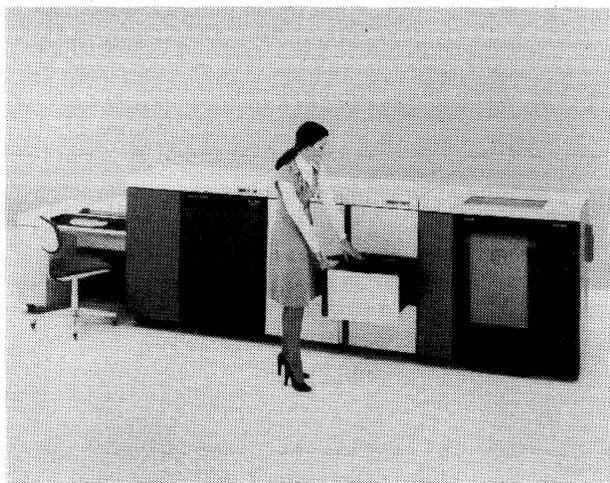# Burroughs B 866/B 876
System and Communications Processor

The B 876-2 System and Communications Processor accommodates up to 32 communications lines and up to 541 million bytes of disk storage.

MANAGEMENT SUMMARY

A microprogrammed computer system with microprogrammed communications processors that supports up to 32 communications lines.

Disk-stored data and communications data have direct memory access.

Systems are available with a 1 MHz or a 2 MHz central processor to function as either remote job entry stations or as communications node processors for data concentration, message switching, or distributed processing.

A typical B 876-2 system with 32 asynchronous half-duplex lines can be purchased for $91,620; leased for 1 year at $2,595 per month, including maintenance; or leased for 5 years at $2,255 per month, including maintenance.

Take a B 800 processing system, alter the microcode and the bussing arrangement to support up to two internally resident microprocessors, and the result is the B 866/ B 876 system. Supply the newly added microprocessor with microcode to support the communications line handling function, supply line interfaces, and the result is a standalone computer system with significant communications capabilities and in which local processing can be performed concurrently with communications processing.

The lower end of the B 866/B 876 systems is suited for use as work stations for Burroughs or IBM host systems. To facilitate such usage, Burroughs is offering software packages to use the system as an RJE.

The upper end of the B 866/B 876 systems is suited for use as a node processor in a large network system.

Since the B 866/B 876 provides for attachment to a local host computer only through communications lines, the system is not intended to operate as a front-end processor.

As with all Burroughs systems, a complete complement of operating software is provided with the system.□

CHARACTERISTICS

VENDOR: Burroughs Corporation, Burroughs Place, Detroit, Michigan 48232. Telephone (313) 972-7000.

DATE OF ANNOUNCEMENT: December 1976.

DATE OF FIRST DELIVERY: B 866-1, 2—scheduled for July 1977; B 876-2—scheduled for July 1977.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Burroughs Corporation.

CONFIGURATION

The B 866/B 876 processor systems are specially tailored members of the B 800 Series capable of supporting up to two independent Data Communications Processors (DCP) dedicated to performing the line handling function for a maximum of 32 communications lines.

Depending on the model, the B 866/B 876 system is available with either a one-million-cycle-per-second processor (1 MHz) or a faster, two-million-cycle-per-second processor (2 MHz). Disk-stored data and all communications line data is transferred to and from memory by way of a Direct Memory Access Bus, without processor intervention. A physical maximum of nine I/O Channels are provided for the attachment of all other peripherals, via separate control units, to the I/O Bus. Data transfers over the I/O Bus to and from memory are under processor interrupt control.

The DCP can support up to 16 lines and, like the central processor, has microcoded logic. Unlike the central processor, the DCP does not have coding stored in a user accessible memory; its function is microcoded in 6144 words of 12-bit "micromemory." Line Adapters, which attach a communications line to the system, are selected on the basis of the type of link to be supported. The Line Adapters are electrically connected to the Line Base feature by the Line Expander feature. The Line Base, which provides the interface with the DCP's data transfer bus, is selected, dependent on the communications mode (full- or half-duplex).

Main memory for the central processor is divided into two functional sections. The Control Memory section holds the Burroughs-supplied operating system and its related routines. The User Memory section holds the application programs. Within the 1 MHz system, both control and user memory are physically identical MOS modules with a cycle time of 1 microsecond and a word size of 16 bits. The MOS ►

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THE B 866/B 876 SYSTEM AND COMMUNICATIONS PROCESSORS

	Model		
	B 866-1	**B 866-2**	**B 876-2**
Processor Speed	1 MHz	2 MHz	2 MHz
Memory provided with Basic System—			
Control Memory I, bytes	32,768	24,576	24,576
Control Memory II, bytes	0	16,384	16,384
User Memory, bytes	16,384	0	0
Allowable Memory on fully expanded system—			
Control Memory I, bytes	49,152	32,768	32,768
Control Memory II, bytes	0	16,384	16,384
User Memory, bytes	65,536	65,536	98,304
Total Memory, bytes	114,688	114,688	147,456
Communications lines supported with Basic System	7	0	0
Communications lines supported on fully expanded system	7	7	32
Maximum I/O Channels	5	5	7
Basic system prices—			
Purchase	$24,200	$17,190	$26,690
1-yr lease including maintenance	$745/mo.	$535/mo.	$782/mo.

► control memory is called Control Memory I. The 2 MHz system replaces 16K of Control Memory I with 16K of Control Memory II, a bipolar memory with a 16 bit word and cycle time of 0.07 microseconds. The maximum size Control Memory required (and allowed) to operate Burroughs software is 49,152 bytes.

Presently, three basic systems are offered: B 866-1, B 866-2, and B 876-2.

The basic B 866-1 system includes the 1 MHz processor, 32K bytes of MOS Control Memory, 16K bytes of MOS User Memory, the 7-Line Data Communications Processor, the 4-Line Line Expander, the 145 millisecond Dual Disk Cartridge Drive/Control with 4.6 megabytes of storage, a real-time clock, and 5 I/O Channels for attachment of various peripherals. One of the I/O Channels is utilized for the Cartridge Drive. From a communications standpoint, only a Line Base and Line Adapters need be added to the basic system to support up to four lines. To support more than four lines (maximum of seven, a 3-Line Line Expander would be required).

The basic B 866-2 includes the 2 MHz processor, 24,576 bytes of Control Memory 1 (MOS), 16,384 bytes of Control Memory II (bipolar), 5 I/O Channels, and a real-time clock. It does not include any User Memory or a DCP. The seven-line DCP can be attached to the system. With fully expanded memory, the B 866-2 supports 32,768 bytes of Control Memory I; 16,384 bytes of Control Memory II; and 65,536 bytes of User Memory.

The basic B 876-2 is functionally similar to the B 866-2. Expansion capabilities make the difference. One or two 16-line DCP's can be added to support up to 32 communications lines. Fully expanded control memory is the same as in the B 866-2. User Memory is expandable to 98,304 bytes. With the I/O Expansion feature, the number of I/O Channels can be physically increased to a total of nine. With this feature attached, only one 16-line DCP can be attached; the second DCP is limited to the 4-line unit.

For all systems, Control Memory I and User Memory are expanded in 8192-byte increments. Control Memory II, restricted to the 2 MHz systems, is available only in a single 16,384-byte increment.

CONNECTION TO HOST COMPUTER: The B 866/B 876 systems can be attached to other computers only through communications lines. The system does not sup-

port special adapters for high speed parallel transfer to a host.

TRANSMISSION SPECIFICATIONS

Line Bases, Line Expanders, and Line Adapters are selected based upon the DCP utilized and the type of communications lines. Line Bases support either four or seven lines.

The 7-Line Line Base is used exclusively in the 7-Line DCP. (The half-duplex version of the 7-line Line Base is half the price of the full-duplex version and is used in a system employing only half-duplex lines; the full-duplex version will support any mix of full- and half-duplex lines.)

The 4-Line Line Base, or multiples thereof, are used in the 4-line and the 16-line DCP. The 4-Line Line Base can also be used in the 7-Line DCP when only four lines are to be attached.

Each 4-Line Line Base requires the 4-Line Line Expander irrespective of the mode-type of Line Base used. Each 7-Line Line Base requires one 4-Line Line Expander and one 3-Line Line Expander. The basic B 866-1 includes the 7-line Line Base and only the 4-Line Line Expander.

Each line attached to the system requires its own Line Adapter. The adapters available are listed in Table 1 and includes support for asynchronous lines up to 1800 bps, synchronous lines up to 64,000 bps, Burroughs Direct Interface, two-wire direct interface, and BDLC protocol.

Table 1. B 866/B 876 LINE ADAPTERS

Line Interface Type	Line Speed, bps	Number Feature
RS-232 C, Asynchronous	1,800	B 658-12
RS-232 C, Synchronous	9,600	B 658-13
RS-232 C, Synchronous	64,000	B 658-3
Burroughs Direct Interface	19,200	B 658-2
BDLC Protocol	9,600	B 658-5
Two-wire Direct Interface	—	B 658-11
Auto Dial-out for B 358-4, 16	—	B 658-4
Auto Dial-out for B 358-7	—	B 658-6

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▶ SOFTWARE

The B 866/B 876 Systems utilize Burroughs' standard Master Control Program (MCP) for their operating system. MCP provides multiprogramming, virtual memory, job scheduling and other features noted for their ease of use.

The Network Definition Language allows the user's specific network configuration to be specified through parameters. These parameter statements generate the Network Control Program, a compilation of tables and coding needed for line control.

The Message Processing Language is used to generate the Message Control System which can perform security, scheduling, validation, reformatting, routing and other functions as data passes between the application programs and the Network Control Program. The Message Control System permits a single line and/or a single station to input transactions to multiple application programs. The Generalized Message Control System is available to permit rapid creation of a Message Control System through a parameter-driven generation.

All of the above plus the COBOL/RPG Interpreter are required for the B 866/B 876 system when used as a data communications processor. Collectively, the software is called the Burroughs Computer Management System (CMS). CMS is resident in Control Memory. The major modules occupy memory as follows:

Master Control Program (MCP)	16,500 bytes
MCP Data Communication Module	4,800
MCP Date/Time Module	800
Index Sequential Module (for use with MPL and/or COBOL)	5,100
MPL Interpreter*	6,000
COBOL/RPG Interpreter*	10,000

*The MPL and COBOL/RPG modules are resident in Control Memory II, when available.

Application programs are written either in COBOL or RPG.

Three program packages are available to allow the B 866/B 876 to function as a remote batch terminal for Burroughs and IBM host systems. One package supports RJE to B 4000, B 3000, and B 2000 computer systems. Another package supports RJE to the B 7000, and the B 6000 systems. The third package permits the B 866/B 876 to look like a 360/20 RJE workstation to IBM systems using HASP.

A store and forward message switching package is also available for use, primarily with the B 876-2.

OTHER PERIPHERALS

Line printers are offered with speeds of 85, 160, 250, 400, or 750 lpm. All models provide 132 print positions per line.

Magnetic tape units include a 10 inch/sec. cassette drive and a 10K bytes/sec., NRZ, 9-channel, 800 bps unit.

Dual disk cartridge drives with 4.6 million byte capacity are offered in two models; one has an average head positioning time of 80 milliseconds, and the other, of 145 milliseconds. A 9.2 million-byte dual drive is also offered, it has an average head positioning time of 100 milliseconds.
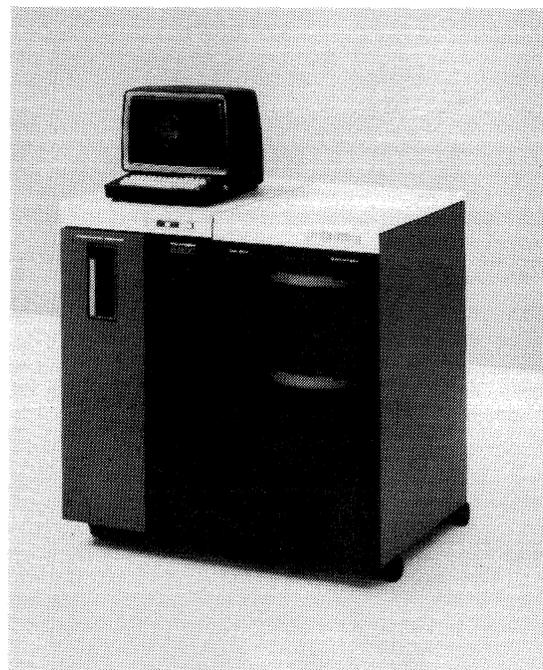
The B 866-1 System and Communications Processor accommodates seven communications lines.

Single spindle Fixed Media Disk Drives are available in 9.4 and 18.8 million byte capacities. Two Dual spindle versions of the single spindle drives are available with double the capacities. All versions have an average head positioning time of 55 milliseconds.

Industry compatible Mini-Disk Drives at 243K and 486K byte capacities are offered along with 1 and 2 million-byte Burroughs Super Mini-Disk Drives.

A 65.2 and a 130.4 million byte Dual Drive for disk packs are available with the latter capable of being expanding to 521.6 MB million bytes. The Disk-Pack Drives have direct memory access; average access time, including head movement and rotational delay, is 33 milliseconds.

A 1920 character display/keyboard or 60 cps printer/keyboard operator console is available.

Card Readers that read 300, 600, or 800 cpm can be included in the system.

PRICING

The B 866/B 876 systems are available for purchase or on a one-, three-, or five-year lease. Lease prices include prime-shift maintenance and permit unlimited use of the equipment.

There is an initial charge for the software packages and either a monthly or annual license fee. Certain packages can be obtained for a limited time (five years) on a monthly fee basis instead of the initial fee and license fee.

Burroughs B 866/B 876
System and Communications Processor

Configuration

B 866/B 876 System

Up to 5 or 7 peripheral devices (3)

Up to 7 or 32 communications lines

Up to 521.6 megabytes
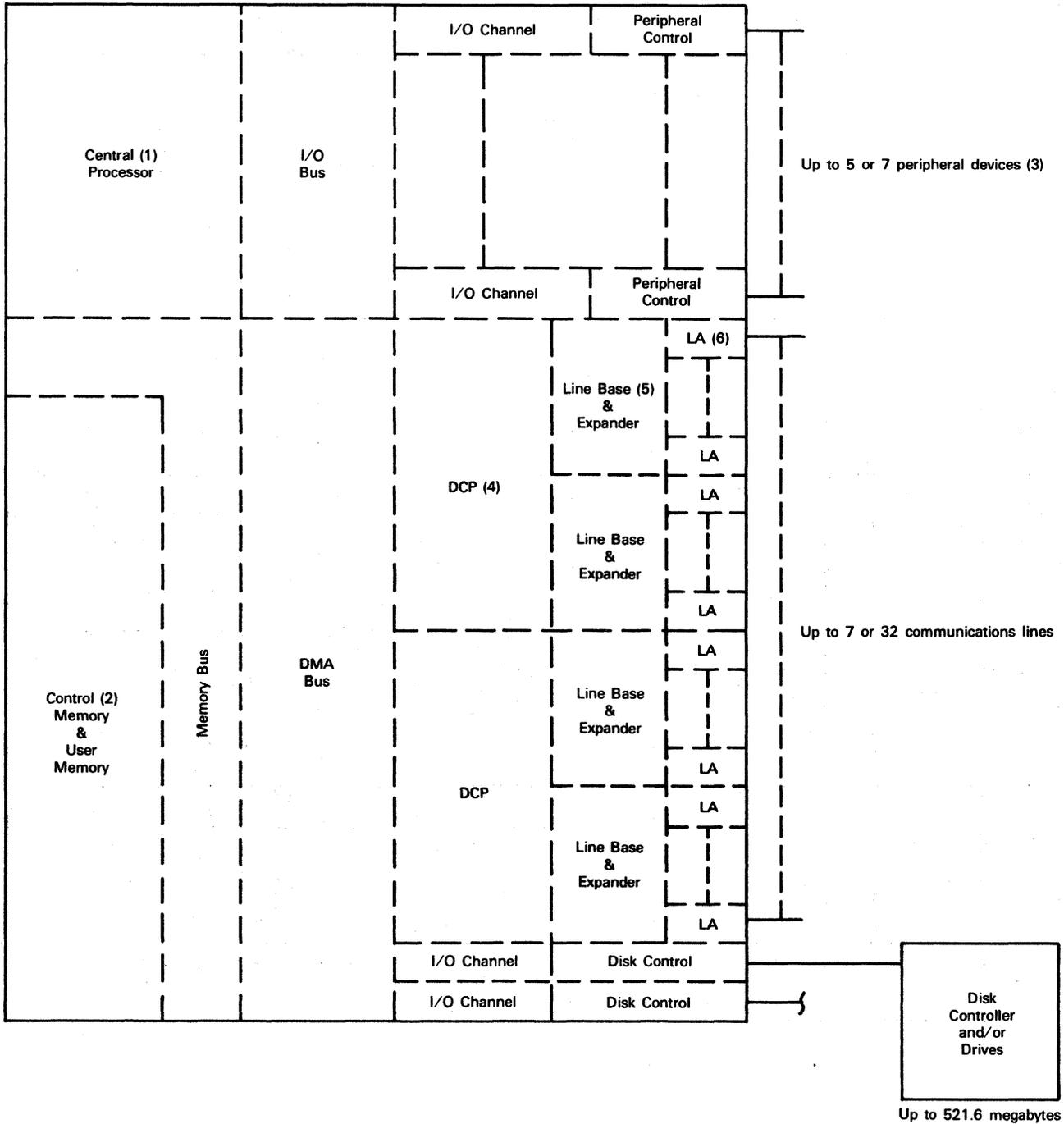
(1) Central Processor available in 1 MHz (B 866-1) or 2 (B 866-2 and B 867-2) MHz speeds.
(2) Up to 49, 152 bytes of MOS Control Memory; 16,384 bytes can be bipolar in 2 MHz systems.
(3) B 866/876 includes 5 I/O Channels for attachment of peripheral controls. B 876-2 can support 7 I/O Channels with I/O Expansion feature; with I/O Expansion, only one DCP can be a 16-line DCP.
(4) One or two DCP's are available to support 4 lines or 16 lines each. Basic B 866-1 allows only a 7-line DCP.
(5) Line Bases are available in half-duplex or full- and half-duplex versions to support 4 or 7 lines each. The 4-Line Base requires the 4-line Line Expander. The 7-line Line Base requires both the 4-line and the 3-line Line Expander.
(6) A Line Adapter is required for each communications line.

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		Monthly Lease*		Purchase Price	Monthly Maint.
		1-yr.	5-yr.		
B 866-1	1 MHz Processor, 32,768 bytes Control Memory I, 16,384 bytes User Memory, Dual Disk Cartridge Drive and Control (4.6 megabytes), DCP with 7-line and 4-line group expander	745	633	24,200	145.00
B 866-2	2 MHz Processor, 24,576 bytes Control Memory I, 16,384 bytes Control Memory II	535	455	17,190	106.00
B 876-2	2 MHz Processor, 24,576 bytes Control Memory I, 16,384 bytes Control Memory II	782	665	26,690	163.00
Memory Options					
B 7-8	8,192 bytes Memory for User Memory or Control Memory I	37	31	990	9.40
B 31-9	16,384 bytes Control Memory II	265	225	9,260	55.00
Printers					
B 243-3	Control for B 9249-1, 2, 3	18	16	625	6.50
B 244-7	ASCII Control for B 9247-12, 13	36	31	1,200	6.50
B 244-8	EBCDIC Control for B 9247-12, 13	36	31	1,200	6.50
B 9249-1	85 lpm Printer	252	227	8,500	75.10
B 9249-2	160 lpm Printer	293	264	9,900	87.60
B 9249-3	250 lpm Printer	392	353	13,400	118.00
B 9948-1	12-Channel Format Tape Reader for B 9249-1, 2, 3	32	29	1,200	—
B 9247-12	400 lpm Printer, 12-channel Format Tape Reader	613	552	21,550	173.00
B 9247-13	750 lpm Printer, 12-Channel Format Tape Reader	968	871	35,000	235.00
Data Communications Processors					
B 358-4	4-line Processor	120	102	4,300	25.80
B 358-7	7-line Processor and 4-line Expander	79	67	2,500	16.00
B 358-16	16-line Processor	158	134	5,000	40.80
Line Bases and Expanders					
B 358-20	Half-duplex, 4 lines	11	9	350	2.90
B 358-21	Full-, half-duplex, 4 lines	21	18	700	5.80
B 358-22	Half-duplex, 7 lines	11	9	350	2.90
B 358-23	Full-, half-duplex, 7 lines	21	18	700	5.80
B 358-24	Line Expander, 4 lines	11	9	350	1.20
B 358-25	Line Expander, 3 lines	42	36	1,350	9.80
Line Adapters					
B 658-12	Asynchronous, 1800 bps	16	11	525	2.50
B 658-13	Synchronous, 9600 bps	16	11	525	2.50
B 658-2	Burroughs Direct Interface, 19200 bps	20	17	660	2.50
B 658-3	Broadband, 64000 bps	78	66	2,600	11.70
B 658-5	BDLC, 9600 bps	25	21	840	4.10
B 658-11	Two-wire Direct Interface	16	14	525	2.50
B 658-4	Auto Dial-out for B 358-4, 16	12	11	375	1.40
B 658-6	Auto Dial-out for B 358-7	12	11	375	1.40
Operator Consoles and Direct Data Entry Devices					
B 347-1	Control for B 9348-4	21	18	700	3.90
B 346-4	Control for B 9346-2	18	15	680	3.90
B 9348-4	Operator Console, Display/Keyboard	120	102	3,850	30.90
B 9346-2	Operator Console, Printer/Keyboard; 60 cps	133	120	5,100	26.80
B 9347-2	Direct Data Entry Terminal	125	113	4,990	19.00
Card Readers					
B 115-1	Control for B 9115, 6, 7	24	20	880	9.10
B 9115	300 cpm Reader	135	122	5,075	39.20
B 9116	600 cpm Reader	213	192	7,135	54.90
B 9117	800 cpm Reader	274	247	9,875	67.30
Magnetic Tape					
B 394-1	Control for B 9490-25	25	21	800	4.00
B 395-1	Control for B 9491-1	33	28	1,250	12.20
B 9490-25	10 IPS Magnetic Tape Cassette	55	50	1,640	8.10
B 9491-2	10 KB Tape Unit, NRZ, 9 Channel, 800 BPI	226	203	8,900	25.00

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		Monthly Lease*			
		1-yr.	5-yr.	Purchase Price	Monthly Maint.
	Disk Cartridge Drives				
B 383-1	Control for B 9480-12, 22, B 9481-12	39	33	1,300	10.30
B 9480-12	4.6 MB Dual Cartridge Drive, 80 ms	342	308	11,900	69.50
B 9480-22	4.6 MB Dual Cartridge Drive, 145 ms	274	247	9,500	65.50
B 9481-12	9.2 MB Dual Cartridge Drive, 100 ms	502	452	14,900	94.40
	Fixed Media Disk Drives				
B 384-1	Control for B 9493	60	51	2,000	6.40
B 9493-9	9.4 MB Single Spindle, 55 ms	308	262	9,250	82.00
B 9493-18	188.8 MB Single Spindle, 55 ms	363	308	10,900	88.00
B 9493-28	28.2 MB Dual Spindle, 55 ms	502	426	14,900	113.00
B 9493-37	37.6 MB Dual Spindle, 55 ms	597	507	17,900	131.00
	Mini-Disk Drives				
B 386-1	Control for B 9489-5	40	34	1,340	6.00
B 386-2	Control for B 9489-17, 18	40	34	1,340	6.00
B 385-2	Control for B 9489-11, 12	21	18	600	6.00
B 9489-5	243 KB Industry Compatible, Inbuilt	82	74	2,950	17.10
B 9489-17	243 KB Industry Compatible, Free-standing	89	80	3,200	22.10
B 9489-18	486 KB Industry Compatible, Free-standing	139	125	5,000	22.10
B 9489-11	1 MB Super Mini-Disk, Free-standing	89	80	3,200	27.50
B 9489-12	2 MB Super Mini-Disk, Free-standing	139	125	5,000	27.50
	Disk-Pack Drives				
B 387-1	Control for B 9387-11, 12	60	51	2,000	12.00
B 9387-11	65.2 MB Dual Drive and Controller	850	765	34,000	254.00
B 9387-12	130.4 MB Dual Drive and Controller	1,150	1,035	46,000	254.00
B 9484-5	130.4 MB Dual Drive Increment (3 max.)	770	693	31,150	140.00

*Monthly lease prices include maintenance.

SOFTWARE

		Initial Charge	Monthly License Fee
CM 800 MCP	Master Control Program	$2,500	$70
CM 800 NDL	Network Definition Language	—	25
CM 800 MPL	Message Processing Language	—	25
CM 800 COB	COBOL	—	50
CM 800 RPG	Report Program Generator	—	50
CM 800 UTL	Utilities	—	15

		Initial Charge	Annual Fee	Limit Time Plan, 5-year
CM 800 GMC	Generalized Message Control System	$4,000	$ 400	$128/mo.
B 800 R41	Remote Terminal Program (RJE to B 4000, B 3000, B 2000 Systems)	1,260	175	31
B 800 R61	Remote Terminal Program (RJE to B 7000, B 6000 Systems)	1,260	175	31
B 800 HSP	Remote Terminal Program (360/20 Look-Alike RJE to IBM HASP)	1,260	175	31
B 800 MSS	Store and forward Message Switch	20,000	1,000	640 ■