dccpro
70

D 1/75

Burroughs B 2500 & B 3500

MANAGEMENT SUMMARY

The Burroughs B 2500 and B 3500 systems deserve careful consideration by companies shopping for small to medium-scale data processing systems. They offer an impressive complement of third-generation hardware and software, an unusually strong emphasis upon multi-programmed operation, and a history of nearly five years of effective operation in user installations.

Multiprogramming, in the case of computer systems renting for less than $20,000 per month, is a concept that nearly everybody talks about—but one that comparatively few installations have put into successful everyday operation to date. The B 2500/3500 systems are notable exceptions. By taking advantage of many of the hardware and software concepts introduced a decade ago in the highly unorthodox Burroughs B 5000 system, Burroughs has proved that all-out multiprogramming can be truly practical and effective in comparatively small computer systems.

In fact, multiprogramming is the everyday way of life for B 2500/3500 users. In one 150K B 3500 installation, a single console operator has completed the processing of more than 200 test and production jobs during an 8-hour shift, and as many as seven COBOL compilations have ▷

In use for nearly five years, the B 2500/3500 systems are noteworthy for their user-oriented software and effective multiprogramming capabilities. New "packaged" configurations at bargain prices keep these systems in serious contention for the highly competitive small to medium-scale business data processing market.

CHARACTERISTICS

MANUFACTURER: Burroughs Corporation, 6071 Second Avenue, Detroit, Michigan 48232.

MODELS: B 2501, B 2502, B 2510, B 2520, B 3501, B 3506, B 3508, B 3510, and B 3514 Electronic Data Processing Systems.

DATA FORMATS

BASIC UNIT: 16-bit word (plus parity bit). Each word can hold two 8-bit bytes or four 4-bit BCD digits. Core storage is addressable by digit position.

FIXED-POINT OPERANDS: Can range from 1 to 100 digits or bytes for most instructions. Data in 4-bit format can be either signed (with 4-bit sign digit in leftmost position) or unsigned. Data in 8-bit format is always unsigned.

FLOATING-POINT OPERANDS: Consist of a 2-digit exponent and a fraction ranging from 1 to 100 digits in ▶

This B 3500 installation at Wisconsin State University-Eau Claire includes a three-drive Magnetic Tape Cluster (foreground) and a 1400-cpm card reader (at left). The central processor and console are at right.

© 1972 DATAPRO RESEARCH CORPORATION

Burroughs B 2500 & B 3500

▷ been run simultaneously. Users typically report that they are processing an average of 4 to 10 programs at a time.

The B 2500/3500 systems are most effective in business data processing applications, though optional floating-point hardware and a FORTRAN compiler make them suitable for scientific and engineering functions as well. The banking industry, which has long been a strong Burroughs market, is well served by fast MICR sorter-readers, multi-tape listers, on-line teller consoles, and supporting software.

The B 2500 and B 3500 were announced in March 1966, and initial customer deliveries were made in May 1967. Over 1000 systems have been installed to date.

The B 2500 and 3500 systems are fully program-compatible with each other. The only significant differences between the two systems are in:

● Internal speed—the B 3500 is exactly twice as fast; core storage cycle times are 2 microseconds per two-byte access for the B 2500 and 1 microsecond per two-byte access for the B 3500.

● Core storage capacity—B 2500 storage can range from 10,000 to 120,000 bytes, whereas the B 3500 can have from 10,000 to 500,000 bytes.

● Number of I/O channels—B 2500 systems can have from 4 to 10 channels, while B 3500 systems can have from 6 to 20.

In March 1970, Burroughs announced the B 4500, a larger, program-compatible system with twice the internal speed of the B 3500. The B 4500, in turn, was superseded in October 1971 by the B 4700 (Report 70C-112-06), an improved system that maintains full compatibility with the B 3500 while delivering roughly 2.3 times the internal speed. As one might expect, B 2700 and B 3700 systems are under development as improved versions of the B 2500 and B 3500, but these have not been introduced to date.

In June 1971, Burroughs brought the price/performance of the B 2500/3500 systems into line with those of recently announced competitive systems by introducing six "packaged" disk-based configurations—the B 2510, 2520, 3506, 3508, 3510, and 3514—at significantly reduced prices. These new systems offer attractively low entry costs, though their possibilities for upward expansion are somewhat limited, as indicated in the accompanying comparison chart. Users who need interchangeable disk pack storage, for example, will have to upgrade to the original B 2501, B 2502, or B 3500 Central Processor at a higher cost.

The B 2510 and B 2520 systems use a slower central processor with 30,000 to 60,000 bytes of 4-microsecond ▷

▶ length; the signs of the exponent and fraction each occupy an additional digit position.

INSTRUCTIONS: May consist of from one to four 6-digit "syllables" or a single 8-digit "syllable." Each instruction may contain from 0 to 3 memory addresses.

INTERNAL CODE: EBCDIC (standard) or ASCII, depending upon the setting of a mode flip-flop.

MAIN STORAGE

STORAGE TYPE: Magnetic core.

CAPACITY: B 2501 Central Processor—10,000 to 60,000 bytes in 10,000-byte increments; B 2502 Central Processor—10,000 to 90,000 bytes in 10,000-byte increments, or 120,000 bytes; B 2510 and B 2520 Systems—30,000 to 60,000 bytes in 10,000-byte increments; B 3500 System—10,000 to 500,000 bytes in variable increments (10,000 to 90,000 in 10,000-byte increments; 90,000 to 240,000 in 30,000-byte increments; 300,000; 360,000; 450,000; or 500,000 bytes); B 3506, 3508, 3510, and 3514 Systems—90,000 to 240,000 bytes in 30,000-byte increments, or 300,000 bytes.

CYCLE TIME: B 2501 and B 2502—2 microseconds per 1-word (2-byte) access; B 2510 and B 2520—4 microseconds per 1-word (2-byte) access; B 3500 (all models)—1 microsecond per 1-word (2-byte) access.

CHECKING: Parity bit with each byte is generated during writing and checked during reading.

STORAGE PROTECTION: Provided by a base register and a limit register. The high-order 3 digits of generated memory addresses are checked to ascertain that they fall within the range defined by these two registers.

CENTRAL PROCESSORS

INDEX REGISTERS: Three 8-digit index registers for each program are stored in reserved core memory locations.

INDIRECT ADDRESSING: Can be specified within the first digit of any instruction address field. If so, the indicated memory location is considered to hold the address of the required operand rather than the operand itself. Multi-level indirect addressing to any depth is possible.

INSTRUCTION REPERTOIRE: 48 standard instructions provide for efficient arithmetic, comparison, and data movement operations on variable-length operands in either 4-bit numeric or 8-bit alphanumeric mode. Included are 3-address add, subtract, multiply, and divide commands and 2-address add and subtract commands, as well as convenient edit, search, and translate instructions. No binary arithmetic is possible, but logical AND, OR, and NOT instructions are included.

Floating-point decimal arithmetic is an optional feature.

Seven of the standard instructions, including Initiate I/O, are "privileged" and may not be used in normal user-written programs.

ADD TIME: For 3-address decimal addition of signed 5-digit fields: 150 microseconds for B 2510 and B 2520, 75 microseconds for B 2501 and B 2502, 37.5 microseconds for B 3500 (all models).

MULTIPLY TIME: For 3-address decimal multiplication of signed 5-digit fields: 832 microseconds for B 2510 and B ▶

Burroughs B 2500 & B 3500

COMPARISON OF THE B 2500/3500 MODELS

	B 2501	B 2502	B 2510	B 2520	B 3501	B 3506	B 3508	B 3510	B 3514
MAIN STORAGE									
Minimum capacity, bytes	10,000	10,000	30,000	30,000	10,000	90,000	90,000	90,000	90,000
Maximum capacity, bytes	60,000	120,000	60,000	60,000	500,000	300,000	300,000	300,000	300,000
Cycle time, microseconds	2	2	4	4	1	1	1	1	1
Bytes fetched per cycle	2	2	2	2	2	2	2	2	2
I/O CHANNELS									
Standard number	4	4	6	6	6	4	4	4	4
Maximum number, total	6	10	6	6	20	12	12	12	12
Maximum number, Type B	3	5	3	3	10	8	8	8	8
INCLUDED IN BASIC SYSTEM									
Integrated I/O controls	None	None	6	6	None	4	4	4	4
Line printer	None	None	300 lpm	300 lpm	None	None	None	None	None
20-msec Disk File storage, bytes	None	None	10 million	20 million	None	None	None	None	None
23-msec Disk File storage, bytes	None	None	None	None	None	20 million	20 million	20 million	20 million
40-msec Disk File storage, bytes	None	None	None	None	None	40 million	60 million	80 million	120 million
AVAILABLE PERIPHERALS									
Disk File storage	Yes	Yes	10 MB max.	50 MB max.	Yes	60 MB max.	80 MB max.	100 MB max.	200 MB max.
Disk pack drives	Yes	Yes	No	No	Yes	No	No	No	No
Single-line communications control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Multi-line communications control	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes

▷ (per 2-byte access) core storage and include a 300-lpm printer, console typewriter, and six integrated I/O controls as standard equipment. Also standard is 10 million (B 2510) or 20 million (B 2520) bytes of Burroughs' head-per-track disk file storage with a 20-millisecond average access time. A complete 30K B 2510 disk/tape system, including three 18KB tape drives, 200-cpm card reader, and 100-cpm card punch, can be rented for as little as $3,965 per month under a five-year lease.

The B 3506, 3508, 3510, and 3514 systems use the standard B 3500 central processor with 90,000 to 300,000 bytes of 1-microsecond core storage. Standard equipment includes a console typewriter, four integrated I/O controls, and from 60 million to 140 million bytes of disk file storage. Nearly all of the Burroughs I/O devices can be used with these systems, but the head-per-track disk file storage capacity cannot be expanded beyond 200 million bytes and disk pack drives are not allowed.

Though the B 2500 and B 3500 are billed as members of the Burroughs "500 Systems" computer family, there is no object-level compatibility between them and either the smaller B 500 system, the larger B 5500, B 6500, B 7500, or B 8500 systems, or the more recent B 5700, B 6700, or B 7700 systems. Burroughs, however, strongly recommends programming in COBOL or FORTRAN and provides "filter" programs which facilitate the conversion of programs written in COBOL or FORTRAN for execution on various members of the 500 Systems or 700 Systems family.

Though the B 2500 and B 3500 systems use the same byte-oriented data structure, EBCDIC internal code, and 7- and 9-track magnetic tape formats as the IBM System/360, there is no object-level program compatibility ▷

▶ 2520, 416 microseconds for B 2501 and B 2502, 208 microseconds for B 3500 (all models).

INPUT/OUTPUT CONTROL

I/O CHANNELS: See table for the standard and maximum number of channels available for each model.

CONFIGURATION RULES: One I/O channel is required for each I/O control unit, and each type of peripheral device requires a different control unit. There are two types of I/O channels, designated Type A and Type B. In general, Type A channels are used for the slower I/O devices, while the faster or more complex peripherals require Type B channels. The maximum number of Type B channels available for each model is shown in the table.

SIMULTANEOUS OPERATIONS: One input or output operation on each installed I/O channel can occur simultaneously with computing.

I/O INTERFERENCE: Only one core storage cycle is required for each unit of I/O data transferred (1 character at a time for Type A channels, and 2 characters in parallel for Type B channels).

MASS STORAGE

HEAD-PER-TRACK DISK FILES: Burroughs offers five models of its fixed-head disk files, with varying capacities and access times, for use with the B 2500/3500 systems. All models utilize non-interchangeable disks, with a fixed read/write head serving each data track. Various mixes of these models can be included in a single disk subsystem through the use of appropriate control units, electronic units, and Disk File Exchange units. Moreover, a single disk subsystem can include one, two, or four control units, each capable of servicing any of the connected disk files. Simultaneous disk read and write operations can occur in a subsystem with two or more control units.

A B 2501 computer system can include only one disk file subsystem, while a B 2502 or B 3500 system can have a maximum of two. The B 2510, 2520, 3506, 3508, 3510, ▶

© 1972 DATAPRO RESEARCH CORPORATION

Burroughs B 2500 & B 3500

▷ between the Burroughs and IBM systems at the machine-language, assembly-language, COBOL, or RPG level.

Emulators to provide machine-level compatibility with the IBM 1400 Series and Burroughs B 200/300 Series computers were included in the original B 2500/3500 announcement, but these were later withdrawn. Burroughs now offers assembly-language translators to aid in converting B 300 and IBM 1400 Series programs for operation on the B 2500/3500 systems. An important recent addition to the Burroughs software complement is COFIRS, a translator that accepts IBM 360/20 RPG source programs and generates COBOL source programs that can be compiled and executed on a B 2500/3500 system.

The B 2500/3500 central processors utilize monolithic integrated circuits and a read-only memory, together with conventional magnetic core main storage. The internal processing speeds of the B 2500 and B 3500 are closely comparable with those of the System/360 Model 30 and Model 40, respectively.

Inside the B 2500/3500 central processors, data can be represented in the form of variable-length fields composed of either 8-bit bytes or 4-bit digits. Numeric fields expressed in the 4-bit and 8-bit modes can be combined in arithmetic operations without the need for prior format conversion. No binary arithmetic facilities are included.

The processors operate in either the Normal State or Control State. The Normal State is used for execution of user programs. Interrupt signals cause the processor to enter the Control State and transfer control to the MCP operating system whenever an I/O operation is completed or an abnormal condition is encountered. Seven "privileged" instructions, executable only in the Control State, enable the MCP to initiate I/O operations, control the storage protection registers, set the 6-digit interval timer, and perform other system control functions.

Burroughs offers a fairly wide assortment of peripheral equipment for the B 2500/3500 systems, nearly all of which is designed and manufactured by Burroughs itself. Most of these devices, though quite conventional in concept and capabilities, are well-engineered and reliable.

Particularly noteworthy are the Burroughs head-per-track disk files, which have achieved an enviable reputation as rapid-access, highly reliable mass storage devices. Burroughs now offers disk files in a wide range of capacities (1 million to 2 billion bytes per control) and average access times (17 to 40 milliseconds). Even so, the cost of these head-per-track disk files may rule out their use in certain applications that require very large amounts of on-line storage. For users with large on-line data base requirements, Burroughs—long a holdout against the industry trend toward interchangeable-pack disk drives— ▷

▶ and 3514 systems include (and are limited to) specific disk subsystems, as described in the comparison table and price list.

The B 9370 Systems Memory unit provides fast-access storage, primarily for the MCP and other systems software, on a single non-interchangeable disk. Two models, the B 9370-1 and B 9370-2, have capacities of 1 and 2 million bytes, respectively. There are 100 tracks per disk face. Each track is divided into 100 segments, and each segment holds 100 data bytes plus a longitudinal parity byte. Average access time is 17 milliseconds, and maximum data transfer rate is 291,000 bytes/sec. The Systems Memory unit can be connected directly to a Systems Memory Control or Disk File Control; no Disk File Electronic Unit is required.

The B 9372-1 Disk File provides 10 million bytes of storage with an average access time of 20 milliseconds. Maximum data transfer rate is 245,000 bytes/sec. Data is recorded in 100-byte segments. The basic B 9372-1 and up to four B 9374-2 Additional 10-Million-Byte Storage Increments can be connected to a B 9371-1 Disk File Electronic Unit, and up to 20 DFEU's can be included in a single disk subsystem.

The B 9373-3 Disk File provides 20 million bytes of storage with an average access time of 23 milliseconds. The B 9373-3 includes one DFEU and can accommodate up to four B 9374-3 Additional 20-Million-Byte Storage Increments. Additional DFEU's can be used if desired to increase the number of simultaneous access paths to the disk files.

The B 9373-4 Disk File provides 20 million bytes of storage with an average access time of 40 milliseconds. The B 9373-4 includes one DFEU and can accommodate up to four B 9374-4 Additional 20-Million-Byte Storage Increments. Additional DFEU's can be used to increase the number of access paths.

The B 9375-4 Head-per-Track Data Memory Bank provides 100 million bytes of storage with an average access time of 40 milliseconds. Data is recorded in 100-byte segments, and maximum data transfer rate is 280,000 bytes/sec. The capacity can be expanded to a maximum of 2 billion bytes per subsystem through the use of B 9376-5 Additional 20-Million-Byte Storage Increments and appropriate control adapters. The Memory Bank prices include one DFEU for each 100 million bytes or fraction thereof. Additional DFEU's can be used to increase the number of access paths.

FILE PROTECT MEMORY: This optional feature permits multiple programs to share a common data base stored on Burroughs head-per-track disk files. The feature makes it possible to "lock" specific disk record addresses, thus guarding against the errors that can occur when one program attempts to access a data record while it is being updated by another program.

The basic File Protect Memory (FPM) consists of a series of registers and sixteen 40-bit words of memory, permitting simultaneous locking of up to 16 disk record addresses. Up to 7 additional 16-word modules of FPM may be added, for a total capacity of 128 words. The FPM can interface into as many as four Disk File Controls.

DISK PACK DRIVES: The B 9484-3/9485-3/9486-3 Magnetic Actuator Disk Pack Drives are dual-drive units that provide up to 121 million bytes of data storage, 60.5 million bytes per disk pack. Up to 968 million bytes of storage can be provided via a single control unit (16 drives). Average arm movement time is 30 milliseconds, and average ▶

Burroughs B 2500 & B 3500

▷ now offers high-performance drives that store up to 60.5 million bytes per 11-disk pack.

The Burroughs Magnetic Tape Clusters represent a novel packaging concept for magnetic tape drives. Each cluster contains up to four 18KB to 72KB tape drives in a single compact cabinet (33 by 30 by 42 inches in size). The Tape Clusters provide effective magnetic tape capabilities in a compact, low-cost package. Burroughs also offers a line of free-standing magnetic tape units with data rates of 50KB to 240KB. Both 7-track and 9-track models are available.

Data communications receives plenty of attention in both the B 2500/3500 hardware and software. Single-line and multi-line controls and numerous adapters permit communication with a broad range of transmission services and terminal equipment. The Master Control Program (MCP) provides effective software control of most communications functions, and a new software system, the Network Definition Language (NDL), facilitates the generation of customized communications handler routines. Burroughs also offers CRT display systems, an audio response system, on-line banking terminals, general-purpose terminals, remote peripheral controllers, and remote terminal concentrators.

Software support for the B 2500/3500 systems was originally divided into two categories, Basic and Advanced, but all B 2500 and B 3500 systems now use the Advanced software, which centers around the disk-oriented Master Control Program. The MCP is an integrated operating system that complements the B 2500/3500 hardware to create an effective environment for multiprogrammed operation. One of the most striking features of the MCP is the fact that it is truly user-oriented and far easier to understand and use than most competitive operating systems. The MCP receives its orders via unusually straightforward control cards and keyboard messages. For example, the control card "COMPILE EDITB WITH COBOL SAVE" will cause the COBOL source program named EDITB to be compiled, executed, and entered into the program library in disk storage.

Other Advanced software facilities include an Assembler, ANS COBOL and FORTRAN compilers, and generators for sorting and media conversion programs. Burroughs also offers a modest assortment of application programs, most of which are oriented toward manufacturing, banking, and hospitals.

The B 2500 and B 3500 have been in service for nearly five years and have proven to be effective, reliable data processing systems. At the same time, the concepts employed in both the hardware and software are still as up to date as those of many of the more recently announced competitive systems. Therefore, these Burroughs entries merit careful consideration by virtually every computer ▷

▶ rotational delay is 12.5 milliseconds. Data is recorded at 2200 bits per inch, producing a data transfer rate of 312,500 bytes/second. Data is recorded on an 11-high disk pack, which is physically compatible with the IBM 2316 pack; the packs, however, are not data-compatible with the IBM equivalents. Twenty surfaces are used for data recording.

The disk pack drives and control units are available in both single-access and dual-simultaneous-access models. Up to 16 drives of either type can be connected to a control unit. The disk pack drives are software-supported by the MCP for I/O operations in either the full-track or 180-byte segment mode. However, every system that uses the MCP must also include at least one of Burroughs' head-per-track disk files for systems software residence, and the disk pack drives cannot use the File Protect Memory facility. Disk pack drives cannot be added to the "packaged" B 2510, 2520, 3506, 3508, 3510, and 3514 computer systems.

INPUT/OUTPUT UNITS

MAGNETIC TAPE CLUSTERS: Contain two, three, or four tape drives in a single compact cabinet. The feed and take-up reels for each tape drive are mounted on concentric vertical shafts, with the feed reel directly above the take-up reel. Pinch rollers and short vacuum-column buffers are employed. Each of the tape drives has its own drive mechanism, but they share a common power supply and read/write circuitry. Up to eight tape drives (two clusters) can be connected to a Cluster Control. Two of the drives in a cluster can read and/or write simultaneously if a Dual Cluster Control is used.

Burroughs offers numerous models of the Magnetic Tape Clusters, as listed in the Equipment Prices section of this report. All models use standard 1/2-inch tape, can read either forward or backward, and record in IBM-compatible formats at a tape speed of 22.5 or 45 inches per second. The 9381 series units record in 9-track NRZI mode at 800 bpi and transfer data at either 18,000 or 36,000 bytes/sec; these units can alternatively be equipped to operate in the 7-track NRZI mode at densities of 200, 556, or 800 bpi. The 9382 series units record in 9-track phase-encoded mode at 1600 bpi and transfer data at either 36,000 or 72,000 bytes/sec. The 9383 series units are 9-track models that can operate in either the 800-bpi NRZI or 1600-bpi phase-encoded mode, with data transfer rates of either 18/36KB or 36/72KB.

FREE-STANDING MAGNETIC TAPE UNITS: These units record data on 1/2-inch tape in IBM-compatible formats. Each tape drive is housed in a separate cabinet of the conventional vertical type. Pinch rollers and vacuum-column buffers are employed. Tape can be read in either the forward or reverse direction. Up to 10 free-standing tape drives can be connected to a Tape Control. Simultaneous read/write operations are possible if two Tape Controls and an Exchange unit are employed.

Eight models of the free-standing tape units are available, with the following recording modes, tape speeds (in inches per second), recording densities (in bits per inch), and data transfer rates (in bytes or characters per second):

B 9390: 7 tracks; 90 ips; 200/556 bpi; 18,000 or 50,000 char/sec.

B 9391: 7 tracks, 90 ips; 200/556/800 bpi; 18,000, 50,000, or 72,000 char/sec. ▶

Burroughs B 2500 & B 3500

▷ buyer who is not totally committed to System/360-compatible equipment and software. □

► B 9392: 9 tracks; 90 ips; 200/800 bpi; 18,000 or 72,000 bytes/sec.

B 9393-1: 9 tracks; 90 ips; 1600 bpi; 144,000 bytes/sec.

B 9393-2: 9 tracks, 120 ips; 1600 bpi; 192,000 bytes/sec.

B 9393-3: 9 tracks; 150 ips; 1600 bpi; 240,000 bytes/sec.

B 9394-1: 7 tracks; 120 ips; 200/556/800 bpi; 24,000, 66,700, or 96,000 char/sec.

B 9394-2: 9 tracks; 120 ips; 200/800 bpi; 24,000 or 96,000 bytes/sec.

B 9110 CARD READER: Reads 80-column cards serially by column, on demand, at up to 200 cpm. EBCDIC is the standard card code, and BCL or binary cards can also be read. The feed hopper and stacker hold 450 cards each.

B 9111 CARD READER: Reads 80-column cards of either standard or postcard thickness serially by column, on demand, at up to 800 cpm. Can also read 51-, 60-, or 66-column cards. EBCDIC is the standard card code, and BCL or binary cards can also be read. The feed hopper and stacker hold up to 2400 cards each and can be loaded and unloaded while the reader is operating. Optional features permit reading of 40-column Treasury Checks and/or round-holed Postal Money Orders.

B9112 CARD READER: Reads up to 1400 cpm. Otherwise, has the same characteristics and features as the B 9111 Card Reader described above.

B 9113 CARD READER: Reads up to 475 cpm. Otherwise, has the same characteristics as the B 9111 Card Reader described above. Currently usable only in B 2510 and B 2520 systems.

B 9210 CARD PUNCH: Punches and read-checks 80-column cards at 100 cpm. EBCDIC is the standard card code, and BCL or binary cards can also be punched. The feed hopper and single stacker hold 800 cards each. The associated control unit contains a full-card buffer.

B 9212 CARD PUNCH: Punches 80-column cards at up to 150 cpm.

B 9213 CARD PUNCH: Punches 80-column cards at up to 300 cpm. EBCDIC is the standard card code, and BCL or binary cards can also be punched. The feed hopper holds up to 2200 cards, and three program-selectable stackers hold at least 1400 cards each. The associated control unit contains a full-card buffer.

B 9120 PAPER TAPE READER: Reads 5-, 6-, 7-, or 8-level punched tape at 500 or 1000 characters per second. The lower speed must be used for fanfold or metallized Mylar tape. Handles reels either 5.5 or 7 inches in diameter. A standard channel-select plugboard and optional Input Code Translator permit wide flexibility in codes.

B 9220 PAPER TAPE PUNCH: Punches 5-, 6-, 7-, or 8-level tape at 100 characters per second. Handles supply reels up to 8 inches in diameter and 5.5- or 7-inch take-up reels. A standard channel-select plugboard and optional Output Code Translator permit wide flexibility in codes.

LINE PRINTERS: Eight printers of the conventional rotating-drum type provide printing speeds ranging from 315 to 1100 lines per minute. All models have a tape-controlled carriage capable of handling continuous forms 5 to 20 inches in width, vertical spacing of 6 or 8 lines per inch, and a standard skipping speed of 25 inches per second. Characteristics of the various models are as follows:

B 9242-1: 860 lpm; 120 or 132 print positions.

B 9242-2: 725 lpm; 120 or 132 print positions; OCR "A" numeric and standard alphabetic character set.

B 9242-3: 725 lpm; 120 or 132 print positions; OCR "B" alphanumeric set.

B 9243-1: 1100 lpm; 120 or 132 print positions.

B 9243-2: 900 lpm; 120 or 132 print positions; OCR "A" numeric and standard alphabetic character set.

B 9243-3: 900 lpm; 120 or 132 print positions; OCR "B" alphanumeric set.

B 9245-5: 300 lpm; 120 print positions; buffered.

B 9245-6: 300 lpm; 132 print positions; buffered.

B 9245-8: 400 lpm; 120 print positions; buffered.

B 9245-9: 400 lpm; 132 print positions; buffered.

The B 9242 and B 9243 models can be equipped with an optional high-speed skipping feature (75 inches per second), a powered forms stacker, and/or a "printer memory" that reduces the demands imposed upon the processor during printing. The B 9245 models are buffered.

B 9244 TAPE LISTER: Produces printed listings of documents read by a MICR Sorter-Reader on 6, 12, or 18 adding-machine tapes, each 2.5 inches wide, which can be individually advanced. The B 9244-1 Master Lister has 6 tapes, and one or two 6-tape B 9244-2 Slave Listers can be connected to it. Maximum printing speed is 1565 lpm when printing is restricted to the digits 0 through 9 and six special characters, or 800 lpm when the full 40-character alphanumeric set is used.

B 9340 CONSOLE PRINTER/KEYBOARD: A Teletype Keyboard Send/Receive unit, used to provide keyboard input and console printouts.

MICR READER-SORTERS: Read MICR-encoded documents at up to 1565 items per minute. Can also operate in demand mode, feeding one document at a time at up to 400 items per minute. Models B 9131 and B 9132 have 13 and 16 pockets, respectively. Both models are also usable for off-line sorting. Optional features include an endorser, validity checking, and an item counter. The B 9130 is a similar, 13-pocket unit designed solely for off-line use.

B 9134-1 READER-SORTER: Reads optically and/or magnetically encoded numeric documents at up to 1625 documents per minute. Can handle both types of documents of varying sizes and weights in intermixed fashion. The sorting section is available in modules of 4 pockets each, and is expandable to a maximum of 32 pockets. Can be used either on-line or off-line. ►

Burroughs B 2500 & B 3500

B 9410 PERIPHERAL SWITCHING UNIT: Permits B 2500/3500 peripheral devices to be manually switched between two control units, which may be connected to different central processors.

COMMUNICATIONS DEVICES

SINGLE-LINE CONTROL: Provides a connection between a single Type B I/O channel and a single communications line. Contains a one-character buffer. Requires an appropriate line adapter, which determines transmission rate, code sensitivity, and character structure. Numerous adapters permit half-duplex communication with a wide range of equipment over dialed, leased, or directly connected lines at speeds of 74.2 to 9600 bits per second.

MULTI-LINE CONTROL: Permits the connection of multiple simultaneously-operating communications lines to a pair of Type B I/O channels. Requires an appropriate line adapter for each line. The basic Multi-Line Control houses up to 4 line adapters. Optional 8-line extensions permit a total of up to 36 lines to be connected. A "scratchpad" memory holds control information and provides a one-character buffer for each line. Numerous adapters permit half-duplex communication with a wide range of equipment over dialed, leased, or directly connected lines at speeds 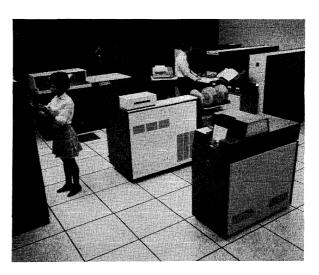of 74.2 to 9600 bits per second. Only one Multi-Line Control can be used in a B 2500/3500 system, and the device is not permitted in a B 2501, 2510, or 2520 system.

AUDIO RESPONSE SYSTEM: Provides responses, in recorded human-voice form, to digital inquiries from push-button telephones. Accommodates up to 128 lines, in 2-line increments. Spoken words or phrases are recorded on film wrapped around a revolving drum. The drum contains 63 audio tracks, each capable of storing either one phrase (up to 1.5 seconds in length), the same word recorded three times, or three different words. The Audio Response Generator is used in conjunction with a B 2500/3500 Multi-Line Control.

SOFTWARE

MASTER CONTROL PROGRAM: The MCP is a modular operating system that supervises and controls all operations of a B 2500 or B 3500 system. The MCP requires from 13K to 40K bytes of core storage, up to 400K bytes of disk file storage, at least one magnetic tape unit, a card or paper tape reader, and a console typewriter. A high-speed trace option adds another 7.5K bytes to the core requirements. In its largest version, the MCP handles all standard peripherals plus MICR and multi-line data communications, controls up to 15 simultaneous programs, and accommodates up to 80 I/O devices and an 80-request I/O queue.

The MCP performs the following principal functions: (1) schedules the loading and execution of user programs in a multiprogramming environment; (2) allocates core storage and relocates user programs as necessary to achieve efficient storage utilization; (3) schedules and initiates all I/O operations; (4) services all interrupts and attempts recovery from I/O errors; (5) provides I/O control functions such as blocking, buffering, file opening and closing, data communications control, etc.; (6) loads program segments or overlays upon request; (7) creates and maintains disk program libraries in symbolic and/or machine-language form; (8) establishes communication between the system and its operator via the console typewriter and control cards; (9) provides dump, trace, and checkpoint/restart facilities; and (10) maintains a comprehensive system log.

Multiprogramming of 4 to 10 independent jobs is an everyday way of life for B 3500 installations such as this one. The central processor is at right rear.

The MCP handles batch-mode jobs entered both locally and from remote terminals, as well as data communications and time-sharing jobs. Programs are loaded and executed in a sequence determined by their assigned priorities and memory requirements. Jobs of equal priority are processed on a first-in/first-out basis, and a time-slicing technique is used to insure equal access to the central processor for all programs of equal priority. Top-priority jobs can cause lower-priority jobs to be rolled out to disk to make the required core storage available. When the end of a job is reached, the remaining programs in core storage are compacted to maximize the contiguous core area available for loading and initiating one or more new programs.

To schedule I/O operations, the MCP maintains tables that show the status of each I/O unit and the priority of each I/O request awaiting initiation. Disk files can be processed either sequentially or randomly.

COBOL: Two COBOL compilers are available for operation under the MCP. Both versions offer the same language facilities, but the larger one provides faster compilation and higher limits on the number of data names, procedure names, and pictures that can be used. The smaller compiler, called simple "COBOL", requires 17K bytes of core storage and 190K bytes of disk storage; the larger one, "COBOL L", requires 30K bytes of core and 240K bytes of disk (in addition to the MCP requirements). Both compilers can accept source-program input from cards, paper tape, and/or magnetic tape.

The B 2500/3500 COBOL language is generally consistent with American National Standard COBOL and includes most of its facilities, although the Report Writer module has not been implemented. Effective (though nonstandard) language facilities are included for the control of data communications, MICR sorter-readers, and multi-tape listers.

The COBOL Cross-Reference Utility System accepts COBOL source programs as input and generates convenient flowcharts and/or cross-reference listings that show where each data name, internal program switch, and special register is used.

© 1972 DATAPRO RESEARCH CORPORATION

Burroughs B 2500 & B 3500

▶ FORTRAN: The B 2500/3500 FORTRAN compiler requires 27K bytes of core storage (in addition to the MCP requirements) and a card or paper tape reader and line printer. Also required is 200K bytes of disk storage for the compiler, plus 340K bytes of working storage for each 1000 source-program cards. The language conforms with American National Standard FORTRAN.

BASIC: Burroughs offers two different compilers for the BASIC language, a Core-Sharing version and a Batch version. Core-Sharing BASIC provides interactive compilation of programs entered from remote terminals. Batch BASIC compiles source programs entered via a card reader. Both versions implement a language that generally corresponds to the original Dartmouth BASIC system, and both provide immediate execution of successfully compiled programs.

A new BASIC compiler, scheduled for delivery in March 1973, will support a larger number of users, allow larger program sizes, and include new functional capabilities.

REPORT PROGRAM GENERATOR: For users accustomed to programming in the IBM 360/20 RPG language, Burroughs offers a software tool called COFIRS (COBOL From IBM RPG Specifications). COFIRS accepts 360/20 RPG source statements and generates a COBOL source program reflecting the RPG program logic, which is then compiled and executed. Although COFIRS was developed primarily to facilitate conversions from the 360/20, Burroughs maintains that it can also be used effectively on a continuing basis by RPG-oriented installations.

An earlier Burroughs Report Program Generator for the B 2500/3500 systems is still available but is no longer being actively supported. The earlier RPG is not compatible with IBM RPG specifications and was de-emphasized when it became apparent that most B 2500/3500 installations had elected to program exclusively in COBOL.

ASSEMBLERS: Assembler Language is the symbolic programming language used to write machine-oriented programs for the B 2500, B 3500, and B 4700. The Advanced Assembler rquires 11K bytes of core storage and at least 90K bytes of disk storage (in addition to MCP and working-storage requirements), plus card or paper tape reader and printer. Magnetic tape may be used for input and/or output if desired.

The Assembly Language programmer normally uses a fixed-format coding sheet whose arrangement corresponds closely with the 3-address format of the B 2500/3500 machine instructions. If the programmer chooses, he can code in a Free-Form Assembly Language which is translated into the regular Assembler format by the Free-Form Translator and then assembled in the usual manner. The Advanced Assembler provides numerous macro and pseudo operations, including data communications control macros. Facilities such as blocking, label checking, and comprehensive error recovery procedures are provided by the MCP.

A new Burroughs Program Language (BPL) Compiler, scheduled for delivery in April 1972, will allow B 2500/3500 programmers to code in a higher-level language that permits complete control of all machine-level facilities, including instruction modification, indexing, incrementation, and character or bit manipulation. Data declarations are required, and facilities for macro instructions and program segmentation are provided. Burroughs emphasizes that BPL is not a COBOL or FORTRAN replacement language, but a replacement for the Assembler for programs that require extensive modification of instructions.

UTILITY ROUTINES: A Sort Program Generator accepts parameters entered by the user and generates disk or tape sort programs tailored to meet his specific requirements. It can also utilize the "intrinsic sort" capability of the MCP to perform immediate sorts without generating specialized programs. When disk units are used to hold the work files, either a tag sort or a full-record sort can be performed. For tape sorting, from 3 to 8 tape units can be used. A merge capability permits from 2 to 8 properly sequenced input files to be combined into a single output file.

Disk-FORTE is a file management system that enables a user to structure up to 99 files on either disk packs or head-per-track disk files and establish as many as 20 relations between any two of these files. The files may have any of four distinct types of organization: indexed sequential, random, indexed random, and unordered. Appropriate search strategies are used to access the data records in each type of file. "Pointers" can be defined to establish chaining and linking network structures among the files. Disk-FORTE generates COBOL source code which is compiled along with the user's application programs.

The CANDE (Command and Edit) program enables users at remote terminals to enter symbolic programs as permanent disk files, compile and execute the programs, load and update previously created symbolic programs, and perform various other operations. A single copy of the CANDE program in core storage can handle up to 99 remote compilations.

The Network Definition Language (NDL) enables B 2500/3500 users to generate customized data communications control programs. These may be individual programs which handle the communications requirements of specific inquiry and processing programs, or they may be incorporated into a comprehensive inquiry and response system. The user can either insert his own COBOL logic for message control functions or use a standard Message Control System (MCS). NDL generates the necessary line control, network monitoring, and error detection and recovery routines in COBOL, which facilitates modifications.

DMPALL is a general information transfer routine that can print the contents of any card, disk, magnetic tape, or paper tape file or transcribe a file between any two types of hardware devices. The file ID, record length, blocking factor, and/or parity can be altered during the transcription process.

The Source Language Library Maintenance system facilitates the maintenance of source-language programs residing on magnetic tape files. The system provides facilities for either temporary or permanent program changes, for test compilations and executions, and for program listings.

The Time Analysis and Billing System (TABS) utilizes the MCP-created system log to analyze and disburse the costs of the computer and related services. The system consists of 7 daily programs, a Cost Distribution program that can be run at any time, and 2 optional monthly programs.

Burroughs offers a number of conversion programs designed to assist users in converting from other Burroughs and IBM computers to the B 2500/3500 systems. Translation programs are available to facilitate conversions from: (1) Burroughs B 500 or B 5500 COBOL to B 2500/3500 COBOL; (2) Burroughs B 300/B 500 Basic or Advanced Assembler to B 2500/3500 Assembler; (3) IBM System/360 RPG to B 2500/3500 COBOL; (4) IBM 1400 Series Auto- ▶

Burroughs B 2500 & B 3500

coder or SPS to B 2500/3500 COBOL; and IBM System/ 360 COBOL (as well as other competitive COBOL compilers) to B 2500/3500 COBOL. Also available are simulators that enable a B 2500/3500 to execute certain object programs written for Burroughs B 300/B 500 or IBM 1401/1440/1460 computers.

APPLICATION PROGRAMS: The steadily expanding array of Burroughs applications software for the B 2500/3500/4700 systems currently includes the following facilities:

    Advanced Linear Programming System (ALPS)
    Assist (integrated statistical system)
    Burroughs Hospital Administrative System (BHAS)
    Burroughs Inventory Control System (BICS)
    Burroughs Numerical Control System (ADAPT)
    Burroughs On-Line Order Entry System
    Commercial Bank Item Processing System
    Central Information File System
    Commercial Loan Accounting System
    Demand Deposit System
    Federal Reserve Bank Item Processing System
    GASP (FORTRAN-based discrete-change simulation language)
    Installment Loan System
    On-Line Financial System (savings and loan)
    Personal Trust System
    Production Control System (PCS)
    Project Oriented Management Information System (PROMIS)
    Time Deposit System

PRICING

EQUIPMENT: The following systems are representative of the types of B 2500/3500 systems that are being widely installed and are supported by the standard Burroughs software. All necessary control units are included in the indicated prices. The quoted rental prices are for the basic one-year lease and include equipment maintenance. (Rental prices under a 3-year or 5-year lease are 7 or 11 percent lower, respectively.)

BASIC B 2510 TAPE/DISK SYSTEM: Consists of 30K Central Processor with 6 I/O Channels, Console with Printer and Keyboard, 10 million bytes of 20-millisecond Disk File storage, B 9381-12 two-drive Magnetic Tape Cluster (18KB), 300-lpm Printer, and 200-cpm Card Reader. Monthly rental and purchase prices are $4,060 and $206,500, respectively.

B 3506 TAPE/DISK SYSTEM: Consists of 90K Central Processor with 6 I/O channels, Console with Printer and Keyboard, 20 million bytes of 23-millisecond Disk File storage, 40 million bytes of 40-millisecond Disk File Storage, B 9382-14 four-drive Magnetic Tape Cluster (36KB), 860-lpm Printer, 800-cpm Card Reader, and 150-cpm Card Punch. Monthly rental and purchase prices are $10,326 and $500,160, respectively.

LARGE B 3500 TAPE/DISK SYSTEM: Consists of 240K Central Processor with 8 I/O Channels and Floating-Point Arithmetic, Console with Printer and Keyboard, B 9370-2 Systems Memory (2 million bytes), B 9375-4 Head-per-Track Memory Bank (100 million bytes), eight B 9393-1 Magnetic Tape Units (144KB) and two tape controls, B 9243-1 Printer (1100 lpm), B 9112 Card Reader (1400 cpm), and B 9213 Card Punch (300 cpm). Monthly rental and purchase prices are $21,000 and $1,005,260, respectively.

SOFTWARE AND SUPPORT: Burroughs has not "unbundled" the B 2500/3500 systems to date, so the equipment prices listed in this report include all of the standard Burroughs software and all normal educational courses and technical assistance. In the case of the B 2510 and B 2520 systems, however, the amount of "free" technical assistance is limited to 90 man-days; additional assistance can be purchased at the rate of $25 per man-hour.

CONTRACT TERMS: The standard equipment lease agreement entitles the customer to unlimited use of the equipment and includes maintenance of the equipment for eight consecutive hours a day, Monday through Friday.

In addition to the standard 1-year lease, Burroughs offers 3-year and 5-year leases at prices 7 and 11 percent lower, respectively, than the 1-year lease prices. ∎

Burroughs B 2500 & B 3500

EQUIPMENT PRICES

		Purchase Price	Monthly Maint.	Rental (1-year lease)*
B 2510/2520 SYSTEMS				
B 2510	System; includes Central Processor with 30,000 bytes of core memory, Operator Console with Printer and Keyboard, 300-lpm Printer with 120 positions, 10 million bytes of 20-millisecond Disk File storage, 6 I/O channels, and I/O controls for: console printer, card reader, card punch, line printer, Disk File, and 18/36KB Magnetic Tape Clusters	172,900	587	3,360
B 2520	System; same as B 2510, except includes 20 million bytes of 20-millisecond Disk File storage	197,140	687	3,865
B 2730	Floating-Point Arithmetic Feature	2,400	7	50
B 2001-1	10,000 Bytes of Additional Core Memory	19,200	10	400
B 2002-1	20,000 Bytes of Additional Core Memory	37,200	15	775
B 2003-1	30,000 Bytes of Additional Core Memory	54,000	20	1,125
Substitutions for the Card Punch Control:				
B 2120-1	Paper Tape Reader Control	—	—	—
B 2120-3	MICR Reader-Sorter Control (for B 9131, 9131-1)	1,680	—	35
B 2130-4	Reader-Sorter Control (MICR only, for B 9134-1)	1,680	—	35
B 2130-5	Reader-Sorter Control (MICR/OCR, for B 9134-1)	4,080	2	85
B 2220-1	Paper Tape Punch Control	—	—	—
B 2351-1	Single Line Control	4,080	6	85
Alternate Magnetic Tape Controls:				
B 2393-4	Tape Control; 7 tracks, 18/50KC	3,600	—	75
B 2393-5	Tape Control; 7 tracks, 18/50/72 KC	4,800	—	100
B 2393-6	Tape Control; 9 tracks, 72KB	6,000	—	125
B 2393-7	Cluster Control; 9 tracks, 36/72KB	7,200	—	150
B 2393-8	Dual Cluster Control; 9 tracks, 18/36KB or 36/72KB (replaces both standard 18/36KB tape control and card punch control)	15,600	18	465
B 2393-9	Tape Control; 9 tracks, 144/192/240KB (includes 1 x 8 Electronics Exchange)	21,320	3	465
Alternate Printers for B 2510/2520 Systems:				
B 9240	700 lpm, 120 positions	8,300	40	415
B 9242-1	860 lpm, 120 positions	10,700	45	465
B 9242-2	725 lpm, OCR A numerics plus std. alpha	10,700	45	465
B 9242-3	725 lpm, OCR B alphanumeric set	10,700	45	465
B 9243-1	1100 lpm, 120 positions	15,740	65	570
B 9243-2	900 lpm, OCR A numerics plus std. alpha	15,740	65	570
B 9243-3	900 lpm, OCR B alphanumeric set	15,740	65	570
B 9245-6	300 lpm, 132 positions	1,920	10	40
B 9245-8	400 lpm, 120 positions	4,800	5	100
B 9245-9	400 lpm, 132 positions	6,720	15	140
B 9374-2	Additional Disk File Increment for B 2520; 10 million bytes, 20 msec (maximum of 3)	31,200	100	650
B 3506/3508/3510/3514 SYSTEMS				
B 3506	System; includes Central Processor with 90,000 bytes of core memory, Operator Console with Printer and Keyboard, 20 million bytes of 23-millisecond Disk File Storage, 40 million bytes of 40-millisecond Disk File Storage and DFEU, 4 I/O channels, and I/O controls for: console printer, card reader, line printer, and Disk File	342,310	652	7,185
B 3508	System; same as B 3506, except includes 60 million bytes of 40-millisecond Disk File storage	366,480	742	7,635
B 3510	System; same as B 3506, except includes 80 million bytes of 40-millisecond Disk File Storage	388,080	832	8,085
B 3514	System; same as B 3506, except includes 120 million bytes of 40-millisecond Disk File storage, 2 DFEU's, and 1 x 2 Disk File Exchange	407,280	1,012	8,485
B 3720	Independent Auxiliary Power Cabinet (for B 3376 File Protect Memory, B 3490 MTU Exchange, and/or B 3471 Basic Disk File Exchange)	12,000	10	250.
B 3730	Floating-Point Arithmetic Feature	4,800	7	103
B 3710	Type A I/O Channel	1,680	5	37
B 3711	Type B I/O Channel	3,120	10	67
B 3012-1	30,000 Bytes of Additional Core Memory	24,000	20	500
B 3015-1	60,000 Bytes of Additional Core Memory	48,000	40	1,000
B 3018-1	90,000 Bytes of Additional Core Memory	96,000	70	2,000
B 3021-1	120,000 Bytes of Additional Core Memory	120,000	100	2,500
B 3024-1	150,000 Bytes of Additional Core Memory	144,000	130	3,000
B 3030-1	210,000 Bytes of Additional Core Memory	219,600	190	4,575

*Rental prices include equipment maintenance.

dotopro
70

Burroughs B 2500 & 3500

EQUIPMENT PRICES

		Purchase Price	Monthly Maint.	Rental (1-year lease) *
B 2500 PROCESSORS & MAIN STORAGE				
B 2501	Central Processor & 4 I/O Channels (2 Type B channels max.)	57,360	125	1,195
B 2502	Central Processor & 4 I/O Channels (2 Type B channels max.)	69,360	130	1,445
B 2720	Independent Auxiliary Power Cabinet (B 2502 only; for B 2376 File Protect Memory, B 2490 MTU Exchange, and/or B 3471 Basic Disk File Exchange)	12,000	10	250
B 2730	Floating-Point Arithmetic Feature	2,400	7	50
B 2740-1	Console (standing level)	720	—	15
B 2740-2	Console (desk level)	720	—	15
B 2710	Type A I/O Channel	1,200	5	25
B 2711	Type B I/O Channel	2,400	10	50
B 2001	Core Memory; 10,000 bytes	21,600	20	450
B 2002	Core Memory; 20,000 bytes	43,200	25	900
B 2003	Core Memory; 30,000 bytes	63,600	30	1,325
B 2004	Core Memory; 40,000 bytes	82,800	40	1,725
B 2005	Core Memory; 50,000 bytes	100,800	45	2,100
B 2006	Core Memory; 60,000 bytes	117,600	50	2,450
B 2007	Core Memory; 70,000 bytes (B 2502 only)	133,200	60	2,775
B 2008	Core Memory; 80,000 bytes (B 2502 only)	147,600	65	3,075
B 2009	Core Memory; 90,000 bytes (B 2502 only)	160,800	70	3,350
B 2012	Core Memory; 120,000 bytes (B 2502 only)	200,400	90	4,175
B 3500 PROCESSOR & MAIN STORAGE				
B 3501	Central Processor & 6 I/O Channels (3 Type B channels max.)	81,360	140	1,746
B 3720	Independent Auxiliary Power Cabinet (for B 3376 File Protect Memory, B 3490 MTU Exchange, and/or B 3471 Basic Disk File Exchange)	12,000	10	250
B 3730	Floating-Point Arithmetic Feature	4,800	7	103
B 3740-1	Console (standing level)	720	—	16
B 3740-2	Console (desk level)	720	—	16
B 3710	Type A I/O Channel	1,680	5	37
B 3711	Type B I/O Channel	3,120	10	67
B 3001	Core Memory; 10,000 bytes	24,000	20	515
B 3002	Core Memory; 20,000 bytes	48,000	25	1,030
B 3003	Core Memory; 30,000 bytes	70,800	30	1,520
B 3004	Core Memory; 40,000 bytes	92,400	40	1,983
B 3005	Core Memory; 50,000 bytes	111,600	45	2,395
B 3006	Core Memory; 60,000 bytes	129,600	50	2,781
B 3007	Core Memory; 70,000 bytes	146,400	60	3,142
B 3008	Core Memory; 80,000 bytes	162,000	65	3,477
B 3009	Core Memory; 90,000 bytes	176,400	70	3,786
B 3012	Core Memory; 120,000 bytes	216,000	90	4,725
B 3015	Core Memory; 150,000 bytes	252,000	110	5,513
B 3018	Core Memory; 180,000 bytes	288,000	140	6,300
B 3021	Core Memory; 210,000 bytes	324,00	170	7,088
B 3024	Core Memory; 240,000 bytes	360,000	200	7,875
B 3030	Core Memory; 300,000 bytes	432,000	260	9,450
B 3036	Core Memory; 360,000 bytes	518,400	320	11,340
B 3045	Core Memory; 450,000 bytes	648,000	410	14,175
B 3050	Core Memory; 500,000 bytes	720,000	440	15,750
HEAD-PER-TRACK DISK FILES				
B 9370-1	Systems Memory; 1 million bytes, 17 msec	18,000	80	375
B 9370-2	Systems Memory; 2 million bytes, 17 msec	21,600	90	450
B 9372-1	Disk File; 10 million bytes, 20 msec	44,000	115	850
B 9373-3	Disk File; 20 million bytes, 23 msec	88,800	205	1,850
B 9373-4	Disk File; 20 million bytes, 40 msec	66,690	205	1,350
B 9374-2	Additional Disk File Increment; 10 million bytes, 20 msec (max. of 4 per B 9372-1)	31,200	100	650
B 9374-3	Additional Disk File Increment; 20 million bytes, 23 msec (max. of 4 per B 9373-3)	36,000	125	500
B 9374-4	Additional Disk File Increment; 20 million bytes, 40 msec (max. of 4 per B 9373-4)	24,170	90	450
B 9375-4	Memory Bank; 100 million bytes, 40 msec	163,360	495	3,150
B 9376-5	Additional Increment; 20 million bytes, 40 msec (max. of 20 per B 9375-4)	32,670	85	575
B 9371-1	Disk File Electronic Unit (DFEU) for B 9372-1	31,200	80	650
B 9371-6	Additional DFEU for B 9374-3 (optional)	31,200	80	650
B 9371-11	Additional DFEU for B 9374-4, 9375-4, & 9376-5 (optional)	31,200	80	650

*Rental prices include equipment maintenance.

© 1972 DATAPRO RESEARCH CORPORATION

datapro
70

Burroughs B 2500 & 3500

EQUIPMENT PRICES

		Purchase Price	Monthly Maint.	Rental (1-year lease)*
HEAD-PER-TRACK DISK FILES (continued)				
B 2371	Systems Memory Control (B 2500)	7,200	12	150
B 2373	Disk File Control (B 2500)	9,600	12	200
B 2375	Disk File Combination Control (B 2500)	12,000	12	250
B 2473	1 x 2 Disk File Exchange	2,640	10	55
B 2474	2 x N Disk File Exchange (B 2502 only)	9,600	10	200
B 2674	Disk File Exchange Adapter (1 required for each DFEU or Systems Memory on B 2474)	480	5	10
B 3371	Systems Memory Control (B 3500)	7,200	12	155
B 3373	Disk File Control (B 3500)	12,000	12	258
B 3375	Disk File Combination Control (B 3500)	14,400	14	309
B 3471	Basic Disk File Exchange, N1 x N2 (up to 4 x 20 with appropriate adapters)	9,600	10	200
B 3471-5	Control Adapter (for N1 side; up to 4 allowed)	2,400	5	50
B 3471-6	DFEU Adapter (for N2 side; up to 20 allowed)	1,440	2	30
B 3471-7	Exchange Extension (for over 10 DFEU's)	7,200	10	150
B 3473	1 x 2 Disk File Exchange (B 3500)	4,080	10	88
B 2376**	File Protect Memory (16 40-bit words)	31,200	108	650
B 2376-1**	FPM Disk File Control Adapter (1 required per control; max. of 4)	2,800	9	60
B 2376-2**	FPM Memory Module (16 40-bit words; max. of 7 allowed on B 2376)	3,600	12	75
DISK PACK DRIVES				
B 9484-3	Dual Drives; 121 million bytes total	48,000	120	1,000
B 9485-3	Dual Drives; 121 million bytes total; simultaneous data access	57,600	145	1,200
B 9486-3	Dual Drive Increment for B 9484-3 or B 9485-3; 121 million bytes total	33,600	100	700
B 2380-1**	Single Control for B 9484-3	86,400	100	1,800
B 2380-2**	Dual Control for B 9485-3	98,400	120	2,050
B 9974-1	Disk Pack; certified at 200 tracks/inch	575	—	25
MAGNETIC TAPE UNITS				
B 9381-12	2-Station Cluster; 800 bpi, 18KB	25,200	175	525
B 9381-13	3-Station Cluster; 800 bpi, 18KB	26,960	195	570
B 9381-14	4-Station Cluster; 800 bpi, 18KB	32,160	235	680
B 9381-22	2-Station Cluster; 800 bpi, 36KB	33,600	200	700
B 9381-23	3-Station Cluster; 800 bpi, 36KB	43,200	230	900
B 9381-24	4-Station Cluster; 800 bpi, 36KB	52,800	260	1,100
B 9382-12	2-Station Cluster; 1600 bpi, 36KB	29,760	200	620
B 9382-13	3-Station Cluster; 1600 bpi, 36KB	34,320	235	715
B 9382-14	4-Station Cluster; 1600 bpi, 36KB	40,560	270	845
B 9382-22	2-Station Cluster; 1600 bpi, 72KB	34,800	225	725
B 9382-23	3-Station Cluster; 1600 bpi, 72KB	45,600	260	950
B 9382-24	4-Station Cluster; 1600 bpi, 72KB	56,400	295	1,175
B 9383-12	2-Station Cluster; 800/1600 bpi, 18/36KB	30,720	225	640
B 9383-13	3-Station Cluster; 800/1600 bpi, 18/36KB	36,000	265	750
B 9383-14	4-Station Cluster; 800/1600 bpi, 18/36KB	43,200	305	900
B 9383-22	2-Station Cluster; 800/1600 bpi, 36/72KB	36,000	250	750
B 9383-23	3-Station Cluster; 800/1600 bpi, 36/72KB	48,000	290	1,000
B 9383-24	4-Station Cluster; 800/1600 bpi, 36/72KB	60,000	330	1,250
B 9390	Magnetic Tape Unit; 7 tracks, 18/50KC	23,000	145	480
B 9391	Magnetic Tape Unit; 7 tracks, 18/50/72KC	27,600	165	575
B 9393	Magnetic Tape Unit; 9 tracks, 72KB	27,600	165	575
B 9393-1	Magnetic Tape Unit; 9 tracks, 144KB	19,440	145	405
B 9393-2	Magnetic Tape Unit; 9 tracks, 192KB	24,960	155	520
B 9393-3	Magnetic Tape Unit; 9 tracks, 240KB	31,200	165	650
B 9394-1	Magnetic Tape Unit; 7 tracks, 24/66/96KC	31,200	170	650
B 9394-2	Magnetic Tape Unit; 9 tracks, 96KB	31,200	170	650
B 2381-11	Cluster Control; 800 bpi, 18/36KB (B 2500)	19,200	12	400
B 3381-11	Cluster Control; 800 bpi, 18/36KB (B 3500)	20,880	12	443
B 2381-12**	Cluster Control; 1600 bpi, 36/72KB	25,200	15	525
B 2381-14**	Dual Cluster Control; 800 bpi, 18/36KB	36,000	30	750
B 2381-15**	Dual Cluster Control; 1600 bpi; 36/72KB	43,200	30	900
B 2381-16**	Dual Cluster Control; 800/1600 bpi; 18/36/72KB	45,600	30	950
B 2391-1	Tape Control; 7 tracks, 18/50KC	13,200	12	275
B 3391-1	Tape Control; 7 tracks, 18/50KC	13,200	12	284
B 2391-3	Tape Control; 7 tracks, 18/50/72KC	14,400	12	300
B 3391-3	Tape Control; 7 tracks, 18/50/72KC	14,400	12	309
B 2391-4	Tape Control; 7 tracks, 24/66/96KC	18,000	15	375
B 3391-4	Tape Control; 7 tracks, 24/66/96KC	19,200	15	412
B 2393-1	Tape Control; 9 tracks, 72KB	15,600	12	325
B 3393-1	Tape Control; 9 tracks, 72KB	18,000	12	387

*Rental prices include equipment maintenance.
**These units are for B 2500 systems; corresponding units for B 3500 are similarly priced, with "3" replacing "2" as first digit of model number.

FEBRUARY 1972

Burroughs B 2500 & B 3500

EQUIPMENT PRICES

		Purchase Price	Monthly Maint.	Rental (1-year lease)*
MAGNETIC TAPE UNITS (continued)				
B 2393-2	Tape Control; 9 tracks, 144/192/240KB	12,000	15	250
B 3393-2	Tape Control; 9 tracks, 144/192/240KB	12,000	15	250
B 2393-3	Tape Control; 9 tracks, 96KB	18,000	15	375
B 3393-3	Tape Control; 9 tracks, 96KB	19,200	15	412
B 2490	Magnetic Tape Unit Exchange; 2 x 10, for B 9390, 9391, 9392, 9394-1, & 9394-2	12,000	10	250
B 3490	Magnetic Tape Unit Exchange; 2 x 10, for B 9390, 9391, 9392, 9394-1, & 9394-2	12,000	10	258
B 2493-1**	Common Electronics Exchange; 1 x 8, for B 9393 series only	19,920	45	415
B 2493-2**	Common Electronics Exchange; 2 x 8, for B 9393 series only	39,840	90	830
B 2680-1**	7-track NRZ Control Adapter for B 2381-11, -14	2,400	10	50
B 9980	Unit Designate Switch for B 9381 & B 9382 series Tape Clusters	480	1	10
B 9989	7-track NRZ Station Adapter for B 9381 series Tape Clusters	2,400	10	50
OTHER INPUT/OUTPUT UNITS				
B 9110	Card Reader; 200 cpm	8,400	40	175
B 9111	Card Reader; 800 cpm	16,250	83	325
B 9112	Card Reader; 1400 cpm	21,600	126	450
B 9113	Card Reader, 475 cpm (for B 2510 or B 2520 systems only)	12,480	70	300
B 2110	Card Reader Control (B 2500)	2,400	8	50
B 3110	Card Reader Control (B 3500)	2,400	8	52
B 9117	Card Counter (for B 9111 or 9112)	240	—	5
B 9118	Postal Money Order feature (for B 9111 or 9112)	1,440	5	30
B 9119	40-Column Read Switch (for 9111 or 9112)	190	—	—
B 9210	Card Punch; 100 cpm	18,425	65	350
B 9212	Card Punch; 150 cpm	20,640	105	430
B 9213	Card Punch; 300 cpm	25,440	135	530
B 2212	Card Punch Control (B 2500)	2,400	8	50
B 3212	Card Punch Control (B 3500)	2,400	8	52
B 2610	BCL-BCL Code Translator (for B 2212)	720	5	15
B 3610	BCL-BCL Code Translator (for B 3212)	720	5	16
B 9120	Paper Tape Reader; 500-1000 cps	16,000	70	300
B 2120	Paper Tape Reader Control (B 2500)	2,400	8	50
B 3120	Paper Tape Reader Control (B 3500)	2,400	8	52
B 9926	Input Code Translator	6,960	10	145
B 9220	Paper Tape Punch; 100 cps	15,300	65	260
B 2220	Paper Tape Punch Control (B 2500)	2,400	8	50
B 3220	Paper Tape Punch Control (B 3500)	2,400	8	52
B 9928	Output Code Translator	6,850	10	130
B 9242-1	Printer; 860 lpm, 120 positions	48,000	180	860
B 9242-2	Printer; 725 lpm, 120 positions; OCR A numerics plus std. alpha	48,000	180	860
B 9242-3	Printer; 725 lpm, 120 positions; OCR B alphanumeric character set	48,000	180	860
B 9243-1	Printer; 1100 lpm, 120 positions	53,500	200	965
B 9243-2	Printer; 900 lpm, 120 positions; OCR A numerics plus std. alpha	53,500	200	965
B 9243-3	Printer; 900 lpm, 120 positions; OCR B alphanumeric character set	53,500	200	965
B 9245-5	Printer; 300 lpm, 120 positions	24,000	135	500
B 9245-6	Printer; 300 lpm, 132 positions	25,920	145	540
B 9245-7	Printer; 400 lpm, 120 positions	28,800	140	600
B 9245-8	Printer; 400 lpm, 132 positions	30,720	150	640
B 2240**	Printer Control (when using B 9943 Printer Memory or B 9245 series Printers)	3,600	8	75
B 2242**	Printer Control (when not using B 9943 Printer Memory)	3,600	12	75
B 9940	High-Speed Slew (for B 9242/9243 Printers)	3,000	20	60
B 9941	12 Additional Print Positions (for B 9242/9243 Printers)	2,000	10	40
B 9943	Printer Memory (for B 9242/9243 Printers)	4,800	10	100
B 9945-8	8-Lines-per-Inch Printing (for B 9245 Printers)	415	—	—
B 9244-1	Master Tape Lister; 1565 lpm	67,500	325	1,350
B 9244-2	Slave Tape Lister; 1565 lpm	32,500	200	650
B 2244	Lister Control	3,600	8	75
B 3244	Lister Control	3,600	8	78
B 9130	MICR Reader-Sorter; 1565 dpm, 13 pockets	90,720	500	1,890
B 9131	MICR Reader-Sorter; 1565 dpm, 13 pockets	91,200	500	1,900
B 9131-1	MICR Reader-Sorter; 1000 dpm, 13 pockets	57,600	450	1,200
B 9132	MICR Reader-Sorter, 1565 dpm, 16 pockets	105,600	615	2,200
B 9134-1	MICR/OCR Reader-Sorter; 1625 dpm, 4 pockets	49,200	325	1,025

*Rental prices include equipment maintenance.
**These units are for B 2500 systems; corresponding units for B 3500 are similarly priced, with "3" replacing "2" as first digit of model number.

datapro
70

Burroughs B 2500 & B 3500

EQUIPMENT PRICES

		Purchase Price	Monthly Maint.	Rental (1-year lease)*
OTHER INPUT/OUTPUT UNITS (continued)				
B 2130	MICR Reader-Sorter Control (for B 9130, 9131, 9131-1, & 9132)	4,800	12	100
B 3130	MICR Reader-Sorter Control (for B 9130, 9131, 9131-1, & 9132)	4,800	12	103
B 9932	Endorser (for B 9131, 9131-1, & 9132)	9,000	50	200.
B 9933	Extended Sort Control (for B 9130, 9131, & 9131-1)	2,400	15	50
B 9937	Validity Checking (for B 9130, 9131, 9131-1, & 9132)	450	—	10
B 2130-1**	Reader-Sorter Control (for B 9134-1; MICR only)	4,800	12	100
B 2130-2**	Reader-Sorter Control (for B 9134-1; MICR/OCR)	7,200	15	150
B 9932-1	Endorser (1625 dpm, for B 9134-1)	9,000	50	200
B 9935-1	Expansion Feature (for over 16 pockets on B 9134-1)	4,800	10	100
B 9935-2	Four-Pocket Module (pockets 5-16 on B 9134-1)	14,400	35	300
B 9935-3	Four-Pocket Module (pockets 17-32 on B 9134-1)	14,400	35	300
B 9938-1	Multi-Track E-13B Feature (for B 9134-1)	18,000	55	375
B 9938-4	Numeric OCR A Feature (for B 9134-1)	31,200	98	650
B 9938-5	Numeric OCR B Feature (for B 9134-1)	31,200	98	650
B 9938-9	Dual Read Option (for B 9134-1)	7,200	25	150
B 9340	Console Printer & Keyboard	2,640	15	55
B 2340	Console Printer Control (B 2500)	3,600	10	75
B 3340	Console Printer Control (B 3500)	4,800	10	103
B 9410	Peripheral Switching Unit (basic switch)	7,200	15	150
B 9410-1	Switch Relay Module	1,440	3	30
DATA COMMUNICATIONS				
B 2350-1**	Terminal Control for CTU	8,400	15	175
B 2350-2**	Central Terminal Unit (for On-Line Banking Subsystem)	39,600	100	825
B 2351**	Single-Line Control	6,000	14	125
B 2353**	Basic Multi-Line Control	17,760	30	370
B 2354**	8-Channel Extension for B 2353	5,520	10	115
B 9950	Audible Alarm for CTU	480	1	10
B 2650**	CTU Adapter for B 2350-1 (first)	1,680	5	35
B 3650-2	Additional CTU Adapter for B 3350-1 (9 max.)	1,440	5	31
B 2651**	Typewriter Inquiry Station Adapter	1,440	5	30
B 2652-1**	TWX/Remote Typewriter Adapter	1,440	5	30
B 2652-2**	TWX/Remote Typewriter Adapter with ADO	2,160	10	45
B 2653-1**	B 2500/3500/4700 Adapter	2,400	5	50
B 2653-2**	B 2500/3500/4700 Adapter with ADO	3,120	10	65
B 2656-1**	IBM 1030 Adapter	2,400	5	50
B 2657**	Model 35 Adapter for 8A1 Selective Call Service	1,440	5	30
B 2662**	Model 28 Adapter for 83B3 Service	1,920	5	40
B 2663**	Audio Dual Line Adapter (for B 2354)	4,800	15	105
B 2665-1**	Burroughs Std. Adapter—Direct Connect	1,920	5	42
B 2665-5**	Burroughs Std. Adapter—Asynchronous	2,400	5	52
B 2665-6**	Mixed B-606/TC-700 Line Adapter	2,400	5	52
B 2665-10**	Burroughs Std. Adapter-Synchronous	2,880	5	62
B 2665-15**	Automatic Dial-Out for B 2665-5 & -10	720	4	15
B 2665-16**	Speed Adapter, for up to 1800 bps on B 2665-1 & -5	720	5	15
B 2665-17**	Speed Adapter, for up to 2400 bps on B 2665-1	1,440	5	30
B 2665-18**	Speed Adapter, for up to 4800 bps on B 2665-1 & -10	1,920	5	40
B 2665-19**	Speed Adapter, for up to 9600 bps on B 2665-1	2,400	5	50
B 9350	Typewriter Inquiry Station	2,640	12	55
B 2355-1**	Voice Response Generator	37,200	31	795
B 9955-1	Audio Recording (Special)	2,575	—	—
B 9955-2	Audio Recording (Library)	750	—	—

*Rental prices include equipment maintenance.
**These units are for B 2500 systems; corresponding units for B 3500 are similarly priced, with "3" replacing "2" as first digit of model number.