Burroughs B 700 Series Model 705 and 711		
705/71 8 2-8 Core 32K-40K 1.0		
No Yes Cobol; RPG		

Model	Capacity, char/pack	Peak Xfer, cps
A9480	4.6 mb	193K
A9481	9.2 mb	193K

Model	Type (trks)	Char/In.	Peak Xfer, cps
A9490-25	Cassette	100	1,000
A9491-2	9	100	10,000

Model	Type	Peak Speed, cpm
A9114-1	80-col	200
A9119-1	96-col	300
A9419-2	96-col rdr/pnch	300/60
A9419-6	96-col rdr/pnch	300/60

Model	Type	Columns	Peak Speed
A9249-1	Chain	132	90/60 lpm
A9249-2	Chain	132	180/120 lpm
A988	Chain	120	164 lpm
A9247-2	Train	120	400 lpm

Model	Type	Peak Speed, cps
A9122-1	11/16 or 1 in.	40
A9222-1	11 or 1 in.	40

Model	Capacity, char/stripe

AE300 Audit Entry

BURROUGHS
B 700 Series

SUMMARY

It's not certain that a "gap" really existed between the Burroughs Series L 8000 and the Burroughs B 1700 Series, but Burroughs has conveniently filled it by the introduction of the B 700 Series, the smallest of the Burroughs "700" family of computers. The B 700 Series is truly a small business machine. It offers hardware, an operating system, a license to programming products, training, and selected maintenance. Programs to be run are called by very simple commands. Data conversion, from card to disc, or from tape cartridge to disc, is simple and fast.

The B 700 system is aimed at first-installation users and is totally designed to be run with the Burroughs Business Management System (BMS). BMS is a comprehensive set of business programs developed for and being used with the Series L 8000 and the B 1700 Series computer systems, and now the 700 series. BMS is priced separately from the hardware and operating system software. According to users, it is sufficiently flexible to contain the needs of any business operation, world-wide.

It is the BMS, in fact, that separates the B 700 from a high-powered programmable accounting machine. Business reports of almost every usable genre can be produced easily, if not quickly.

Clearly, the Series L 8000, B 700, and B 1700 overlap. All use the Business Management System and all have Cobol. The larger two have RPG. The B 1700 and L 8000 can handle communications, the B 700 currently cannot (hints are being made about the B 700, however). The L 8000 cannot handle disc or full-sized magnetic tape reels. The B 700 and B 1700 both have operating systems. The B 1700 currently can handle IBM System/3 RPG, the B 700 cannot (more hints). Prices and core capacity overlap between the L 8000 and the B 700, and between the B 700 and the B 1700.

It appears that the deciding factor in which system to purchase should be the amount of data and the degree of general purpose flexibility desired. The B 1700 is technologically and operationally superior; at the low end it completely encompasses the B 700 for a slightly higher price. At the high end it overlaps the medium general purpose B 2700.

However, for a pure and simple business system, flexible within the constraints of small business requirements, and little else, the B 700 is a good system if not too much data needs to be readily accessible at any one time.

One of the better features of data entry is the Audit Entry capability. The operator/data-enterer is informed by a beep whenever illogical or invalid data is entered in a specific field. The console used for entering data is the same pleasantly pastel color-coded terminal used for the L 8000. The Audit Entry Terminal (AE 300) is available whenever input needs go beyond a single data enterer, or whenever data is to be encoded at a different location and transferred for entry to the machine. The AE 300 enters data onto a magnetic tape cassette, compatible with the L 8000. Information from the tape cassette is read by the B 700 processor and placed on disc.

Data and programs to be executed are stored on disc. This is different from the L 8000, for which programs are stored as object programs on tape cassettes, and require previous compilation on a B 3500, and data is stored on magnetic records. Disc-resident programs are the norm for the B 1700 Series, and the data can be stored on disc or tape. And of course, the B 700 offers the ever-present 80- or 96-column punched card.

Security procedures were not mentioned at the B 700's announcement, although the organization of data stored on disc for the B 700 series is key-oriented. Apparently, access to the machine and knowledge of report programs' names yield access to the data.

Another similarity with the B 1700 Series is that the B 700 series has an operating system, albeit a naive one. The operating system can assign resources, handle the checkpoint/restarting of the program running (Burroughs calls this facility "interrupt/resume"), and handle the invocation of general programs, sort, utilities, and the Cobol and RPG compilers.

Physically, the B 700 system is small, both in occupied floor space and number of units, and is quiet. It is also low to the ground; access to the disc cartridges, the printer, the terminal, and the tape storage area is best performed by continual and uncomfortable stooping.

COMPETITIVE POSITION

In addition to competing with other Burroughs products, the B 700 competes with the HIS 2020, the Univac 9200, the IBM System/3 Model 10, the Singer System Ten, and the NCR Century 50.

The HIS 2020 has a wider range of peripherals and available languages, and already offers communications capabilities. It also has a slightly more sophisticated operating system which, although not offering a checkpoint/restart, can handle two programs at one time by alternating I/O and CPU time. Both the B 700 and the HIS 2020 are disc-oriented. Both offer a wide range of applications programs for businesses, banks, wholesalers, etc.

The B 700 however is technologically more innovative than is the HIS 2020 and as a result operates at significantly faster speeds. The operating system on the B 700 is microprogrammed, as are all I/O instructions and the instructions for the Cobol interpreter, the sort program, and the utilities, that is, the B 700 is a mini-computer disguised as a small business machine. The HIS 2020 is a conventional smaller version of a larger general-purpose machine.

Both the HIS 2020 and the B 700 are upward compatible with their respective general-purpose machines at the source code level.

Users who want a larger choice of business and scientific applications software than is offered by the B 700, IBM System 360/370 compatibility, but not IBM prices, can opt for the Univac 9200. The Univac 9200 is completely upward compatible with the rest of the Univac 9000 series.

The nearest IBM competitor to the B 700 is the System/3 Model 10. The system is more flexible, offers a wider variety of programming support and of peripherals, and has a more sophisticated operating system. It is also more expensive. And it is completely incompatible with the larger general purpose computers in the IBM product line.

In the discussion of relatively isolated performers, i.e., machines that are not upward compatible with anything in particular, the Singer System Ten is a noteworthy competitor. Its strongest distinguishing factor when compared with the B 700 is its wide range of special purpose peripherals, including employee badge readers and cash-register-type terminals with merchandise tag readers. It also supports a CRT display.

The System Ten doesn't have an operating system, but it does have a sophisticated memory segmentation and I/O channel sharing that allows multiprogramming of up to 20 programs at one time.

The NCR Century 50 could be called the "plain vanilla" competitor of the B 700. It offers about the same functions, to approximately the same user base, for about the same price. However, its total core capacity is less. And it is not intended for any kind of conversational user-machine interaction. Its typewriter keyboard is an optional feature that serves primarily for communication with the CPU.

CONFIGURATION GUIDE

Two central processors are available for the B 700 series; the B 705 and B 711. Both have 1 microsecond cycle times, although processor speed for the B 705 is half as fast as processor speed for the B 711. The B 705 has a 32K byte basic memory which is field expandable to 40K. The B 711 has a 32K byte basic memory, field expandable in two 8K byte increments to 48K bytes. There is no technological reason why either of the processors could not be further expanded.

The processor logic, memory, peripheral controls, and power supplies are all included in one unit. Two buffered I/O controls, the minimum per processor, may be expanded to eight I/O controls.

Regardless of functional orientation, every basic configuration includes 32K bytes of memory, a 26-inch console, and a disc cartridge drive with 4.6 megabytes of storage. Every basic configuration can accommodate either of the two available processor speeds.

Tailoring of the basic configuration for audit entry includes addition of a 90-line-per-minute printer, a magnetic tape cassette drive, and an AE 300 audit entry terminal equipped with a magnetic tape cassette.

Tailoring of the basic configuration for a card system includes addition of a 90-line-per-minute printer, a 96-column card reader/punch/printer/data recorder, and an off-line 96-column card data recorder for data preparation.

Equipment announced as available, and a general comparison with the L 8000 and the B 1712/1714, appears in Table 1.

COMPATIBILITY

At the source code level, the B 700 Cobol and RPG programs are compatible with the B 1700 and therefore with the rest of Burroughs' medium systems (the B 2700, B 3700, B 4700, etc.).

Object code is in no way compatible. Data should be compatible. Cobol programs written for tape cassettes and with minimal I/O from the L 8000 will run on the B 700 with little or no modification.

The Cobol and RPG are not compatible with other manufacturer's versions of the same languages.

Peripheral compatibility appears in Table 1.

SOFTWARE

The most noteworthy feature of the software is the Burroughs Management System, which is indeed the set of applications programs of the same name that exists for the L 8000 and the B 1700.

The BMS is actually a collection of over 350 modules, each of which performs a single, common business function. The modules are collected into different groups to perform the required functions of the user. The same modules are used in whatever functional group requires them.

For example, a hospital accounting routine payroll subsystem may require deductions of various natures. Even though the function and performance results of the entire package may differ from the results of a wholesaler's payroll subsystem, the chances are that exactly the same BMS module is being used in both packages to perform the desired payroll deductions. To the user, this modularity means desirable flexibility, comprehensiveness, and ease of use.

The BMS is heavily report oriented. Its data base is key-oriented, which makes production of reports much simpler. Key-oriented data bases lend themselves to cross-referencing.

Table 1. Available B 700 Peripheral Devices

B 700 Characteristic or Device	Compatible with L 800	Compatible with 1712/1714
B 9343 Console	No	No
AE 300 Audit Entry Computer	No	No
Disc Cartridge		
A 9480 (4.6 megabyte)	No	Yes
A 9481 (9.2 megabytes)	No	Yes
Magnetic Tape Cassette		
A 9490-25 (240,000 char, 800 bpi, 10 inches per second)	Yes	No
A 9491-2 (9-channel, 800 bpi, NRZI, 10 kb)	No	Yes
Line Printers		
A 9249-1 (90 lpm, 132 char. print line)	Yes	Yes
A 9249-2 (180 lpm, 132 char. print line)	No	Yes
A 988 (164 lpm, 120 char. print line)	No	No
A 9247-2 (400 lpm, 120 char. print line)	No	No
Card Reader		
A 9114-1 (80-col, 200 cpm)	Yes	No
A 9119-1 (96-col, 300 cpm)	No	Yes
Card Reader/Punch/Data Recorder		
A 9419-2 or -6 (96-col, 300/60 cpm)	No	Yes
Paper Tape Reader		
A 9122	No	No
Paper Tape Perforator		
A 9222-1	No	No

Registers, reports, journals, statements, and inventories of many descriptions are available.

Other software functions available are a sort program, and various data conversion utilities.

The B 700 operates under the control of the System Control Program (SCP) which is primarily a serial batch processor. The SCP handles interrupts (I/O and operator), I/O transfer (including parallel I/O), and checkpoint/restart (which Burroughs calls "interrupt/resume"). The checkpoint/restart facility means that an executing program (including a utility, or sort) can be temporarily suspended. Another program can then be invoked and executed. The first program can then be resumed, without omission or duplication of any function.

The SCP is disc-oriented. Programs are read to disc before being executed. This allows for much faster processing than in the L 8000, for example.

TECHNOLOGY

Burroughs has a marketing habit — annoying to people who prefer technical accuracy — of stressing design features that are sometimes inaccurately named. For the MCP it was "virtual memory", for the B 1700 it was "bit addressability". For the B 700 the design feature inaccurately named is "Dynamic Interpreter Configuration".

Classically, an interpreter is a fixed set of routines designed to provide immediate execution of a series of programming language instructions, as each instruction is encountered.

Burroughs when it refers to an interpreter, means an organized group of micro-instructions used to control the processor functions. Immediate execution of sequential instructions does not enter into the picture at all. Also, Burroughs' interpreter refers not just to the programming language "compilers", but also to the various sort and utilities routines.

What Burroughs means by "dynamic interpreter configuration" is the following. Memory on the B 700 is divided into a shared memory (magnetic core) and nanomemory (bipolar ROM). The shared memory is used for all applications programs, utilities, sort, and the microcoded operating system. The nanomemory holds the microcode for every basic function that the machine is capable of performing. The functions in the nanomemory are language-independent.

They are a group of 256 carefully chosen instruction primitives designed to represent a composite of the basic desirable functions of Cobol, RPG, sort, various utilities, and the operating system, including I/O.

When each application program is compiled, a list is made of the micro-instructions it will use, and the proper execution sequence for the instructions. These lists are read onto disc. When the program is called into memory, micro-memory collapses to include only those micro-instructions needed for execution; the remainder of memory is therefore expanded and can be used for the processing of the application.

There is overhead in I/O transfer from memory to disc; but generally this overhead should be offset by the increased available core.

Again, as it did with the B 1700's variable word length, Burroughs has chosen not to promote what seems to be the most exciting technological aspect of the B 700 — that is, the modular treatment of the language-independent primitive instructions of the machine.

The difference between this concept and, say, the way IBM operates, is that IBM designs its basic machines around the functions represented by the Assembler language.

Burroughs in the B 700 has designed basic functions irrespective of any one particular language.

What this means for the B 700 is that any application program can have access to whatever micro-instructions are best suited to the tasks it is performing. It does not have to suffer through a series of micro-instructions that are makeshift substitutes for its preferred functions. This means that processing time and core resources are being much more effectively used.

Burroughs engineers probably learned this from their application program designers. The Business Management System, for example, is composed exactly the same way: it is a clearly defined group of basic, company-independent functions, able to be combined in a wide variety of ways to perform almost every conceivable business function (hospitals, wholesalers, banks, etc.).

The use of microprocessors will very likely give the B 700 a processing edge with respect to its competitors.

MAINTENANCE AND TRAINING

Maintenance test routines exist that will convert the system to a diagnostic tester. Microcoded diagnostics routines use test cards and a dictionary to isolate memory failures.

Maintenance of hardware, operating system software, and program products is provided if the user buys the entire package of hardware, operating system, licensing of program products, and the training of personnel. No mention was made of maintenance agreements available if the entire package is not purchased.