

Telcon  
Distributed  
Communications  
Processor/40



The Distributed Communications Processor/40 (DCP/40) is a *powerful, versatile* and cost-effective system designed to satisfy an extensive range of data communications needs without complicating the day-to-day processing of host processors.

It is the largest member of the DCP family.

The DCP/40 is based on a unified family of hardware and software that uses the same Communications Processor Architecture (CPA) and Telcon communications software available with the DCP/10 and DCP/20.

The DCP/40 is a modular hardware system that can be tailored to meet

the needs of a broad range of users. It can operate as a front-end processor for SPERRY Series 1100 and Series 90 virtual host processors; function as a network processor and remote concentrator; and simultaneously support transaction processing, timesharing, remote job entry and distributed processing applications.

The Telcon system's extensive communications capabilities include efficient interfaces to both circuit (X.21) and packet (X.25) public data networks.

At its maximum configuration, the DCP/40 consists of a communications processor; I/O processors, rigid disks; cartridge disks; and magnetic tapes.

Located in the processor cabinet, memory for the DCP/40 is a multiport, multibank, error correcting storage system that is expandable from the minimum 512K to 2M bytes in 512K increments. An additional 1.5M bytes can be added in an expansion cabinet for a system total of 3.5M bytes.

When used according to the SPERRY Distributed Communications Architecture guidelines, the DCP/40 and Telcon software provides extensive communications and networking capabilities that can meet your data communications needs. Contact your local Sperry office for further details.





### **More About the DCP/40**

The DCP/40 provides network control, handling a wide range of data transmission rates, multiple terminal type support and line cost savings. It can be tailored to fit your data processing and data transmission needs. And it is modular, able to grow as your needs dictate.

The DCP/40 hardware consists of four main components: a communications processor; I/O processors; local storage; and communications line modules.

Available peripherals include mass storage disk subsystems, including the 8409 disk subsystem, cartridge disk and magnetic tape subsystems. Host interface modules are also available.

The DCP/40 accommodates asynchronous, synchronous and wideband transmissions at speeds up to 64KB per second. It provides support for the Universal Data Link Control procedure as well as a full range of character-oriented communications protocols.

Telcon network control software resides in all DCP/40 front end, network and remote processors, performing routing and processing within the network. This includes: host interface; network management interface; internetwork control; line termination and handling; statistics; error control; on-line diagnostics; status monitoring; command processing; system synchronization and others.

### **Distributed Communications Processor/40**

#### **PHYSICAL CHARACTERISTICS**

Width: 42 inches (107 cm)  
Height: 64 inches (163 cm)  
Depth: 30 inches (77 cm)  
Weight: 800 lbs. (360 kg)

#### **POWER REQUIREMENTS**

Nominal voltages: 200, 208, 220, 230, 240 volts  
Nominal frequency: 50 or 60 Hz  
Phase: Single phase: 2 wire plus safety ground  
Power: 6 kva—Approximate power consumption for maximum DCP/40 (type 8596-00)

#### **ENVIRONMENTAL CHARACTERISTICS**

##### **Nominal working range:**

Temperature 50° F—93° F  
10° C—32° C

Humidity: 20% to 80%

#### **The Communications Processor**

The communications processor is a microprogrammable device that has direct access to local storage. Specific program tasks are accomplished by software routines executed within microprocessor-based arithmetic logic units and registers.

The communications processor serves as a general-purpose processor for managing network operations. It is a microcontroller that uses a 32-bit microinstruction format and has a high-speed cycle time of 65 nanoseconds.

Local storage is accessed by virtual addresses that provide the communications processor with an address range of up to 3.5M bytes.



## Communications Processor

### FUNCTIONAL CHARACTERISTICS

Instruction Repertoire: 40 basic instructions in four formats, with modifiers, up to 297 unique instructions.

Microprogrammed: 32-bit microinstruction plus byte parity  
Data path: 16 bit, checked by parity and duplication

Storage interface: 32 bit plus byte parity; 24 bit, byte address

General registers: 128, 16-bit registers plus parity

Other registers: memory interface registers, program address, instruction, breakpoint and status registers.

### I/O Processor (IOP)

The IOP is a microcontroller specifically designed to handle the input/output responsibilities of the DCP/40. Each IOP provides programmed control for up to 16 data paths. These may be a combination of serial lines to remote equipment, parallel links to peripheral devices and channel



connections on-site Series 1100 and Series 90 virtual host processors. The IOP uses virtual addressing to access the full storage range of the DCP/40.

IOPs are controlled at the programmer's level by a repertoire of more than 60 macroinstructions, executed from local storage through input/output chains. These control data reception and transmission and a full range of specialized input/output activities, including:

- Polling and calling for data from remote terminals
- Allocating buffers for temporary storage of input and output messages
- Checking messages for errors and requesting retransmission when necessary
- Reporting operational status of the communications lines
- Maintaining traffic and error statistics.

## I/O Processor

### FUNCTIONAL CHARACTERISTICS

Configuration: 1 to 16 IOPS per system

Microprogrammed: 16 bit microinstruction

Data path: 8 bit

Storage Interface: 32 bit plus byte parity; 24 bit, byte address

Internal registers: 1024 by 32-bit stack with byte parity

### Local Storage

This is provided by a high-performance, integrated circuit memory that has a minimum size of 512K 8-bit bytes. It can be expanded by adding 512K byte storage arrays in the processor cabinet for a total of 2M bytes. Up to 1.5M bytes can be added in 128K byte increments in an expansion cabinet, providing a total of 3.5MB.

### Storage

#### FUNCTIONAL CHARACTERISTICS

Capacity: a total of 3.5M bytes with up to 2M bytes (65K chip) in 512K-byte increments. An additional 1.5 bytes (16K chips) in 128K byte increments in an expansion cabinet.

Port: 4 port storage with ports optionally expanded in large systems.



Integrity: all single bit errors are corrected and all double bit errors are detected. All errors are automatically logged.

Word length: 32 bits plus 4 parity bits at the interface; 32 bits plus 7 error correcting bits internally.

Speed: real cycle = 500ns  
full word write cycle = 500ns

### Data Security Design

The DCP/40 processing components are designed to meet the demand for security and privacy in electronic data handling.

A wide range of protective mechanisms at both the software and hardware levels safeguard the DCP/40 data from error, unwarranted intrusion and inadvertent modification. These mechanisms include privileged instructions, virtual addressing techniques and a number of advanced methods designed in the DCP/40.

The protective mechanisms used by the DCP/40 include:

- Storage protection to control access rights to local storage
- Levels of privilege to reserve instructions in executive software
- Architectural designs that confine and isolate programs and data within protected environments
- Error detection and recovery procedures to protect data from inadvertent alteration

The DCP/40 is dedicated at all levels to preserving privacy and security for electronic data transfer.

### Communications Line Modules

Microprogrammable line modules operate the 16 communications ports of the input/output processor. Each port requires one line module, capable of handling full-duplex or half-duplex communications. All communication line modules terminate one line per port except the multi-line asynchronous line module that multiplexes four circuits onto one port.

In addition to providing a hardware interface, a line module performs communications functions for each line in a system.

Line module functions include:

- Character assembly/disassembly
- Character parity and block check sequence generation and checking
- Data buffering
- Control character recognition
- Line timing and asynchronous clocking
- Automatic data rate detection

### FUNCTIONAL CHARACTERISTICS

#### Electrical Interfaces

The following electrical interfaces are supported for line speeds up to 64K bps:

- RS232C (V.24, V.28)
- V.35
- Auto Dial (US RS366)
- Auto Dial (Japan NTT)
- RS449
- Bell 303
- X.21

### Parallel Line Modules

These modules provide the hardware interface between peripheral subsystems or host processors and the DCP/40. Five parallel modules are provided:

- The host byte channel module, which interfaces to a SPERRY Series 90 virtual host byte multiplexer channel
- The host word channel module, which provides full duplex, 32-bit interface to a SPERRY Series 1100 host word channel.
- The 16-bit peripheral line module, which has a 16-bit interface to a peripheral subsystem. It operates in either 8- or 16-bit mode.
- The byte I/O line module, which provides an 8-bit interface to a flexible disk and the 8409 disk subsystem.

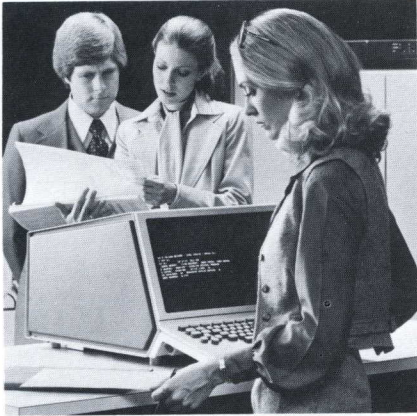
### UNISERVO 10 Magnetic Tape Subsystem

The UNISERVO 10 tape subsystem, the magnetic tape peripheral for the DCP/40, offers convenience, technological innovation, reliability and the economy required with the DCP/40.

The convenience features for the operator allow fast and efficient tape handling and provides automatic load and wrap around cartridge compatibility as a standard feature.

The UNISERVO 10 has phase encoded recording (PE) and non-return to zero (NZRI). It operates at 25 IPS for a transfer rate of 40KB per second, PE, and 20 KB per second, 9-track NRZI.





**PHYSICAL CHARACTERISTICS**

Width: 27 inches (68 cm)  
 Height: 50 inches (126 cm)  
 Depth: 31 inches (78 cm)  
 Weight: 356 lbs. (162 kg)

**FUNCTIONAL CHARACTERISTICS**

**Operational Functions**

Reads or writes 9-track tapes  
 Reads in forward or backward direction  
 Writes in forward direction  
 Read after write check capability

**Recording Modes**

Phase encoding (PE)  
 Non-return to zero (NZRI)

**Recording Densities**

1600 bits per inch (PE)  
 800 bits per inch (NZRI)

**Tape Speed**

25 inches per second

**Transfer Rate (PE/NZRI 9-track)**

40/20KB per second

**Rewind Speed (maximum)**

200 inches per second

**Interblock Gap**

0.60 inches PE and NZRI 9-track

**Tape Media**

0.5-inch wide up to 2400-foot length on compatible tape reels up to 10.5 inches in diameter

**POWER REQUIREMENTS**

**Nominal voltage**

100, 120, 200, 240 volts

**Nominal frequency**

50 and 60 Hz

**8409 Disk Subsystem**

This subsystem is a freestanding, medium performance mass storage device offered for those communications, environments where extensive capability is required. It can be used as storage for Telcon system files, network data base files and distributed data processing applications.

The subsystem can be ordered with one or two disk drive assemblies. Each supports up to 14.25 megabytes of storage.

**PHYSICAL CHARACTERISTICS**

Height: 31 inches (79 cm)  
 Width: 23 inches (58 cm)  
 Depth: 29 inches (74 cm)  
 Weight (with two drives): 256 lbs (71 kg)

**FUNCTIONAL CHARACTERISTICS**

Capacity per unit: 4.75 or 14.25  
 Speed: 3600 RPM  
 Transfer rate: 5 megabits per second

**Access time**

Track to track: 12ms  
 Average stoke: 45ms  
 Average latency: 8.3ms

**Cartridge Disk Subsystem**

The SPERRY cartridge disk subsystem is a low-cost mass storage peripheral for retaining network data bases, distributed communications data and distributed processing applications.

The cartridge disk provides 10MB capacity, 5MB fixed, 5MB removable. Recording is on four surfaces in each unit, two on the fixed disk and two on the removable disk.

**PHYSICAL CHARACTERISTICS**

Width: 22 inches (56 cm)  
 Height: 31 inches (79 cm)  
 Depth: 30 inches (76 cm)  
 Weight: (with two drives): 310 lbs. (141 kg)

**FUNCTIONAL CHARACTERISTICS**

**Nominal capacity/unit**

5 megabytes, fixed  
 5 megabytes, removable  
 2 units/subsystem

**Speed**

2400 RPM  
 Rotational latency average: 12.5ms  
 Rotational latency minimum: 25.0ms

**Arm movement**

Minimum: 10ms  
 Maximum: 90ms  
 Average: 50ms

**Transfer rate**

Kilobytes per second: 312  
Sector size (bytes): 256  
Record size (bytes): 256-1024  
Sectors/track: 24  
Tracks/inch: 200

**Access Time**

50ms average

**Integrated Flexible Disk Subsystem**

The integrated flexible disk subsystem provides microcode load capability for the DCP/40. Each system includes a single flexible disk drive that is contained within the DCP/40 cabinet and used for the microprogram load.

The basic configuration of the flexible disk subsystem contains one disk drive.

**FUNCTIONAL CHARACTERISTICS**

Storage available: 256 KB  
Number of tracks: 77 data tracks  
Track format: 26 sectors at 128 bytes/sector

**Access time**

Track to track seek time: 10ms  
Head load time: 50ms  
Head load and seek time:  
    can overlap with setting time at 10ms  
Average latency: 83ms  
Flexible disk rotational speed:  
    360 RPM  $\pm$  2%

**Transfer rate**

31.25 KB/sec.

**Remote Control Module**

The remote control module provides the means to control the DCP/40 in an unattended, remote environment. It provides control of power, system program load and start/stop operations for as many as four processors. Control commands are transmitted to the remote control module via serial communications circuits.

**Line Switch Module**

The line switch module is designed to support unattended operation of the communications subsystem. It permits switching communications lines and peripherals subsystems between DCP/40s. Switching control may be affected in three ways: manually; under remote program control; and under local program control. Under the control of the Telcon software, the line switch module enhances the operation of redundant configurations in both local and unattended modes.

**Summary**

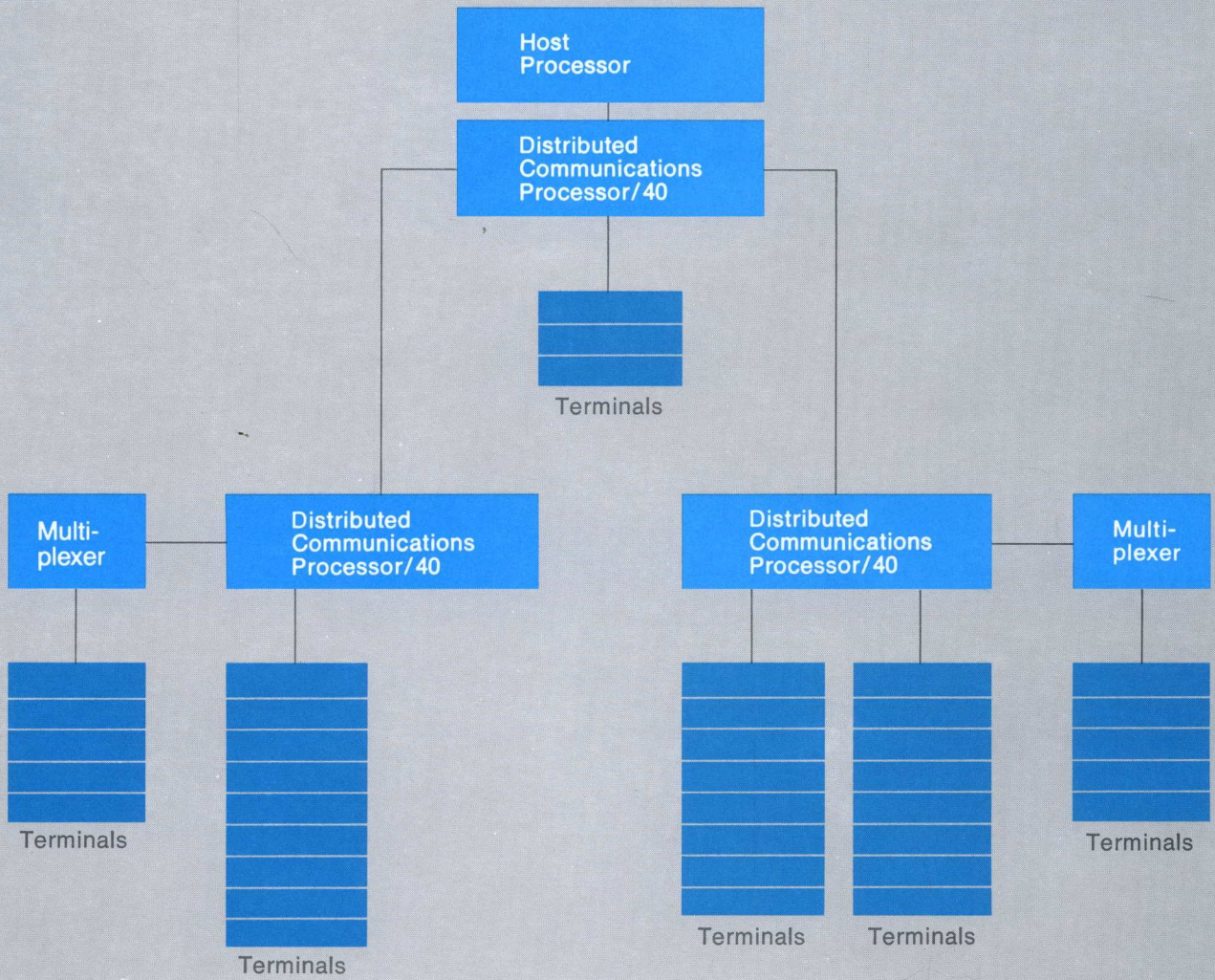
The SPERRY Telcon software and DCP/40 system area software/hardware combination that easily handle the diverse needs of today's network users. It provides a modular architecture that protects the investment of the long-term user. This product incorporates constantly improving technology and permits development expansion free from constraints on growth and utilization.

This product was designed and developed in compliance with the SPERRY Distributed Communications Architecture.

For today's telecommunications market, the DCP/40 offers significant price/performance, technological superiority and ease of migration.



# Telcon System





*We understand how important it is to listen.*