

R 8/75

Burroughs L 8000 Series

MANAGEMENT SUMMARY

In a move that should further contribute to its leadership position in the field, Burroughs recently added two new members to its successful L 8000 Series of keyboard-oriented small accounting computers. These new systems are the L 8800 and L 8900, both of which will be available for delivery by the end of the third quarter of 1974. The L 8800 joins the high end of the L 8000 Series accounting computer line (the L 8200, L 8300, and L 8400), while the L 8900 becomes the higher-priced counterpart of the previously lone magnetic record computer in the line, the L 8500.

The purchaser buys improved performance when he selects either the L 8800 or the L 8900. According to Burroughs, the performance of these new systems has been improved from 17 percent to 40 percent over that of the other L 8000 systems, depending on application. Throughput has been improved primarily by using 32-character hardware buffers at the keyboard or input side and on the output side. In the other L 8000 computers, the output buffers are soft buffers implemented by Burroughs' micrologic firmware, which resides on disk. Other improvements include a faster printer (30 characters per second vs. 20 characters per second for the other L 8000 systems), a faster program loader (100 characters per second vs. 15.5 characters per second), and an electronic keyboard.

The original L 8000 Series computers, announced in October 1972, represented the most powerful members of Burroughs' large and highly successful L Series family of keyboard-oriented small accounting computers. The introduction of the L 8800 and L 8900 continues Burroughs' commitment to the small business sector and adds even more power to the L 8000 line. ➤

These keyboard-oriented accounting computers, now available in 13 models, substantially extend the performance range of Burroughs' immensely successful L Series family while maintaining full compatibility with the smaller members. A wide array of forms-handling and input/output equipment is available.

CHARACTERISTICS

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

MODELS: L 8200, L 8300, L 8400, and L 8800 Accounting Computers; L 8500 and L 8900 Magnetic Record Computers.

DATA FORMATS

BASIC UNIT: 64-bit word. Each word in memory can hold 15 decimal digits plus sign, 8 alphanumeric characters, or up to 4 instructions. (Note: Memory capacities are usually expressed in 8-bit bytes, with 8 bytes equaling one 64-bit word).

FIXED-POINT OPERANDS: Consist of 15 decimal digits plus sign or 8 alphanumeric characters.

FLOATING-POINT OPERANDS: No provision for floating-point arithmetic.

INSTRUCTIONS: SL3 basic instruction format is 4 digits in length. However, systems with more than 6K bytes (768 words) of user memory use SL5 machine instructions with an expanded 6-digit format for instructions that reference memory. Arithmetic instructions are of the one-address "add-to-accumulator" type. All instructions are decimal in nature. SL5 memory reference instructions have a 16-bit (2-byte) address specification field and an 8-bit (1-byte) operation code. ➤



Burroughs' new L 8900 Magnetic Record Computer, the latest and largest in the L Series, is shown here in an expanded configuration. From left to right are a 9-track magnetic tape unit, the computer with a 4-drive cassette unit, the free-standing Magnetic Record Handler, and a 30-cps line printer. The basic L 8900 with an integral magnetic record device, a slower printer, and 6K bytes of user memory can be purchased for \$26,780. The smallest L 8000 begins at \$12,990.

Burroughs L 8000 Series

▷ Since the introduction of the first L Series models in 1968 as non-communications versions of the keyboard-oriented TC 500 Terminal Computers, Burroughs has installed more than 25,000 of its small business systems in a broad range of industries and applications.

In contrast to the disk memories used in earlier L and TC Series computers, the L 8000 processors utilize MOS memory and logic circuitry to achieve greatly increased internal speed—yet maintain complete upward compatibility with programs, data, and operating procedures of the earlier models.

Earlier L and TC Series computers use a machine language called System Language 3 (SL3). The L8000 maintains upward compatibility with these L and TC programs by incorporating SL3 as one of two machine languages available for all L 8000 systems. The other System Language (SL5) is basically an extension of SL3 that allows increased memory addressing and additional peripheral device handling capability.

The basic L 8000 Series system consists of a single compact console, a 20-cps or 30-cps ball printer, and a forms handler. Thirteen L 8000 models are currently available, and a wide array of forms-handling facilities and input/output equipment can be attached to these systems.

In an apparent reversal of form, Burroughs has announced no lease prices for the latest additions to the L 8000 Series. As with the L 6000 Series, also just introduced, the entire L 8000 line is now quoted for ▷

▶ INTERNAL CODE: ASCII.

MAIN STORAGE

STORAGE TYPE: MOS (metal-oxide semiconductor).

CYCLE TIME: 1.5 microseconds. (Memory access times, however, will average 3 microseconds—the same as the central processor's machine cycle time.)

CAPACITY: 4,096 to 49,152 bytes of user memory, in 2,048-byte increments; plus 8,192 to 16,284 bytes of microprogram memory (MPM). The basic processor and console require 8,192 bytes of MPM, and additional MPM is automatically furnished with each additional peripheral device. Minimum user memory capacity is 6K bytes for the L 8500 and L 8900 Magnetic Record Computers and 4K bytes for all other models. The A 2011 or A 2012 Extended Memory Potential feature is required for total user memory capacities in excess of 16K or 40K bytes, respectively.

CHECKING: Parity check on each 8-bit byte.

STORAGE PROTECTION: None.

CENTRAL PROCESSOR

GENERAL: One particularly interesting feature that is standard on all L 8000 systems is an automatic power failure/automatic restart capability. At the time of a power failure, an interrupt is generated that causes activation of a cassette recording device in the processor that operates under battery power. Battery power is then used to copy the contents of memory and the status of all registers to the cassette. Upon resumption of normal power, the memory and register contents are automatically restored from the cassette.

The following entries refer to the "S-level" machine, which provides program compatibility with the earlier ▶

SUMMARY DATA FOR THE L 8000 SERIES PROCESSORS

Processor Model	L 8200-100	L 8300-100	L 8400-100	L 8541-100 L 8541-104* L 8541-109**	L8542-100 or L8542-109**	L 8800-100	L 8941-100 or L 8941-109**	L 8942-100 or L 8942-109**
Width of forms handler, inches	15.5	15.5	26	26	26	26	26	26
Number of print positions	150	150	255	255	255	255	255	255
Type of forms feed	Rear	Front	Front	Front	Front	Front	Front	Front
Type of platen	Split	Split	Split	Split	Split	Split	Split	Split
Magnetic Memory Record facilities	None	None	None	Standard	Standard	None	Standard	Standard
Maximum capacity of each magnetic-stripe document, digits	—	—	—	352	704	—	352	704
Basic user memory capacity, bytes	4,096	4,096	4,096	6,144	6,144	4,096	6,144	6,144
Max. user memory capacity, bytes	49,152	49,152	49,152	49,152	49,152	49,152	49,152	49,152

* Uses solid platen.

** Includes console magnetic record handler, A 9362-2.

Burroughs L 8000 Series

PERIPHERALS/TERMINALS

DEVICE	DESCRIPTION	SPEED
MAGNETIC TAPE		
A9490-25	Cassette station (includes controller) 10 ips, 800 bpi, 860 (256-character) records	1KC/sec
A1495	Industry-compatible, 12.5 ips, 9-track, 800 bpi	10 KBS
PUNCHED PAPER TAPE		
A9122-1	Reader, 5-8 channel	40 cps
A9222-1	Punch, 5-8 channel	40 cps
PUNCHED CARD		
A9114-1	Reader, 80-column	200 cpm
A9418-2	Reader/Punch/Data Recorder, 80-column	200/45/45 cpm
A9119-1	Reader, 96-column	300 cpm
A9419-2,-6	Reader/Punch/Data Recorder, 96-column	300/60/60 cpm
LINE PRINTERS		
A9245-1	132-position, 48/64 character	85 lpm
A9249-2	132-position, 48/64 character	160 lpm

▷ purchase only. Purchase prices of the basic L 8200, L 8300, L 8400, and L 8800 models range from \$12,990 to \$16,990. Purchase prices of the basic L 8500 and L 8900 Magnetic Record Computers range from \$22,900 to \$28,780. These prices can escalate substantially when expanded memory capacity, auxiliary input/output units, and optional forms-handling facilities are added to the basic systems.

The L 8000 Series computers are controlled by "variable micrologic"—an advanced form of microprogramming. Each L 8000 Series system has from 8K to 16K bytes of microprogram memory, and from 4K to 48K bytes of MOS *user memory* in 2K-byte increments. (Minimum user memory capacity of the L 8500 and L 8900 Magnetic Record Computers is 6K bytes).

Designed primarily for applications employing visible records and keyboard entry of transaction data, the L 8000 Series computers feature "human-engineered" controls and flexible forms-handling facilities that can accommodate a wide variety of continuous and cut forms, either singly or in various combinations. In addition, the L 8000 magnetic record computers can read and write up to 704-digits of data on magnetic-stripe documents, which can be fed and stacked automatically by unique console attachments. The forms handler available on the L 8500 and L 8900 is the only one in the industry, according to Burroughs, that features a "park" (i.e., hold) function. This feature parks a ledger card temporarily following processing for recall, if needed, prior to stacking.

▶ Burroughs L and TC series computers. The S-level machine is, in fact, a "soft" processor whose functions are implemented through standard microprograms.

Operational ambient conditions for the L 8000 Series are 50° to 105°F with a relative humidity between 5 and 95 percent. Storage conditions (non-operating) and 50° to 160°F with a relative humidity between 5 and 100 percent. Power requirements for the L 8200, L 8300, L 8400, and L 8800 are a nominal voltage of 120 vac at 8 amperes with a voltage range between 108 and 126 volts at 60 Hertz; heat is dissipated at the rate of 2,389 BTU per hour (maximum). Power requirements for the L 8500 and L 8900 are a nominal 120 vac at 8.2 amperes with a voltage range between 108 and 126 volts at 60 Hertz; heat is dissipated at the rate of 2,457 BTU per hour (maximum).

REGISTERS: Four index registers are provided. Indexing is specified by a "Modify" instruction which immediately precedes the instruction to be modified.

INDIRECT ADDRESSING: Yes, in SL5 instructions via an indirect branch instruction.

INSTRUCTION REPERTOIRE: Approximately 650 instructions are defined at the hardware or microprogram ("M") levels in approximately 70 functional categories. These hardware instructions are activated by 190 SL3 or 257 SL5 commands at the user or source ("S") level. These commands can be categorized as 94 or 128 I/O instructions, 21 or 21 arithmetic, 6 or 6 index, 54 or 84 move and load, and 15 or 18 branch and test instructions for the SL3 or SL5 machine language, respectively. Because the L 8000 is microprogrammed, the entire "S" level instruction sets can be altered as desired by Burroughs.

Burroughs L 8000 Series

➤ L 8000 Series computers can be equipped with a single or dual data communications interface to become TC 3500 Serial Terminal Computers. Data can be transmitted in either asynchronous or synchronous mode, at speeds ranging from 75 to 9600 bits per second. A TC 3500 can communicate with other Burroughs computers or terminals, as well as with BSC-mode devices from other vendors, enabling it to serve effectively in a wide range of communications functions.

The 1.5-microsecond MOS memory used in all the L 8000 Series computers gives them a 30-to-1 internal speed advantage over the earlier L Series computers, but, even so, the instruction execution speeds of the L 8000 processors fall far below those of the Burroughs B 1700 and the IBM System/3 batch-oriented computers. Nevertheless, the slower instruction execution speeds of the L 8000 are well suited to the operator-oriented applications that the L 8000 is designed to serve.

The L 8000 Series computers represent a direct Burroughs response to the NCR 399 Accounting Computer, an impressive minicomputer-based system unveiled in March 1972 by Burroughs, perennial arch-rival in the small accounting computer market. Whether by accident or by design, the two competitive product lines are closely comparable in performance and pricing, and currently rank among the "best buys" in the small accounting computer market. However, a number of key features of the L 8000 not found on the NCR 399 include simultaneous CPU and I/O operations, keyboard buffers that allow the operator to type up to 32 alphanumeric characters ahead of the keyboard print mechanism and/or processor, plus the availability of Program Keys for the operator to permit calling in program subroutines.

User reaction to the entire L Series has shown ratings from good to excellent for overall performance, ease of operation, hardware reliability, software, and maintenance. Ease of programming and technical support, however, have been rated only good to fair by L Series users. Due to the short life thus far of the L 8000 models, only a small sampling of user reaction is available. □

➤ **INSTRUCTION TIMINGS:** All times are in *milliseconds* for signed 16-digit operands at the user level. The times assume that the machine language instructions being executed are SL5 instructions. However, the shorter SL3 instruction format produces timings about 10 percent faster than the SL5 timings listed below.

Move:	0.745
Add/Subtract:	1.55/1.63
Multiply*/Divide:**	18.25/2.70
Compare & Branch:	1.77

*1-digit multiplier and signed 16-digit multiplicand.
**5-digit divisor into signed 16-digit dividend.

INTERRUPTS: Four levels, three of which are initiated by peripheral device conditions and can result in programmed action, operator notification (signal light, etc.), or termination of operation. The fourth level permits device status interrogation by the processor.

CONTROL STORAGE: 8K bytes of memory used for the basic Interpreter function of translating or "interpreting" the S-level object program code at execution time, causing the execution of the M-level microinstructions.

INPUT/OUTPUT CONTROL

I/O CHANNELS: Each type of peripheral device or subsystem except the console can use any available I/O control, and each I/O control, in turn, requires an appropriate "slot" or port in the central processor.

SIMULTANEOUS OPERATIONS: The L 8800 and L 8900 systems include a 32-character hardware keyboard buffer and a 32-character hardware output buffer, both of which permit simultaneous input/output and processing operations. The keyboard buffer accepts alphanumeric program select and operation control data while processing and printing previously entered data. Thus, indexing, processing, and printing operations can be performed simultaneously.

The L 8200, L 8300, L 8400, and L 8500 systems perform only one I/O data transfer operation at a time, and internal processing is suspended while the processor is transferring data to or from any peripheral device.

CONFIGURATION RULES: The number of peripheral devices and/or memory modules that can be used in an L 8000 Series system is limited by the capacity of the processor backplane, which can house a maximum of 100 circuit cards. The basic processor logic and first 16K bytes of user memory require 50 card slots, leaving the other 50 slots for additional memory and/or peripheral control logic.

MASS STORAGE

No magnetic disk unit nor any other type of random-access mass storage device has been announced for the L 8000 Series computers to date.

INPUT/OUTPUT UNITS

(See also Peripherals/Terminals table.)

CONSOLE: This basic unit, available in 13 different models, is the central component of every L 8000 Series computer system. It houses the system's processing logic, memory, keyboard, basic printer and forms handler, control keys and indicators, and basic program loader (a small paper tape reader). In some models, the console also contains Magnetic Memory Record facilities and/or a single cassette tape drive.

The console is 53 or 59 inches wide (for 15.5-inch or 26-inch forms handlers, respectively), 41 inches deep, and 30 inches high.

BASIC PROGRAM LOADER: The basic program loader for the L 8200, L 8300, L 8400, and L 8500 reads 8-channel paper tape from self-threading cartridges at a speed of 15.5 characters per second. It is designed solely for program-loading and cannot be used for input of

Burroughs L 8000 Series

► transaction data. In the L 8800 and L 8900, the basic program loader is a photoelectric paper tape reader that reads 8-channel paper tape from self-threading cartridges at a speed of 100 characters per second. The loader on the two new systems is also designed solely for program loading and cannot be used for input of transaction data.

INTEGRATED PRINTER: The L 8200, L 8300, L 8400, and L 8500 integrated printer uses an interchangeable ball-shaped printing element that prints one character at a time at a rated speed of 20 characters per second. The L 8800 and L 8900 systems use a similar printer, but one having a speed of 30 characters per second. Both the 20- and 30-cps printers have printing elements with 64 ASCII characters. The print line has a maximum of 150 character positions in the L 8200 and L 8300 models, and 255 print positions in all other models. A 32-character print buffer permits printing and printer positioning to be largely overlapped with internal processing. In the L 8800 and L 8900 systems, the buffer is a hardware item; in all other models, the buffer is incorporated in the micrologic firmware.

Forms can be inserted from the front in all models except the L 8200, which has a rear-feed forms handler. A split platen is standard in all models except the L 8541-104, which has a solid platen.

MAGNETIC MEMORY RECORD (MMR) FACILITIES: These facilities, standard in the L 8500 and L 8900 computers, permit data to be read from and recorded upon ledger cards and other documents containing magnetic stripes. The L 8541 and L 8941 models have a single-track MMR facility and can record a maximum of 352 data digits plus a block-check digit and two line-location digits on each document. The L 8542 and L 8942 models feature an expanded, dual-track MMR facility and can record a maximum of 704 digits on each document plus a block-check digit and two line-location digits. An additional facility is available by which the ledger cards can be used as an output medium onto which object programs can be dumped and from which they can be subsequently reloaded.

A 9362 CONSOLE MAGNETIC RECORD HANDLER: This optional attachment receives magnetic-stripe documents ejected from the console and, under program control, either stacks them in sequence or holds them for subsequent reprocessing; the holding step is called "parking." The A 9362 includes automatic feeding and insertion of a file of magnetic-stripe documents into the console. If desired, the A 9362 can be used to permit a semi-unattended mode of operation depending upon user application requirements.

A 9161 MAGNETIC RECORD READER: Reads data stored on magnetic-stripe documents and transmits the data to the central processor for processing at up to 45 documents per minute.

A 9162 MAGNETIC RECORD READER: Has the same characteristics and capabilities as the A 9161 plus dual-track reading capability for up to 704 digits to be read from two tracks on each document.

COMMUNICATIONS CONTROL

When equipped with a data communications interface, an L 8000 Series computer becomes a TC 3500 Series Terminal Computer. Transmission can be in either asynchronous or synchronous mode, at speeds ranging from

75 to 9600 bits per second. In addition to the Burroughs standard line control procedures used for communication with other Burroughs computers and terminals, the TC 3500 can be equipped to use the binary synchronous communications (BSC) procedures as well as numerous other disciplines and communicate with various IBM and IBM-compatible devices. Transmit and receive buffers can vary in length to a maximum of 4096 characters, as defined by the COBOL program, or greater if written in assembly language.

The TC 3500 can be equipped to handle dual data communications operations, with each operation occurring independently of the other. In addition, the two operations can use different transmission speeds, different modes, and different line control procedures. Thus, a TC 3500 can control a "mini-network" of smaller terminals while simultaneously communicating with a larger central computer, or it can act as a data concentrator for other Burroughs terminal systems.

SOFTWARE

OPERATING SYSTEMS: None.

PROGRAMMING: The principal programming language for the L 8000 Series computers is L 8000 COBOL, a revised, upward-compatible version of Burroughs' present L/TC COBOL. Compilation of programs written in L 8000 COBOL must be performed on a Burroughs B 3500, B 3700, or B 4700 computer with at least 90K bytes of main storage. The compiler produces object programs in an S-level language that can be loaded into the L 8000 Series for execution by the Interpreter, i.e., by the standard microprograms.

For users who wish to program their L 8000 Series computers in symbolic machine-oriented language, the SL3 Assembler language is fully upward-compatible with that of the earlier Burroughs L and TC Series computers. SL3 programs can be assembled on the earlier L and TC Series systems as well as Burroughs' medium-scale computer systems.

The SL5 Assembler includes additional instructions for the L 8000 Series peripheral devices, and expanded addressing facilities for user memories larger than 6K bytes. SL5 assembly—unlike COBOL compilation—can be performed on the L 8000 Series computer itself.

APPLICATIONS: Burroughs offers a wide assortment of ready-made programs for specific applications from its "Hall of Programs" and its library of Business Management Systems.

The Business Management Systems include programs designed to provide operational control of specific types of businesses through the production of comprehensive management reports. Business Management Systems are currently offered for the wholesale, retail, manufacturing, governmental, hospital, and banking industries. Each system maintains a general ledger using a standard chart of accounts, and produces profit-and-loss statements, balance sheets, and various other reports. Each system is available either with or without formal training at a Burroughs training site.

PRICING

POLICY: Burroughs is now offering the L 8000 systems for purchase only. The standard maintenance agreement ►

Burroughs L 8000 Series

► includes equipment servicing and permits use of the equipment during one eight-hour period per day. For usage in excess of eight hours per day, Burroughs may negotiate for extra-shift charges; however, this is not normally done unless the user wants extended maintenance coverage during these extra use periods.

SUPPORT: One-time charges for individual application programs range from approximately \$200 to \$2,500. Prices of the Business Management Systems range from \$1,500 to \$4,000, depending upon the industry and whether or not user training is included. Burroughs technical assistance is available at \$120 per day, in half-day increments. Burroughs also offers fixed-price turnkey contracts, under which it assumes total responsibility for the programming and installation of a system.

EQUIPMENT: The following typical systems include all

necessary control units.

MINIMUM SYSTEM: Consists of a processor with 4K bytes of user memory, one cassette station, keyboard, and 15.5 inch rear-feed forms handler. Purchase price is \$14,930.

MINIMUM MAGNETIC LEDGER SYSTEM: Consists of a processor with 6K bytes of memory, one cassette station, keyboard, and 26-inch Magnetic Memory Record forms handler. Purchase price is \$24,930.

EXPANDED CARD/CASSETTE/PRINTER SYSTEM: Consists of a processor with 16K bytes of user memory, four cassette stations, 96-column Multi-Purpose Card Unit, 160-lpm line printer, standard keyboard, and 26-inch front-feed forms handler with Dual Pin Feed Device. Purchase price is \$55,940. ■

EQUIPMENT PRICES

		Purchase Price	Annual Maint.*	Rental (1-year lease)**	Rental (5-year lease)**
PROCESSORS AND MAIN STORAGE					
L 8200-100	Processor with 4K bytes of user memory, 15.5" rear-feed forms handler, and 20-cps printer	\$12,990	\$ 598	—	—
L 8300-100	Processor with 4K bytes of user memory, 15.5" front-feed forms handler, and 20-cps printer	13,490	598	—	—
L 8400-100	Processor with 4K bytes of user memory, 26" front-feed forms handler, and 20-cps printer	14,990	629	—	—
L 8800-100	Processor with 6K bytes of user memory, 26" front-feed forms handler, 30-cps printer, and electronic keyboard	16,990	709	—	—
L 8541-100	Processor with 6K bytes of user memory and 26" single-track MMR forms handler with split platen, and 20-cps printer	22,990	940	—	—
L 8541-104	Processor with 6K bytes of user memory, 26" single-track MMR forms handler with solid platen, and 20-cps printer	20,990	940	—	—
L 8541-109	Processor with 6K bytes of user memory, 26" MMR forms handler, A 9362-2 Console Magnetic Record Handler, split platen, 352-digit data track, and 20-cps printer	25,780	1,125	—	—
L 8542-100	Processor with 6K bytes of user memory, 26" dual-track MMR forms handler with split platen, 704-digit data track and 20-cps printer	23,990	972	—	—
L 8542-109	Processor with 6K bytes of user memory, 26" MMR forms handler, A 9362-2 Console Magnetic Record Handler, split platen, 704-digit data track, and 20-cps printer	26,780	1,157	—	—
L 8941-100	Processor with 6K bytes of user memory, 26" MMR forms handler, split platen, 352-digit data track, 30-cps printer, and electronic keyboard	24,990	1,020	—	—
L 8941-109	Processor with 6K bytes of user memory, 26" MMR forms handler, A 9362-2 Console Magnetic Record Handler, split platen, 352-digit data track, 30-cps printer, and electronic keyboard	27,780	1,205	—	—
L 8942-100	Processor with 6K bytes of user memory, 26" MMR forms handler, split platen, 704-digit data track, 30-cps printer, and electronic keyboard	25,990	1,052	—	—
L 8942-109	Processor with 6K bytes of user memory, 26" MMR forms handler, A 9362-2 Console Magnetic Record Handler, split platen, 704-digit data track, 30-cps printer, and electronic keyboard	28,780	1,237	—	—

* Annual maintenance prices are for Burroughs Metro schedule.

** Rental prices include maintenance and are given only for peripherals and for processor options.

Burroughs L 8000 Series

EQUIPMENT PRICES

PROCESSORS AND MAIN STORAGE (Continued)		Purchase Price	Annual Maint.*	Rental (1-year lease)**	Rental (5-year lease)**
A 4011	2 KB Memory Module (up to 16 KB total)	\$ 1,100	\$ 21	\$ 31	\$ 28
A 4011-1	2 KB Memory Module (over 16 KB)	810	21	21	19
A 2011	24 KB Extended Memory Potential (required for total user memory capacity of 18 KB through 40 KB)	750	—	21	19
A 2012	32 KB Extended Memory Potential (required for total user memory capacity of 42 KB through 48 KB)	800	—	22	20
PERIPHERAL EQUIPMENT					
A 2322-1	Card/Tape Controller (for A 9122-1, A 9222-1, and/or A 9114-1)	1,000	23	28	25
A 9122-1	Paper Tape Reader; 40 char/sec.	1,590	114	42	38
A 9222-1	Paper Tape Punch; 40 char/sec.	1,990	144	53	48
A 9114-1	80-Column Card Reader; 200 cpm	2,790	244	78	71
A 9418-2	80-Column Card Reader/Punch/Data Recorder	10,990	1,020	280	252
A 2331-1	96/80-column Card Controller	2,000	23	56	50
A 9119-1	96-Column Card Reader; 300 cpm	3,500	300	85	77
A 9419-2	96-Column Card Reader/Punch/Data Recorder	9,490	852	240	216
A 9419-6	96-Column Multi-Purpose Card Unit (programmable stacker select)	11,390	1,020	285	257
A 2362-1	Line printer controller	1,500	—	42	38
A 9249-1	Line Printer; 85 lpm	8,500	720	240	216
A 9249-2	Line Printer; 160 lpm	11,200	840	280	252
A 9490-25	Cassette Tape Subsystem:				
—	First station (includes A 2391-1 controller)	1,940	97	55	50
—	Second, third or fourth station	1,940	74	55	50
A 2392-1	Data Collection MTU Controller	1,000	23	28	25
A 1495-1	Magnetic Tape Unit; 2 ports	11,500	444	365	280
A 1495-2	Magnetic Tape Unit; 4 ports	11,750	444	373	286
A 1495-3	Magnetic Tape Unit; 6 ports	12,000	444	381	292
A 1495-4	Magnetic Tape Unit; 8 ports	12,250	444	389	298
A 9161-1	Magnetic Record Reader; 352-digit data track	4,790	305	148	112
A 9162-1	Magnetic Record Reader; 704-digit data track	4,990	305	161	122
A 9362-2	Console Magnetic Record Handler; feeder/stacker/hold; includes PF29	2,990	—	84	75
Continuous Forms Pin-Feed Devices:					
PF 21	15.5" rear feed; single synchronous	250	—	7	6
PF 22	15.5" rear feed; single asynchronous	250	—	7	6
PF 23	15.5" rear feed; dual	500	—	14	13
PF 24	15.5" front feed; single synchronous	250	—	7	6
PF 25	15.5" front feed; single asynchronous	250	—	7	6
PF 26	15.5" front feed; dual	500	—	14	13
PF 27	26" front feed; single synchronous	250	—	7	6
PF 28	26" front feed; single asynchronous	250	—	7	6
PF 29	26" front feed; dual	500	—	14	13

* Annual maintenance prices are for Burroughs Metro schedule.

** Rental prices include maintenance and are given only for peripherals and for processor options.