

Burroughs B 25

Modular Business System



Burroughs B 25 is a modular, compact system designed to span a wide range of business users needs such as:

- The "first-time" user with no previous data processing or computer experience.
- "Second-time" users who have outgrown other microcomputer's capabilities.
- Individuals in large corporations who need distributed processing capabilities.
- Small businesses who need a complete computer system including adequate disk storage, printer power and multiple workstation capabilities.
- Departments in large organizations whose members share common files.

Versatility

The key to the B 25's capabilities is its modularity. Users can start with a stand-alone dual-floppy B 25 with 256KB of memory and expand the system to 1MB of memory and 40MB of disk by simply plugging in or snapping on additional modules. These modules are interchangeable among other B 25 systems. An organization can swap modules or upgrade systems as required. All without obsolescing any part of the system.

Designed as building blocks, the B 25 hardware components are totally modular with multiple upgrade paths available. The software is also compatible throughout the upgrade path as well as with previous B 20 models. The BTOS operating system dynamically allocates, at "power up", the system's resources. So a stand-alone B 25 can be upgraded to support up to five additional (B 21, B 22 or B 25) cluster workstations without software modification.



The real-time, multi-tasking proprietary operating system, BTOS, is designed to be built upon and supports four standard programming languages — COBOL, FORTRAN, BASIC and Pascal. Data management facilities include ISAM, Forms, and Sort/Merge. Word processing is designed specifically for data processing integration. Communications protocols include Asynchronous Terminal Emulator, Burroughs Poll/Select, X.25, and IBM 3270 (SNA and Bi-Sync) and 2780/3780.

In addition to BTOS, the native B 20 operating system, the B 25 offers two industry popular operating systems, MS-DOS™ and CP/M-86®.

Burroughs B 25 was built with people in mind. Its sensitivity to the operator's physiological and psychological needs provide the user with unprecedented flexibility in locating, moving and operating a microcomputer.

System Highlights

- High performance desktop microcomputer directly addresses up to 1MB of memory.
- Each B 25 consists of a 16-bit CPU, up to 1MB of RAM, keyboard, video display, and power module.

- Proprietary X-Bus connection that allows addition of B 25 modules such as floppy or hard disks, graphics, etc.
- B 25s can be linked together via a high speed RS 422 cluster network, providing multistation access to shared resources.
- High resolution 12-inch (monochrome) or 15-inch (color) display with software control over character generation, multiple split screens and a wide range of display attributes.
- Easy hardware configuration to unique user requirements.
- Real-time, multi-tasking operating system, BTOS, provides all the functionality needed to implement real-time and interactive applications.
- Standard programming languages include COBOL, FORTRAN, BASIC and Pascal.
- Communications protocols include Asynchronous Terminal Emulator, Burroughs Poll/Select, X.25, and IBM 3270 (SNA and Bi-Sync) and 2780/3780.

- Software compatibility with previous B 20 systems.
- High speed RS 422 Local Cluster Network supporting a mixture of B 21, B 22 and B 25 systems.
- Industry Popular MS-DOS and CP/M-86 operating systems.

System Overview

Burroughs B 25 Modular Business System incorporates five major system elements — video display, processor, disk storage device, keyboard and power module.

Video Display

The B 25 can be equipped with either 12-inch monochrome or 15-inch color, character-mapped (optional bit-mapped graphics module also available) high resolution video display mounted horizontally in "landscape mode." The display may be tilted from 15 to 45 degrees above the horizontal plane, and rotated ± 30 degrees for easy viewing. The display unit's software selectable display of 29



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CP/M-86 is a registered trademark of Digital Research, Inc.

lines by 80 characters, has a 60 Hz refresh rate, and green phosphor that creates sharp, lasting images which can help reduce eyestrain. Brightness can be quickly adjusted by the operator at any time.

Processor

The processor, one of the B 25's modules, contains the CPU, memory, I/O and video circuitry, and power regulator. The CPU is an Intel IAPX 186 16-bit microprocessor.

The processor's memory can be quickly expanded from 256K to 1MB (in increments of 256K) as your user requirements grow. Each 256K RAM increment is enclosed in a sealed "game cartridge"-like module that is user installable.

The processor module also provides the following system functions:

- Memory control and video refresh logic.
 - Interrupt control.
 - RAM parity check.
 - DMA control.
 - Bootstrap (8KB ROM) software and logic.
 - Serial keyboard interface.
 - Two RS 232 data communications ports.
 - Centronics compatible parallel printer interface.
 - RS 422 cluster interface.
 - Character-mapped video controller.
 - X-Bus logic.



Storage Devices

There are four types of mass storage modules: Dual Floppy, 10MB Hard/Floppy, 10MB Hard Disk Upgrade, 10MB Hard Disk Expansion.

Dual Floppy Storage Module

The dual floppy disk subsystem contains two 5¼-inch, slim-line disk drives (each 630KB formatted), disk controller, X-Bus, and a local power regulator.

10MB Hard/Floppy Disk Storage Module

The hard/floppy disk subsystem contains one 5¼-inch, slim-line floppy drive (630KB formatted), one 5¼-inch Winchester drive (10MB formatted), disk controller, X-Bus, and local power regulator.

10MB Hard Disk Upgrade Module

The hard disk upgrade subsystem contains one 5¼-inch, slim-line Winchester drive (10MB formatted), a disk controller, X-Bus, and local power regulator.

10MB Hard Disk Expansion Module

A disk expansion capability is provided, independent of the X-bus, that allows for the addition of one 5¼-inch Winchester disk (10MB formatted) to a hard/floppy disk and/or hard disk upgrade module. With this addition, the total hard disk capacity of each hard disk subsystem is 20MB, for a total of 40MB of hard disk attached to a B 25 workstation.

Graphics Module

The Graphics Controller Module consists of a single module which contains the graphics control circuitry and X-Bus interface. The B 25 standard 12-inch monochrome monitor or 15-inch color monitor is used to display both character-mapped and bit-mapped graphics. The B 25's 15-inch color monitor can independently display any 8 colors out of a pallet of 64 selected program-matically.

The controller module contains a NEC PD7220 graphics processor capable of:

- Character-Mapped Graphics:
 - 29 lines of 80 characters each.
 - Character cell is 9 x 12 pixel with ½ dot shift.
 - Attributes: underline, blink, bold, struckthrough.
- Bit-Mapped Graphics:
 - Resolution of 720 x 348.
 - 128KB dual-ported display memory, 3 display planes.
 - Supports: line drawing, characters, and raster operations.
- Color Graphics:
 - 3 bit color code
 - 8 color display
 - 64 color pallet

Keyboard

The B 25 microcomputer's slim-line 98-key keyboard has a typewriter style, sculptured surface, contoured keycaps and palm rest for operator comfort.

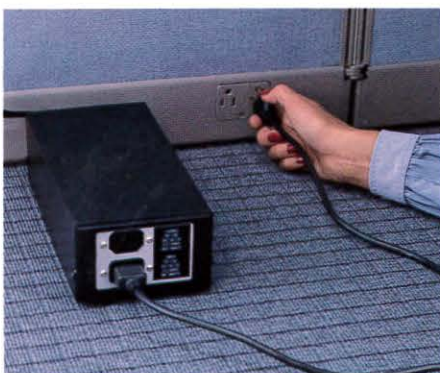
The keyboard is detachable and connected to the video module via a coiled cable that allows the keyboard to be held up to 6 feet away. Plugs are located on both the left and right side of the keyboard, thereby accommodating both left and right-hand oriented operators. The remaining unused keyboard plug may be used as a serial connection for the addition of optional input devices that share control functions with the keyboard.



The keyboard consists of a standard alphanumeric "typewriter style" section, 14-key numeric pad, and 8-key status/control function pad, 6-key cursor control pad, 4-key page control pad and 10 programmable function keys. The keyboard also provides software controllable LED indicators on 8 keys.

Power Module

The power module translates line AC to safe low-voltage 35V DC, which is distributed to each component in the system. The power module can be located close to the wall outlet keeping the main source of heat away from the operator and the system's other components. Additional power modules can be added as system power requirements grow.



Software

Burroughs software is structured for the system builder and provides the necessary components to speed application development:

- A real-time multi-task operating system, BTOS.
- Four standard programming languages.
- Program development tools.
- Data management facilities.
- Text management facilities.
- Standard communications protocols.

The BTOS Operating System provides a reliable, high-performance foundation for real-time, interactive applications. It is efficient, easily extended, and highly configurable. Its modular structure provides an adaptable environment that is ideal for implementing applications.

The BTOS operating system supports two optional operating systems, MS-DOS and CP/M-86. The machine dependent portions of these two systems, the BIOS, have been implemented to take advantage of the BTOS environment. On a hard disk system, this allows the B 25 user to switch between BTOS, MS-DOS and CP/M-86 applications at the stroke of a key, without having to reboot the system. Also, all BTOS, MS-DOS, and CP/M-86 files can coexist on the same physical hard disk drive.

On a dual floppy B 25, MS-DOS can appear to be the only operating system running. When the system is booted, the user does not see BTOS at all, the system appears to enter directly into MS-DOS.

Through the use of these two optional operating systems, it is possible to run many of the most popular applications packages available for personal computers.

Burroughs BTOS programming languages are:

- COBOL—ANSI '74 (high/intermediate level).
- FORTRAN—ANSI '77.
- Pascal—ISO draft 5.
- BASIC—ANSI '78.

Each language implements its relevant standard, augmented by extensions aimed at enhancing its utility in its application areas.

Productive program development requires good tools. Burroughs B 25 provides a complete, state-of-the-art environment. The B 25 Editor makes it easy to write and revise source code. The Linker/Librarian is used to maintain object libraries and to link together independently compiled modules. The Debugger is a powerful software debugging tool designed to help debug programs efficiently, including real-time programs.

Data management facilities are optimized for the B 25 system architecture. The multi-key ISAM provides flexible access to records with an option for record-level locking; its B-Tree implementation allows efficient retrieval by exact match, range match, or prefix match. The Forms facility makes it easy to design screen forms, display them on the screen, and accept operator-supplied data. The Sort/Merge facility sorts multiple files of unordered records and merges multiple files of ordered records into one ordered file.

Text management facilities are organized by the system builder. WRITEone is a state-of-the-art word processing package that includes a document assembly feature to allow merging of data processing and word processing capabilities.

Five industry standard communications packages are supported: Burroughs Poll/Select, IBM 3270 (Bi-Synch and SNA) and 2780/3780 RJE Terminal Emulator, Asynchronous Terminal Emulator, and X.25.

The Business Graphics Package is designed with both small business and departments of large corporations in mind. It is a powerful tool for creating high quality business graphics and charts on B 25 graphics workstations for easy data interpretation and presentation.

The Business Graphics Package is designed with a "seamless interface" to MULTIPLAN™.

An application program interface allows data created by custom application programs to be graphed without any special programming knowledge.

The Business Graphics Package is highly interactive and virtually self-teaching. With on-screen function key labels and menus, even a beginner can create, edit, combine, and rearrange standard bar, pie, and line charts in minutes.

MULTIPLAN, an executive planning tool, provides an electronic "spreadsheet" of up to 63 columns and 255 rows. By utilizing the "spreadsheet," decision makers can define the relationships of pertinent financial data, determine the outcome of changes to that data, and analyze "what if" results.

MULTIPLAN through Symbolic Link (SYLK) files, allows for an interface to data files created by other programs and vice versa.

A "seamless" interface between MULTIPLAN and the Business Graphics Package allows a user to graphically interpret data from MULTIPLAN worksheets.

The addition of the graphics option makes MULTIPLAN an extremely powerful, flexible, and efficient planning tool.

Data Manager is a parameter driven application development tool. It significantly simplifies application program development and increases programmer productivity. It can be used by B 25 users and third-party programmers to develop custom software for the B 25.

The complete menu interface, easy-to-read screen formats and reports, optional help screens, concise error messages and consistent use of function keys make B 20 Data Manager application systems easy to use.

The B 25 Mail Master is a fully distributed electronic mail system that allows the user to compose, send and receive messages. It automates communications in the office, substantially reduces paper traffic and ensures that information is distributed in a timely and efficient manner.

System Specifications Memory Capacity

Maximum RAM: 1MB
Minimum RAM: 256KB
Maximum ROM: 16KB

Mass Storage Dual Floppy Storage Module

- Two 5¼-inch, slim-line disk drives (630KB formatted each).
- Disk controller.
- X-Bus interface.

10MB Hard/Floppy Storage Module

- One 5¼-inch Winchester hard disk (10MB formatted).
- One 5¼-inch, slim-line floppy disk (630 formatted).
- Disk controller.
- X-Bus interface.

10MB Hard Disk Upgrade Module

- One 5¼-inch Winchester hard disk (10MB formatted).
- Disk controller.
- X-Bus interface.

10MB Hard Disk Expansion Module:

- One 5¼-inch Winchester hard disk (10MB formatted).
- Add-on for Hard/Floppy and/or hard disk upgrade modules.
- Independent of X-Bus.

Timing

Mass Storage Timing

- 5¼-inch Winchester Disk Drive (10MB formatted)
Transfer Rate: 5.0 M Bits/Second.
Access Time (Avg.): 85 msec.
(Including hd. settle time).
Access Time (track to track): 3 msec.
- Floppy Disk Drive (630 KB formatted)
Transfer Rate: 250 K Bits/Second.
Access Time (Avg.): 94 msec.
(Including hd. settle time).
Access Time (track to track): 3 msec.
Motor Start Time: 250 msec.

Serial I/O Rates

- External Clock
RS-232C: 110 baud to 19.2 K baud.
- Internal Clock:
RS-232C: 50 baud to 19.2 K baud.
RS-422: 110 baud to 1.8 M baud.

Parallel I/O Rate (printer interface):
Programmed I/O: 9.6K CPS typical.

Electrical Specifications

AC Power Capacity:
60Hz ± 0.5Hz (U.S.).
50Hz ± 0.5Hz (International).

Voltage:
85 to 130 Vrms (U.S.).
170 to 260 Vrms (International).

AC Power Requirements:

- B 25 System with one (1) Power Module:
150 Watts—
2.5 Amps (U.S.).
1.2 Amps (International).

- B 25 System with two (2) Power Modules:
300 Watts—
5.0 Amps (U.S.).
2.5 Amps (International).
- B 25 System with three (3) Power Modules:
400 Watts—
7.5 Amps (U.S.).
3.8 Amps (International).
- B 25-D3 15-inch Color Display:
100 Watts—
2.0 Amps (U.S.).
1.0 Amps (International).

Temperature and Humidity

Operating Temperature:
0°C to 40°C.
32°F to 104°F.

Non-Operating Temperature:
-40°C to 75°C.
-40°F to 167°F.

Humidity:
5% to 95%.

Environmental and Safety

- Meets UL 478 (EDP) and 114 (Office Equipment).
- Meets CSA 154 (EDP) and 143 (Office Equipment).
- Designed to meet VDE 0806 (EDP and Office).

- Meets BSI 5850 (electrical safety of office equipment).
- Meets IEC 380 (electrical safety of office equipment).

EMI

- Designed to meet U.S. FCC Rules and Regulations, Part 15, Subpart J, Class B.
- Designed to meet VDE 0871 Level A.

Altitude

Operating: 15,000 feet ASL
(4575 meters)

Non-Operating: 25,000 feet ASL
(7625 meters)

Acoustic Noise Level: NR 30

Physical Specifications

| MODULE | HEIGHT | | WIDTH | | DEPTH | | WEIGHT* | |
|----------|--------|-------|-------|-------|-------|-------|---------|-------|
| | In. | cm | In. | cm | In. | cm | Lbs. | Kgs |
| B 26-CPU | 8.00 | 20.32 | 5.75 | 14.61 | 12.00 | 30.48 | 12.0 | 5.46 |
| B 26-256 | 6.75 | 17.15 | 6.75 | 17.15 | .75 | 1.90 | 1.0 | .49 |
| B 25-D1 | 12.00 | 30.48 | 12.25 | 31.12 | 12.00 | 30.48 | 21.0 | 9.55 |
| B 25-K1 | 1.18 | 30.00 | 18.00 | 45.72 | 9.00 | 22.86 | 5.0 | 2.27 |
| B 25-M1 | 8.00 | 20.32 | 5.75 | 14.61 | 12.00 | 30.48 | 15.0 | 6.82 |
| B 25-M3 | 8.00 | 20.32 | 5.75 | 14.61 | 12.00 | 30.48 | 14.0 | 6.36 |
| B 25-MU3 | 8.00 | 20.32 | 4.60 | 11.68 | 12.00 | 30.48 | 7.7 | 3.50 |
| B 25-MX3 | 8.00 | 20.32 | 2.52 | 6.40 | 12.00 | 30.48 | 6.0 | 2.73 |
| B 25-GRA | 8.00 | 20.32 | 2.52 | 6.40 | 12.00 | 30.48 | 5.0 | 2.27 |
| B 25-D3 | 15.00 | 30.10 | 13.75 | 34.93 | 15.00 | 30.10 | 27.0 | 12.27 |
| B 25-PS | 3.00 | 7.62 | 4.50 | 11.43 | 10.50 | 26.67 | 5.0 | 2.27 |

*Shipping Weight

| | |
|-------------------------------|--|
| Cable Lengths: AC Power Cable | 6.5 Ft. 1.98 M |
| DC Power Cable | 6.0 Ft. 1.83 M |
| Keyboard to Monitor | 14 In. (Coiled) 5.51 cm 6 Ft. (Extended) 1.83 M |
| Cluster Cable (RS422) | 50 Ft. (15.27 M) |
| Maximum Cluster Diameter | 1200 Ft. (366 M) |

Burroughs