

# Burroughs L Series

## MANAGEMENT SUMMARY

The Burroughs L Series has seen extensive growth over the last eight years. Since their first release in 1968, these accounting minicomputers have competed effectively against similar equipment from NCR, Litton, Phillips, and Nixdorf. The L Series offered higher performance than the older electromechanical bookkeeping machines, but offered no compatibility, since the L Series uses COBOL programming while the bookkeeping machines used a series of pins and stops on a moving carriage.

The original L Series consisted of the L 2000, L 3000, L 4000, and L 5000 minicomputers, which are no longer actively marketed. The L 7000 was a short-lived version of the first L series systems that featured multiple disk memory modules. Although the L 7000 never gained a large user base, there are still a few in active service.

In 1974, Burroughs announced the L 6000 line, and this was soon followed with the announcement of the L 8000 line of minicomputers. The L 6000 models were essentially the same as the earlier L series systems but featured improvements in the areas of program loading, keyboard touch, and I/O buffering. The L 8000 series used MOS memory, which yielded a 30-to-1 increase in program execution, and also offered new peripheral devices such as tape cassettes, line printers, expanded memory, and reel-to-reel magnetic tape units. Both the L 6000 and L 8000 lines offered complete upward compatibility, enabling users to gain increased output with little or no conversion.

The L 8200, 8300, 8400, and 8500 models all retained the 20-cps ball printer that was found on the L 6000's and the original L Series models. Burroughs later released 30-cps versions of the L 8000 Series. Some of these models are ▷

The current line of Burroughs ledger card and keyboard-oriented accounting mini-computers stretches from the L 6300 (\$8,740) to the new L 9945 (\$27,190). This upward-compatible series has enjoyed over 125,000 installations since 1968 and serves a wide range of accounting applications in manufacturing, wholesaling, government, banking, insurance, medical, education, and other fields.

## CHARACTERISTICS

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

**MODELS:** L 9900, L 9800, L 9700, L 9500, L 9400, L 9300, L 8800, L 8700, L 6500, L 6400, and L 6300 Accounting Computers. (Numerous earlier L Series models are no longer actively marketed.)

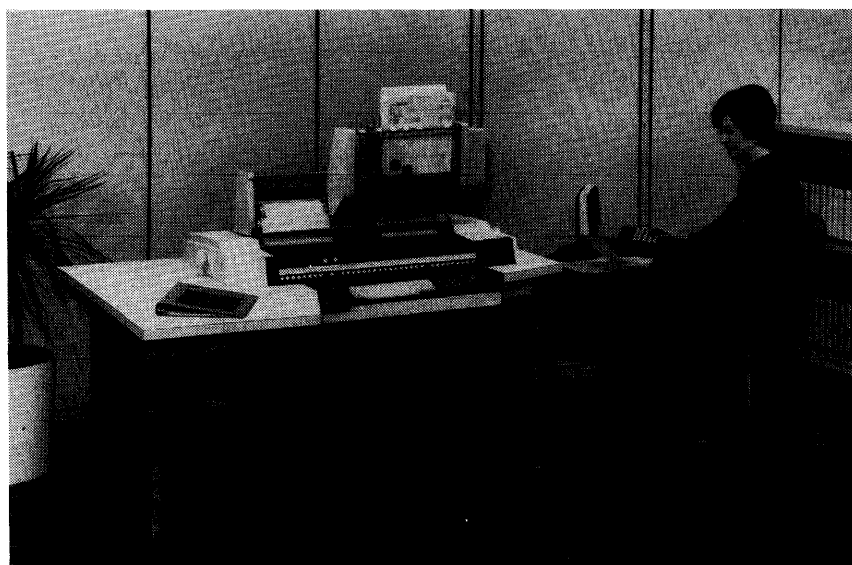
### DATA FORMATS

**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 equalling 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 ▶



*The Burroughs L 9900 Magnetic Record Computer is shown with some of the peripheral devices that are currently available. From left to right are four Magnetic Tape Cassette Stations, the 26-inch console with an A9362 Feeder/Stacker for magnetic striped ledger cards, and the TD 700 keyboard and display unit. The Basic L 9941-259 with 6K bytes of user memory, a 90-cps matrix printer, one cassette station, a stripe capacity of 352 digits, and the bi-directional feature sells for \$24,690.*

## Burroughs L Series

### CHARACTERISTICS OF THE L SERIES SYSTEMS

Model*	120-cps matrix printer models				90-cps matrix printer models			
	L 9945-259	L 9944-259	L 9803-250	L 9703-250	L 9942-259	L 9941-259	L 9800-250	L 9700-250
Date announced	9/76	9/76	9/76	9/76	3/76	3/76	3/76	3/76
Width of forms handler (inches)	26	26	26	15.5	26	26	26	15.5
Number of print positions	255	255	255	150	255	255	255	150
Magnetic Memory Record facilities	Standard	Standard	—	—	Standard	Standard	—	—
Capacity of magnetic stripe (digits)	704	352	—	—	704	352	—	—
Type of memory	MOS	MOS	MOS	MOS	MOS	MOS	MOS	MOS
Basic user memory capacity (bytes)	6K	6K	4K	4K	6K	6K	4K	4K
Maximum user memory capacity (bytes)	48K	48K	48K	48K	48K	48K	48K	48K
Console printer type	Matrix	Matrix	Matrix	Matrix	Matrix	Matrix	Matrix	Matrix
Console printer speed (cps)	120	120	120	120	90	90	90	90
Line printer speed (lpm)	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250
Standard number of cassette stations	1	1	1	1	1	1	1	1
Maximum number of cassette stations	4	4	4	4	4	4	4	4
Basic price	\$27,190	\$26,190	\$20,190	\$19,690	\$25,690	\$24,690	\$19,490	\$18,990

\*All models include split platen and front forms feed.

All 120- and 90-cps matrix printers include upper/lower case and bidirectional printing as standard.

All MMR models include one A9362 feeder/stacker for magnetic striped ledger cards.

➤ still available, although they are now classified as "Previous Styles." In June 1975, the first of the L 9000 models were unveiled. With the L 9000, Burroughs introduced a matrix printer rated at 60 characters per second. Throughout all of these upgrades in the L Series product line, Burroughs maintained compatible programming to allow users of the earlier versions great flexibility in choosing subsequent models.

The current L 6000 Series closely resembles the earlier L 3000, 4000, and 5000 models. The basic differences are the presence of a high-speed photoelectric program loader, electronic keyboard, and increased I/O buffering that allows simultaneous operation of the processor and various I/O devices. The L 6000 models are the only current models that can use the head-per-track disk memory and the 20-cps ball printing device that were hallmarks of the earlier L Series models.

The predominant programming language for the entire L Series line is COBOL, although an assembler language is also available. The use of COBOL gives the user a wide choice of sources for his programming needs. Some software houses offer "turnkey" packages, designed specifically around one or more of the L Series computers.

Many of the L Series computers are no longer being actively marketed by Burroughs. The L 2000, 3000, 4000, and 5000 all had 20-character-per-second printers and disk memories. The L 2000 and L 3000 featured a 15½-inch rear-feed forms handler, while the L 3000 also allowed for front-feed forms. The L 4000 and L 5000 had a 26-inch front-feed forms handler, while the L 5000 offered a magnetic stripe ledger handler that had a capacity of 352 digits.

➤ 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.

INTERNAL CODE: ASCII.

MAIN STORAGE (L 8000, L 9000)

STORAGE TYPE: Dynamic MOS (metal oxide semiconductor).

CYCLE TIME: 1.5 microseconds. (Memory access times will average 1.2 microseconds, but the rate of access is 3.0 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 16,384 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 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: The control area of memory is protected, since this area is not accessible to users and cannot be written into.

MAIN STORAGE (L 6000)

STORAGE TYPE: A non-removable ceramic, magnetic disk with fixed heads.

ACCESS TIME: Average disk access time is 5 milliseconds for all 6000 Series models.

## Burroughs L Series

## CHARACTERISTICS OF THE L SERIES SYSTEMS (Continued)

Model*	60-cps matrix printer models				30-cps ball printer models			
	L 9542-259	L 9541-259	L 9400-250	L 9300-250	L 8700-300	L 8800-300	L 8700-700	L 8800-700
Date announced	6/75	6/75	6/75	6/75	10/74	10/74	10/74	10/74
Width of forms handler (inches)	26	26	26	15.5	15.5	26	15.5	26
Number of print positions	255	255	255	150	150	255	150	255
Magnetic Memory Record facilities	Standard	Standard	—	—	—	—	—	—
Capacity of magnetic stripe (digits)	704	352	—	—	—	—	—	—
Type of memory	MOS	MOS	MOS	MOS	MOS	MOS	MOS	MOS
Basic user memory capacity (bytes)	6K	6K	4K	4K	10K	10K	4K	4K
Maximum user memory capacity (bytes)	48K	48K	48K	48K	48K	48K	48K	48K
Console printer type	Matrix	Matrix	Matrix	Matrix	Ball	Ball	Ball	Ball
Console printer speed (lpm)	60	60	60	60	30	30	30	30
Line printer speed (lpm)	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250	85, 160, or 250
Standard number of cassette stations	1	1	1	1	3	3	—	—
Maximum number of cassette stations	4	4	4	4	4	4	4	4
Basic price	\$24,190	\$23,190	\$18,490	\$17,490	\$15,700	\$16,100	\$12,490	\$12,990

\*All models include split platen and front forms feed.

All matrix printers include bidirectional printing as standard.

All MMR models include one A9362 feeder/stacker for magnetic striped ledger cards.

➤ The L 8200, 8300, 8400, 8500, and 8900 have also been classified as "Previous Styles." These models featured basically the same characteristics as the L 2000, 3000, 4000, and 5000, except that the L 8000 Series models used MOS memory which yielded a substantial increase in processing speed. The L 8900, with its 30-cps printer, represented a 50 percent increase in printer speed, but it too has now been overshadowed by the matrix printers with speeds that range as high as 120 cps.

Even though these earlier models are not at the top of Burroughs' current price list, the programs that are now running on them are easily transportable to the newer L 9000 and L 8000 Series systems. Therefore, existing L Series users can readily increase their throughput, and new users have access to the ever-growing library of developed L Series programs.

The top of the Burroughs line is now occupied by the L 9900, which may be purchased alone or in various package formats that include cassette stations, expanded memory, bidirectional printing, and automatic ledger card handlers. Other available peripheral devices include 85-, 160-, and 250-line-per-minute printers, memory modules, punched paper tape units, 96-column card units, 80-column card units, up to four magnetic tape cassette drives, reel-to-reel magnetic tape units, and TD 700 Data Capture terminals. In addition, off-line data preparation devices, such as the Burroughs AE500 and AE 300 Audit Entry Systems, can prepare magnetic tape cassettes for input to the L 9900.

The new L 9900 Series utilizes a matrix printer that offers printing speeds of either 90 or 120 characters per second for a 50 or 100 percent increase in raw printing speed over the earlier L 9000 models. All the Burroughs matrix

➤ **CAPACITY:** L 6000 Series disk storage contains a maximum of 1,280 64-bit words organized into 5 blocks (256 words per block). Each block consists of eight tracks, with a read/write head servicing each track.

Memory is divided into three areas: normal, control, and variable. System control functions are under microprogram control. That is, two or more microinstructions (machine-level instructions) are linked together to execute a macroinstruction. The normal memory area is the user program storage area, where series of macroinstructions are stored as macroprograms. The control area stores all system microinstructions, and the composite of this area is called System Firmware. The variable area is available for enhancement of the user (macroprogram storage) and control (microinstruction storage) areas.

Maximum storage on all L 6000 systems amounts to 1,280 words of storage. Systems with the entire 1,280 words implemented are called "Series L with extended memory." In some systems, only part of the variable area may be implemented, with the normal user area ranging from 128 to 768 words of user (macroprogram) storage. The control area contains a minimum of 512 words for microinstruction storage. Where more than 512 words of microinstructions are required, the additional storage is taken from the variable area, thus reducing the available user storage by a corresponding amount.

L 6500 disk memory, for example, can be implemented with a minimum of 544 user words. Since all L 6500's are extended-memory systems, the control area contains up to 736 words for microinstruction storage. At the upper range of user storage, L 6500's can be implemented with a maximum of 608 user words. The control area then contains up to 672 words for microinstruction storage.

#### CENTRAL PROCESSOR (L 8000, L 9000)

➤ **GENERAL:** One particularly interesting feature that is standard on all L 8000 and L 9000 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

## Burroughs L Series

### CHARACTERISTICS OF THE L SERIES SYSTEMS (Continued)

Model*	20-cps ball printer models				
	L 6511-869	L 6436-890	L 6436-800	L 6336-890	L 6336-800
Date announced	5/74	5/74	5/74	5/74	5/74
Width of forms handler (inches)	26	26	26	15.5	15.5
Number of print positions	255	255	255	150	150
Magnetic Memory Record facilities	Standard	—	—	—	—
Capacity of magnetic stripe (digits)	352	—	—	—	—
Type of memory	Disk	Disk	Disk	Disk	Disk
Basic user memory capacity	576 words	768 words	128 words	768 words	128 words
Maximum user memory capacity	576 words	768 words	768 words	768 words	768 words
Console printer type	ball	ball	ball	ball	ball
Console printer speed (cps)	20	20	20	20	20
Line printer speed (lpm)	—	—	—	—	—
Standard number of cassette stations	—	—	—	—	—
Maximum number of cassette stations	2	2	2	2	2
Basic price	\$17,990	\$12,740	\$9,740	\$11,740	\$8,740

\*All models include split platen and front forms feed.

➤ printers feature a positioning speed of 330 characters per second, and position to the most significant digit at high speed. The new 120- and 90-cps models also have a "printer motor shutoff" feature, which automatically idles the matrix printer when it is not being utilized by the processor.

Since all current L Series programs are upward-compatible, it is possible for a user to upgrade his present L 5000 (with the 20-cps ball printer) to an L 9944 and enjoy a 600 percent increase in raw printer speed. What's more, the 1.5-microsecond MOS memory used in all the L 8000 and L 9000 Series computers gives a 30-to-1 advantage in instruction execution speed over the earlier disk-memory models.

As a standard feature, all L 9700, L 9800 and L 9900 systems utilize the full 94-character ASCII print set, which includes both upper and lower case alpha characters. All present program products will operate in the upper case, and require no modification. However, to take advantage of the bidirectional feature of the matrix printer, the output must be formatted as if it were being printed on a line printer.

Users of both L 8000 and L 9000 systems can now enjoy on-line keyboard/display data entry from up to two (at this writing) TD 700 Data Entry Stations. Data entry is to a dedicated magnetic tape cassette station, and can take place concurrently with program execution. This complements other data entry methods, such as cassette preparation on stand-alone Burroughs AE 300 and AE 500 Audit Entry Computers.

Programs can be prepared in-house by users who have the personnel and facilities available to write COBOL or Assembler programs and compile object programs on ➤

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

**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; not user-accessible.

**REGISTERS:** No user-accessible registers, except for index registers, are provided. Accumulators are set up by programs in user memory.

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

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

**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 and L 9000 processors are microprogrammed, the entire "S" level instruction sets can be altered as desired by Burroughs.

**INSTRUCTION TIMINGS:** All times are in *milliseconds* for signed 15-digit (1-word) operands at the user level. The times assume that the machine language instructions being executed are SL5 instructions. However, the shorter SL3 ➤

## Burroughs L Series

### PERIPHERALS/TERMINALS FOR L 8000 AND L 9000 SERIES

DEVICE	DESCRIPTION	SPEED
<b>MAGNETIC TAPE</b>		
A9490-25 A1495	Cassette station (includes controller); 12.5 ips, 800 bpi; 860 (256-character) records Industry-compatible; 12.5 ips, 9-track, 800 bpi	1KCS 10 KBS
<b>PUNCHED PAPER TAPE</b>		
A9122-1 A9222-1	Reader, 5-8 channel Punch, 5-8 channel	40 cps 40 cps
<b>PUNCHED CARD</b>		
A9114-1 A9418-2	Reader, 80-column Reader/Punch/Data Recorder, 80-column	200 cpm 200/45/45 cpm
A9119-1 A9419-2, -6	Reader, 96-column Reader/Punch/Data Recorder, 96-column	300 cpm 300/60/60 cpm
<b>LINE PRINTERS</b>		
A9249-1 A9249-2 A9249-3	132 positions, 48/64 characters 132 positions, 48/64 characters 132 positions, 48/64 characters	85 lpm 160 lpm 250 lpm
<b>DATA ENTRY MODULE</b>		
TD 701-1	256-character screen	—

### PERIPHERALS/TERMINALS FOR L 6000 SERIES

DEVICE	DESCRIPTION	SPEED
<b>MAGNETIC TAPE</b>		
A9490-25 A1495	Cassette tape drive Industry-compatible, 12.5 ips, 9-track, 800 bpi	1 KCS 10 KBS
<b>PUNCHED PAPER TAPE</b>		
A562 A581	Punched; 5-, 6-, 7-, or 8-channel Reader; 5-, 6-, 7-, or 8-channel	40 cps 40 cps
<b>PUNCHED CARD</b>		
A595 A596	Card reader; 80-column Card reader; 80-column, EBCDIC	100 cpm 100 cpm

▷ punched tape or cards. Programs can be written in Burroughs L/TC COBOL or Assembler language and either compiled or assembled on the Burroughs medium-scale data processing systems, or assembled only on the L or TC Series systems themselves. Programs are prepared on punched paper tape and are easily loaded either at the console or through peripheral input units.

Extensive software support is available from Burroughs Corporation. Application program packages, including documentation and program tapes, can be purchased from the company. As you can see from the list of Software Prices in this report, the program packages cover a wide range of applications, including wholesalers, contractors, credit unions, hospitals, clinics, school boards, local governments, banks, etc. ▷

▶ 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.

### CENTRAL PROCESSOR (L 6000)

**GENERAL:** Central processing functions are performed by defined strings of micrologic software instructions (firm- ▶

## Burroughs L Series

➤ Earlier L and TC Series computers used a machine language called System Language 3 (SL3). The L 8000/9000 family maintains upward compatibility with these L and TC programs by incorporating SL3 as one of two machine languages available for all L 8000 and L 9000 systems. The other System Language (SL5) is basically an extension of SL3 that allows increased memory and addressing and additional peripheral device handling capability.

The L 8000 and L 9000 Series computers are controlled by "variable micrologic"—an advanced form of micro-programming. Each L 8000/9000 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 Magnetic Record Computers is 6K bytes).

Designed primarily for applications employing visible records and keyboard entry of transaction data, the L 8000 and L 9000 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 and L 9000 Series magnetic record computers can read and write up to 704 digits of data on magnetic-stripe documents, which can be fed, held, and stacked automatically by a unique console device. This feature can "park" a ledger card temporarily following processing for recall, if needed, prior to stacking.

L 6000 Series minicomputers can be equipped with data communications interfaces to become TC 600, TC 750, TC 1600, or TC 2600 Series Terminal Computers. Data can be transmitted in either asynchronous or synchronous mode at speeds up to 2,000 bits per second.

L 8000 or L 9000 Series computers can be equipped with a single or dual data communications interface to become TC 3500 or TC 3800 Series 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.

Due to the wide growth potential of the L 8000 and L 9000 Series computers, users can enjoy the benefits of upgrading instead of replacing equipment. In the area of input, card readers, cassette readers, terminals, and data communications can be added; while line printers, bidirectional printing, and reel-to-reel magnetic tape units can be used to increase output speeds. The user should be aware, however, that the addition of these devices may require programming changes. As an example, increasing your line printers speed from 85 to 250 lines per minute wouldn't require programming changes, but converting from console printer output to line printer output would probably require reformatting of the output. To take ➤

➤ ware) stored as microinstructions in the control area of disk. Firmware accomplishes all processing tasks, including arithmetic and logical operations, input and output control, and data manipulation. Each macroinstruction in a user's program is decoded in the logic section and is carried out by executing the appropriate string of microinstructions in the System Firmware.

**REGISTERS:** One 64-bit (15 digits plus flag) accumulator is used for temporary storage of numeric data. It serves as a working memory location to move data between memory word locations, and it temporarily stores numeric data for printing. The accumulator is active whenever data is entered in the numeric mode, and subsequent data entered in this mode replaces the previous contents with the new data. Four index registers are available, with indexing specified by a "Modify" instruction immediately preceding the instruction to be modified.

**INDIRECT ADDRESSING:** No.

**INSTRUCTION REPERTOIRE:** Firmware instructions are activated by 167 commands (macroinstructions) at the user or source level, which fall into the following groups: standard set (76); additional data communications, magnetic record (L 6500 only), and optional I/O device instructions (91). The standard set includes 12 keyboard instructions, 11 print instructions, 11 forms-handler and forms-control instructions, 17 arithmetic and data move instructions, 4 flag instructions, 6 index register instructions, 3 branch instructions, 9 skip/execute instructions, and 3 miscellaneous instructions. The 91 optional instructions include 32 data communications instructions 22 punched card instructions, 21 paper tape instructions, and 16 magnetic unit record instructions. Because of the firmware system used in L Series equipment, all of the source-level instruction sets are alterable by Burroughs.

**INSTRUCTION TIMINGS:** All execution times listed below are in *milliseconds* for 15-digit (1-word) operands at the user level:

Move:	30
Add/Subtract:	50/50
Multiply/Divide:	Not available
Compare and Branch:	60

**INTERRUPTS:** None. However, keyboard error conditions cause a machine halt, a sound alarm, and a keyboard indication (light). Pressing the reset key removes the error condition.

### PHYSICAL SPECIFICATIONS (L 6000, L 8000, L 9000)

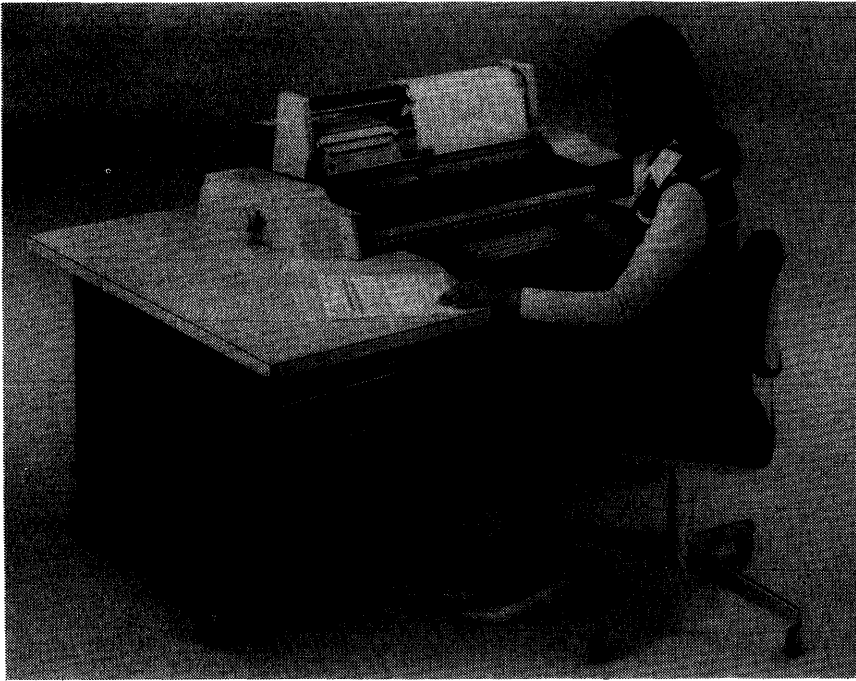
Processors are 29.875 inches high (at the work surface), 53.25 or 62.5 inches wide (depending on whether the console printer is a 15.5-inch or 26-inch unit), and 41 inches deep. The maximum weight ranges up to about 550 to 600 pounds.

Operational ambient conditions for the processors are 50° to 105°F. with a relative humidity between 5 and 95 percent. Storage conditions (non-operating) are 50° to 160°F. with a relative humidity between 5 and 100 percent. Special air conditioning and raised flooring are not normally required. The power line should be "clean."

Power requirements for the L 9800, L 9700, L 8800, and L 8700 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/hour (maximum).

Power requirements for the L 6300 and L 6400 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 ➤

## Burroughs L Series



*The Burroughs L 6400 is shown here with its maximum of two cassette stations. The L 6400 features a 26-inch front-feed forms handler, 20-character-per-second ball printer, electronic keyboard, 100-character-per-second program loader, and from 128 to 768 words of user memory. Prices of the L 6400 models range from \$9,740 to \$12,740.*

▷ advantage of bidirectional printing, the program must format output as if it were going to a line printer.

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 delivered and installed more than 125,000 of its small business systems in a broad range of industries and applications. Of these, some 50,000 are said to have been installed in the United States. With systems ranging upward in price from as low as \$8,500, Burroughs competes with a large group of rivals.

NCR's 299, 399, and 499 systems bear a close resemblance to the L 6000, L 8000, and L 9000. One significant feature of the L Series that is not found on the NCR computers is the use of COBOL. Olivetti's models A5, A6, and A7 also represent direct competition for Burroughs. Although Olivetti does not offer COBOL, the A7 models do offer RPG and PL/1. Burroughs L Series also competes with IBM's System/32, although the Burroughs B 700 and B 80 systems are more closely related to the System/32 due to the availability of disk storage.

### USER REACTION

Six users of Burroughs L Series equipment responded to Datapro's 1976 survey of small business computer users, and six additional names were selected from a list of L 9500 users provided by Burroughs. Our sample therefore consisted of seven L 9500's, two L 8500's, one L 8300, one L 8700, and one L 7000 installation. As of this writing, no users had reported on the L 9900, L 9800, or L 9700 systems (released in September 1976).

▶ 2,389 BTU/hour (maximum). Power requirements for the L 6500 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/hour (maximum).

### INPUT/OUTPUT CONTROL (L 8000, L 9000)

**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 8700, L 8800, and L 9000 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.

All models can be equipped with locally connected TD 700 Data Entry Terminals (keyboards with Self-Scan displays) for data entry onto a dedicated magnetic tape cassette station concurrently with execution of a program.

**CONFIGURATION RULES:** The number of peripheral devices and/or memory modules that can be used in an L 8000 or L 9000 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.

### INPUT/OUTPUT CONTROL (L 6000)

**I/O CHANNELS:** Each type of peripheral device (except the console and keyboard) can use any available I/O control, and each I/O control requires an appropriate slot electrically connected to the system backplane. All I/O operations are performed under program control.

## Burroughs L Series

➤ In the following tabulation of user reactions, the usual questions about operating systems and compilers have been eliminated because 1) the L Series has no operating system, and 2) the application programs were not written by the users, meaning that they had no opportunity to evaluate the compilers. In all cases, the application programs were provided either by Burroughs or by software houses that specialize in Burroughs L Series software.

These 12 users supplied the following ratings for their systems in 9 performance categories:

	Excellent	Good	Fair	Poor	WA*
Ease of operation	6	5	1	0	3.4
Reliability of mainframe	7	4	0	1	3.4
Reliability of peripherals	4	4	0	0	3.5
Maintenance service:					
Responsiveness	3	7	1	1	3.0
Effectiveness	3	4	3	2	2.7
Technical support	1	4	4	3	2.3
Manufacturer's software:					
Application programs	1	6	0	1	2.9
Ease of conversion	4	2	0	3	2.8
Overall satisfaction	1	8	2	1	2.8

\*Weighted average on a scale of 4.0 for Excellent.

As a group, the L Series users had a high regard for the ease of operation and reliability of their equipment. Most users thought that the responsiveness of the maintenance personnel was good, but there seemed to be some dispute as to the effectiveness of the maintenance. While Burroughs scored three "excellent" and four "good" marks, there were also three "fair" and two "poor" grades for effectiveness. Some users complained that the service they get is somewhat erratic.

One L 9500 user with eight months of experience rated his L 9500 as "excellent" in all areas, except for a "good" rating for reliability of peripherals. He also felt that the field engineering support was excellent. This user represented a small municipality in the East, which was using its L 9500 for utility billing, budgetary accounting, and payroll. Another small municipality, located in the Midwest and with 6 months of experience, was using its L 9500 for the same applications and felt that the effectiveness of service and technical support could have been better.

While the user reaction to the Burroughs L Series was generally favorable, technical support stands out as an area that could use some improvement. Among those who felt that the technical support was not satisfactory, a common reason was that the operating instructions were not complete, or not clear. Another reason cited was that the training provided was not adequate, and that in some cases it was difficult to correct mistakes once they were made, necessitating phone calls to the local Burroughs office for help. □

➤ **SIMULTANEOUS OPERATIONS:** A 32-character hardware keyboard buffer and a 32-character hardware printer buffer 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.

**CONFIGURATION RULES:** The number of peripheral devices and/or memory modules that can be used in an L Series system is limited by the capacity of the processor backplane, which can house a maximum of 60 circuit cards.

### MASS STORAGE

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

### PROCESSOR CONSOLE

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. 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 cassette tape drives.

All currently available L Series minicomputers have electronic keyboards for rapid, convenient data entry. Features of the keyboard include: a set of program selection keys (16 keys for the 15.5-inch forms handlers, 24 keys for the 26-inch forms handlers), a set of operator communication lights, an alphanumeric keyboard, a 10-key numeric keyboard, and four operational control keys on each of the two keyboards.

The program control keys are used for starting programs, loading programs, starting utility routines, and selecting alternate application-program routines. Each key has a light above it to indicate the availability of its use at any particular time, and a strip of abbreviated operating instructions is located above the lights. The combination of prompting messages and program control keys should reduce the need for an inexperienced operator to refer to a book of operating instructions.

This same console is the operator's input device on the Burroughs B 700 Series systems, and a very similar keyboard has been incorporated into the B 80 Series of computers, making the upward transition for operators as simple as possible.

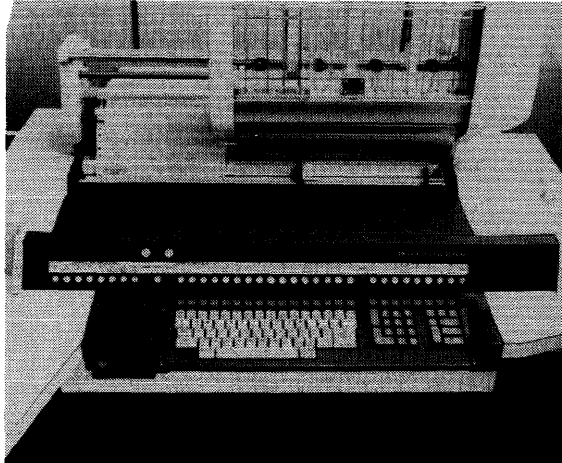
The basic program loader on all models is a photoelectric paper tape reader that reads 8-channel paper tape from self-threading cartridges at a speed of 100 characters per second. Designed solely for program loading, the unit cannot be used for input of transaction data.

Programs can also be loaded from various peripheral devices. Most L 8000 and L 9000 models are offered with one cassette station, which may be omitted. Program loading via the cassette station is very simple; the operator merely types in the program I.D., and the cassette will be searched until the program is found. Since the capacity of the cassette is approximately 220K bytes, 25 programs averaging 8K bytes each could easily fit on one cassette. This same cassette station could also be used to store data for retrieval via program control.

Optional dynamic overlay of memory (for the L 8000 and L 9000 systems only) permits the loading of program segments via the tape cassette station, so that programs that are larger than the memory size can be executed if they are written in segments.



## Burroughs L Series



*This close-up of the 26-inch console shows the A9362 Feeder/Stacker mounted on a PF29 pin-feed forms controller. The typewriter keyboard is used for entering alphanumeric data, while the 10-key pad to its right is used for entering numeric data. Just above the typewriter keyboard, you'll find the Program Select Keys, each with its own communication light, and a written set of abbreviated operating instructions. The 100-cps photoelectric paper tape reader is to the left of the typewriter keyboard.*



*From one to four magnetic tape cassette stations are available on the L 8000 and L 9000 series minicomputers. The cassettes have a capacity of 220 KB and can be used for storing data and loading programs. Sorting and merging utilities are available from Burroughs. Cassettes can be recorded "off site" through the use of an AE 500 Audit Entry computer and later entered under program control to enhance the keyboard input capabilities.*

### ► INPUT/OUTPUT UNITS

**INTEGRATED PRINTER:** The entire family of L 6000 models utilizes an interchangeable ball-shaped printing element that prints one character at a time at a rated speed of 20 characters per second. The L 8700 and L 8800 models use a similar printer that has a rated speed of 30 characters per second. Both printers have printing elements with 64 ASCII characters. An automatic pressure-sensing device adjusts the printer according to the thickness of the forms being used on the console, and produces up to 10 readable carbon copies, depending upon the type of paper used. The ball printer also has a "compressed punctuation" feature that allows the use of decimals and/or commas in numeric fields without requiring additional character positions. Horizontal spacing is 1/10 inch, allowing 150 print positions on the 15.5-inch models and 255 print positions on the 26-inch models. Vertical spacing is 1/6 inch and is controlled by the internal program, thus eliminating the need for a punched paper tape forms control device.

A 32-character print buffer permits printing and printer positioning to be largely overlapped with internal processing. In the L 8700 and L 8800 models, the buffer is a hardware item; in all other models, the buffer is incorporated into the micrologic firmware.

The L 9000 Series systems use matrix printers. The L 9300, 9400, and 9500 models are rated at 60 cps, while the L 9700, 9800, 9941, and 9942 models have 90-cps printers. At the top of the line are the L 9803, 9703, 9944 and 9945 models, which have matrix printers rated at 120 cps.

All of the matrix printers have a positioning speed of 330 positions per second. The L 9000 Series systems are offered with a bidirectional printing feature that can take advantage of output that is formatted the same as line printer formats. The matrix printers are also "intelligent," in the sense that the head can calculate the optimum print direction for each line and move to the most significant character position at high speed. Up to 6 carbon copies are possible with the

matrix printers. All L 9700, 9800 and 9900 models feature the full 94-character ASCII print set, which includes both upper and lower case characters.

While the matrix printers do not employ red/black printing, as the ball printers do, this is seldom a problem, since the programs are usually written to print minus signs after negative amounts for carbon copies. The matrix printers simply ignore ribbon shifting commands.

Forms can be inserted from the front on all models. A split platen is standard.

**MAGNETIC MEMORY RECORD (MMR) FACILITIES:** These facilities, standard on the L 9900, L 9500 and L 6500 models, permit data to be recorded on, and read from, ledger cards and other documents containing magnetic stripes. All MMR modules utilize a single-track MMR facility and can record a maximum of 352 digits of data, including a block-check digit and two line-find digits, on each document. The L 8000 and L 9000 MMR models can have an optional second track that provides a total capacity of 704 digits of data, including a block-check digit and two line-find digits on each document.

**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 ►

## Burroughs L Series

- reading capability for up to 704 digits to be read from two tracks on each document.

For characteristics of all the other L Series input/output units, please see the Peripherals/Terminals tables on page M11-112-205.

### COMMUNICATIONS CONTROL

When equipped with a data communications interface, an L 8000 or L 9000 Series computer becomes a TC 3500 or TC 3800 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 models 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 Series units 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 or TC 3800 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.

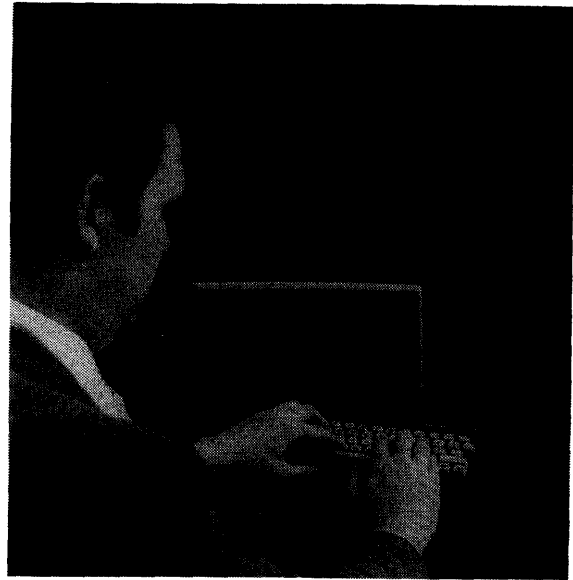
**PROGRAMMING:** The principal programming language for the L 8000 and L 9000 Series computers is L 8000 COBOL, a revised, upward-compatible version of Burroughs' earlier L/TC COBOL. Compilation of programs written in L 8000 COBOL must be performed on a Burroughs B 3500, B 3700, or B 4700 computer with 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 or L 9000 Series for execution by the Interpreter, i.e., by the standard microprograms.

For users who wish to program their L 8000 or L 9000 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 and L 9000 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 or L 9000 Series computer itself.

The principal programming language used by the L 6000 Series minicomputers is L/TC COBOL. However, COBOL programs must be compiled on a larger Burroughs computer system before being loaded on the L 6000 Series. As an alternative to L/TC COBOL programming, programs can be written in assembler language and then assembled either on the L 6000 Series minicomputers themselves or on larger Burroughs computer systems such as the B 3500.

System software used with the L 6000 Series equipment includes debugging aids and a basic report writer. Object programs can be prepared on standard punched paper tape



*Shown here are the TD 700 display and keyboard. (The Controller can be stored behind a desk.) L 8000 and L 9000 users can use up to two TD 700 Data Capture Stations for data entry to a dedicated magnetic tape cassette station, which can take place concurrently with program execution. The display shows 8 rows of 32 characters for a total page of 256 characters. The memory in the TD 700 stores 4 pages of information for a total capacity of 1024 characters.*

and loaded either at the keyboard (which includes a special paper tape reader) or, optionally, through a separate A 581 paper tape reader. Program loading can also be accomplished through the use of I/O devices such as tape cassettes or card readers.

**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 Series computer systems for purchase or on a 1-year or 3-to-5-year lease. The standard maintenance agreement 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 about \$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. ►

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► Burroughs also offers fixed-price turnkey contracts, under which it assumes total responsibility for the programming and installation of a system.

**EQUIPMENT:** The following "packaged" systems are complete except for software. The purchase price of each system is \$1,380 less than the separately priced components.

**L 9944-359**—Includes a basic L9944-259 processor plus a total of 10K bytes of user memory and a total of 3 cassette stations. Purchase price is \$29,490.

**L9541-359**—Includes a basic L9541-259 processor plus a total of 10K bytes of user memory, and a total of 3 cassette stations. Purchase price is \$26,490. ■

### EQUIPMENT PRICES

		Purchase Price	Annual Maint.	Rental, 1-Year Lease*	Rental, 5-Year Lease*
<b>L 9000 SERIES SYSTEMS</b>					
L9300-250	Processor, 4KB user memory, 15.5-inch front-feed forms handler, 60-cps bidirectional matrix printer, 1 cassette station	\$17,490	\$1,089	\$646	\$614
L9400-250	Processor, 4KB user memory, 26-inch front-feed forms handler, 60-cps bidirectional matrix printer, 1 cassette station	18,490	1,020	589	560
L9541-259	Processor, 6KB user memory, 26-inch front-feed forms handler, 60-cps bidirectional matrix printer, 1 cassette station	23,190	1,712	739	702
L9542-259	Processor, 6KB user memory, 26-inch front-feed forms handler, 60-cps bidirectional matrix printer, 1 cassette station, 352-digit magnetic strip capacity, A9362 ledger card feeder/stacker	24,190	1,712	770	732
L9700-250	Processor, 4KB user memory, 15.5-inch front-feed forms handler, 90-cps bidirectional matrix printer, 1 cassette station	18,990	1,153	625	594
L9800-250	Processor, 4KB user memory, 26-inch front-feed forms handler, 90-cps bidirectional matrix printer, 1 cassette station	19,490	1,185	611	580
L9941-259	Processor, 6KB user memory, 26-inch front-feed forms handler, 90-cps bidirectional matrix printer, 1 cassette station, 352-digit magnetic stripe capacity, A9362 ledger card feeder/stacker	24,690	1,777	786	747
L9942-259	Processor, 6KB user memory, 26-inch front-feed forms handler, 90-cps bidirectional matrix printer, 1 cassette station, 704-digit magnetic stripe capacity, A9362 ledger card feeder/stacker	25,690	1,777	818	777
L9703-250	Processor, 4KB user memory, 15.5-inch front-feed forms handler, 120-cps bidirectional matrix printer, 1 cassette station	19,690	1,214	623	592
L9803-250	Processor, 4KB user memory, 26-inch front-feed forms handler, 120-cps bidirectional matrix printer, 1 cassette station	20,190	1,246	639	607
L9944-259	Processor, 6KB user memory, 26-inch front-feed forms handler, 120-cps bidirectional matrix printer, 1 cassette station, 352-digit magnetic stripe capacity, A9362 feeder/stacker	26,190	1,838	860	817
L9945-259	Processor, 6KB user memory, 26-inch front-feed forms handler, 120-cps bidirectional matrix printer, 1 cassette station, 704-digit magnetic stripe capacity, A9362 feeder/stacker	27,190	1,838	860	817
<b>L 8000 SERIES SYSTEMS</b>					
NOTE: L 8000 models are subject to availability and have been classified "Previous Styles."					
L8700-300	Processor, 10KB user memory, 30-cps printer, 15.5-inch front-feed forms handler, 3 cassette stations	15,700	—	—	—
L8800-300	Processor, 10KB user memory, 30-cps printer, 26-inch front feed forms handler, 3 cassette stations	16,100	—	—	—
L8700-700	Processor, 4KB user memory, 30-cps printer, 15.5-inch front-feed forms handler	12,490	—	—	—
L8800-700	Processor, 4KB user memory, 30-cps printer, 26-inch front-feed forms handler	12,990	—	—	—
<b>L 6000 SERIES SYSTEMS</b>					
L6336-	Processor, 20-cps printer, I/O, cassette interface, 15.5-inch front-feed forms handler, with:				
-800	128-word storage	8,740	—	321	305
-820	256-word storage	9,490	—	356	339
-840	384-word storage	10,240	—	393	373
-860	512-word storage	10,990	—	428	407
-890	768-word storage	11,740	—	464	441
L6436-	Processor, 20-cps printer, I/O, cassette interface, 26-inch front-feed forms handler, with:				
-800	128-word storage	9,740	—	357	339
-820	256-word storage	10,490	—	393	373
-840	384-word storage	11,240	—	428	407
-860	512-word storage	11,990	—	464	441
-890	768-word storage	12,740	—	500	475
L6501-869	Processor, 576-word store, 352-digit magnetic stripe capacity, A9362 ledger card feeder/stacker, 26-inch front-feed forms handler, 20-cps printer	16,990	—	597	567
L6511-869	Processor, 576-word store, 352-digit magnetic stripe capacity, A9362 ledger card feeder/stacker, 26-inch front-feed forms handler, 20-cps printer, I/O potential	17,990	—	629	598
Omit Option	Omit A9362 from L6500 models; deduct:	(1,200)	—	(62)	(60)
<b>MEMORY (L 8000, L 9000)</b>					
A4011	2KB Memory Module	800	26	25	24
A4011-2	4KB Memory Module	1,400	52	44	43
A4011-3	6KB memory Module	2,000	21	63	61
A4011-4	8KB Memory Module	2,500	21	78	76
A2011	24KB Extended Memory Potential (required for total user memory capacity of 18KB through 40KB)	750	—	22	21
A2012	32KB Extended Memory Potential (required for total user memory capacity of 42KB through 48KB)	800	—	23	22
<b>MAGNETIC TAPE EQUIPMENT (L 6300, L 6400, L 8000, L 9000)</b>					
A9490-25	Cassette Tape Subsystem:				
—	First station (includes A2391-1 controller)	1,640	92	59	56
—	Second, third or fourth station	1,640	74	59	56
A2392-1	Data Collection MTU Controller	1,000	31	29	28

\*Equipment rental prices include maintenance.

## Burroughs L Series

### EQUIPMENT PRICES

		Purchase Price	Annual Maint.	Rental, 1-Year Lease*	Rental, 5-Year Lease*
<b>MAGNETIC TAPE EQUIPMENT (L 6300, L 6400, L 8000, L 9000) (Continued)</b>					
A1495-1	Magnetic Tape Unit; 2 ports	11,500	554	369	309
A1495-2	Magnetic Tape Unit; 4 ports	11,750	569	377	316
A1495-3	Magnetic Tape Unit; 6 ports	12,000	444	385	323
A1495-4	Magnetic Tape Unit; 8 ports	12,250	599	393	380
<b>PRINTERS (L 8000, L 9000)</b>					
A2362-1	Line Printer Controller	490	314	21	20
A9249-1	Line Printer; 85 lpm	8,500	858	252	239
A9249-2	Line Printer; 160 lpm	9,900	1,000	293	275
A9249-3	Line Printer; 250 lpm	13,400	—	392	372
<b>PUNCHED CARD EQUIPMENT (L 8000, L 9000)</b>					
A9114-1	80-Column Card Reader; 200 cpm	2,890	306	82	78
A9418-2	80-Column Card Reader/Punch/Data Recorder	12,060	1,187	321	305
A2331-1	96/80-Column Card Controller	2,000	31	56	54
A9119-1	96-Column Card Reader; 300 cpm	3,840	357	98	93
A9419-2	96-Column Card Reader/Punch/Data Recorder	10,410	1,015	274	260
A9419-6	96-Column Multi-Purpose Card Unit (programmable stacker select)	12,500	1,215	326	310
<b>PUNCHED CARD EQUIPMENT (L 6300, L 6400)</b>					
A 595	80-Column Card Reader (not available for L 6500)	2,950	—	98	90
A 596	80-Column Card Reader, EBCDIC (not available for L 6500)	3,490	—	117	107
<b>PUNCHED TAPE EQUIPMENT (L 8000, L 9000)</b>					
A2322-1	Card/Tape Controller (for A9122-1, A9222-1, and/or A9114-1)	1,000	31	29	28
A9122-1	Paper Tape Reader; 40 char/sec.	1,590	141	43	41
A9222-1	Paper Tape Punch; 40 char/sec.	1,990	141	54	51
<b>PUNCHED TAPE EQUIPMENT (L 6000)</b>					
A 562	Paper Tape Punch; 40 char/sec.	1,715	—	53	49
A 581	Paper Tape Reader; 40 char/sec.	1,500	—	47	43
<b>MAGNETIC STRIPED LEDGER CARD READERS (L6000, L 8000, L 9000)</b>					
A9161-1	Magnetic Record Reader; 352-digit data track	4,790	382	150	137
A9162-1	Magnetic Record Reader; 704-digit data track (L 8000, L 9000 only)	4,990	382	163	149
A9362-2	Console Magnetic Record Handler; feeder/stacker/hold; includes PF29	2,990	—	85	81
<b>CONTINUOUS FORMS PIN-FEED DEVICES (L 6000, L 8000, L 9000)</b>					
PF24	15.5" front feed; single synchronous	250	—	8	8
PF25	15.5" front feed; single asynchronous	250	—	8	8
PF26	15.5" front feed; dual	500	—	15	14
PF27	26" front feed; single synchronous	250	—	8	8
PF28	26" front feed; single asynchronous	250	—	8	8
PF29	26" front feed; dual	500	—	15	14
<b>TERMINALS (L 8000, L 9000)</b>					
TD701	256-Character Self-Scan Station	3,000	—	94	89
A7355	TD701 Contoller	2,500	—	114	108
TD12	TD701 Keyboard	400	—	13	12

\*Equipment rental prices include maintenance.

### SOFTWARE PRICES

NOTE: First five characters of each software product number denote the L Series model on which the product was designed to run.

		One-Time License Fee	Annual Maint.
L9900-W01	Business Management System (payroll, sales and expense accounting, general ledger, invoicing, and related reports)	\$4,100	—
L9800-W01	Business Management System (payroll, sales and expense accounting, general ledger, invoicing, and related reports)	2,450	—
L9700-W01	Business Management System (payroll, sales, and expense accounting, general ledger, invoicing, and related reports)	1,480	—
L9000	Business Management System components:		
	General Ledger BMS	995	150
	Accounts Receivable BMS	1,350	150
	Inventory Control and Reporting System BMS	1,595	150
	Accounts Payable BMS	1,250	150
	Invoicing BMS	1,095	150
	Payroll BMS	1,250	150

**Burroughs L Series**

**SOFTWARE PRICES**

		<u>One-Time License Fee</u>	<u>Annual Maint.</u>
L9900-D01	Doctors and Clinic System (account update, insurance statement, doctors' daily report, age analysis, delinquent notices, trial balance, cash receipts, patient statement preparation, related reports)	2,450	150
L9000-A07	Automobile Dealers Business Management System, (journalizing, DOC sheets reconciliation, warranty claims, G/L, financial statements, A/R reports)	2,850	150
L9900-C07	Contractor Accounting System (labor posting, labor reporting, payroll writing, 941A, W2 reports, HUD reports, union reports, asset depreciation reports, job cost, accounts payable, check writing, general ledger, financial statements, related reports and maintenance routines)	3,450	170
L9900-C07	Contractor Accounting System (home builders invoice register, purchase journal, cash requirement report, check writing, retainage payable, cash receipts, lot cost report, payroll, 941A, W2, general ledger and financial statement)	4,000	200
L9500-U03	Credit Union Accounting System (member record update cash posting, trial balance, dividend rebate statements, 1099, proxy preparation, share and loan analysis report, delinquency report, CUNA insurance and federal report)	2,200	150
L9900-M05	Property Management System (rent billing, charge posting, cash receipts, lease expiration report, delinquency report, escalation notice, collection report, security and vacancy report)	3,500	175
L9900-R07	Route Accounting System (invoice audit, daily settlement sheet, daily sales, inventory and warehouse report, store report, customer A/R, driver's ledger)	2,150	150
L9900-W07	Budgetary Accounting System (budget posting with appropriation ledger, revenue ledger and fund ledger, budgetary and related reports, payroll, 941A and W2)	2,950	150
L9900-H05	Hospital Accounting System (new patient set-up admission report, ticket entering and pricing, patient posting, trial balance, revenue posting, cash receipts, age analysis, operational reports, related reports)	3,700	185
L9900-H03	Hospital Accounting System (in-patient and out-patient accounting, management reports, age analysis and notice, billing, Medicare forms preparation)	2,400	150
L9800-X01	Insurance Agency System (daily transaction journal, customer master file, maintenance, open item status, monthly billing, age analysis and statement preparation, salesman and activity update, all related reports)	2,750	150
L9900-K01	School Board Accounting System (encumbrance accounting with check writing, budgetary reports, vendor reports, purchase order report, payroll, check writing, government reports, school board accounting, related reports)	2,595	150
L9800-C01	Commercial Bank System (DDA and service charge, savings installment loan, commercial loan and report, certificate of deposit, general ledger and financial statement, related reports, 1099's)	3,250	160
L9700-U01	Utility Billing System (file maintenance, data entry, bill creation, cash receipts, age analysis report, consumption analysis report)	1,750	150
L9700-C03	Client Accounting System (income statement, balance sheet, client accounting journalizing and reports, detailed general ledger, supporting schedules, gross profit analysis payroll update, time and charges, asset depreciation, A/R statement preparation and age analysis; 96-column card system only)	3,500	175