DCP/10A, DCP/10, DCP/20 and DCP/40

Marketing Guide

Company Confidential – C

SPERRY

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1 INTRODUCTION

This marketing guide informs you of the new announcements relating to the DCP family of network processors. It should be used to supplement the already existing Sales Information Manual (S7390). ***It is not intended to replace that document.*** We are publishing this information in a separate document instead of updating the existing SIM because the current SIM does not accurately represent some of the latest developments resulting from the ever changing data communications marketplace.

For instance, the continuing evolution of Sperry's Distributed Communications Architecture (DCA) has obsoleted some sections, and the development of Distributed Data Processing (DDP) and some of the Gateway Products to meet market requirements has diverged from the descriptions originally included in the SIM.

As a result of these and other changes, a new set of DCA related documentation will be published in FY '86. This new documentation will reflect not only the latest hardware and software products, but will also capture the new Sperry spirit, represented by its commitment to the data communications marketplace via new interconnect products visible on all new Sperry processors, and the DCA-related products such as the DCP family of network processors and Telcon.

In the interim, this document provides sufficient information to allow you to respond to a bid on the whole range of DCP network processors, from the new DCP/10A with its higher capacity memory and new peripherals, to the existing DCP/20 and DCP/40. Coupled with the new Communications Delivery, CD2, acclaimed as the best-ever Telcon/CMS delivery, and the new Gateway Program Products, such as IBM's SNA and BSC connectivity and the X.25 support, you have a veritable arsenal of products from which you can propose solutions to all of your customer's requirements. So, read on! Understand what products you have to sell and how they fit together. The communications part of the bid is an area where you have great strength. Use it to give leverage to your mainframe sales. Good Luck and Good Selling!

2 THE NEW SPERRY DCP/10A

2.1 OVERVIEW

The SPERRY DCP/10A is a new, entry level communications processor that replaces the SPERRY DCP/10. It is more than a DCP/10 with higher memory capacity; it includes some enhancements made possible by using new technology not available when the DCP/10 was first introduced. It will no longer be possible to purchase a DCP/10. The DCP/10A uses new technology, new packaging techniques, a new power supply and new integrated peripherals.

It is not possible to upgrade a DCP/10 to a DCP/10A!

Existing DCP/10s can be field upgraded with the new memory up to the new maximum of 2.0 Megabytes; however, this is the ***only*** upgrade available, and it does ***not*** turn the DCP/10 into a DCP/10A.

The DCP/10A is a low-cost, entry level system designed for those environments that require support for a small number of lines. Its price/performance is consistent with its attachment as a front-end processor to small host processors such as the low end of the 1100/60 range, and to distributed processors such as the System 11 and MAPPER® 10 System. It is also well suited for use as a nodal processor in a small network, or as a remote concentrator connected to a front-end DCP by leased lines or a public or private data network (X.21 or X.25 Packet Circuit Switching standards) (CCITT).

The DCP/10A uses the same Telcon software as the other members of the DCP Telcon family, but it must be supported at Telcon 6, Release 2 or higher (part of the CD2R2 deliverable). It also uses the same CPA hardware architecture as the other members of the DCP family. For more detail about the CPA hardware architecture, see the Distributed Communications Systems SIM (S-7390); however, there is absolutely no need for you to understand this architecture to successfully sell DCPs.

Because the DCP/10A uses the same software and architecture as the DCP/20 and DCP/40, it can use the same hardware, such as line modules, host channel modules and peripheral interfaces. It also can use the same applications and program products as the other members of the DCP family, such as the Gateway Program Products like X.25, BSC, SNA and the SPERRY-LINK™ System.

The DCP/10A consists of a single processor based on communications processor architecture. It provides eight I/O ports which can be used for host and peripheral interfaces or communications line modules. The DCP/10A accommodates a maximum of 2.0 Megabytes of integrated storage, available in 512K-byte increments.

The DCP/10A includes the same type of availability, reliability and maintainability support features found in other members of the DCP family.

2.2 DCP/10A COMPONENTS

The DCP/10A system includes the following items:

- Hardware components contained in a standard 19-inch enclosure either rack-mounted or enclosed in a special DCP/10A cabinet (up to two enclosures can be included per cabinet)
- Peripheral equipment for local loading and mass storage

The entire basic DCP/10A system is contained in the 19-inch enclosure and includes the following equipment:

- Processor card containing 512K bytes of memory
- Memory expansion board capable of adding 1.5 Megabytes of memory
- Up to eight peripheral/line modules
- Microprogram storage
- Power distribution and power supplies
- Operator controls and indicators
- Integrated 5¼-inch flexible diskette
- Optional integrated 5¼-inch 10 Megabyte hard disk

In addition to the above features, the 8409 8-inch Disk Subsystem, the freestanding peripheral, can be attached to the DCP/10A system.

2.3 DCP/10A FEATURES

Enclosure and Cabinets

The basic DCP/10A is housed in a 19-inch rack enclosure (Figure 2-1). The enclosure is self-contained; it includes power distribution, power supplies, operator control panel, cooling and the processor card with 512K bytes of memory. There is mounting space for one flexible diskette, the optional hard disk and up to eight line modules (occupying no more than eleven PC slots) and the memory expansion board.

Because the DCP/10A enclosure is designed to be mounted in a standard 19-inch rack, it can also be mounted in a UPS3 cabinet or customer supplied 10-inch rack. A cabinet (Figure 2-2), is offered as an optional DCP/10A feature to house the processor.

This cabinet (Type 1986-01) is designed to accommodate either one or two DCP/10As. The previous cabinet (Type 1986-00) which housed the DCP/10 could not do this.

An old DCP/10 may not be installed in the new cabinet. Likewise, a new DCP/10A may not be installed in the old cabinet. It follows, therefore, that it is not possible to mix DCP/10As and DCP/10s in any of the cabinets.

The major hardware components of the DCP/10A are the:

- Processor,
- Local storage,
- Line modules, and
- System controls and indicators

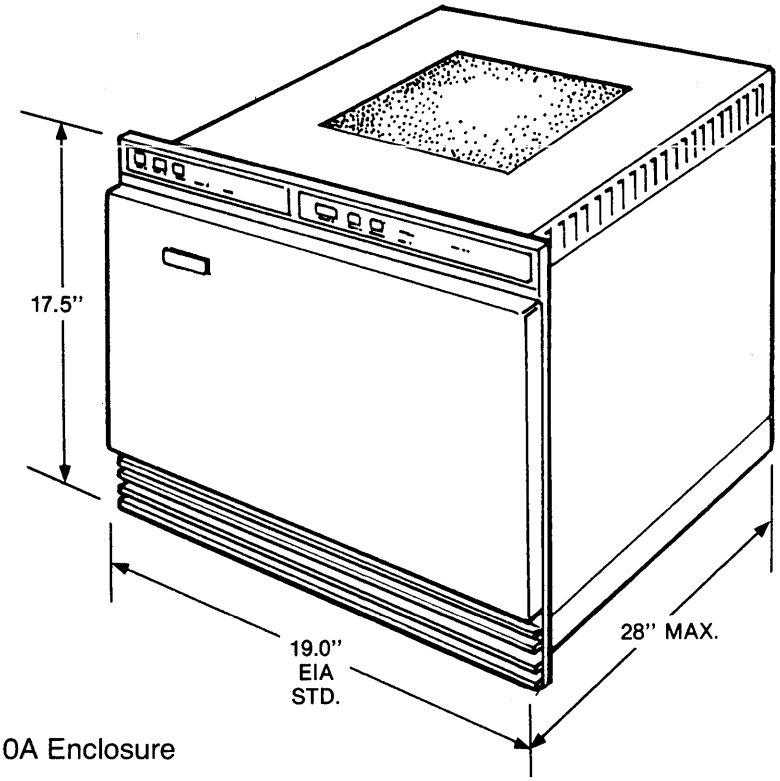

Figure 2-1. DCP/10A Enclosure

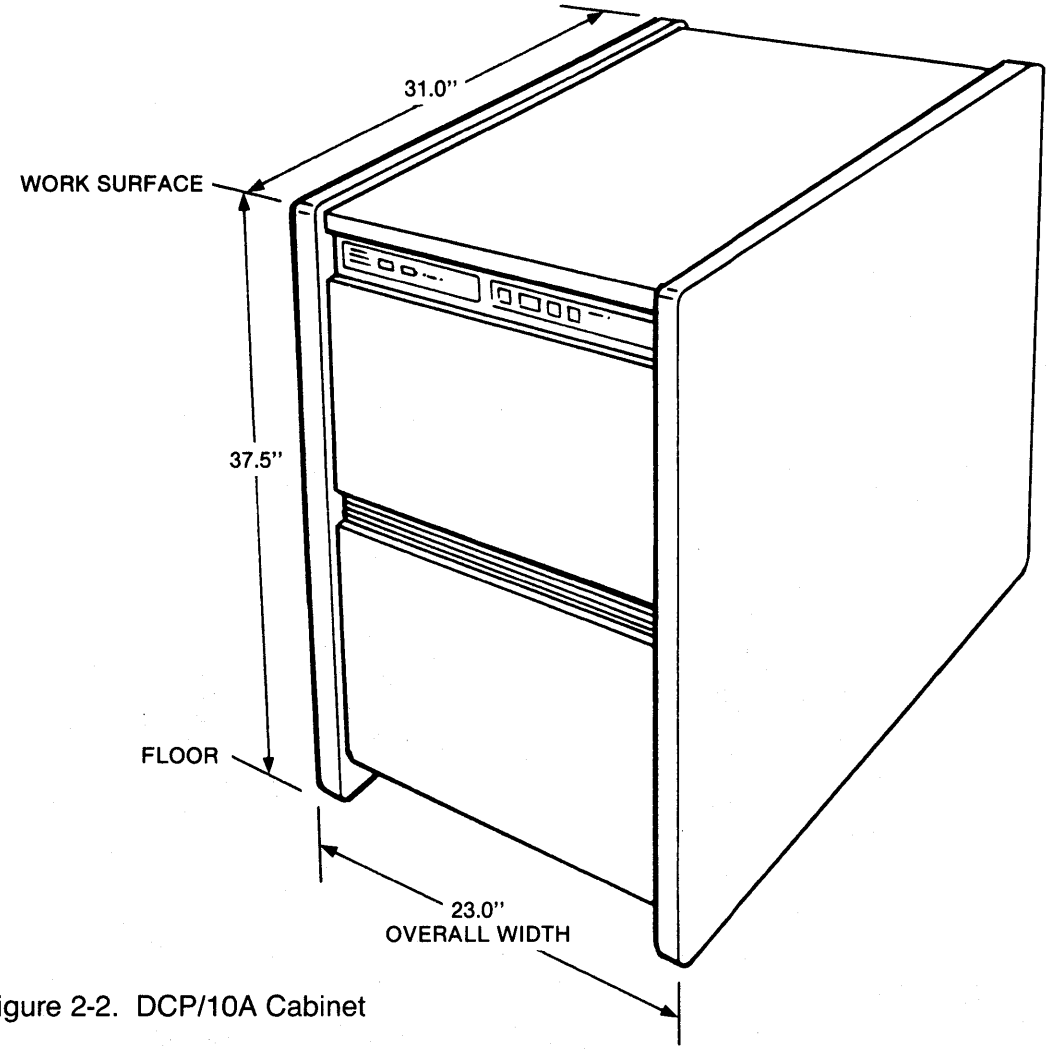

Figure 2-2. DCP/10A Cabinet

DCP/10A Processor

The DCP/10A processor implements the communications and input/output processing requirements of the system. The physical processor is logically partitioned into nine virtual processors represented by sets of control registers and microstorage that are under control of the Arithmetic/Logic Unit (ALU) at any given time. One of the nine virtual processors is reserved for communications processing. The remaining eight are used for input/output processing; one for each of the eight possible line modules.

The DCP/10A communications and I/O processors function the same as the DCP/10. For further details, refer to the DCP/10 section of the Distributed Communications System Sales Information Manual (S7390).

Local Storage

Local storage is a single-port single bank error-correcting storage system with a capacity of up to 2.0 Megabytes. The processor board contains the first 512K bytes, which is the minimum memory configuration. Additional memory is provided in 512-K byte increments, accommodated on the memory expansion board.

Data is formatted in storage as a 16-bit word, made up of 8-bit bytes. A write-access to storage permits partial, full, or multiple words to be written. The storage components consist of 256K bit semiconductor random access memory (RAM) devices.

The error correcting logic of the DCP/10A system is designed to ensure maximum system reliability. Error detection and correction are accomplished by an error correcting code (ECC) which corrects all single-bit errors and detects all double-bit errors. Error logging mechanisms allow the processing system to analyze the frequency of detected errors.

Line Modules

Line modules play an important part in the increased speed, flexibility and economy of the DCP systems. Because the I/O processors are designed to present the same programming interface to the serial lines or parallel or host channels, line modules are used to satisfy the unique interface characteristics of individual lines. These plug-in modules are available as off-the-shelf hardware, suiting the I/O processors to almost any communications configuration.

Line modules are available to satisfy the interface requirements of the following forms of network communications:

- Asynchronous, synchronous, or wideband serial communications
- Direct-channel communications with host-processing systems
- Parallel-channel communications with operator consoles and on-site peripherals

In addition to the line modules currently supported by the other members of the DCP family, the DCP/10A supports several new line modules: the Multiple Device Line Module (MDLM) and the Front End Processor Interface (FEPI).

The Multiple Device Line Module uses the ANSI standard SCSI interface for attaching a SCSI controller to which may be connected an integrated diskette and disk as well as other SCSI-compatible disk devices.

The FEPI is used to connect a System 11 or MAPPER 10 System to a freestanding DCP/10A. This interface enables the mass-storageless version of the DCP/10A to access mass storage on the attached host.

For further information regarding the line modules available on the DCP family, refer to the Distributed Communications Systems Sales Information Manual, (S7390).

DCP/10A Peripherals

The wide range of peripherals supported on the other members of the DCP family are not required on the DCP/10A due to its size and targeted marketplace.

Also recent improvements in mass storage technology have enabled us to offer larger systems at lower costs, therefore obviating the need for many of the options that used to be needed to adequately address a customers needs.

The following peripherals are available on the DCP/10A:

- Integrated diskette
- Integrated disk
- 8409 Disk Subsystem

These peripherals are described in the following paragraphs.

Integrated Diskette

The integrated diskette is a required feature in all of the DCP systems. The diskette is used to begin system loading at initialization time. It allows microprograms contained on the disk to be written into the microstorage of the communications processor and the I/O processors. With this accomplished, further system loading of the macrolevel software can be accomplished from another source.

The integrated 5¼-inch diskette unit is integrated into the DCP/10A enclosure and is connected to the Multiple Device Line Module (MDLM) which occupies one card position in the DCP/10A.

Integrated Hard Disk

The integrated hard disk is an optional feature in the DCP/10A. It attaches to the same Multiple Device Line Module (MDLM) as the integrated flexible diskette discussed earlier, and therefore does not occupy any extra card positions. It is also enclosed in the DCP/10A.

It provides mass storage for loading and storing the Telcon operating programs and configuration software, as well as specialized user applications and Program Products.

It uses Winchester technology and provides up to 10 Megabytes of online storage. Most configurations will not need to go above this capacity.

8409 Disk Subsystem

The 8409 Disk Subsystem is a freestanding mass storage device, housed in a floor model cabinet. It is available in three versions: 4, 14 and 23 Megabyte capacity. The storage medium is an 8-inch rigid nonremovable platter. The disk subsystem supports up to two drives depending on the model selected.

Most requirements should be addressed by the integrated 10-Megabyte disk referred to earlier. Only in unusual circumstances should it be necessary to configure this subsystem with the DCP/10A.

Customer Installability of the DCP/10A

A primary DCP/10A design consideration is its relative ease of installation and configuration. Step-by-step procedures are provided with the DCP/10A to enable a customer to unpack the equipment, connect communications equipment, connect line module interfaces to peripheral equipment, and verify hardware operation.

NOTE: Some features available with the DCP/10A are not designed as customer installable equipment. For example, Sperry customer services representative may be necessary to complete installation of these features such as host related interfaces.

3 UPGRADES TO THE DCP FAMILY

3.1 DCP/10 UPGRADES

The fact that the DCP/10A has superceded the DCP/10 does not mean that customers who have purchased a DCP/10 from us have nowhere to go. One of Sperry's greatest strengths in the past has been its commitment to protecting the user's investment. The upgrades to the DCP/10 are an example of such protection. While it is not possible to upgrade the DCP/10 to a DCP/10A, it is possible for the user to benefit from the extra memory available through the DCP/10 upgrade kit.

This is a field-installable kit which replaces the old DCP/10 processor card, containing 128K bytes of the old memory, with a new processor card which contains 512K bytes of the newer 256K bit VLSI memory chips. The old memory expansion cards, that each used to hold 128K bytes, are replaced by the new memory expansion board that comes ready populated with 512K bytes, and capacity for a further 1024K bytes.

Users may not replace existing DCP/10 memory with the new memory. Also, a memory expansion board must be ordered to upgrade the customer to 1.0 Megabyte.

NOTE: Upgrading a DCP/10 does not create a DCP/10A. It merely increases the memory capacity to 2.0 Megabytes. A DCP/10A includes other features which cannot be added to a DCP/10.

3.2 DCP/20 MEMORY UPGRADES

The DCP/20 has traditionally suffered from the same restrictions as the DCP/10. For example, with a maximum memory capacity of only 512K bytes, its ability to accommodate Program Products, or a Telcon system for a diverse network was severely limited.

With the new memory enhancements, this restriction disappears. The new memory on the DCP/20 supports up to 2.0 Megabytes of memory.

All new DCP/20s will be shipped with 512K bytes of the new memory, and therefore will be immediately upgradable. Existing DCP/20s can be upgraded by a field-installable upgrade kit. This replaces the current memory module that includes backpanel, memory array cards, controllers and interface cards with a new module containing the new 512K byte array cards and appropriate interface cards and controllers. Once installed, this new memory module can accommodate memory up to 2.0 Megabyte maximum.

The field upgrade kit comes with 1.0 Megabyte of memory so it is only possible to obtain the field upgrade when expanding memory.

This is the same memory as is used on the DCP/40.

3.3 DCP/40 MEMORY UPGRADES

The memory on the DCP/40 main cabinet was upgraded several years ago from 16K-bit chip technology to 64K-bit technology. This allowed a user to put up to 2.0 Megabytes in this cabinet. The upgrade was not applied to the expansion cabinet at the time hence the expansion cabinet could only accommodate 1.5 Megabytes of the old style memory.

As demand for larger systems has been increasing, and the supply of the old style memory has been decreasing, changes have been made to the expansion cabinet and controllers and interfaces to accommodate the newer 64K-bit chip memory. Thus, it is now possible to accommodate up to 4.0 Megabytes of memory in the expansion cabinet, giving a system maximum of 6.0 Megabytes. It is generally felt that this should be enough to be going on with for the time being!

4 PERIPHERAL SUPPORT

Within the context of this new announcement, the only changes in the peripheral support are as a result of consolidation of technology rather than new products. As technology improves, it becomes more feasible to address the diverse needs of the customers with fewer products, when these newer products represent an improvement in cost/performance. The benefits are easier system configuration and reduced cost of carrying inventory for a large selection of options which may never be required.

Consequently, some of the peripherals that used to be available on the DCP family have been discontinued or replaced, due either to technological improvement, or to the fact that the demand for such peripherals is minimal for the particular market into which we sell.

The following paragraphs summarize the products now available on the specific members of the DCP family.

4.1 DCP/10A PERIPHERAL SUPPORT

As the DCP/10A is intended for use as a Front End Processor for small mainframes, or as part of a larger network functioning as a nodal switch or remote concentrator. There is no requirement to attach a wide range of peripherals.

For instance, the need for a dedicated system console could not be justified for a small Front End Processor, and in the network environment, would probably already exist on another node. A similar argument would apply to the magnetic tape subsystem. For this reason, the only peripherals available on the DCP/10A are the mass storage subsystems.

NOTE: It is unnecessary for any DCP to have a dedicated system console. Any connected workstation can be designated as a network management console and perform the functions that a standalone console does. However, when traffic volumes exceed a certain level it is expedient to have a standalone console. It is unlikely that this level will be exceeded in systems below a DCP/20.

Mass Storage Systems

With the availability of the integrated 10 Megabyte hard disk on the DCP/10A, there really is little need for many other peripherals on this model. The only other mass storage device available is the freestanding 8409 Disk Subsystem, available in capacities of 4.75, 14.25 or 23 Megabytes.

It is most unlikely that you will ever have occasion to respond to a bid for the 8409 Disk Subsystem. The only circumstances where you may need this is when the customer requires more than 10 Megabytes, which is highly unlikely. Should this situation arise, then you could either offer the 8409 Disk Subsystem as an addition to, or in lieu of, the integrated disk.

The 8406 Diskette Subsystem is no longer available on the DCP/10A.

Figure 4-1 shows the DCP/10A peripheral support for the DCP/10A hardware system.

4.2 DCP/20 PERIPHERAL SUPPORT

The level of peripheral support on the DCP/20 reflects its intended market. Being more powerful than the DCP/10A, it is more likely that it would be sold as a Front End Processor to a medium range host processor or as a major node in a network. As such, it is possible that there would be a requirement for a standalone operators console/printer or even a magnetic tape subsystem.

Also, the absence of an integrated hard disk means that additional freestanding peripherals have to be offered on the DCP/20 until new lower cost alternatives are available.

The currently supported peripherals on the DCP/20 are described in the following paragraphs.

SPERRY 8406 Diskette Subsystem

The SPERRY 8406 Diskette Subsystem is being offered on the DCP/20 as a temporary measure until the new mass storage devices are supported. The new devices are the 8441 Mass Storage Subsystems which will be supported as part of Communications Delivery 2 Release 3, currently scheduled for delivery to customers in October 1985. This will offer a capacity of up to 60 Megabytes of online storage.

Because it is not possible at this time to offer the 8441 Mass Storage Subsystems, and get the resulting price benefit, refurbished 8406 Diskette systems will be available, in limited quantities, out of the Returned Equipment Inventory. This should give you the flexibility to enable you to offer a competitive system using refurbished 8406 Diskettes on monthly rental basis until the newer peripherals are available. This is only for the customer whose requirements are for 2.0 Megabytes of memory or less. If the requirements exceed this, the 8409 Disk Subsystem should be offered.

Operator Console

For the user whose traffic volumes are low, there is no need to have a dedicated operator console; however, when the traffic volumes reach a certain threshold, it may be more expedient to designate a local UTS terminal as an operator console. This terminal is linked to a synchronous line module via a serial communications line on a Direct Connect Modem (DCM) basis.

Any of the currently supported UTS terminals can be used as an operator console. The SPERRY PC can also be used with the appropriate UNISCOPE emulation hardware and software. Some of the network management functions may benefit by using the color capabilities of the UTS 60 color graphics terminal, or one of the color versions of the SPERRY PC. Naturally, any of the currently supported printers can be attached as output devices for the purpose of printing network management messages.

SPERRY 8409 Disk Subsystem

Other than the addition of a 23 Megabyte version to the previously available 4.75 Megabyte and 14.25 Megabyte versions, the description of the SPERRY 8409 Disk Subsystem contained in the Distributed Communications System SIM (S7390, current version) is still applicable.

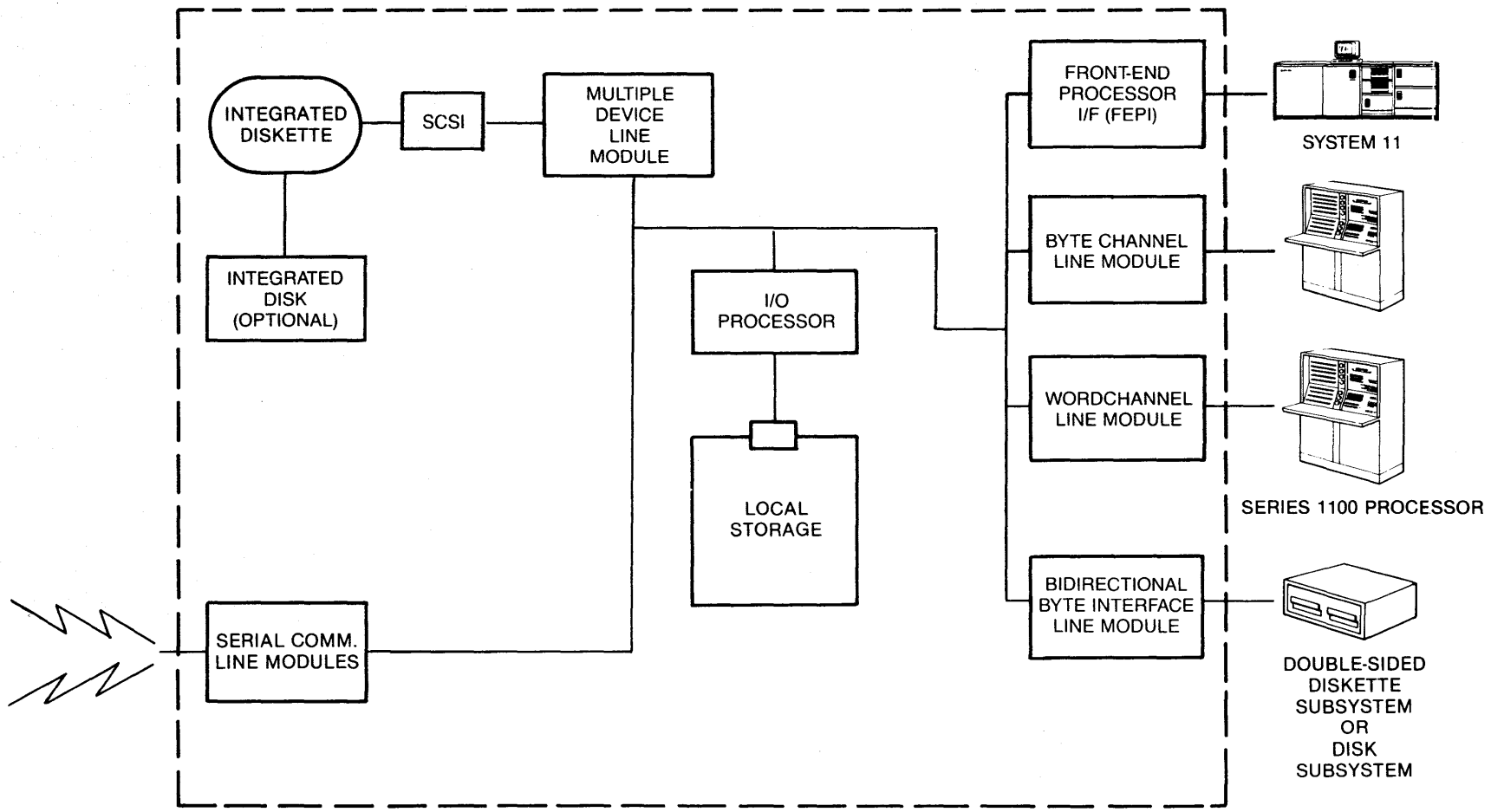

Figure 4-1. DCP/10A Hardware System

SPERRY 0871 UNISERVO 10 Magnetic Tape Subsystem

The description of the magnetic tape contained in the Distributed Communications System SIM is still applicable.

Figure 4-2 shows the DCP/20 peripheral support for the DCP/20 hardware system.

4.3 DCP/40 PERIPHERAL SUPPORT

With the exception of the 8406 Diskette Subsystem, the same peripherals are supported on the DCP/40 as on the DCP/20. As the demands of the DCP/40 have always been too great to be accommodated on an 8406 Diskette, this has never been offered. To summarize, the peripherals supported on the DCP/40 are:

- Operator console
- 8409 Disk Subsystem
- 0871 UNISERVO 10 Magnetic Tape Subsystem

The DCP/20 descriptions contained in Section 4.2 and the Distributed Communications System SIM are also applicable to these peripherals.

Figure 4-3 shows the DCP/40 peripheral support for the DCP/40 hardware system.

4.4 COMMUNICATIONS COMPONENTS

The DCP family also supports connection of the Line Switch Module (LSM) and the Remote Communications Module. Descriptions of these devices are also contained in the Distributed Communications System SIM, (S7390, current version).

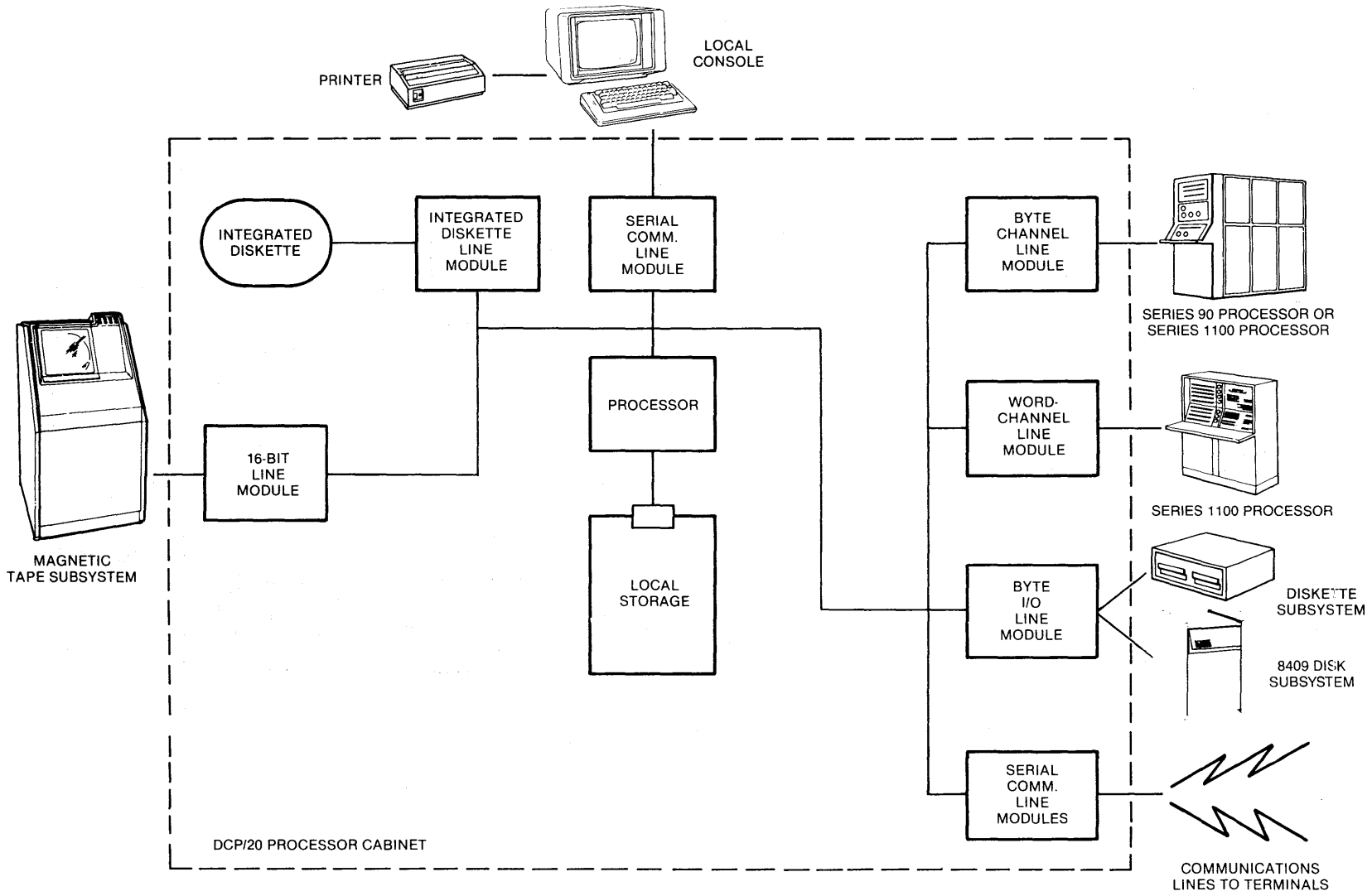

Figure 4-2. DCP/20 Hardware System

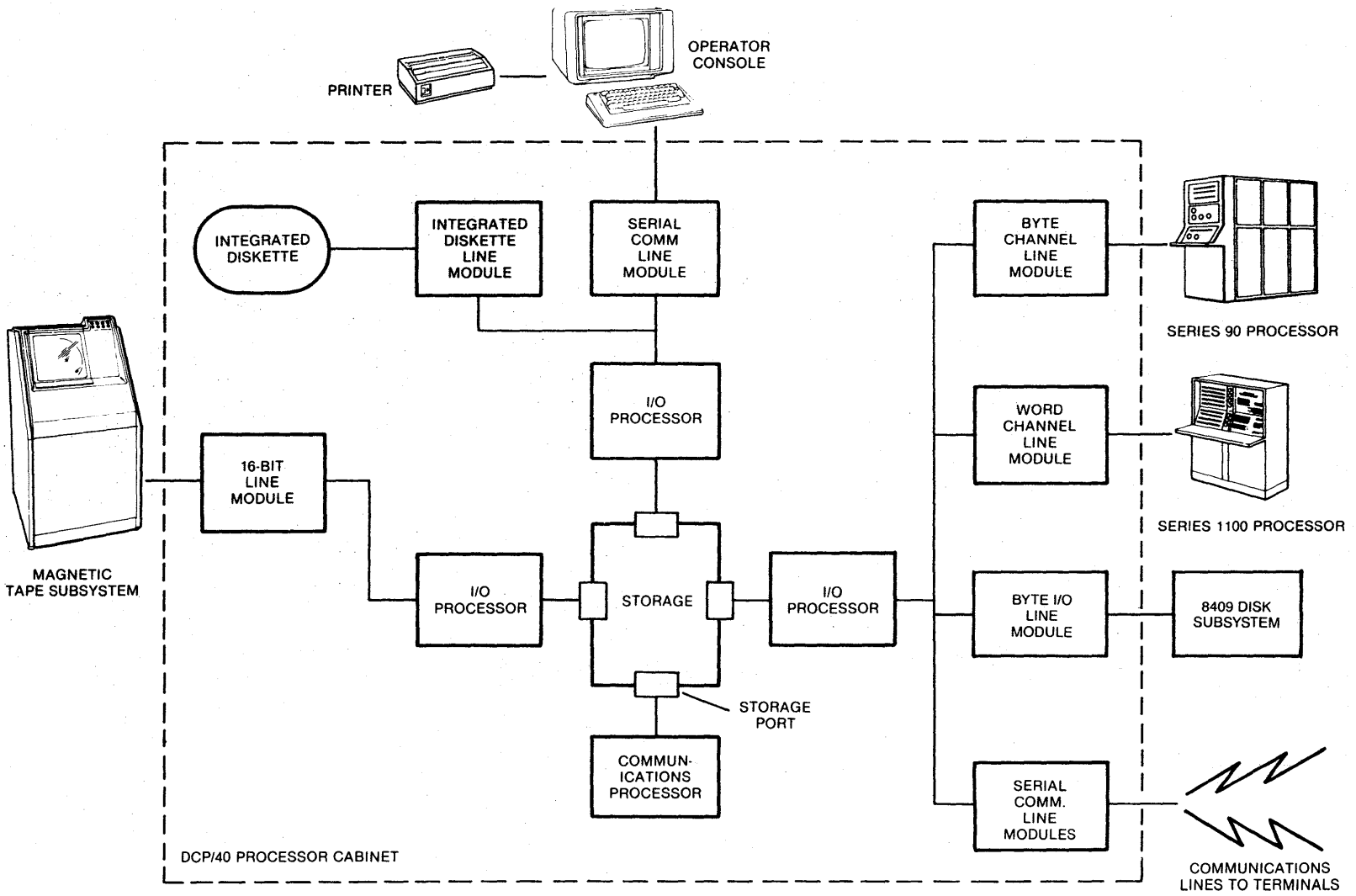

Figure 4-3. DCP/40 Hardware System

5 TELCON DEPENDENCIES

As Telcon functionality increases and the range of the DCP is extended by adding new peripherals or line modules, architectural changes to the DCP have to be made occasionally to accommodate this evolution. The change could be in different microcode needed to support the new products, with resulting changes to Telcon. As with any evolutionary changes it is contradictory and often impractical to retrofit changes to previous releases of software.

As a result of this evolution, certain levels of Telcon are needed to run specific DCPs or peripherals. Table 5-1 summarizes the level of Telcon, and associated Communications Delivery releases which are required to support the different hardware products.

Table 5-1. Communications Delivery Level Summary

Product	Telcon Level	Communications Delivery Level
DCP/10A	Telcon 6R2	CD2R2
DCP/10	Telcon 5R1	CD1R1
DCP/40	Telcon 4R1	N/A
SPERRY 8409 Diskette Subsystem	Telcon 4R1	N/A
SPERRY 8406 Diskette Subsystem	Telcon 4R1	N/A (now available on DCP/20 via RER)
SPERRY 8408 Diskette Subsystem	Telcon 4R1	N/A (discontinued)
Integrated Hard Disk	Telcon 6R2	CD2R2
0871 UNISERVO 10 Magnetic Tape Subsystem	Telcon 4R1	N/A

In Table 5-1, anything that is supported by Telcon 4 may also be supported by earlier releases of Telcon. Since the number of pre-Telcon 4 sites is minimal, and should soon be zero, discussion of those releases would be pointless. In fact, for the majority of sales environments where you will be active, the only relevant releases are the Communications Delivery based systems, CD1 and CD2.

The current releases of Telcon are part of Communications Delivery 2 (CD2) delivered to Sperry customers in November 1984. This delivery pairs CMS 1100 Level 3 and Telcon Level 6. All previous Program Products are supported under CD2. For a detailed list of the features and functionality of CD2, refer to the Communications Delivery 2R2 Software Release Description (UP-10726.2).

6 INTERCONNECT PRODUCTS

One of the major requirements for any supplier of a data transport system, or communications network, is the need to communicate with environments other than our own to exchange and share data and information between multiple users. These may be dual or co-vendor environments where connection to other vendor's equipment is required; or, alternatively, where there are government or industry standards that demand support from the would-be supplier.

Sperry offers a number of interconnect products, or gateways, that satisfy these requirements. These products reflect both the competitive market, typified by de facto industry standards (i.e., IBM's Binary Synchronous Communications (BSC) protocol, or their Systems Network Architecture (SNA)) as well as the regulated market where national and international standards (i.e., the X.25/X.21 Packet and Circuit Switching standards recommended by the CCITT).

The following sections summarize the Gateway Program Products currently available from Sperry. For further details on these Program Products, refer to the Program Product Specifications (PPSs), or check with your local Communications Marketing Manager. Since new products are continuously released, familiarize yourselves with them when they are available.

6.1 PUBLIC DATA NETWORKS (PDN)

Public Data Networks include those networks that offer services based on the CCITT recommended standards X.21 and X.25. The X.21 recommendation covers the physical interface used in packet and circuit switching and the X.25 recommendation covers the link and network layers for packet switching.

The following sections provide guidelines and information regarding this marketplace.

6.2 PDN ENVIRONMENT

The new communications standards are primarily oriented toward Public Data Networks. A Public Data Network (PDN), in its most general sense, could be any data network available to the public. Public Data Networks have undergone several years of development, testing and change. Only recently some services have become operational or are expected to, in the near future.

There are many types of Public Data Networks, but the important ones are either circuit-switched (X.21) or packet-switched (X.25). The main reason that these two types will dominate is that they both provide a means of sharing the communications lines, resulting in lower costs.

6.3 CIRCUIT SWITCHED (X.21) NETWORKS

A circuit-switched network is one in which a dedicated path through the network is established at call-initiation time. After initialization, the user retains the entire path exclusively for the duration of the call.

Circuit-switched PDNs need to handle messages that only last for seconds, and, therefore, need much faster call establishment. For the duration of the transmission, the various links that form a communications path between end users are connected together by high-speed solid-state switches controlled by stored program controllers at the circuit switch exchange. This effectively provides an end-to-end connection over which the data is sent. No data is stored in the network itself. On completion of the transmission, the switches are reset to allow other users to use the same links.

The length of time for which the connection is held depends on the nature of the transaction. If there is a considerable gap between successive transmissions, such as in interactive processing, it is probably more economical to disconnect after each transaction. On the other hand, in the case of sustained transmission, as in batch or trunk communications, the idle periods are relatively small, so it may be better to maintain the connection for the duration of the whole transmission.

Circuit-switched channels are charged by the second, regardless of use, so this is an important factor to be considered when deciding which approach to take.

To summarize, circuit switching involves the hardware switching of communication lines by switching exchanges.

6.4 PACKET SWITCHED (X.25) NETWORKS

A packet-switched network is one in which data is transmitted in fixed sized "packets." Address and control information is appended to each packet. The packet is moved through the network via a "Routing" process, which is determined by the network. Each link in the network can be shared by many different users at the same time, providing efficient utilization of the lines for intermittent data transfers.

In packet switching, the various links that form the communications path between the end users are connected by packet-switching exchanges that use software to "switch" the data, instead of hardware for switching the lines, as in circuit switching.

A "packet" of information is taken from one link. Its "envelope" is examined to determine its destination, and it is then placed on a queue. From there it will be transmitted, interleaved with other users' packets along the next link to the next packet-switched node and eventually to its destination.

Packets rather than messages are transmitted because this store and forward approach introduces delay by filling buffers at each intermediate mode. Obviously, the longer the message, the longer the time spent filling buffers.

Use of this technique enables the first packet from a complete message to be put on the second link, while the second packet is still being transmitted along the first link, and so on. This overlapping of transmission allows a much faster transmission time for the whole message, with resulting improvement in response time.

Obviously, because the "packet" is stored for discrete periods at each node along its path, the potential for errors is much greater. Consequently, many techniques for ensuring the integrity of the data and the network itself have been developed and are incorporated in the X.25 international recommendation for packet-switching networks.

Charges for this sort of network are usually by the packet and tend to favor the transaction/interactive environment rather than batch.

Of the two approaches, circuit switching is the more advanced in terms of hardware technology but is expensive and, to a degree, involves a higher risk in view of its pioneering nature. Packet switching offers a cheaper, lower risk alternative, once the necessary precautions are developed to protect the network and guarantee the integrity of the data. These precautions, plus others, are contained in the X.25 international standard governing connection to packet-switching networks. Eventually, most countries will offer both circuit and packet switching, either as alternatives or possibly as hybrid PDNs.

6.5 WHY DOES THE CUSTOMER WANT PUBLIC NETWORK SUPPORT?

The customer's needs must be examined from two perspectives:

1. Why he wants the PDNs themselves.

2. Why he needs to be able to interface with them.

PDNs offer advantages by providing improved flexibility for configuring networks that provide the best solution – a degree of network transparency and adherence to international standards.

Secondary to this is the need to interface with PDNs because of pressure from the local PTTs as part of their marketing policy and for future developments.

Topological Flexibility

Many customer needs for lines arise from the physical layout of their network rather than as a result of traffic volume. Providing a dedicated line to interconnect all of the outlying sites is expensive and wasteful. When configuring networks, providing a communications facility which satisfies the geographic requirement and can economically handle the traffic volume gives unlimited flexibility.

Reaction to Public Telephone and Telegraph (PTT) Customer Base Management

The monopoly power of many PTTs means that few customers are in a position to resist the pressure created by the PTT tariffing structures. The customers need to be able to respond to these pressures in a flexible and inexpensive way, using the most economical facilities.

Foundation for Integrating Future Services

The PTTs are beginning to offer more value-added services, such as VIDEOTEX and TELETEX. Most of these value-added services will use the local PDNs. By using those same PDNs the customer is in a better position to use these services when they become available.

Network Transparency

Many users, particularly the smaller ones, cannot afford the luxury of an expert for handling data communications problems. Using PDNs enables them to use a data network the same way they use the telephone system. Thus, the responsibility for the network is shifted to the vendor and the PTT.

Standards

Most PDN implementations adhere to international standards laid down by the CCITT. These standards are known as the X-series recommendations. The best known is the X.25 standard. Adherence to such standards gives the customer greater investment protection.

6.6 SPERRY PDN SUPPORT

Sperry Hardware and Program Products

This section presents the hardware and program products provided by Sperry to facilitate PDN connectivity. It also describes the product support by network.

X.21 Network Support

The Public Data Network (PDN) pairings supported by the X.21 Circuit Switched Communications Software (CSCS) are DCP – DCP, DCP – UTS 20X, and DCP – UTS 30X. The current program product is DCP X.21 CSCS 2R1 paired with CD1R2 and higher. The following networks are supported:

- DATEX (Sweden)
- DATEX (Denmark)
- DATEX (Finland)
- DATEX (Norway)

NOTE: Currently, it is not possible to support the X.21 and X.25 standards in the same DCP.

X.25 Network Support

The cross-network pairings supported by the X.25 Packet Switched Communications Software (PSCS) are DCP – DCP and DCP – UTS 4000. The current program product is DCP X.25 PSCS 2R1 paired with CD1R1 and higher. This release supports the following Public Data Networks:

- DATEX-P (Germany)
- PSS (United Kingdom)
- AUSTPAC (Australia)
- IBERPAC (Spain)
- TRANSPAC (France)
- DATEX-P (Austria)
- DATANET 1 (Holland)
- ARPAC (Argentina)
- TELENET (USA)

The next release of this program product, DCP PSCS 3R1 supports the following cross-network pairings: DCP – DCP, DCP – UTS 4000 and DCP – Asynchronous Device (PC or TTY). The pairing is accomplished with an X.3/X.28/X.29 PAD (Packet Assembler/Disassembler). This release pairs with CD2R1 and higher, and is scheduled for release imminently. In addition to the previously listed networks, this release supports the following networks:

- ITAPAC (Italy)
- TELEPAC (Portugal)
- DCS (Belgium)
- TELEPAC (Mexico)
- BX.25 (Bell Communications Research)
- DATAPAC (Canada)
- TELEPAC (Switzerland)
- DATAPAK (Finland)
- NZPAK (New Zealand)
- SAPONET (South Africa)

NOTE: Currently, it is not possible to support the X.21 and X.25 standards in the same DCP.

6.7 PUBLIC DATA NETWORK (PDN) FACILITIES

The facilities currently supported by Sperry for both X.21 and X.25 networks are listed in paragraphs 6.8 through 6.8.5. The following text explains the user benefits of these PTT facilities.

Reverse Charging

The normal charging principle is that all usage charges are paid by the calling party. Any terminal may ask for the charges to be reversed, but such calls will be connected only if the called party agrees to accept charges, and is willing to accept the particular call in operation.

Logical Channels

Logical channels enable the user to hold more than one communication simultaneously, using only one physical link between the terminal and the packet switching exchange. There is no need for a host computer to sequentially poll at its terminals because each terminal will be able to call the host using a free logical channel, whenever it has some data to send.

The user can elect to have two-way channels, incoming-only or outgoing-only channels. The advantage of two-way channels is that calls will never be refused while there is a free channel.

The advantage of incoming only and outgoing-only channels is that these cannot be "borrowed" to set up calls in the opposite direction. Consequently when the allocation of two-way and incoming logical channels are all in use, outgoing calls can still be made.

Permanent Virtual Circuitry (PVC) may be used for DCP – DCP pairing. A PVC requires no call establishment/clearing procedures.

Flow Control Negotiation

Several of the PDNs provide a facility that allows dynamic flow control negotiation. This facility must be subscribed to allow the calling and called Data Terminal Equipment (DTEs) to negotiate a packet size and window size different from the PDN defaults. An example that illustrates the benefit of this facility is that a DCP and a UTS 4000 can negotiate flow control parameters that allow greater throughput.

Calling Line Identification (Circuit Switching)

The terminal equipment obtains the number of the calling subscriber from the PDN when the call is established. Then the equipment being called can decide whether or not communication is desired.

Called Line Identification (Circuit Switching)

This facility primarily provides a check that the network has correctly interpreted the called number. The network reports the number before a connection is made.

Direct Call (Circuit Switching)

On calling, the subscribe is always connected to a predetermined number. If necessary, this facility can be combined with other selection facilities, e.g., number selection.

6.8 PDN SOFTWARE FEATURES

Product line support is currently offered on several Public Data Networks. The features and functions they support are described for each product in the following paragraphs.

DCP X.21 Circuit-Switched Communications Software (CSCS) 2R1

The SPERRY DCP X.21 Circuit-Switched Communications Software (CSCS) provides necessary additions to the DCP/Telcon for support of the X.21 DATEX circuit-switched Public Data Network used in Sweden, Norway, Denmark, and Finland.

Product Features

Support for the Nordic circuit-switched PDN is based on CCITT recommendation X.21. DCP X.21 CSCS enhances the Telcon software to use the Nordic PDN for communication to another DCP, to run X.21 DCP CSCS (UDLC protocol), or to run a circuit-switched terminal (UTS 20 or UTS 30).

The network features supported by DCP X.21 CSCS are:

- Address call
- Multiple lines at same address (group number)
- Call progress signal handling with user-defined retry procedures (including timing)

In addition to these network features, CSCS 2R1 provides features to minimize the PDN tariff charges:

- Considerably fewer lines are needed from the DCP to the PDN than there are remote DTEs to be connected.

- For the UTS 20 or UTS 30, a connection is established only when there is data to be exchanged – not for idle polling. Configuration parameters are available to tailor the time a connection is held in anticipation of additional data to/from the same terminal.
- For a DCP – DCP connection, an expansion/reduction algorithm automatically connects or disconnects additional links between the same two DCPs, as the traffic between them varies.
- Circuit-switched DCP – DCP connections may be used simultaneously with one or more leased lines. This enables use of the circuit-switched links as backup or overflow for the leased lines.
- Additional Telcon operator commands control the circuit-switched lines.

DCP X.25 Packet-Switched Communications Software (PSCS) 2R1

Release 2R1 of the SPERRY DCP X.25 Packet-Switched Communication Software (PSCS) provides the necessary additions to the DCP/Telcon for support of the nine PDN's listed previously.

Product Features

Support for these PDNs is based on CCITT recommendation X.25 standard. This software enhances the Telcon software to use the X.25 PDN for communication with another DCP processor also running DCP X.25 PSCS or a packet-switched terminal product of the UTS 4000 family.

The network features supported by DCP X.25 PSCS 2R1 are:

- Switched virtual circuits for UTS 4000 and remote DCP pairings
- Permanent virtual circuits for remote DCP pairings
- Any subscription packet and window size
- Packet and window size negotiation

In addition to these network features, DCP X.25 PSCS 2R1 provides features to minimize the PDN tariff charges:

- Virtual circuits for all remote connections can be multiplexed on a single link to the PDN
- All connections to workstations on a cluster controller can be multiplexed on a single virtual circuit
- All DCA sessions to a remote DCP can be multiplexed on a single virtual circuit

UTS X.25 Packet-Switched Communications Software (PSCS) 2R1

The SPERRY UTS X.25 Packet-Switched Communications Software provides necessary additions to the SPERRY UTS 4040 and UTS 4020 cluster controllers for support of the nine X.25 packet-switched PDNs.

Product Features

Support for the packet-switched PDNs is based on CCITT recommendation X.25. UTS X.25 PSCS 2R1 enhances the UTS 4000 cluster controller to use an X.25 PDN for communication with a DCP or System 80 system with packet-switching capability.

The network features supported by UTS X.25 PSCS are:

- Switched virtual circuits
- Switched virtual circuits
- Subscription packet and window size
- Packet size and window size negotiation

In addition to these network features, UTS X.25 PSCS provides a pairing protocol to multiplex traffic from all workstations over a minimum of one virtual circuit and to provide cross-network error detection and recovery.

Future Offerings on UTS 4000

UTS 4000 X.25 PSCS 2R1A and 2R2 will pair with the cluster controller software SCP 1R4A and 2R1 respectively. UTS 4000, X.25 PSCS 2R1A and 2R2 coupled with cluster controller software SCP 1R4A and 2R1 will support the additional networks included under DCP X.25 PSCS 3R1 networks.

DCP X.25 Packet-Switched Communications Software (PSCS) 3R1

Release 3R1 of DCP X.25 Packet-Switched Communications Software supports the same nine PDNs of release 2R1 and also supports the eight group two networks which are listed earlier.

Product Features

Support for these PDNs is based on CCITT recommendations X.25, X.3, X.28, and X.29. This software enhances the Telcon software to use the X.25 PDN for communication with another DCP processor also running DCP X.25 PSCS, a packet-switched terminal product of the UTS 4000 family, or an asynchronous device (PC or TTY) using an X.3/X.28/X.29 Packet Assembly/ Disassembly.

The network features supported by DCP X.25 PSCS 3R1 are:

- Switched virtual circuits for all pairings
- Permanent virtual circuits for remote DCP pairings
- Any subscription packet and window size
- Packet size and window size negotiation
- Throughput class facility acceptance
- Reverse Charging

DCP X.25 PSCS 3R1 provides a standardized X.25 platform at the level 3 interface as a user interface for future development of additional product pairings. Some of the features of the X.25 platform are:

- User-level (upper-level) D-bit support
- User-level (upper-level) M-bit support
- Nonconfigured call establishment
- Interrupt packet support
- User-level support of nonstandard facilities

Along with this user interface is a higher level module called PLS (Packet Layer Services) that uses this interface. This is intended for host-to-host dialogue across a PDN. Through PLS, a host application can create and terminate network connections, request specific connection attributes, and send or receive data across a PDN. All higher level (above Level 3) protocols will be developed in the 1100 host.

In addition to the above stated features, DCP X.25 PSCS 3R1 provides features to minimize the PDN tariff charges:

- Virtual circuits for all remote connections can be multiplexed on a single link to the PDN
- All connections to workstations on a cluster controller can be multiplexed on a single virtual circuit
- All DCA sessions to a remote DCP can be multiplexed on a single virtual circuit.

6.9 FUTURE PDN PRODUCT DEVELOPMENT

Future development is being planned by Micro Products Division both in the X.25 and X.21 areas. X.25 support is planned for the UTS 30. X.21 support is planned on the DOPS/20. There may be others.

Table 6-1. PDN Program Products Reference Summary

Product	Type No.	PPS	RD	UG	IG
DCP X.21 CSCS 2R1	6258-01	UP-10128	UP-10219	UP-9515	
DCP X.25 PSCS 2R1	6257-04	UP-10126	UP-10217	UP-9522	
UTS X.25 PSCS 2R1	6844-00	UP-10127	UP-10218	UP-9532	
DCP X.25 PSCS 3R1	6257-05	UP-10126	UP-10217.1	UP-10481.1	UP-10217.2

6.10 IBM INTERFACE SOFTWARE

Four program products allow Sperry and IBM terminals to access applications on either vendors mainframe processors.

The program products are:

- IBM 3270 Terminal Handler
- IBM 3270 Inverted Terminal Handler
- IBM 2780/3780 Inverted Terminal Handler
- Telcon System Network Architecture (SNA) Gateway

These separately priced program products in conjunction with currently available Telcon System software provide an environment in which Sperry and IBM interactive and remote batch terminals can access application programs in Sperry and IBM host processors.

Product Benefits

The IBM coexistence software permits a user to share a mixed environment of Sperry and IBM terminals and host applications. Here are some potential benefits of this capability:

- Reduced terminal costs
- Reduced network (line and modem costs)
- Increased terminal user productivity
- More efficient use of host resources
- Access to more powerful Sperry Applications by IBM terminals
- Easier migration from IBM to Sperry host systems using an IBM network
- Ability of Sperry terminals to access IBM host applications

6.11 BSC INTERACTIVE MODE

Coexistence between Sperry and IBM products is provided by the IBM 3270 Terminal Handler and the IBM 3270 Inverted Terminal Handler.

The IBM 3270 Terminal Handler provides line and terminal control of 3270 bisynchronous cluster controllers, display stations and printers.

The IBM 3270 Inverted Terminal Handler provides an interface to an IBM 3705 communications controller. This handler emulates IBM 3270 cluster controllers, and allows the DCP to appear as a number of cluster controllers to the IBM system.

Using the above handlers and existing Telcon software (see Figure 6-1), the following capabilities are available:

- IBM 3270 BSC terminals* can access applications in the Sperry or IBM host processors. The IBM 3270 runs as a UTS to Sperry host applications.
- Sperry UTS terminals can access applications in the Sperry or IBM host processors. The UTS appears as IBM 3270 terminals to the IBM host applications.

Due to variations in the capabilities of the UTS terminal and the IBM 3270, some functions normally available with a UTS will not be available to IBM applications. Likewise, some IBM 3270 terminal functions will not be available when communicating to Sperry applications.

When a UTS 400/4000 is communicating with a Sperry application, or an IBM 3270 is communicating with an IBM application, all native terminal functions are available.

6.12 IBM 3270 TERMINAL HANDLER

The SPERRY Telcon IBM BSC 3270 Terminal Handler supports, via a DCP, IBM 3270-compatible terminals using the BSC (Binary Synchronous) protocol.

**Support is provided for the class of BSC procedure described in Chapter 6, "Remote Operations – BSC", of the IBM SRL (Systems Reference Library) document, IBM 3270 Information Display System – Component Description, SRL No. GS27-2749, Update Level 8, 11th Edition, February 1980, File No. S360/S370/S3-09.*

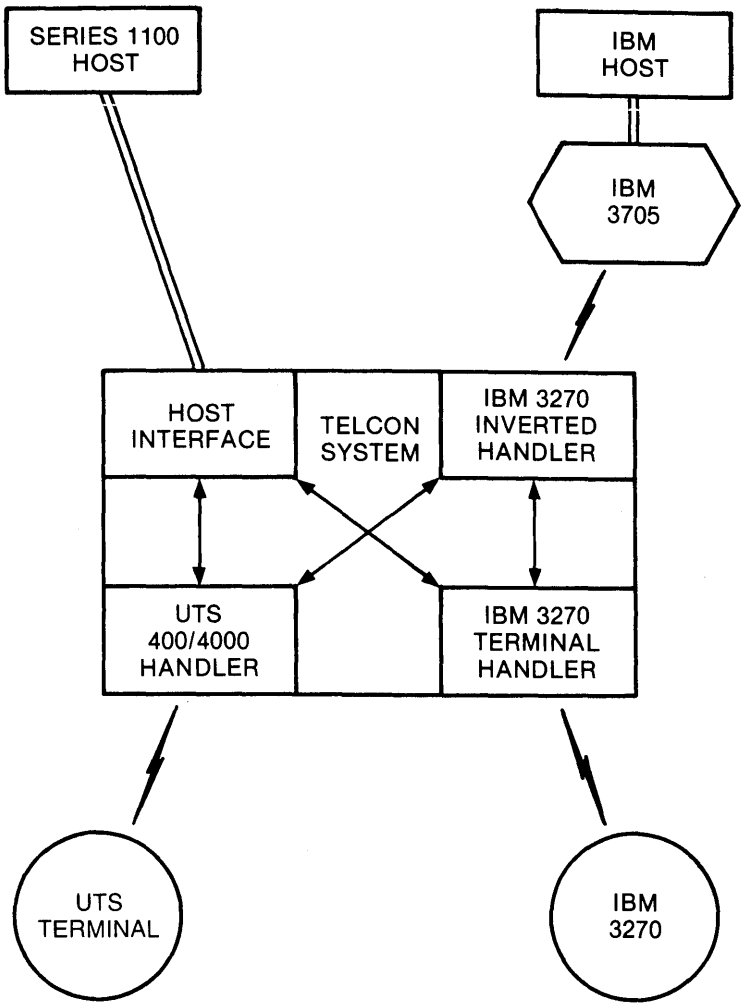

Figure 6-1. IBM 3270 Coexistence

When this handler is used, the SPERRY Series 1100 host will interact with an IBM 3270 as if it is a SPERRY UTS 400/4000 terminal. Translation and transformation are performed by Telcon.

If used with the IBM 3270 Inverted Terminal Handler, both UTS 400/4000 and IBM 3270-compatible terminals connected to a given DCP may converse with either a Series 1100 or an IBM host connected to that DCP (see Figure 6-1).

Due to variations in the capabilities of the UTS 400/4000 and the IBM 3270, some functions, normally available to the IBM 3270 connected to the IBM host, are unavailable when the user communicates with the Series 1100 host.

Product Features

Point-to-point or multidrop IBM 3270 terminal configurations are supported, either on switched or dedicated lines.

The IBM 3270 BSC Terminal Handler is configured for each DCP node in a given network that is required to support locally attached IBM 3270 BSC control units.

A given IBM 3270 BSC Terminal Handler will support up to 32 IBM 3270 control units per BSC communications link with the DCP node.

The following IBM 3270 control units, configured for BSC mode of operation, are supported:

- 3271 Models 1 and 2
- 3274 Model 1C (BSC) and 51C (BSC)
- 3276 Models 1, 2, 3, and 4

The maximum number of IBM devices (terminals and printers) permitted for the control unit supported is:

- 3271, 3274 – Up to 32 devices per control unit
- 3276 – Up to 7 devices in addition to the Native Display Station

IBM 3277 Models 1 and 2, and 3278 Models 1, 2, 3, and 4 display stations, attached to the appropriate 3270 control units, are supported. The previously listed standard IBM 3270 display station features, supported by the 3270 control units, are supported.

IBM 3284 Models 1, 2, and 3; 3286 Models 1 and 2; 3287 Models 1, 1C, 2, and 2C; 3288 Model 2; and 3289 Models 1 and 2 printers attached to the appropriate IBM 3270 control units already listed are supported. The standard IBM 3270 printer features, supported by the 3270 control units, are supported.

6.13 IBM 3270 INVERTED TERMINAL HANDLER

Through a DCP, the SPERRY Telcon IBM BSC 3270 Inverted Terminal Handler supports connection to an IBM 3705 front end to an IBM host using the BSC (Binary Synchronous) protocol.

Using this handler, Sperry UTS terminals may converse with applications resident in either a Series 1100 host or an IBM host connected to the DCP. Additionally, if used with the IBM BSC 3270 (Real) Terminal Handler, 3270-compatible terminals may also converse with either a Series 1100 host or an IBM host connected to the DCP (see Figure 6-1).

Due to variations in the capabilities of the UTS terminal and the IBM 3270 terminals, some functions normally available to an IBM host-resident application will be unavailable when communicating with a UTS terminal via the Inverted Terminal Handler.

Product Features

Point-to-point or multidrop IBM 3270 terminal configurations are emulated, either on switched or dedicated lines.

The IBM host sees DCP/Telcon as a member of cluster controllers on multidrop lines. DCP/Telcon will map the "IBM network" (as defined within the IBM System) to the actual network, which will be controlled by the Telcon Network Management System. Thus, the actual IBM 3270 network will be freely configurable, if the IBM 3270 hardware rules and the BSC addressing limitations are obeyed.

If both the real and inverse terminal handlers are employed, then native functionality is supported when an IBM 3270 communicates with the IBM host.

The IBM 3270 BSC Inverse Terminal Handler is configured, in a given network, for each DCP node required to communicate with an IBM 3705 front end to an IBM host.

The following IBM 3270 control units, configured for BSC mode of operation, will be emulated:

- 3271 Models 1 and 2
- 3274 Model 1C (BSC) and 51C (BSC)
- 3276 Models 1, 2, 3, and 4

The maximum number of IBM devices (terminals and printers) permitted for the control unit emulated is:

- 3271, 3274 – Up to 32 devices per control unit
- 3276 – Up to 7 devices in addition to the Native Display Station

IBM 3277 Models 1 and 2, and 3278 Models 1, 2, 3, and 4 display stations attached to the appropriate 3270 control units are emulated. The standard IBM 3270 display station features, supported by the 3270 control units already listed, are emulated.

IBM 3284 Models 1, 2, and 3; 3286 Models 1 and 2; 3287 Models 1, 1C, 2, and 2C; 3288 Model 2; and 3289 Models 1 and 2 printers attached to the appropriate previously listed IBM 3270 control units are emulated. The listed standard IBM 3270 printer features, supported by the 3270 control units, are emulated.

6.14 BSC REMOTE BATCH MODE

Coexistence between Sperry and IBM products is provided by the existing IBM 2780/3780 Terminal Handler and the program product IBM 2780/3780 Inverted Terminal Handler.

The IBM 2780/3780 Terminal Handler performs line and terminal control of IBM 2780/3780 terminals and "emulation" terminals operating in BSC mode.

The IBM 2780/3780 Inverted Terminal Handler provides an interface to an IBM 3705 communications controller. It emulates 2780/3780 terminals and allows the DCP to appear to the IBM 3705 as a number of 2780/3780 terminals.

Using the above handlers and existing Telcon software (see Figure 6-2), IBM 2780/3780 terminals or emulation terminals can access remote batch applications in either the Sperry or IBM host. The Sperry host views the terminal as a Nine Thousand Remote (NTR) terminal, and the IBM host views it in its native mode.

6.15 IBM 2780/3780 INVERTED TERMINAL HANDLER

Through a DCP, the SPERRY Telcon IBM BSC 2780/3780 Inverted Terminal Handler supports connection to all IBM 3705 front end to an IBM host using the BSC (Binary Synchronous)* protocol.

**Support is provided for the class of BSC procedure described in "General Information – Binary Synchronous Communications", of the IBM SRL (Systems Reference Library), SRL No. GS27-3004, Update Level 2, 3rd Edition, October 1970, File No. TP-09.*

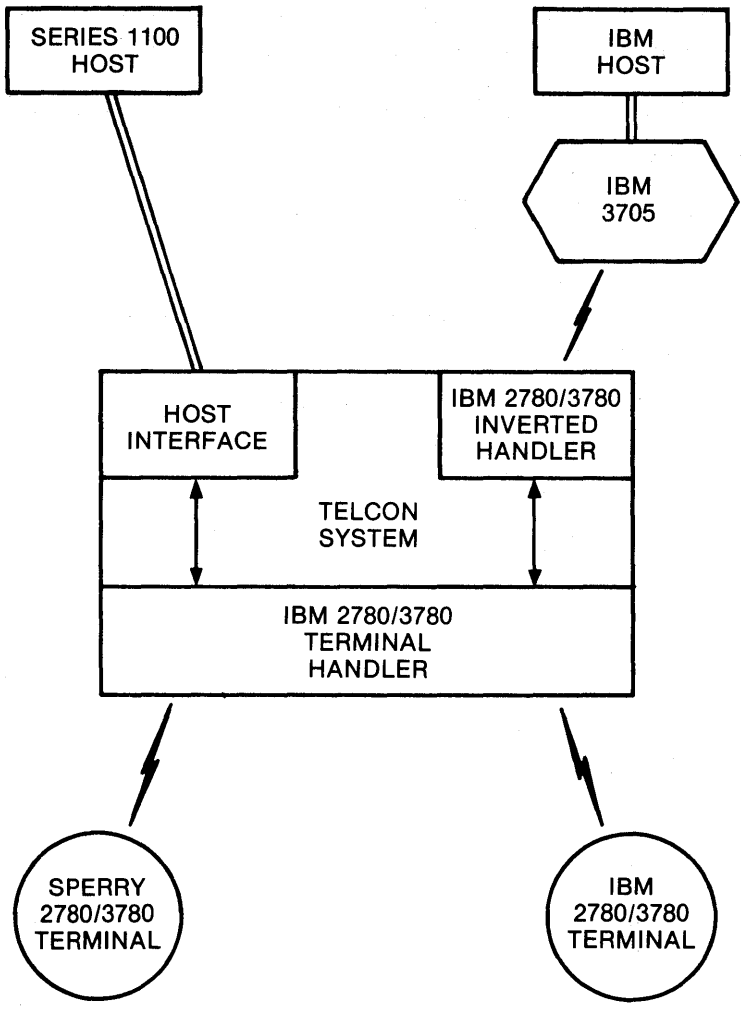

Figure 6-2. IBM 2780/3780 Coexistence

Using this handler with the IBM BSC 2780/3780 (Real) Terminal Handler, 2780/3780-compatible terminals may converse with applications in either a Series 1100 host or an IBM host connected to the DCP (see Figure 6-1).

Product Features

Only point-to-point terminal line configurations are supported. The point-to-point link is always established between the same two stations. The link may be leased or switched (dial up).

The IBM host sees the DCP as a number of 2780/3780 terminals on point-to-point lines. The actual network is controlled by the Telcon Network Management System.

Interfaces are provided which convert between internal format and 2780/3780 data stream. Text transparent data is not supported.

The following features are also supported:

- ASCII character code
- EBCDIC character code

- Variable-length records
- Multiple records per block
- Space decompression (IBM 3780)
- Reverse interrupt (input)
- Temporary text delay
- Printer
- Printer format control
- Card reader
- Card punch

Translation between the EBCDIC and ASCII character sets is performed by Telcon.

6.16 TELCON SNA GATEWAY

The SPERRY DCP Series SNA Gateway program product permits IBM systems and terminals using IBM systems network architecture (SNA) communications procedures and SPERRY systems and terminals using SPERRY Distributed Communications Architecture (DCA) and non-DCA procedures to communicate and coexist in the same environment.

The DCP Series SNA Gateway program product runs with the standard Telcon software and uses many of the standard Telcon functions:

- Online configuration – Allows dynamic configuration of the Telcon/SNA environment.
- Universal Data Link Control (UDLC) communications line handler – Supports Synchronous Data Link Control (SDLC) Normal Response Mode (NRM) discipline to control primary and secondary link stations.
- Data transport – Provides data transport across the DCA network.
- Loading and dumping facilities are supported.

The DCP series SNA program product consists of the required base gateway product (6843-00) and optional features. Each feature performs a specific SNA-related service.

The base gateway and features are summarized as follows:

- SNA/Base Gateway (6843-00) – Provides services and interfaces required by all of the SNA gateway features.
- SNA/UTS Gateway Feature (F6124-00) – Provides access to host computers using SNA procedures by Sperry UTS terminals, when the host computers and the UTS terminals are connected to a Telcon network.
- SNA/3270 Gateway Feature (F6124-01) – Provides access to host computers using SNA procedures and SPERRY Series 1100 computers using DCA procedures by IBM 3270 Series terminals (using Synchronous Data Link Control (SDLC) discipline), when they are connected to a TELCON network.
- SNA/3770 Gateway Feature (F6124-02) – Provides access to host computers using SNA procedures and SPERRY Series 1100 computers using DCA procedures by IBM 3770 Series terminals (using Synchronous Data Link Control (SDLC) discipline), when they are connected to a Telcon network.

- SNA/Transport Feature (F6124-03) – Provides access by user applications using the SNA Program Interface (SNA/PI) to host computers using SNA procedures from SPERRY Series 1100 computers using DCA procedures, when the host computers are connected to a Telcon network.

6.17 PRODUCT FEATURES

SNA/Base Gateway

The SNA/Base Gateway contains:

- Common Logical Unit (LU), Physical Unit (PU), and interface functions required by the gateway features.

  These include macroinstructions and definitions; Telcon interfaces; and, SNA protocol and service elements. These elements include Path Control (PC), Transmission Control (TC), Data Flow Control (DFC), PU services, and LU services. Transmission control and data flow control support enforcement of both primary and secondary logical unit half-session Transmission Services (TS) and Function Management (FM) profiles for logical unit types 1, 2, and 3.

- A System Services Control Point (SSCP) function to activate and deactivate real SNA cluster controllers and terminals.
- An SNA communications trace capability and trace analysis utility and extensions to the Telcon Network Management Services (NMS) facility that can be used to determine the status and control for SNA facilities.

SNA/UTS Gateway Feature

The SNA/UTS Gateway feature allows SPERRY UTS 400/4000 compatible-mode terminals and printers to communicate with IBM host application programs, when the UTS terminals and the IBM host are connected to a SPERRY Telcon network.

This gateway feature appears to the IBM host as a number of virtual cluster controllers on a communications link using Synchronous Data Link Control (SDLC) discipline. The basic capability of the feature is that of an IBM 3274/3276 cluster controller supporting those formats and protocols associated with LU types 1, 2, and 3.

This gateway feature supports the following Sperry terminals in cluster and single station configurations:

- Universal Terminal System 20 (UTS 20) Single Station
- Universal Terminal System 30 (UTS 30) Single Station
- Universal Terminal System 40 (UTS 40) Single Station
- Universal Terminal System 60 (UTS 60) Single Station
- Universal Terminal System 400 (UTS 400) Display Terminal
- Universal Terminal System 4020 (UTS 4020) Cluster Controller
- Universal Terminal System 4040 (UTS 4040) Cluster Controller

The cluster controllers support the following workstations:

- Universal Terminal System 20W (UTS 20W) Workstation
- Universal Terminal System 40W (UTS 40W) Workstation

The following IBM host application subsystems are supported:

- Information Management System (IMS)
- Customer Information Control System (CICS)
- Time Sharing Option (TSO)

SNA/3270 Gateway Feature

This gateway feature enables IBM 3274/3276 cluster controllers and attached terminals and devices to access IBM host systems and Sperry host systems when they are connected to a SPERRY Telcon network. The cluster controllers and terminals must conform to IBM Systems Network Architecture (SNA) and use synchronous Data Link Control (SDLC) discipline. The Sperry host system uses distributed communications architecture (DCA).

When installed in a Distributed Communications Processor (DCP), this gateway acts as a number of virtual cluster controllers connected to the IBM host system. It also acts as a primary SDLC link station to real IBM cluster controllers connected to the DCP. To the Sperry host system, the gateway acts as a number of virtual UTS terminals.

Data is transferred without change (transparently) between the SNA terminal and the IBM host. Between the Sperry host and the SNA terminal, data is converted to UTS/SNA format as required. That is, presentation service level conversions between SNA cluster controller data presentation protocol (SCS, IBM 3270 DSC) and DCA interactive terminal presentation protocol (INT-1) are performed.

This gateway feature provides a subset of SNA SSCP services for activating and controlling the clusters and provides the Primary Logical Unit (PLU) half-session functions supporting those formats and protocols associated with Logical Unit (LU) types 1, 2, and 3.

The following IBM cluster controllers are supported:

- 3274 models 1C and 51C
- 3276 models 11, 12, 13, and 14

The maximum number of displays/printers per controller is supported.

The following IBM host applications are supported:

- Information Management System (IMS)
- Customer Information Control System (CICS)
- Time Sharing Option (TSO)

The following Sperry host applications are supported:

- Demand
- TIP (Transaction Interface Processor)
- MAPPER System

SNA/3770 Gateway Feature

This gateway feature enables IBM 3776/3777 terminals and attached devices to access IBM host systems and Sperry host systems when they are connected to a SPERRY Telcon network. The IBM host and terminals must conform to IBM Systems Network Architecture (SNA) and use synchronous Data Link Control (SDLC) discipline. The Sperry host system uses Distributed Communications Architecture (DCA).

When installed in a Distributed Communications Processor (DCP), this gateway acts as a number of virtual cluster controllers connected to the IBM host system. It also acts as a primary SDLC link station to real IBM cluster controllers connected to the DCP. To the Sperry host system, the gateway acts as a number of virtual Nine Thousand Remote (NTR) terminals.

Data is transferred without change (transparently) between the SNA terminal and the IBM host. Between the Sperry host and the SNA terminal, data is converted to NTR/SNA format as required. That is, presentation service level conversions between SNA terminal data presentation protocol (SCS) and DCA remote batch terminal presentation protocol (RB-2) are performed.

This gateway feature provides a subset of SNA SSCP services for activating and controlling the terminal and provides the Primary Logical Unit (PLU) half-session functions supporting those formats and protocols associated with Logical Unit (LU) type 1.

The following IBM 3770 terminals are supported:

- 3776 models 1 and 2
- 3777 model 1

The IBM host application subsystem normally supported is the Job Entry Subsystem (JES). The Sperry host application supported is remote batch.

SNA/Transport Feature

The SNA/Transport Feature with the SNA Base Gateway appears to the IBM SNA host as a number of virtual cluster controllers on an SDLC link. DCA sessions are used to transfer data between the SNA host environment connection point to Telcon and the Series 1100 DCA host SNA/PI program product. The SNA data is passed transparently on the DCA session. SNA Transmission Service (TS) profile enforcement is optionally performed by the SNA/PI program product; SNA FM profile enforcement is performed by the SNA/PI user application.

Applicable LU types are per subsystem. The IBM host application subsystems are:

- Information Management System (IMS)
- Customer Information Control System (CICS)
- Job Entry Subsystem (JES)

User-written VTAM-direct applications are supported.

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Printed in U.S.A.