Printer may be requested be per system.

3. ENGINEERING/PROVISIONING

This section contains the engineering/provisioning rules used to generate Meridian MS-1 configurations.

3.1 SOFTWARE PROVISIONING

The current Meridian MS-1 release offers base software features and one optional feature.

3.1.1 MS-1 Software

Base software features **are** included in each Conference Bridge Assembly. The assembly provisioned is determined by the number of ports requested (System Options input 1).

<u>Ports</u>	<u>Assembly</u>			
1-18	NT4G81SB	18 Port	MS-1	Software
19-24	NT4G81TB	24 Port	MS-1	Software
25-48	NT4G81UB	48 Port	MS-1	Software

3.1.2 Reservations Software

NT4G81YE Reservations Software allows attendants to make reservations up to 12 months in advance. This is quoted by entering a one for System Options input 50.

3.2 HARDWARE PROVISIONING

The following subsections summarize the hardware provisioned for different input parameters.

3.2.1 Conference Bridge Assembly

One assembly is provisioned for each quote. The actual assembly is determined by the *number* of ports requested (System Options input 1).

<u>Ports</u>	<u>Assembly</u>			
1-18	NTMS1800	18 Port	Conference Bridge Assembly	
19-24	NTMS2400	24 Port	Conference Bridge Assembly	
25-48	NTMS4800	48 Port	Conference Bridge Assembly	

3.2.2 Application Processor

One 3 MB Applications Processor **NT4G25CA** is required to support Reservations Software. It is quoted if a one is entered for System Options input 50.

3.2.3 Trunk'ing

An MS-1 system may be configured to support **T1**, Ground Start, or 4-Wire E&M trunking. The appropriate hardware is provisioned as follows.

3.2.3.1 Digital Trunk Link SRU

The **NT4G23BA** Digital Trunk Link SRU is provisioned if a one is entered for System Options input 2, indicating **T1** trunking. Two are quoted if a 48 Port Conference Bridge Assembly is provisioned, otherwise only one is quoted. One **NT4G23AD** cable is required for each Digital Trunk Link.

3.2.3.2 Ground Start Bundle

Ground Start trunking is quoted if a two is entered for input number 2, indicating Ground Start trunking. The **assembly** provisioned is determined by the number of ports requested (System Options input 1).

<u>Ports</u>	<u>Assembly</u>
1-18	NT1GS18 18 Port Ground Start Bundle
19-24	NT1GS24 24 Port Ground Start Bundle
25-48	NT1GS48 48 Port Ground Start Bundle

3.2.3.3 4-Wire E&M Bundle

4-Wire E&M trunking is quoted if a three is entered for input number 2, indicating 4-Wire E&M trunking. The **assembly** provisioned is determined by the number of ports requested, (System Options input 1).

<u>Ports</u>	<u>Assembly</u>
1-18	NT1EM18 18 Port E&M Bundle
19 - 24	NT1EM24 24 Port E&M Bundle
25-48	NT1EM48 48 Port E&M Bundle

3.2.4 Power Equipment

An MS-1 system **may be** provisioned with either **110V** AC or -48V DC power. The appropriate equipment is provisioned as follows.

3.2.4.1 **110V** AC Power Supply

Each cabinet requires one **110V** AC Power Supply if AC power is requested by entering a 1 for **System Option** input 3.

3.2.4.2 (-) 48V DC Power Converter

Each cabinet requires one -48V DC Power Converter if DC power is requested by entering a 2 for System Option input 3.

3.2.4.3 (-) 48V DC Wiring Harness

One is provisioned for each -48V DC Power Converter quoted.

3.2.5 Miscellaneous **Equipment**

Additional equipment is provisioned according to the following rules.

3.2.5.1 Digital Trunk Cable (50')

One is provisioned for each Digital Trunk Link quoted.

3.2.5.2 Connector Kit

Two are quoted if a 48 Port Conference Bridge Assembly is provisioned, otherwise only one is quoted.

3.2.5.3 MS-1 Cabinet

The number quoted depends solely on card slot requirements for the equipment provisioned. There are no power or thermal restrictions for the **MS-1** Cabinets.

The following guidelines specify the number quoted:

- All 18 port systems require two cabinets.
- Three cabinets are necessary for 24 port systems utilizing **4-Wire E&M** trunking. All other 24 port systems require two cabinets.
- Two cabinets are needed for 48 port systems with **T1** trunking, AC power, and no Reservations software. All other 48 port systems require three cabinets.

3.2.5.4 Cabinet Door Latch

Each cabinet requires a Cabinet Door Latch.

3.2.5.5 Input Jumper

One is provisioned for each quote.

3.2.5.6 Vertical Jumper

One is provisioned for each quote.

3.2.5.7 Horizontal Jumper

The number provisioned equals the number of cabinets quoted minus one.

3.2.6 Terminal Devices

The following terminal devices are provisioned as follows.

3.2.6.1 M4020 Terminal

The number quoted equals the number requested (Peripherals input 10). A maximum of five terminals may be supported by an MS-1 system.

3.2.6.2 LAN Interface Unit (LIU)

One is quoted if either a LAN Interface Unit (Peripherals input 20) or a System Matrix Printer (Peripherals input 32) to LIU is requested. A maximum of one LIU may be included in a quote.

3.2.6.3 System Matrix Printer

One is quoted if either a System Matrix Printer to M4020 (System Options input 30) or System Matrix Printer to LIU (System Options input 32) is requested. A maximum of one may be supported by an MS-1 system.

3.2.6.4 Parallel Printer Cable (10')

One is provisioned for each System Matrix Printer to LIU requested (System Options input 32).

3.2.6.5 Serial Printer Cable (10')

One is provisioned for each System Matrix Printer connected to a M4020 terminal.

4. REPORTS

This section provides information on most reports available with the Meridian MS-1 quotation model. An explanation of each report is also included.

A sample of report 15 Discount Summary will not appear in the User Guide. This report provides discounting information which may vary for different **Autoquote** users.

4.1 Price Summary - Report 1

This report subtotals Commercial List Price (CLP) by product group. **CLP** subtotals are for quoted items listed in Report 9 Equipment List. The Installation and Basic Monthly Maintenance prices are also listed.

```
=====
R1 --- PRICE SUMMARY ---                QUOTE: 00003574      04/11/90
      MS-1 HARDWARE                      $    36231.00
      PERIPHERALS                         $     4255.00
TOTAL CLP                                $    40486.00

INSTALLATION                             $     586.00

BASIC MONTHLY MAINTENANCE                 $     323.00
=====
```

4.2 Equipment List - Report 9

This report lists all items which are included in the price quoted. If a hardware or software item is not listed in this report, it is not included in the price. Package and assembly codes are used whenever possible.

For each of these items, the quantity, part number, description, type code, unit CLP and extended CLP are listed. The number in the Type Code column is the **Autoquote** equipment type code used to designate logical groupings of hardware and software. The letter in the Type Code column is the product discount category.

```
=====
R9 --- EQUIPMENT LIST ---          QUOTE: 00003574          04/11/90

      QTY PART NO. DESCRIPTION          TYPE   UNIT   EXTENDED.
      CODE   CLP      CLP

1 NTMS1800 MS-1 18 PORT CONFERENCE BRIDGE  G31  27025.00  27025.00
-- FOLLOWING IS A PARTIAL LIST OF ITEMS CONTAINED IN THE ABOVE SYSTEM.
-- THEY ARE LISTED FOR REFERENCE ONLY.
1 NT4G16HA 5MB PRIMARY PROCESSOR SRU
1 NT4G25DA 5MB APPLICATIONS PROCESSOR SRU
1 NT4G20FB 80 MB DISK STORAGE SRU
1 NT4G24CA 3MB CONFERENCING SERVICE SRU
1 NT4G14BA LANLINK SRU
1 NT4G22BA NETWORK SERVICES SRU
1 NT4G49BA DIGITAL TONE RECEIVER
1 A0321335 CROSS CONNECT PANEL
1 A0328670 CABLE/ 25 PR, 25 FT.
1 M4020 DATA/VOICE TERMINAL
*****
-- ADDITIONS REQUIRED TO THE 18 PORT CONFERENCE BRIDGE ARE:
1 NT4G23BA DIGITAL TRUNK LINE CABLE 50' FT.  G31  3500.00  3500.00
2 NT4G13AJ 110V AC POWER SUPPLY             G31  1000.00  2000.00
2 NT4G13FA MS-1 CABINET                      G31  1320.00  2640.00
2 NT4G13BA MS-1 CABINET DOOR LATCH          G31    .00    .00
1 NT4G23AD DIGITAL TRUNK LINK CABLE 50 FT.  G31   70.00   70.00
1 NT4G23AE CONNECTOR KIT                    G31    6.00    6.00
1 NT4G42CA INPUT JUMPER                     G31   330.00  330.00
1 NT4G41BA VERTICAL JUMPER                  G31   330.00  330.00
1 NT4G40CA HORIZONTAL JUMPER                G31   330.00  330.00
1 M4020 DATA/VOICE TERMINAL                G31  1395.00  1395.00
1 A0317073 SYSTEM MATRIX PRINTER           G31  2860.00  2860.00
=====
```

4.3 Input Listing - Report 6

This report lists all inputs used to engineer and provision the Meridian MS-1 system quoted. Default values and input adjustments will be reflected in this report. Actual saved inputs can be viewed when loading an existing quote. The inputs will be stored as shown on this **report** if the quote is saved after generating reports.

```
=====
R6 --- INPUT LISTING ---                               QUOTE: 00003574      04/11/90
- BASE SYSTEM -
001      18.0                                NUMBER OF PORTS
002      1.0                                TRUNK TYPE (1=T1,2=Ground Start,3=4-Wire E&M)
003      1.0                                POWER INDICATOR (1=AC,2=DC)
- PERIPHERAL EQUIPMENT -
010      2.0                                M4020  TERMINALS
030      1.0                                SYSTEM MATRIX PRINTER on M4020
=====
```



5. APPENDIX 1: INPUT FORM

=====

NORTHERN TELECOM MBS QUOTATION SYSTEM	
MERIDIAN MS-1 CONFERENCING SYSTEM	04/11/90
VERSION: 88.01	

SALESMAN: _____	TYPE QUOTE: 1 2 3
	INDUSTRY CODE: _____
END-USER NAME: _____	CUTOVER DATE: _____
END-USER LOC: _____	

MODEL GENERIC CODE: MS1

SYSTEM OPTIONS

1/ _____	NUMBER OF PORTS (18,24,48)
2/ _____	TRUNK TYPE (1=T1,2=GROUND START,3=4-WIRE E&M)
3/ _____	POWER INDICATOR (1=AC,2=DC)
50/ _____	RESERVATIONS SOFTWARE

PERIPHERALS

10/ _____	M4020 TERMINALS
20/ _____	LAN INTERFACE UNIT
30/ _____	SYSTEM MATRIX PRINTER to M4020
32/ _____	SYSTEM MATRIX PRINTER to LIU
40/ _____	PERSONAL PRINTER

=====

Meridian 1

Communication Systems

AUTOQUOTE USER GUIDE

**MERIDIAN MESSAGE
CENTER**

MERIDIAN MESSAGE CENTER
AUTOQUOTE USER GUIDE CHAPTER I

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1. INTRODUCTION

This chapter of the Meridian Business Systems Autoquote User Guide provides information on quoting the Meridian Message Center. The mechanics of using Autoquote are not included in this product chapter. Refer to the Introduction and Overview chapter for detailed information on how to use the Autoquote System.

1.1 PRODUCT DESCRIPTION

The Meridian Message Center provides text messaging capabilities to business and medical applications.

1.2 VALID MODELS

There are two Meridian Message Center **Autoquote** models.

Model	Generic	Release
Meridian Message Center	MSG	<cr>
On-line Input Form	MSGF	<cr>

Since, neither model has an associated release, simply enter a carriage return at the release prompt.

Autoquote Ueerguide - April 20, 1990

2. INPUTS

This section covers all inputs **associated with** the Meridian Message Center generic.

As with all Autoquote models, data input consists of responses to prompted entries and manual inputs associated with specific input codes. A blank input form is included in the back of this chapter. It is recommended that copies be used for preparing quotations. An on-line input form is also available on the Autoquote system (Model/Generic "MSGF").

2.1 INPUT CLASSES

Meridian Message Center inputs are organized into two input classes:

System Options	[S]
Peripherals	[P]

When creating a new quote, Autoquote will prompt for each input class in the order listed above. The letter designation is used to make selections from the Input Menu.

2.2 INPUT CODES, DESCRIPTIONS, AND DEFAULT VALUES

The following pages contain information on each Meridian Message Center input: codes, descriptions, and default values where appropriate.

2.2.1 System Options

All System Options inputs accept one entry.

- 1 SYSTEM INDICATOR
 - . (1=**BASIC**, 2=**PHYSICIANS ANSWERING**, 3=**PHYSICIANS REGISTRY**)

Enter one (1) for the Basic Message Center system package, two (2) for the Physicians Answering system package, or three (3) for the Physicians Registry system package.

50 DEMAND PRINT

Enter one (1) if desired.

51 **INTRA-OFFICE** MESSAGING

Enter one (1) if desired.

52 PAGER INTERFACE

Enter one (1) if desired.

53 PHYSICIANS **REFERRAL**

Enter one (1) if desired.

54 **PRE-PROGRAMMED MESSAGES**

55 REMOTE DEMAND PRINT

Enter one (1) if desired.

56 USER CHANGE OF STATUS

Enter one (1) if desired.

57 SL-1 AUTO SCREEN ACTIVATION

Enter one (1) if desired.

60 SMDI **AUTO SCREEN ACTIVATION (<=1000 LINES)**

Enter one (1) if required to support less than 1000 lines.

61 SMDI **AUTO SCREEN ACTIVATION (>1000 LINES)**

Enter one (1) if required to support over 1000 lines.

2.2.2 Peripherals

All Peripherals inputs accept one entry.

1 M4010 TERMINALS

Enter the quantity desired.

'2 REGISTRY TERMINALS (NT220)

Enter the quantity desired.

3 **REGISTRY TERMINAL ENCLOSURES**

Enter the quantity desired.

10 ADDITIONAL LAN INTERFACE **UNITS**

Enter the quantity desired.

11 ADDITIONAL **LANLINK** UNITS

Enter the **quantity** desired.

12 8-PORT MUX OPTIONS

Enter the quantity desired.

13 PAGING INDICATOR (1=Tone/Digital, 2=Alphanumeric, 3=Both)

If paging functionality is desired, the type(s) of paging to be supported must be specified. Enter one (1) for Tone or Digital paging **Only**, two (2) for Alphanumeric paging only, or three (3) for both Tone/Digital and Alphanumeric paging.

30 SYSTEM PRINTERS to LIU

Enter the number of system printers that are to be connected to a LAN interface unit.

31 SYSTEM PRINTERS to M4010

Enter the number of system printers that are to be connected to a **M4010**.

3. ENGINEERING/PROVISIONING

This section contains the engineering/provisioning rules used to generate Meridian Message Center configurations.

3.1.1 DTMF-ASCII Converter Box

One is required for each of the following software options: Demand Print, Pre-Programmed Messages, and User Change of Status. Note that one is included in the Demand Print assembly.

3.1.2 DTMF-ASCII Converter Box Cable

One is required for each DTMF-ASCII Converter Box

3.1.3 **SL-1** RS232 Connection Cable

One is required for Auto-Screen Activation. Note that one is included in the Basic Message Center base package.

3.1.4 M4010 Terminal

The number provisioned is equal to the number requested at Peripherals input 1. Two are included in all base system packages.

3.1.5 NT220 Registry Terminal

- The number provisioned is equal to the number requested at Peripherals input 2. One is included in the Physicians Registry base system package.

3.1.6 Registry Terminal Cable

The number provisioned is equal to the number of NT220 Registry Terminals provisioned. One is included in the Physicians Registry base system package.

3.1.7 Registry Terminal Enclosure

The number provisioned is equal to the number requested at Peripherals input 3.

3.1.8 1200 Baud Modem

One is included in every system package. An additional 1200 Baud Modem is required for Alphanumeric paging.

3.1.9 224 AT/D Modem

One is required for Remote Demand Print.

3.1.10 202 T Modem

One is required for SMDI Auto-Screen Activation.

3.1.11 Modem Cable

One is required for each of the following modems: 1200 Baud Modem, 224 AT/D Modem, and 202 T Modem. One is included in every base system package.

3.1.12 Printer Cable

One is **provisioned** for each system printer to be connected to an LIU (Peripherals input 30).

3.1.13 Serial Ports

One serial port is required for each of the following: NT220 Registry Terminal, SL-1 RS232 Connection Cable, 1200 Baud Modem, 224 **Autodial** Modem, 202 T Modem, and DTMF-ASCII Converter Box. Serial ports are found on both the LAN Interface Unit and 8-Port MUX Option.

3.1.14 Parallel Ports

One parallel port is required for each system printer to be connected to an LIU, indicated with Peripheral input 20. Parallel ports are found on both the LAN Interface Unit and 8-Port Mux Option.

3.1.15 **8-Port** Mux Option

Each 8-Port Mux Option supports eight serial ports and one parallel port. The number provisioned is the number requested at Peripherals input 12.

3.1.16 **9-Pin** Conversion Cable

One is provisioned for each 8-Port Mux Option.

3.1.17 LAN Interface Unit

Each LAN Interface Unit (LIU) supports two serial ports and one parallel port. The number of **LIU's** required to support serial and parallel ports is calculated independently.

$$S = (SR - (8 * M)) / 2$$

where S = **LIU's** to support serial ports.

SR = Serial ports required.

M = Number of **8-Port Mux** Options.

$$P = (PR - (8 * M))$$

where P = LIU's to support parallel ports.
PR = Parallel ports required.
M = Number of **8-Port** Mux Options.

The maximum number of LIU's required to meet serial and parallel port requirements plus any additional requested at Peripherals input 10 determine the total number of LIU's provisioned.

$$L = \text{maximum}(S, P) + A$$

where L = Number of LIU's provisioned.
S = LIU's to support serial ports.
P = **LIU's** to support parallel ports.
A = Additional LIU's desired (Peripherals input 10).

Note that one LIU is contained in each base system package.

3.1.18 *Lanlink SRV*

Each Lanlink SRU has eight ports to support the following: LAN Interface Unit, M4010 Terminal, and **8-Port** Mux Option. The number provisioned is determined as follows.

$$S = (L + T + M) / 8 + A$$

where S = Number of Lanlink SRU's provisioned.
L = Number of LIU's provisioned.
T = Number of **M4010** Terminals provisioned.
M = Number of **8-Port** Mux Options provisioned.
A = Additional Lanlink SRU's desired (Peripherals input 11).

A maximum of four Lanlink SRU's may be configured on any one Message Center system. Note that one Lanlink SRU is contained in each base system package.

Autoquote Userguide April 20, 1990

4. REPORTS

This section provides information on **most** reports available with the Meridian Message Center quotation model. An explanation of each report is also included.

A sample **of** report 15 Discount Summary will not appear in the User Guide. This report provides discounting information which may vary for different Autoquote users.

4.1 Price Summary • Report 1

This report subtotals Commercial List Price (CLP) by product group. **CLP** subtotals are for quoted items listed in Report 9 Equipment List. The Installation and Basic Monthly Maintenance prices are also listed.

```

=====
R1 --- PRICE SUMMARY ---                QUOTE:                04/11/90
    MESSAGE CENTER HARDWARE             $   55780.00
    MESSAGE CENTER SOFTWARE              $    5000.00
    TOTAL CLP                            $   60780.00

    INSTALLATION                         $    1540.00

    BASIC MONTHLY MAINTENANCE            $     638.00
=====
    
```

4.2 Equipment List - Report 9

This report lists all items which are included in the price quoted. If a hardware or software item is not listed in this report, it is not included in the price. Package and assembly codes are used whenever possible.

For each of these items, the quantity, part number, description, type code, unit CLP and extended CLP are listed. The number in the Type Code column is the Autoquote equipment type code used to designate logical groupings of hardware and software. The letter in the Type Code column is the product discount category.

=====

R9--- EQUIPMENT LIST --- QUOTE: 04/11/90

QTY	PART NO.	DESCRIPTION	TYPE CODE	UNIT CLP	EXTENDED CLP
1	NTMSG-01	MESSAGE CENTER SYSTEM	G3	41400.00	41400.00
-- FOLLOWING IS A LIST OF ITEMS CONTAINED IN THE ABOVE SYSTEM:					
1	NT4G16HA	5MB PRIMARY PROCESSOR SRU			
1	NT4G20FA	80MB DISK STORAGE SRU			
1	NT4G26BC	SMB SASI FILE PROCESSOR SRU			
1	NT4G20HA	170MB DISK SRU			
1	NT4G46CA	LAN INTERFACE UNIT			
1	NT4G14BA	LANLINK SRU			
2	NT4G13AJ	110V AC POWER SUPPLY			
2	NT4G13FA	MS-1 CABINET			
1	NT4G42CA	INPUT JUMPER			
1	NT4G40CA	HORIZONTAL JUMPER			
1	NT4G41BA	VERTICAL JUMPER			
1	A0321335	CROSS CONNECT PANEL			
1	A0328670	CABLE/ 25 PR, 25 FT.			
1	NT4G96DH	SL-1 RS232 CONN CABLE 25 FT.			
1	NT4G81PH	DXMS OPERATING SYSTEM			
1	NT4G91CS	DVIX V TIMESHARING SOFTWARE			
1	NT4G91DA	MESSAGE CENTER SOFTWARE			
1	NT4G91DB	SL-1 AUTO SCREEN ACTIVATION			
1	NT4G91DC	DEMAND PRINT MODULE			
2	M4010	DATA TERMINAL			
1	A0344322	1200 BPS MODEM			
1	NTOM96DG	CABLE/ RS232 MODEM - 10 FT.			

-- ADDITIONS REQUIRED TO THE MESSAGE CENTER SYSTEM ARE:

1	NT4G46CA	LAN INTERFACE UNIT	G3	950.00	950.00
1	NT4G14BA	LANLINK SRU	G3	3000.00	3000.00
1	NT4G91EA	INTRA-OFFICE MESSAGING	G3	5000.00	5000.00
8	M4010	DATA TERMINAL	G3	1295.00	10360.00
2	NTOM96DN	10 FT. PARALLEL CABLE	G3	35.00	70.00

=====

4.3 Input Listing - Report 6

This report lists all inputs used to engineer and provision the Meridian Message Center system quoted. Default values and input adjustments will be reflected in this report. Actual saved inputs can be viewed when loading an existing **quote**. The inputs will be stored as shown on this report if the quote is saved after generating reports.

```
=====
R6 --- INPUT LISTING ---                               QUOTE:                04/11/90
- SYSTEM -
001      1.0      SYSTEM INDICATOR
050      1.0      DEMAND PRINT
051      1.0      INTRA-OFFICE MESSAGING

- PERIPHERALS -
001      10.0     M4010  TERMINALS
030      2.0     SYSTEM  PRINTERS
=====
```


5. APPENDIX 1: INPUT FORM

=====

NORTHERN TELECOM MBS QUOTATION SYSTEM
MERIDIAN MESSAGE CENTER SYSTEM
VERSION: 88.01

04/11/90

SALESMAN: _____ TYPE QUOTE: 1 2 3
INDUSTRY CODE: _____

END-USER NAME: _____ CUTOVER DATE: _____
END-USER LOC: _____

MODEL GENERIC CODE: MSG

SYSTEM OPTIONS 04/11/90

1/ _____ SYSTEM INDICATOR
(1=BASIC, 2=PHYSICIANS ANSWERING, 3=PHYSICIANS REGISTRY)

50/ _____ DEMAND PRINT

51/ _____ INTRA-OFFICE MESSAGING

521/ _____ PAGER INTERFACE

53/ _____ PHYSICIANS REFERRAL

54/ _____ PRE-PROGRAMMED MESSAGES

55/ _____ REMOTE DEMAND PRINT

56/ _____ USER CHANGE OF STATUS

57/ _____ SL-1 AUTO SCREEN ACTIVATION

60/ _____ SMDI AUTO SCREEN ACTIVATION (<=1000 LINES)

61/ _____ SMDI AUTO SCREEN ACTIVATION (>1000 LINES)

PERIPHERALS 04/11/90

1/ _____ M4010 TERMINALS

2/ _____ REGISTRY TERMINALS (NT220)

3/ _____ REGISTRY TERMINAL ENCLOSURES

10/ _____ ADDITIONAL LAN INTERFACE UNITS

11/ _____ ADDITIONAL LANLINK UNITS

12/ _____ 8-PORT MUX OPTIONS

13/ _____ PAGING INDICATOR (1=Tone/Digital, 2=Alphanumeric, 3=Both)

30/ _____ SYSTEM PRINTERS to LIU

31/ _____ SYSTEM PRINTERS to M4010

