

Unisys CP 9500 Series Communications Processors

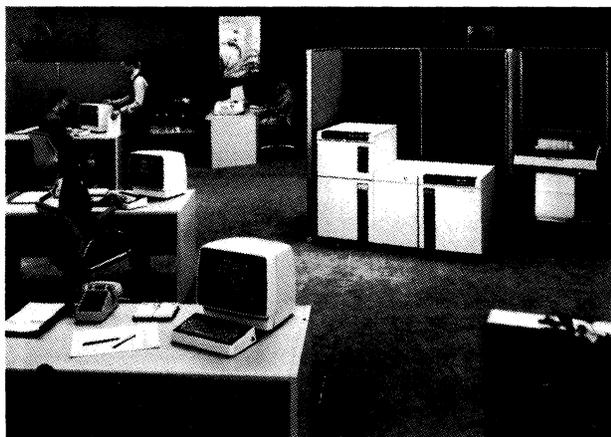
MANAGEMENT SUMMARY

UPDATE: *Since this report was last updated, Burroughs has merged with Sperry to form the Unisys Corporation. At this time, communications processors from both Burroughs and Sperry continue to be offered under the Unisys name. This may change in the future, but for now, we shall continue to carry separate product reports on both communications processors. Since the last update, no changes have occurred to the CP9500 Series, except that the processors no longer utilize the Computer Management Distributed Information System (CMDIS) in their software.*

The CP 9500 Series Communications Processors were introduced in 1980. The original members of this series superseded the earlier B 870, B 860, and B 770 Series communications processors. The CP Series is used to interlink remote data processing operations and local terminal networks with each other and with central computers (Unisys or non-Unisys), and can also serve as hosts in distributed processing networks. The CP 9585 communications processor was announced in October 1984. The CP 9582 and the CP 9585 are similar in makeup and operation; the main difference is that the CP 9585 can accommodate a built-in Winchester hard disk, which is not available in the CP 9582.

The CP 9582/5 use a multiprocessor architecture that has characterized the entire CP 9500 Series models, and accommodates four to eight microprocessors. All processors in the system are Unisys' Basic Data System (BDS) microprocessors, which operate concurrently at 3MHz. Each processor operates in a semiautonomous manner, executing instructions from its own memory module and performing a specific function.

Four processors are required in the basic system configuration. One processor (Processor #1 in Figure 1) is responsible for executing the Master Control Program (MCP), the



The Unisys CP 9500 Series system uses a multiprocessor architecture with each processor operating in a semiautonomous manner.

Unisys, which is the result of a merger between Burroughs and Sperry Corporations, continues to offer the CP 9500 Series of communications processors formerly offered by Burroughs. These processors are used to interlink remote data processing operations and local networks of terminals with each other and with central computers to form data communications networks of various sizes. The CP 9500 Series communicates with Unisys (formerly Burroughs) and non-Unisys computers and terminals over switched or leased lines and through packet-switching networks. The CP 9500 Series processors can also function as hosts in distributed processing networks.

The CP 9585 communications processor includes four to eight 3MHz microprocessors and a maximum main memory of 3.4M bytes. Up to 39 data communications lines can be installed in the CP 9585 cabinet; and with CP 9530 Line Expansion Modules, a maximum of 128 lines can be supported.

FUNCTION: Communications processor, remote concentrator, distributed processor.
HOST COMPUTERS SUPPORTED: Unisys (Burroughs), IBM.
ARCHITECTURE SUPPORTED: Burroughs Network Architecture (BNA).
OPERATING SOFTWARE: Computer Management System (CMS), Computer Management Distributed Information System (CMDIS).
COMPETITION: IBM Corporation.
PRICE: Depends upon configuration.

CHARACTERISTICS

VENDOR: Unisys Corporation, 6071 2nd Avenue, Detroit, MI 48232. Telephone (313) 972-7000.

DATE OF ANNOUNCEMENT: CP 9500 Series—March 1980; CP 9582—June 1982; CP 9585—October 1984.

DATE OF FIRST DELIVERY: CP 9500 Series—May 1980; CP 9582—June 1982; CP 9585—October 1984.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Unisys Corporation.

CONFIGURATION

The CP 9500 Series Communications Processor Systems are built on a multiprogramming and multiprocessing architecture similar to that utilized by Burroughs (now Unisys)

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▷ operating system that directs the activities of the CP 9585 system. This processor/memory set houses and executes all the microcoded control routines associated with the MCP except for disk functions. It also provides data storage buffers as needed for I/O devices attached to the system. The operating system processor is interrupted by the other processors as MCP services are needed, and it interrupts the other processors for passage of control information. This processor controls the system's time-of-day clock, the operator display terminal, and other nondisk peripherals. The memory set with this processor contains 524,288 bytes.

The second processor (Processor #3 in Figure 1) provides direct interfacing to attached disk device(s). This file management processor/memory set houses and executes the logical and physical disk I/O functions. The memory module with this processor contains 65,536 bytes for storage of its functions. An additional 16K bytes of Read Only Memory (ROM) attached to the processor includes logic to provide system load functions. The ROM also provides the logical capability to perform diagnostic testing automatically each time the basic system load functions are performed. A disk file cache module, including 262,144 or 524,288 bytes of memory, can optionally be installed with the file management processor. By storing frequently used data in its fast-access memory, the disk file cache module can reduce file access time.

The third processor (Processor #8 in Figure 1) provides a direct interface to data communications lines attached to the system. The data communications processor/memory set houses and executes the network handling code generated to user specifications by Burroughs Network Definition Language. Other functions performed by the data communications processor (DCP) include establishment of line protocol for attached terminal devices and first-level error recovery. The memory module with this processor contains 65,536 bytes for storing its functions. It is possible to use the data communications processor for applications processing when data communications processing is terminated. In that case, the DCP must have the 262,144 byte memory module.

Of the eight processors that the CP 9582/5 system can accommodate, up to four processors can be used as data communications processors. Each of the optional DCPs can be configured with 65,536 bytes, providing a potential maximum of 262,144 bytes of memory for data communications functions. No single data communications processor needs more than 65K bytes.

The fourth required processor in the basic system is an application processor, which executes user programs and user-oriented utilities, such as sorting. Both user programs and utilities are stored in the associated memory during the period of execution. The application processor executes code created from Cobol, RPG, and MPL (Message Processing Language). The memory set with this processor has either 262,144 or 524,288 bytes.

▶ for their B 900 Series of computers. The systems are designed as small compact units and provide high-density disk storage with printer back-up. They can be controlled either locally by a directly attached dedicated console, or remotely using an ET 1100 display terminal. Two line printers, three fixed disk drives, and a 6MB diskette subsystem were introduced with the CP 9500 Series.

The CP 9500 systems provide four types of processors, each of which has its own dedicated memory and operates independently to perform a specific set of functions: an operating system processor, a file management processor, an applications processor, and a data communications processor. Depending on the model, one or more of each type of processor may be configured with the system. Each processor is connected to the system's memory bus so that, when necessary, information exchanges can take place between the processors.

The CP 9500 Series is available in two basic models as follows:

- CP 9582—includes four 3MHz processors, cabinet, power supply, DCP controller synchronizing card (CSC), two 65K byte memory modules, two 524K-byte memory modules, and an extended backplane. The controller synchronizing card is required for any DCP unless it is attached to a Line Expansion Module. The total memory with a basic system of four processors is approximately 1M bytes.
- CP 9585—is exactly the same as the CP 9582 but is capable of supporting a 5¼-inch inbuilt Winchester hard disk.

Options to the basic CP 9500 configurations consist of processor add-ons, main memory add-ons, peripheral devices, and data communications features.

Additional applications and data communications processors can be added, accompanied by add-on memory modules, up to the maximum number of processors. For the CP 9582/5, memory modules of 65,536 bytes, 262,144 bytes, or 524,288 bytes and disk file cache memory modules of 262,144 or 524,288 bytes are available.

Processor redundancy can be configured for the operating system processor and the file management processor using applications processors and I/O Select Modules. System maximums for the CP 9582/5 are eight processors and 3.4M bytes of main memory. Add-on processors and memory modules ordered after initial system delivery can be installed by a local field engineer.

CONNECTION TO HOST AND PERIPHERALS

CP 9500 systems can be connected to Unisys (Burroughs) or non-Unisys host computers through data communications lines. The systems do not support high-speed parallel transfer to a host, except through Inter Systems Control (ISC) connection using BNA to Unisys (Burroughs) hosts.

Peripherals for the CP 9500 include an operator console, flexible disk, disk cartridge, fixed disk, disk pack, disk loader, and magnetic tape control options. A line printer and control is also offered. Peripheral options for the CP 9582 include fixed disk, (up to 240M bytes external, 102M bytes internal), disk pack (up to 1.5GB), magnetic tape (up to 160KB per second), card reader (up to 600 cards per minute), and line printer (up to 1,500 lines per minute).

Unassigned I/O channels are available for the attachment of peripherals to the basic system. Model CP 9585 provides up to five. An I/O Expansion Module, available as an option, adds four more I/O channels to any model for the attachment of additional peripherals.

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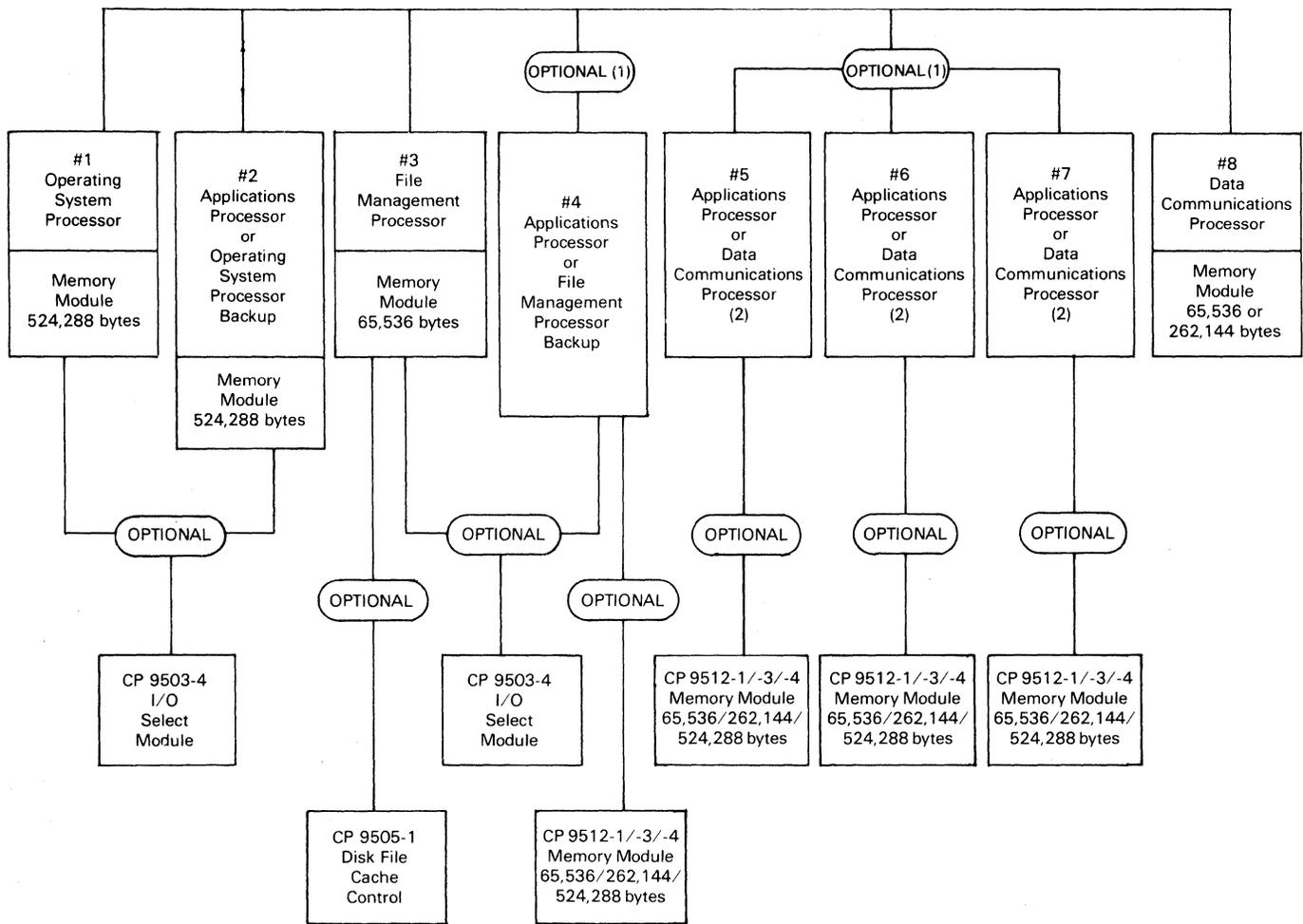


Figure 1. Schematic of CP9582/5 processor and memory options

- Up to five processors can be assigned to the application processing function. Each of the optional applications processors can have a memory of 262,144 or 524,288 bytes.

The CP 9582/5 also accommodate up to two Input/Output Select Modules (IOSM). The IOSM allows an application processor to serve either as a backup operating system processor or as a backup file management processor; thus separate redundancy can be provided for these functions. The system configuration must include at least five processors (with one backup processor) or six (with both backup processors) to use this feature. The operating system or file management processor and the applications processor with which it is paired must have identical amounts of memory.

The basic CP 9500 system supports up to 30 communications lines. Burroughs' CP 9530 Line Expansion Module, introduced in March 1982, can be used to extend the maximum number of lines to 128. The Line Expansion Module can be connected to two independent CP 9585 systems, enabling communication lines to be switched from one system to another under program control for backup purposes.

- A controller is required for connection of each peripheral unit to the system, and provides the interface between the peripheral and the I/O channel to which it is attached; in the case of the disk options, one disk loader module is also required. All peripherals except the disk/diskette units are interfaced to the operating system processor. The disk subsystems are interfaced to the file management processor. The CP 9500 models accommodate up to three disk controls in addition to the loader. Up to nine I/O controls are provided. A removable "cold start" disk is required for system load functions; this disk may also be used for load/dump functions.

The data communications components available as options include line expansion modules and units (LEM and LEU), DCP interface kits, dual host options, and 50- or 25-foot LEU-DCP cables. An LEM is a 30-inch-high free-standing cabinet that contains a line expansion unit (LEU), consisting of a control panel with line indicator lights and an independently powered backplane for up to 16 data communications line adapters. Optionally, an additional LEU with indicator panel, backplane, and power supply for up to 16 additional data communications line adapters can be added to the LEM cabinet.

- The maximum number of communications lines that can be configured is 128. Each datacomm processor will support a maximum of 1500 cps aggregate bandpass.

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► Offered with the CP 9500 systems, on an unbundled basis, is a wide range of software products designed for use in an on-line transaction-oriented environment, including a full-function operating system, extensive software support for on-line programming and on-line data entry, and RPG, Cobol, and Basic programming language compilers. The operating system consists of the Computer Management System (CMS), which is compatible with both the predecessor B 867 and B 877 systems' software, and with Unisys B 80, B 90, B 900, B 1800, and B 1900 mainframes. Numerous Computer Management program products provide for on-line data entry, on-line file maintenance and inquiry, message handling, system-to-system RJE operations, and other functions. Communications packages are available for Unisys-standard RJE; IBM 360/20 HASP, 2780/3780, or 3270 emulation; Burroughs Network Architecture (BNA) compatibility (for CP 9585 only); IBM System Network Architecture, (SNA) compatibility (CP 9585 only); and interfacing with public packet-switching networks using the X.25 protocol.

COMPETITIVE POSITION

The Unisys CP 9500 Series communications processors have limited competition as they are designed to work mainly with the company's host computers. They can also interface with IBM's SNA and BSC communications networks. Other communications processors are plug-compatible with IBM and compete for that market. Unisys' aim is to target, encourage, and embrace international and/or industrial standards. When standards have not yet been finalized, their strategy is to implement IBM or SNA protocols.

ADVANTAGES AND RESTRICTIONS

The multiprocessor architecture of Unisys' CP 9500 communications processors allows for various functions to occur simultaneously. The principle of dedicated processors enables users to expand their systems according to current requirements. Since all CP 9500 systems are compatible, users of previous CP 9500 models can acquire the new CP 9585 without reprogramming. Applications made possible by the CP 9582/5 software include distributed user application processing; remote functions such as data entry, report preparation, and on-line programming; message switching; protocol conversion; and network/terminal concentration. The CP 9500 Series has increased memory size over earlier versions and also has a faster MHz cycle than earlier models. The CP 9585 can be interfaced for SNA compatibility and can also interface with public packet-switching networks that use the X.25 protocol.

The CP 9500 Series communications processors, as front-end processors, have no channel connections to non-Unisys hosts. They can connect through synchronous or asynchronous communications lines. With Unisys hosts, they use the ISC intersystem control connection. ►

► Line printers offered include: the B 9249 Series, which includes 160, 250, and 350 lpm models; the B 9246-3 and -6, which operate at 320 lpm and 650 lpm with a 48-character set and 300 lpm and 600 lpm with a 64-character set, respectively; the B 9349-375, B 9246-13, B 9247-14, and B 9247-15 line printers, which print at 375, 1,250, 1,100, and 1,500 lpm, respectively. All models feature 132 print positions per line and operator-changeable print bands, and provide a 12-channel format tape reader as either standard or optional.

Fixed disk drives include: a pair of single-spindle drives that provide 18.8MB capacities; the B 9493-20, -40, and -80, three single-spindle Winchester-type units; and CP 9493-61, -62, and -63 units supporting 1, 2, and 3 inbuilt 5¼-inch disks internally. Each internal disk supports 34MB for a maximum of 102MB.

Dual disk pack drives include: the B 9387-11, a 65.2MB unit with electronic controller; the B 9387-12, a 130.4MB unit with electronic controller; the B 9387-41 disk pack controller; and the B 9484-5, a 130.4MB unit that is used as an add-on drive to the B 9387-12. The electronic controller handles all internal disk functions, such as addressing, sector management, and exchanges between multiple drives. Up to three add-on drives may be accommodated by the B 9387-12's controller. All disk pack drives have direct memory access; average access time is 33 milliseconds. A maximum of 1.7GB disk is supported.

Unisys offers several of its Super Mini Disk subsystems for use with the CP 9500 Series, including the B 9489-1, an integrated 1MB drive; the B 9489-11 and -12, two free-standing Super Mini Disk models that provide 1MB and 2MB of storage, respectively; and the B 9489-21 and -23, two 6MB units. The B 9489-21 is an integral "cold start" drive; the B 9489-21 is a free-standing unit that can be used only as a "warm-start" auxiliary to the B 9489-21. A 5¼-inch flexible disk is also available.

The operator console used with the CP 9500 Series is a Unisys ET 1100 display terminal. The ET 1100 is a fully featured editing terminal with a display capacity of 2,000 characters, arranged in 25 rows of 80 characters, and a detachable typewriter keyboard with an optional numeric pad.

TRANSMISSION SPECIFICATIONS

Connection of data communications lines to the data communications processor involves the use of such attachment features as line adapters and connect kits. A line adapter, the Type 2 Line Adapter (there were previous styles), provides either BDLC or non-BDLC interfacing for both modem and direct connections, and allows the system to support a greater number of lines.

The RS-232-C interface supports asynchronous transmission at up to 1800 bps and synchronous transmission at up to 9600 bps; a DDS data service unit can be installed for access to AT&T's Dataphone Digital Service. The BDI interface supports asynchronous transmission at up to 19,200 bps. The TDI interface supports direct connections at a rate of up to 9600 bps for devices located within 1,000 feet of the processor; 38,400 bps for devices located within 250 feet. The BDLC Interface supports synchronous modem connections only, at up to 9600 bps. The CP 9585 adds bit-oriented capability for SDLC and HDLC. A Type 3 Line Adapter performs all of the above over two lines on a single adapter cord.

The connection kits are available for RS-232-C (modem) or TDI (direct) connection, or (for Line Adapter Type 3), or for both. ►

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► USER REACTION

Seventeen users of Unisys' CP 9500 Series communications processors responded to Datapro's 1986 Data Communications User's Survey; among them, they had 49 installed systems. Their ratings are shown in the chart below:

	Excellent	Good	Fair	Poor	WA*
Ease of installation	4	11	2	0	3.1
Ease of operation	5	7	5	0	3.0
Ease of expansion	5	7	3	2	2.9
Hardware reliability	9	7	1	0	3.5
Quality of manufacturer's software/firmware	7	5	4	0	3.2
Ease of programming	7	5	4	0	3.2
Quality of manufacturer's maint. svc./tech. support	2	7	7	1	2.6
Overall performance	5	9	3	0	3.1

*Weighted Average based on a scale of 4.0 for Excellent.

Datapro was unable to contact individual users of Burroughs' CP 9500 Series communications processors for additional comments. □

- The data communications processor can also support one auto-call unit interface per line adapter, which permits automatic dialing of that line via a AT&T 801 Automatic Calling Unit.

SOFTWARE

CP 9500 Series systems utilize Unisys' Computer Management System (CMS) software. Computer Management programs are compatible both with predecessor communications processor systems and with current communications processors.

CMS includes: the Master Control Program, a Utilities package, a File Management package, and high-level language compilers.

The Master Control Program (MCP) is the CP 9500 operating system and controls all other system functions. MCP features multiprogramming, multiprocessing, virtual memory, dynamic resource allocation, and I/O control.

The Utilities package provides various system routines to be used for system initialization; program development; and conventional and indexed sequential file sort, file dump, file load, file lists, directory maintenance, and media conversion.

File management capabilities of CMS support sequential, index sequential, and random file organizations directly through the MCP via compilers and utilities. Access to files can be either sequential or random with read, add, update, and delete functions. CMS also features shared file capabilities that give multiple update programs concurrent access to the same file or group of files. The MCP automatically locks and unlocks blocks of records to avoid data corruptions that might occur if simultaneous updating of the same data were permitted. Programs receive up-to-date records even when other programs are adding, changing, or deleting records in the same file. The shared files feature is supported by Cobol, RPG, and MPL and applies to both indexed and sequential files.

The use of high-level languages on Unisys CMS systems is the key to the portability of applications programs between

CMS equipment. All CMS systems support the same compilers to generate common executable object code. Languages supported include On-board Cobol, On-board Report Program Generator (RPG), On-board Network Definition Language (NDL), On-board Message Processing Language II (MPL II), and Basic.

NDL is a parameterized user-oriented language used to describe the system's data communications environment. NDL statements define the lines, modems, terminals, line speeds, character translation, etc. Using these statements, the NDL compiler generates the code and tables required for the Network Control Program. NDL is designed to simplify the implementation of data communications networks and to allow changes in the network to be made quickly and easily.

MPL II is the language that generates Message Control Systems (MCS) programs. These programs are used to process, edit, collect, verify, route, and audit messages in a data communications network. The MPL II language is made up of parameterized user-oriented statements that permit users to customize the MCS programs to meet specific requirements of their networks. User programs may also be written in MPL II.

Additions to the CMS software for the CP 9582/5 include the SNA RJE and 3270 Pass-thru. The SNA RJE interface program allows a CP 9582/5 to perform remote job entry functions in an SNA environment. RJE control statements and job streams are prepared at the remote CP 9582/5 site and transmitted to the IBM host system for processing. After the job is processed by the host, the resulting "print" or "punch" output is transmitted back to the CP 9582/5 where it can be printed or written on disk for remote processing. The SNA RJE program can communicate with IBM batch applications running under JES2, JES3, RES, or POWER job entry subsystems.

The SNA Passthrough interface program allows applications programs or 3270 terminals on a CP 9582/5 system to communicate interactively with message processing programs executing under any application subsystem on an IBM SNA host.

CMS also includes the Generalized Message Control System (GEMCOS); Unisys (formerly Burroughs) Networking Facilities; IBM Network Interface Facilities, providing capabilities in addition to the SNA interface programs; Public Data Network Facilities; Program Development Aids; and other software.

GEMCOS provides a link between the communications network and application programs. It enables messages to be processed before being directed to application programs, thus eliminating repetitive coding in application programs and providing additional flexibility for line and terminal use. GEMCOS incorporates security and audit trails, transaction routing, alternate routing, and message formatting.

Unisys (Burroughs) Networking Facilities include Burroughs Network Architecture (BNA), Unisys System Communication Module (SYCOM), and Unisys' Remote Job Entry (RJE). These programs aid the interfacing of CP 9500 systems in networks with other Unisys products.

Unisys software packages providing IBM Network Interface Facilities include the IBM HASP Remote Job Entry Interface Program, IBM 2780/3780 Look-Alike Remote Terminal Program Interface, and IBM 3270 Line Protocol Remote Terminal Program Interface.

The Public Data Network Facilities X.25 interface program allows CP 9500 systems running local user programs to communicate with application programs or packet mode

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► terminals residing in other systems via public data networks that conform with the CCITT X.25 standard. The X.25 interface program performs virtual calls, directs virtual circuit procedures, disassembles messages into packets, and assembles the packets into messages. The physical interface connects full-duplex lines transmitting at speeds up to 9600 bps. The bit-oriented procedures provided through NDL conform to the HDLC standards for link access as specified by the X.25 standard.

The Program Development Aids include the Command and Edit Language (CANDE) On-Line Programming, On-Line Reporter, and Direct On-Line Maintenance and Inquiry System (DOMAIN). CANDE provides on-line programming facilities for Cobol, MPL II, NDL, and RPG II programmers; this interactive system enables the user to create and update source and data files. The On-Line Reporter simplifies the generation of customized reports. DO-

MAIN is a program that provides a method for quickly developing file maintenance and inquiry programs in on-line terminal installations. DOMAIN does not require user knowledge of any programming language. It can be used to create, add, delete, and maintain records in a disk file, as well as inquire into records in a disk file.

Other software includes the On-Line Data Entry System (ODESY). ODESY is a data entry and verification system that supports up to 16 Unisys display terminals.

PRICING

The CP 9500 systems are available for purchase or on a one-, three-, or five-year lease. Lease prices include 24 hour, 7-days-a-week maintenance. The software is licensed and priced separately. Detailed pricing information on the CP 9500 Series models can be obtained from the vendor. ■